

Data Collection Survey on the Digital Health for the Covid-19 Response (QCBS)

Final Report Appendix and Summary

February 2022

Japan International Cooperation Agency (JICA)

International Total Engineering Corporation

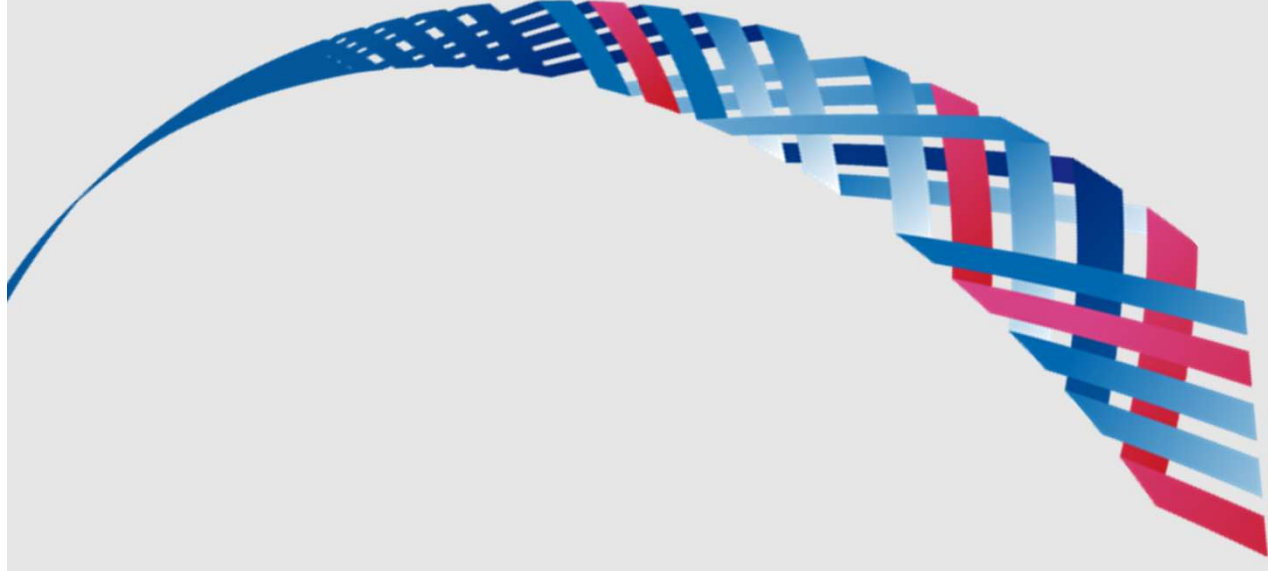
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Appendix 1. Domestic projects related to this survey



Domestic projects related to this survey (1/2)

No.	Organization	Department	Year	Project	Outline
1	JICA	Office for STI and DX, Governance and Peacebuilding Department	-	Worldwide (wide-area) data collection and confirmation survey for DX mainstreaming	<p>In order to mainstream DX, this project collects and analyzes basic information on the impact of digital technology and examples of its use in the rapidly developing field of development cooperation, and examines how to mainstream DX in JICA projects and the mechanisms for utilizing data. Based on the trials and lessons learned through the pilot activities, information will be collected and analyzed in order to formulate preconditions for the formation of cooperation programs and projects.</p>
2	JICA	Private Sector Partnership and Finance Department	2019	Data collection and confirmation survey on the use of the private sector to improve health in Six African Countries	<p>In order to promote the contribution of the Japanese private sector to the improvement of health in Africa, this project collects and analyzes basic information that will lead to the formation of projects that will realize sustainable improvement of people's health by utilizing the technological capabilities of Japanese companies.</p>
3	JICA	Private Sector Partnership and Finance Department	2020	Data collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the global health sector (strengthening measures against infectious diseases and improving nutrition)	<p>This project collects and analyzes the current situation, changing needs, and structural changes in the industry due to COVID-19 in the healthcare sector in the target countries. This project also identifies the products and technologies of Japanese companies in the field that meet the changing conditions and needs, and analyzes and examines the effectiveness of the products and technologies in the target countries and their potential for use in ODA projects.</p>
4	JICA	Private Sector Partnership and Finance Department	2021	Data collection and confirmation survey on matching needs of developing countries with private sector technologies for global healthcare and welfare (aging and nursing care)	<p>This project researches the needs of countries around the world in the fields of health care and welfare, including COVID-19 countermeasures, and support the matching of technologies and products of Japanese private companies that can provide solutions to these needs. The specific themes of the targeted technologies and products are strengthening countermeasures against infectious diseases, telemedicine, measures for aging and nursing care, and human resource development and return flows. A total of 10 private sector technologies and products will be brought to one of the 11 target countries for a pitch event. Among the private companies, the focus will be on the potential for venture companies, including start-ups, to enter the market.</p>

Domestic projects related to this survey (2/2)

No.	Organization	Department	Year	Project	Outline
5	JICA	Economic Development Department	2020	Basic data collection and confirmation survey on formation of technology cooperation facility and ecosystem for global impact investment	Through matching of innovative technologies (including those of Japanese companies) with start-ups in target countries in the fields of health and medical care, public health, and agriculture (food, nutrition, etc.), support for the formulation of commercialization plans by local start-ups, and support for the trial implementation of commercialization, consider specific TA facilities under different ecosystems, the role of public institutions, and methods of ecosystem formation.
6	JICA	-	2020	Consultant for data collection survey for improvement of investment environment in Africa	Mapping of global trends in digital health and relevant digital health technologies and players in Africa are conducted. In addition, the main medical issues, digital health technologies, players, and barriers to future digital health deployment in individual target countries (Kenya, Nigeria, Senegal, and Cote d'Ivoire) will be extracted, and future support measures by JICA are proposed.
7	Cabinet Office	Cabinet Secretariat Health & Medical strategic office	2020	Basic survey for selecting candidate countries for new MOC agreements in Africa and finding business partners in the healthcare field	This project provides basic information on the health care sector in African countries as a basis for examining potential new countries for the African Health Initiative, changes in the situation due to the new coronavirus, and surveys of local companies that could be business partners for Japanese companies.
8	Cabinet Office	Cabinet Secretariat Health & Medical strategic office	2020	Survey on the possibility of establishing a private sector business for the "Africa Health Initiative"	In collaboration with the Healthcare Working Group of the African Business Council, this project compiles examples of private sector projects and business proposals in the healthcare field that could be proposed to African countries, and conducted a needs assessment and business introduction seminar for local medical professionals in Ghana and Kenya.
9	Cabinet Office	Cabinet Secretariat Health & Medical strategic office	2020	Online international conference management support services on the theme of telemedicine using ICT devices and software, etc.	Targeting the Philippines, India, Vietnam, and Indonesia, with which the Japanese government has concluded a memorandum of cooperation to promote the Asian Health Initiative, online international conferences will be held with local doctors and medical professionals as well as Japanese medical ICT companies to understand local needs through dialogue.

Appendix 2. Major donors and their support for the implementation of digital health



Major donors and their support for the implementation of digital health

Summary Each donor is aware of the effectiveness of digital health in solving medical issues in developing countries and is providing support and investment. There are many programs that match companies with digital health technology with government agencies in countries and regions that need support, and provide opportunities to verify the business feasibility and effectiveness.

■ Typical Donors and Their Main Support for the Promotion of Digital Health (Global)

Donor

Bill & Melinda Gates Foundation

Main Support

Based on the four main initiatives of digital health, HIV, innovation technology, and diagnostics, the project will conduct research and short-term investments in technologies that have the potential to contribute to solving medical issues faced by the poor and other populations in developing countries. Technologies that are judged to be promising will be tested for applicability to specific issues through Proof of Concept (PoC). If the technology is judged to be applicable, additional investment will be made and the technology will be introduced to other foundations, institutions, and programs.

■ Innovations for Improving the Impact of Health Campaigns

The program is conducted on a regular basis and is open to a wide range of innovative technologies that contribute to improving health campaigns in developing countries.

Center for Disease Control and Prevention (CDC)

■ HQ Supported Development, Implementation, Use and Evaluation of Interoperable HIS to Achieve HIV/AIDS and TB Epidemic Control under PEPFAR

Under the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), support the development, implementation, and operation of interoperable medical information systems (electronic medical records, laboratory information systems, etc.) to control the epidemic of HIV/AIDS and tuberculosis in PEPFAR target countries.

International Finance Corporation (IFC)

■ TechEmergence

The program invites companies and other organizations with innovative technologies from around the world and matches them with key companies and institutions in emerging markets to pilot their technologies, services, and business models, thereby promoting the adoption of technologies that have the potential to contribute most to solving problems. The winners will receive grants and support during the PoC, and successful PoCs will be eligible for business contracts with local companies and potential investment opportunities from IFC. TechEmergence has three focus areas: healthcare, resilience, and sustainable cooling, and has a program for each. Healthcare (TechEmergence Health) targets East Africa, Brazil, and India.

Inter-American Development Bank (IDB)

■ Open Innovation for the Health Sector in the Fight Against COVID-19

Gov, an open innovation program of the state government of Sao Paulo. "Gov" is a partnership between InovaHC and IPA to validate medical technology solutions related to COVID-19.

National Institute of Health (NIH)

■ Mobile Health: Technology and Outcomes in Low and Middle Income Countries (R21/R33 - Clinical Trial Optional)

Have research proposals on the development, validation, feasibility, and effectiveness of innovative mobile health interventions and tools specific to low- and middle-income countries. Support will be provided for up to two years (R21 phase) for technology development and demonstration research, followed by a larger scale demonstration (R33 phase). The goal is to promote innovation through interdisciplinary research to solve global health problems, build the evidence base on the use of mobile health technologies to improve clinical and public health outcomes, and strengthen mobile health research capacity in low- and middle-income countries.

Major donors and their support for the implementation of digital health

Summary Various digital health-related programs are being implemented by various donors. On the other hand, there are cases where the contents of support are fragmented or duplicated, and there is a growing need for cooperation and coordination among donors to ensure effective and efficient support.

■ Mechanism for Co-creation and Collaboration Among Donors on Promotion of Digital Health (Global)

Program	Organizing	Main Support
Digital Health Atlas (DHA)	WHO	Formed an open-source web platform designed to support national governments, donors, technologists, and implementers to coordinate digital health activities globally.
Digital Square	PATH A U.S. non-profit organization funded and established by the U.S. Agency for International Development, the Bill & Melinda Gates Foundation, and a consortium of other donors.	Digital Square is a PATH-led initiative. It supports three main areas. (1) Support for investment opportunities, procurement and operation support Development of digital health solutions (3) Leading the DXification of the medical system at the national level
Digital Health Leadership Program	African Alliance of Digital Health Networks	It aims to support the development of the technical capacity of African digital health leaders, especially government agencies, to manage digital health initiatives, investment and development in the country. It will develop human resources in a systematic and coherent manner through training, mentorship and support throughout the program. The program will aim to improve digital health capacity across the continent, with a particular focus on public sector institutions such as national health ministries and technology (or communications) ministries in Africa.
■ Collaborative Framework Among Donors on Promoting Digital Health (Global)		
Program	Main Participating Donors	Main Support
Digital Investment Principles	African Development Fund Bill & Melinda Gates Foundation CDC European Union UK aid Unicef USAID World Bank, etc.	In developing countries, support and investment in the field of digital health by various countries and organizations are increasing, but development effectiveness and efficiency may be compromised due to fragmented or overlapping support. Based on the Digital Investment Principles, each donor will collaborate on the content of support for digital health in the target countries, and will aim to make transparent investments and measure development effectiveness in accordance with the development strategies and technology levels of the target countries. Digital Investment Principles were launched at the 2018 Global Health Summit.

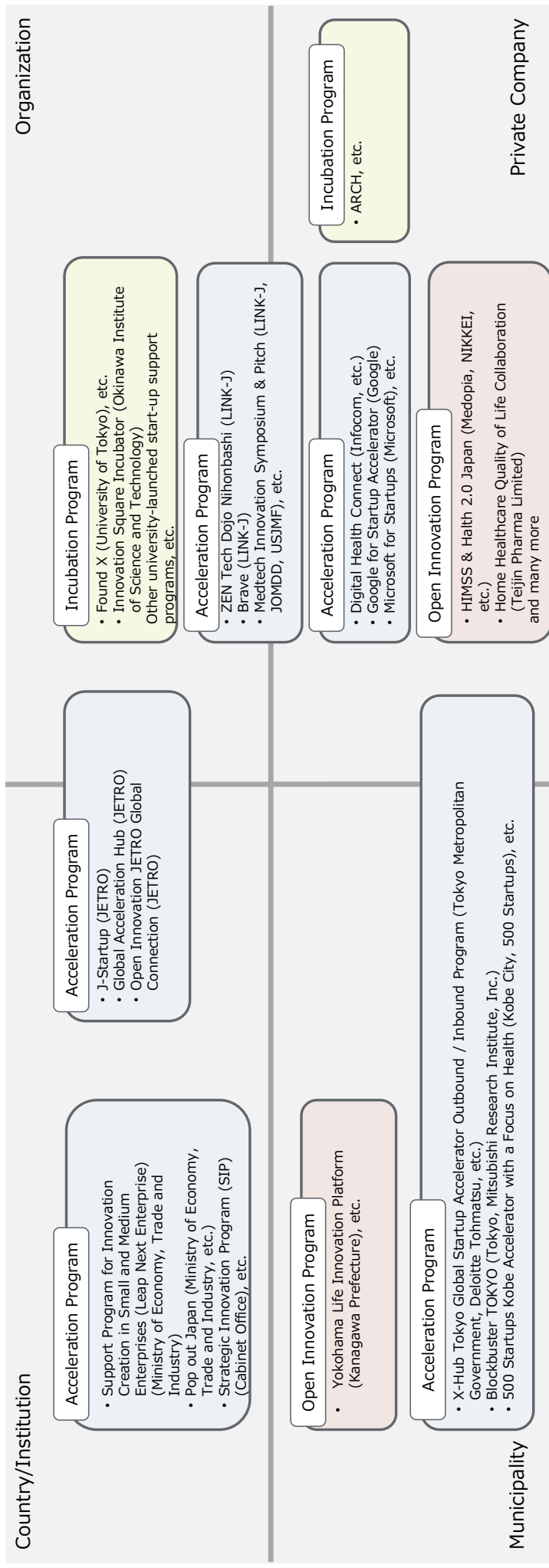
**Appendix 3.
Major co-creation/co-operation initiatives and specific
support for the promotion of the healthcare sector,
including Digital Health**



Major co-creation/co-operation initiatives, specific support (Japan)

Summary In Japan, the following co-creation and collaboration initiatives are being implemented in the promotion of the healthcare sector, including digital health. In addition to governmental support for the overseas deployment of private companies and technologies, there is a wide range of opportunities for local governments and private companies and organizations to pitch and match, provide funding, and conduct demonstration experiments.

- Major Co-creation/Cooperation Initiatives and Specific Support for the Promotion of the Healthcare Field Including Digital Health (Japan, Including Past Examples)
- In recent years, there has been an increase in the number of open innovation programs and demonstration programs and demonstration experiment programs, sponsored by local governments, which has increased competition among local governments in promoting DX and attracting companies. The content of these programs varies widely, ranging from business matching to mentoring for selected companies, pitching opportunities, support for market and intellectual property research, and opportunities for demonstration experiments at public facilities.
- On the other hand, many open innovation programs sponsored by private companies are meant to find partners outside the company for the development of new technologies and products using the company's technologies.



Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's Major Venture Business Support Programs (Only Programs Targeting the Healthcare Sector) (for_overseas_1/3)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Cabinet Secretariat	Asia DX Project	Up to 40 million yen	Promoting the creation of new businesses through collaboration with companies in emerging countries as an opportunity to change the corporate culture of Japanese companies. The Japan External Trade Organization (JETRO) has established a DX Promotion Team, and JETRO and Japanese diplomatic missions abroad are working together to promote collaboration between Japanese companies and companies in emerging countries by identifying promising companies in emerging countries and supporting coordination with local governments. In collaboration with the relevant ministries and agencies, the team will pick up the first pioneering companies and create a leading model that will generate a "Peer Effect."
Ministry of Economy, Trade and Industry	Innovation Creation Support Program for Small and Medium-Sized Enterprises "Leap Next Enterprise	Subsidized travel and accommodation expenses	This is a program that selects small, medium, and venture companies with high technology and excellent business ideas from all over Japan and sends them to Silicon Valley and other advanced innovation hubs overseas. The program supports the global expansion of the participating companies through visits to excellent overseas startup ecosystems and individual meetings with local companies and investors.
	J-Startup "The next growth for Japanese startups. The next innovation for the world.	-	The goal is to achieve the government's goals through the creation of globally growing startups, and to further strengthen Japan's startup ecosystem by fostering an entrepreneurial mindset throughout society to launch their own companies and take on challenges through the creation of role models. Support for overseas expansion, inbound support, and the establishment of a tax system to promote open innovation will be implemented.
	Global Startup Ecosystem Enhancement Project	-	"We will accurately grasp the demands of Japanese startups, including those participating in the J-Startup program, and provide support appropriate to each phase to promote growth into unicorn companies. In addition, to create unicorn companies, we will support the development of innovators who can work globally and mass production of manufacturing startups, and strengthen the player base of the startup ecosystem.
	Project to support the commercialization of intellectual property from Japan JETRO Innovation Program (JIP)	-	We support the overseas expansion of small and medium-sized companies and start-ups with innovative technologies, products and intellectual property. In partnership with overseas accelerators, we provide hands-on support for the overseas expansion of Japanese companies by offering a variety of support services such as business model development, mentoring, pitches, and opportunities for business negotiations at exhibitions.
	JETRO Global Acceleration Hub (JGAH) Open Innovation JETRO Global Connection (JETRO)	-	Partnering with accelerators in advanced startup ecosystems around the world to support the local development of Japanese startups and the expansion of leading local startups into Japan. In light of the impact of COVID-19, we have strengthened our online services.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's Major Venture Business Support Programs (Only Programs Targeting the Healthcare Sector) (for_overseas_2/3)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Ministry of Economy, Trade and Industry	X-HUB TOKYO GLOBAL STARTUP ACCELERATOR	-	A platform that connects the innovation ecosystem of Tokyo and the world and accelerates the startups that will open up a new era. It provides Tokyo-based startups with the information they need to conquer overseas markets, as well In addition to providing opportunities for human networks, mentoring, and pitches with large corporations and VCs, we also support the creation of an unprecedented new normal through exchanges between overseas startups and companies in Tokyo.
	J-Bridge	-	A business platform for collaboration and cooperation between Japanese companies and overseas start-up companies. We support international open innovation that utilizes the digital technologies of Japanese companies. We support the selection of strategies, the selection of potential partner companies, and the realization of commercialization in collaboration with experts, and we hold online seminars, matchmaking, hackathons, and other events using our DX platform.
ASEAN-Japan Economic and Industrial Cooperation Committee	DISG (Dialogue for Innovative and Sustainable Growth)	-	"In addition to the information dissemination through the website, webinars with a wide range of stakeholders (government officials, industry and academia) will be held once a month.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's Major Venture Business Support Programs (Only Programs Targeting the Healthcare Sector) (for_overseas_3/3)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Tokyo Metropolitan Government	Blockbuster TOKYO	-	By providing various programs to address the issues faced by drug discovery and medical ventures, we aim to encourage entrepreneurship and growth, revitalize the Tokyo economy, and contribute to the health and longevity of the people of Tokyo and the nation. Support for research for marketability and intellectual property strategy of seeds, matching with experts, individual mentoring, and holding global pitches to overseas VCs and companies.
Kobe City	500 Startups Kobe Accelerator	-	In 2015, 500 Startups launched an initiative to accumulate and nurture startups with the aim of creating an ecosystem that generates innovation for the sustainable development of the Kobe economy. Mentors selected by 500 Startups from all over the world, including Silicon Valley, provide the program for eight weeks. As support from the city of Kobe, the program provides commercialization support and special mentoring in collaboration with Kobe Medical Industry Development Project.
City of Yokohama	Yokohama Life Innovation Platform (LIP, Yokohama)	-	A platform for the City of Yokohama to work with industry, government and academia with the aim of continuously creating innovation in the health and medical fields from Yokohama. It promotes the development of new technologies and products by creating innovative projects from a network of companies, universities, and research institutes, as well as providing support for commercialization to small and medium-sized venture companies. Collaborates with the acceleration program of CONNECT, a start-up support organization in San Diego, USA.
Google	Google for Startups Accelerator	-	Google provides expert support to promising startups using AI technology across a wide range of areas, including technology and organizational management. This includes support for developing company and product strategies, opening the Google for Startups Campus, and mentoring by Google mentors.
Microsoft	microsoft for startups	Approximately 2.5 million yen in free Azure credits per year	A support program for BtoB startups with unique and innovative technical solutions. Once selected for the program, they will receive enterprise-level technical support, as well as technical and sales support to help them grow their business.
Medopia Nikkei Inc.	HIMSS & Health 2.0 Japan	-	An opportunity for opinion leaders and innovators to come together to share their experiences and thoughts, and to experience demonstrations of the latest healthcare technologies. A place to learn and share information with the common goal of using data and technology to develop healthcare in Japan, as Japanese society is rapidly aging.
Internet Corporation for Assigned Names and Numbers	Pop out Japan!	Up to 30 million yen per company	We support small and medium-sized enterprises (SMEs) that work with local universities, research institutions, NGOs, and companies in developing countries to develop products and services that will help solve social issues in those countries. By providing support to business supporters in developing countries such as Africa, we promote the resolution of social issues in developing countries and the overseas expansion of small and medium-sized companies.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's Major Venture Business Support Programs (Only Programs Targeting the Healthcare Sector) (for_Japan_1/4)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Cabinet Office	Strategic Innovation Program (SIP)	Commissioned research expenses	To address issues that are essential to society and important to Japan's economic and industrial competitiveness, we promote cross-sectoral initiatives in cooperation with government ministries and agencies through industry-academia-government collaboration. Promote research and development with an eye on everything from basic research to practical application and commercialization. Support for intellectual property systems that make it easier for companies to strategically utilize research results.
Cabinet Office	Integrated Innovation Strategy 2020 (approved by the Cabinet on July 17, 2020)	-	(1) Doubling the number of venture companies established by universities and R&D corporations from the FY2016 level, (2) raising the ratio of venture investment to nominal GDP to the world's highest level, and (3) creating 20 unlisted or listed venture companies with corporate value or market capitalization of at least one billion dollars by 2023. (3) Create 20 unlisted or listed venture companies with corporate value or market capitalization of \$1 billion or more by 2023. In order to overcome the fact that the economic activities of start-ups in Japan are still minor, we aim to form a start-up ecosystem centered on cities represented by the United States and China.
	Japan Open Innovation Prize (JOIP)	-	Open innovation initiatives that are leading, highly original, exemplary, and socially relevant Awards will be given for high impact and sustainability in the form of Minister's Prizes for each area of responsibility and President's Prizes for economic and academic organizations, and the best of each award will be given the Prime Minister's Prize.
Ministry of Economy, Trade and Industry	IP Acceleration Program for Startups (IPAS)	-	A program to accelerate the growth of startups in terms of both business and intellectual property. Business mentors and IP mentors provide mentoring to startups on diagnosis of IP/business strategies, brush-up of strategies, and growth strategies. The mentoring team is made up of multiple experts with skills and knowledge that match the challenges and support needs of the startups they support.
	NEDO TCP (Technology Commercialization Program)	-	This program is designed to support entrepreneurs, pre-entrepreneurs, and researchers with an entrepreneurial mindset who want to start a business based on technology and greatly expand their business. The program supports (1) educational programs that provide the knowledge necessary to commercialize technology seeds, (2) support and mentoring by experts in the preparation of business plans, and (3) business plan presentations, networking, and matching to large companies and venture capitalists in order to link them to business.
	AIST&DBJ VENTURE2050	-	This is a framework to support the creation of ventures through collaboration between the National Institute of Advanced Industrial Science and Technology (AIST) and the Development Bank of Japan (DBJ). By combining AIST's R&D and technological capabilities with DBJ's financial and commercialization know-how, the aim is to create technology-based ventures that contribute to solving social issues and realizing a sustainable society.
	Unexplored Advanced Business	Up to 10 million yen for activities	In addition to guidance and advice by project managers and business advisors who have excellent abilities and achievements, the project will provide activity expenses according to the results of activities (results of engagement in training) so that unexplored IT human resources can make the most of their own ideas and technical capabilities to solve business and social issues.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's major venture business support programs (only programs targeting the healthcare sector) (for Japan_2/4)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Ministry of Economy, Trade and Industry	Research and Development Type Startup Support Project NEDO Entrepreneurs Program (NEP)	Up to 30 million yen per project depending on project type	The program aims to promote entrepreneurship and accelerate the commercialization of R&D startups by providing potential entrepreneurs with funds for confirming the principles of technology seeds and market demand, training and individual mentoring for building business plans for commercialization, business plan presentations, and matching opportunities with investors and business companies. The goal is to promote entrepreneurship and accelerate commercialization of R&D startups.
	R&D Startup Support Project / Commercialization Support for R&D Startups in Seed Stage (STS)	Up to 70 million yen or up to 200 million yen	By cooperating with VCs and NEDO to support the funds and activities necessary for the research, development, and commercialization of STSs (Seed-stage Technology-based Startups), we aim to create and nurture STSs that will become future mega ventures. The purpose of this program is to create and foster STS that will become future mega ventures, and to strengthen the ecosystem by stimulating the activities of VCs and other organizations with global networks in Japan.
	R&D-based Startup Support Project / Product Commercialization Alliance (PCA)	Up to 250 million yen in principle	The purpose of this program is to support R&D start-ups that have a business plan that can be expected to generate continuous sales through commercialization by approximately three years from the time of proposal, a highly certain fund-raising plan, and a system to achieve these goals (internal system, external collaboration system, etc.), and that have a high need for subsidies in order to achieve commercialization. The purpose of this program is to support R&D startups that have a plan to achieve these goals (internal structure, external collaboration, etc.) and have a high need for subsidies to achieve commercialization.
	Research and Development Type Startup Support Project / Project to Promote Commercialization of Startups Contributing to Economic Structural Transformation (TRY)	Grant amount: Up to 100 million yen in principle Subsidy rate: 2/3 or less of eligible expenses	Grants are provided to R&D-oriented startups that see the market changes resulting from the shift in social structure as a great opportunity and are moving forward to transform their business with a significant social impact. Among the mining and industrial technologies (robotics, AI, electronics, IoT, clean technology, materials, medical equipment, life science, etc.) under the jurisdiction of the Ministry of Economy, Trade and Industry, this program targets technology development that contributes to the realization of new social patterns (non-contact, telemedicine, unmanned vehicles, and other technologies that solve various social issues).
	Healthcare Innovation Hub (InnoHub)	-	Consultation service for venture companies involved in healthcare and life sciences. Depending on the content of the consultation, the center provides business plan consultation, information and matching to supporters and support groups (InnoHub advisors and supporters) for healthcare ventures, etc., and supports the consultant by utilizing its diverse network.
Ministry of Internal Affairs and Communications (formerly Ministry of Public Management, Home Affairs, Posts and Telecommunications)	Xenophobic vation	3 million yen (upper limit)	In the world's unpredictable ICT field, where new technologies and ideas are born every day, it is important to be prepared for the unexpected. It's an outlandish, unconventional world with great potential for creating devastating global value. Helping you tackle vicious technical challenges. Challenging worthwhile failures that provide a clear path to the goal. Foster an atmosphere where people are not afraid to fight.
Ministry of Health, Labour and Welfare	Medical venture and total support business (MEDISO)	-	We match medical venture companies, academia, and other organizations that are facing challenges in commercializing their products with experts who can provide advice on how to solve these challenges (experts in various fields such as legal compliance, marketing, business planning, financing, management strategy, intellectual property strategy, and international expansion). It provides detailed consultation and support for each stage of the process, with a comprehensive and bird's-eye view of everything from the R&D stage to practical application in clinical settings, insurance coverage, and entry and spread in the global market.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's major venture business support programs (only programs targeting the healthcare sector) (for Japan_3/4)

*Subsidized or Unsubsidized: "-" means not exist or unknown.

Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Ministry of Education, Culture, Sports, Science and Technology	Program for the Creation of New Industries from Universities (START)	Up to about 30 million yen per year Up to 3 years	By July 2020, 53 START-launched ventures have been created. By July 2020, 53 START-launched venture companies have been created.
	Social Contribution Acceleration Program (SCORE)	Team promotion type 1 year in principle 5 million yen/year University support type 5 years in principle 60 million yen/year	The purpose of this program is to promote the creation of university-launched ventures as a preliminary step to START. In the "team promotion type," researchers and commercialization producers support practical learning of knowledge useful for starting a business through training and mentoring by accelerators with commercialization support know-how. In the "university promotion type", the industry-academia collaboration division supports the recruitment and selection of research and development issues for the creation of university-launched ventures based on technological seeds within the university, as well as the operation of support programs for entrepreneurial activities and activities for the realization of sustainable support for entrepreneurial activities after the support period.
	Support Program for New Business Creation through Investment (SUCCESS)	Maximum investment Less than 1/2 of total voting rights and less than 500 million yen per company in cumulative amount	JST provides capital, human resources, and technical assistance to venture companies that aim to commercialize the results of JST's R&D. The aim is to attract private sector funds by making JST a shareholder of the venture company. In addition to financial contributions, JST can also provide in-kind contributions of its intellectual property and equipment. In particular, by allowing in-kind contributions of intellectual property, it is expected that unused patents held by JST and universities will be effectively utilized.
Tokyo Metropolitan Government	Research and Development Environment Improvement Support Project (Wet Laboratory Rent Subsidy)	Subsidy rate: 1/2 of eligible expenses Upper limit: 2 million yen per year per case	This program supports individuals or corporations that are engaged in specific R&D projects for the practical application of seeds in the fields of drug discovery and medical care by providing support for moving into facilities (wet labs) that contribute to R&D.
Japan Medical Research and Development Organization (AMED)	Creation of Innovative Core for Medical Research and Development (CICLE)	-	By mobilizing the power of Japan through industry-academia-government collaboration, we will form the foundation (including human resources) for fundamental innovation in R&D that accurately responds to the demands of the medical field and accelerates the practical application of drug discovery, etc. We will also promote the creation of an environment that strongly promotes open innovation and venture development in the field of medical R&D.
The University of Tokyo	Medical Engineering Innovation Promotion Project	Up to about 78 million yen/year, depending on class	Promote the entry of small and medium-sized companies and venture businesses with advanced manufacturing technologies into the medical device field, as well as collaboration and joint projects with medical facilities, with the aim of revitalizing Japan's medical device industry and promoting the development and commercialization of medical devices that meet the demands of the medical field, including the realization of improvements in the quality of medical care.
	FOUNDX	-	Startup support program run by the University of Tokyo. For graduates and researchers of the University of Tokyo and graduate schools who are about to start a startup, we provide free resources useful for starting a business. Provides an environment where they can grow their business and develop as entrepreneurs, and supports them on their way to being able to raise lucrative funds.

Major co-creation/co-operation initiatives, specific support (Japan)

■ (Reference) Japan's major venture business support programs (only programs targeting the healthcare sector) (for Japan_4/4)

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Institution/ Companies	Program Name	Subsidized or Unsubsidized	Overview
Beyond Next Ventures, Inc.	BRAVE	Recommendations for JST START and NED STS	The program provides researchers and entrepreneurs from universities and research institutes with the knowledge and know-how to commercialize innovative technologies, as well as human resource networks and growth capital. It is one of the largest acceleration programs in Japan specializing in pre-startup university technology seeds. A unique feature of this program is that you can find executives and advisors in the early stages of business, as well as managers and co-founders who are responsible for promoting commercialization. The program includes training programs and mentoring by experts in various industries and experienced managers, followed by a pitch competition on the last day.
Indy Japan Co.	ZENTECH DOJO NIHONBASHI	Up to 5 million yen in angel investment	An entrepreneurship support program that examines the first steps of starting a business from the stage before a business model is formed by emphasizing soft support such as knowledge, experience, and personal connections more than financial support, unlike general support by venture capitalists. The program provides entrepreneurial support, angel investment, technical consultation, regulatory and legal support, fundraising support, mentoring, etc.
LINK-J	Medtech Innovation Symposium & Pitch	Invest up to 100 million yen or subsidize development costs for the winner	The symposium will feature keynote speeches and panel discussions by researchers at the forefront of medical innovation under the theme of "Digitalization in Medicine, Medical Big Data, and the Transformation of Industry and Medicine through Technology. At the pitch event, start-up companies that provide medical devices and services will make business pitches in front of a panel of judges including medtech venture capitalists from Japan and the United States. I'm not sure.
Teijin Pharma Limited ad-light	Home Healthcare Quality of Life Collaboration	-	With a view to developing joint ventures, etc., Ad-Rite, an innovation creation support company, and Teijin Pharma, a leading company in home healthcare, will promote business creation. Mentoring will be provided to companies that pass the screening in the incubation phase to verify the feasibility of their business.
infocom corporation	Digital Health CONNECT	-	A program to attract IT ventures and people with business ambitions from outside the healthcare market by making the issues of the healthcare/medical market widely known to the public, and to realize the business ideas that emerge from these ventures. The program promotes innovation through seminars, business plan contests, and support for start-ups and entrepreneurs.
Mori Building Co.	ARCH Toranomon Hills Incubation Center	-	The incubation center was conceived specifically for organizations whose mission is to reform the business of large corporations and create new businesses. Focusing on the possibilities and challenges unique to large corporations with abundant resources and networks, we support business creation from both hardware and software perspectives.
Japan Medical Venture Association	Online symposiums, seminars, etc.	-	Conducts activities for information exchange, collaboration, and cooperation with domestic and overseas companies, organizations, and related ministries and agencies with the aim of revitalizing the medical and healthcare market and increasing Japan's presence in the global medical and healthcare industry. In addition to centralizing effective information for medical and healthcare businesses, we promote communication with each stakeholder to create an environment for smoother business operations.

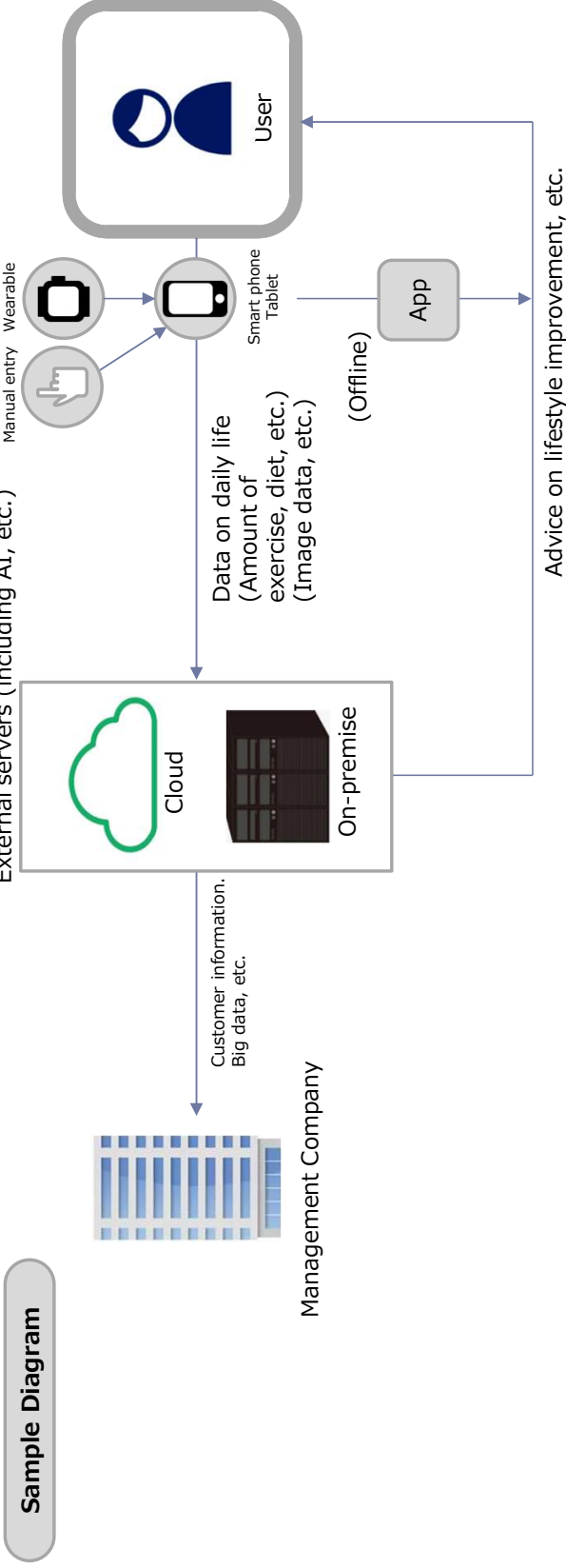
Appendix 4. Major Technology Types in the Digital Health Field (Global/Japan)



Major Technology Types in the Digital Health Field (Global/Japan)

Technology 1 **B to C** **Prevention**

Health Promotion App	
Definition.	Through information and communication devices, the system will record life-logs of daily diet, exercise, sleep, etc., analyze the data using AI, and provide users with advice on how to improve their lifestyle.
User	B to C (companies that provide solution services, customers)
Expected Effects	Encourage users to reflect on their own lifestyles, prevent lifestyle-related diseases, and improve their immunity.
Major Companies (Japan)	FINC, Linc & Communication, etc.
Major Companies (World)	Mon4t, Donisi Health, etc.



5. Major Technology Types in the Digital Health Field (Global/Japan)

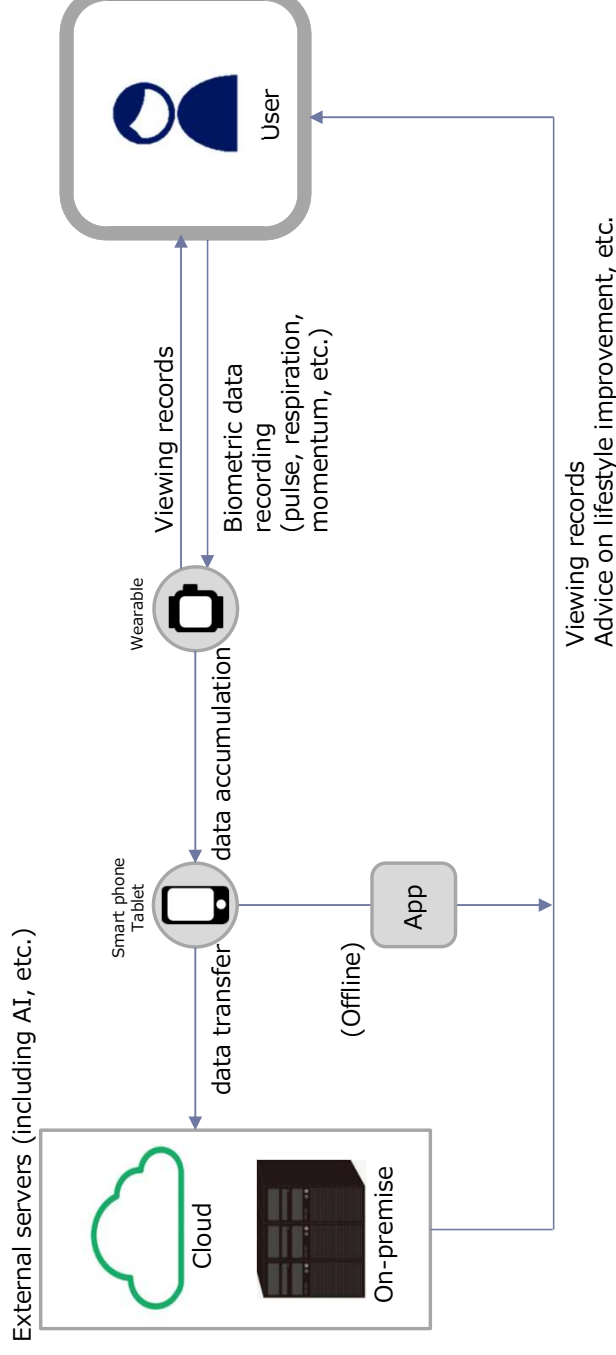
Technology ②

B to C

Prevention

Wearable Device	
Definition.	The user wears the device on his or her body, and the sensors on the device acquire information such as body movements and heart rate to record the user's activities and manage his or her health.
User	B to C (companies that provide solution services, customers)
Expected Effects	Encourage users to reflect on their own lifestyles, prevent lifestyle-related diseases, and improve their immunity.
Major Companies (Japan)	Omron Healthcare, Terumo, Panasonic, etc.
Major Companies (World)	Apple, Fitbit, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology ③

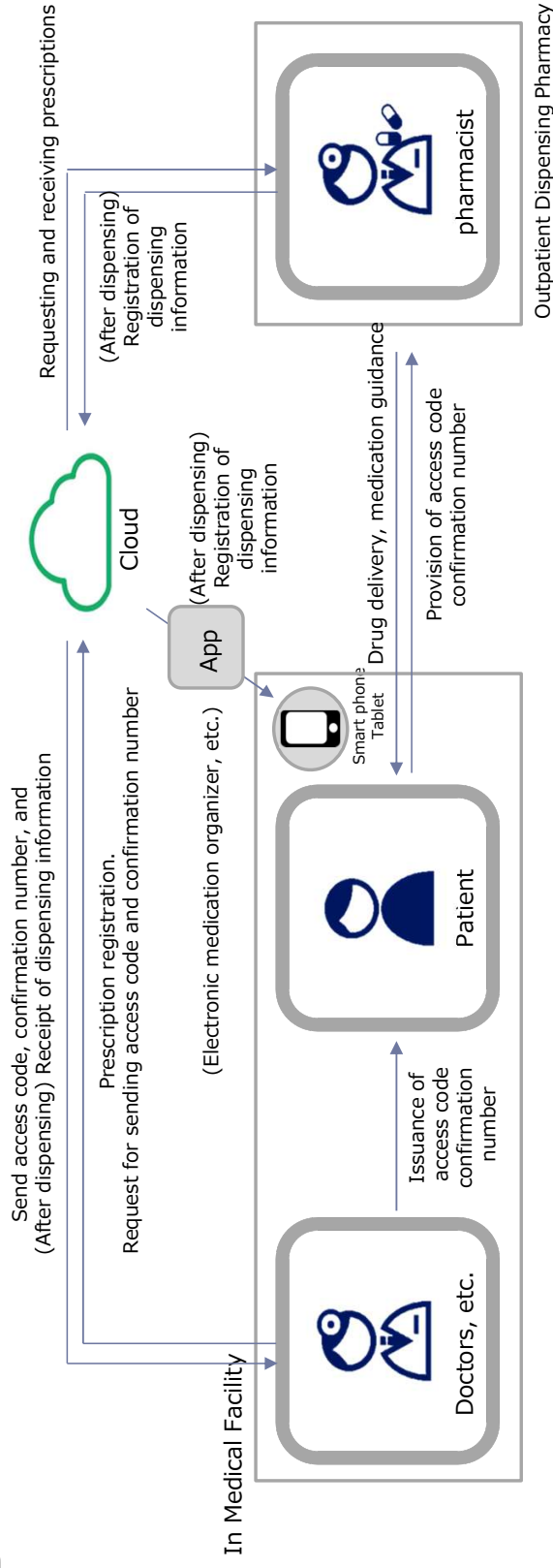
B to C

Ongoing Treatment and Follow-up

Digital Pharmacy	
Definition.	Issuing prescriptions, dispensing prescription drugs, and paying out prescriptions using information and communication devices to patients who have been issued prescriptions after receiving face-to-face or online consultations at medical facilities.
User	D to P (doctor, pharmacist, patient)
Expected Effects	By sharing prescription data, it is possible to reduce medical risks such as duplication of medication and to check patients' medical history in case of disaster.
Major Companies (Japan)	Drugstore companies, etc.
Major Companies (World)	Amazon, Imprivata, etc.

Sample Diagram

*case of digital prescriptions for pharmaceuticals



5. Major Technology Types in the Digital Health Field (Global/Japan)

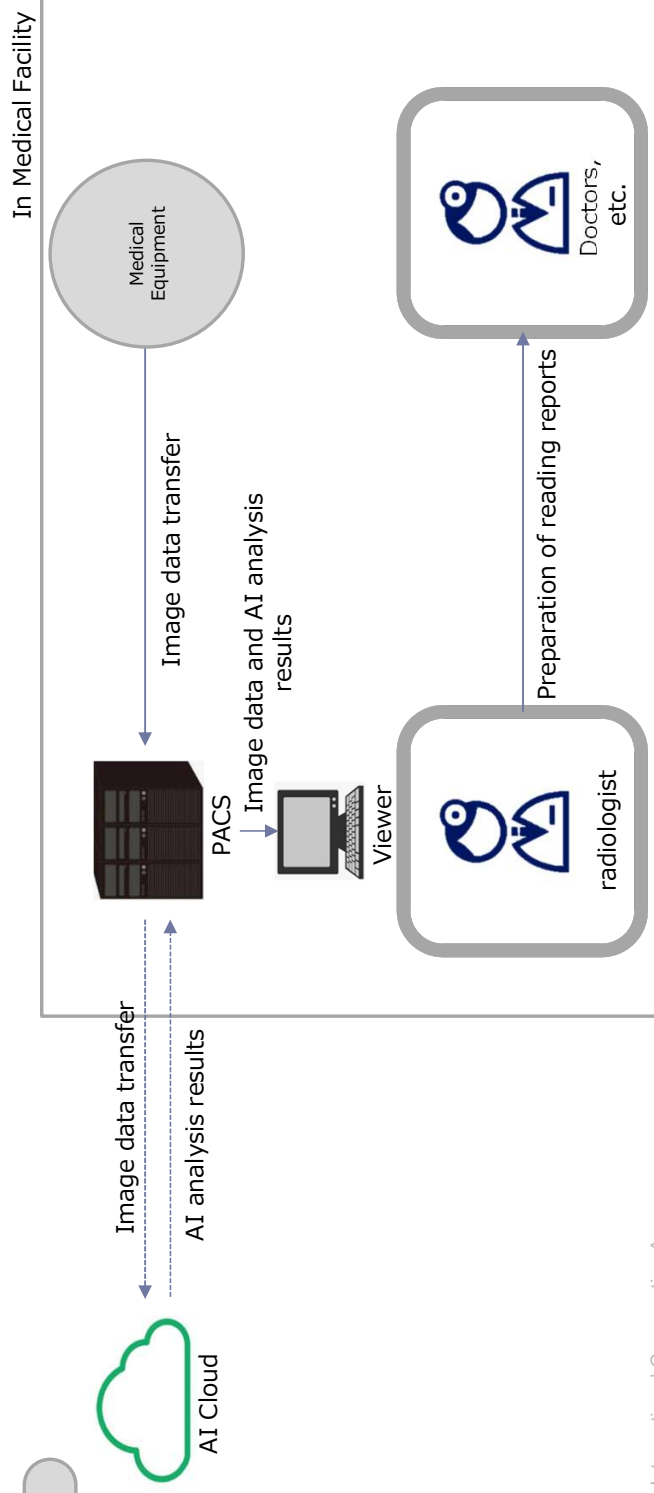
Technology 4

B to C

Examination and Diagnosis

AI Diagnostic Imaging Support	
Definition.	It automatically analyzes medical images (radiological images, etc.) using AI, identifies disease sites, and assists doctors in reading images.
User	B to D (companies providing AI solution services, doctors)
Expected Effects	Reduce the burden of image reading work on doctors by using AI, implement image reading in facilities and regions that lack radiologists, etc.
Major Companies (Japan)	NTT Data, Fujifilm, Canon Medical Systems, etc.
Major Companies (World)	GE Healthcare, Siemens, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

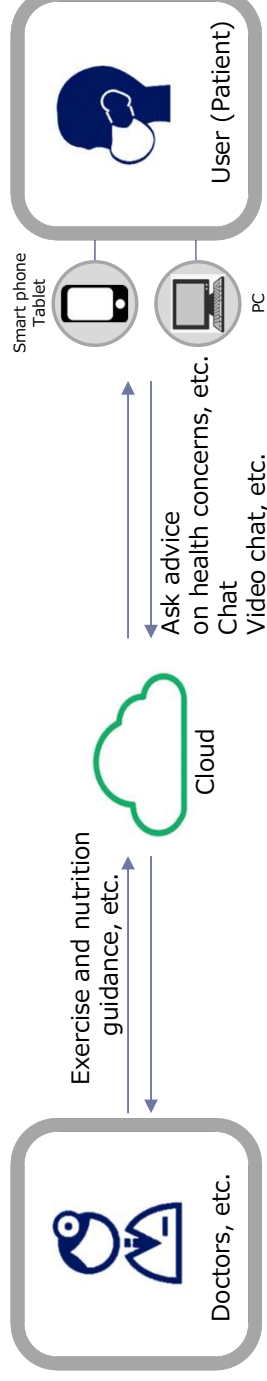
Technology ⑤

D to C
(D to P)

Prevention

Online Health Advisory	
Definition.	Through the use of information and communication devices, the company will provide various types of advice to customers who are concerned about their physical and mental health, and recommend and guide them to medical facilities.
User	D to C (physicians, clients who are concerned about their physical and mental health but have not yet visited a medical facility or obtained a definitive diagnosis)
Expected Effects	Health promotion for users, early detection of diseases, etc.
Major Companies (Japan)	LINE Healthcare, MICIN, Doctors, etc.
Major Companies (World)	Ping An Healthcare and Technology Company Limited, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 7

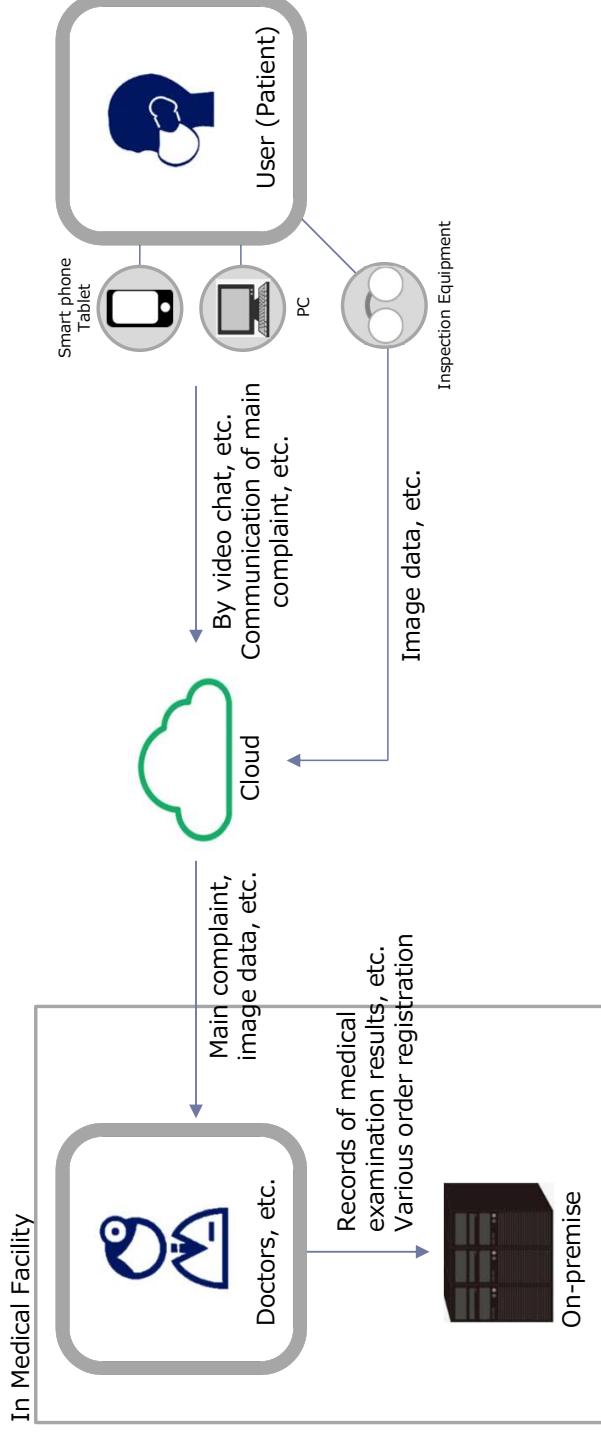
D to C
(D to P)

Screening

Examination and
Diagnosis

Online Consultation	
Definition.	Perform patient examination and diagnosis through information and communication devices.
User	D to P (doctor, patient)
Expected Effects	Asymptomatic or mildly ill patients should be managed at home, while more seriously ill patients should be referred to the hospital to avoid physical closeness and prevent the spread of infection.
Major Companies (Japan)	Line Healthcare, MICIN, Optimum, etc.
Major Companies (World)	Medavis, TytoCare, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

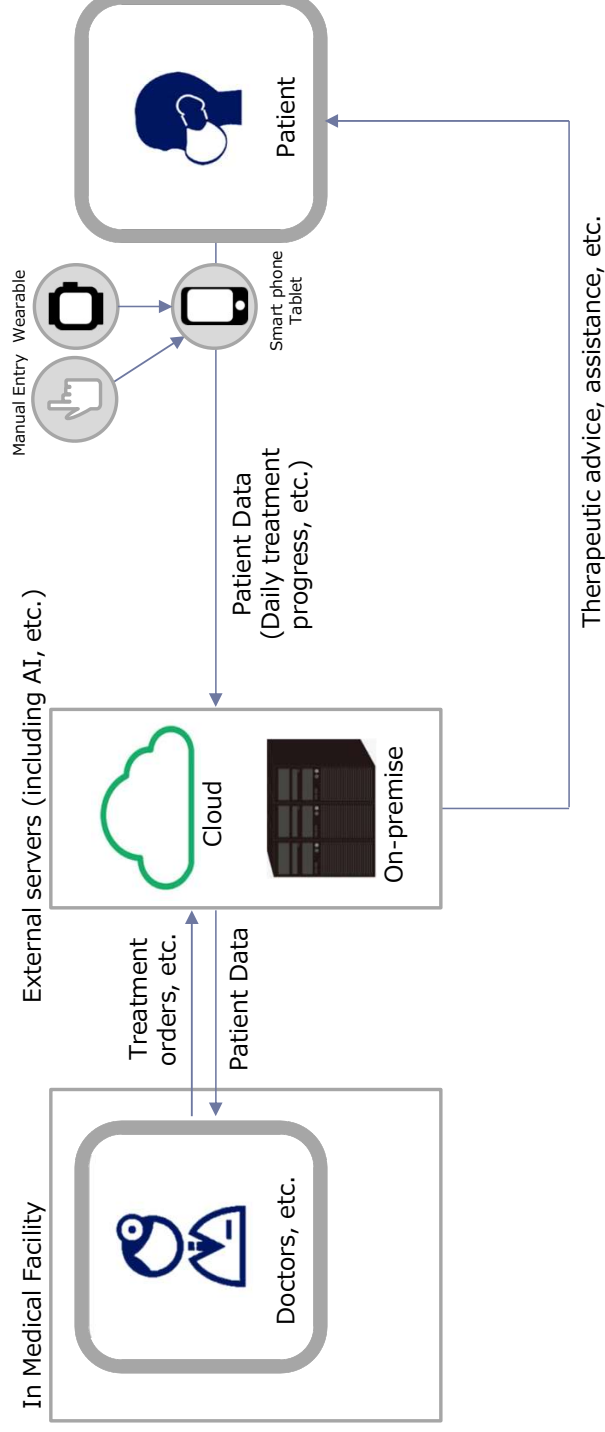
Technology ⑧

Ongoing treatment and follow-up

D to C (D to P)

Digital Therapeutic App	
Definition.	An application is downloaded onto a smart phone or tablet and used by patients in their daily lives to treat their illnesses.
User	D to P (doctor, patient)
Expected Effects	Appropriate follow-up by the app can fill in the blank treatment period between visits to the hospital and keep the patient motivated to continue treatment.
Major Companies (Japan)	CureApp, exawizards, etc.
Major Companies (World)	WellDoc, Pear Therapeutics, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

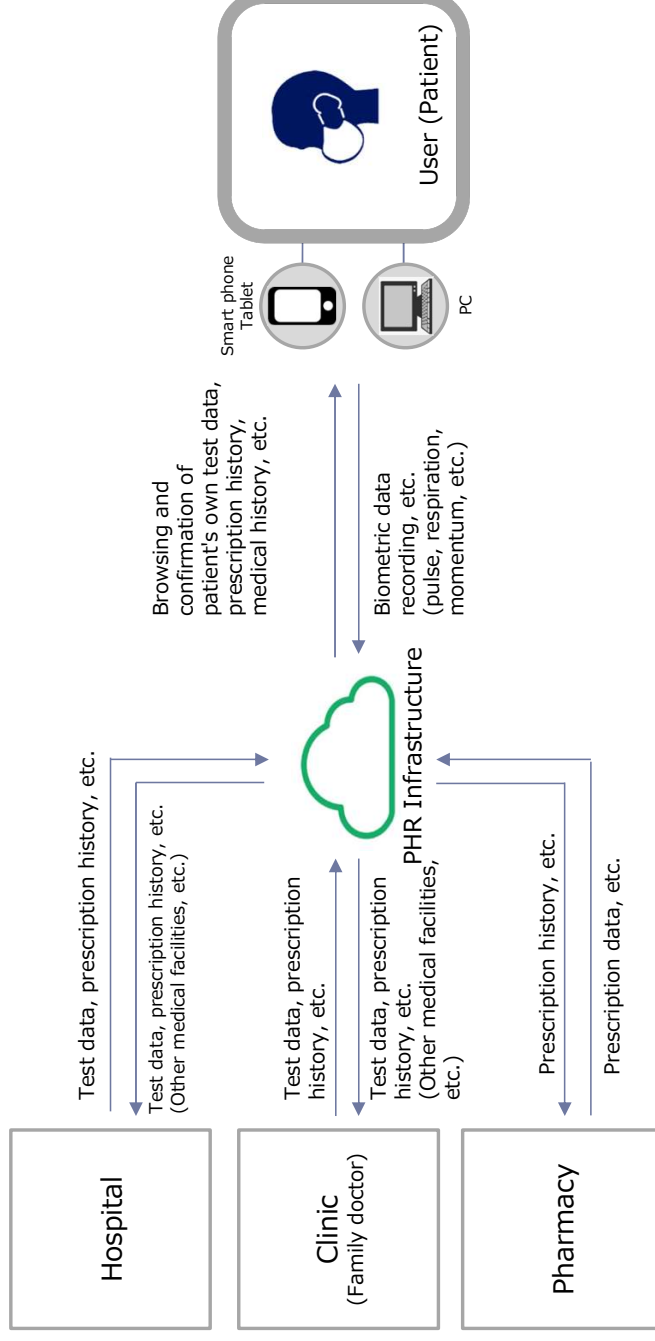
Technology 9

Ongoing Treatment and Follow-up

D to C (D to P)

PHR	
Definition.	A system that allows individuals to record their own medical information and health-related data, and manage it in their own hands.
User	D to C
Expected Effects	Medical history, daily measurements, and even medical checkup data are managed in an integrated manner to help manage and improve health.
Major Companies (Japan)	Tdilot x Hoppe
Major Companies (World)	Oxford Health NHS Foundation Trust, IHIS

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 10

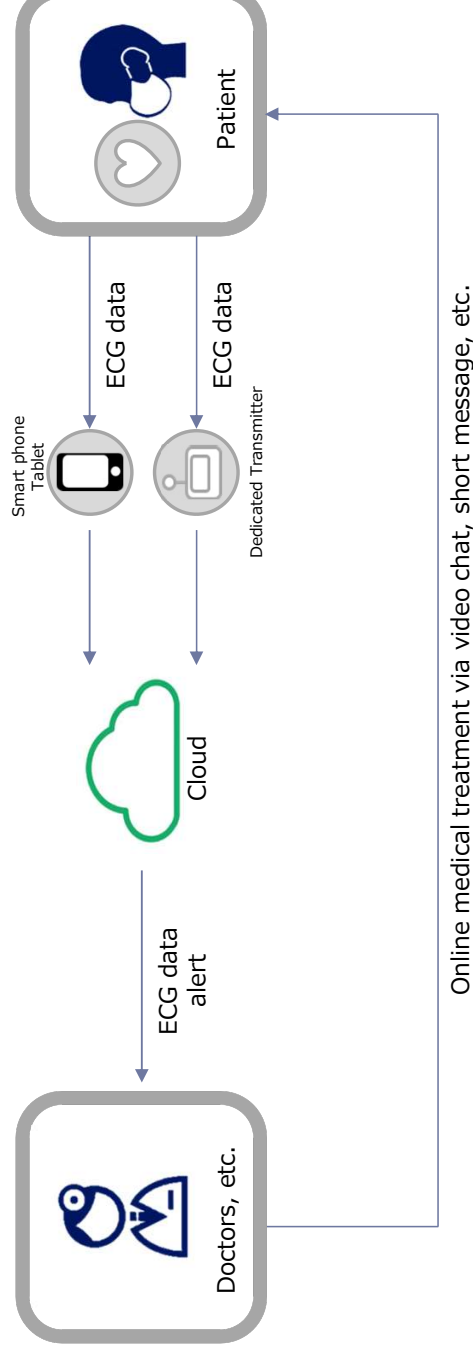
Ongoing Treatment and Follow-up

D to C (D to P)

Telemonitoring	
Definition.	Remote monitoring of patient information using devices with information and communication capabilities. (Telemonitoring via an implantable cardioverter defibrillator (ICD) or cardiac resynchronization therapy implantable cardioverter defibrillator (CRT-D), telemonitoring of patient biometric data in remote locations, etc.)
User	D to P (doctor, nurse, patient)
Expected Effects	Monitoring can be done without a visit to the hospital, avoiding physical closeness and preventing the spread of infection. Early intervention is possible in the event of an abnormality.
Major Companies (Japan)	Canon ITS Medical, Canon Medical Systems, etc.
Major Companies (World)	Medtronic, Boston Scientific, etc.

Sample Diagram

* case of implantable cardioverter defibrillator



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 11

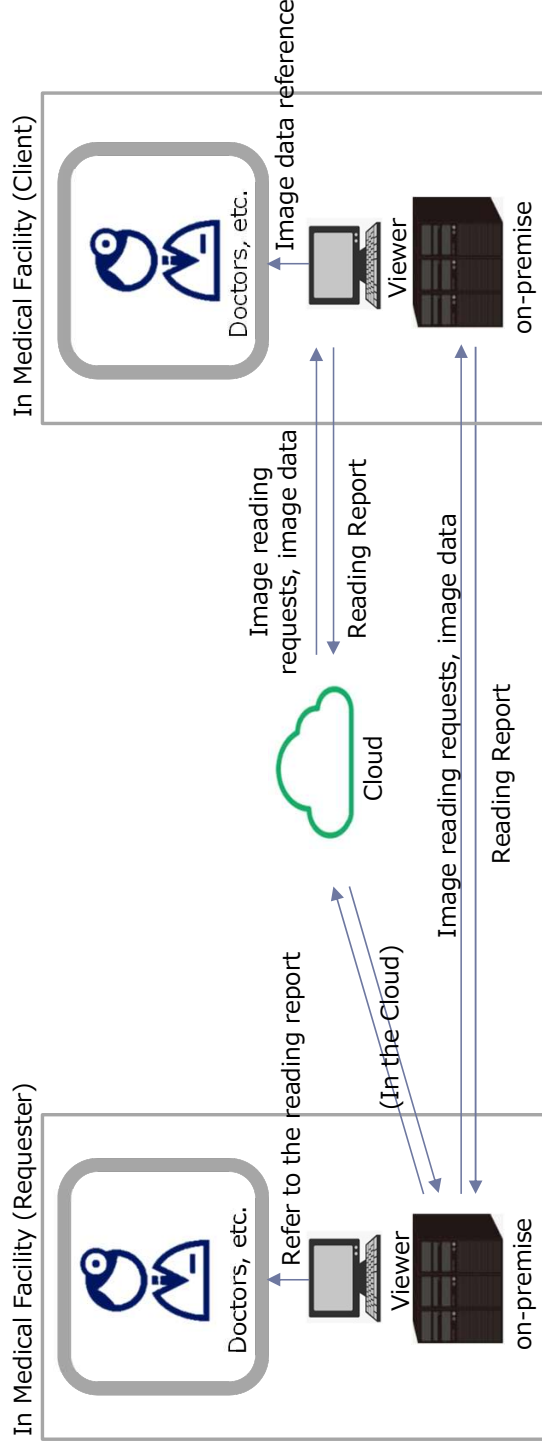
D to D

Examination and Diagnosis

Remote Diagnosis Support (Imaging, Pathology, etc.)	
Definition.	Pathological information is digitized into images, etc., and transmitted to other locations using information and communication technology, and diagnosis and consultation are performed at remote locations.
User	D to D (lab technician, doctor)
Expected Effects	It enables remote radiologists to read images and report on the results, resulting in higher quality diagnosis.
Major Companies (Japan)	Fujifilm, Doctor Net, Medical Chigo, etc.
Major Companies (World)	

Sample Diagram

*case of remote diagnostic imaging



5. Major Technology Types in the Digital Health Field (Global/Japan)

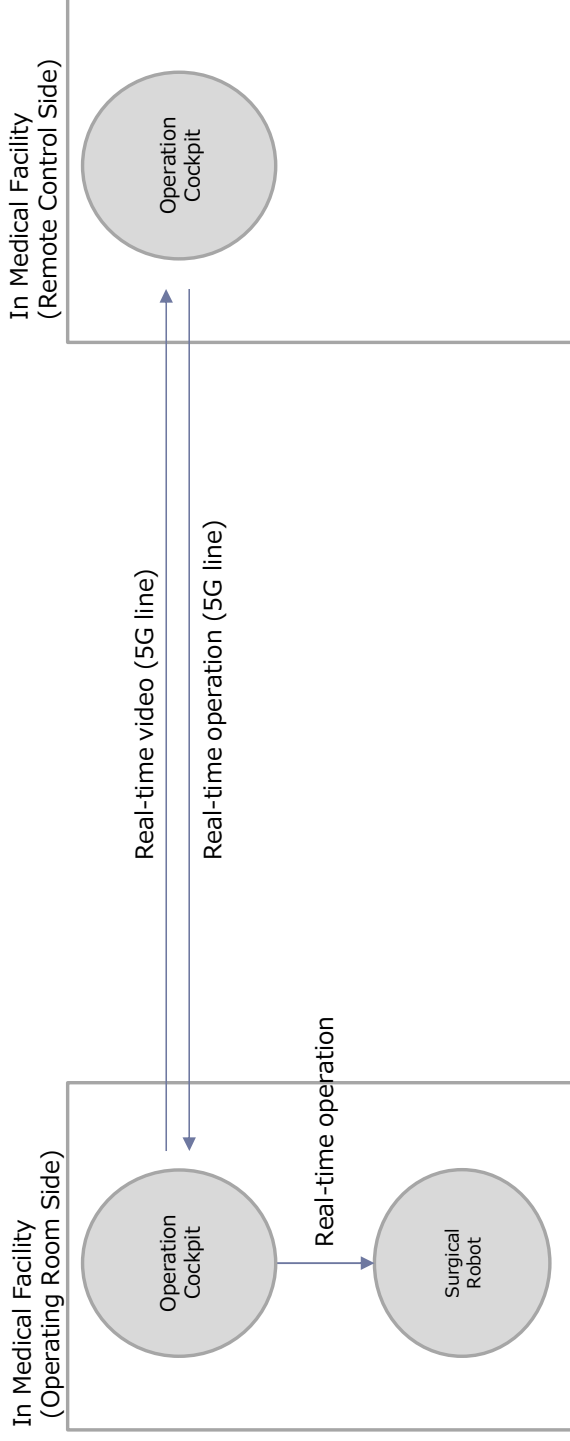
Technology 12

Treatment (Hospitalization)

D to D

Remote Surgery	
Definition.	Information and communication devices and surgical robots allow surgeons to perform surgery on patients in remote areas.
User	D to P (doctor on the operating room side, doctor on the remote control side)
Expected Effects	It will be possible to perform surgeries that are difficult to perform without a doctor in a remote area, or for patients who are difficult to transport or move due to their physical strength.
Major Companies (Japan)	Medicaid
Major Companies (World)	Intuitive Surgical, Johnson & Johnson, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 13

D to D

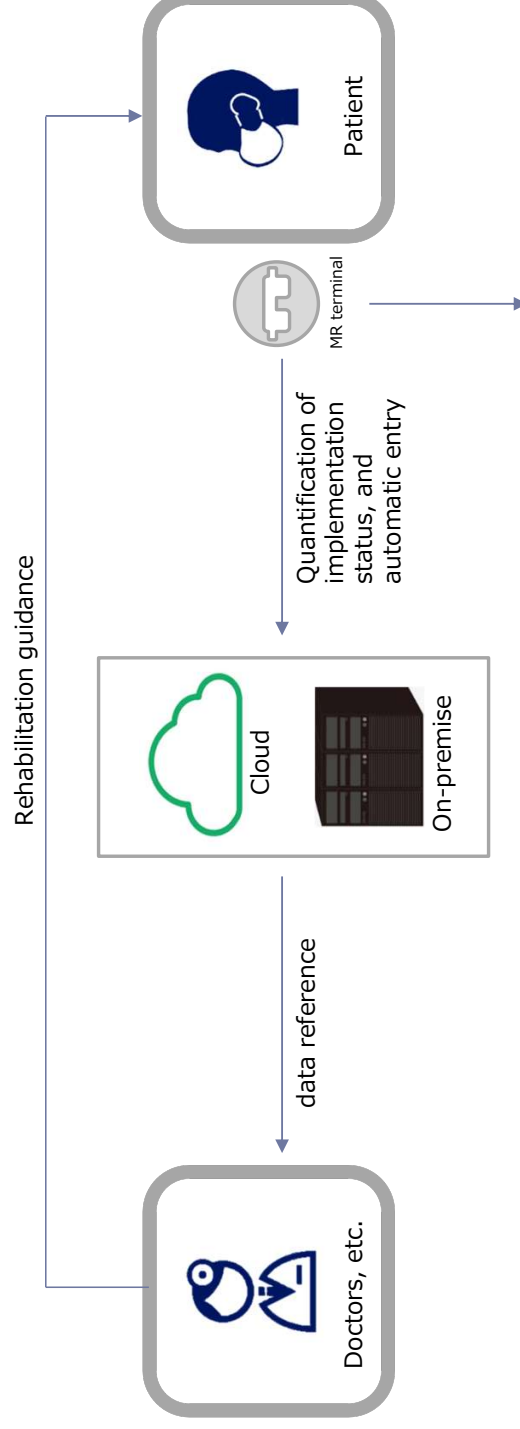
Treatment (Hospitalization)

Ongoing Treatment and Follow-up

MR (Mixed Reality)	
Definition.	A general technology that mixes real and virtual space and builds a new space where real and virtual objects interact in real time.
User	D to D
Expected Effects	Even in cases where medical professionals cannot actually be present, they can provide medical services as if they were there face-to-face in the augmented space of MR.
Major Companies (Japan)	Tekliko, etc.
Major Companies (World)	Huaning Quanshi, etc.

Sample Diagram

*case of MR utilization for rehabilitation



In a space augmented by MR
Implementation of rehabilitation therapy, etc.

5. Major Technology Types in the Digital Health Field (Global/Japan)

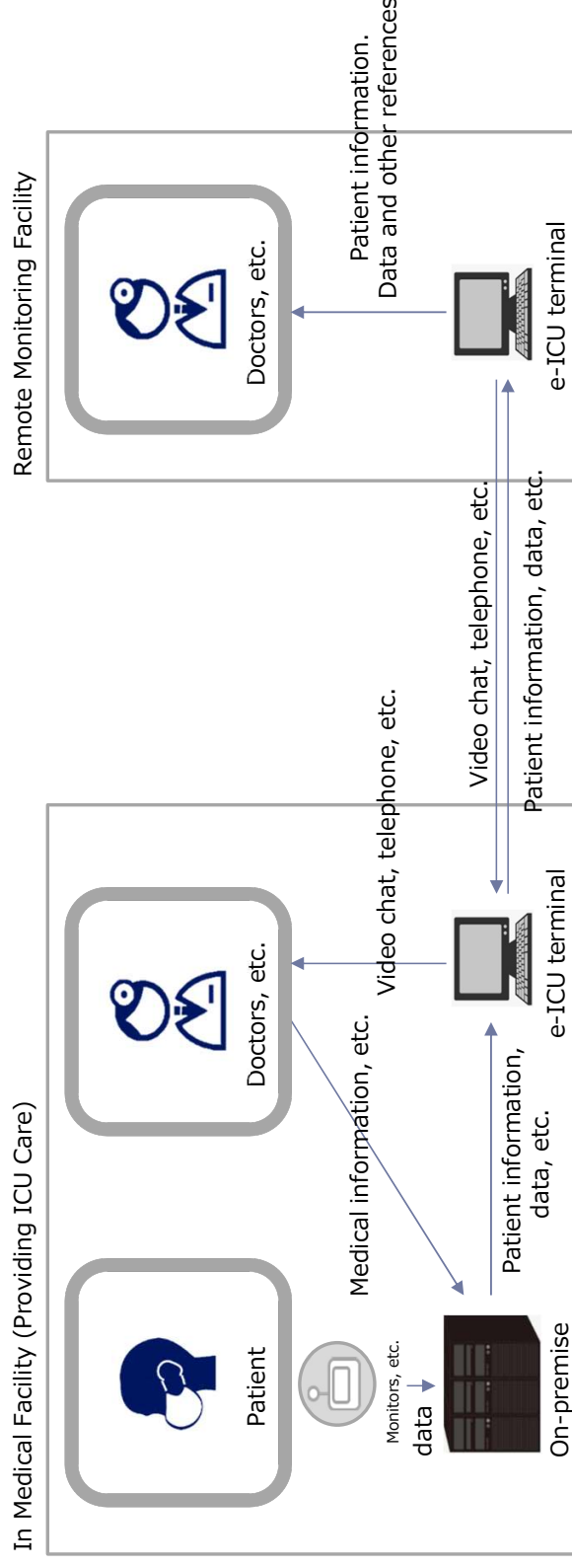
Technology 14

D to D

Treatment
(Hospitalization)

e-ICU	
Definition.	A doctor specialized in intensive care at a remote site will provide advice based on information and monitoring data provided by doctors and nurses in the field.
User	D to D (doctor, nurse)
Expected Effects	In the absence of a doctor specialized in intensive care, the specialist can give advice remotely, thereby reducing the burden on doctors and nurses in the field. It will be possible to remotely observe patients at risk of infection.
Major Companies (Japan)	T-ICU
Major Companies (World)	Philips

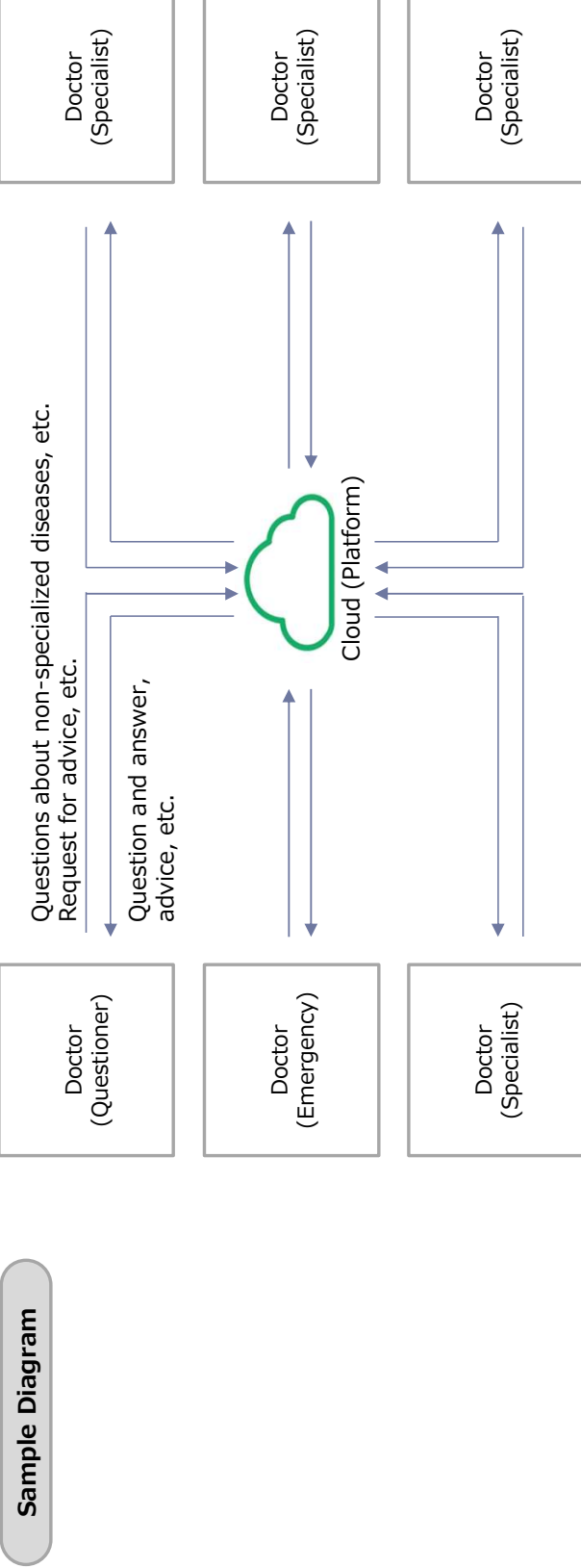
Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 15 **D to D** Screening Examination and Diagnosis Treatment (Hospitalization) Ongoing Treatment and Follow-up

Doctor-to-Doctor Platform	
Definition.	Share necessary medical information and support communication among medical professionals.
User	D to D (doctor, nurse, co-medical, etc.)
Expected Effects	It is expected to speed up the response to emergency cases by activating communication and information exchange between medical personnel inside and outside the hospital, and by listening to the opinions of outside specialists when there is no specialist in the hospital.
Major Companies (Japan)	Arum, Antar, Medpia, etc.
Major Companies (World)	Medlinker, etc.



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 16

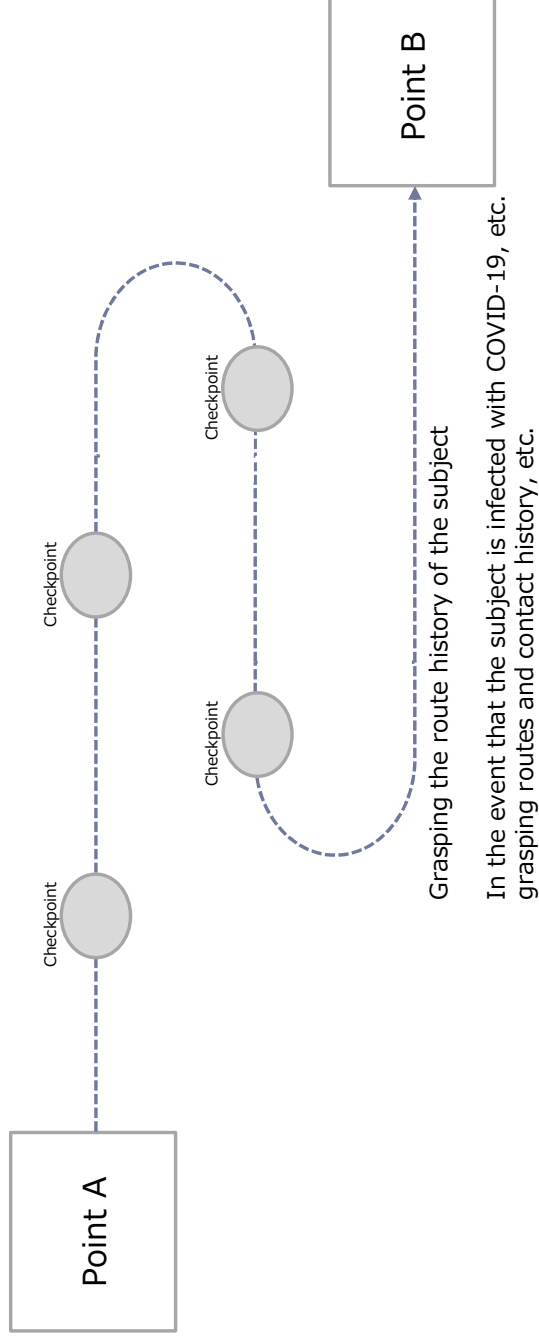
Operation and Management

Prevention

Screening

Contact Tracing	
Definition.	Provide guidance to users of devices (smartphones and tablets) who may have had close contact with patients with infectious diseases to encourage them to change their behavior, such as refraining from going out. Alternatively, the user's behavioral history can be recorded at a checkpoint set up in advance, and the route history and contact history of the target person can be checked when an infectious disease outbreak occurs.
User	Operation and management (use in medical facilities)
Expected Effects	Grasping the route history of the subject, grasping the route and contact history of the subject in case the subject is infected with COVID-19, etc.
Major Companies (Japan)	TDK, etc.
Major Companies (World)	DIMAGI, Government of Singapore, etc.

Sample Diagram



5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 17

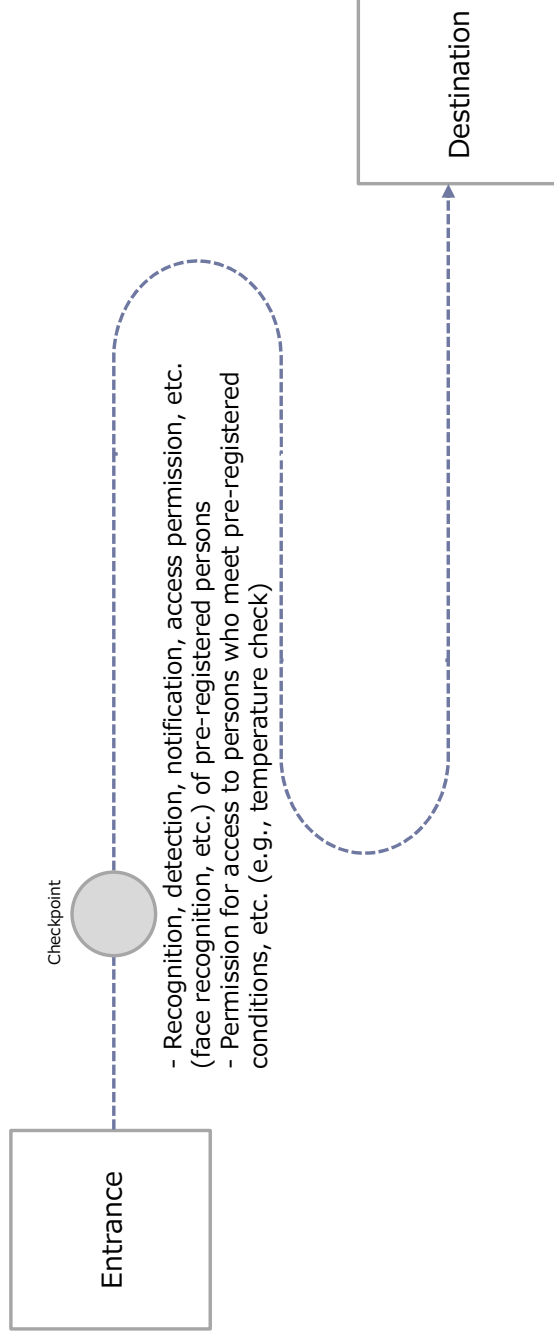
Operation and Management

Prevention

Screening

Authentication System	
Definition.	Recognizes, detects and notifies, gives access authentications to, etc. (e.g., face recognition), and gives access authentications to persons who meet pre-registered conditions, etc. (e.g. temperature detection).
User	Operation and management (use in medical facilities)
Expected Effects	Prevent the spread of infectious diseases in the facility by extracting those with restricted access due to fever, etc., and guiding them to the appropriate flow lines. Identify the faces of persons to be monitored during quarantine, and notify the administrator to prevent infectious diseases and accidents.
Major Companies (Japan)	NEC, Panasonic, etc.
Major Companies (World)	

Sample Diagram



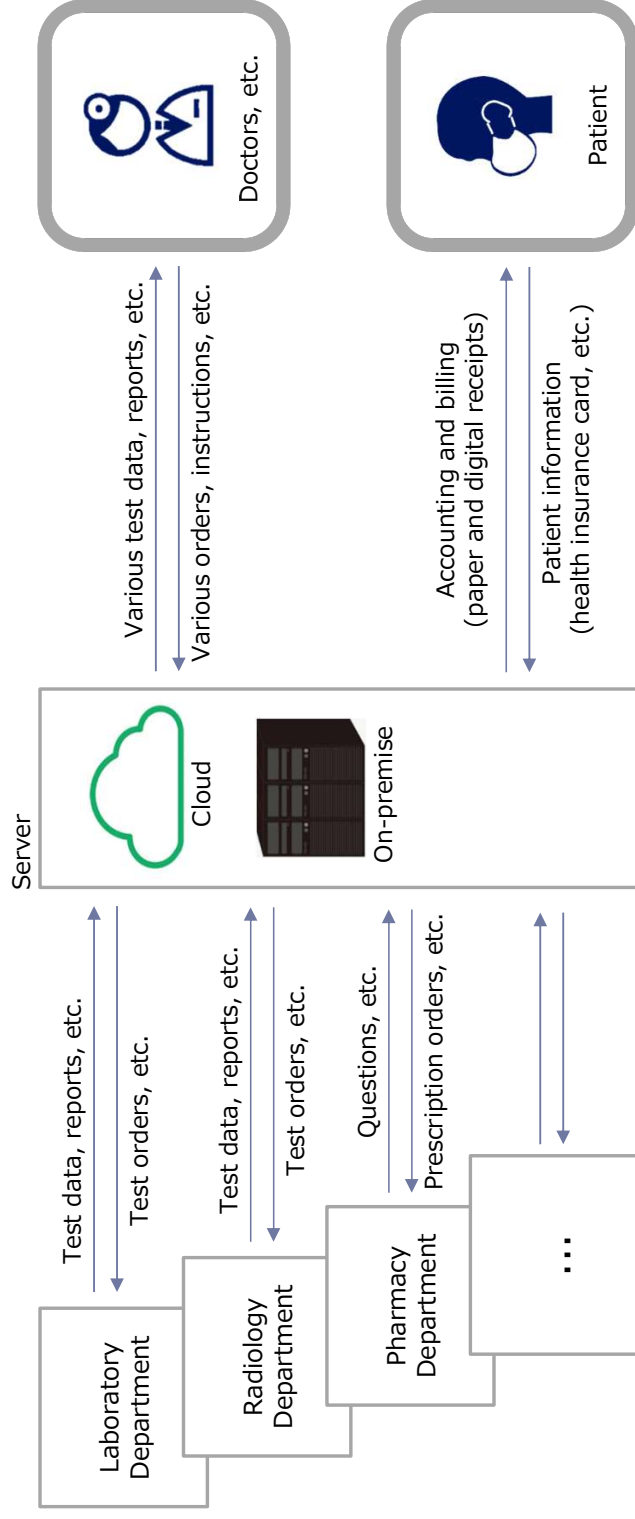
5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 18

Operation and Management

Electronic Medical Records and Digital Receipts	
Definition.	Medical records recorded by doctors, nurses, co-medical staff, and other medical personnel in medical facilities are digitized, stored, and managed.
User	Operation and management (in or out of medical facilities)
Expected Effects	Reduction of workload, improvement of work efficiency, secondary use of data, provision of EBM, etc. through digitization
Major Companies (Japan)	Fujitsu, NEC, NTT Data, Software Service, etc.
Major Companies (World)	Cerner, InterSystems, epic, etc.

Sample Diagram

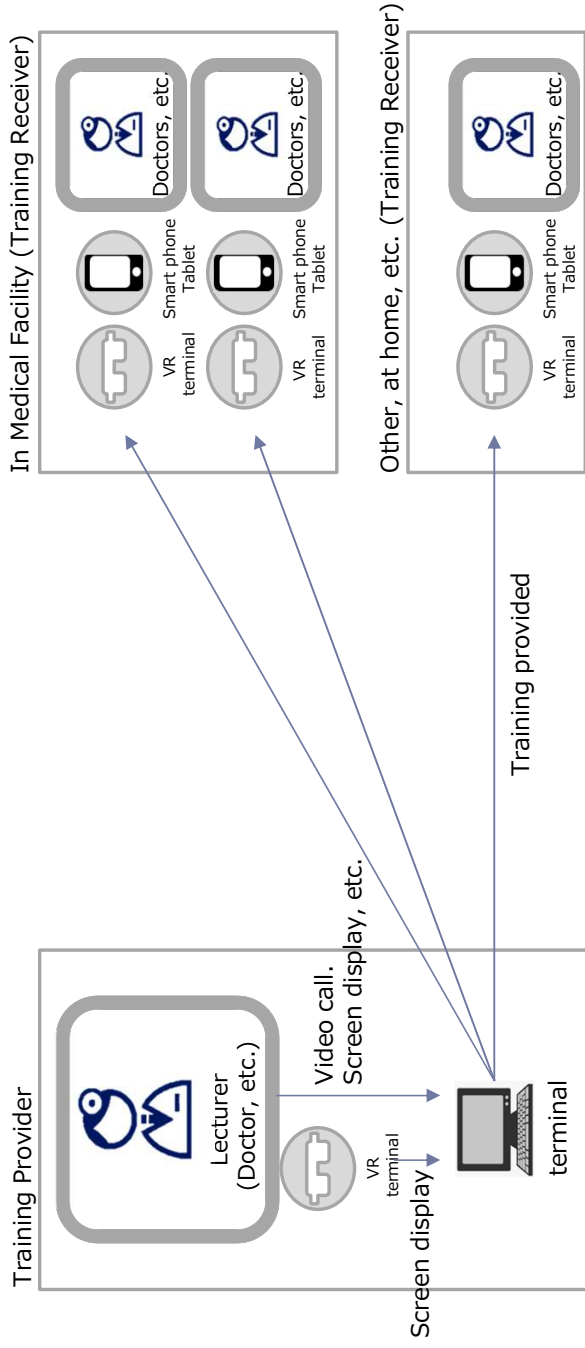


5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 19 Operation and Management

VR (Virtual Reality) Training	
Definition.	This is a technology that makes virtual space feel like reality, and is being applied to training in the medical field.
User	resident
Expected Effects	In particular, students will learn effective techniques by evaluating acquired skills in surgery and other procedures, and by experiencing rare cases and risky procedures.
Major Companies (Japan)	Jolly Good, Holoeyes, etc.
Major Companies (World)	XRHealth, Immertec, etc.

Sample Diagram



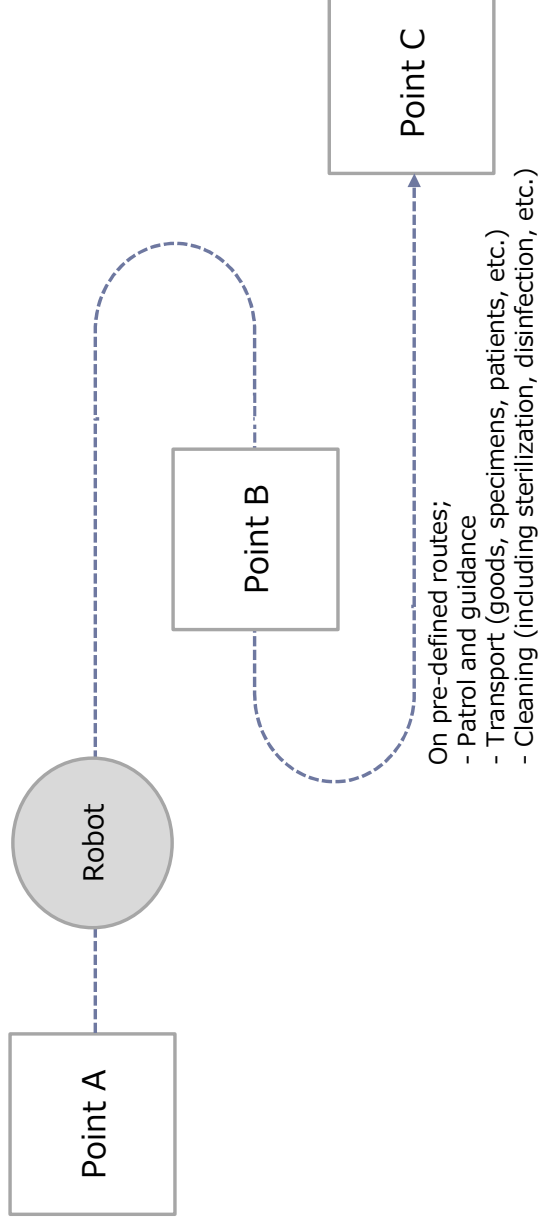
5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology 20

Operation and Management

Robotics (Patrol, Transport, Work Assistance, etc.)	
Definition.	Robotics technology that enables safe autonomous driving along a predetermined route while avoiding obstacles and other obstacles.
User	Operation and management (use in medical facilities)
Expected Effects	Patrol, guide, transport (goods, specimens, patients, etc.), and clean (including sterilization, disinfection, etc.) on predetermined routes to reduce dangerous work and health risks for hospital staff in isolation wards and contaminated areas.
Major Companies (Japan)	Panasonic Corporation, Hitachi, Ltd.
Major Companies (World)	Xenex Disinfection Services, Ava Robotics

Sample Diagram



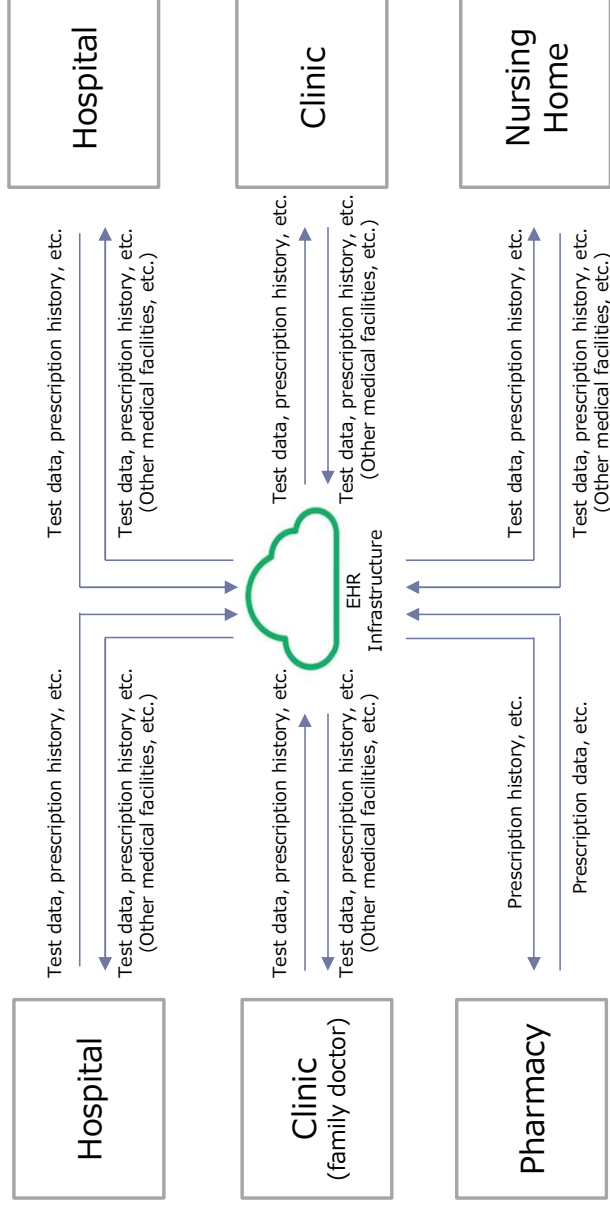
5. Major Technology Types in the Digital Health Field (Global/Japan)

Technology (21)

Operation and Management

Regional Collaboration System (EHR)	
Definition.	Medical information stored in the hospital can be accessed through the network.
User	D to D (doctor, nurse, co-medical, etc.)
Expected Effects	By sharing patient information with other medical facilities, smoother medical services will be provided, etc.
Major Companies (Japan)	TMMC, etc.
Major Companies (World)	Healthix, etc.

Sample Diagram



Appendix 5. Major Laws and Regulations Related to Digital Health in Japan



Major Laws and Regulations Related to Digital Health in Japan (1/3)

Field	Related Laws and Regulations	Overview
Information Security	<p>Guidelines for the Appropriate Handling of Personal Information in the Health, Labor and Welfare Field, etc. (Ministry of Health, Labour and Welfare)</p>	<p>A generic term for a series of guidelines, guidance, etc. in the field of health and labor. The following are excerpts from the main guidelines.</p> <ul style="list-style-type: none"> • Guidance for the Appropriate Handling of Personal Information by Medical and Nursing Care Providers (Revised on October 9, 2020) Indicates specific points to note, examples, etc., to support activities related to ensuring the proper handling of personal information by business operators, etc., such as hospitals, clinics, pharmacies, and those engaged in in-home services stipulated in the Long-Term Care Insurance Law. • Guidelines for the Safety Management of Medical Information Systems (5th Edition) (Revised on January 29, 2021) It covers not only systems that store medical information, but also all information systems that handle medical information, and the people and organizations involved in the introduction, operation, use, maintenance, and disposal of these systems. In addition to documents related to medical care (medical records, dispensing records, prescriptions, etc.) stipulated in various laws such as the Medical Practitioners Act, the Dental Practitioners Act, and the Pharmaceutical Practitioners Act as legally stored documents to which the e-Documentation Act (the three principles of electronic storage) is applied, the guideline also covers documents related to home nursing stations and nursing care facilities, in accordance with the revision of the 5th edition of the MHLW Safety Management GL. In addition to documents related to medical care (medical records, dispensing records, prescriptions, etc.) stipulated by various laws, such as the Medical Practitioners Act, Dental Practitioners Act, etc., the revised 5th edition of the Safety Management GL by the Ministry of Health, Labour and Welfare (MHLW) has been organized for documents handled by home nursing stations and nursing care providers (home nursing plans/reports, various nursing care plans and service plans, etc.).
	<p>Guidelines for Safety Management when Cloud Service Providers Handle Medical Information (Ministry of Internal Affairs and Communications)</p>	<p>Established for businesses that provide online services such as medical information processing.</p> <p>The Ministry of Internal Affairs and Communications (MIC) guidelines stipulate comprehensive measures to be implemented by cloud service providers, based on the requirements for medical facilities in the Ministry of Health, Labour and Welfare (MHLW) guidelines mentioned above. (organizational safety management measures, physical safety management measures, technical safety management measures, human safety management measures, exchange of medical information with external parties, emergency response, etc.)</p>
	<p>Guidelines for Information Processors Managing Medical Information on Consignment (2nd Edition) (Ministry of Economy, Trade and Industry)</p>	<p>The Ministry of Health, Labour and Welfare's "Guidelines for the Safety Management of Medical Information Systems, Version 5" targets medical facilities, while the Ministry of Internal Affairs and Communications' "Guidelines for the Safety Management of Cloud Service Providers Handling Medical Information, Version 1" and the Ministry of Economy, Trade and Industry's "Guidelines for Information Processing Providers Managing Medical Information on Consignment, Version 2" This time, the guidelines of the Ministry of Internal Affairs and Communications (MIC) and the Ministry of Economy, Trade and Industry (METI) were finalized and published as this guideline after the consolidation and integration of the above-mentioned guidelines for businesses.</p> <p>In addition to businesses that provide medical information systems and services based on contracts with medical facilities, businesses that do not have a direct contractual relationship with medical facilities will be subject to this guideline if they provide systems and services as part of the supply chain of medical information systems.</p>

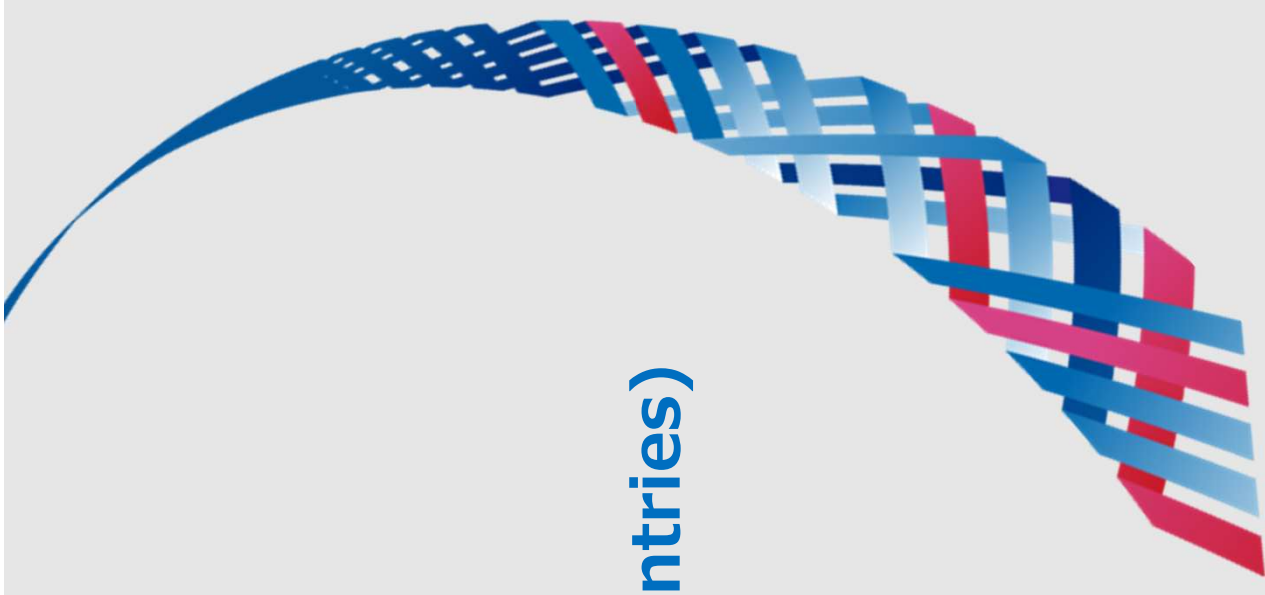
Major Laws and Regulations Related to Digital Health in Japan (2/3)

Overview	
Personal Information Protection	<p>Revised Personal Information Protection Law</p> <p>The main revisions are as follows.</p> <ul style="list-style-type: none"> • The state of individual rights ⇒ Strengthen protection of individual rights • The nature of the responsibility of the business to be protected ⇒ Additional responsibility of the business • Establishment of a system to encourage voluntary efforts by businesses ⇒ Establishment of a new system to accredit organizations that target specific fields of businesses • The state of policies related to data utilization ⇒ Promotion of data utilization • Penalties ⇒ Stronger penalties for violations of laws and regulations • Extraterritorial application of laws and cross-border transfers ⇒ Add penalties for foreign businesses, such as collection of reports and on-site inspections
	<p>Next Generation Medical Care Infrastructure Act</p> <p>With regard to anonymized processed medical information for the purpose of contributing to research and development in the medical field, the Act was enacted to promote advanced research and development and the creation of new industries related to health and medical care, and thereby contribute to the formation of a healthy society with longevity, by providing for the certification of persons engaged in the business of creating anonymized processed medical information, and regulations concerning the handling of medical information and anonymized processed medical information. Enacted for the purpose of</p> <p>Establish a system for the smooth and secure use of anonymously processed medical information.</p> <ul style="list-style-type: none"> • Certifies those who can ensure high information security, meet certain standards, and perform anonymization properly and reliably. • Medical facilities, etc. are allowed to provide medical information to authorized service providers if the individual does not refuse to provide it.
	<p>The "data localization" regulation</p> <p>Unlike the Cross-border Data Transfer Regulation, which focuses on the act of cross-border transfer of personal data, the Data Localization Regulation is a regulation that requires the domestic establishment and storage of the servers and data itself necessary for a particular business activity in a certain country (or from a foreign country to that country). In addition, while cross-border personal data transfer regulations allow for the transfer of data overseas with the consent of the individual in principle, data localization regulations do not allow for the transfer of data with the consent of the individual, as the subject data is not limited to personal data, and cross-border transfer of data often requires the permission of the government of the country concerned. In many cases, permission from the government of the country concerned is required for cross-border transfer of data.</p>
Approval	<p>Act on Securing the Quality, Efficacy and Safety of Pharmaceuticals and Medical Devices</p> <p>To ensure the quality, efficacy and safety of pharmaceuticals and medical devices, and to regulate manufacturing, labeling, sales, distribution and advertising.</p> <p>Healthcare applications may fall under the category of "medical devices" under Article 2, Section 4 of the Act.</p> <p>If a healthcare application in the development stage constitutes a medical device, it must be tested and approved before it is manufactured and sold.</p> <p>(1) Medical device manufacturing and sales license (Article 23-2 of the Act)</p> <p>Registration as a manufacturer of medical devices (Article 23-2-3 of the Act, Article 23-2-4 of the Act)</p> <p>(iii) i. "Approval" by the Minister (Article 23-2-5 of the Act) or ii. "Approval" by the Minister (Article 23-2-5 of the Law) or ii. "Certification" by a private third party certification body (Article 23-2-23 of the Law), or iii. "Notification" (Article 23-2-12 of the Law)</p> <p>It is necessary to</p>

Major Laws and Regulations Related to Digital Health in Japan (3/3)

Overview	
<p>Field</p> <p>Specific Digital Health Field Relation</p> <p>[Telemedicine]</p>	<p>Related Laws and Regulations</p> <p>Medical treatment using information and communication devices (so-called "telemedicine") (2015)</p> <p>Guidelines for the Appropriate Use of Online Medical Services</p> <p>Temporary and Exceptional Treatment of Medical Treatment Using Telephones and Information and Communication Devices at the Time of Expansion of COVID-19 (Administrative Notice, April 10, 2020)</p> <p>Handling of Medical Device Programs</p>
<p>Specific Digital Health Field relation</p> <p>[Medical apps]</p>	<p>The target audience for telemedicine is as follows.</p> <ul style="list-style-type: none"> • Patients undergoing home oxygen therapy • Patients with intractable diseases at home • Diabetic patients at home • Asthma patients at home • Patients with specific diseases, such as home hypertension patients, should be treated in principle through direct face-to-face treatment, with telemedicine as a complement to face treatment. <p>Guidelines for the Appropriate Use of Online Medical Services</p> <ul style="list-style-type: none"> • Definition of online medical care: In telemedicine, the act of examining and diagnosing a patient, communicating the results of diagnosis, and prescribing medical treatment in real time between a doctor and a patient through information and communication devices. • Indications: In principle, initial consultations should be conducted in person (except for smoking cessation outpatient clinics and clinics related to emergency contraception). • In cases where a physician receives medical treatment, etc. from a patient via telephone, etc., the physician may make a diagnosis or prescribe a prescription from the initial consultation via telephone or information communication equipment, to the extent that the physician deems it medically feasible under his/her responsibility. • It is acceptable for medical facilities to send prescriptions to pharmacies via fax or other means, and for pharmacies to deliver them to patients' homes. <p>Scope of application: Programs that fall under the definition of "medical devices" as defined in Article 2, Paragraph 4 of the "Act on Quality, Efficacy and Safety of Pharmaceuticals, Medical Devices and Other Products" Act are covered, and other programs that do not fall under the definition of medical devices are not covered.</p> <ul style="list-style-type: none"> • Licensing of manufacturing and sales operations • Registration of Manufacturing Business • Handling of QMS Surveys • Legal notices, etc. <p>Eligible programs: Individual programs for diagnosis and treatment</p> <ul style="list-style-type: none"> • Procedures for handling programs subject to regulation: If the program is handled as a medical device, both the "business license" for the company handling the program and the "manufacturing and marketing approval" for the product handling the program are required. • Regulations: Procedures related to registration and permission for "manufacturing business," "manufacturing and sales business," and "sales business" need to be carried out. • Regulations on products: Before marketing, manufacturers and distributors need to apply for marketing approval, etc. Applications for marketing approval and marketing certification are filed with the Pharmaceuticals and Medical Devices Agency (PMDA) and registered certification organizations, respectively.

Appendix 6. Online-questionnaire Survey Results(3 countries)



Online-questionnaire Survey Results



Summary

In order to understand the local medical issues from a more detailed perspective, an online-questionnaire survey of individual hospitals was conducted. Individual follow-up interviews were also conducted with the responding facilities.

- Purpose of the Survey
 - Understand the demand of medical facilities in the target countries, identify issues that can be solved by digital health, and explore the possibility of support
 - Understand the digital health technologies already in place and how they are being used
 - Understanding the status of communication infrastructure, IT literacy of users, and factors that act as barriers to the introduction of digital health
 - Identify medical facilities that can serve as implementation sites for the Proof of Concept (PoC) in this project
- Survey Period
 - June 2, 2021 - June 25, 2021
- Target facilities
 - Selection based on past JICA project cooperating hospitals, with less bias toward public/private and referral.
 - In addition, input from local JICA offices and local subcontractor companies
- Survey Method
 - Online-questionnaire survey format using Google forms
 - All answers were selectable, and answers that did not fit into the selectable fields were given a free space as "Other"
 - Follow-up interviews were conducted with the target hospitals after the questionnaires were collected in order to better understand the content of the questionnaires.

Valid Response Rate

	Brazil	Kenya	Indonesia
Number of Distribution	20	27	44
Number of Responses	7	15	16
Number of Valid Responses	7	15	16
Valid Response Rate* (%)	35%	55%	36%

*Valid Response Rate = Number of valid responses / Number of distribution

*Rounded down to the nearest whole number

Online-questionnaire Survey Results (Brazil)



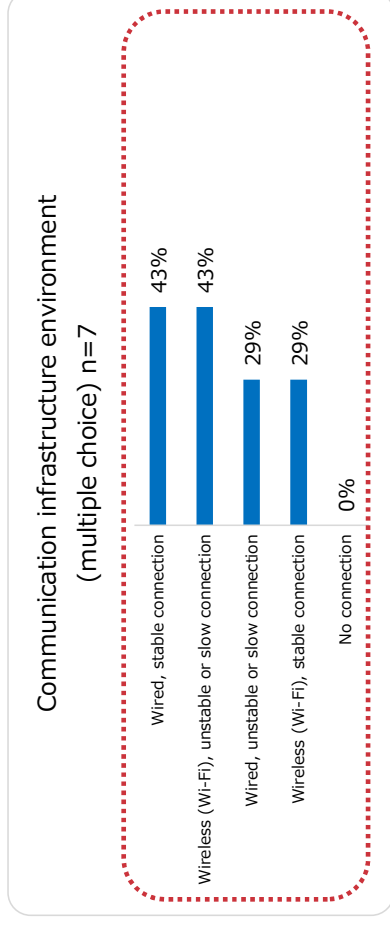
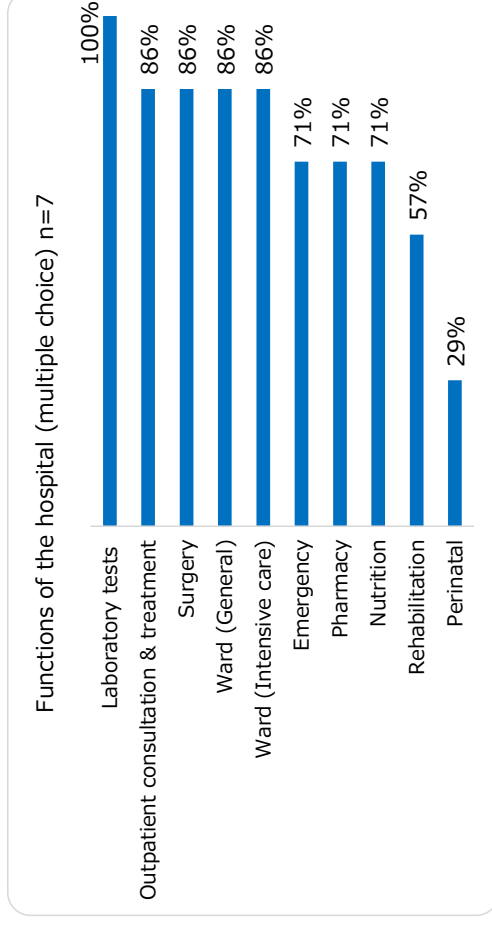
[Target Medical Facility] The number of medical facilities that were able to cooperate with the survey was small due to the shortage of medical care caused by the spread of infection. The respondents were secondary to tertiary level medical facilities, and although there were no medical facilities that had no communication infrastructure at all, the stability of the connection varied.

■ List of Target Medical Facilities

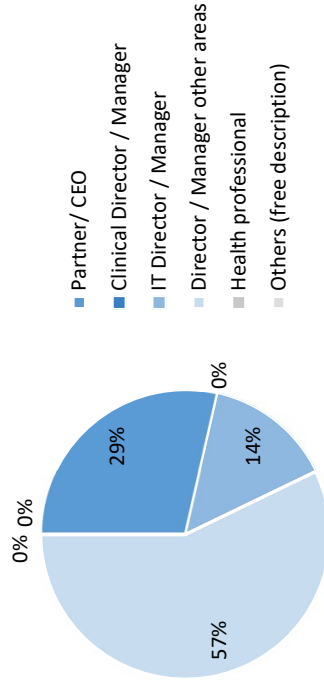
Classification		Facility Name	PoC Interest Level
Tertiary	Public	• Hospital Universitário Clementino Fraga Filho	○
		• Universidade Estadual de Campinas - Hospital de Clínicas	○
	• Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro	○	
	Private	• Hospital Santa Casa de Juiz de Fora	○
Secondary	Public	• Hospital SBC	○
		• Hospital Novo Atibaia SA	●

* PoC Interest Level ●: Confirmed intention in interview, ○: Answered questionnaire including possibility of PoC

■ General Information



Respondent's Occupation



Online-questionnaire Survey Results (Brazil)

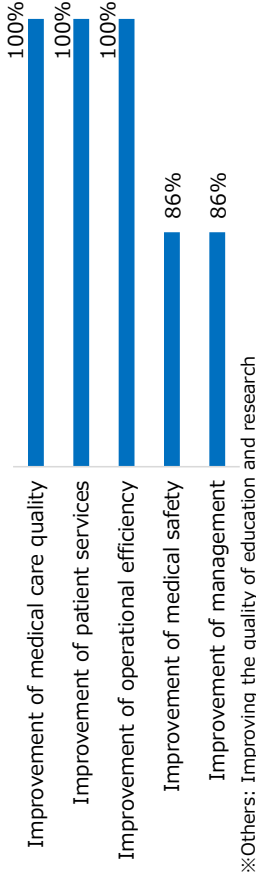


Summary

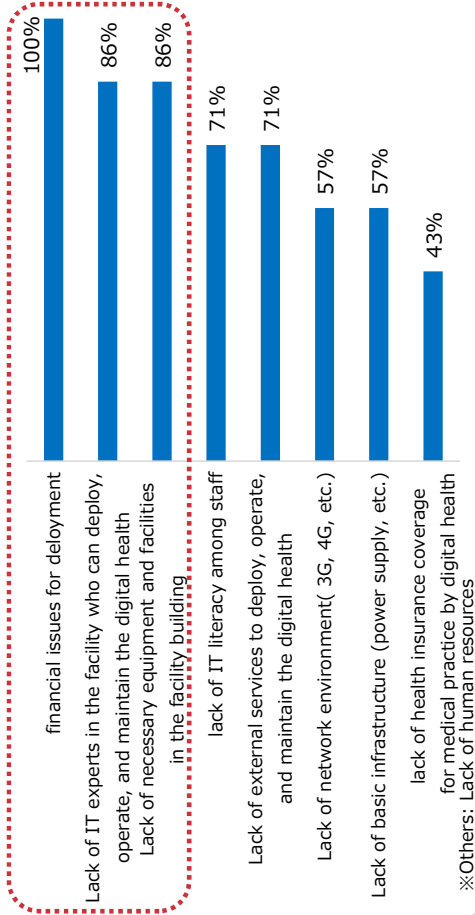
[Status of Digital Health] The major issues in the introduction of ICT are cost, lack of IT human resources, and lack of necessary equipment. Online medical treatment and online health consultation are cited as the digital health to be introduced in the future, and there is high demand for remote/non-contact and data linkage.

■ Digital Health Status

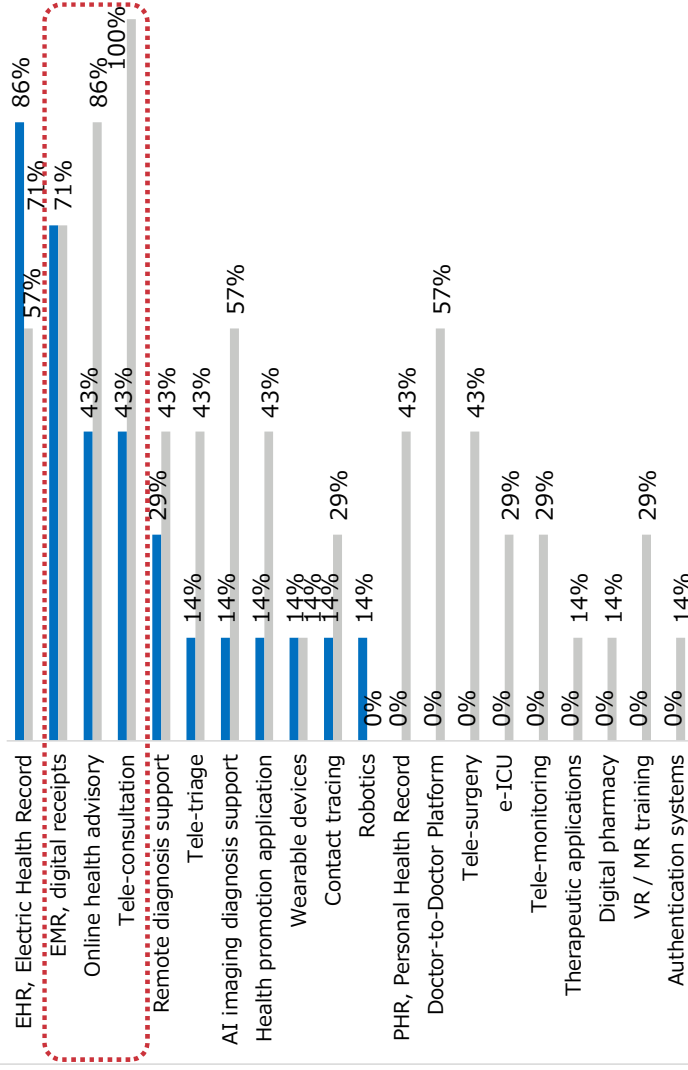
Expectations for digital health (multiple choice) n=7



Challenges in introducing digital health (multiple choice) n=7



Digital health that has been introduced, and digital health that should be introduced in the future (multiple choice) n=7



*Other (digital health to be introduced in the future): Software development for personnel, material and equipment management
 ■ Digital health already installed ■ Digital health to be installed in the future

Online-questionnaire Survey Results (Brazil)

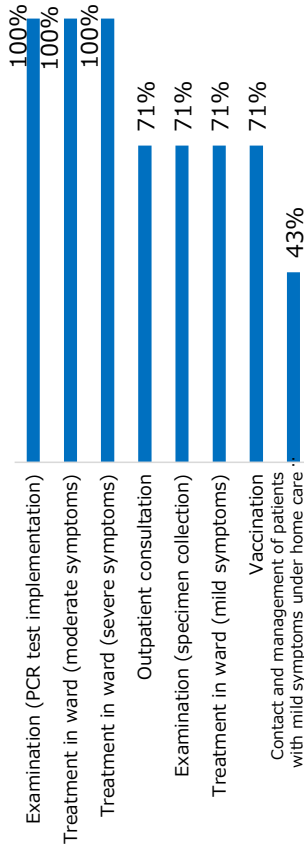


Summary

[Response to COVID-19] Lack of human resources and operations (e.g., inadequate manuals) are recognized as major issues rather than hospital beds, medical equipment, and medical materials. All medical facilities provide inpatient treatment for moderately to severely ill patients, but more than half of them complain of a lack of ventilators.

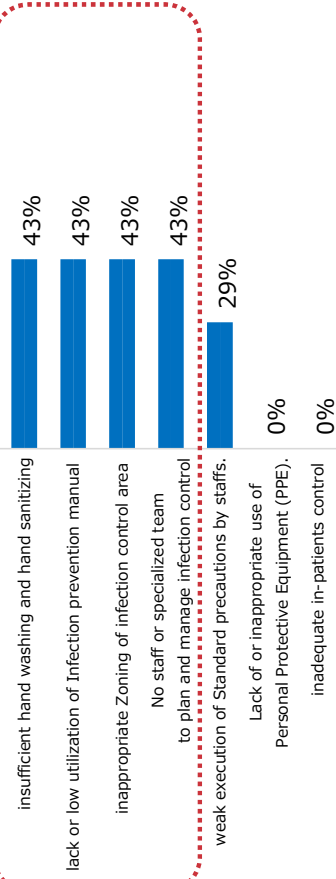
Compatible with COVID-19

What we are doing for COVID-19 (multiple choice) n=7



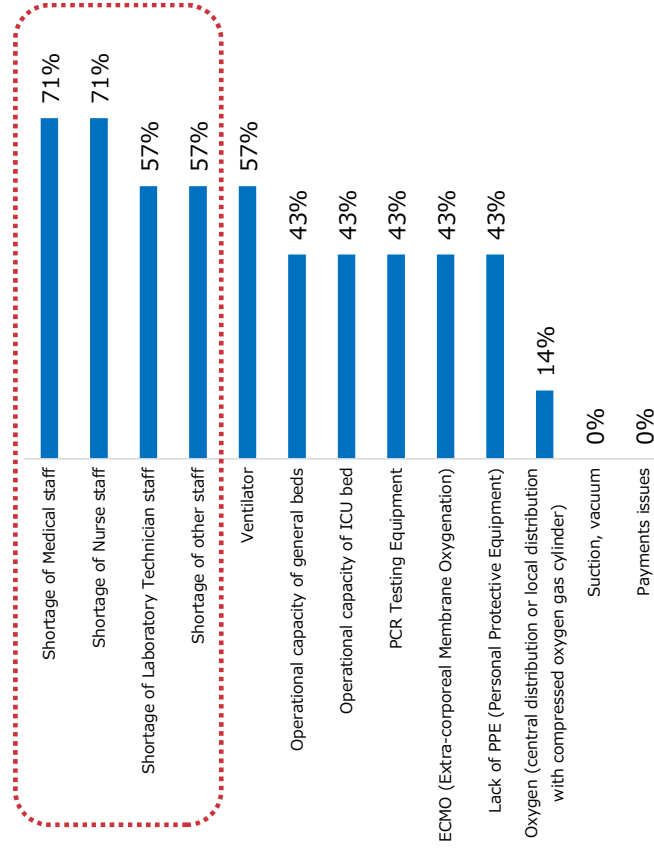
※Others: Collaborative research on viruses, rehabilitation

Issues in infection control (multiple choice) n=7



※Others: Time required for PCR test

Lack of support for COVID-19 (multiple choice) n=7



※Others: limited laboratory equipment, budget cuts, shortages of certain drugs (sedatives, anesthetics, etc.)

Online-questionnaire Survey Results (Brazil)

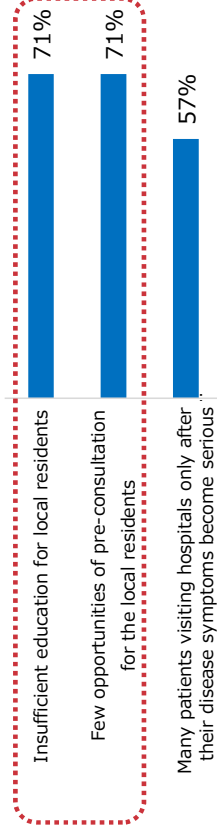


[Issues from Prevention to Follow-up] It is recognized that there are insufficient opportunities to provide educational guidance to local residents and patients, and to consult with doctors. Outpatient and inpatient wards are crowded, and the workload of staff is increasing. There is a high demand for a system and structure that allows efficient work to be carried out with fewer personnel.

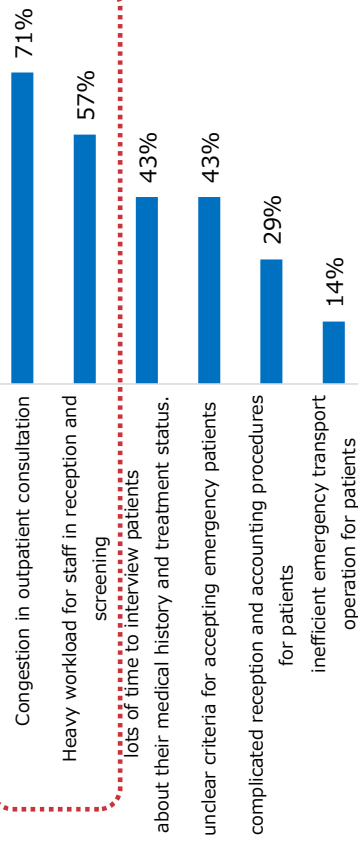
Summary

Operational Issues (1/2)

Operational issues related to prevention (multiple choices) n=7

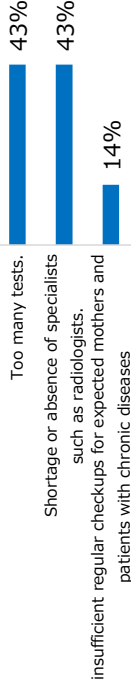


Operational issues related to screening (multiple choices) n=7

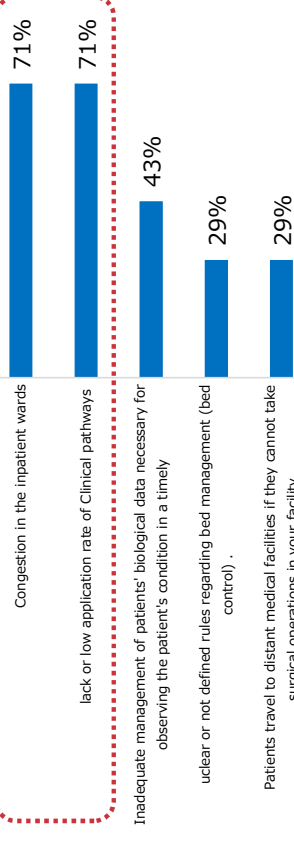


※Others: Time required for PCR testing, introduction of new technologies

Operational issues related to testing and diagnosis (multiple choices) n=7

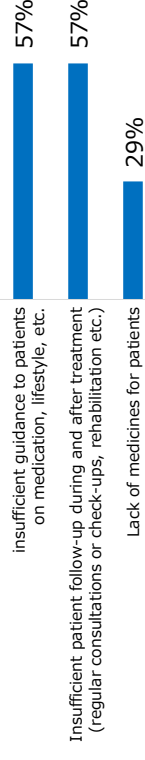


Operational issues related to inpatient care (multiple choices) n=7



*Other: ICU bed-dependent surgical waiting time, communication

Operational issues related to continuous treatment and follow-up (multiple choices) n=7



Online-questionnaire Survey Results (Brazil)

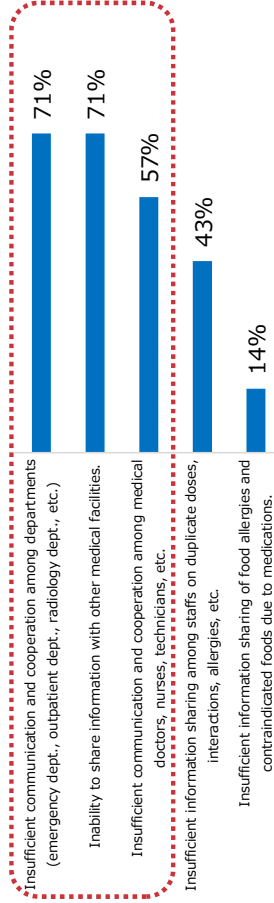


[Operational Issues] A high percentage of respondents were aware of issues related to the coordination of work and information between occupations, departments, and facilities. In addition, the need for education and training is also recognized. In addition, the need for education and training is also recognized. A mechanism and system for cooperation that can effectively and efficiently utilize limited resources is required.

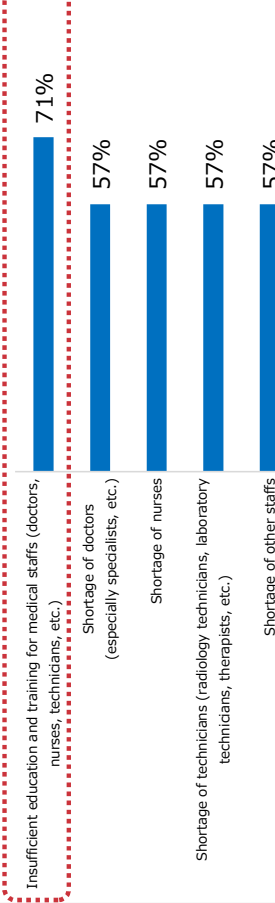
Summary

Operational Issues (2/2)

Operational issues related to organizational collaboration (multiple choices) n=7

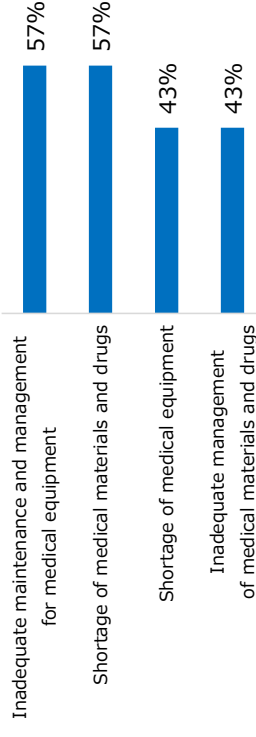


Operational issues related to the medical system (multiple choices) n=7



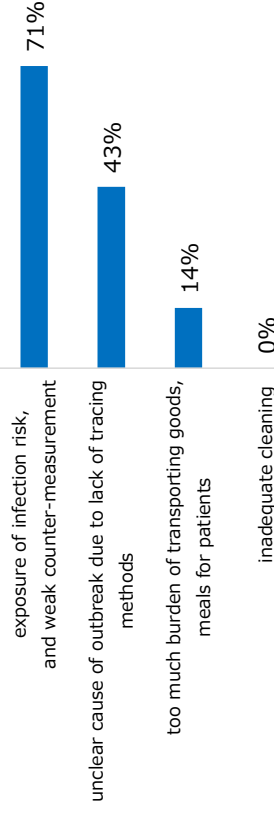
※Others: Shortage of general doctors.

Operational issues related to equipment and supplies (multiple choices) n=7



※Others: Training of personnel responsible for materials and equipment management, management of items used only during COVID-19 compliance

Other operational issues (multiple choice) n=7



※Other: Many manual, non-PC business processes.

Online-questionnaire Survey Results (Kenya)



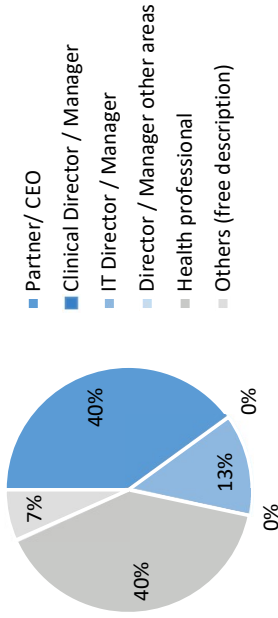
[Target Medical Facility] About half of the responding facilities were at the primary level, and interest in improving medical care through the use of digital health was high. The number of medical facilities that already have some kind of communication infrastructure is only about half of all responding facilities. This ratio is particularly low in rural areas.

■ List of Target Medical Facilities

Classification		Facility Name	PoC Interest Level
Tertiary	Private	• Aga Khan University Hospital	●
		• Gertrude's Children's Hospital	○
		• Mediheal Hospital	○
Secondary	Public	• Kericho County Hospital	●
		• Eldoret Hospital	●
	Private	• Nairobi West Hospital	○
		• Radiant Group of hospitals	○
		• Nyali Healthcare Limited	○
Primary	Public	• Sosiot Health Centre	●
		• Kabutii Matiret Dispensary	○
		• Kipsitet Dispensary	●
		• Nyailibuch Dispensary	●
		• Kaitui Dispensary	●
		• Ushirika Medical Clinic	○
		• Aldama Ebenezer Medical Clinic	●

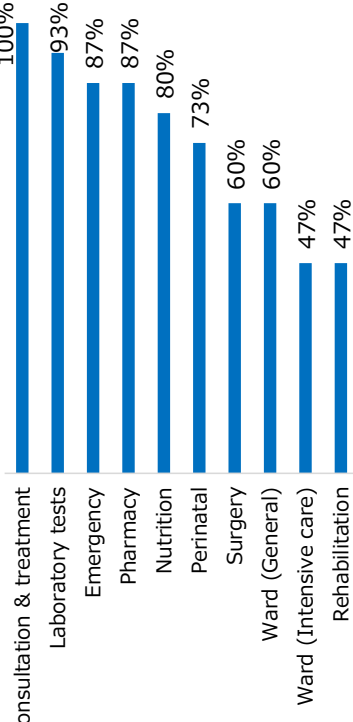
* PoC Interest Level ●: Confirmed intention in interview, ○: Answered questionnaire including possibility of PoC

Respondent's occupation



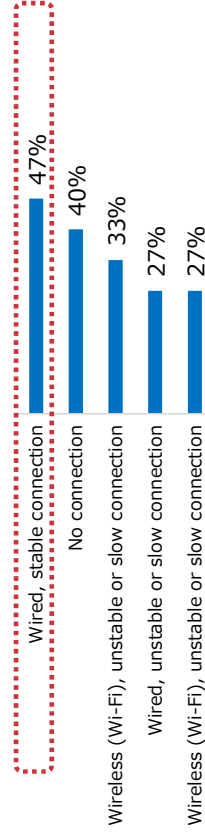
■ General Information

Functions that the hospital has (multiple choice) n=15



※Other: Dialysis, Infectious disease center, vaccination

Communication infrastructure environment (multiple choice) n=15



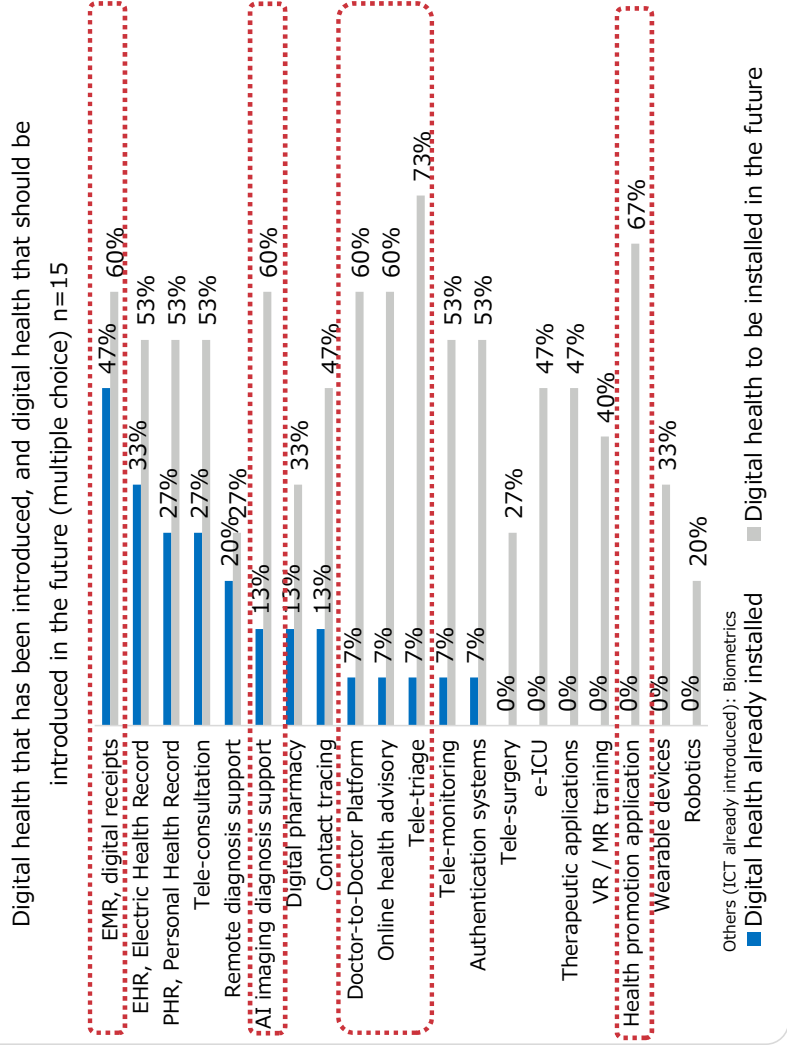
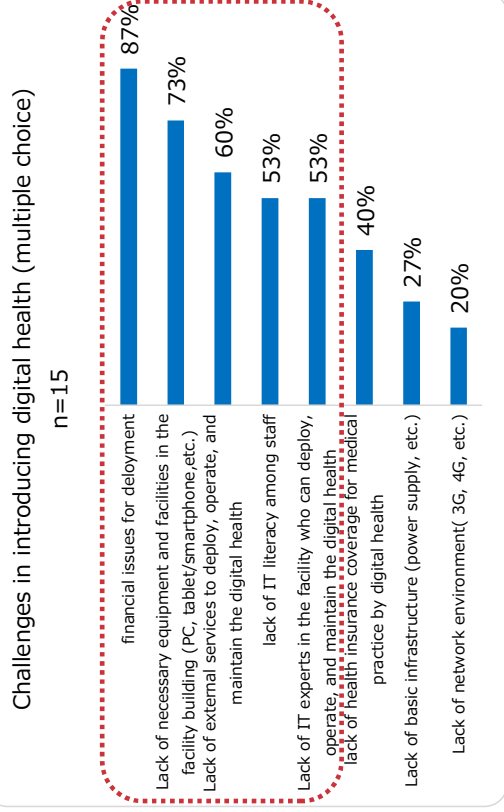
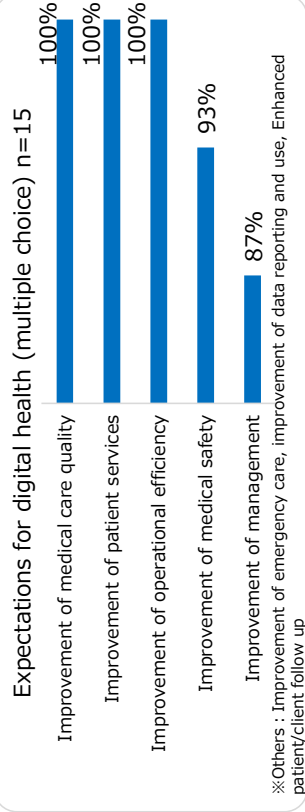
Online-questionnaire Survey Results (Kenya)



[Status of Digital Health] Cost, lack of IT human resources, and lack of communication equipment and facilities are the major issues in the introduction of ICT. The number of digital healths that have been introduced is low overall, but the willingness to introduce them in the future is high, so the potential demand is considered to be high. In particular, in addition to remote/non-contact and data linkage, there is a high interest in reducing the workload and improving the quality of diagnosis using AI, as well as disease prevention using health promotion applications.

Summary

■ Digital Health Status

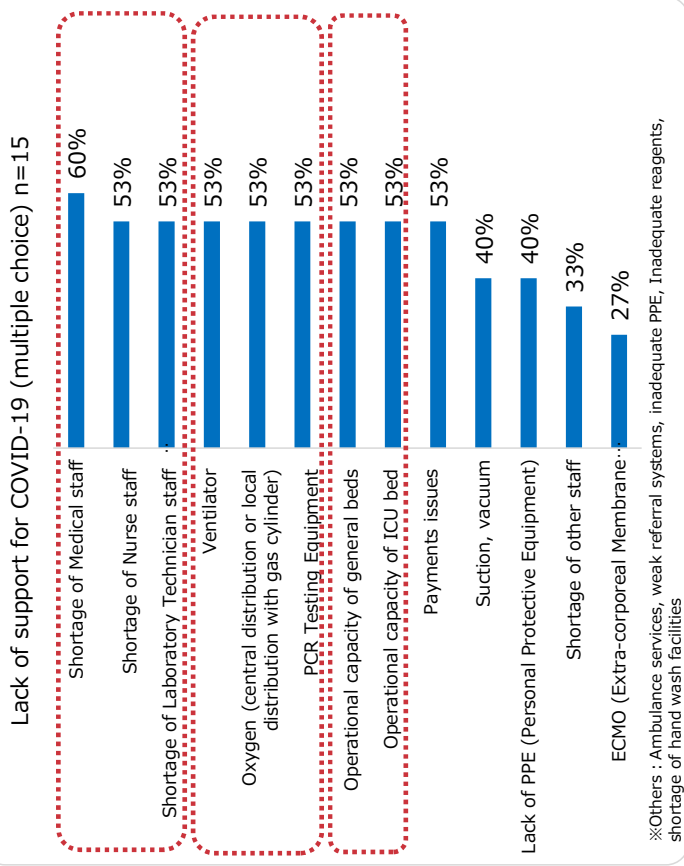
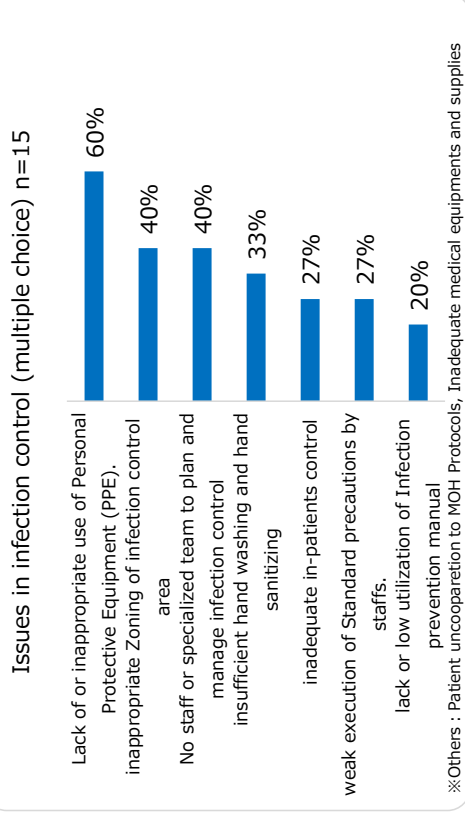
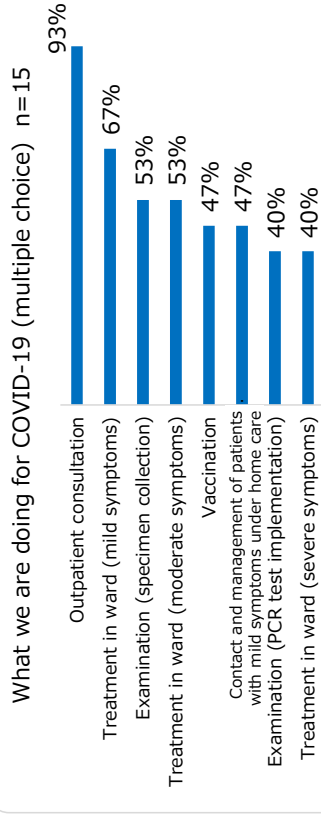


Online-questionnaire Survey Results (Kenya)



Summary **[Responses to COVID-19]** Since about half of the responding facilities are primary medical facilities, outpatient consultations are the main way to respond to COVID-19. There is an overall shortage of human resources, and supplies such as personal protective equipment (PPE) and medical equipment are also in short supply.

■ Compatible with COVID-19



Online-questionnaire Survey Results (Kenya)

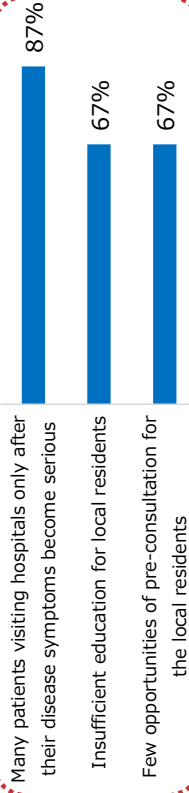


[Issues from Prevention to Follow-up] In primary and secondary care facilities, there is a lack of prevention and community education and guidance, as well as inadequate access to medical care, so many patients are already seriously ill when they arrive at the hospital. In terms of diagnosis and treatment, there are many issues such as lack of medical specialists, limited number of diseases that can be treated in their own hospitals, and shortage of medicines.

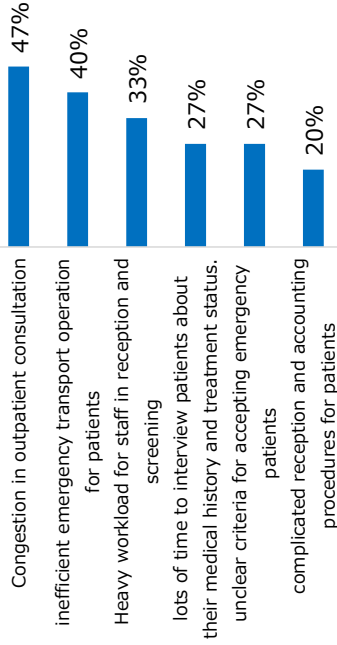
Summary

Operational Issues (1/2)

Operational issues related to prevention (multiple choices) n=15

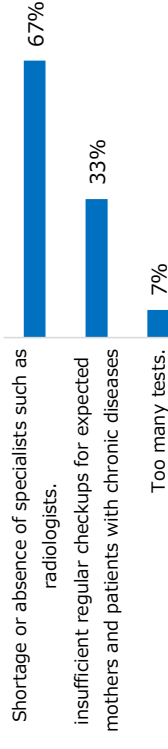


Operational issues related to screening (multiple choices) n=15



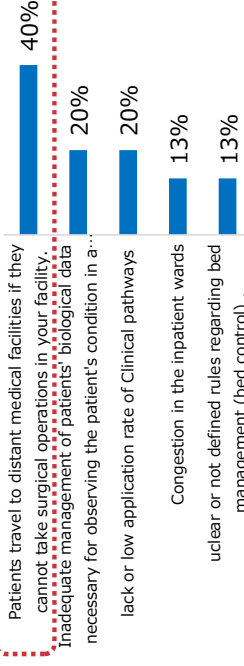
※Others : Inadequate space for clients' and staff's comfort, Too much paper work and long time getting authorization from insurance companies

Operational issues related to testing and diagnosis (multiple choices) n=15

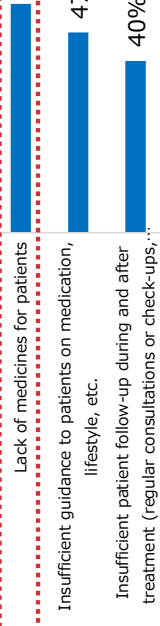


※Others : Lack of equipment and staff, No medical lab facility and equipments

Operational issues related to inpatient care (multiple choices) n=15



Operational issues related to continuous treatment and follow-up (multiple choices) n=15



※Others : Lack of staff

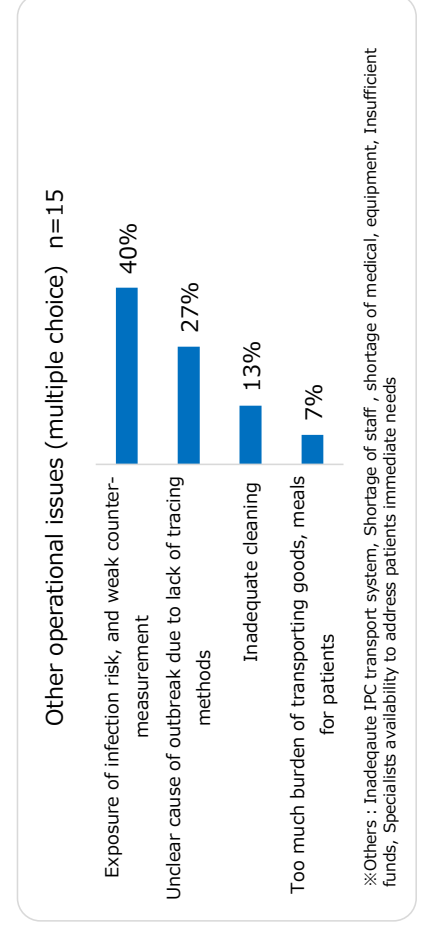
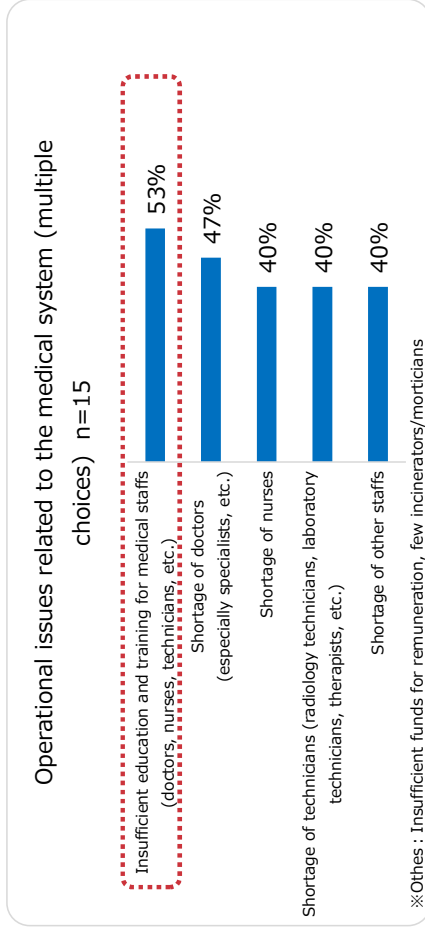
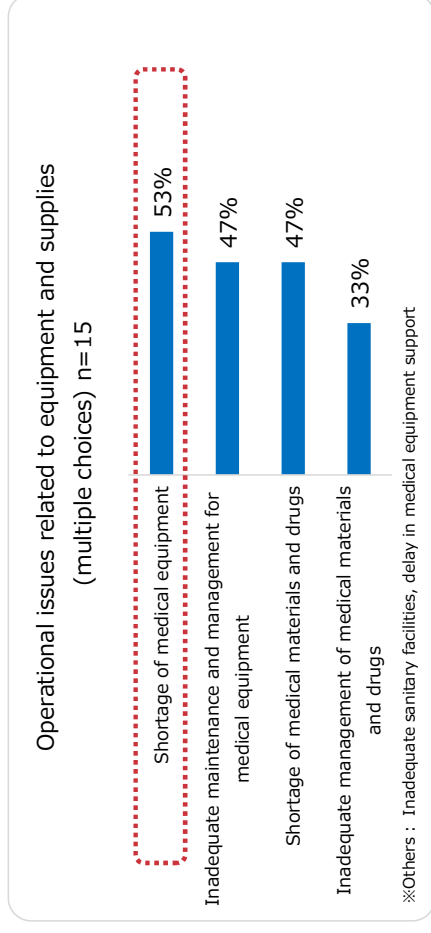
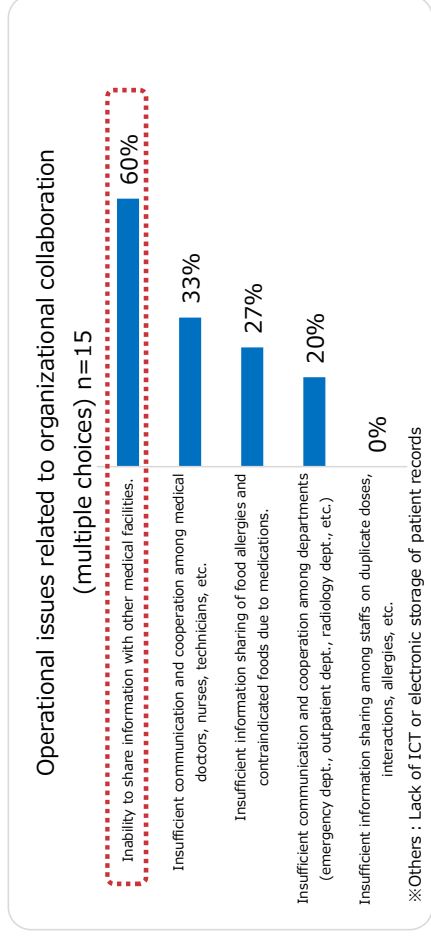
Online-questionnaire Survey Results (Kenya)



[Operational Issues] The overall shortage of personnel, medical equipment, and medical materials is a major issue. Many of the target medical facilities are aware that there are issues with information linkage with other facilities regarding patient examination records and test images, and it is presumed that there is a high demand for a mechanism and system that enables effective and efficient linkage.

Summary

■ Operational Issues (2/2)



Online-questionnaire Survey Results (Indonesia)



Summary

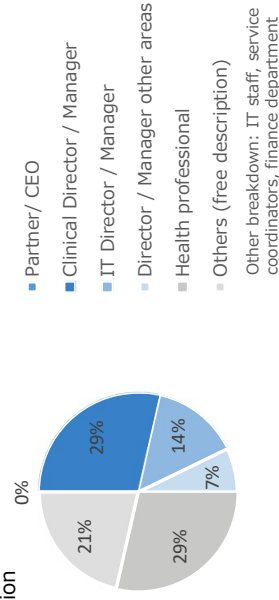
[Target Medical Facility] In Indonesia, a well-balanced response was obtained from medical facilities at different levels. More than 80% of all responding facilities have a good communication environment, and it can be inferred that the barriers to ICT adoption in terms of communication infrastructure are not very high.

List of Target Medical Facilities

Classification		Facility Name	PoC Interest level
Tertiary	Public	• National Cardiovascular Centre Harapan Kita	○
		• Dr. Hasan Sadikin National General Hospital	○
		• Dr. M. Goenawan Partowidigdo Lung Hospital	○
		• Harapan Kita Mother and Children Hospital	○
Secondary	Public	• H. Adam Malik National General Hospital	●
		• Hasanuddin University Hospital	○
		• Siti Fatimah Regional General Hospital of South Sumatera Province	○
		• Udayana University Hospital	○
		• North Sumatera University Hospital	●
Private	Private	• Brawijaya University Hospital	○
		• Murni Teguh Memorial Hospital	○
		• Bunda Thamrin General Hospital	●
		• PKU Muhammadiyah Bantul General Hospital	○
		• Mitra Medika General Hospital	○
		• Mitra Medika General Hospital	●

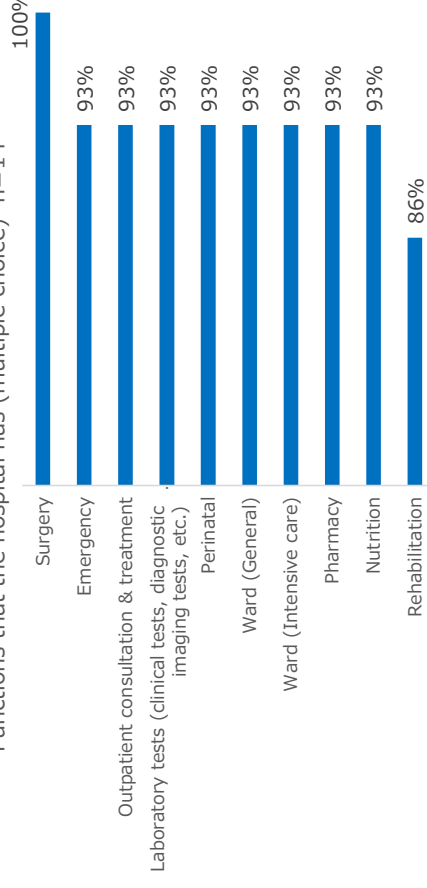
* PoC Interest Level ● : Confirmed intention in interview, ○ : Answered questionnaire including possibility of PoC

Respondent's occupation



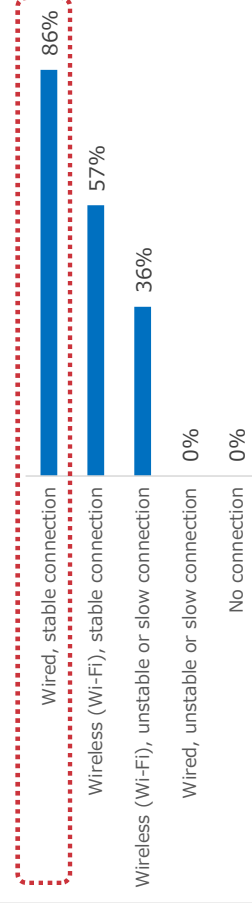
General Information

Functions that the hospital has (multiple choice) n=14



※Others: hemodialysis, radiation therapy, medical records, nuclear medicine, UTDRS, palliative vaccination

Communication infrastructure environment (multiple choice) n=14



Online-questionnaire Survey Results (Indonesia)

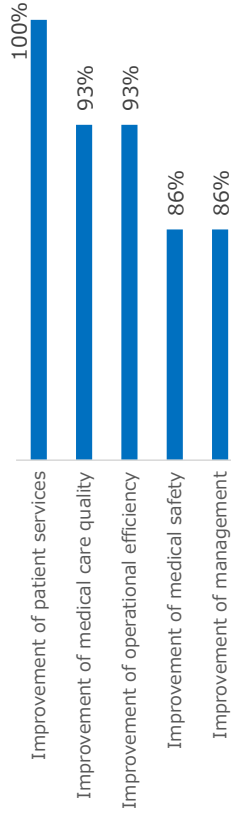


Summary

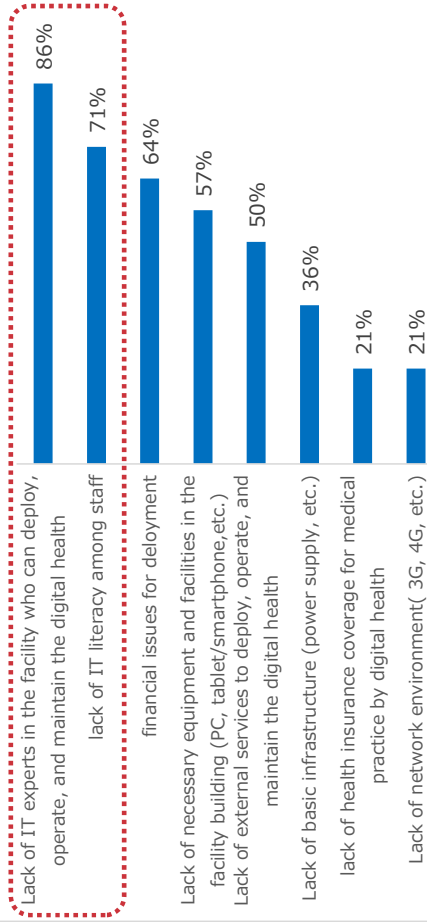
[Status of Digital Health] The lack of human resources capable of operating and managing digital health is the main barrier to adoption, followed by the low IT literacy of general staff. Electronic medical records, online medical care, and EHR have already been introduced at a high rate. There is high interest in physician-to-physician platforms, telemedicine, and information collaboration.

Digital Health Status

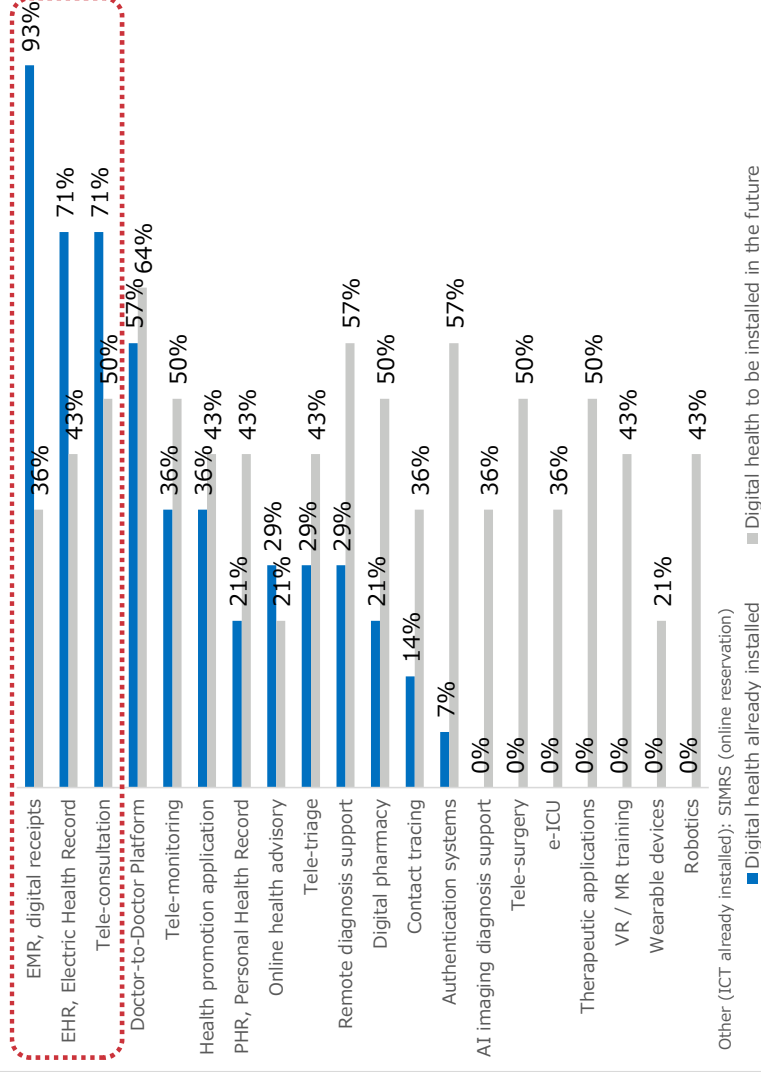
Expectations for digital health (multiple choice) n=14



Challenges in introducing digital health (multiple choice) n=14



Digital health that has been introduced, and digital health that should be introduced in the future (multiple choice) n=14



Online-questionnaire Survey Results (Indonesia)

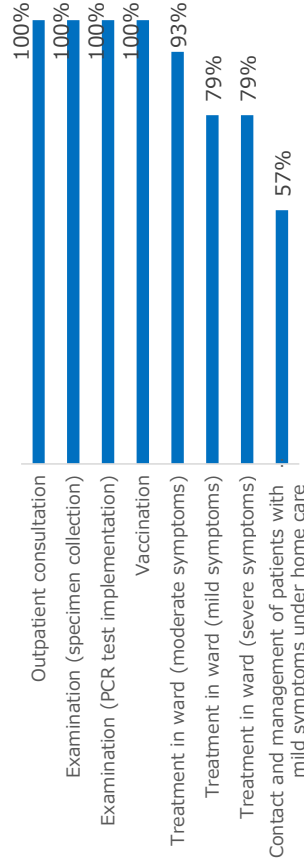


Summary

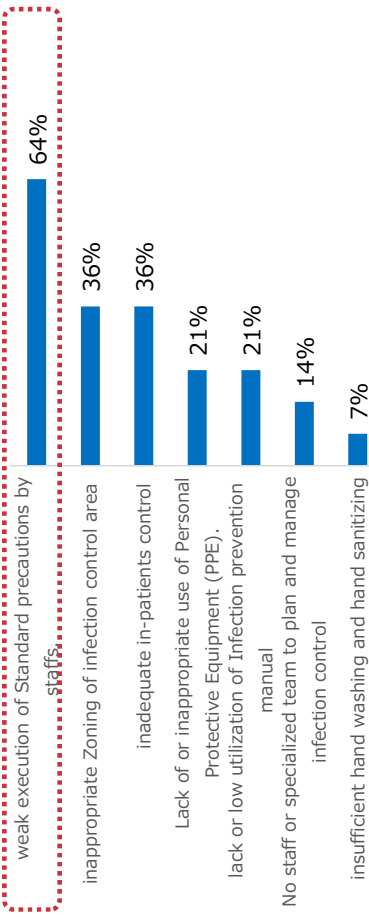
[Responses to COVID-19] The shortage of nurses and ventilators and the lack of standard precautions have been recognized as major issues.

Compatible with COVID-19

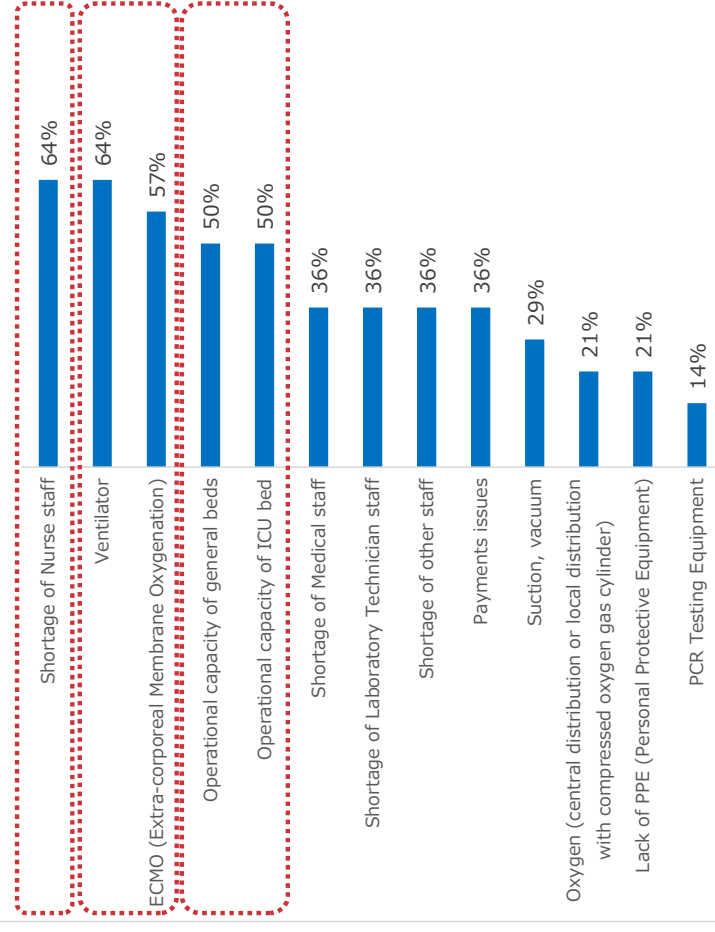
What we are doing for COVID-19 (multiple choice) n=14



Issues in infection control (multiple choice) n=14



Lack of support for COVID-19 (multiple choice) n=14



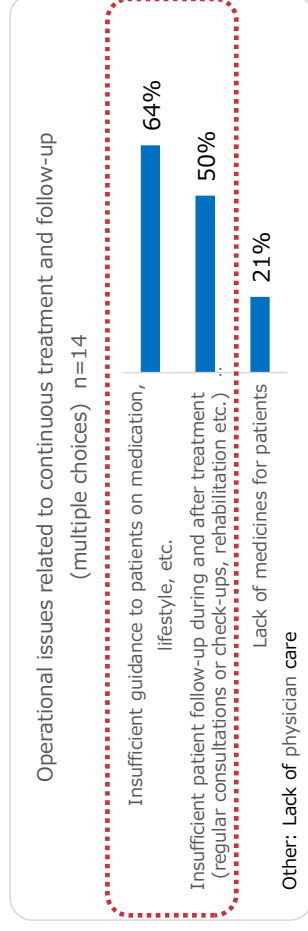
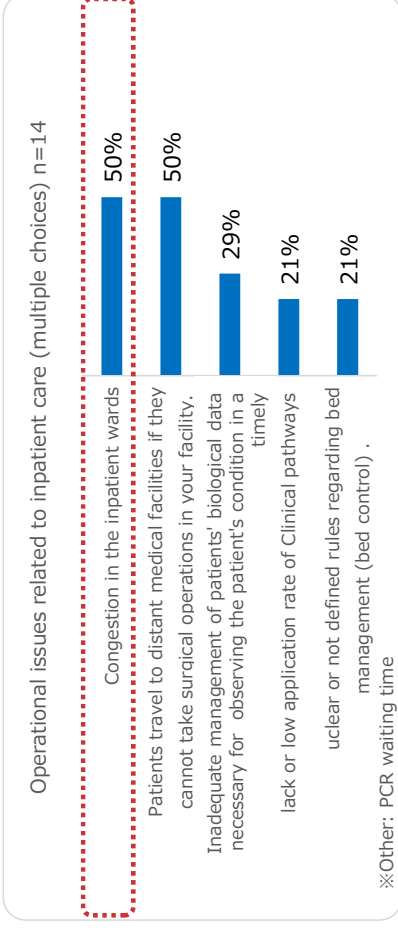
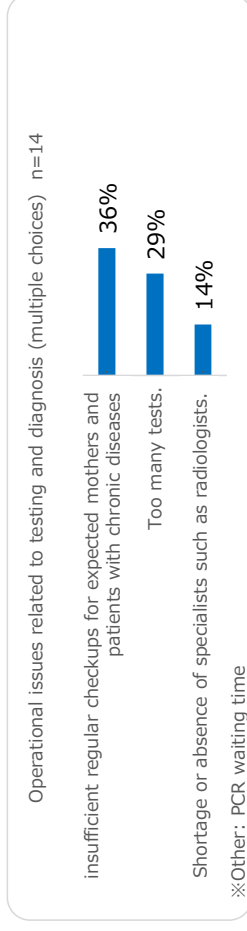
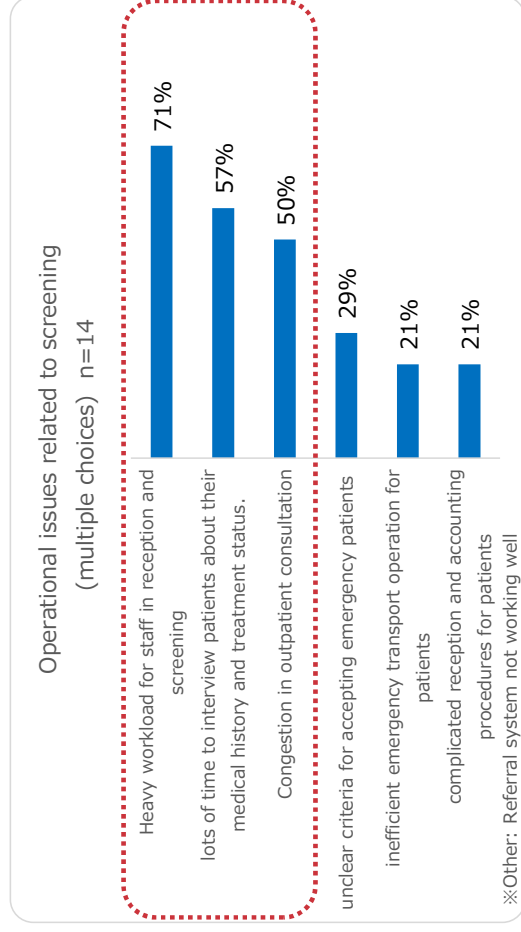
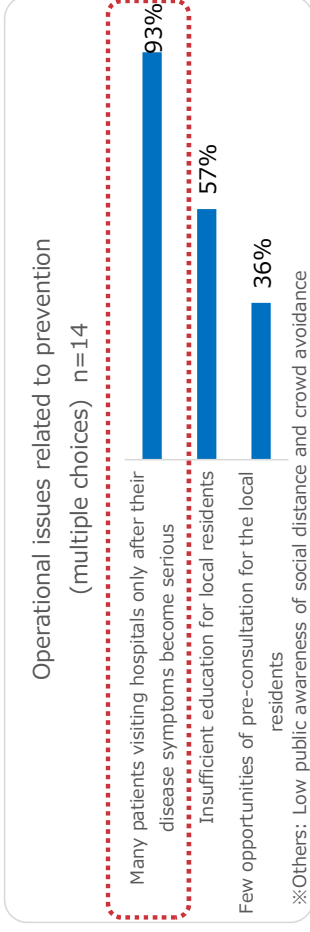
Online-questionnaire Survey Results (Indonesia)



[Issues from Prevention to Follow-up] In many cases, the disease is already serious when the patient arrives at the hospital due to lack of education and guidance for local residents and patients, as well as insufficient access to medical care. The congestion of outpatients places a heavy workload on the staff, and there is a high demand for the use of digital health to improve work efficiency.

Summary

■ Operational Issues (1/2)



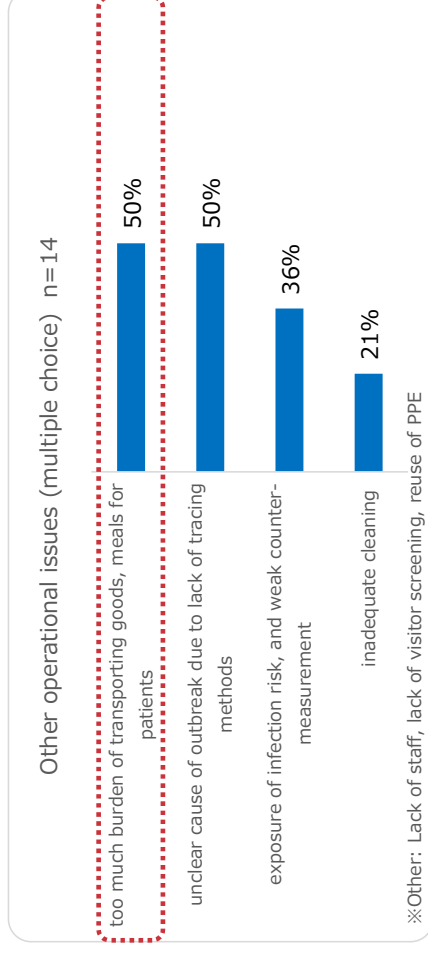
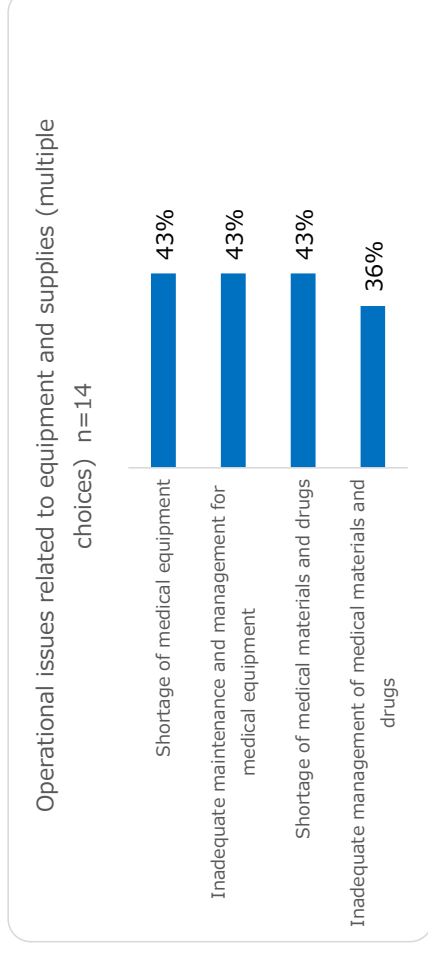
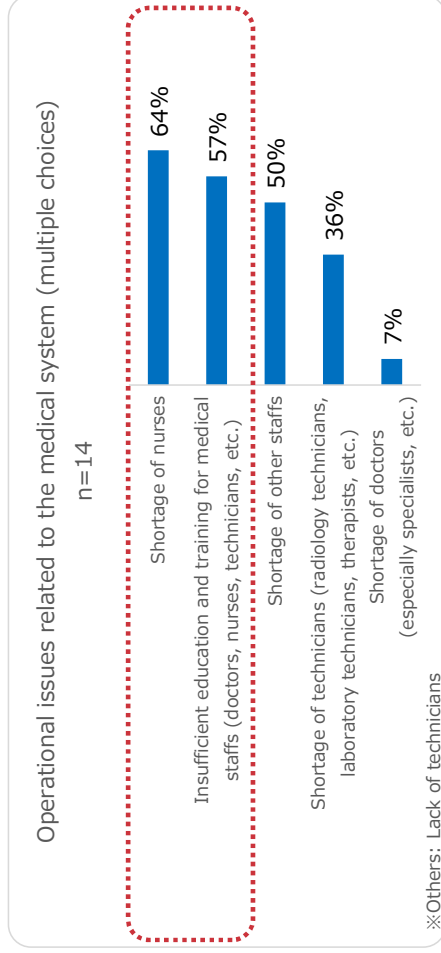
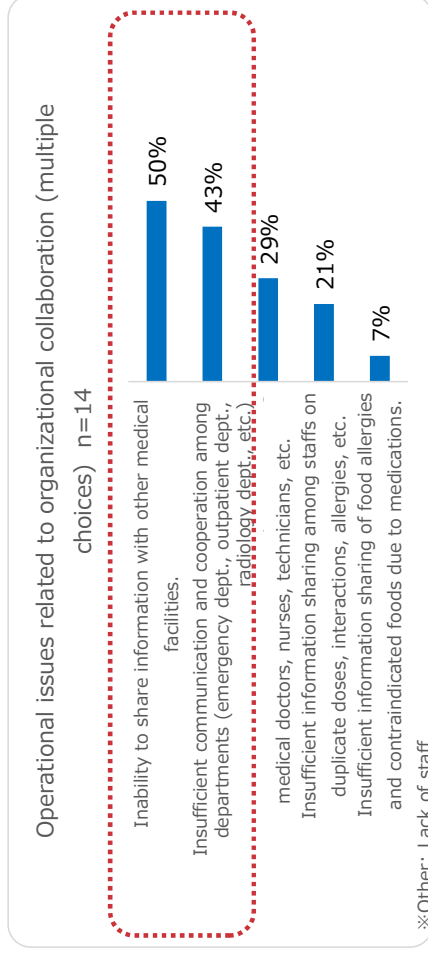
Online-questionnaire Survey Results (Indonesia)



[Operational Issues] The overall shortage of personnel, medical equipment, medical materials, etc. is a major issue. A high percentage of respondents were aware of issues related to the coordination of operations and information between departments and facilities. Education and training are perceived to be inadequate, and demand for remote training is presumed to be high.

Summary

Operational Issues (2/2)



Appendix 7. Detailed information on each medical facility (Brazil)



Detailed information on each medical facility

■ List of medical facilities

Classification	Facility Name	Interest in PoC
Tertiary	<ul style="list-style-type: none"> Hospital Universitário Clementino Fraga Filho Universidade Estadual de Campinas - Hospital de Clínicas Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro 	<input type="radio"/> <input type="radio"/> <input type="radio"/>
	Private	<input type="radio"/>
Secondary	<ul style="list-style-type: none"> Hospital SBC Hospital Novo Atibaia SA 	<input type="radio"/> ●



Distance from Japan

18,100 km

Time difference from Japan time (JST)

JST-12

Flight time from Japan

About 25 to 27 hours

Language

Portuguese

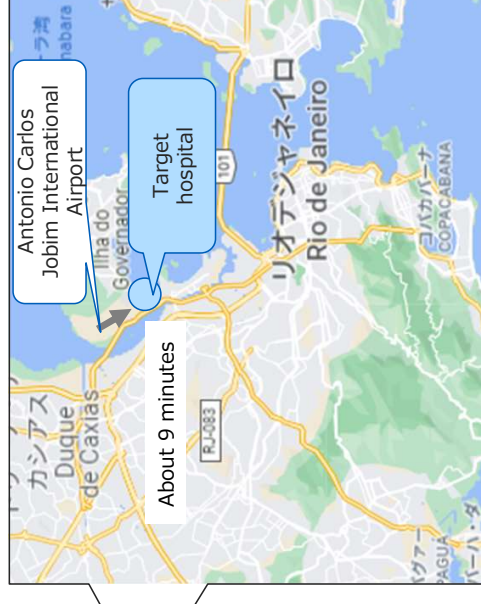
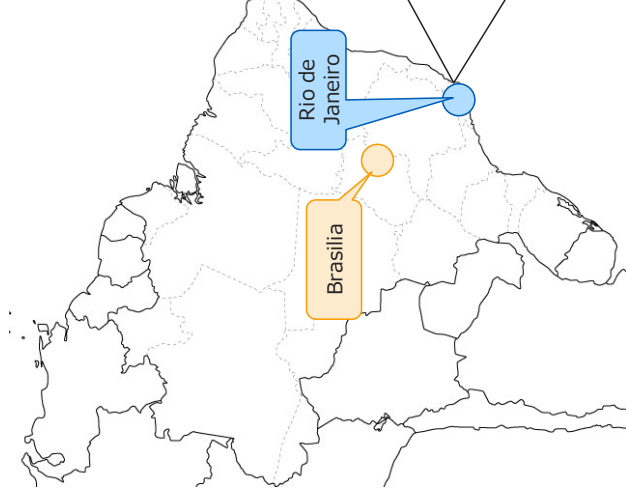
*[Interest in PoC] ●: Confirmed interest through follow-up interviews

○: Responded to questionnaire including possibility of PoC

Hospital Universitário Clementino Fraga Filho

General Information

Location	Rio de Janeiro, Rio de Janeiro Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Medical facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input checked="" type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	251
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary There is a certain level of acceptance of digital health in hospitals. On the other hand, the necessary equipment, facilities, and IT human resources in the hospital are limited, and access to network infrastructure and urban infrastructure outside the hospital is also limited.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	* No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. In the case of products that connect other facilities, confirmation of the communication infrastructure outside the hospital is required.
Situation of Digital Health	<input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others ()	* No interview conducted	
Issues on Digital Health Deployment	<input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input checked="" type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others ()	* No interview conducted	

Summary The medical facilities provide a wide range of services against COVID-19, from outpatient treatment to inpatient treatment in critical conditions. On the other hand, there is a shortage of doctors, nurses and technicians.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	<p>* No interview conducted</p>	<p>-</p>
	<p>What is lacking for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff [Facilities, Equipment, etc.] <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input checked="" type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>* No interview conducted</p>	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Patient monitoring devices in isolation beds (biometric data collection devices such as cloth-type and bedside type, etc.) • Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) • Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>* No interview conducted</p>	<p>-</p>

Summary There is a possibility that there is insufficient education and guidance for local residents and patients regarding health care. There is concern that this situation may lead to delays in early detection of diseases and worsening of symptoms in existing patients. There seems to be a high demand for preventive medicine and solutions that allow patients to have contact with medical professionals. There is also likely to be demand for digital health to ease congestion in outpatient and hospital wards and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Health promotion application • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of clinical pathways management (bed control) <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in the facility <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Wearable devices • EMR (Electric Medical Record)

Summary The medical facility expects to collaborate within the hospital, but lacks the necessary infrastructure and foundation. Overall, there is a shortage of resources such as personnel, pharmaceuticals, and equipment and supplies, and there may be demand for operational efficiency and workload reduction to optimize staffing, as well as for digital health and other systems that enable efficient procurement, management, and use of limited resources.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Digital pharmacy
Organizational cooperation	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input checked="" type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications <input type="checkbox"/> Inability to share information with other medical facilities <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • EMR (Electric Medical Record), etc.
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. <ul style="list-style-type: none"> → EMR (computerization of medical information), monitoring equipment, wearable terminals, utilization of robots, etc. • Remote diagnosis support • AI imaging diagnosis support • Doctor-to-Doctor Platform
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	*No interview conducted	-

[Tertiary, Public] Hospital Universitário Clementino Fraga Filho

Summary There is room for the use of digital health to reduce congestion in outpatients and wards.

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems Others	<input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others ()	* No interview conducted	<ul style="list-style-type: none"> Alleviate peak waiting times and improve efficiency <ul style="list-style-type: none"> → Triage (AI Questionnaire) → Reservation system for visiting hospitals Ease congestion in wards, improve efficiency <ul style="list-style-type: none"> → facility expansion → digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.)
Collaboration Status with Other Donors	-	* No interview conducted	-
Expected support from Japan and JICA	-	* No interview conducted	-
Interest in PoC	-	* No interview conducted	-

Summary The following are the digital health that have been introduced and will be introduced at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment *Details unknown	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health budget • N/A
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	<ul style="list-style-type: none"> ■ Time of introduction of digital health • N/A
Tele-surgery	-		Tele-surgery	<ul style="list-style-type: none"> ■ Others • N/A
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

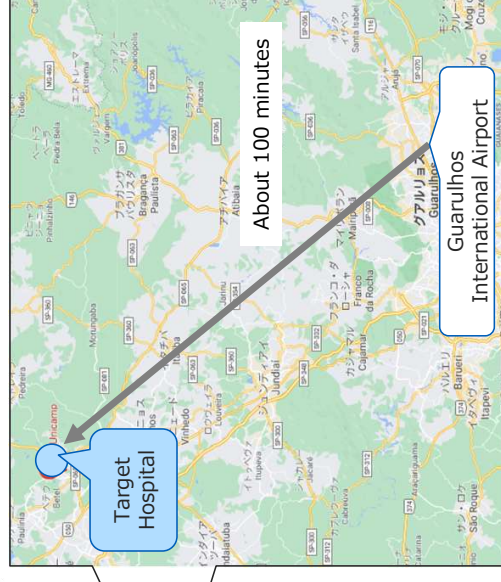
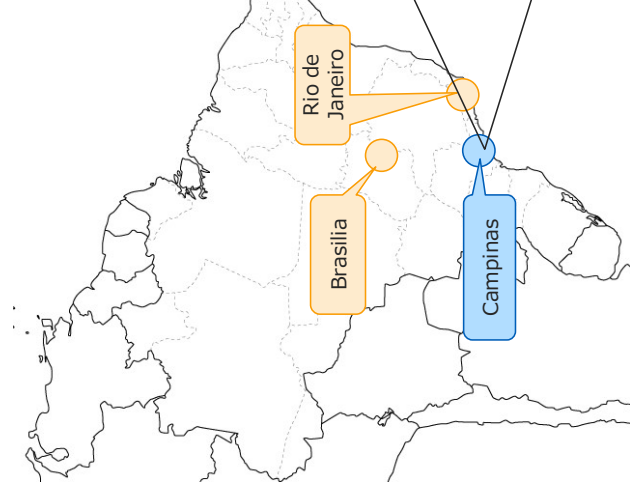
○ Hospital response ○ Potential demand (survey team's evaluation)

[Tertiary, Public] Universidade Estadual de Campinas - Hospital de Clinicas

Universidade Estadual de Campinas - Hospital de Clinicas

General Information

Location	Campinas, State of São Paulo
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Medical facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input checked="" type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	496
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary There is a certain degree of readiness to accept digital health in hospitals. On the other hand, the necessary equipment, facilities, and IT personnel are limited in the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wireless (Wi-Fi), stable connection <input type="checkbox"/> Improvement of medical care quality <input type="checkbox"/> Improvement of patient services <input type="checkbox"/> Improvement of medical safety <input type="checkbox"/> Improvement of operational efficiency <input type="checkbox"/> Improvement of management <input type="checkbox"/> Others ()	*No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. In the case of products that connect other facilities, confirmation of the communication infrastructure outside the hospital is required.
Situation of Digital Health	<input checked="" type="checkbox"/> Expectation for Digital Health	*No interview conducted	-
Issues on Digital Health Deployment	<input checked="" type="checkbox"/> Financial issues for deployment <input checked="" type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input checked="" type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input checked="" type="checkbox"/> Others ()	*No interview conducted	<ul style="list-style-type: none"> IT literacy among healthcare professionals is not high, which is likely to be a barrier to the introduction of digital health. → There will be demand for effective digital health that can be used intuitively and simply. Wireless connection is available, but the necessary equipment and terminals may be insufficient, and it is necessary to confirm what facilities and equipment are available in the hospital when introducing digital health.

Summary It provides a wide range of services, from outpatient treatment of patients with COVID-19 to inpatient treatment of patients with moderate disease. On the other hand, there is a shortage of doctors, nurses, technicians, and other personnel. In addition, there is a shortage of hospital beds and equipment and supplies.

Results of online questionnaire and follow-up interview (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	✘	<p>* No interview conducted</p>	-
<p>What is lacking for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input checked="" type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✘	<p>* No interview conducted</p>	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) • Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input checked="" type="checkbox"/> Lack or low utilization of Infection prevention manual <input checked="" type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	✘	<p>* No interview conducted</p>	-

Summary There is a possibility that local residents have limited access to health care. This situation may lead to delays in early detection of diseases and worsening of symptoms in existing patients. There is likely to be a high demand for preventive medicine and solutions that allow patients to have contact with their healthcare providers. There is also likely to be demand for digital health to ease congestion in outpatient and hospital wards and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Health promotion application • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	*No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input checked="" type="checkbox"/> Lack or low application rate of Clinical pathways management (bed control) <input checked="" type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Wearable devices • EMR (Electric Medical Record)

[Tertiary, Public] Universidade Estadual de Campinas - Hospital de Clinicas

Summary There are challenges in patient follow-up during and after treatment, but there is room for the use of digital health. The hospital expects collaboration within and outside the hospital, but lacks the necessary infrastructure and foundation. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) □ Lack of medicines for patients □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic applications • Remote rehabilitation • VR / MR training • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. ■ Insufficient communication and cooperation among departments ■ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. ■ Insufficient information sharing of food allergies and contraindicated foods due to medications ■ Inability to share information with other medical facilities □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • EMR (Electric Medical Record) • EHR (Electric Health Record) • PHR (Personal Health Record) • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> ■ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses ■ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. → Use of electronic medical records (computerization of medical information), monitoring equipment, wearable terminals, robots, etc. • Remote diagnosis support • AI imaging diagnosis support • Doctor-to-Doctor Platform • VR / MR training (education and training)
Equipment and Supplies	<ul style="list-style-type: none"> □ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs ■ Inadequate management of medical materials and drugs □ Others () 	*No interview conducted	-

[Tertiary, Public] Universidade Estadual de Campinas - Hospital de Clinicas

There is room for the use of digital health to reduce congestion in outpatients and wards.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	* No interview conducted	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency <ul style="list-style-type: none"> → Triage (AI Questionnaire) → Reservation system for visiting hospitals • Ease congestion in wards, improve efficiency <ul style="list-style-type: none"> → facility expansion → digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.) • Reduce the burden of transport operations by using robots, etc.
Collaboration Status with Other Donors	-	* No interview conducted	-
Expected support from Japan and JICA	-	* No interview conducted	-
Interest in PoC	-	* No interview conducted	-

[Tertiary, Public] Universidade Estadual de Campinas - Hospital de Clinicas

Summary The following is a list of digital health that have been introduced and are being considered for introduction at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	*Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

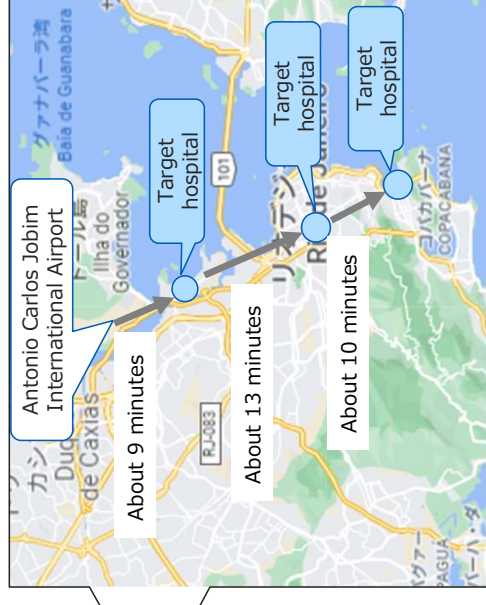
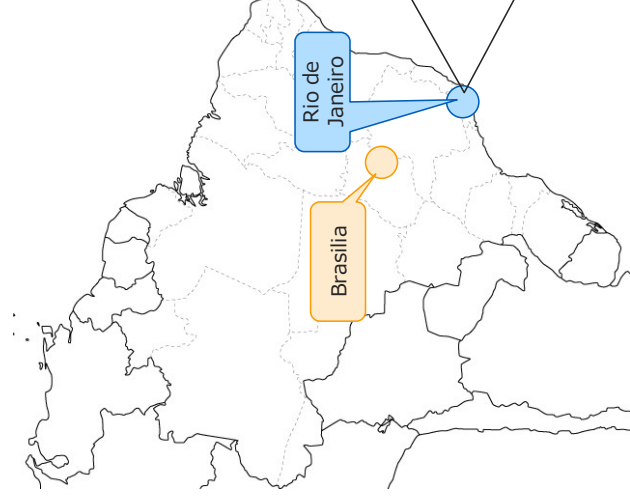
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of introduction of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro

General Information

Location	Rio de Janeiro, Rio de Janeiro Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Medical facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input checked="" type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	659
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Public] **Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro**

Summary The communication infrastructure in the hospital has been introduced, but it is unstable. There is a lack of resources overall, including personnel for digital health, necessary facilities and equipment in the hospital, utilization of external resources, and communication infrastructure outside the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, unstable or slow connection Wireless (Wi-Fi), unstable or slow connection</p>	* No interview conducted	<ul style="list-style-type: none"> There is a communication infrastructure in the hospital, but it is not stable.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others (Improvement of the quality of education and research) 	* No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others (lack of human resources) 	* No interview conducted	<ul style="list-style-type: none"> IT literacy among healthcare professionals is not high, which is likely to be a barrier to the introduction of digital health. <ul style="list-style-type: none"> → There will be demand for effective digital health that can be used intuitively and simply. Wired and wireless connections are available, but the necessary equipment and terminals may be insufficient, and it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

[Tertiary, Public] **Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro**

Summary The medical facility provides a wide range of services, from outpatient treatment to inpatient treatment of critically ill patients with COVID-19 infection. On the other hand, there is a shortage of doctors, nurses, technicians, and other personnel. In addition, there is a shortage of hospital beds and equipment and supplies.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination ■ Contact and management of patients with mild symptoms under home care ■ Others (Rehabilitation) 	<p>*No interview conducted</p>	-
	<p>What is lacking for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> ■ [Human Resources] <ul style="list-style-type: none"> ■ Doctor ■ Nurse ■ Laboratory technician ■ Other staff ■ [Facilities, Equipment, etc.] <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator ■ Suction, vacuum ■ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) ■ [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>*No interview conducted</p>	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) • Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> ■ [Software: Manual, Operation] <ul style="list-style-type: none"> ■ Insufficient hand washing and hand sanitizing by staff ■ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE ■ [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control ■ [Human Resources] <ul style="list-style-type: none"> ■ No staff or specialized teams for infection control ■ Others 	<p>*No interview conducted</p>	-

Summary There may be a lack of education and guidance for local residents and patients regarding health care. There is likely to be a high demand for preventive medicine and solutions that enable patients to have contact with healthcare providers. There is also likely to be demand for digital health that can help reduce the workload of staff in outpatient clinics and wards and improve the efficiency of work processes.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents □ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • Health promotion application • Online health advisory
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status ■ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests □ Insufficient regular checkups for expected mothers and patients with chronic diseases □ Shortage or absence of specialists such as radiologists ■ Others (introduction of new technology (is necessary)) 	*No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> ■ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) ■ Lack or low application rate of Clinical pathways management (bed control) □ Unclear or not defined rules regarding bed management (bed control) □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility ■ Others (ICU bed-dependent surgical wait times) 	*No interview conducted	<ul style="list-style-type: none"> • Wearable devices • EMR (Electric Medical Record)

Summary The hospital expects to collaborate with other hospitals, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be inadequate, and there is demand for the provision of training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others () 	*No interview conducted	-
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications <input checked="" type="checkbox"/> Inability to share information with other medical facilities <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • EHR (Electric Health Record) • PHR (Personal Health Record) • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. <ul style="list-style-type: none"> → Use of electronic medical records (computerization of medical information), monitoring equipment, wearable terminals, robots, etc. • Remote diagnosis support • AI diagnostic imaging support • Doctor-to-Doctor Platform • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	*No interview conducted	-

[Tertiary, Public] Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro

No major problems have been identified.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (not applicable) 	* No interview conducted	-
Collaboration Status with Other Donors	-	* No interview conducted	-
Expected support from Japan and JICA	-	* No interview conducted	-
Interest in PoC	-	* No interview conducted	-

[Tertiary, Public] **Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro**

Summary The following is a list of digital health that have been introduced and are being considered for introduction at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

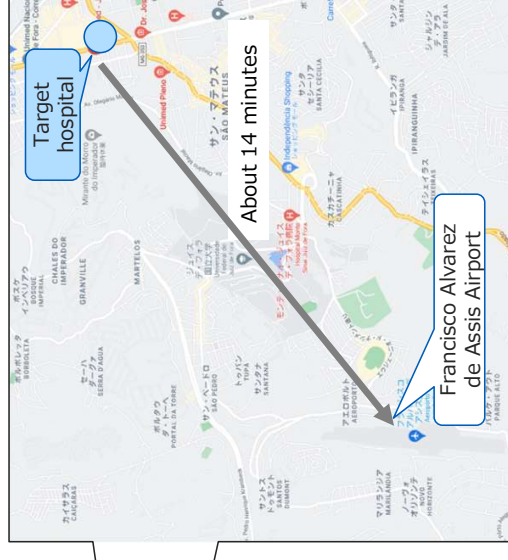
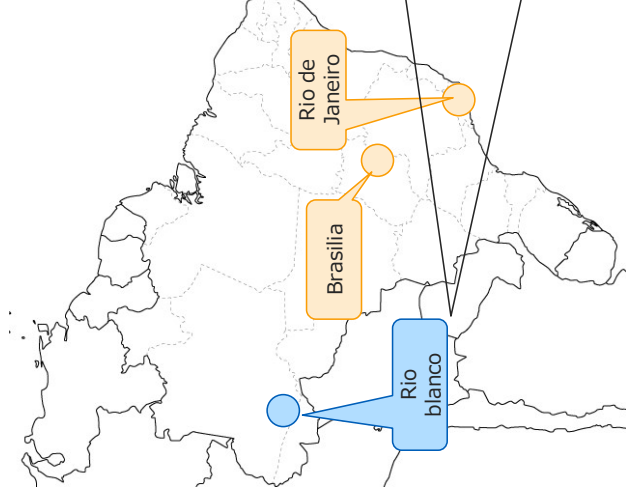
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of introduction of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Hospital Santa Casa de Juiz de Fora

General Information

Location	Rio Branco, Akure State
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Medical facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input checked="" type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	391
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Private] Hospital Santa Casa de Juiz de Fora

Summary There is a certain level of acceptance of digital health in hospitals. On the other hand, the introduction cost and IT literacy of the staff are recognized as issues in the introduction of digital health.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<ul style="list-style-type: none"> Wired, stable connection Wireless (Wi-Fi), unstable or slow connection 	*No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. In the case of products that connect other facilities, confirmation of the communication infrastructure outside the hospital is required.
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input type="checkbox"/> Improvement of medical safety <input type="checkbox"/> Improvement of operational efficiency <input type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	*No interview conducted	
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input checked="" type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	*No interview conducted	

[Tertiary, Private] Hospital Santa Casa de Juiz de Fora

Summary The medical facility provides a wide range of services from outpatient treatment of COVID-19 infected patients to inpatient treatment of critically ill patients. On the other hand, there is a shortage of doctors, nurses, etc., as well as a shortage of hospital beds and equipment.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	<p>* No interview conducted</p>	-
COVID-19 Measures	<p>What is lacking for COVID-19 response in the hospital</p> <p>[Human Resources]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>* No interview conducted</p>	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) • Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
COVID-19 Measures	<p>Problems for Infection Control in the hospital</p> <p>[Software: Manual, Operation]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>* No interview conducted</p>	-

Summary

Delays in early detection of diseases and worsening of symptoms in existing patients are recognized as challenges. There is likely to be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Outpatients are said to be uncrowded, but the workload for staff may not be small. There is likely to be demand for digital health to ease congestion in the wards.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Remote Diagnosis Support
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways management (bed control) <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Reduction of workload • Wearable device • EMR

[Tertiary, Private] Hospital Santa Casa de Juiz de Fora

Summary The hospital expects collaboration within the hospital, but lacks the necessary infrastructure. In particular, there is a shortage of general practitioners, and resources such as equipment and supplies are also lacking.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Online consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications <input checked="" type="checkbox"/> Inability to share information with other medical facilities <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input checked="" type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Doctor-to-Doctor Platform
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	*No interview conducted	-

[Tertiary, Private] Hospital Santa Casa de Juiz de Fora

Summary: There is room for the use of digital health to reduce congestion in hospital wards, etc.

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	✖	<ul style="list-style-type: none"> • Waiting area efficiency <ul style="list-style-type: none"> → Triage (AI Questionnaire) → Reservation system for visiting hospitals • Ease congestion in wards, improve efficiency <ul style="list-style-type: none"> → facility expansion → digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.)
Collaboration Status with Other Donors	-	* No interview conducted	-
Expected support from Japan and JICA	-	* No interview conducted	-
Interest in PoC	-	* No interview conducted	-

[Tertiary, Private] Hospital Santa Casa de Juiz de Fora

Summary The following are the digital health that have been introduced and will be introduced at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

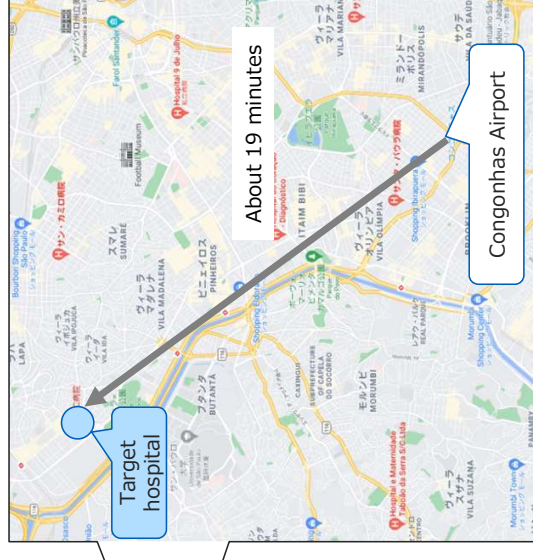
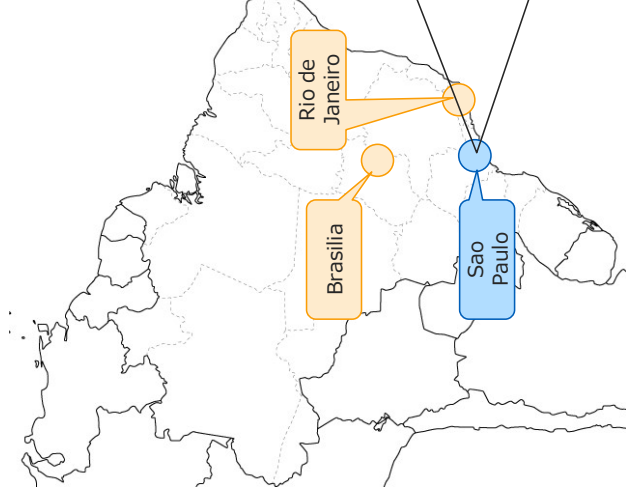
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health budget • N/A
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	<ul style="list-style-type: none"> ■ Time of introduction of digital health • N/A
Tele-surgery	-		Tele-surgery	<ul style="list-style-type: none"> ■ Others • N/A
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

○ Hospital response ○ Potential demand (survey team's evaluation)

Hospital SBC

General Information

Location	Sao Paulo, Sao Paulo State
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Medical facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input checked="" type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	30
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Hospital SBC

Summary There is an overall lack of resources for digital health, including personnel, necessary facilities and equipment in the hospital, use of external resources, and communication infrastructure outside the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wireless (Wi-Fi), unstable or slow connection	*No interview conducted	• There is a communication infrastructure in the hospital, but it is not stable.
Situation of Digital Health	<ul style="list-style-type: none"> ■ Improvement of medical care quality ■ Improvement of patient services ■ Improvement of medical safety ■ Improvement of operational efficiency ■ Improvement of management □ Others () 	*No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> ■ Financial issues for deployment ■ Lack of health insurance coverage for medical practice by health ICT ■ Lack of IT literacy among staff ■ Lack of IT experts in the facility who can deploy, operate, and maintain the digital health ■ Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) ■ Lack of external services to deploy, operate, and maintain the digital health (3G, 4G, etc.) ■ Lack of network environment (power supply, etc.) ■ Lack of basic infrastructure (power supply, etc.) □ Others () 	*No interview conducted	<ul style="list-style-type: none"> • Recovery of implementation costs will be difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult. • IT literacy among healthcare professionals is not high, which is likely to be a barrier to the introduction of digital health. <p>→ There will be demand for effective digital health that can be used intuitively and simply.</p> <ul style="list-style-type: none"> • Wired and wireless connections are available, but the necessary equipment and terminals may be insufficient, and it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

[Secondary, Private] Hospital SBC

Summary The medical facility provides a wide range of services, from outpatient care for patients with COVID-19 infection to inpatient care for critically ill patients, and no particular problems have been identified other than the lack of ECMO and ventilators.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	* No interview conducted	-
	<p>What is lacking for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input type="checkbox"/> [Facilities, Equipment, etc.] Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] Payment problem <input type="checkbox"/> Others 	* No interview conducted	-
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] No staff or specialized teams for infection control <input checked="" type="checkbox"/> Others (time required for PCR test results) 	* No interview conducted	-

Summary There may be a lack of education and guidance for local residents and patients regarding healthcare. There is likely to be a high demand for preventive medicine and solutions that enable patients to have contact with healthcare providers. There is also likely to be demand for digital health that can help reduce the workload of staff in outpatient clinics and wards and improve the efficiency of work processes.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • online health consultation
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input checked="" type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with triage • Electronic medical records (more efficient reception and accounting processes)
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	*No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input checked="" type="checkbox"/> Lack or low application rate of Clinical pathways management (bed control) <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Electronic medical records, etc.

[Secondary, Private] Hospital SBC

Summary There are issues in patient follow-up during and after treatment, but there is room for the use of digital health. The medical facility expects to collaborate with outside hospitals, but lacks the necessary infrastructure and foundation. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications <input checked="" type="checkbox"/> Inability to share information with other medical facilities <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • EHR • PHR • remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	*No interview conducted	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	*No interview conducted	-

[Secondary, Private] Hospital SBC

Summary Although congestion in outpatients and wards is not recognized as a major problem, staff members feel the risk of infection, and there is demand for digital health that contributes to infection control and countermeasures.

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others ()	* No interview conducted	<ul style="list-style-type: none"> Alleviate peak waiting times and improve efficiency <ul style="list-style-type: none"> → Triage (AI Questionnaire) → Reservation system for visiting hospitals Non-contact and non-face-to-face operations <ul style="list-style-type: none"> → Use of telemedicine, equipment, etc. → Use of robots, etc. Zoning, proper infection control, organization of patient flow lines, reduction of contact between staff and patients, etc.
Collaboration Status with Other Donors	-	* No interview conducted	-
Expected support from Japan and JICA	-	* No interview conducted	-
Interest in PoC	-	* No interview conducted	-

[Secondary, Private] Hospital SBC

Summary The following are the digital health that have been introduced and will be introduced at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

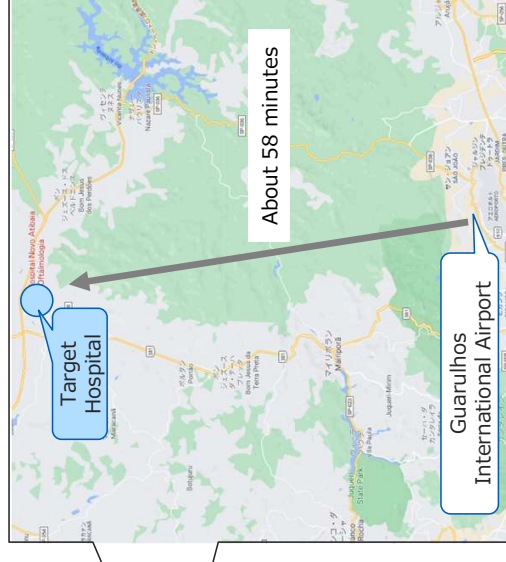
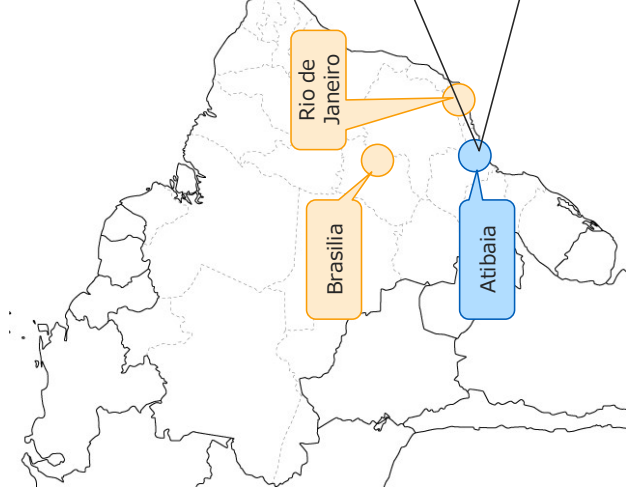
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health budget • N/A
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	<ul style="list-style-type: none"> ■ Time of introduction of digital health • N/A
Tele-surgery	-		Tele-surgery	<ul style="list-style-type: none"> ■ Others • N/A
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

○ Hospital response ○ Potential demand (survey team's evaluation)

Hospital Novo Atibaia SA

General Information

Location	Atibaia, São Paulo State
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Medical facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient <input checked="" type="checkbox"/> Examination (specimen examination, radiographic examination, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal Care <input checked="" type="checkbox"/> Hospitalization (general) <input type="checkbox"/> Hospitalization (intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	76
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Hospital Novo Atibaia SA

Summary There is a certain degree of readiness to accept digital health in hospitals. On the other hand, the necessary equipment, facilities, and IT personnel are limited in the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection	-	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. In the case of products that connect other facilities, confirmation of the communication infrastructure outside the hospital is required.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> N/A 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> N/A <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Recovery of implementation costs will be difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult. Wired and wireless connections are available, but the necessary equipment and terminals may be insufficient, and it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

Summary The medical facility is responding to the examination and inpatient treatment of patients with COVID-19 infection. On the other hand, there is a shortage of physicians and nurses.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> Outpatient consultation <input type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others (vaccination of medical personnel) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> The number of ICU beds was expanded from 16 to 30. 	-
What is lacks for COVID-19 response in the hospital	<p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others (lack of sedatives or neuromuscular blocking agents) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> In order to meet the demands of the ICU, medical staff needed to be redeployed and specialized training needed to be provided; three nurses were assigned to develop educational areas and a training model was developed. The number of monitoring devices and respirators was insufficient. 	<ul style="list-style-type: none"> Reduction of workload and optimization of personnel allocation Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
Problems for Infection Control in the hospital	<p>[Software: Manual, Operation]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>[Other issues]</p> <ul style="list-style-type: none"> At the beginning of the COVID-19 pandemic, nosocomial infections were on the rise and training for medical staff was needed. <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> Six clinical protocols, including sepsis, prematurity, strep, exacerbations, and chest pain, are maintained and incorporated into the quality management system. Another 170 protocols are stored in pdf format. 	-

[Secondary, Private] Hospital Novo Atibaia SA

Summary There may be a lack of education and guidance to local residents and patients regarding healthcare. Demand for solutions that contribute to prevention is likely to be high. There is also likely to be demand for digital health to ease congestion in outpatient clinics and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents □ Few opportunities of pre-consultation for the local residents □ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Health Promotion App • online health consultation
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status □ Heavy workload for staff in reception and screening □ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Appointments are concentrated on the most popular doctors who are polite and have good communication skills, while other doctors have open slots, causing bias. • Missed patient visits <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Training has already been developed to help patients and staff better connect with each other. • Already working with a local company on an initiative using an appointment centre (call back to confirm cause of missed appointments, WhatsApp to confirm appointments) 	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with triage
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests □ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The facility does not use any diagnostic imaging support AI, but there is a demand for it from internal team. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • AI diagnostic imaging support • remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) ■ Lack or low application rate of Clinical pathways management (bed control) □ Unclear or not defined rules regarding bed management (bed control) □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • electronic medical records

[Secondary, Private] Hospital Novo Atibaia SA

Summary There is room for the use of digital health, although there are issues in teaching patients about medication and lifestyle habits. The hospital expects to collaborate with the hospital, but the necessary infrastructure are recognized as insufficient. It is also recognized that the education and training of medical personnel is insufficient, and there is demand for the provision of training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	<p style="text-align: center;">✖</p> <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications <input type="checkbox"/> Inability to share information with other medical facilities <input type="checkbox"/> Others () 	<p style="text-align: center;">✖</p> <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The adoption rate of electronic medical records is not 100%. • The lack of a PACS also makes it difficult to access and manage patient information • No digital tools to facilitate communication • Don't have a digital solution to facilitate communication between teams <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Electronic Medical Records
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p style="text-align: center;">✖</p> <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others (drugs used only during a COVID-19 pandemic) 	<p style="text-align: center;">✖</p> <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • -

[Secondary, Private] Hospital Novo Atibaia SA

Summary There is room for the use of digital health to alleviate outpatient congestion and to digitize and improve the efficiency of business processes.

Results of online questionnaire and follow-up interview (5/6)

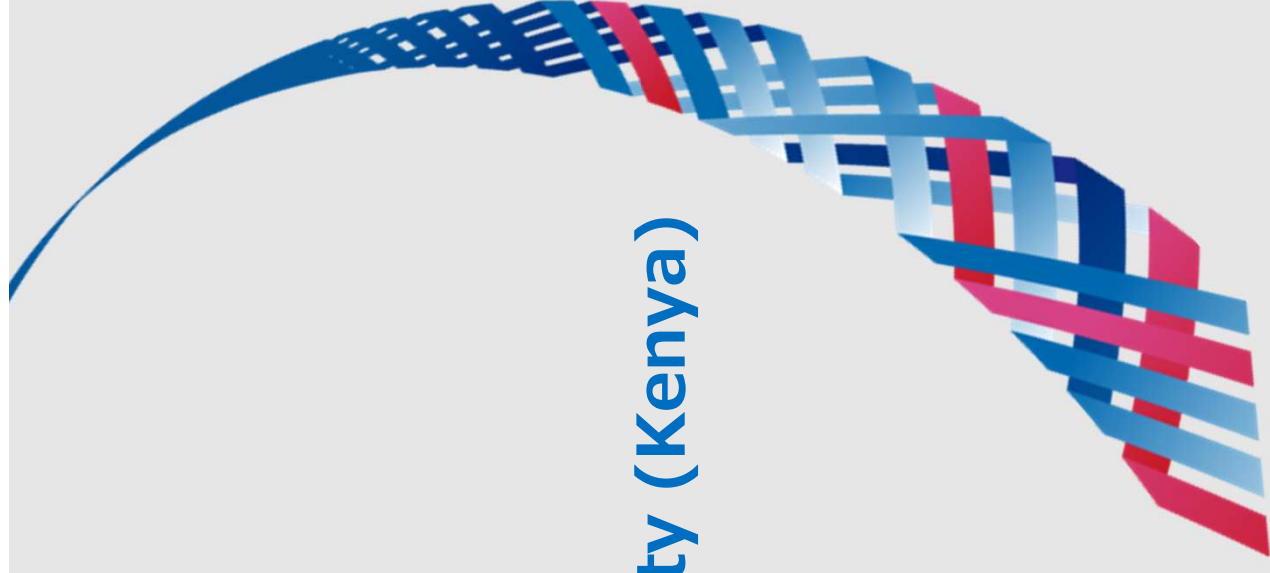
	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (manual, many business processes that do not use PCs) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency <ul style="list-style-type: none"> → Triage (AI Questionnaire) → Reservation system for visiting hospitals • Reduced workload and improved operational efficiency <ul style="list-style-type: none"> → Online questionnaire, electronic medical record, etc.) → digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.)
Collaboration Status with Other Donors	-	• N/A	-
Expected support from Japan and JICA	-	• N/A	-
Interest in PoC	-	• N/A	-

Summary The following is a list of digital health that have been introduced or are being considered for introduction at the hospital. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-	<p>Community Collaboration System (EHR)</p> <ul style="list-style-type: none"> MV Sistemas. used in the inpatient setting, operating room, and emergency room, but the facility's strategy is to expand to the outpatient setting. At the outpatient level, there are approximately 4,000 consultations per month. <p>Others: EAD platform</p> <ul style="list-style-type: none"> Institutional content, security policies and integration processes There is no PAC system and no AI has been implemented so far. 	EMR (Electric Medical Record)	<p>Digital health plan and policy</p> <ul style="list-style-type: none"> There is no structured formal document, but the strategy is discussed internally at the hospital. ICT budget is not prioritized. (even if ICT implementation costs are low, other items such as purchase of medical consumables are prioritized) The priority at this time is to expand electronic health records to outpatient services. With regard to telemedicine, several ICTs were considered, but priority was given to outpatient medical records. There is a demand for telemedicine services from the Oncology team and they would like to prioritize psychology and nutrition services for this type of modality. The hospital's IT infrastructure is aging and requires investment in upgrades to continue the MV Soul implementation plan. <p>Digital health system</p> <ul style="list-style-type: none"> The IT team consists of 11 staff and external experts. The breakdown is as follows: 6 people in charge of infrastructure, 2 people in charge of development (reporting, tools on demand) and 3 people in charge of systems. <p>Digital health budget</p> <ul style="list-style-type: none"> N/A <p>Time of introduction of digital health</p> <ul style="list-style-type: none"> N/A <p>Others</p> <ul style="list-style-type: none"> N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	
EHR (Electric Health Record)	-		EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

Appendix 7. Detailed information on each medical facility (Kenya)



Detailed information on each medical facility

■ List of medical facilities

Classification		Facility Name	Interest in PoC
Tertiary	Private	• Aga Khan University Hospital	●
		• Gertrude's Children's Hospital	○
		• Medilheal Hospital	○
Secondary	Public	• Kericho County Hospital	●
		• Eldoret Hospital	●
Primary	Private	• Nairobi West Hospital	○
		• Radiant Group of hospitals	○
		• Nyali Healthcare Limited	○
		• Sociot Health Centre	●
		• Kabutii Matiret Dispensary	○
		• Kipsitet Dispensary	●
Public	Public	• Nyailibuch Dispensary	●
		• Kaitui Dispensary	●
		• Ushirika Medical Clinic	○
		• Aldama Ebenezer Medical Clinic	●
		• Aldama Ebenezer Medical Clinic	●

*[Interest in PoC] ● : Confirmed interest through follow-up interviews

○ : Responded to questionnaire including possibility of PoC



Distance from Japan

11,000 km

Time difference from Japan time (JST)

JST-6

Flight time from Japan

About 17 to 21 hours

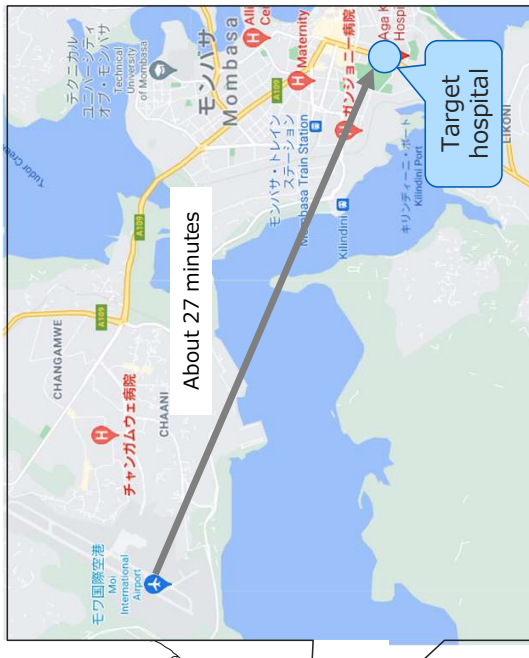
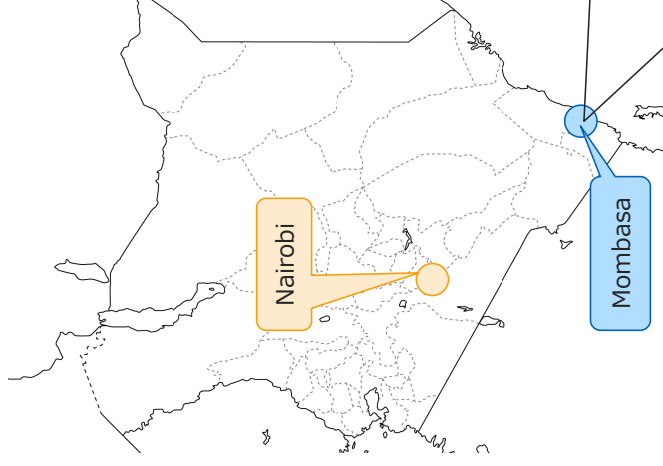
Language

Swahili, English

Aga Khan University Hospital

General Information

Location	Mombasa, Coast Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	100
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary Although it is a top referral hospital, the IT literacy of the medical staff is not high and the IT human resources are limited, so the demand for solutions that can be used intuitively and simply is expected to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, stable connection Wireless (Wi-Fi), stable connection (occasionally unstable)</p>	-	<ul style="list-style-type: none"> The communication infrastructure in the hospital has been developed to some extent, and it is possible to implement digital health. For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> Selected as general statements 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Medical staffs (especially nurses) are not IT literate and do not have a good understanding of the benefits of digital health The hospital has only 5 IT personnel <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> No government support for digital health. As the hospital is privately owned, there are no expectations for government support either. Expectations to the government are as follows <ul style="list-style-type: none"> Investment in communication infrastructure Measures to stimulate investment in digital health Provide incentives for new technologies Improvement of the framework to allow international players and investors to be more active 	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high As the communication infrastructure inside the hospital is in place to some extent, expect government support for network infrastructure outside the hospital and for the activation of the digital health market

Summary The impact of COVID-19 has increased and continues to impact patient reticence to seek care. It is estimated that there is a high demand for solutions that will help providing necessary healthcare services while continuing to reduce face-to-face contact opportunities.

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> The rate of health checkups has decreased compared to the rate before the COVID-19 	<ul style="list-style-type: none"> Tele-consultation for patients who hesitate to visit the hospital Teletriage (AI interview) to reduce waiting time, improve flow efficiency, minimize patient retention and face-to-face contact opportunities when visiting the hospital.
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> Construction to expand hospital beds suspended due to COVID-19. Currently, the isolation ward needs to be expanded in size, and the construction plan needs to be reconsidered. First, we plan to respond to changes in demand by reviewing software (services) rather than hardware. The area in which the hospital is located had a thriving tourism industry, so the COVID-19 caused significant damage to the local economy. As a result, patients' ability to pay has been reduced. <p>[Other issues]</p> <ul style="list-style-type: none"> N/A <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> An infection control committee consisting of different medical professionals has been established and has its own policies and KPIs Hand hygiene was actively practiced before COVID-19, and there was no cross-infection after COVID-19. 	<ul style="list-style-type: none"> Rapid expansion and deployment of ICU and remote ICU solutions to compensate for the absence of doctors specialized in intensive care. Patient monitoring devices in isolation beds (biometric data collection devices such as clothe type and bedside type, etc.) Testing and diagnostic equipment in isolation beds (remotely available stethoscopes, etc.) Utilization of robots in isolation beds (automatic transportation, automatic cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 		

Summary There are concerns about delays in disease detection and worsening conditions due to patients' reluctance to seek medical consultation. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online questionnaire and follow-up interview (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Government curfews discourage patients from visiting hospitals • Hospitals have implemented Facebook-based events to maintain contact with patients, but it hasn't worked. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for digital health to change patients' attitudes and promote their health 	<ul style="list-style-type: none"> • Health Promotion App • online health advisory <p>The hospital is a top private referral hospital. The number of patients with smart phones is estimated to be high.</p>
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status. □ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • In general, outpatient areas of medical facilities are crowded. The main reason is that patients come to the hospital without an appointment. • In order to secure social distance, the number of patients in the waiting room is limited. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Encourage patients to make an appointment. • Expansion plans for the facility include a larger waiting area. 	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. ■ Insufficient regular checkups for expected mothers and patients with chronic diseases □ Shortage or absence of specialists such as radiologists □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Government curfews discourage patients from visiting hospitals <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Apps that automatically notify patients when their appointments are approaching, etc. 	<ul style="list-style-type: none"> • Tele-consultation • Testing equipment available at home (equipment for antenatal checkups, stethoscopes available remotely, etc.)
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) ■ Lack or low application rate of Clinical pathways management (bed control) ■ Unclear or not defined rules regarding bed management (bed control) ■ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Selected as a general issue related to inpatient care in Kenya, but no major problems with inpatient care at the hospital <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	-

Summary There are issues with patient follow-up during and after treatment, and there is potential for the use of digital health. There is demand for collaboration with other hospitals, but the necessary infrastructure is lacking. Demand for education of medical staff is expected to be high.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of funds <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Introduction of digital health that enables health promotion, patient education, etc. 	<ul style="list-style-type: none"> • Tele-consultation (medication guidance, etc.) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital uses a patient number to share information within the facility, but there is little collaboration with other hospitals • Information sharing and collaboration between facilities is controlled by the government for confidentiality reasons <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • All patients to have a single secure record (PHR), government-led centralized data management • The hospital is interested in an app that allows remote access to medical records and data sharing. 	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • There's not enough time. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Introduced virtual training portal (no details), but would like to implement something better 	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Few distributors • Few trained technicians <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for remote education programs, apps to connect with technicians, ICT solutions that can provide technical support, etc. 	-

[Tertiary, Private] Aga Khan University Hospital

Summary As a top private sector referral, they have already collaborated with many donors, but have not yet collaborated in the field of digital health. They has expressed interest in PoC through this project, and there is potential for future collaboration.

Results of online questionnaire and follow-up interview (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods () <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Congestion in waiting area, etc. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Recognize that this is not a digital health issue but a hardware issue such as expansion of facility size 	<ul style="list-style-type: none"> • Reduce congestion in waiting areas, improve process efficiency ➢ Tele-triage (AI questionnaire) ➢ Medical Appointment System
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • Working with USAID, European Community, Global Affairs Canada, German Reconstruction Finance Corporation (KfW), etc. • The areas of collaboration are clinical and COVID-19 support, not digital health. On the other hand, the hospital is open to collaboration in the digital health field. 	<ul style="list-style-type: none"> • Potential for future collaboration in the digital health field
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Infrastructure improvements (cabling, switches, servers, technology upgrades, database management, automation, etc.) 	<ul style="list-style-type: none"> • Most of the requests are for infrastructure improvement based on hardware maintenance, but there are also some issues that can be improved by digital health as a whole.
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary The policy, system, and budget for digital health are relatively in place, and the hospital can openly discuss collaboration with companies. However, the priority of digital health in the overall plan and budget is not high, and it will take time for the hospital to make a decision.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures
EMR (Electric Medical Record)	-
PHR (Personal Health Record)	-
EHR (Electric Health Record)	-
Doctor-to-Doctor Platform	-
Online health advisory	-
Tele-triage (AI questionnaire)	-
Tele-consultation	●
AI imaging diagnosis support	-
Remote diagnosis support	-
Tele-surgery	-
e-ICU (Remote ICU)	-
Tele-monitoring	-
Therapeutic applications	-
Digital pharmacy	●
VR / MR training	-
Health promotion application	-
Wearable devices	-
Contact tracing	-
Authentication systems	-
Robotics	-
Others	●

Main Reasons for Deployment
<ul style="list-style-type: none"> COVID-19 Measures <ul style="list-style-type: none"> Introduced Tele-consultation, drug delivery services, and virtual training portal (details unknown) Remote diagnosis support, Tele-monitoring <ul style="list-style-type: none"> Because the CT and MRI already included such functions (both made by SIEMENS) . It was not introduced ambitiously and systematically.

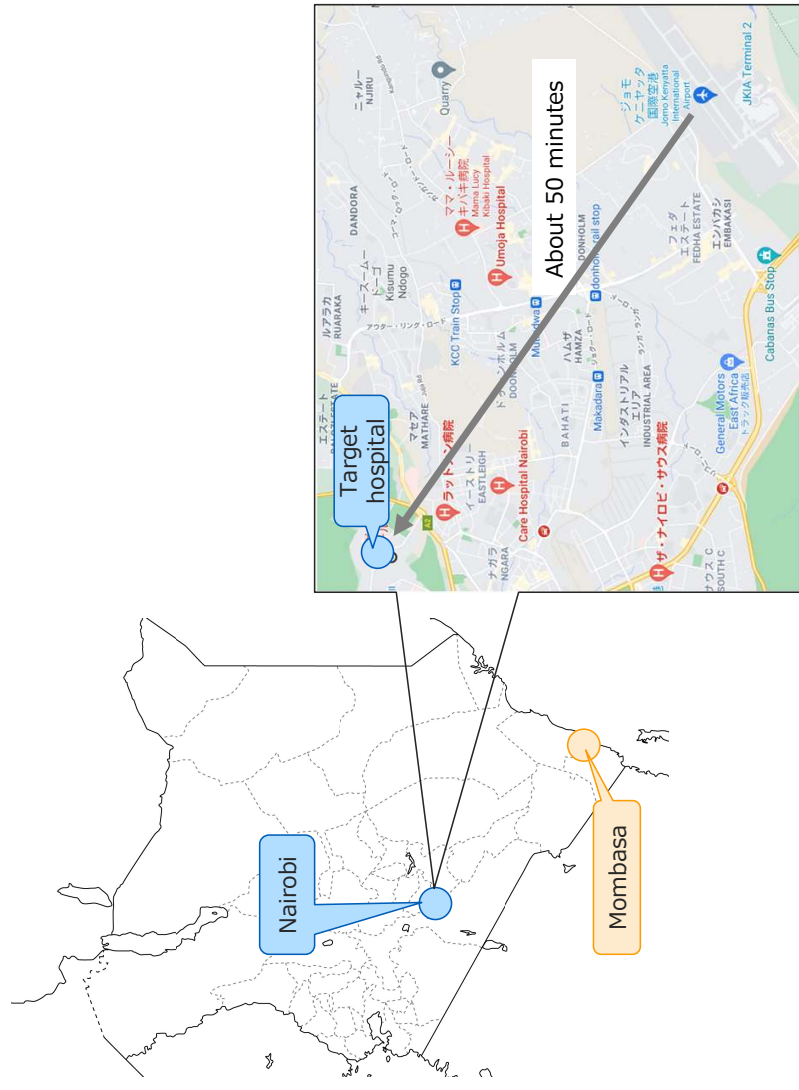
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> Digital health plan and policy <ul style="list-style-type: none"> There is an overall strategic policy Digital health which was introduced as COVID-19 measure will be continued to use Digital health system <ul style="list-style-type: none"> 5 ICT personnel are employed. Digital health budget <ul style="list-style-type: none"> Approximately 3~5% of the total budget. However, it is often allocated to communication infrastructure and server purchase costs. Time of deployment of digital health <ul style="list-style-type: none"> In the network of 4 hospitals in East Africa, it takes a long time to make a decision on how to proceed with implementation while coordinating with other hospitals. The network has been discussing the introduction of EMR for 3 to 5 years. It may take 3 months to 1 year to introduce other technologies. Others <ul style="list-style-type: none"> They are open to companies and products that have a high return on investment in terms of lifecycle costs, resource utilization and that contribute to the benefit of the hospital.

Gertrude's Children's Hospital

General Information

Location	Nairobi, Nairobi Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	100
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Private] Gertrude's Children's Hospital

Summary The environment for the acceptance of digital health is in place to some extent. The cost of implementing digital health and its recovery is recognized as the most significant issue.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital has been developed to some extent, and it is possible to implement digital health. For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	No interview conducted	-
Expectation for Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input checked="" type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult

[Tertiary, Private] Gertrude's Children's Hospital

Summary As a top referral hospital, it provides a wide range of services from outpatient care for COVID-19 patients to intensive admission care. No particular problems have been recognized except for the shortage of laboratory technicians.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input checked="" type="checkbox"/> [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Equipment and supplies, hospital beds, etc. are sufficient to some extent. • There is a shortage of laboratory technicians, and there is a possibility that there will be demand to reduce the workload by improving the efficiency and automation of tests (Limited potential for improvement by digital health).
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	-

[Tertiary, Private] Gertrude's Children's Hospital

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention and for patients to be able to have contact with medical professionals. There may be high demand for digital health that can help alleviate congestion in outpatient clinics and wards.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Survey Response	Follow-up interview responses	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health promotion application • Online health advisory <p>This hospital is a top private referral hospital. The percentage of patients with smart phones is also estimated to be relatively high.</p>
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input checked="" type="checkbox"/> Others (Many patients come to the hospital at the same time.) 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support (reducing the workload of medical specialists such as radiologist) • Doctor-to-doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) . <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	-

[Tertiary, Private] Gertrude's Children's Hospital

Summary There are issues with patient follow-up during and after treatment, and there is potential for the use of digital health. The hospital expects to collaborate with other hospitals, but lacks the necessary infrastructure. There is a demand for communication tools between specialists and external doctors.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation (medication guidance, etc.) • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input checked="" type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

[Tertiary, Private] Gertrude's Children's Hospital

Summary There is room for the use of digital health to reduce outpatient congestion.

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Others problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others () 		
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

[Tertiary, Private] Gertrude's Children's Hospital

Summary The background and details of the deployment are unknown. Overall, there seems to be a latent demand for communication and information coordination inside and outside the hospital.

Results of online questionnaire and follow-up interview (6/6)

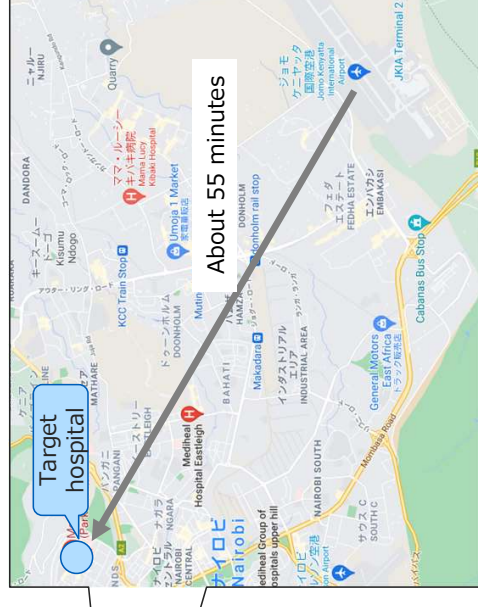
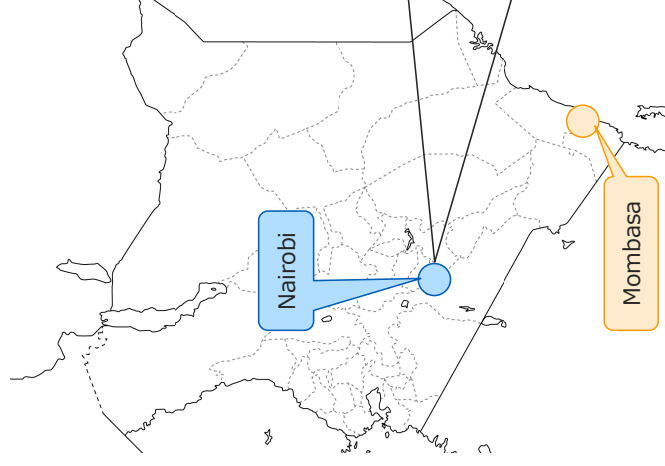
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health Budget • N/A
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Time of deployment of digital health • N/A
Online health advisory	-		Online health advisory	<ul style="list-style-type: none"> ■ Others • N/A
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

○ Hospital response ○ Potential demand (survey team's evaluation)

Mediheal Hospital

General Information

Location	Nairobi, Nairobi Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	400
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Private] Mediheal Hospital

Summary ICT facilities, equipment and terminals may not be sufficient. Although it is a top referral hospital, the IT literacy of the medical staff is not high and the IT human resources are limited, so the demand for solutions that can be used intuitively and simply is expected to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	<p>Wired, stable connection</p>	No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent. However, there is no wireless connection For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> Although it is a top private referral hospital, the IT literacy of medical staff may not be high. Likely to be a barrier to the adoption of digital health ➢ There will be demand for effective digital health that is intuitive and simple to use. Wired connection is available, but wireless connection and necessary equipment may be insufficient, so it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

Summary As a top referral hospital, it provides a wide range of services from outpatient care for COVID-19 patients to intensive admission care. No particular problems have been recognized other than the lack of oxygen supply and the lack of infection control team.

Results of online questionnaire and follow-up interview (2/6)

COVID-19 Measures	Online Survey Response	Follow-up interview responses	Implication
What is being done for COVID-19 in the hospital	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
What is lacks for COVID-19 response in the hospital	<ul style="list-style-type: none"> [Human Resources] <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Personnel, equipment and supplies, and hospital beds are sufficient to some extent. • Oxygen cylinders are in short supply, but there is no potential for improvement through digital health.
Problems for Infection Control in the hospital	<ul style="list-style-type: none"> [Software: Manual, Operation] <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <input checked="" type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	-

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention and for patients to be able to have contact with medical professionals. There may be high demand for digital health that can help alleviate congestion in outpatient clinics and wards.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational Problems				
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	✖	No interview conducted	<ul style="list-style-type: none"> • Health promotion application • Online health advisory • This hospital is a top private referral hospital. The percentage of patients with smart phones is also estimated to be relatively high.
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	✖	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	✖	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways (bed control) <input type="checkbox"/> Unclear or not defined rules regarding bed management <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	✖	No interview conducted	<ul style="list-style-type: none"> • Appropriate zoning and isolation to prevent the spread of infection in the ward • Expansion and development of wards area • Digital health solutions to compensate for staff shortages due to expansion ➢ Patient monitoring devices (cloth-type and bedside type biometric data collection devices, etc.), robotics (automatic transportation, automatic cleaning and disinfection, etc.)

Summary There are issues with patient follow-up during and after treatment, and there is potential for the use of digital health. The hospital has a demand for multi-professional collaboration within the hospital, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be inadequate, so there is a demand for training using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	✖	<ul style="list-style-type: none"> • Tele-consultation (medication guidance, etc.) • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	✖	<ul style="list-style-type: none"> • EMR
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	✖	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	✖	<ul style="list-style-type: none"> -

There is room for the use of digital health to reduce congestion in outpatients and wards.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Operational problems	Others	Online Survey Response	Follow-up interview responses	Implication
			<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others () 	✕	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency ➢ Tele-triage (AI questionnaire) ➢ Appointment booking system with Tele-triage • Ease congestion in wards, improve efficiency ➢ Facility expansion ➢ Digital health to make up for the shortage of personnel (Remote monitoring, Robots, etc.)
Collaboration Status with Other Donors			-	✕	-
Expected support from Japan and JICA			-	✕	-
Interest in PoC			-	✕	-

[Tertiary, Private] Mediheal Hospital

Summary The following are the digital health that have been introduced and will be introduced at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

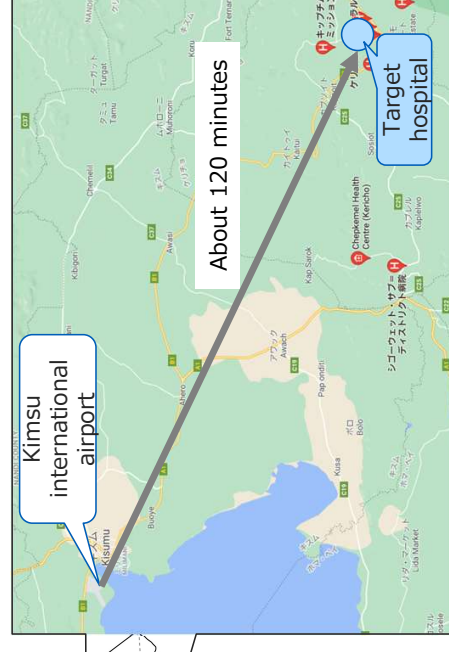
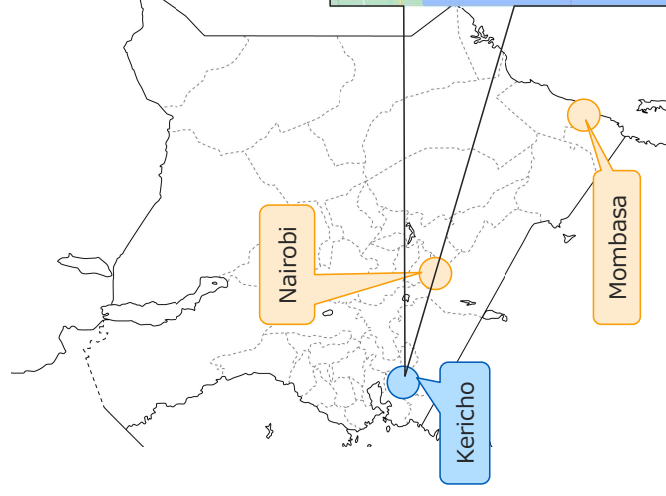
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Digital health Budget • N/A
Doctor-to-Doctor Platform	-		Online health advisory	<ul style="list-style-type: none"> ■ Time of deployment of digital health • N/A
Online health advisory	-		Tele-triage (AI questionnaire)	<ul style="list-style-type: none"> ■ Others • N/A
Tele-triage (AI questionnaire)	-		Tele-consultation	
Tele-consultation	-		AI imaging diagnosis support	
AI imaging diagnosis support	-		Remote diagnosis support	
Remote diagnosis support	-		Tele-surgery	
Tele-surgery	-		e-ICU (Remote ICU)	
e-ICU (Remote ICU)	-		Tele-monitoring	
Tele-monitoring	-		Therapeutic applications	
Therapeutic applications	-		Digital pharmacy	
Digital pharmacy	-		VR / MR training	
VR / MR training	-		Health promotion application	
Health promotion application	-		Wearable devices	
Wearable devices	-	Contact tracing		
Contact tracing	-	Authentication systems		
Authentication systems	-	Robotics		
Robotics	-	Others		
Others	-			

○ Hospital response ○ Potential demand (survey team's evaluation)

Kericho County Hospital

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other (Dialysis, Infectious Disease Center)
Number of beds	100
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Public] Kericho County Hospital

Summary Communication infrastructure, ICT facilities and equipment may not be sufficient. Since IT literacy among medical professionals is not high and IT human resources are limited, expectations for intuitive and simple-to-use solutions are likely to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	<p>Wired, unstable or slow connection Wireless (Wi-Fi) , unstable or slow connection</p>	-	<ul style="list-style-type: none"> There is a communication infrastructure in the hospital, but it is not stable
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> Expect to improve the quality of medical care by using digital health to compensate for personnel shortages 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> The budget plan is uncertain as it depends on the budget from the government. Due to this situation, the digital health budget is not a priority. There is a plan by the government to provide digital health funding to the hospital, but the progress is unknown. <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> There is no government subsidy program. On the other hand, the hospital has a plan to provide government funding for digital health (details unknown) 	<ul style="list-style-type: none"> Recovery of implementation costs is difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult There are plans for government funding for digital health, but the details is uncertain The IT literacy of medical staff may not be high. Likely to be a barrier to the adoption of digital health There will be demand for effective digital health that is intuitive and simple to use. Wired connection is available, but wireless connection and necessary equipment may be insufficient, so it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

[Secondary, Public] Kericho County Hospital

Summary As a core public hospital in the region, it provides a wide range of services from outpatient care for COVID-19 patients to inpatient care for critically ill patients. Due to the shortage of staff, the operational situation is severe, and there is high demand for operational efficiency and workload reduction to optimize staffing.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination ■ Contact and management of patients with mild symptoms under home care ■ Others (Patient follow-up, home care) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patients are less likely to visit the hospital for treatment than before the spread of COVID-19 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency in order to minimize patient retention and contact when visiting the hospital.
What is lacking for COVID-19 response in the hospital	<ul style="list-style-type: none"> ■ [Human Resources] ■ Doctor ■ Nurse ■ Laboratory technician ■ Other staff ■ [Facilities, Equipment, etc.] ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum ■ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) ■ [Other] ■ Payment problem ■ Others (Ambulance, laboratory drugs, etc.) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • There was a time when one nurse was handling about 70 patients in the general ward, so the situation was very difficult. • There is a chronic shortage of PPE. The shortage is covered by donations. • The demand for oxygen is increasing due to the increase of patients with COVID-19, but the current oxygen distribution system is not sufficient to meet the demand, and this is affecting patients other than COVID-19 patients (e.g., patients in the neonatal unit). 	<p>Expansion of isolation beds, reduction of workload in isolation wards, optimization of personnel allocation</p> <ul style="list-style-type: none"> • Monitoring and management of isolation beds using external doctors (e-ICU) • Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation beds (remote stethoscopes, etc.) • Utilization of robots in isolation beds (automatic transportation, cleaning and disinfection, etc.)
Problems for Infection Control in the hospital	<ul style="list-style-type: none"> ■ [Software: Manual, Operation] □ Insufficient hand washing and hand sanitizing by staff ■ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE ■ [Hardware: Facilities, Zoning] ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control ■ [Human Resources] □ No staff or specialized teams for infection control 	<p>[Other issues]</p> <ul style="list-style-type: none"> • None <p>[Infection control guideline]</p> <ul style="list-style-type: none"> • Deployed (details unknown) 	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of isolation facilities, and associated products and solutions

[Secondary, Public] Kericho County Hospital

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention and for patients to be able to have contact with medical professionals. There may be high demand for digital health that can help alleviate congestion in outpatient clinics and wards.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Survey Response	Follow-up interview responses	Implication
Prevention	<ul style="list-style-type: none"> Insufficient education for local residents Few opportunities of pre-consultation for the local residents Many patients visiting hospitals only after their disease symptoms become serious Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Patients are reluctant to go to hospital Lack of medical knowledge of the local residents (more wary of COVID-19 than necessary) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Education and guidance for patients using digital health 	<ul style="list-style-type: none"> Health Promotion Application Tele-consultation
Screening	<ul style="list-style-type: none"> Congestion in outpatient consultation Lots of time to interview patients about their medical history and treatment status. Heavy workload for staff in reception and screening Unclear criteria for accepting emergency patients Inefficient emergency transport operation for patients Complicated reception and accounting procedures for patients Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Lack of medical staff. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Reducing paperwork at the reception desk by using digital health Facilitation of accounting procedures Central consolidation and management of patient information 	<ul style="list-style-type: none"> Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency Appointment booking system with tele-triage Accounting systems, EMR, etc. (digitalization of patient information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> Too many tests. Insufficient regular checkups for expected mothers and patients with chronic diseases Shortage or absence of specialists such as radiologists Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Insufficient number of radiologist for the number of patients <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Remote diagnosis support 	<ul style="list-style-type: none"> Remote diagnosis support AI imaging diagnostic support Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> Congestion in the inpatient wards Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) Lack or low application rate of Clinical pathways Unclear or not defined rules regarding bed management (bed control) Patients travel to distant medical facilities if they cannot take surgical operations in your facility. Others (Insufficient patient isolation) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Lack of space. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Appropriate isolation and bed control through the use of digital health 	<p>Expansion of hospital beds, reduction of workload, optimization of staffing</p> <ul style="list-style-type: none"> Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices. Use of robotics (automatic transport, cleaning and disinfection, etc.)

[Secondary, Public] Kericho County Hospital

Summary There are issues with patient follow-up during and after treatment, and there is potential for the use of digital health. The hospital has a demand for multi-professional collaboration within the hospital, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be inadequate, so there is a demand for training using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Follow-up by phone only, but insufficient <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Notification of consultation appointment to patients using digital health (SMS, etc.) <p>*Since the hospital is located in a rural area, IT literacy of patients and accessibility to devices must be considered.</p>	<ul style="list-style-type: none"> Tele-consultation Reservation system (patient notification) Therapeutic Apps Remote rehabilitation VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> There is no digital health that can share information within the hospital Sharing of laboratory reports, etc., is also an analog operation and is inefficient. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Since PCs are placed in each department, the hospital expects to introduce digital health necessary for sharing medical records and searching labo reports, etc. 	<ul style="list-style-type: none"> EMR EHR PHR Remote diagnosis support Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors(especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input checked="" type="checkbox"/> Others (lack of staff for incineration and funeral related services) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> Nothing can be done about staffing because it is a government's matter. We would like to increase our staff, but there are not enough medical personnel in the entire county. Lack of funds for staff training <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Distance training that can provide CPD (Continuing Professional Development) (certification to be able to award CPD credits) 	<ul style="list-style-type: none"> Optimize personnel allocation by reducing workload and improving operational efficiency, etc. Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. Remote diagnosis support AI imaging diagnostic support Doctor-to-Doctor Platform VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input checked="" type="checkbox"/> Others (lack of sanitary, incinerators, oxygen facilities) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> N/A (lack of funds, equipment and facilities) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> Equipment and facilities maintenance 	-

[Secondary, Public] Kericho County Hospital

There is potential for the use of digital health to reduce congestion in outpatients clinics and wards.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> ■ Inadequate cleaning □ Too much burden of transporting goods, meals for patients ■ Exposure of infection risk, and weak counter-measurement □ Unclear cause of outbreak due to lack of tracing methods ■ Others (emergency transport system) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of funds. • Difficulty in securing an ambulance to transport a patient to another facility <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for a system that uses digital health to secure the nearest ambulance 	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency <ul style="list-style-type: none"> → Triage (AI questionnaire) → Reservation system • Ease congestion in wards, improve efficiency ➢ facility expansion ➢ digital health to make up for the shortage of personnel (remote monitoring, robotics, etc.) • Emergency transport system using digital health
Collaboration Status with Other Donors	-	✖	<ul style="list-style-type: none"> • None <p>The Kenya Medical Association (KMA) provides training support on an irregular basis.</p>	-
Expected support from Japan and JICA	-	✖	<ul style="list-style-type: none"> • Equipment maintenance 	-
Interest in PoC	-	✖	<ul style="list-style-type: none"> • Interested 	-

[Secondary, Public] Kericho County Hospital

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

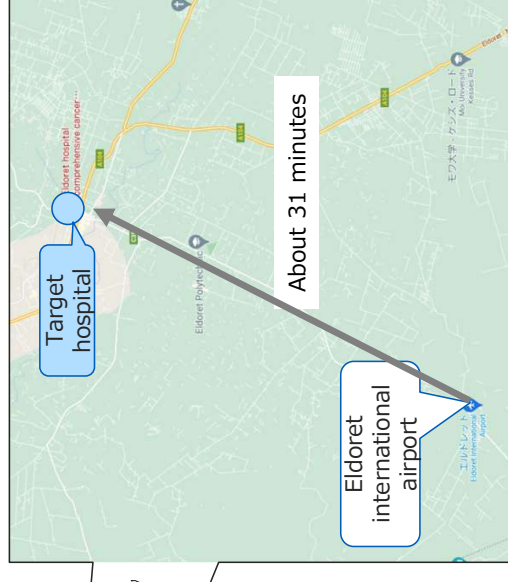
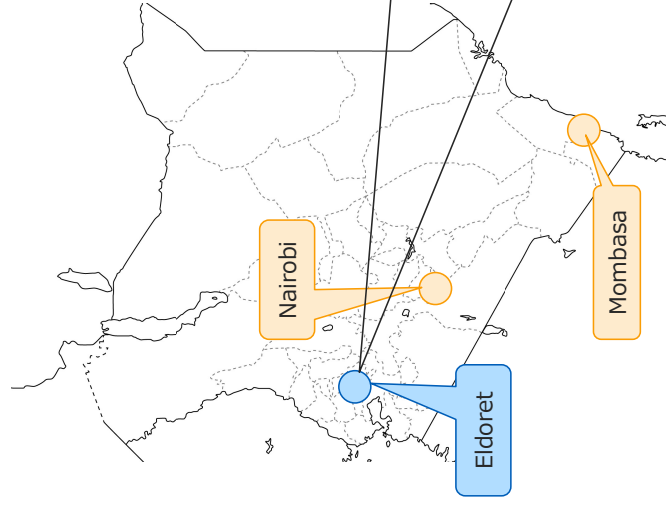
Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • Plans and policies available • Digital health budget based on the plan, with plans for funding from the government ■ Digital health system <ul style="list-style-type: none"> • 3 (2 regular, 1 non-regular) ■ Digital health Budget <ul style="list-style-type: none"> • There is a budget, but it depends on the budget from the government of the year. The percentage is unknown. • There are plans of government funding for digital health ■ Time of deployment of digital health <ul style="list-style-type: none"> • as soon as possible ■ Others <ul style="list-style-type: none"> • Any digital health solution is welcome.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	
EHR (Electric Health Record)	-		EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

Eldoret Hospital

General Information

Location	Eldoret, Rift Valley Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	150
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Eldoret Hospital

Summary There is a certain degree of readiness to accept digital health. On the other hand, since the IT literacy of medical professionals is not high and IT human resources are limited, expectations for solutions that can be used intuitively and simply are likely to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	-	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. In the case of products that connect other facilities, confirmation of the communication infrastructure outside the hospital is required.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> We are always conscious of improving the quality of medical care. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Budget for digital health is not a priority <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> There is no government subsidy system. We don't receive any government assistance. 	<ul style="list-style-type: none"> IT literacy among healthcare professionals is not high. Likely to be a barrier to the introduction of digital health <p>→ There will be demand for effective digital health that can be used intuitively and simply.</p>

Summary The impact of COVID-19 has increased and continues to impact patient reticence to seek care. It is estimated that there is a high demand for solutions that will help provide necessary healthcare services while continuing to reduce contact opportunities.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Change in patient behavior (presuming the patient refrains from visiting the clinic for treatment) • On the other hand, the regime and systems remain as they were before COVID-19 	<p>Implication</p> <ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency in order to minimize patient retention and contact when visiting the hospital.
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> □ Doctor □ Nurse □ Laboratory technician □ Other staff □ [Facilities, Equipment, etc.] □ Capacity of general beds □ Capacity of ICU bed □ PCR Testing Equipment □ ECMO (Extra-corporeal Membrane Oxygenation) □ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) □ Lack of PPE (Personal Protective Equipment) □ [Other] ■ Payment problem □ Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patient Payment • Rather than digital health, a fund needs to be set up and help patients to pay for treatment 	-
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> □ [Software: Manual, Operation] □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE □ [Hardware: Facilities, Zoning] □ Inappropriate zoning of infection control areas □ Inadequate in-patients control □ [Human Resources] □ No staff or specialized teams for infection control □ Others 	<p>Other issues</p> <ul style="list-style-type: none"> • None <p>[Infection control guidelines in place or not]</p> <ul style="list-style-type: none"> • Use guidelines of MOH 	-

[Secondary, Private] Eldoret Hospital

Summary There are concerns about delays in disease detection and worsening of symptoms due to patients' reluctance to seek medical attention. There is likely to be a high demand for solutions that can prevent diseases and allow patients to have contact with their healthcare providers. While there are no major problems, there is likely to be demand for more efficient processes and reduced workload.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational Problems				
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of healthcare knowledge of local residents <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Health Promotion App • Tele-consultation 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Some of the procedures remain analog <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Digitization of paper media such as medical records and receipts 	<p>As a hospital, we don't see any major issues.</p> <ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage • Accounting systems, EMR, etc. (digitalization of medical information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input checked="" type="checkbox"/> Others (Low merit) ⇒ * Details unknown 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • None <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • None 	-
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) . <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input checked="" type="checkbox"/> Others (lack of knowledge of policies from insurers and NHIF) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Unclear policies from insurers and NHIF <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • None (this is a problem for insurers and NHIF, not something that can be solved by hospitals or digital health) 	-

Summary The hospital expects to collaborate with other hospitals, but lacks the necessary infrastructure. It has already implemented an education and training portal for medical personnel due to COVID-19, but the demand for education and training is still expected to be high.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Cost) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • High cost burden for patients <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Rather than digital health, patient cost sharing and other financial support is needed 	<ul style="list-style-type: none"> • Reduction of cost burden other than treatment cost → Reducing the cost burden of transportation by utilizing online consultation
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is a private institution and does not cooperate with national hospitals. • When patients change hospitals, they have to start from the beginning again for examination and testing, which is inefficient. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Manage domestic medical information in a central database like the National Health Service (NHS) in the UK. 	<ul style="list-style-type: none"> • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • As a private, for-profit hospital, the staff is paid out to make a profit <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • None <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • None 	<p>-</p>

Summary There is potential for the use of digital health to reduce the burden of paperwork on staff and to improve the efficiency of business processes.

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (The paperwork load for insurance applications is huge, and it takes too long to get accepted.) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Some of the procedures remain analog <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Digitization of paper media such as medical records and receipts 	<ul style="list-style-type: none"> • Accounting systems, EMR, etc. (digitalization of medical information, streamlining of paperwork and procedures, etc.)
Collaboration status with other donors	-	<ul style="list-style-type: none"> • None 	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Digital health Support • Digital health equipment support 	-
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary It is thought that there is a demand for the digitization of medical information in the hospital, the improvement of the efficiency of business processes, and the coordination of information inside and outside the hospital.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> ■ Tele-consultation <ul style="list-style-type: none"> ➢ Details unknown ➢ Outsourcing to outside doctors and specialists ■ AI diagnosis support <ul style="list-style-type: none"> ➢ Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

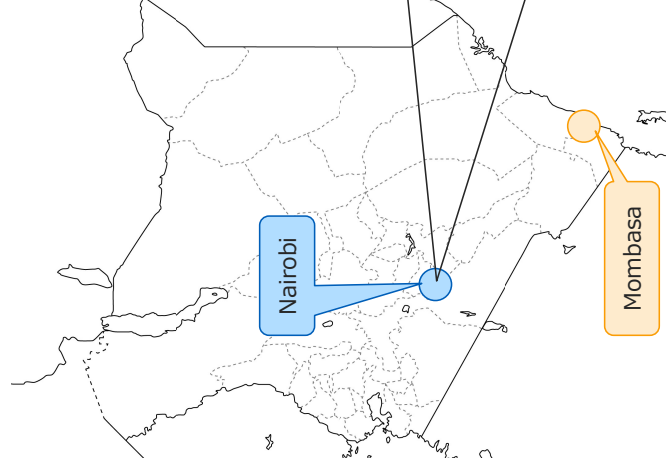
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital policy and budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • Plans and policies available (details unknown) ■ Digital health system <ul style="list-style-type: none"> • IT team available (number of people unknown) ■ Digital health budget <ul style="list-style-type: none"> • Budget available (details unknown) ■ Time of deployment of digital health <ul style="list-style-type: none"> • During this year (from July 2021 to July 2022) ■ Others <ul style="list-style-type: none"> • They don't want a specific digital health, any will do.

Nairobi West Hospital

General Information

Location	Nairobi, Nairobi Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	150
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Nairobi West Hospital

Summary There is a certain level of readiness to accept digital health, but ICT facilities, equipment and device may not necessarily be sufficient. Since the IT literacy of medical professionals is not high and IT human resources are limited, expectations for intuitive and simple-to-use solutions are high.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital has been developed to some extent, and it is possible to implement digital health. For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high As the communication infrastructure inside the hospital is in place to some extent, expect government support for network infrastructure outside the hospital and for the activation of the digital health market

[Secondary, Private] Nairobi West Hospital

Summary The hospital provides a wide range of services from outpatient care for COVID-19 patients to inpatient care for critically patients. On the other hand, there is a shortage of staff and beds, and there may be a high demand to improve operational efficiency and reduce workload in order to optimize staffing levels.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) □ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	No interview conducted	-
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> ■ Doctor ■ Nurse □ Laboratory technician □ Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> □ Capacity of general beds □ Capacity of ICU bed ■ PCR Testing Equipment □ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum ■ Oxygen (central distribution or gas cylinder) □ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> ■ Payment problem □ Others 	No interview conducted	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Rapid expansion and deployment of ICU and e-ICU solutions to compensate for the absence of intensivists • Patient monitoring devices in isolation wards (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation wards (remote stethoscopes, etc.) • Utilization of robots in isolation wards (automatic transportation, cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> □ Inappropriate zoning of infection control areas □ Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> ■ No staff or specialized teams for infection control □ Others 	No interview conducted	-

[Secondary, Private] Nairobi West Hospital

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational Problems				
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	✘	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	✘	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	✘	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support (reducing the workload of medical specialists such as radiologist) • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways (bed control) ■ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	✘	No interview conducted	-

Summary The hospital expects collaboration with external facility, but lacks the necessary infrastructure. A shortage of nurses has been recognized as an issue, and there is potential for the use of digital health to reduce the workload in order to optimize staffing.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Vaccine supply is controlled by the government.) 	No interview conducted	-
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. → Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc.
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input checked="" type="checkbox"/> Others (lack of oxygen supply) 	No interview conducted	-

[Secondary, Private] Nairobi West Hospital

There seems to be a demand for the introduction of digital health that enables efficient and prompt transport to other hospitals.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (Transport to other hospital) 	✖	No interview conducted	<ul style="list-style-type: none"> • Emergency transport system
Collaboration status with other donors	-	✖	No interview conducted	-
Expected support from Japan and JICA	-	✖	No interview conducted	-
Interest in PoC	-	✖	No interview conducted	-

It is thought that there is demand for digital health that enables collaboration and communication with outside the hospital.

Summary

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others(emergency transport system)

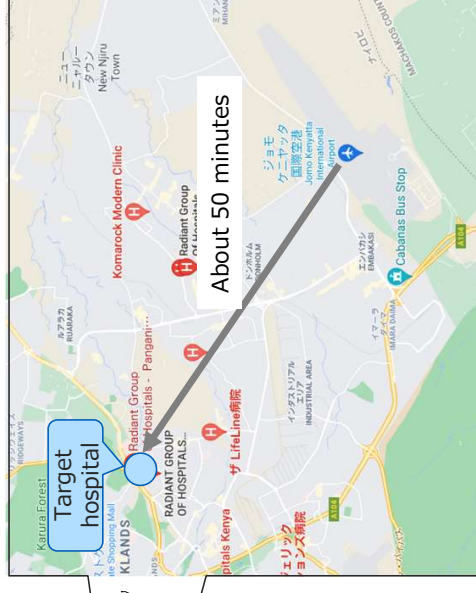
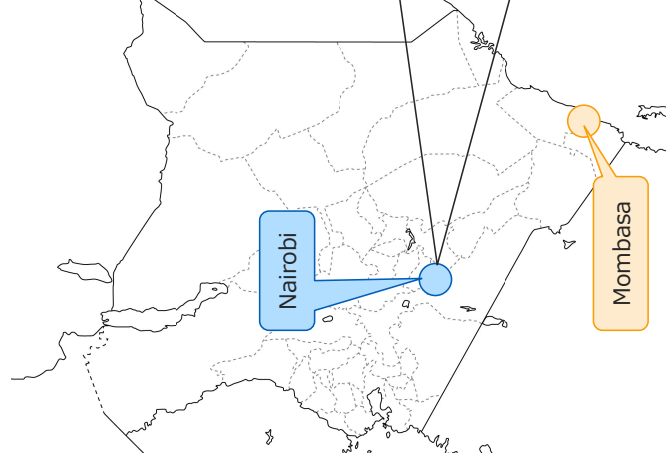
Hospital policy and budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

○ Hospital response ○ Potential demand (survey team's evaluation)

Radiant Group of Hospitals

General Information

Location	Nairobi, Nairobi Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	70
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Radiant Group of Hospitals

Summary Communication infrastructure, ICT facilities, equipment and device may not be sufficient. Urban infrastructure, such as electricity, is also lacking in some areas and needs to be considered in the introduction of digital health.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	<p>Wired, unstable or slow connection Wireless (Wi-Fi) , unstable or slow connection</p>	No interview conducted	<ul style="list-style-type: none"> There is a communication infrastructure in the hospital, but it is not stable
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	No interview conducted	<ul style="list-style-type: none"> Recovery of implementation costs is difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult Wired and wireless connections are available, but the necessary equipment and device may be insufficient, and it is necessary to confirm what kind of devices are available in the hospital when deploying digital health.

[Secondary, Private] Radiant Group of Hospitals

Summary Provide a wide range of services from outpatient care for COVID-19 patients to inpatient care for critically patients. On the other hand, there is a shortage of staff and hospital beds, and there may be a high demand to improve operational efficiency and reduce workload in order to optimize staffing levels.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Rapid expansion and deployment of ICU (e.g. prefab) and remote ICU solutions to compensate for the absence of intensivists • Patient monitoring devices in isolation beds (biometric data collection devices of the clothed type and bedside type, etc.) • Testing and diagnostic equipment in isolation wards (remotely available stethoscopes, etc.) • Utilization of robots in isolation wards (automatic transportation, cleaning and disinfection, etc.)
Problems for Infection Control in the hospital	<ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Inappropriate zoning of infection control areas <input checked="" type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of isolation facilities, and associated products and solutions • Access control solutions (face recognition, etc.)

[Secondary, Private] Radiant Group of Hospitals

Summary

It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention and for patients to be able to have contact with medical professionals.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems			
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with tele-triage • Accounting systems, EMR, etc. (digitalization of medical information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Testing equipment available at home (equipment for antenatal checkups, remote stethoscopes, etc.)
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	-

[Secondary, Private] Radiant Group of Hospitals

Summary There are issues in patient follow-up during and after treatment, so there is potential for the use of digital health. The hospital expects collaboration within and outside the hospital, but lacks the necessary infrastructure and foundation.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational treatment and follow-up problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input checked="" type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

[Secondary, Private] Radiant Group of Hospitals

There is potential for the use of digital health to reduce congestion in outpatient clinics, etc.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	✕	▲
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

- Alleviate peak waiting times and improve efficiency
- Triage (AI questionnaire)
- Reservation system for visiting hospitals

[Secondary, Private] Radiant Group of Hospitals

Summary The following is a list of digital health that have been deployed and to be deployed in the future at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

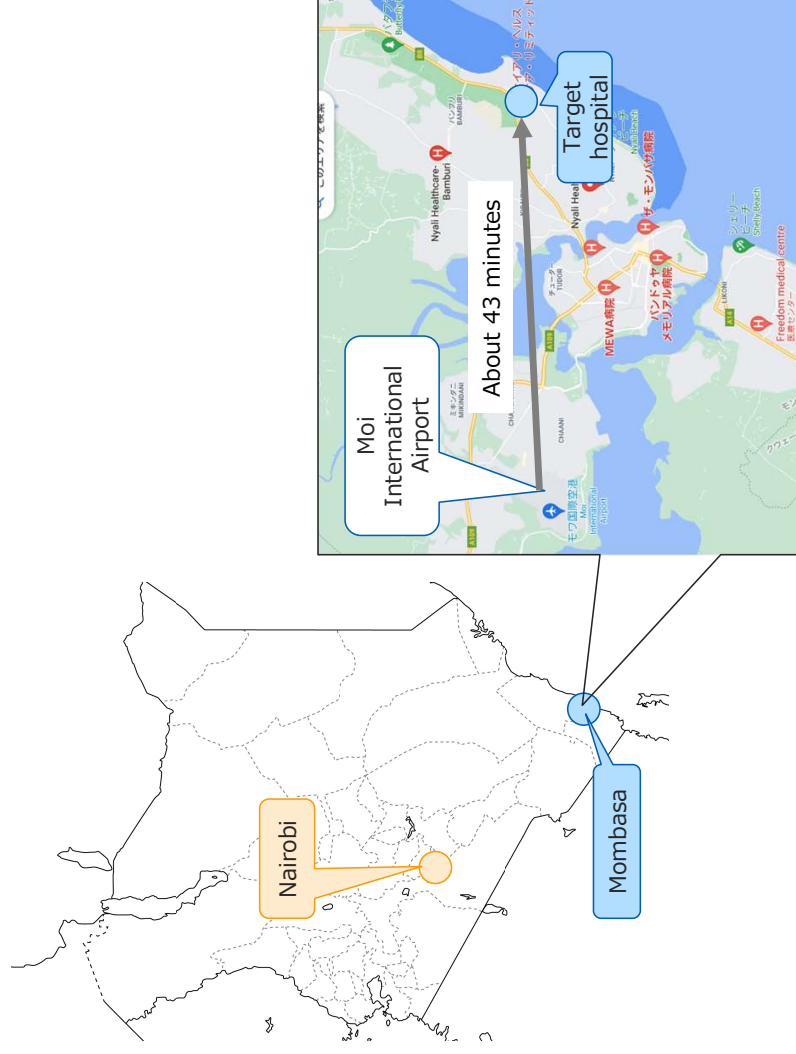
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system <ul style="list-style-type: none"> • N/A.
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health Budget <ul style="list-style-type: none"> • N/A.
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A.
Online health advisory	-		Online health advisory	<ul style="list-style-type: none"> ■ Others <ul style="list-style-type: none"> • N/A.
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

○ Hospital response ○ Potential demand (survey team's evaluation)

Nyali Healthcare Limited

General Information

Location	Mombasa, Coast Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	50
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Communication infrastructure, ICT facilities, equipment and device may not always be sufficient.

Summary

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	<p>Wired, stable connection Wireless (Wi-Fi), unstable or slow connection</p>	-	<ul style="list-style-type: none"> There is a communications infrastructure in the hospital, but it is somewhat unstable
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> N/A. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> N/A. <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> N/A. 	<ul style="list-style-type: none"> Recovery of implementation costs will be difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult Wired and wireless connections are available, but the necessary equipment and device may be insufficient, and it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

Summary Provide outpatient care for patients with COVID-19 and inpatient care for patients with minor illnesses. The hospital does not accept seriously ill patients, and no particular problems have been identified other than thorough hygiene management and lack of laboratory equipment.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () <p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>No interview conducted</p>	-
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input checked="" type="checkbox"/> Weak execution of Standard precautions by staffs <input checked="" type="checkbox"/> Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>No interview conducted</p>	-

Summary

It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems			
Prevention	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-trage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input checked="" type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • Remote diagnosis support • AI imaging diagnostic support (reducing the workload of medical specialists such as radiologist) • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input checked="" type="checkbox"/> Lack or low application rate of Clinical pathways (bed control) . <input type="checkbox"/> Unclear or not defined rules regarding bed management <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR

Summary

There are challenges in patient follow-up during and after treatment, but there is potential for the use of digital health. The hospital expects collaboration within the hospital, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) ■ Lack of medicines for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. ■ Insufficient information sharing of food allergies and contraindicated foods due to medications. □ Inability to share information with other medical facilities. □ Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> ■ Shortage of doctors (especially specialists, etc.) □ Shortage of nurses □ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) □ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment □ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs ■ Inadequate management of medical materials and drugs □ Others () 	No interview conducted	-

No other specific operational issues have been identified.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (Lack of wages) 	✖	No interview conducted	▲
Collaboration Status with Other Donors	-	✖	No interview conducted	▲
Expected support from Japan and JICA	-	✖	No interview conducted	▲
Interest in PoC	-	✖	No interview conducted	▲

It is believed that there is potential demand in a wide range of digital health fields.

Summary

Results of online questionnaire and follow-up interview (6/6)

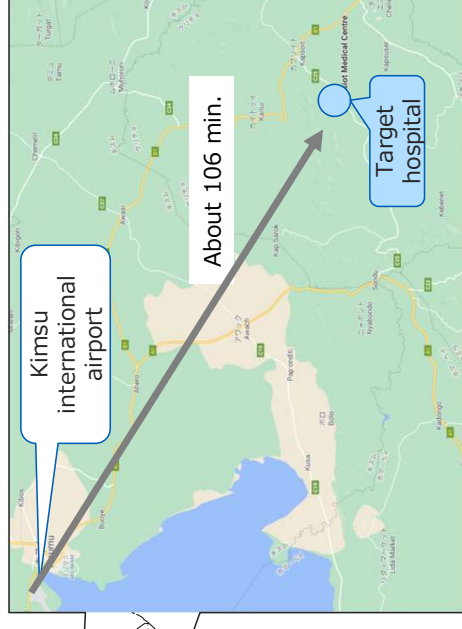
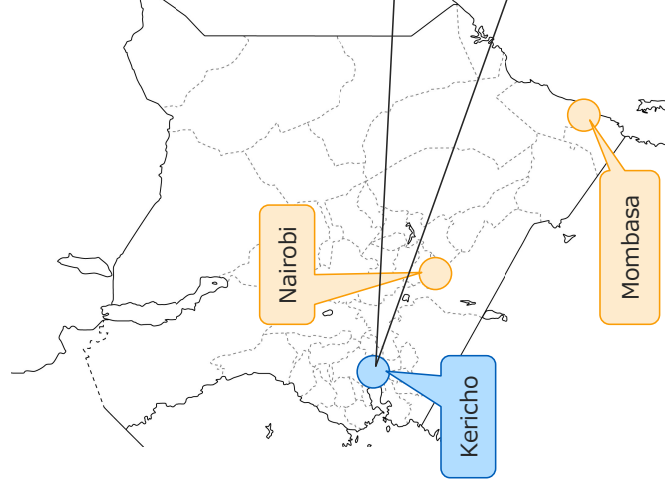
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A.
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health Budget • N/A.
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Time of deployment of digital health • N/A.
Online health advisory	-		Online health advisory	<ul style="list-style-type: none"> ■ Others • N/A.
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

○ Hospital response ○ Potential demand (survey team's evaluation)

Sosiot Health Centre

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary There is an overall lack of resources for digital health, including budget, personnel, IT literacy of the entire staff, necessary facilities and equipment in the hospital, and the use of external resources.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	None	-	<ul style="list-style-type: none"> No communication infrastructure in the hospital
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> Expect for healthcare services through more efficient documentation of medical records, etc. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Difficult to set up a medium- to long-term digital health budget because the overall budget is fluid Budget for digital health is not a priority <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> There is no government subsidy system. 	<ul style="list-style-type: none"> Lack of overall resources including budget, ICT personnel, IT literacy of staff, necessary facilities and equipment in the hospital, and utilization of external resources Infrastructure as an external environment outside the hospital is available to some extent (but the details of the situation are unknown)

Summary As a primary medical facility in the region, it mainly provides outpatient treatment and vaccination of COVID-19. There is a shortage of doctors, nurses, and other personnel, as well as hospital beds, and there may be a high demand for efficient operations to optimize staffing, reduce workload, and collaborate with specialists outside the hospital.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation □ Examination (specimen collection) □ Examination (PCR test implementation) □ Treatment in ward (mild symptoms) □ Treatment in ward (moderate symptoms) □ Treatment in ward (severe symptoms) ■ Vaccination ■ Contact and management of patients with mild symptoms under home care □ Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patients are not coming in for treatment. 	<p>Implication</p> <ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency to minimize patient retention at the time of visit <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> ■ [Human Resources] <ul style="list-style-type: none"> ■ Doctor ■ Nurse ■ Laboratory technician ■ Other staff ■ [Facilities, Equipment, etc.] <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum ■ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) ■ [Other] <ul style="list-style-type: none"> ■ Payment problem □ Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • N/A. 	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform • Improve operational efficiency and reduce workload ➢ Digitalization of medical information ➢ Tele-triage (AI questionnaire), etc. <p>(*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
Problems for Infection Control in the hospital	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> ■ [Software: Manual, Operation] <ul style="list-style-type: none"> ■ Insufficient hand washing and hand sanitizing by staff ■ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE ■ [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control ■ [Human Resources] <ul style="list-style-type: none"> ■ No staff or specialized teams for infection control □ Others 	<p>[Other issues]</p> <ul style="list-style-type: none"> • Lack of waste containers hinders waste separation • Parts of the facility are small and space is inadequate • We don't have enough supplies, so we have to make do with what we have. <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> • Waste separation and disposal • Washing hands • Social distance 	<ul style="list-style-type: none"> • Rapid expansion and deployment of facilities, and associated products and solutions

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention and for patients to be able to have contact with medical professionals, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • With COVID-19, patients are discouraged from visiting the hospital for treatment • Lack of knowledge of healthcare of local residents <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Need to expand facilities to ensure social distance • Health Promotion App 	<ul style="list-style-type: none"> • Health Promotion App • online health advisory <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation ■ Lots of time to interview patients about their medical history and treatment status. ■ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients ■ Inefficient emergency transport operation for patients ■ Complicated reception and accounting procedures for patients □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of staff. • Lack of space. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Increase in the number of personnel • Space Expansion • Introduction of EMR to improve work efficiency, reduce workload, and screen patients 	<ul style="list-style-type: none"> • Triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage • Accounting systems, EMR, etc. (digitalization of patient information, streamlining of paperwork and procedures, etc.) <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. □ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • In addition to outpatient care, provide maternal and child care and specialized HIV treatment, which requires many specialists in the first place. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Remote diagnostic support (with county hospitals) 	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) □ Lack or low application rate of Clinical pathways management (bed control) □ Unclear or not defined rules regarding bed management (bed control) □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility 	✖	<p>We don't provide inpatient care. (The ward is currently under construction, but it is expected to take about two years to start operation)</p>	-

Summary There are issues in patient follow-up during and after treatment, but there is potential for the use of digital health. The hospital expects to collaborate with outside hospitals, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) ■ Lack of medicines for patients □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of funds to purchase medicines (inadequate supply from KEMSA) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • financial assistance • Notification of regular checkups and consultation to patients using digital health (SMS, etc.) 	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation) <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Organizational cooperation	<ul style="list-style-type: none"> □ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. ■ Inability to share information with other medical facilities. □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of ICT infrastructure <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for digital health to enable information sharing at the sub-county level 	<ul style="list-style-type: none"> • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform <p>As a primary healthcare facility, ICT access is estimated to be limited across the board.</p>
Medical system	<ul style="list-style-type: none"> ■ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses ■ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • As the hospital is a Level 3 hospital, it should have a doctor on staff, but the doctor works at several facilities and is not a resident. • We can't do anything about recruiting, because that's government jurisdiction. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Remote communication with external doctors 	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform • VR/MR Training (Education and Training) • Improvement of operational efficiency (computerization of procedures using EMR, etc.)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs □ Inadequate management of medical materials and drugs □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of funds. • No technician available for medical equipment maintenance (stationed at County Level Hospital) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Establish a platform and mechanism for engineers to be notified in real time when needs 	<ul style="list-style-type: none"> • Remote communication with technicians

Summary There is a possibility of future collaboration with JICA, which has shown interest in the PoC through this project. However, there are high expectations for testing equipment that is more directly related to medical treatment.

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Others problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Procedures in the hospital are manual and analog. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • A system that records all of the patient's contact information. Track what day and time the patient visited the clinic, whether the patient is COVID-19 positive, etc. 	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • none in particular <p>They hope to collaborate with JICA.</p>	<ul style="list-style-type: none"> • Proactive cooperation with JICA
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Financial assistance • Equipment maintenance (radiography equipment, laboratory equipment, outpatient equipment such as pulse oximeters, ultrasonography, delivery tables, hospital beds) 	<ul style="list-style-type: none"> • Expectations for the provision of equipment that is more directly related to medical practice, such as medical equipment, rather than digital health
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary The digital health that has been introduced and will be introduced in the hospital are as follows. The infrastructure is poor and there is no experience of introducing digital health. There is potential demand in a wide range of digital health fields.

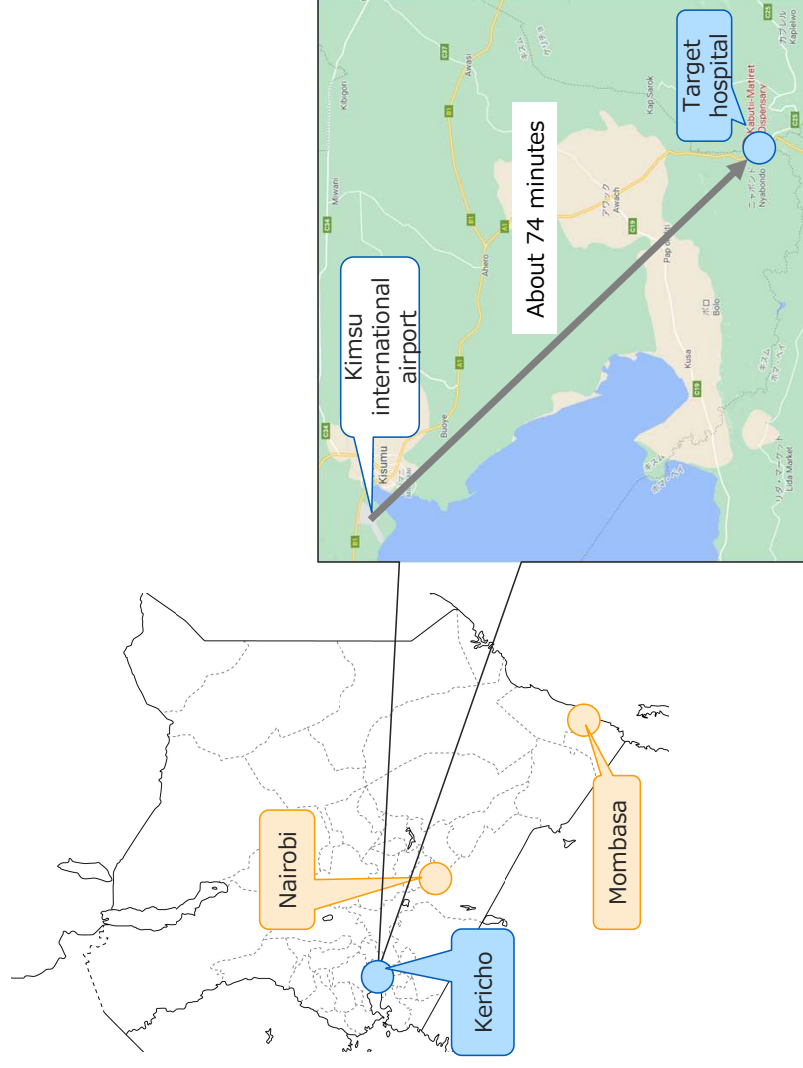
Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • None ■ digital health system <ul style="list-style-type: none"> • None ■ Digital health budget <ul style="list-style-type: none"> • None ■ Time of deployment of digital health <ul style="list-style-type: none"> • as soon as possible ■ Others <ul style="list-style-type: none"> • They don't want a specific digital health, any will do.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	
EHR (Electric Health Record)	-		EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others(Medical Device Technician Communication)		

Kabutii Matiret Dispensary

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Primary, Public] Kabutii Matiret Dispensary

Summary There is an overall lack of resources for digital health, including budget, personnel, IT literacy of the entire staff, necessary facilities and equipment in the hospital, and the use of external resources.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	None	-	<ul style="list-style-type: none"> No communication infrastructure in the hospital
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> N/A 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> N/A <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Lack of overall resources including budget, ICT personnel, IT literacy of staff, necessary facilities and equipment in the hospital, and utilization of external resources

[Primary, Public] Kabutii Matiret Dispensary

Summary As a primary medical facility in the region, it mainly provides examination for local residents and patients related to COVID-19. There is a shortage of facilities, equipment, and hospital beds, and there may be high demand for facility expansion and associated digital health.

Results of online questionnaire and follow-up interview (2/6)

COVID-19 Measures	Online Survey Response	Follow-up interview responses	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input checked="" type="checkbox"/> Others () 	✖	No interview conducted	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input checked="" type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Expansion and development of general wards, etc. <p>(*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of isolation wards, and associated products and solutions

[Primary, Public] Kabutii Matiret Dispensary

Summary There will be high demand for preventive care and solutions that allow patients to have contact with their medical staffs. There will also be demand for digital health to ease congestion in outpatient clinics and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Survey Response	Follow-up interview responses	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health promotion App • Online health advisory <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input checked="" type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with teletriage <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input checked="" type="checkbox"/> Lack or low application rate of Clinical pathways (bed control) . <input checked="" type="checkbox"/> Unclear or not defined rules regarding bed management <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Wearable device • EMR

Summary Kenya has a country-wide shortage of medicines, and the supply of medicines is even more inadequate at the local primary health care level.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems treatment and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Digital pharmacy As a primary healthcare facility, ICT access for patients is estimated to be limited.
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	-
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	-
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

[Primary, Public] Kabutii Matiret Dispensary

It is thought that there is demand for the use of digital health to reduce the workload of in-hospital transportation.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Robotics (automatic transfer)
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

[Primary, Public] Kabutii Matiret Dispensary

Summary The digital healths that have been deployed and will be deployed in the hospital are as follows. The background and details of the introduction are unknown, and the infrastructure is inadequate. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

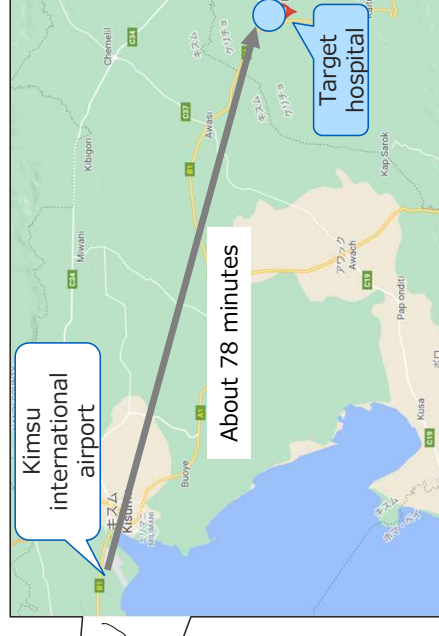
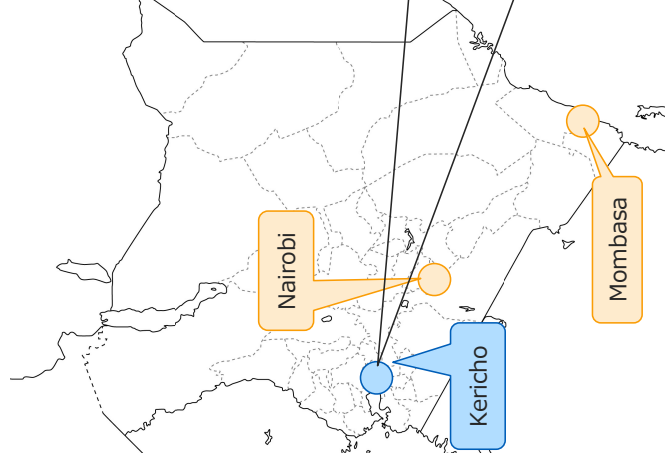
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A.
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health budget • N/A.
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Time of deployment of digital health • N/A.
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

○ Hospital response ○ Potential demand (survey team's evaluation)

Kipsitet Dispensary

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Primary, Public] Kipsitet Dispensary

Summary There is an overall lack of resources for digital health, including budget, personnel, IT literacy of the entire staff, necessary facilities and equipment in the hospital, and the use of external resources.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	None	-	<ul style="list-style-type: none"> No communication infrastructure in the hospital
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others (Improvement of emergency care) 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> In cases of COVID-19, there is no testing capacity or human resources. Expectations for digital health to rectify the situation 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Medical staffs don't understand to the benefits of digital health. They are sceptical about the accuracy and safety of digital health and often think it is better to operate manually Budget is reduced by the government. Difficult to set up a medium or long-term digital health budget because the overall budget is fluid Budget for digital health is not a priority No IT staff, but a Health Record Officer is in place and can be trained as an ICT person. <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> There is no government subsidy system. 	<ul style="list-style-type: none"> Lack of overall resources including budget, ICT personnel, IT literacy of staff, necessary facilities and equipment in the hospital, and utilization of external resources

Summary As a primary medical facility in the region, they only provide outpatient care to patients with COVID-19. There is a shortage of doctors, nurses, and other personnel, and there is a possibility of high demand for work efficiency improvement, workload reduction, and collaboration with specialists outside the hospital in order to optimize staffing.

Results of online questionnaire and follow-up interview (2/6)

Online Survey Response	Follow-up interview responses	Implication
<p>COVID-19 Measures</p> <p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation □ Examination (specimen collection) □ Examination (PCR test implementation) □ Treatment in ward (mild symptoms) □ Treatment in ward (moderate symptoms) □ Treatment in ward (severe symptoms) □ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patients are less likely to visit the hospital for treatment than before the COVID-19 *Before the COVID-19, we treated 150-200 patients/day, now down to 70-100 patients/day 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency to minimize patient retention. <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
<p>What is lacks for COVID-19 response in the hospital</p> <p>[Human Resources]</p> <ul style="list-style-type: none"> ■ Doctor ■ Nurse ■ Laboratory technician □ Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> □ Capacity of general beds □ Capacity of ICU bed □ PCR Testing Equipment □ ECMO (Extra-corporeal Membrane Oxygenation) □ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> □ Payment problem ■ Others(Space of washing hands) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform • Improve operational efficiency and reduce workload ➢ Digitalization of medical information ➢ Tele-triage (AI questionnaire), etc.
<p>Problems for Infection Control in the hospital</p> <p>[Software: Manual, Operation]</p> <ul style="list-style-type: none"> ■ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> □ Inappropriate zoning of infection control areas □ Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> □ No staff or specialized teams for infection control ■ Others(Patient is not cooperating with the MOH's guidelines) 	<p>Other issues</p> <ul style="list-style-type: none"> • Lack of disinfectants and masks • Cannot secure social distance due to lack of space <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> • Developing guidelines for their own hospitals in line with the MOH's guidance ➢ Hand washing and hand sanitizing ➢ Social distance, etc. 	<ul style="list-style-type: none"> • Rapid expansion and deployment of facilities, and associated products and solutions

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious ■ Others (low interest at the community level) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a rural area, many residents are poor and lack health awareness and knowledge. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for digital health to change patients' attitudes and promote their health • Most Patients Use Cell Phones, Not Smartphones 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation ■ Lots of time to interview patients about their medical history and treatment status. □ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The cause of the congestion is lack of space • Workload is a manpower issue <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expansion of facilities • Increase in the number of medical personnel 	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with tele-triage <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. ■ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of personnel and capacity to perform complex medical procedures • Lack of forceps, ultrasound equipment, etc. for maternal care <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Referrals to county and sub-county level hospitals 	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) □ Lack or low application rate of Clinical pathways □ Unclear or not defined rules regarding bed management (bed control) . □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. 	✖	<p>General inpatient care is not provided (only for perinatal).</p>	-

Summary There are challenges in patient follow-up during and after treatment, but there is potential for the use of digital health. The hospital expects collaboration within the hospital, but lacks the necessary infrastructure. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. □ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) ■ Lack of medicines for patients 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Delay in supply of medicines from the government <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Creation of a fund for essential medicines (especially for patients under 5 years of age) 	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. ■ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. □ Inability to share information with other medical facilities. 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Doctors are too busy to communicate and share information <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for a mechanism for sharing knowledge and information using ICT 	<ul style="list-style-type: none"> • EMR • As a primary healthcare facility, ICT access for patients is estimated to be limited.
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors(especially specialists, etc.) ■ Shortage of nurses □ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Selection of staff for education and training is determined at the sub-county level, not by the facility itself. Opportunities are not equal and there is no sharing of knowledge and experience within the facility <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Utilize ICT to understand the content of education and training to be provided, the participants and non-participants, and to provide opportunities for non-participants 	<ul style="list-style-type: none"> • VR/MR Training (Education and Training) • Improvement of operational efficiency (computerization of procedures using EMR, etc.)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs ■ Inadequate management of medical materials and drugs □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • There are no technicians available for medical equipment maintenance. Not many in the community. • Delay in supply of medicines from the government <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Establishment of a platform and mechanism that allows a small number of technicians to be in charge of multiple dispensary facilities and receive real-time notifications when equipment repairs are required. 	<ul style="list-style-type: none"> • Remote communication with technician

There is potential for the use of digital health to reduce congestion in outpatient clinics, etc.

Summary

Results of online questionnaire and follow-up interview (6/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> ■ Inadequate cleaning □ Too much burden of transporting goods, meals for patients ■ Exposure of infection risk, and weak counter-measurement □ Unclear cause of outbreak due to lack of tracing methods □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of supplies for cleaning and disinfection <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Donations and contributions <p>The hospital has the phone numbers and addresses of the patients, so can trace them in case of a pandemic.</p>	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency ➢ Triage (AI questionnaire) ➢ Reservation system for visiting hospitals
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • Not coordinated. <p>Some organizations provided hand washing supplies for COVID (Brighter Communities Kenya).</p>	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Facilities (Space Expansion) • Equipment, digital health • Human resources (especially medical equipment technicians, nurses and cleaners) • Operating funds <p>Collaboration must first involve county government</p> <p>The county government is willing to cooperate with JICA to improve the health care system (cooperated in the past).</p>	<ul style="list-style-type: none"> • Expectations for the provision of equipment that is more directly related to medical practice, such as medical equipment, rather than digital health
Interest in PoC	-	<ul style="list-style-type: none"> • interested 	-

Summary The digital health that have been deployed and will be deployed in the hospital are as follows. The background and details of the introduction are unknown, and the infrastructure is inadequate. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> ■ EMR For storing medical records of HIV patients (it is assumed that the hospital has not introduced its own electronic medical record but uses the HIV patient information registration system operated by another institution)
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

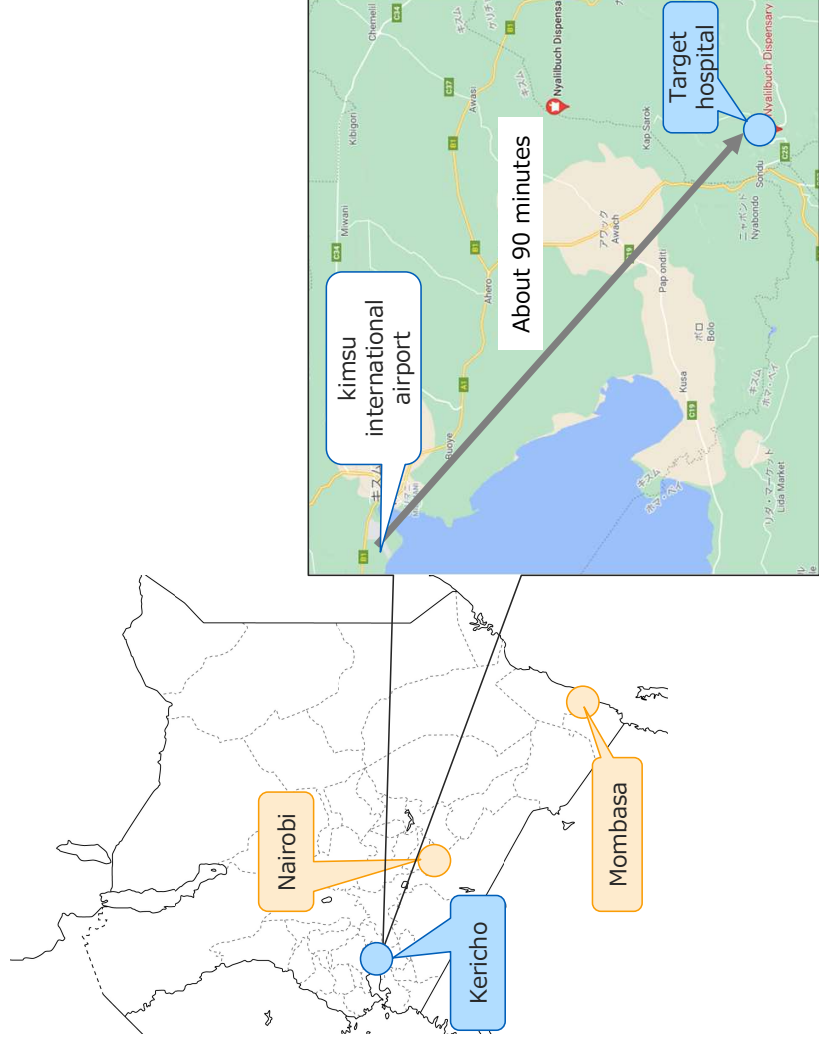
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others (Medical Device Technician Communication)

Hospital policy and budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • No ■ Digital health system <ul style="list-style-type: none"> • No IT staff, but a Health Record Officer is in place and can be trained as an ICT person. ■ Digital health budget <ul style="list-style-type: none"> • budget-free ■ Time of deployment of digital health <ul style="list-style-type: none"> • None (at any time) ■ Others <ul style="list-style-type: none"> • none

Nyalibuch Dispensary

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Pharmacy <input type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other (Vaccination)
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary There is an overall lack of resources for digital health, including budget, personnel, and necessary facilities and equipment in the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	None	-	<ul style="list-style-type: none"> No communication infrastructure in the hospital
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> Overall, resources such as personnel and equipment are insufficient, and a multifaceted approach including digital health is necessary. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Difficult to set up a medium or long-term digital health budget because the overall budget is fluid Budget for digital health is not a priority <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> The government has promised to provide financial support for the digital health, but there is no timetable for implementation. It will take time. The government requires each medical facility to be connected to the communications infrastructure, but this depends largely on self-help efforts on the part of each facilities. Individual support is needed to fulfill the government's request. Communication infrastructure is already in place at sub-county level medical facilities. 	<ul style="list-style-type: none"> Lack of resources in general, including budget, ICT personnel, and necessary facilities and equipment in the hospital

[Primary, Public] Nyalibuch Dispensary

Summary As a primary medical facility in the region, they mainly provide outpatient care to patients with COVID-19. The facility is operated by one person, and there is a shortage of doctors, nurses, and other personnel, so there may be high demand for work efficiency, workload reduction, and collaboration with specialists outside the hospital.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Hospital staffs are being forced to respond differently than before. In particular, they are paying attention to how we treat patients and how we minimize congestion in our facilities. 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency to minimize patient retention <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input checked="" type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input checked="" type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • N/A. 	<ul style="list-style-type: none"> • Expansion of hospital beds and associated solutions • Remote diagnosis support • Doctor-to-Doctor Platform • Improve operational efficiency and reduce workload ➢ Digitalization of medical information ➢ Triage (AI questionnaire), etc. <p>(*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input checked="" type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No staff or specialized teams for infection control <input checked="" type="checkbox"/> Others(Lack of equipment, supplies, etc.) 	<p>Other issues</p> <ul style="list-style-type: none"> • Government support is insufficient (Masks are supplied, but not enough. Funds for own hospital are also insufficient) <p>[Infection control guidelines in place or not]</p> <ul style="list-style-type: none"> • Using the MOH guidelines <ul style="list-style-type: none"> ➢ Hand washing and disinfection ➢ Use of mask and PPE ➢ Social distance 	<ul style="list-style-type: none"> • Rapid expansion and deployment of facilities, and associated products and solutions

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located interior of the county, and the local population lacks health awareness and knowledge. Traditional herbal medicine is popular, so many patients come to the hospital when they are severe, (*The area is also an endemic area for malaria). <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for digital health to change patients' attitudes and promote their health 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory • Online training (like a web conference for training for community health volunteers) <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> □ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status. ■ Heavy workload for staff in reception and screening □ Unclear criteria for accepting emergency patients ■ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients ■ Others (Equipment or facilities for testing and diagnosis) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • With only 1 staff managing the facility, there is a heavy workload for paperwork and patient care. • Because the nearest medical institution is far away, emergency transport also takes time (No vehicles for emergency transport) • Not available for rapid typhoid or malaria test. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Improvement of operational efficiency and centralized data management using digital health • Solution to display and call the nearest ambulance 	<ul style="list-style-type: none"> • EMR • Tele-trage • Emergency transport system <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. □ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists ■ Others (Equipment or facilities for testing and diagnosis) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a remote area <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A. 	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> ■ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) □ Lack or low application rate of Clinical pathways □ Unclear or not defined rules regarding bed management (bed control) □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. ■ Others (Lack of ward space) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Insufficient materials and equipment due to lack of funds • Lack of space in the facility <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Space Expansion 	<ul style="list-style-type: none"> • Rapid expansion and deployment of facilities, and associated products and solutions • Wearable device • Patient monitoring devices (clothing-type and bed-type biometric data collection devices, etc.)

Summary With one staff, the hospital is chronically understaffed, and there is potential for the use of digital health to improve operational efficiency and reduce workload. The hospital expects to collaborate with outside hospitals, but lacks the necessary infrastructure.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Lack of manpower and equipment) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a remote area <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Digital health to train community health volunteers and enable them to educate the local population 	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Online training (like a web conference for training for community health volunteers)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others (Lack of manpower) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a remote area <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Increase in personnel 	<ul style="list-style-type: none"> • Improve work efficiency and reduce workload (electronic medical records, use of robots, etc.)
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a remote area <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Increase in personnel • Digital health that enables consultation with specialists in remote areas, etc. 	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform • Improvement of operational efficiency (computerization of procedures using EMR, etc.)
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a remote area • Now, a written order form for medical supplies, drugs, must be completed and submitted to the county government for application. <p>Since the facility is operated by one person, it is necessary to close the facility for transportation when applying.</p> <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • National-level digital health capable of ordering and supplying medicines and consumables 	<ul style="list-style-type: none"> • Digital pharmacy

[Primary, Public] Nyalibuch Dispensary

Urban infrastructure, such as water supply facilities, is more inadequate than digital health.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems Others	<ul style="list-style-type: none"> ■ Inadequate cleaning □ Too much burden of transporting goods, meals for patients ■ Exposure of infection risk, and weak counter-measurement □ Unclear cause of outbreak due to lack of tracing methods □ Others (No drinking water facilities, other infrastructure is inadequate) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of support and funding from the government <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Infrastructure development (especially infrastructure that can provide clean water) 	-
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • With support from JICA • No other donor linkage 	<ul style="list-style-type: none"> • Proactive cooperation with JICA
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Introduction of ICT facility expansion • Increase in the number of personnel • Equipment maintenance (diagnostic equipment, lab-related equipment (microscopes, blood test equipment, etc.)) 	<ul style="list-style-type: none"> • High expectations for the introduction of digital health to reduce workload and improve the quality of medical care • Expectations for the provision of equipment more directly related to medical practice, such as medical equipment, and the development of infrastructure.
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

[Primary, Public] Nyalibuch Dispensary

Summary The hospital has experience working with JICA. They are also interested in PoC through this project, and there is a possibility of future collaboration. Expectations are high for digital health, but expectations are also high for testing equipment that is more directly related to medical treatment.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

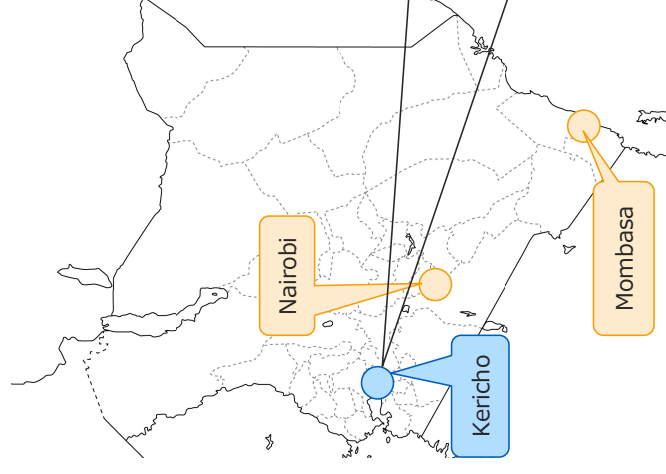
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others (web conferencing tools)

Hospital policy and budget
<ul style="list-style-type: none"> Digital health plan and policy <ul style="list-style-type: none"> The government requires each medical facility to be connected to the telecommunications infrastructure, and the hospital has been considering strategies to introduce ICT in healthcare. The government's policy is largely dependent on the self-help efforts of each medical institutions, and has not been implemented due to lack of fund. Individual support is needed to meet the government's request. Digital health system <ul style="list-style-type: none"> None Digital health budget <ul style="list-style-type: none"> None. They tried to set up a budget before, but couldn't get resource. Time of deployment of digital health <ul style="list-style-type: none"> As soon as possible (within the year) Others <ul style="list-style-type: none"> They don't want a specific digital health, any will do.

Kaitui Dispensary

General Information

Location	Kericho, Rift Valley Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Primary, Public] Kaitui Dispensary

Summary There is an overall lack of resources for digital health, including budget, personnel, necessary facilities and equipment in the hospital, and use of external resources.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	unknown	-	(As a primary healthcare facility, it is highly unlikely to have a stable communications infrastructure)
Situation of Digital Health	<ul style="list-style-type: none"> ■ Improvement of medical care quality ■ Improvement of patient services ■ Improvement of medical safety ■ Improvement of operational efficiency ■ Improvement of management ■ Others (Improvement of emergency care) 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> • In particular, they want to improve the quality of healthcare and save patients' lives. • Expectations for collaboration with facilities that have ambulances, rapid transport and provision of treatment using digital health 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> ■ Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff ■ Lack of IT experts in the facility who can deploy, operate, and maintain the digital health ■ Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) ■ Lack of external services to deploy, operate, and maintain the digital health ■ Lack of network environment (3G, 4G, etc.) ■ Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> • Difficult to set up a medium or long-term digital health budget because the overall budget is fluid • Budget for digital health is not a priority <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> • Government subsidies do not exist in the system. • Depending on the level of the hospital, there may be a separate government budget. The hospital is Level 2, so it may not be a high priority 	<ul style="list-style-type: none"> • Lack of resources in general, including budget, ICT personnel, necessary facilities and equipment in the hospital, and use of external resources

Summary As a primary medical facility in the region, it mainly provides outpatient treatment for patients with COVID-19 and inpatient treatment for patients with minor illnesses. There is a shortage of doctors, nurses, and other personnel, as well as hospital beds, and there may be high demand for more efficient operations to optimize staffing, reduce workload, and collaborate with specialists outside the hospital.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patients are not coming in for treatment. 	<p>Implication</p> <ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency to minimize patient retention <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input checked="" type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • There is a shortage of human resources • Because the operation is performed with oxygen cylinders, the staff has to spend time transporting and replacing them, which hinders the treatment of patients with COVID-19 infection 	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Expansion and development of general wards, etc. (prefab, etc.) <p>(*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input checked="" type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>Other issues</p> <ul style="list-style-type: none"> • Lack of waste containers hinders waste separation <p>[Infection control guidelines in place or not]</p> <ul style="list-style-type: none"> • Using the Department of Health guidelines <ul style="list-style-type: none"> ➢ Hand washing and disinfection ➢ Use of mask ➢ Waste treatment ➢ Social distance 	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of isolation facilities, and associated products and solutions

Summary It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems			
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of knowledge of healthcare by the local population (the hospital is located in a rural area) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Utilize digital health to train local healthcare volunteers with health promotion applications. These volunteers will then go out into the community to provide education and guidance. 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital does not own an ambulance and if emergency transport is needed, it must be requested from a sub-county level hospital. This makes the transport time consuming and inefficient. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for a system that uses digital health to locate and request the nearest ambulance 	<ul style="list-style-type: none"> • Teletrage • Emergency transport system <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Inability to secure specialist doctor (government problem) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Remote diagnosis support 	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	<p>No provide inpatient care.</p>	<p>(*Conflicts with the results of the previous questionnaire)</p>

Summary There are issues in patient follow-up during and after treatment, but there is room for the use of digital health. The hospital expects to collaborate with outside hospitals, but lacks the necessary infrastructure and foundation.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patient forgets appointment and does not visit • Inadequate education and guidance <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Notification of periodic medical checkups and consultations to patients using digital health 	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation) <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of infrastructure to enable the adoption of digital health <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for communication between departments using digital health 	<ul style="list-style-type: none"> • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform <p>As a primary healthcare facility, ICT access is estimated to be limited throughout.</p>
Medical system	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Nothing can be done about human resources because it is under government jurisdiction. Depends on the government budget. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Remote diagnosis support 	<ul style="list-style-type: none"> • Remote diagnosis support • AI imaging diagnostic support • Doctor-to-Doctor Platform • Improvement of operational efficiency (computerization of procedures using EMR, etc.)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Inadequate supply from government <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Maintain equipment and secure necessary funding 	<p>-</p>

It seems that there is a demand for the deployment of digital health that contributes to infection control in hospitals.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (Lack of human resources, medical equipment, and incinerators for medical waste) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of space. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Space Expansion 	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • None 	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Equipment maintenance (lab test equipment for COVID-19, delivery table, sterilizer, hematology equipment, incinerator (for disposal of medical waste such as used needles), etc.) • Improvement of facilities (expansion of scale, establishment of radiation department) 	<ul style="list-style-type: none"> • Expectations for the provision of equipment that is more directly related to medical practice, such as medical equipment, rather than digital health
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary The background and details of deployment of digital health are unknown, and the infrastructure is inadequate. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown
EMR (Electric Medical Record)	-	
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

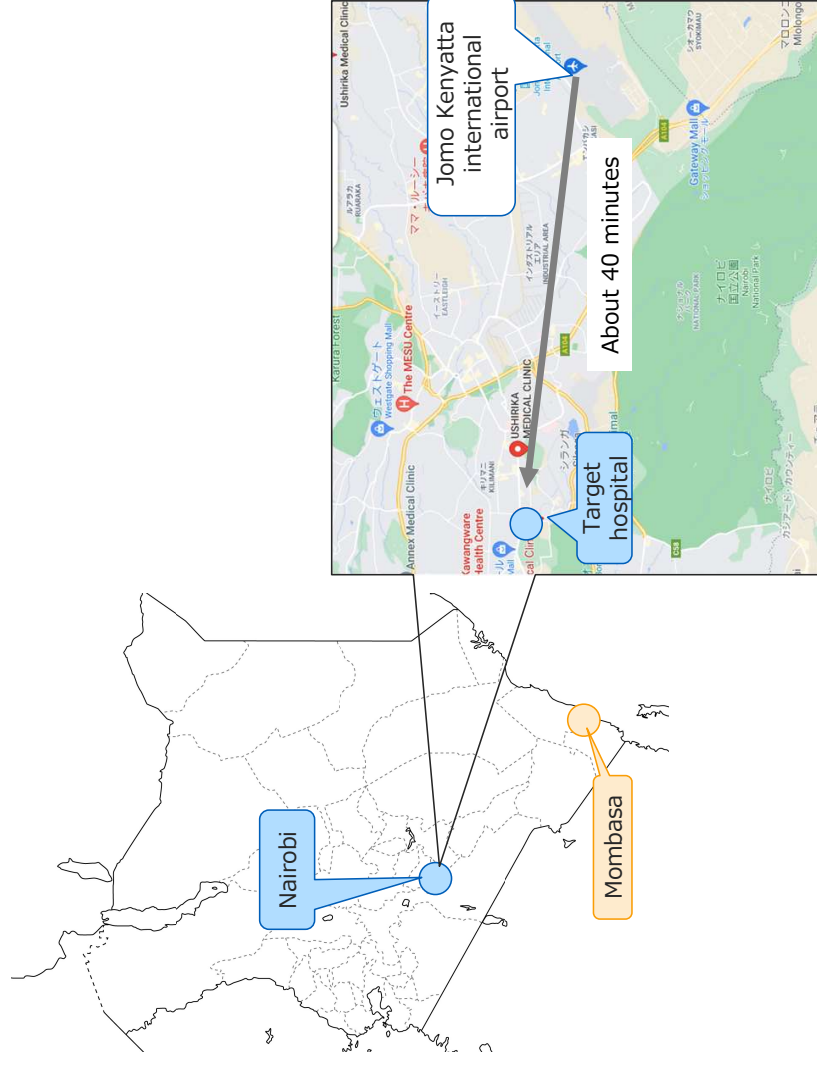
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others (Emergency transport system)

Hospital policy and budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • None ■ Digital health system <ul style="list-style-type: none"> • None ■ Digital health budget <ul style="list-style-type: none"> • None ■ Time of deployment of digital health <ul style="list-style-type: none"> • As soon as possible ■ Others <ul style="list-style-type: none"> • They don't want a specific digital health, any will do.

Ushirika Medical Clinic

General Information

Location	Nairobi, Nairobi Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Primary, Public] Ushirika Medical Clinic

Communication infrastructure, ICT facilities, equipment and terminals may not always be sufficient.

Summary

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	<p>Wired, unstable or slow connection Wireless (Wi-Fi), unstable or slow connection</p>	No interview conducted	<ul style="list-style-type: none"> There is a communication infrastructure in the hospital, but it is not stable
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> Recovery of implementation costs will be difficult, and evaluation of the cost-effectiveness of digital health implementation is estimated to be difficult

[Primary, Public] Ushirika Medical Clinic

Summary As a primary medical facility in the region, they only provide outpatient care to patients with COVID-19. There is a shortage of doctors, nurses, and other personnel, and there is a possibility of high demand for work efficiency improvement, workload reduction, and collaboration with specialists outside the hospital in order to optimize staffing.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input type="checkbox"/> Examination (specimen collection) <input type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
	<p>What is lacking for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input type="checkbox"/> [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support • Doctor-to-Doctor Platform • Improve operational efficiency and reduce workload ➢ Digitalization of medical information ➢ Tele-triage (AI questionnaire), etc. <p>(*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	-

Summary

It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems			
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input checked="" type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-trage <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input checked="" type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Online medical care, laboratory equipment for home use • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	-

Summary Kenya has a country-wide shortage of medicines, with even more inadequate supplies at the local primary care level. The hospital also lacks funding for staffing, which may make digital health an even lower budget dividend priority.

Results of online questionnaire and follow-up interview (4/6)

Operational problems	Online Survey Response	Follow-up interview responses	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Digital pharmacy As a primary healthcare facility, ICT access for patients is estimated to be limited.
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input checked="" type="checkbox"/> Others (No electronic storage of medical records) 	No interview conducted	<ul style="list-style-type: none"> • EMR
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input checked="" type="checkbox"/> Others (No money to pay compensation) 	No interview conducted	-
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

Summary It seems that there is a demand for the deployment of digital health that contributes to infection control measures in hospitals.

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	✕	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	✕	-
Expected support from Japan and JICA	-	✕	-
Interest in PoC	-	✕	-

Summary The following is a list of digital health that have been deployed and will be deployed in the hospital. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

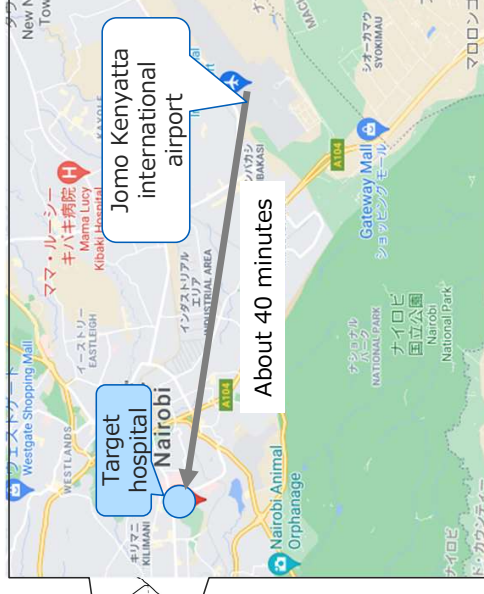
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital policy and budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A. ■ Digital health system <ul style="list-style-type: none"> • N/A. ■ Digital health budget <ul style="list-style-type: none"> • N/A. ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A. ■ Others <ul style="list-style-type: none"> • N/A.
PHR (Personal Health Record)	-		PHR (Personal Health Record)	
EHR (Electric Health Record)	-		EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

○ Hospital response ○ Potential demand (survey team's evaluation)

Aldama Ebenezer Medical Clinic

General Information

Location	Nairobi, Nairobi Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input checked="" type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other ()
Number of beds	None
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary There is an overall lack of resources for digital health, including budget, personnel, IT literacy of the entire staff, necessary facilities and equipment in the hospital, and the use of external resources.

Results of online questionnaire and follow-up interview (1/6)

	Online Survey Response	Follow-up interview responses	Implication
Communication Infrastructure	None	-	<ul style="list-style-type: none"> No communication infrastructure in the hospital
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing this option]</p> <ul style="list-style-type: none"> To expect that the introduction of digital health will improve medical safety and provide optimal treatment to patients 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Healthcare providers do not have a good understanding of the benefits of digital health. They are sceptical about the accuracy and safety of digital health and often think it is better to operate manually Budget for digital health is not a priority No IT staff. <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> There is no government subsidy system. 	<ul style="list-style-type: none"> Lack of overall resources including budget, ICT personnel, IT literacy of staff, necessary facilities and equipment in the hospital, and utilization of external resources

Summary As a primary medical facility in the region, they only provide outpatient care to patients with COVID-19. There is a shortage of doctors, nurses, and other personnel, and there is a possibility of high demand for work efficiency improvement, workload reduction, and collaboration with specialists outside the hospital in order to optimize staffing.

Results of online questionnaire and follow-up interview (2/6)

	Online Survey Response	Follow-up interview responses	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation □ Examination (specimen collection) □ Examination (PCR test implementation) □ Treatment in ward (mild symptoms) □ Treatment in ward (moderate symptoms) □ Treatment in ward (severe symptoms) □ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Patients are less likely to visit the hospital for treatment than before the COVID-19 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency to minimize patient retention <p>As a primary healthcare facility, ICT access for patients is estimated to be limited.</p>
What is lacks for COVID-19 response in the hospital	<p>[Human Resources]</p> <ul style="list-style-type: none"> ■ Doctor ■ Nurse ■ Laboratory technician ■ Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum ■ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> ■ Payment problem ■ Others (Lack of space) 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Facility expansion, ancillary products, etc. • Remote diagnosis support • Doctor-to-Doctor Platform • Improve operational efficiency and reduce workload <p>➢ Digitalization of medical information</p> <p>➢ Triage (AI questionnaire), etc.</p> <p>*Since inpatient care is not provided, there are some discrepancies with questionnaire responses.</p>
Problems for Infection Control in the hospital	<p>[Software: Manual, Operation]</p> <ul style="list-style-type: none"> ■ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> □ No staff or specialized teams for infection control □ Others 	<p>Other issues</p> <ul style="list-style-type: none"> • Lack of space <p>[Infection control guidelines in place or not]</p> <ul style="list-style-type: none"> • Developing guidelines for their own hospitals in line with the MOH's guidance <ul style="list-style-type: none"> ➢ Patient protection (use of mask, hand washing) ➢ Fumigation of surgical area, cleaning and disinfection every 3 hours 	<ul style="list-style-type: none"> • Rapid expansion and deployment of facilities, and associated products and solutions

Summary

It is feared that the lack of education and guidance for local residents and patients regarding health care is leading to delayed detection of diseases and worsening of symptoms. There is likely to be a high demand for solutions for disease prevention, for patients to be able to have contact with medical professionals, to ease congestion in outpatient clinics, and to compensate for the shortage of specialist doctors.

Results of online questionnaire and follow-up interview (3/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational Problems	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The hospital is located in a slum and most of the patients do not have a steady income. They come to the hospital only after their symptoms worsen. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Community health workers visit home patients by creating and systematizing EMR 	<ul style="list-style-type: none"> • Health Promotion App • online health advisory <p>Limited ICT access for patients as it is a primary care facility Possibility of providing support starting from community health workers</p> <ul style="list-style-type: none"> • Facility expansion, ancillary products, etc.
Screening	<ul style="list-style-type: none"> □ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status. □ Heavy workload for staff in reception and screening □ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients ■ Others (Lack of space) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The small space results in a crowded outpatient operation, forcing patients to wait outside. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • They're renting space outside the facility. 	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • Remote diagnosis support • Doctor-to-Doctor Platform
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. ■ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of equipment (especially ultrasound for prenatal care, etc.) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Need medical equipment such as ultrasound from digital health 	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) □ Lack or low application rate of Clinical pathways (bed control) □ Unclear or not defined rules regarding bed management □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. □ Others () 	<p>They don't provide inpatient care.</p>	<p>-</p>

Summary Kenya has a country-wide shortage of medicines, with even more inadequate supplies at the local primary care level. The hospital also lacks funding for staffing, which may make digital health an even lower budget dividend priority.

Results of online questionnaire and follow-up interview (4/6)

	Online Survey Response		Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • There is a shortage of medicines in the entire country. Even when refers to higher level hospitals, the necessary medicines are not available <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Expectations for prescription records and inventory management using digital health 	<ul style="list-style-type: none"> • Digital pharmacy • As a primary healthcare facility, ICT access for patients is estimated to be limited.
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others (No electronic storage of medical records) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Medical records are not digitized and are operated on paper. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Introduction of EMR to digitize medical records and improve the efficiency of information sharing within the hospital 	<ul style="list-style-type: none"> • EMR
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others (No money to pay compensation) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of necessary funds to pay for the services. Therefore, they cannot secure human resources (most of staff are volunteers) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Recruitment of volunteer through ICT 	-
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • N/A (obviously underfunded) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Need equipment such as laboratory equipment, microscopes, centrifuges, ultrasound machines for antenatal care rather than digital health 	<ul style="list-style-type: none"> • Remote communication with technicians

It seems that there is a demand for the introduction of digital health that contributes to infection control in hospital.

Summary

Results of online questionnaire and follow-up interview (5/6)

	Online Survey Response	Follow-up interview responses	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of a way to trace the cause <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • ICT-based patient tracing and appropriate follow-up expected 	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • Not coordinated. 	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Facilities (Space Expansion) • Equipment, digital health • Operating funds 	-
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary The digital health that has been deployed and will be deployed in the hospital are as follows. The infrastructure is poor and there is no experience of introducing digital health. There is potential demand in a wide range of digital health fields.

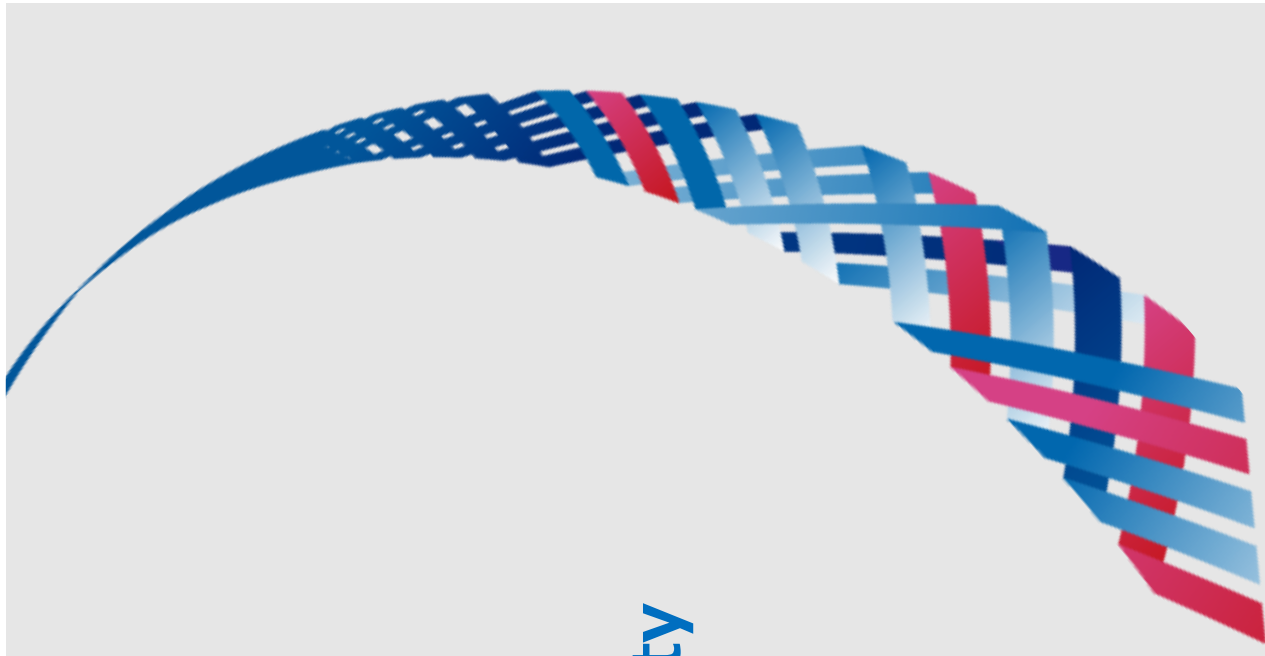
Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others (Medical Device Technician Communication)

Hospital policy and budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • No clear plan or policy has been formulated. • The priority areas for digital health are under consideration. They want to be able to share medical records in those area <ul style="list-style-type: none"> ➢ Reception ➢ Laboratory ➢ Medication ■ Digital health system <ul style="list-style-type: none"> • No ICT personnel ■ Digital health budget <ul style="list-style-type: none"> • None ■ Time of deployment of digital health <ul style="list-style-type: none"> • Within a year ■ Others <ul style="list-style-type: none"> • None

Appendix 7. Detailed information on each medical facility (Indonesia)



Detailed information on each medical facility

■ List of medical facilities

Classification		Facility Name	Interest in PoC
Tertiary	Public	• National Cardiovascular Centre Harapan Kita	<input type="radio"/>
		• Dr. Hasan Sadikin National General Hospital	<input type="radio"/>
		• Dr. M. Goenawan Partowidigdo Lung Hospital	<input type="radio"/>
		• Harapan Kita Mother and Children Hospital	<input type="radio"/>
		• H. Adam Malik National General Hospital	<input checked="" type="radio"/>
Secondary	Public	• Hasanuddin University Hospital	<input type="radio"/>
		• Siti Fatimah Regional General Hospital of South Sumatera Province	<input type="radio"/>
		• Udayana University Hospital	<input type="radio"/>
		• North Sumatera University Hospital	<input checked="" type="radio"/>
		• Brawijaya University Hospital	<input type="radio"/>
Private	Private	• Murni Teguh Memorial Hospital	<input type="radio"/>
		• Bunda Thamrin General Hospital	<input checked="" type="radio"/>
		• PKU Muhammadiyah Bantul General Hospital	<input type="radio"/>
		• Mitra Medika General Hospital	<input checked="" type="radio"/>

*[Interest in PoC] ● : Confirmed interest through follow-up interviews

○ : Responded to questionnaire including possibility of PoC



Distance from Japan

5,700 km

Time difference from Japan time (JST)

JST-2

Flight time from Japan

About 7 to 8 hours

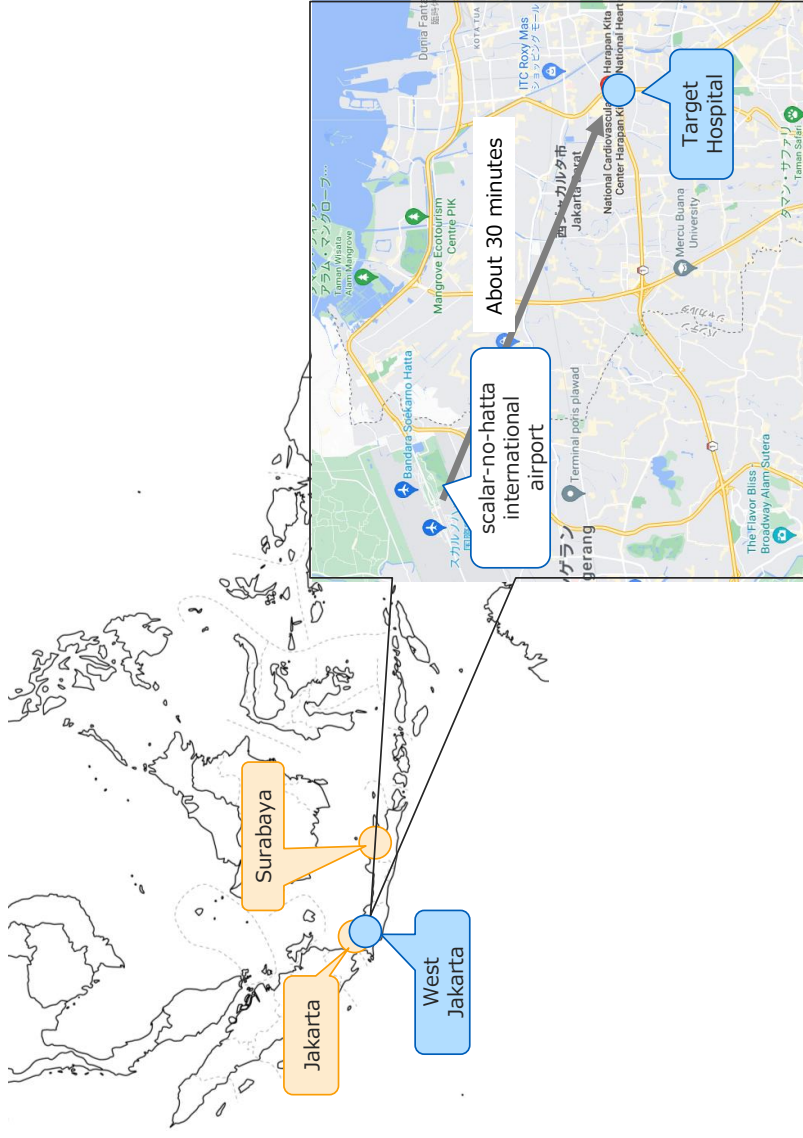
language

Bahasa Indonesia

National Cardiovascular Centre Harapan Kita

General Information

Location	West Jakarta City, Jakarta Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input type="checkbox"/> Emergency <input type="checkbox"/> Outpatient consultation & treatment <input type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Pharmacy <input type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	379
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary Although it is a top referral hospital, the IT literacy of the medical staff is not high and the IT human resources are limited, so the demand for solutions that can be used intuitively and simply is expected to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, stable connection Wireless (Wi-Fi), unstable or slow connection</p>	No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital has been developed to some extent, and it is possible to implement digital health. However, the wireless connection is a little unstable. For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> ■ Improvement of medical care quality ■ Improvement of patient services ■ Improvement of medical safety ■ Improvement of operational efficiency ■ Improvement of management □ Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> ■ Financial issues for deployment ■ Lack of health insurance coverage for medical practice by health ICT ■ Lack of IT literacy among staff ■ Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) □ Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) □ Lack of external services to deploy, operate, and maintain the digital health □ Lack of network environment (3G, 4G, etc.) □ Lack of basic infrastructure (power supply, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> ➢ The demand for solutions that can be used intuitively and simply is expected to be high Wired and wireless connections are available, but the necessary equipment and device may be insufficient, and it is necessary to confirm what kind of facilities and equipment are available in the hospital when introducing digital health.

Summary Although it is a top referral hospital, it is presumed that it does not accept moderate to severe COVID-19 patients because it is a cardiovascular hospital. Staffing and hospital beds seem to be sufficient to some extent, but there are issues in operation (inadequate infection prevention measures by staff, inappropriate zoning, etc.).

Results of online questionnaire and follow-up interview (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Perhaps because it is a cardiovascular hospital, it does not provide inpatient care for moderate to severe patients
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> □ Doctor □ Nurse □ Laboratory technician □ Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> □ Capacity of general beds □ Capacity of ICU bed □ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) □ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> □ Payment problem □ Others 	No interview conducted	<ul style="list-style-type: none"> • Personnel, equipment and supplies, and hospital beds are sufficient to some extent.
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> □ No staff or specialized teams for infection control □ Others 	No interview conducted	<ul style="list-style-type: none"> • Appropriate zoning and isolation to prevent the spread of infection in the ward • Access control solutions (face recognition, etc.) • (In the case of isolation) Patient monitoring equipment in isolation beds (biometric data collection equipment of the dressing type and bed type, etc.)

Summary The problem is that patients are already seriously ill when they arrive at the hospital. There may be a demand for patient education and solutions that allow patients to easily consult with their healthcare providers online. Congestion is a problem in both outpatient and inpatient wards.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input checked="" type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve efficiency of reception • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Remote diagnosis support
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Appropriate zoning and isolation to prevent the spread of infection in the ward • Expansion and development of wards (prefabricated, etc.)





Summary There are issues with patient follow-up during and after treatment, and there is potential for the use of therapeutic apps and Tele-consultation. Education and training for medical professionals is perceived to be inadequate, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • HER • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. ➢ Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

Summary There is potential for the use of digital health to alleviate congestion in outpatient clinics and wards and to reduce the workload of staff.

Results of online survey and follow-up interview responses (5/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Others <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others ()			<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency ➢ Tele-triage (AI questionnaire) ➢ Reservation system for visiting hospitals • Ease congestion in wards, improve efficiency ➢ facility expansion ➢ Digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.) • Reduce the burden of transport operations by using robots, etc. • Contact tracing
Collaboration Status with Other Donors		No interview conducted	-
Expected support from Japan and JICA		No interview conducted	-
Interest in PoC		No interview conducted	-

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. Overall, there is a latent demand for communication and information coordination within and outside the hospital.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown
EMR (Electric Medical Record)	-	
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

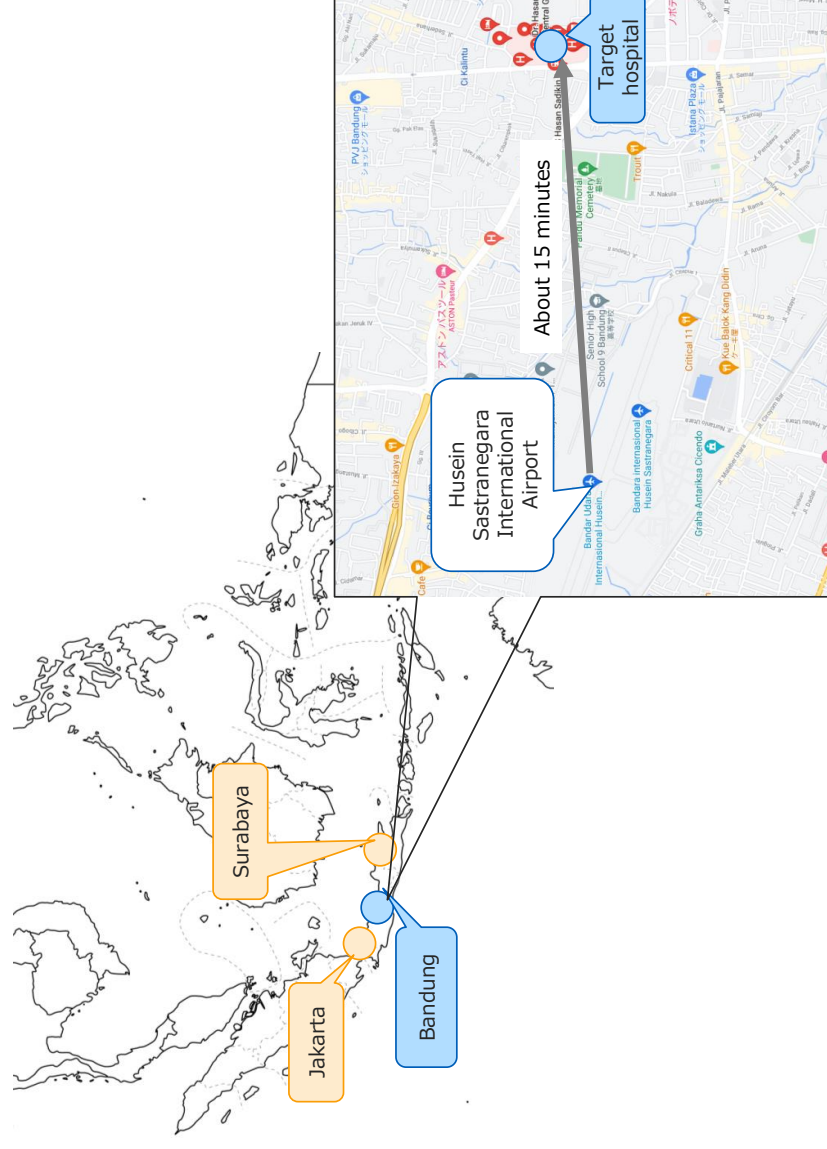
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Dr. Hasan Sadikin National General Hospital

General Information

Location	Bandung, Java
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input type="checkbox"/> Emergency <input type="checkbox"/> Outpatient consultation & treatment <input type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input type="checkbox"/> Perinatal <input type="checkbox"/> Ward (General) <input type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input type="checkbox"/> Pharmacy <input type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	1,013
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Public] Dr. Hasan Sadikin National General Hospital

Summary Although the hospital is a top public referral hospital and has a good communication infrastructure, it is aware of many barriers to the introduction of digital health, such as costs, IT literacy of users, lack of equipment, IT personnel and internal systems. It is believed that there is a demand for digital health that can be used easily and with low initial investment and running costs.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	No interview conducted	<ul style="list-style-type: none"> Good communication environment for both wired and wireless
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

Summary

As a top referral hospital, it provides a wide range of services from outpatient treatment for COVID-19 infected patients to inpatient treatment for critically ill patients. There is a shortage of doctors and nurses, etc., and also a shortage of hospital beds.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	✖	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency in order to minimize patient retention and contact opportunities when visiting the hospital.
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff <input checked="" type="checkbox"/> [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✖	No interview conducted	<p>Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc.</p> <ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remotely available stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, automatic cleaning and disinfection, etc.)
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input checked="" type="checkbox"/> Lack or low utilization of Infection prevention manual <input checked="" type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input checked="" type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input checked="" type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of facilities, and associated products and solutions

Summary

There are concerns about delays in disease detection and worsening conditions due to patients' reluctance to seek medical consultation. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation ■ Lots of time to interview patients about their medical history and treatment status. ■ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients ■ Inefficient emergency transport operation for patients ■ Complicated reception and accounting procedures for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage • Accounting systems, electronic medical records, etc. (digitalization of patient information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> ■ Too many tests. ■ Insufficient regular checkups for expected mothers and patients with chronic diseases □ Shortage or absence of specialists such as radiologists □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • Remote diagnosis support • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> ■ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) ■ Lack or low application rate of Clinical pathways (bed control) □ Unclear or not defined rules regarding bed management □ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. □ Others () 	No interview conducted	<p>Expansion of hospital beds, reduction of workload, optimization of staffing</p> <ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)

Summary

There are issues in patient follow-up during and after treatment, and there is potential for the use of digital health. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) ■ Lack of medicines for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Rehabilitation
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. ■ Inability to share information with other medical facilities. □ Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses ■ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. ➢ Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs ■ Inadequate management of medical materials and drugs □ Others () 	No interview conducted	-

Summary

It is expected that there will be demand for the use of digital health to reduce the workload of in-hospital transportation and cleaning.

Results of online survey and follow-up interview responses (5/6)

	Operational problems	Others	Online Questionnaire Response	Follow-up Interview Response	Implication
			<ul style="list-style-type: none"> ■ Inadequate cleaning ■ Too much burden of transporting goods, meals for patients ■ Exposure of infection risk, and weak counter-measurement ■ Unclear cause of outbreak due to lack of tracing methods □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Alleviate peak waiting times and improve efficiency ➢ Tele-triage (AI questionnaire) ➢ Medical Appointment System • Ease congestion in wards, improve efficiency ➢ facility expansion ➢ digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.) • Reduce the burden of transport operations by using robots, etc.
Collaboration Status with Other Donors			-	No interview conducted	-
Expected support from Japan and JICA			-	No interview conducted	-
Interest in PoC			-	No interview conducted	-

Summary

The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are not known, and since all items were selected for the digital health to be introduced in the future, it is not clear which solutions the hospital considers to be of high priority.

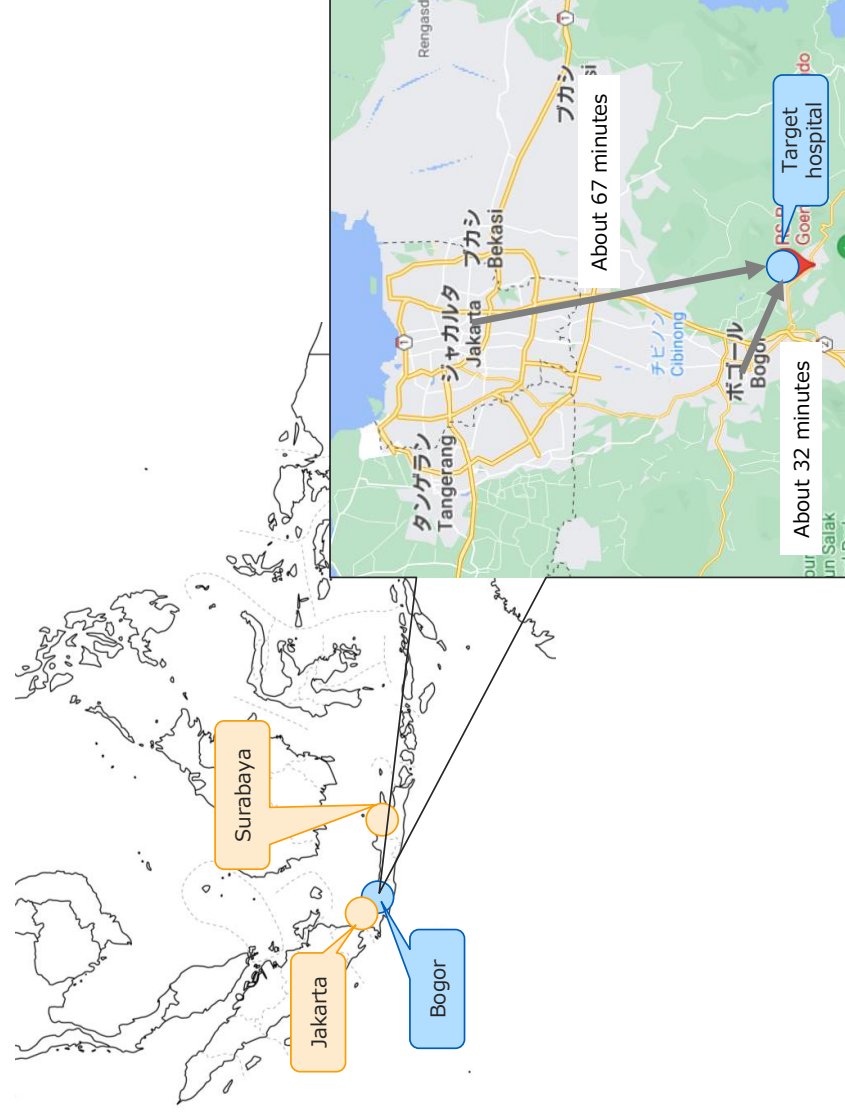
Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	
EHR (Electric Health Record)	-		EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	
Online health advisory	-		Online health advisory	
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-	Wearable devices		
Contact tracing	-	Contact tracing		
Authentication systems	-	Authentication systems		
Robotics	-	Robotics		
Others	-	Others		

Dr. M. Goenawan Partowidigdo Lung Hospital

General Information

Location	Bogor, West Java
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	203
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Public] Dr. M. Goenawan Partowidigdo Lung Hospital

Summary There is a certain degree of readiness to accept digital health. Although the hospital is a top public referral hospital, the IT literacy of the medical staff is not high and the IT human resources are limited, so the expectation for intuitive and simple-to-use solutions is high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, stable connection Wireless (Wi-Fi), unstable or slow connection</p>	No interview conducted	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place. For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> <input type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

Summary

As a top referral hospital, it provides a wide range of services from outpatient care for patients with COVID-19 to inpatient care for critically ill patients. Other than the shortage of nurses and ICU beds, no other major problems have been recognized.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	✖	No interview conducted	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✖	No interview conducted	<p>Reduction of workload for nurses, optimization of staffing, etc.</p> <ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remotely available stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input checked="" type="checkbox"/> Others (Follow pandemic measures) 	✖	No interview conducted	-

Summary

There are concerns about delays in disease detection and worsening conditions due to patients' reluctance to seek medical consultation. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input checked="" type="checkbox"/> Others (The referral system is not working well) 	No interview conducted	
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input checked="" type="checkbox"/> Others (No particular problem with COVID-19 support.) 	No interview conducted	
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	

Summary Inter-departmental cooperation within the hospital is not a problem, but cooperation with district health bureaus and primary health centers is a problem. The education of medical staff is said to be sufficient, the shortage of nurses is a problem.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Communication and coordination with Puskesmas and Bogor district health office) 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Doctor-to-Doctor Platform
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input checked="" type="checkbox"/> Others (No problems with coordination) 	No interview conducted	-
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. <ul style="list-style-type: none"> → Use of EMR(digitalization of medical information), monitoring equipment, wearable devices, robots, etc.
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input checked="" type="checkbox"/> Others (Not applicable) 	No interview conducted	-

Summary Other operational issues not applicable.

Results of online survey and follow-up interview responses (5/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (Not applicable) 	No interview conducted	-
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online survey and follow-up interview responses (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown
EMR (Electric Medical Record)	-	
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

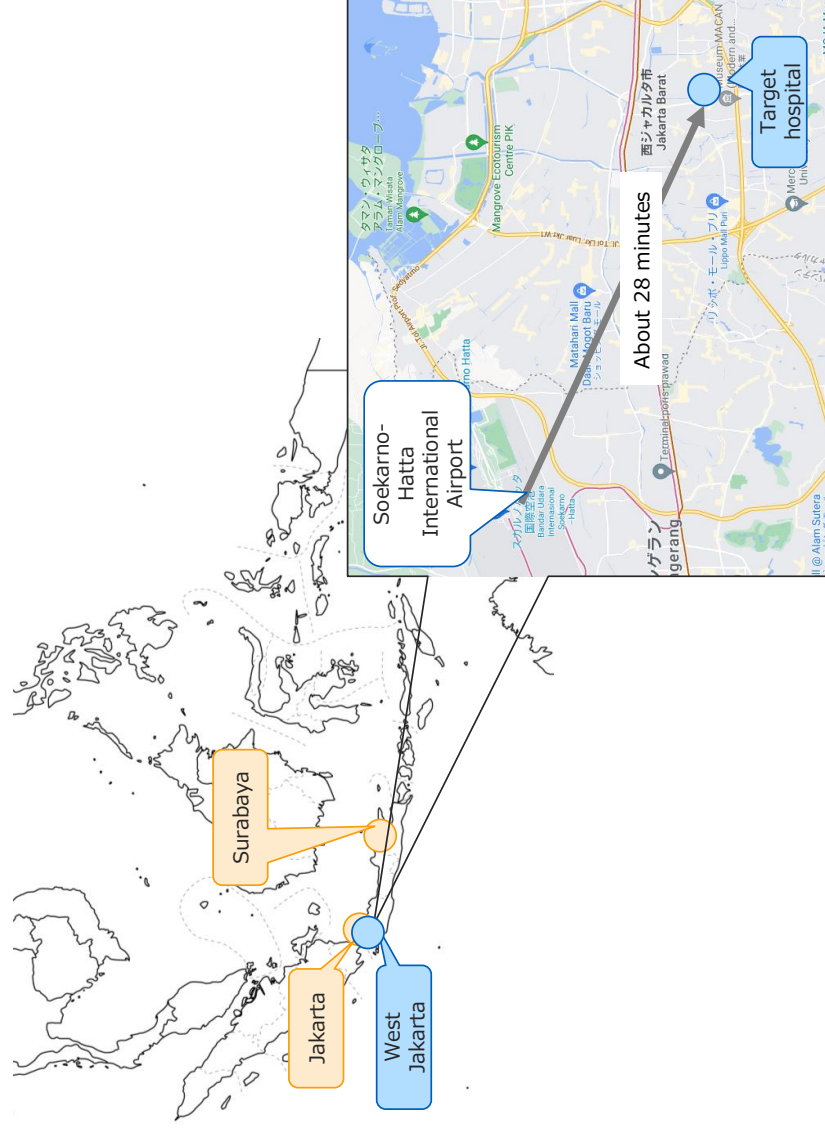
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Harapan Kita Mother and Children Hospital

General Information

Location	West Jakarta, Jakarta Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other (Center for Birth Defects, IVF)
Number of beds	492
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Tertiary, Public] Harapan Kita Mother and Children Hospital

Summary The hospital is a top public referral hospital, and although the communication infrastructure is in place, there is a lack of overall costs, IT literacy of users, IT human resources, and hospital systems. It is believed that there is demand for digital health that can be used easily and with low initial investment and running costs.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, stable connection</p> <p>Wireless (Wi-Fi), unstable connection</p>	No interview conducted	<ul style="list-style-type: none"> Good communication environment for both wired and wireless For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	No interview conducted	
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Even in the top-referral hospitals, IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

[Tertiary, Public] Harapan Kita Mother and Children Hospital

Summary As a top referral hospital, we provide a wide range of services from outpatient care for COVID-19 patients to inpatient care for moderately ill patients. There is a shortage of both medical personnel and ICU beds, as well as essential medical equipment such as ventilators and oxygen.

Results of online survey and follow-up interview responses (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency in order to minimize patient retention and contact opportunities when visiting the hospital.
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input checked="" type="checkbox"/> [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input checked="" type="checkbox"/> Suction, vacuum <input checked="" type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<p>Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc.</p> <ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remote stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of facilities, and associated products and solutions

Summary There are concerns about delays in disease detection and worsening conditions due to patients' reluctance to seek medical consultation. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> ■ Congestion in outpatient consultation ■ Lots of time to interview patients about their medical history and treatment status. ■ Heavy workload for staff in reception and screening ■ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients □ Complicated reception and accounting procedures for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. □ Insufficient regular checkups for expected mothers and patients with chronic diseases □ Shortage or absence of specialists such as radiologists ■ Others (PCR test is limited) 	No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards ■ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) ■ Lack or low application rate of Clinical pathways (bed control) . □ Unclear or not defined rules regarding bed management ■ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Wearable device • EMR

[Tertiary, Public] Harapan Kita Mother and Children Hospital

Summary There are issues in patient follow-up during and after treatment, and there is potential for the use of digital health. There is demand for information sharing and collaboration inside and outside of hospitals.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training(Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	-
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input checked="" type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

[Tertiary, Public] Harapan Kita Mother and Children Hospital

It seems that there is a demand for digital health that contributes to infection control measures in hospitals.

Summary

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

[Tertiary, Public] Harapan Kita Mother and Children Hospital

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

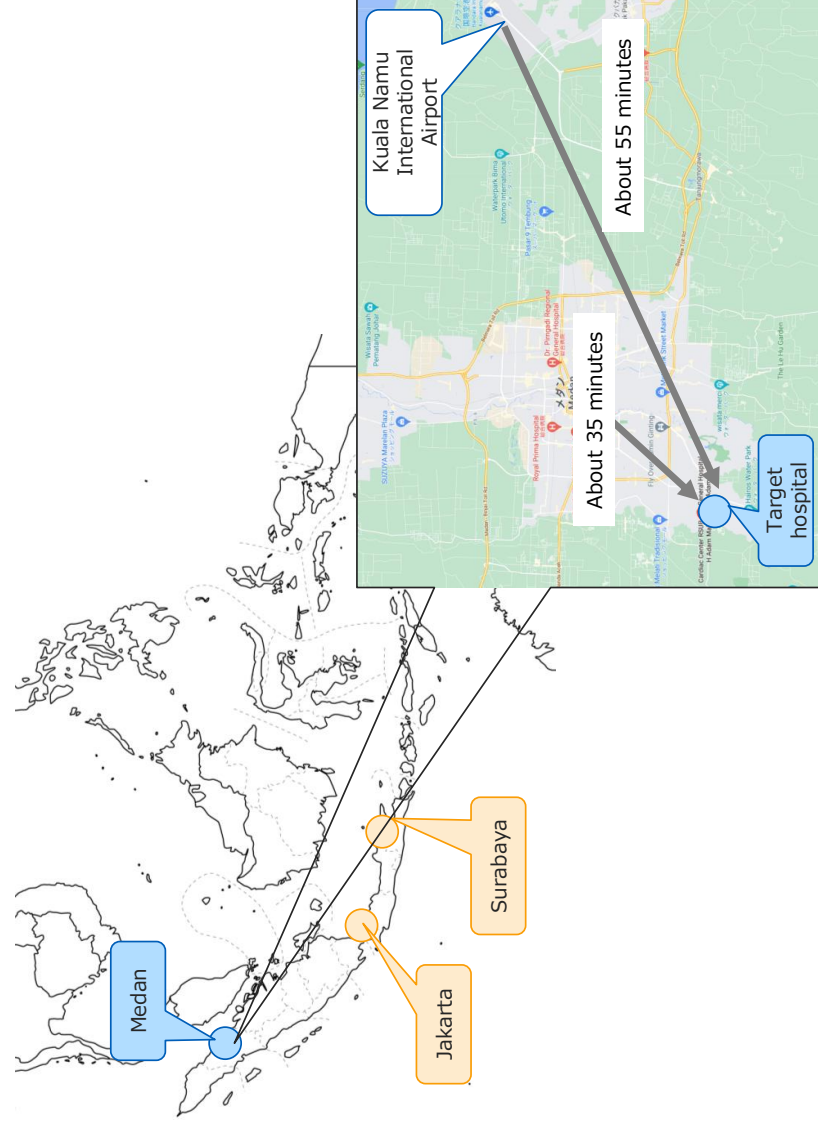
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-		EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system • N/A
EHR (Electric Health Record)	-		Tele-triage (AI questionnaire)	<ul style="list-style-type: none"> ■ Digital health budget • N/A
Doctor-to-Doctor Platform	-		Tele-consultation	<ul style="list-style-type: none"> ■ Time of deployment of digital health • N/A
Online health advisory	-		AI imaging diagnosis support	<ul style="list-style-type: none"> ■ Others • N/A
Tele-triage (AI questionnaire)	-		Remote diagnosis support	
Tele-consultation	-		Tele-surgery	
AI imaging diagnosis support	-		e-ICU (Remote ICU)	
Remote diagnosis support	-		Tele-monitoring	
Tele-surgery	-		Therapeutic applications	
e-ICU (Remote ICU)	-		Digital pharmacy	
Tele-monitoring	-		VR / MR training	
Therapeutic applications	-		Health promotion application	
Digital pharmacy	-		Wearable devices	
VR / MR training	-		Contact tracing	
Health promotion application	-		Authentication systems	
Wearable devices	-		Robotics	
Contact tracing	-		Others	
Authentication systems	-			
Robotics	-			
Others	-			

○ Hospital response ○ Potential demand (survey team's evaluation)

H. Adam Malik National General Hospital

General Information

Location	Medan, North Sumatra Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input checked="" type="checkbox"/> Tertiary <input type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other (Isolation wards)
Number of beds	878
Bed occupancy rate	About 80%.
Average length of hospital stay	7-10 days
Number of medical staffs	Doctors : More than 400 Nurses : More than 900 Others : Midwife 20, IT Staff 37, Pharmacist 35, Dietitian 20, Radiographer more than 20, Medical record 47



Summary The environment for the acceptance of digital health is in place to some extent. There are concerns about implementation costs, low IT literacy on the part of patients, and a lack of IT personnel in hospitals.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wireless (Wi-Fi) , stable connection</p>	-	<ul style="list-style-type: none"> The communication infrastructure in the hospital is in place to some extent, and the environment for digital health acceptance is in place.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing the answer]</p> <ul style="list-style-type: none"> Therefore, the quality of medical care, patient service, medical safety, operational efficiency, and management should be integrated to solve the problems. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Although the website already has a simple design, many patients complain that they don't know how to access the website and don't seem to be able to use the technology It is also inferred that they do not have a high performance mobile phone with internet access. Even though we have entered the age of digitalization, we still need people with relevant skills to verify these operations, and there is no concern that the spread of ICT will lead to the downsizing of human resources. <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> The government does not provide subsidies for digital health (government subsidies are limited to drugs and medical equipment) If the government is willing to provide subsidies related to digital health, they would be happy to use 	<ul style="list-style-type: none"> It is difficult to recover the cost of implementation and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult In the absence of expected government support, effective digital health is required, taking into account initial investment and running costs

Summary As a top referral hospital, it provides a wide range of services from outpatient care for COVID-19 patients to inpatient care for critically ill patients. Although the impact of COVID-19 led to an increase in patient reluctance to visit the hospital, it has now recovered. It is expected that there will be high demand for solutions that help provide necessary medical services while continuing to reduce contact opportunities.

Results of online survey and follow-up interview responses (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination ■ Contact and management of patients with mild symptoms under home care □ Others () 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • The most significant impact is the drastic decrease in patient numbers • In November 2020, the number of patient gradually returned to normal 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital
What is lacks for COVID-19 response in the hospital	<ul style="list-style-type: none"> □ Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] □ Capacity of general beds <input type="checkbox"/> Capacity of ICU bed □ PCR Testing Equipment <input type="checkbox"/> ECMO <input type="checkbox"/> PPE □ Ventilator <input type="checkbox"/> Suction, vacuum □ Oxygen (central distribution or gas cylinder) [Other] ■ Payment problem <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Personal Protection Equipment (PPE) production was limited and difficult to obtain in the early days of the pandemic 	<ul style="list-style-type: none"> • There is no shortage of goods, but the shortage of human resources is an issue.
Problems for Infection Control in the hospital	<ul style="list-style-type: none"> □ [Software: Manual, Operation] □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE □ [Hardware: Facilities, Zoning] □ Inappropriate zoning of infection control areas □ Inadequate in-patients control □ [Human Resources] □ No staff or specialized teams for infection control □ Others 	<p>[Other issues]</p> <ul style="list-style-type: none"> • Patients and medical staffs are not aware of infection control and don't comply with protocols that should be followed. • Inadequate oversight of PPI committees <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> • There is a PPI (Infection Prevention and Control) committee that develops policies, guidelines and SOPs. • Overview of Clinical Guidelines ➢ Screening: Prior antigen testing and thoracic photography are mandatory for all hospitalized patients ➢ Patients must first undergo PCR test for surgeries and other procedures that require general anesthesia • If someone does not comply with the protocol, a verbal reprimand or other sanction is given 	<ul style="list-style-type: none"> • Infection control guidelines and protocols exist, but thorough compliance is an issue.

Summary

The introduction of Tele-triage has facilitated the screening process. There are still many patients who come to the hospital after they have become seriously ill, and there is likely to be high demand for preventive medicine and solutions that allow patients to have contact with their healthcare providers. There is potential for the use of remote imaging and doctor-to-doctor platforms as a means of improving the accuracy of diagnostic imaging.

Results of online survey and follow-up interview responses (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<p>Prevention</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () <p>Screening</p> <ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () <p>Examination and Diagnosis</p> <ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input checked="" type="checkbox"/> Others (Limitation of diagnostic staff) <p>Inpatient treatment</p> <ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) . <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <p>[Solutions considered by the hospital]</p> <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • A patient with an initially negative PCR test that later turns out to be positive, or a patient with an initially clear chest radiograph that later turns out to be positive <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Online questionnaire facilitated screening in the hospital. • If a patient is known to be positive for COVID-19, the hospital must follow up <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • PCR testing was not available in North Sumatra at the beginning of the pandemic • All samples were sent to a laboratory in Jakarta and it took to get the results (7-14 days). <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Now it is able to perform all PCR tests in the hospital. <p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Less of a problem because they have beds, complete testing, and appropriate clinical pathways <p>[Solutions considered by the hospital]</p>	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory <ul style="list-style-type: none"> • Tele-triage is already in place but details are unknown. • Improve the accuracy of remote diagnosis , AI imaging diagnosis support and doctor-to-doctor platform, etc.
	✖		
	✖		
	✖		
	✖		

Summary There is an issue when transferring patient information to other hospitals after treatment is completed, and the use of EHRs and doctor-to-doctor platforms is expected. It is recognized that education and training for medical personnel is insufficient, and there is demand for training opportunities using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Patient follow-up at the original hospital) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Communication with patients is sometimes poor. Patients may not feel understood, they may feel they are not being treated well enough. • The challenge is for doctors to provide patients and their families with easy-to-understand explanations <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Mandatory written education on patient condition, nutrition, and medications, and use of educational sheets • Use digital health to share information with patients and their families online, so that they can read it over and over again 	<ul style="list-style-type: none"> • Therapeutic Apps • PHR
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Integrated system (SIRS) is used, and communication and cooperation between healthcare professionals and departments is smooth. • Patient data is recorded in SIRS and there are no restrictions on information sharing <p>[Solutions considered by the hospital]</p>	-
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input checked="" type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Increase in ICU patients, shortage of ICU nurses • Shortage of IT staff in system development and maintenance <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Train 900 nurses to acquire the competencies required for ICU nursing 	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. ➢ Use of EMR, monitoring equipment, wearable devices, robots, etc. • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Sometimes dealers run out of medicine and can't order it. • When patient needs a chemotherapy drug, but the distributor sometimes does not have it in stock. So the hospital has to borrow it from another hospital. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Collaboration with multiple distributors to secure pharmaceuticals 	-

Summary It is expected that there will be demand for the use of digital health to reduce the workload of in-hospital transportation and cleaning.

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Although visitors were limited to one person, many patients' families came to the hospital and drew crowds, seemingly ignoring or not caring about the prevention protocol. • Difficulty in informing and educating patients and visitors about infection control measures <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Mandatory antigen testing of visitors is expected to make visitors more cautious and avoid congestion • Video calling platform can be used to share patient information to family members to prevent increased visitation 	<ul style="list-style-type: none"> • Digital health to make up for the shortage of personnel (remote monitoring, use of robots, etc.) • Online information sharing tool between medical staff and patients' families
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • Strong desire to cooperate with JICA in the future 	
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • All kinds of support from JICA regarding funding, equipment, facilities, digital health, etc. are welcome. 	
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	

Summary The following is a list of digital healths that have been deployed in the hospital and those that are being considered for deployment in the future. Compared to other hospitals in Indonesia, the situation of digital health is more advanced, and the IT literacy of the staff is considered to be well-equipped.

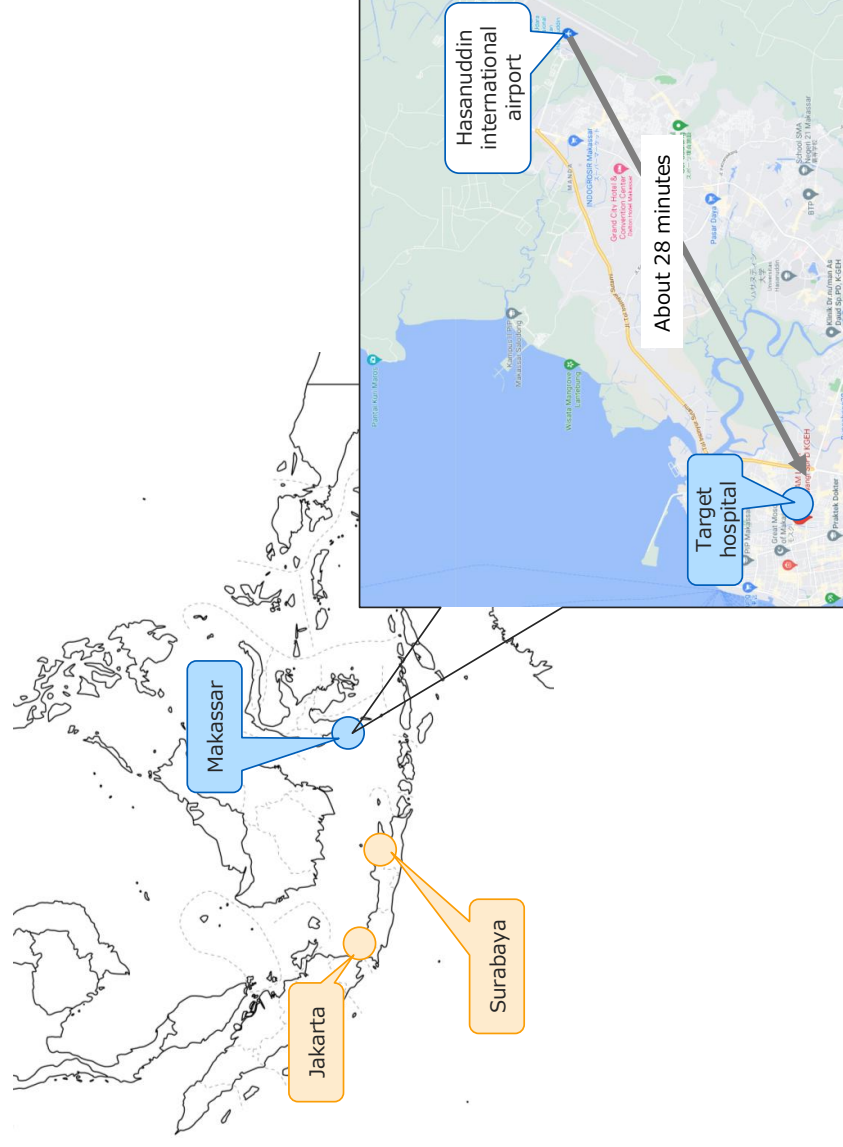
Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> EMR Using the integrated medical IT system SIRS (developed by PT. Buana Varia Komputama) 	EMR (Electric Medical Record)	<ul style="list-style-type: none"> Digital health plan and policy <ul style="list-style-type: none"> Developed their own digital health system, STARS (scheduled to start in November 2021) Plans to completely replace SIRS with STARS in the future (the challenge is how to complete STARS in a timely manner) STARS functionality is similar to SIRS (EMR, EHR, Doctor-to-Doctor platform) Full digitization of medical records (existing EMRs are still only partially applied) Decision-makers are supportive of the adoption of digital health Digital health system <ul style="list-style-type: none"> 26 ICT staff members There are 7 temporary IT staff/programmers contracted for STARS development Digital health budget <ul style="list-style-type: none"> Less than 5% of last year's ICT budget (estimated) Digital health budget still a low priority Digital health is procured independently by hospitals Time of deployment of digital health <ul style="list-style-type: none"> Undecided
PHR (Personal Health Record)	-	<ul style="list-style-type: none"> SIRS includes an EMR, but it is not yet fully digitized and manual medical records remain 	PHR (Personal Health Record)	
EHR (Electric Health Record)	-	<ul style="list-style-type: none"> Community Collaboration System (EHR) 	EHR (Electric Health Record)	
Doctor-to-Doctor Platform	-	<ul style="list-style-type: none"> Included in SIRS Doctor-to-Doctor Platform 	Doctor-to-Doctor Platform	
Online health advisory	-	<ul style="list-style-type: none"> Tele-triage 	Online health advisory	
Tele-triage (AI questionnaire)	-	<ul style="list-style-type: none"> Returning patients can enter a medical questionnaire prior to their visit on the website or download the app 	Tele-triage (AI questionnaire)	
Tele-consultation	-	<ul style="list-style-type: none"> Tele-consultation 	Tele-consultation	
AI imaging diagnosis support	-	<ul style="list-style-type: none"> Linkage with the Ministry of Health's application called TEMENIN (Tele Medicine Indonesia) 	AI imaging diagnosis support	
Remote diagnosis support	-	<ul style="list-style-type: none"> Remote diagnosis support 	Remote diagnosis support	
Tele-surgery	-	<ul style="list-style-type: none"> Conducted in partnership with Palapat Hospital using TEMENIN. 	Tele-surgery	
e-ICU (Remote ICU)	-	<ul style="list-style-type: none"> Tele-monitoring 	e-ICU (Remote ICU)	
Tele-monitoring	-	<ul style="list-style-type: none"> Included in TEMENIN 	Tele-monitoring	
Therapeutic applications	-	<ul style="list-style-type: none"> Health promotion apps 	Therapeutic applications	
Digital pharmacy	-	<ul style="list-style-type: none"> No standalone app, but promotion from website and Instagram's 	Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others	-		Others	

Hasanuddin University Hospital

General Information

Location	Makassar, Makassar Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	165
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary Although the communication infrastructure is in place, many barriers to the introduction of digital health are recognized, such as costs, IT literacy of users, and lack of equipment. It is believed that there is demand for digital health that can be used easily and with low initial investment and running costs.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable or connection	No interview conducted	<ul style="list-style-type: none"> Good communication environment for both wired and wireless
Situation of Digital Health	<input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others ()	No interview conducted	-
Issues on Digital Health Deployment	<input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others ()	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

Summary Although it is a secondary hospital, it provides a wide range of services from outpatient care for patients with COVID-19 to inpatient care for critically ill patients, and lacks ICU beds and advanced medical equipment necessary for treatment.

Results of online survey and follow-up interview responses (2/6)

Compatibility with COVID-19	Online Questionnaire Response	Follow-up Interview Response	Implication
What is being done for COVID-19 in your hospital	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
What your hospital lacks in terms of COVID-19 compliance	<ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff <input type="checkbox"/> [Facilities, Equipment, etc.] <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <ul style="list-style-type: none"> <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Expansion of hospital beds, etc.
In my own hospital Challenges in Infection Control	<ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • Authentication systems(Access control) • Patient monitoring devices

Summary

There are concerns about delays in disease detection and worsening conditions due to patients' reluctance to seek medical consultation. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input checked="" type="checkbox"/> Others (Limitations on the types of tests) 	No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) . <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Patient monitoring devices (clothed type and bedside type biometric data collection devices, etc.), robotics (automatic transportation, cleaning and disinfection, etc.)

Summary There are issues in patient follow-up during and after treatment, but there is potential for the use of digital health. Education and training for medical personnel is perceived to be insufficient, and there is demand for training using digital health.

Results of online questionnaire and follow-up interview (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others (Slow execution of planned training.) 	No interview conducted	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input checked="" type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

It is expected that there will be demand for the use of digital health to reduce the workload of in-hospital transportation.

Summary

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Digital health to make up for the shortage of personnel (Remote monitoring, use of robots, etc.)
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

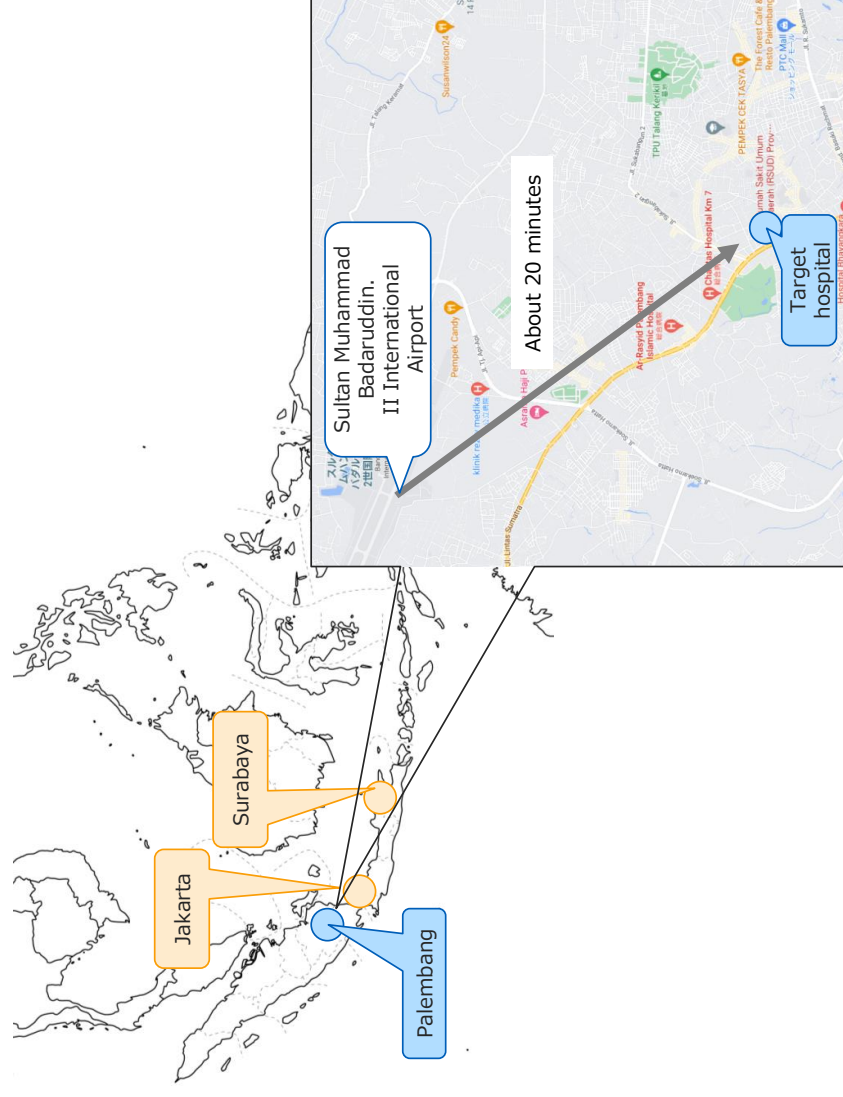
Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

[Secondary, Public] Siti Fatimah Regional General Hospital of South Sumatera Province

Siti Fatimah Regional General Hospital of South Sumatera Province

General Information

Location	Palembang, South Sumatra Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	187
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Public] Siti Fatimah Regional General Hospital of South Sumatera Province

Summary Although the communication infrastructure is in place, they recognize the barriers to the introduction of digital health, such as the lack of equipment, IT personnel and hospital systems. Since IT human resources are also limited, expectations for intuitive and simple-to-use solutions are high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	No interview conducted	<ul style="list-style-type: none"> Good communication environment for both wired and wireless
Situation of Digital Health	<input type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input type="checkbox"/> Improvement of medical safety <input type="checkbox"/> Improvement of operational efficiency <input type="checkbox"/> Improvement of management <input type="checkbox"/> Others ()	No interview conducted	-
Issues on Digital Health Deployment	<input type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others ()	No interview conducted	<ul style="list-style-type: none"> IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

[Secondary, Public] Siti Fatimah Regional General Hospital of South Sumatera Province

Summary Although it is a secondary hospital, it provides a wide range of services from outpatient treatment for COVID-19 patients to inpatient treatment for critically ill patients. There is a shortage of both medical personnel and hospital beds, and medical equipment such as ventilators are in short supply.

Results of online survey and follow-up interview responses (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
COVID-19 Measures	<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input type="checkbox"/> Treatment in ward (mild symptoms) <input type="checkbox"/> Treatment in ward (moderate symptoms) <input type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	No interview conducted	-
	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input checked="" type="checkbox"/> Laboratory technician <input checked="" type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input checked="" type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc. • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remote stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
	<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input checked="" type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	No interview conducted	<ul style="list-style-type: none"> • As above, rapid expansion and deployment of facilities, and associated products and solutions

Summary The problem is that patients are already seriously ill when they arrive at the hospital. There is a high potential demand for patient education and solutions that allow patients to easily consult with their healthcare providers online.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to improve the efficiency of interview work • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Testing equipment available at home (equipment for antenatal checkups, remote stethoscopes, etc.)
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways (bed control) <input type="checkbox"/> Unclear or not defined rules regarding bed management <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices • Use of robots in hospital beds (automatic transport, automatic cleaning and disinfection, etc.)

[Secondary, Public] Siti Fatimah Regional General Hospital of South Sumatera Province

Summary There are issues in patient education, and there is room for the use of digital health, such as detailed follow-up through tele-consultation and education using applications. Education and training for medical professionals is recognized as insufficient, and there is demand for the provision of training opportunities using digital health.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. □ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) □ Lack of medicines for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. □ Inability to share information with other medical facilities. □ Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • PHR
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors (especially specialists, etc.) □ Shortage of nurses ■ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) □ Shortage of other staffs □ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. → Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • AI imaging diagnosis support • Doctor-to-Doctor Platform • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> □ Shortage of medical equipment □ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs □ Inadequate management of medical materials and drugs □ Others () 	No interview conducted	-

[Secondary, Public] Siti Fatimah Regional General Hospital of South Sumatera Province

Summary It is expected that there will be demand for the use of digital health to reduce the workload of in-hospital transportation.

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • digital health to make up for the shortage of personnel (remote monitoring, robots, etc.)
Collaboration Status with Other Donors	-	No interview conducted	
Expected support from Japan and JICA	-	No interview conducted	
Interest in PoC	-	No interview conducted	

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

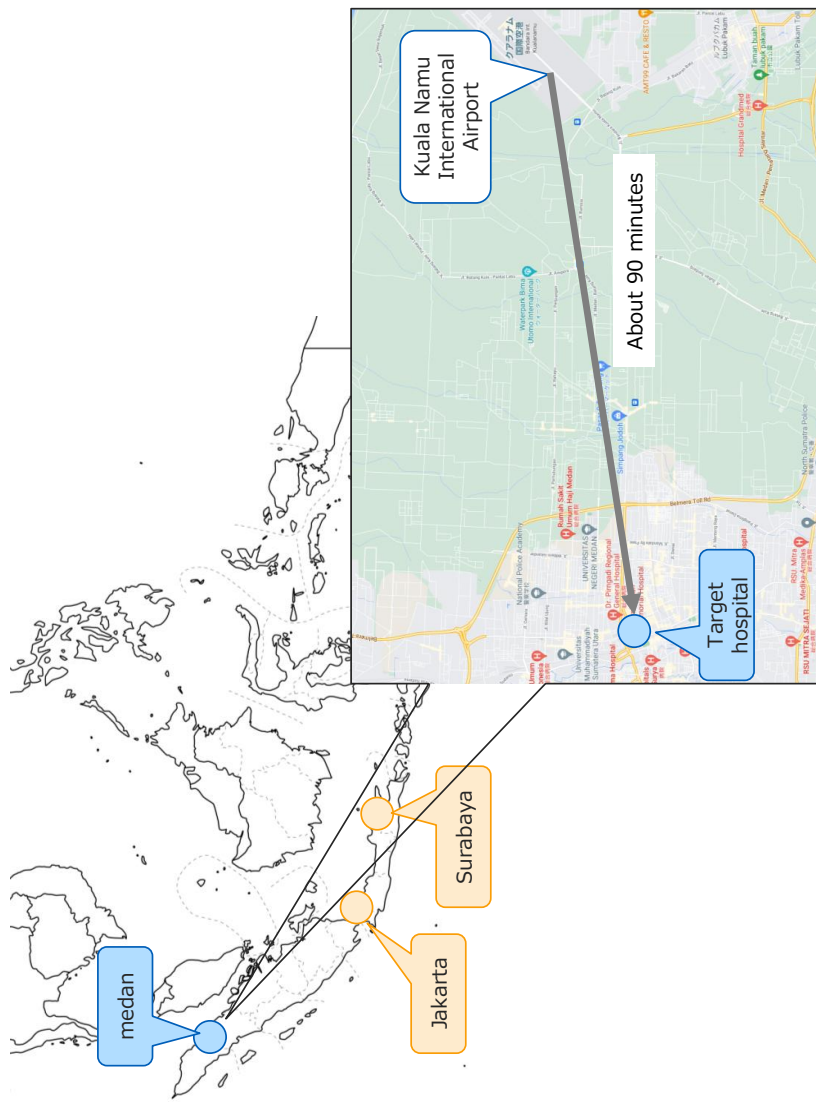
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Murni Teguh Memorial Hospital

General Information

Location	Medan, North Sumatra Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	370
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Private] Murni Teguh Memorial Hospital

Summary Although the environment for digital health is in place to some extent, the IT literacy of medical staffs is not high and IT human resources are limited, so expectations for solutions that can be used intuitively and simply are likely to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<ul style="list-style-type: none"> Wired, stable connection Wireless (Wi-Fi), stable connection 	No interview conducted	<ul style="list-style-type: none"> • Good communication environment for both wired and wireless
Situation of Digital Health	<ul style="list-style-type: none"> ■ Improvement of medical care quality ■ Improvement of patient services □ Improvement of medical safety ■ Improvement of operational efficiency □ Improvement of management □ Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> □ Financial issues for deployment □ Lack of health insurance coverage for medical practice by health ICT ■ Lack of IT literacy among staff ■ Lack of IT experts in the facility who can deploy, operate, and maintain the digital health □ Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) ■ Lack of external services to deploy, operate, and maintain the digital health ■ Lack of network environment (3G, 4G, etc.) □ Lack of basic infrastructure (power supply, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> • IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> ➢ The demand for solutions that can be used intuitively and simply is expected to be high • Although there is a wired connection, there is a possibility that the necessary equipment and devices are insufficient.

[Secondary, Private] Murni Teguh Memorial Hospital

Summary Although it is a secondary hospital, it provides a wide range of services from outpatient care for patients with COVID-19 infection to inpatient care for critically ill patients. There is a shortage of nurses and general hospital beds.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	✖	No interview conducted	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input checked="" type="checkbox"/> [Facilities, Equipment, etc.] <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc. • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remote stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.)

[Secondary, Private] Murni Teguh Memorial Hospital

Summary

There are concerns about delays in disease detection and worsening conditions due to insufficient education for local residents and patients regarding health care. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to improve the efficiency of interview work • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input checked="" type="checkbox"/> Others (PCR test results take up to 4 hours at the earliest) 	No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Expansion of hospital beds, reduction of workload, optimization of staffing • Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)

Summary There are issues in patient education, and there is potential for the use of digital health, such as detailed follow-up through tele-consultation and education using applications. Education and training for medical professionals is recognized as insufficient, and there is demand for the provision of training opportunities using digital health.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. □ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) □ Lack of medicines for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps
Organizational cooperation	<ul style="list-style-type: none"> □ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. ■ Inability to share information with other medical facilities. □ Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses □ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) □ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. → Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • AI imaging diagnosis support • Doctor-to-Doctor Platform • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> □ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment □ Shortage of medical materials and drugs □ Inadequate management of medical materials and drugs □ Others () 	No interview conducted	-

[Secondary, Private] Murni Teguh Memorial Hospital

Summary There are issues in managing visitors and conducting screening, and there is room for the use of digital health, such as access control linked to face recognition and automatic temperature checks.

Results of online survey and follow-up interview responses (5/6)

	Operational problems	Others	Online Questionnaire Response	Follow-up Interview Response	Implication
			<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Use of access control systems (access control linked to face recognition, automatic temperature check, etc.)
	Collaboration Status with Other Donors		-	No interview conducted	-
	Expected support from Japan and JICA		-	No interview conducted	-
	Interest in PoC		-	No interview conducted	-

[Secondary, Private] Murni Teguh Memorial Hospital

Summary The following is a list of digital health that have been deployed and are being considered for deployment at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment Details unknown
EMR (Electric Medical Record)	-	
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

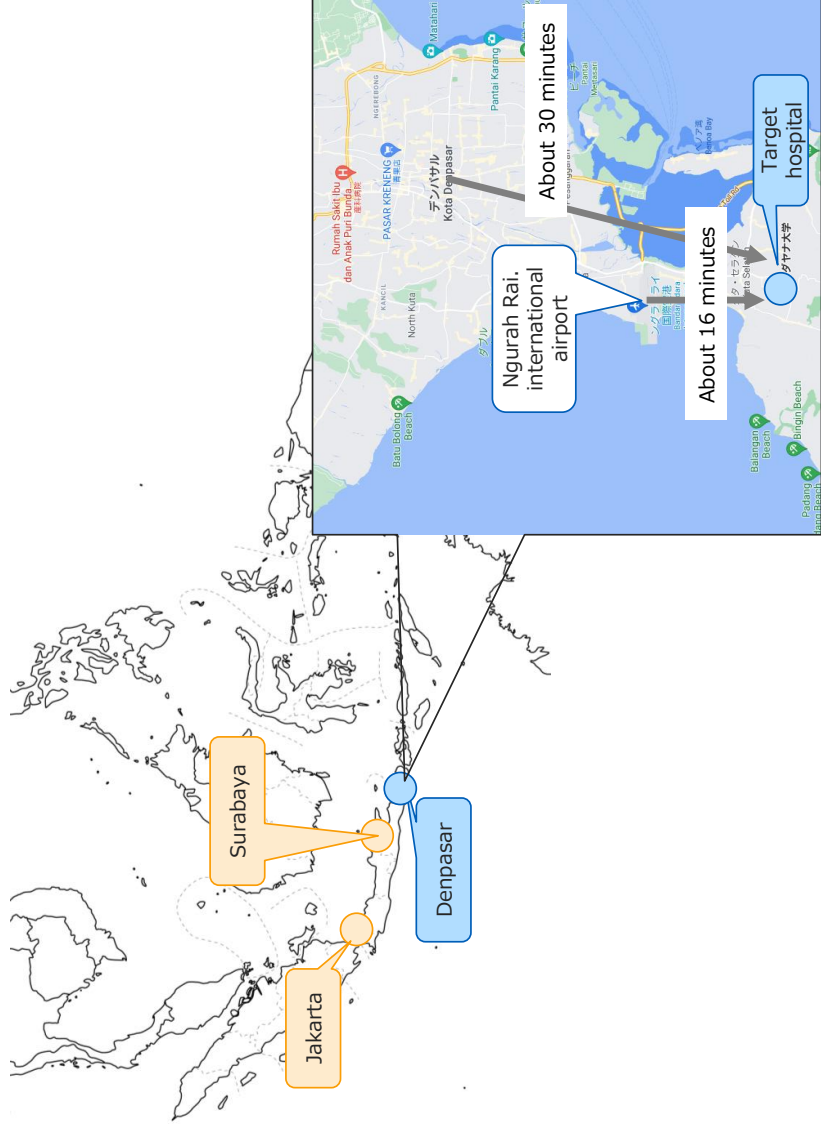
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Udayana University Hospital

General Information

Location	Denpasar, Bali
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	107
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



[Secondary, Public] Udayana University Hospital

Summary Communication infrastructure, ICT facilities, equipment and devices may not necessarily be sufficient. Urban infrastructure such as electricity is also lacking in some areas, and this needs to be taken into consideration when introducing digital health. Rather than IT literacy of medical staff and the lack of IT human resources, the bottleneck is the cost of implementation. Demand for solutions with low initial investment and running costs is expected to be high.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wireless (Wi-Fi), unstable or slow connection ✕	No interview conducted	<ul style="list-style-type: none"> There is a communication infrastructure in the hospital, but it is not stable
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () ✕	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () ✕	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Wireless connection is available, but the necessary equipment and devices may be insufficient, and it is necessary to confirm what facilities and equipments are available in the hospital when introducing digital health.

Summary We provide a wide range of services from outpatient care for patients with COVID-19 infection to inpatient care for critically ill patients.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Treatment in ward (severe symptoms) <input checked="" type="checkbox"/> Vaccination <input type="checkbox"/> Contact and management of patients with mild symptoms under home care <input type="checkbox"/> Others () 	✖	No interview conducted	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Human Resources] <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <input type="checkbox"/> [Facilities, Equipment, etc.] <input type="checkbox"/> Capacity of general beds <input type="checkbox"/> Capacity of ICU bed <input type="checkbox"/> PCR Testing Equipment <input type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <input type="checkbox"/> [Other] <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	✖	No interview conducted	<ul style="list-style-type: none"> • Equipment and supplies, hospital beds, etc. are sufficient to some extent.
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> <input type="checkbox"/> [Software: Manual, Operation] <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <input type="checkbox"/> [Hardware: Facilities, Zoning] <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <input type="checkbox"/> [Human Resources] <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	✖	No interview conducted	-

Summary

There is a possibility that there is insufficient education and guidance for local residents and patients regarding health care. There is concern that this situation may lead to delays detection of diseases and worsening of symptoms in patients. There is likely to be a high demand for preventive medicine and solutions that allow patients to have contact with healthcare providers.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> ■ Insufficient education for local residents ■ Few opportunities of pre-consultation for the local residents ■ Many patients visiting hospitals only after their disease symptoms become serious □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> □ Congestion in outpatient consultation □ Lots of time to interview patients about their medical history and treatment status. ■ Heavy workload for staff in reception and screening □ Unclear criteria for accepting emergency patients □ Inefficient emergency transport operation for patients ■ Complicated reception and accounting procedures for patients □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve efficiency of reception • Appointment booking system with Tele-triage • Accounting systems, EMR, etc. (digitalization of patient information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> □ Too many tests. ■ Insufficient regular checkups for expected mothers and patients with chronic diseases ■ Shortage or absence of specialists such as radiologists □ Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Inspection equipment that can be used at home (equipment for maternity checkups, checkup delivery service, etc.) • Remote image diagnosis support
Inpatient treatment	<ul style="list-style-type: none"> □ Congestion in the inpatient wards □ Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) □ Lack or low application rate of Clinical pathways (bed control). ■ Unclear or not defined rules regarding bed management ■ Patients travel to distant medical facilities if they cannot take surgical operations in your facility. □ Others () 	No interview conducted	

Summary

There are issues with patient follow-up during and after treatment, and there is potential to resolve these issues through the use of digital health such as tele-consultation and therapeutic applications. The hospital has high expectations for collaboration within and outside the hospital, but lacks the necessary infrastructure.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input checked="" type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input checked="" type="checkbox"/> Insufficient communication and cooperation among departments <input checked="" type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EHR • PHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Doctor-to-Doctor Platform
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

Summary

There is a possibility that robotics can be used in cleaning the hospital and transporting.

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Inadequate cleaning <input checked="" type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Cleaning robot • Transfer robot
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

Summary

The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. Since the hospital does not have an EMR, it is thought that there are barriers that there are barriers to the introduction of ICT that must be linked to EMR.

Results of online questionnaire and follow-up interview (6/6)

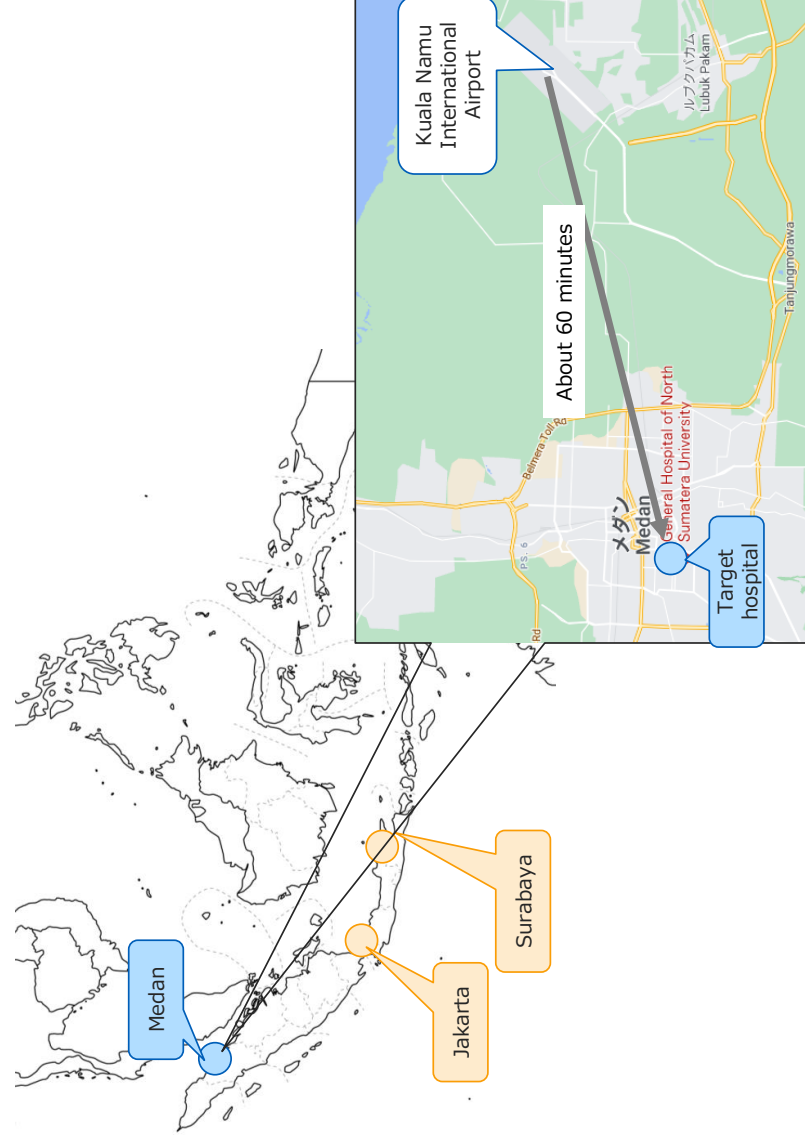
Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment	Digital Health to be Deployed in the Future	Hospital Policy and Budget
EMR (Electric Medical Record)	-	Details unknown	EMR (Electric Medical Record)	<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A
PHR (Personal Health Record)	-		PHR (Personal Health Record)	<ul style="list-style-type: none"> ■ Digital health system <ul style="list-style-type: none"> • N/A
EHR (Electric Health Record)	-		EHR (Electric Health Record)	<ul style="list-style-type: none"> ■ Digital health budget <ul style="list-style-type: none"> • N/A
Doctor-to-Doctor Platform	-		Doctor-to-Doctor Platform	<ul style="list-style-type: none"> ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A
Online health advisory	-		Online health advisory	<ul style="list-style-type: none"> ■ Others <ul style="list-style-type: none"> • N/A
Tele-triage (AI questionnaire)	-		Tele-triage (AI questionnaire)	
Tele-consultation	-		Tele-consultation	
AI imaging diagnosis support	-		AI imaging diagnosis support	
Remote diagnosis support	-		Remote diagnosis support	
Tele-surgery	-		Tele-surgery	
e-ICU (Remote ICU)	-		e-ICU (Remote ICU)	
Tele-monitoring	-		Tele-monitoring	
Therapeutic applications	-		Therapeutic applications	
Digital pharmacy	-		Digital pharmacy	
VR / MR training	-		VR / MR training	
Health promotion application	-		Health promotion application	
Wearable devices	-		Wearable devices	
Contact tracing	-		Contact tracing	
Authentication systems	-		Authentication systems	
Robotics	-		Robotics	
Others SIMRS (online booking)	-	Others		

○ Hospital response ○ Potential demand (survey team's evaluation)

North Sumatera University Hospital

General Information

Location	Medan, North Sumatra Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	400
Bed occupancy rate	20%.
Average length of hospital stay	5 days
Number of medical staffs	Doctors : 61 Nurses : 193 Others : IT Staff 10, Pharmacist 4



[Secondary, Public] North Sumatra University Hospital

Summary The environment for the acceptance of digital health is in place to some extent. There are concerns about implementation costs, low IT literacy on the part of patients, and a lack of IT personnel in hospitals.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	<p>Wired, stable connection</p> <p>Wireless (Wi-Fi), unstable or slow connection</p>	-	<ul style="list-style-type: none"> Wired connections are stable, but wireless connections are required for digital health installations.
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing this option]</p> <ul style="list-style-type: none"> All issues are interrelated and should all be prioritized. Improvements in patient service, medical safety, operational efficiency, and management are essential to improving healthcare services. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Not all patients have access to facilities related to digital health and low IT literacy may make it difficult for patients to use the services Even in the age of digitalization, the workforce for quality control is still necessary, and there is no concern that the spread of ICT will lead to a reduction in the workforce. IT staff are not motivated to develop or maintain systems High wages for talented IT staff, unable to retain them <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> Supported by the government through the University of North Sumatra 	<ul style="list-style-type: none"> It is difficult to recover the cost of implementation and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult Effective digital health is required, taking into account initial investment and running costs

Summary It provides a wide range of services from outpatient care for COVID-19 patients to inpatient care for critically ill patients. Although the impact of COVID-19 led to an increase in patient reluctance to seek medical care, this has now recovered. It is expected that there will be high demand for solutions that help provide necessary medical services while continuing to reduce contact opportunities.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care 	<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> □ Doctor □ Nurse □ Laboratory technician □ Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) □ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> □ Payment problem □ Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • The most significant impact suffered at the beginning of the pandemic was a dramatic reduction in the number of patients • All services in the hospital were affected. <p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Bed occupancy rates and patient numbers are still low 	<ul style="list-style-type: none"> • Tele-consultation for general patients who hesitate to visit the hospital • Expansion of hospital beds, etc.
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual ■ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> □ Inappropriate zoning of infection control areas □ Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> □ No staff or specialized teams for infection control □ Others 	<p>[Other issues]</p> <ul style="list-style-type: none"> • Lack of awareness of infection control on the part of patients and non-compliance with protocols that should be followed • It is difficult to educate patients and their families that visitors are limited to one person. <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> • Clinical guidelines include screening, which requires visitors to wash their hands with soap, take their temperature, and complete a questionnaire confirming symptoms of COVID-19 • PCR testing is performed on high-risk patients, such as hemodialysis patients and surgical patients • If someone does not comply with the protocol, a verbal reprimand or other sanction is given 	<ul style="list-style-type: none"> • Use of access control systems (access control linked to face recognition, automatic temperature check, etc.) 	

Summary There may be insufficient education and guidance for local residents and patients regarding health care. This situation may lead to a delay in the early detection of the disease, and the spread of infection may not be prevented.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Despite the fact that the number of accompanying family members was limited to one, many patient families visited the hospital and formed a crowd • Patients and visitors seemed to ignore or not care about the protocol for COVID-19 prophylaxis <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Informing family members of the patient's current status via videophone to prevent densification caused by the accompanying family member's visit to the hospital 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patients who initially tested negative on the PCR test could later test positive. • Interviews are conducted manually and screening measures are lacking <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Having a website for outpatient and inpatient interviews would solve screening-related problems. 	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input checked="" type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists 	<p>[Causes considered by the hospital]</p> <p>[Solutions considered by the hospital]</p>	-
Inpatient treatment	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) . <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patients requiring more advanced cares are referred to other hospitals, and the bed occupancy rate is only about 20% (as a Type C hospital, the medical equipment is incomplete) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Focusing on medical equipment maintenance and improvement of medical services 	<ul style="list-style-type: none"> • Patient monitoring devices (Clothed type and bedside type biometric data collection devices, etc.), robot utilization (automatic transportation, cleaning and disinfection, etc.)

Summary

There are issues in providing patients with easy-to-understand informed consent, sharing information with patients' families, and providing patient education, and there is room for the use of digital health.

Results of online survey and follow-up interview responses (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. □ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) □ Lack of medicines for patients □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Sometimes patients assume they have already recovered and do not come to see the doctor as recommended. • The challenge is how doctors can provide easy-to-understand explanations about diseases, treatment, and self-management. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Use digital health to share information online with patients and their families so that information can be read back clearly and repeatedly 	<ul style="list-style-type: none"> • Tele-consultation (medication guidance, etc.) • Therapeutic Apps • Sharing of patient information to patient families using PHRS
Organizational cooperation	<ul style="list-style-type: none"> □ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. ■ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. □ Inability to share information with other medical facilities. 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Heavy workload for receptionists (need to deliver the status of hundreds of patients or more to each outpatient doctor to be examined) <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Integrated online patient status makes it easier to manage, as receptionists no longer need to communicate patient status to each outpatient department or doctor 	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time, improve reception efficiency, and reduce contactlessness when visiting a hospital • Linking AI questionnaires to EMR • Appointment booking system with Tele-triage
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses ■ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs □ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Increase in COVID-19 hospital admissions • Shortage of nurses in ICU (because nurses are mainly assigned to deal with isolation rooms) 	<ul style="list-style-type: none"> • Patient monitoring devices (clothed type and bedside type biometric data collection devices, etc.), robot utilization (automatic transportation, cleaning and disinfection, etc.)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment □ Inadequate maintenance and management for medical equipment □ Shortage of medical materials and drugs □ Inadequate management of medical materials and drugs □ Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Due to a shortage of medical equipment, patients requiring advanced procedures are referred to other hospitals, resulting in a decline in the hospital bed utilization rate. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Improve and equip medical equipment • Improving the IT sector to make it easier for patients to access their information 	-

digital health should be used to enhance non-contact hospital operations.

Summary

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • At the beginning of the pandemic, PCR testing was not available in North Sumatra, so all samples were sent to a laboratory in Jakarta, and it took time for the results to arrive (7-14 days). <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Currently, all PCR testing is done by the hospital itself. 	<ul style="list-style-type: none"> • Need to use digital health to enhance non-contact hospital operations • Contact tracing
Collaboration Status with Other Donors	-	-	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Very willing to cooperate with JICA • Welcomes and expects all kinds of support in the field of digital health, equipment and funding for facilities 	-
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

Summary The following digital health have been deployed and will be deployed at the hospital: EMR, HER, doctor-to-doctor platform, Tele-triage , Tele-consultation, and Digital pharmacy.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> EMR AISHA (Automated Integrated System to support Hospital Administration) is used. AISHA is proprietary to the hospital and includes EMR Medical records are not fully electronic, some are still managed manually Community Collaboration System (EHR) Included in AISHA Doctor-to-Doctor Platform Included in AISHA <p>There is no digital health introduced for the purpose of COVID-19 compliance.</p>
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

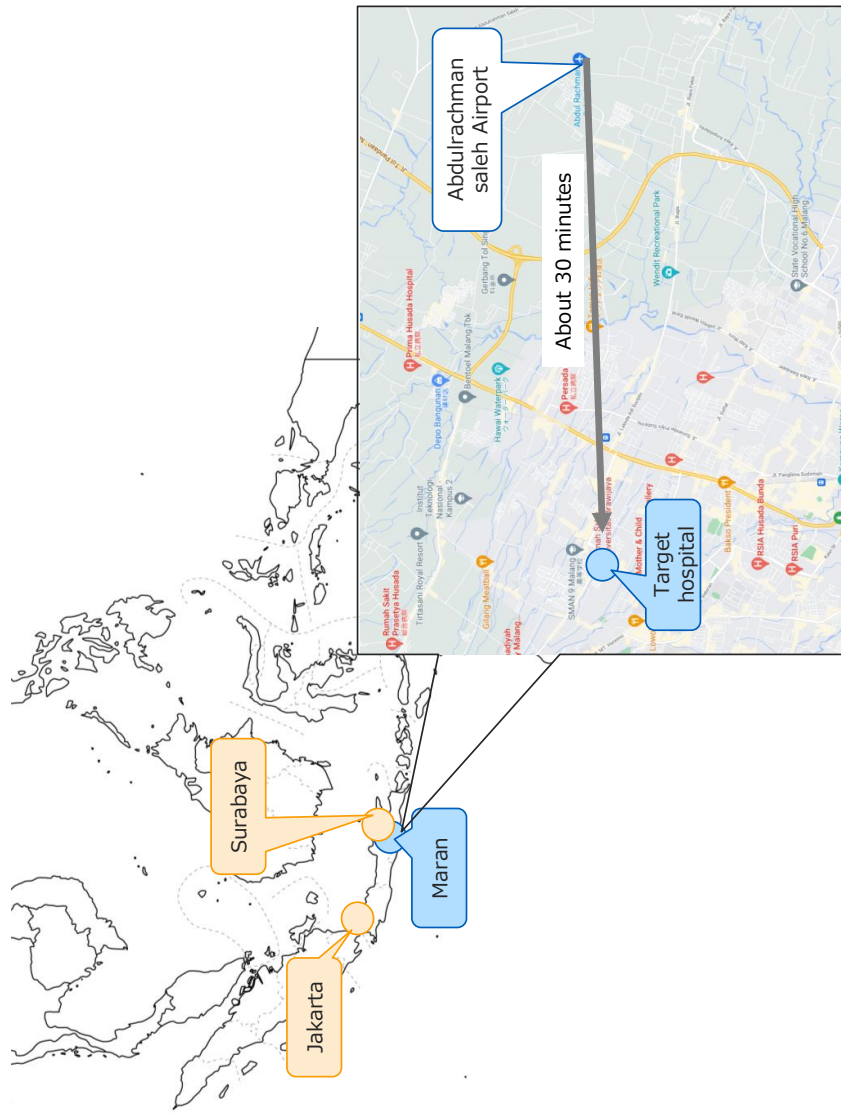
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> Digital health plan and policy Waiting for MoU with BNI to help procure digital health 'periksa.id' Periksa.id is a cloud-based software that includes EMR, EHR, doctor-to-doctor platform, Tele-triage , online practice and digital pharmacy capabilities In the future, they plan to replace AISHA with periksa.id Decision-makers fully support ICT promotion
<ul style="list-style-type: none"> Digital health system 5 IT staff members
<ul style="list-style-type: none"> Digital health budget The share of digital health in the budget is unknown AISHA development requires significant funding, but budget priorities are still low
<ul style="list-style-type: none"> Time of deployment of digital health undecided
<ul style="list-style-type: none"> Others

Brawijaya University Hospital

General Information

Location	Malang, East Java Province
Public/private	<input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	168
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary Although the communication infrastructure environment is in place, many barriers to the introduction of digital health are recognized, such as introduction cost, IT literacy of users, lack of equipment, and lack of IT personnel and hospital systems. It is believed that there is demand for digital health that can be used easily and with low initial investment and running costs.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	No interview conducted	<ul style="list-style-type: none"> Good connection both wired and wireless
Situation of Digital Health Expectation for Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	No interview conducted	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, and there is no government support, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

Summary As a secondary hospital, it provides a wide range of services from outpatient care for patients with COVID-19 infection to inpatient care for moderately ill patients. There is a shortage of doctors and nurses, a shortage of hospital beds, and a shortage of medical equipment and materials.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
What is being done for COVID-19 in the hospital	<ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care □ Others () 	No interview conducted	-
What is lacks for COVID-19 response in the hospital	<ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> ■ Doctor <input type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator <input type="checkbox"/> Suction, vacuum ■ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> ■ Payment problem <input type="checkbox"/> Others 	No interview conducted	Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc. <ul style="list-style-type: none"> • Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) • Examination and diagnostic equipment in hospital beds (remote stethoscopes, etc.) • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
Problems for Infection Control in the hospital	<ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas ■ Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> ■ No staff or specialized teams for infection control □ Others 	No interview conducted	<ul style="list-style-type: none"> • Understanding of patient behavior using patient monitoring devices (dressing-type and bedside biometric collection devices, etc.)

Summary

There are concerns about delays in disease detection and worsening conditions due to lack of patient education. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Insufficient education for local residents <input checked="" type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input checked="" type="checkbox"/> Inefficient emergency transport operation for patients <input checked="" type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage • Accounting systems, EMR, etc. (digitalization of patient information, streamlining of paperwork and procedures, etc.)
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input checked="" type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input checked="" type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation, laboratory equipment for home use • AI imaging diagnosis support (reducing the workload of medical specialists such as radiologists) • Doctor-to-Doctor Platform
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input checked="" type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input checked="" type="checkbox"/> Lack or low application rate of Clinical pathways <input checked="" type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Reduction of workload and optimization of personnel allocation • Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices • Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)

Summary

There are issues with patient follow-up during and after treatment, and there is potential for the use of digital health. There are many issues in information sharing and cooperation within and outside the facilities. Education and training for medical personnel is perceived to be insufficient, and there is demand for training opportunities using digital health.

Results of online survey and follow-up interview responses (4/6)

Operational problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-consultation • Reservation system (patient notification) • Therapeutic Apps • Remote rehabilitation • VR/MR Training (Rehabilitation)
Organizational cooperation	<ul style="list-style-type: none"> ■ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. ■ Insufficient communication and cooperation among departments ■ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. ■ Insufficient information sharing of food allergies and contraindicated foods due to medications. ■ Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • EMR are deployed, but overall collaboration within the facility has been a challenge • Use of PHR, EHR, and doctor-to-doctor platforms for collaboration with external facilities
Medical system	<ul style="list-style-type: none"> ■ Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs ■ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) ■ Others (Shortage of administration staff) 	No interview conducted	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. ➢ Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • AI imaging diagnosis support • Doctor-to-Doctor Platform • VR/MR Training (education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> ■ Shortage of medical equipment ■ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs ■ Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

Summary It is expected that there will be demand for the use of digital health to reduce the workload of in-hospital transportation and cleaning.

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> ■ Inadequate cleaning ■ Too much burden of transporting goods, meals for patients ■ Exposure of infection risk, and weak counter-measurement ■ Unclear cause of outbreak due to lack of tracing methods □ Others () 		
Collaboration Status with Other Donors	-	No interview conducted	-
Expected support from Japan and JICA	-	No interview conducted	-
Interest in PoC	-	No interview conducted	-

Summary The following are the digital healths that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others:SIMRS	-	

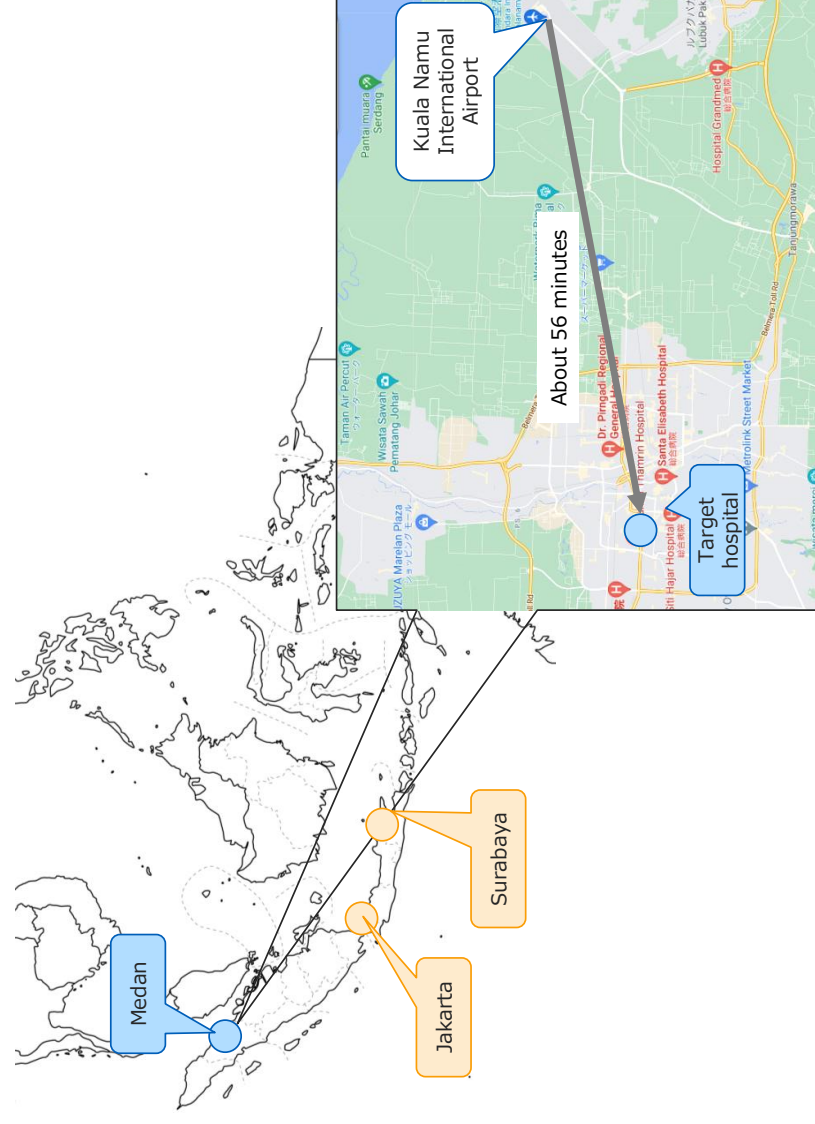
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Bunda Thamrin General Hospital

General Information

Location	Medan, North Sumatra Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input checked="" type="checkbox"/> Other (Delivery room, hemodialysis)
Number of beds	257
Bed occupancy rate	June 60-65%, Jan-Mei >80
Average length of hospital stay	8-10 days
Number of medical staffs	Doctors : 60-80 Nurses : 350-400 people Others : 50 Midwife, 5 IT Staff, Pharmacist 8, Dietitian 4, Radiographer 12persons, Physical examination 10persons



[Secondary, Private] Bunda Thamrin General Hospital

Summary The environment for acceptance of digital health is in place to some extent. There are concerns about the low IT literacy of the staff and the lack of IT personnel in the hospital.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), stable connection	-	<ul style="list-style-type: none"> Stable connection for both wired and wireless
Situation of Digital Health	<ul style="list-style-type: none"> Improvement of medical care quality Improvement of patient services Improvement of medical safety Improvement of operational efficiency Improvement of management Others () 	<p>[Reason for choosing this option]</p> <ul style="list-style-type: none"> In digitizing, they prioritize the points of care quality, medical safety, operational efficiency, and management No concern that widespread use of ICT will lead to staff reductions 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> Financial issues for deployment Lack of health insurance coverage for medical practice by health ICT Lack of IT literacy among staff Lack of IT experts in the facility who can deploy, operate, and maintain the digital health building (PC, tablet/smartphone, etc.) Lack of necessary equipment and facilities in the facility Lack of external services to deploy, operate, and maintain the digital health Lack of network environment (3G, 4G, etc.) Lack of basic infrastructure (power supply, etc.) Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> Patients these days are digitally literate and many of them can already register online via Whatsapp Patient services will be supported by physical hospitality services in addition to digital health There is a concern that if everything is digitalized, patient hospitality will be diminished and patients will complain that the staff is preoccupied with apps. Although there is some concern about security, the hospital has established multi-level security to protect patient data by allowing only certain people to open all patient medical records and restricting unauthorized people to certain functions <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> Government does not provide subsidies related to digital health to private hospitals 	<ul style="list-style-type: none"> IT literacy among medical staff is not high. Likely to be a barrier to the adoption of digital health <ul style="list-style-type: none"> The demand for solutions that can be used intuitively and simply is expected to be high

Summary The hospital provide a wide range of services from outpatient care for patients with COVID-19 infection to inpatient care for critically ill patients. The impact of COVID-19 has dramatically reduced patient visits. It is presumed that there is a high demand for solutions that contribute to the provision of necessary medical services while continuing to reduce contact opportunities.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Vaccination □ Contact and management of patients with mild symptoms under home care ■ Others (Care of critically ill patients in ICU) 	✖	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • The most significant impact at the beginning of the pandemic was a dramatic decrease in the number of patients • Outpatient visits also decreased by 75% (because patients were afraid to go to the hospital) • All of the professional medical associations are recommending that patients not come to the hospital and that medical staff reduce their hospital care 	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> ■ Doctor ■ Nurse □ Laboratory technician □ Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> □ Capacity of general beds □ Capacity of ICU bed □ PCR Testing Equipment □ ECMO (Extra-corporeal Membrane Oxygenation) □ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) □ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> □ Payment problem □ Others 	✖	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> • Shortage of COVID-19 drugs such as Actemra tocilizumab and intravenous immunoglobulin due to limited supply 	<ul style="list-style-type: none"> • There is no shortage of goods, but the shortage of human resources is an issue.
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs □ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> ■ Inappropriate zoning of infection control areas [Human Resources] <ul style="list-style-type: none"> □ Inadequate in-patients control □ No staff or specialized teams for infection control □ Others 	✖	<p>[Other issues]</p> <ul style="list-style-type: none"> • Healthcare professionals already know the guidelines, but they do not consistently work in compliance with clinical guidelines • The countermeasure is to repeatedly educate medical personnel. <p>[Infection control guidelines in place or not]</p> <ul style="list-style-type: none"> • There is a PPI (Infection Prevention and Control) committee that develops policies, guidelines and SOPs • The clinical guideline outlines (1) how to wash hands, (2) how to use and remove PPE, (3) early warning to prevent infections, and (4) recording the incidence of infections. 	-

Summary

There are concerns about delays in disease detection and worsening conditions due to lack of patient education. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patient awareness of avoiding crowds is low. • Difficult to educate patient's family members so that they don't come in groups and create crowds in the hospital <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • TVs are available as a means of educating patients, and posters are displayed with a variety of information related to prevention 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patients are often unable to talk about their medical history, so doctors need to go into depth during the interview, which is time-consuming. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Recording of patient data, issuing of medical record numbers, management of available beds, doctor schedules, etc. are all managed by the EMR • An e-med application is used to support the testing procedure and all prescription medications are detailed with item and price 	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve efficiency of reception • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists 	<p>[Causes considered by the hospital]</p> <p>[Solutions considered by the hospital]</p>	-
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Not accepting patients from BPJS (if BPJS patients wish to be treated, they must be referred to a BPJS affiliated hospital) • Surge in COVID-19 patients, crowded inpatient admissions <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • The distribution of patients on each floor can be monitored from SIRS, and the number of patients on each ward can be viewed and the number of beds can be increased if there is a shortage. • Redesigned and increased the number of special beds for isolation patients 	<ul style="list-style-type: none"> • Appropriate bed control appears to be in place for ward congestion.

Summary There are issues in follow-up with patients and their families during and after treatment, and there is potential for the use of digital health. A shortage of nurses is an issue, and there is a need to optimize the allocation of personnel by reducing the workload and improving work efficiency.

Results of online survey and follow-up interview responses (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input type="checkbox"/> Lack of medicines for patients <input checked="" type="checkbox"/> Others (Lack of nurses) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Inadequate medication and health control guidance for patients • Inadequate patient follow-up (regular consultations, check-ups, rehabilitation) during and after treatment • Patients may neglect self-management or fail to visit hospital and treatment to the patient's condition, examination results, says "Ok" and does not understand, and the explanation is not communicated to the family. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Require doctors to repeatedly explain to patients and families 	<ul style="list-style-type: none"> • Tele-consultation (medication guidance, etc.) • Therapeutic Apps • Sharing information with other medical facilities using HER and doctor-to-doctor platforms
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input type="checkbox"/> Inability to share information with other medical facilities. <input checked="" type="checkbox"/> Others (Lack of doctor care) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The integrated digital health system (SIRS) has facilitated communication and collaboration among medical professionals and departments. • All patient data is recorded in SIRS, so patient information can be easily shared • Has a SISRUITE (Integrated Referral Information System designed by MOH) account and can refer to other hospitals that also have a SISRUITE account 	-
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input checked="" type="checkbox"/> Shortage of nurses <input type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Shortage of nurses, doctors and receptionists due to increase in patient numbers <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of IT staff in the programmer department to develop SIRS • Recruit new graduates and train them to become nurses after their probationary period 	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. <ul style="list-style-type: none"> → Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc. • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input checked="" type="checkbox"/> Inadequate management of medical materials and drugs 	<p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • In terms of medical equipment, the available ventilators are quite extensive, as there are more ventilators than beds available • Essential medicines are always kept in stock. 	-

[Secondary, Private] Bunda Thamrin General Hospital

No other major operational issues have been identified.

Summary

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input checked="" type="checkbox"/> Others (Reuse of PPE) 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Work with contractors for cleaning services. • Established the Infection Prevention and Control Committee for infection control • There is a monitoring staff for contact tracing, and patient data, phone numbers, addresses, diagnoses, etc. on positive patients are reported to the health department on a regular basis so that the health department can follow up • If a patient is confirmed to have COVID-19 infection after admission, the health department will request follow-up within 3 days at the latest <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • N/A 	-
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • Strong desire to cooperate with JICA in the future 	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • All kinds of support from JICA regarding funding, equipment, facilities, digital health, etc. are welcome. 	-
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

[Secondary, Private] Bunda Thamrin General Hospital

Summary The following is a list of digital health that have been deployed and are being considered for deployment in the hospital. Compared to other hospitals in Indonesia, the deployment of digital health is more advanced, and various efforts are underway.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> EMR
PHR (Personal Health Record)	-	<ul style="list-style-type: none"> An integrated digital health system called SIRS and e-Med (Electronic Medicine)
EHR (Electric Health Record)	-	<ul style="list-style-type: none"> SIRS is an application originally developed by hospital staff
Doctor-to-Doctor Platform	-	<ul style="list-style-type: none"> e-Med is an application developed by a vendor called Cahayasoft
Online health advisory	-	<ul style="list-style-type: none"> SIRS includes EMR (not fully digitized, paper records remain)
Tele-triage (AI questionnaire)	●	<ul style="list-style-type: none"> Community Collaboration System (EHR)
Tele-consultation	-	<ul style="list-style-type: none"> Deployed in SIRS
AI imaging diagnosis support	-	<ul style="list-style-type: none"> Doctor-to-Doctor Platform Deployed in SIRS
Remote diagnosis support	-	<ul style="list-style-type: none"> Tele-triage
Tele-surgery	-	<ul style="list-style-type: none"> Use pre-visit questionnaire on the website
e-ICU (Remote ICU)	-	<ul style="list-style-type: none"> Tele-consultation
Tele-monitoring	-	<ul style="list-style-type: none"> Use video call only
Therapeutic applications	-	<ul style="list-style-type: none"> Digital pharmacy
Digital pharmacy	●	<ul style="list-style-type: none"> Integration with Halodoc to deliver medications to patient homes
VR / MR training	-	<ul style="list-style-type: none"> Health Promotion App
Health promotion application	-	<ul style="list-style-type: none"> Use via website or Instagram (No app)
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

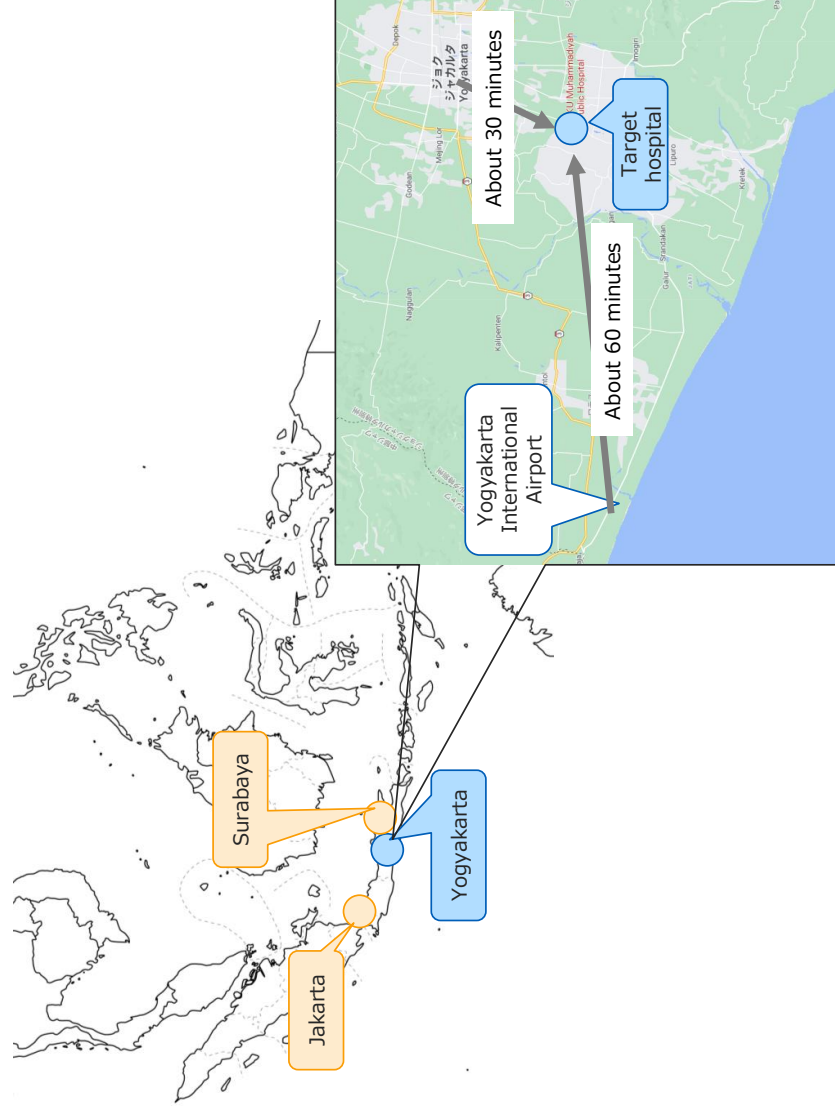
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> Digital health plan and policy There is an ICT policy. They want all medical records to be electronic in the future (very few are electronic now) Decision makers are fully supportive of ICT diffusion They are also interested in tele-consultation. They recognize that digital health services are still in their infancy
<ul style="list-style-type: none"> Digital health system 5 ICT staff on staff
<ul style="list-style-type: none"> Digital health budget The share of digital health in last year's budget is unknown Digital health is given priority in the budget, but if there are other items that are urgent, necessary and have a clear purpose, they may also be given priority
<ul style="list-style-type: none"> Time of deployment of digital health Undecided

PKU Muhammadiyah Bantul General Hospital

General Information

Location	Yogyakarta, Yogyakarta Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	133
Bed occupancy rate	N/A
Average length of hospital stay	N/A
Number of medical staffs	Doctor : N/A Nurse : N/A Other : N/A



Summary It is aware of many barriers to the introduction of digital health, such as introduction costs, IT literacy of users, equipment and facilities, and lack of IT personnel and internal systems. It is believed that there is demand for digital health that can be used easily and with low initial and running costs.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, stable connection Wireless (Wi-Fi), unstable or slow connection	No interview conducted	<ul style="list-style-type: none"> For products that connect to other facilities, it is necessary to check the communication infrastructure outside the hospital.
Situation of Digital Health Expectation for Digital Health	<input checked="" type="checkbox"/> Improvement of medical care quality <input checked="" type="checkbox"/> Improvement of patient services <input checked="" type="checkbox"/> Improvement of medical safety <input checked="" type="checkbox"/> Improvement of operational efficiency <input checked="" type="checkbox"/> Improvement of management <input type="checkbox"/> Others ()	No interview conducted	-
Issues on Digital Health Deployment	<input checked="" type="checkbox"/> Financial issues for deployment <input type="checkbox"/> Lack of health insurance coverage for medical practice by health ICT <input checked="" type="checkbox"/> Lack of IT literacy among staff <input checked="" type="checkbox"/> Lack of IT experts in the facility who can deploy, operate, and maintain the digital health facility building (PC, tablet/smartphone, etc.) <input checked="" type="checkbox"/> Lack of external services to deploy, operate, and maintain the digital health <input checked="" type="checkbox"/> Lack of network environment (3G, 4G, etc.) <input checked="" type="checkbox"/> Lack of basic infrastructure (power supply, etc.) <input type="checkbox"/> Others ()	No interview conducted	<ul style="list-style-type: none"> It is difficult to recover the cost of digital health deployment, so the evaluation of the cost-effectiveness of the introduction of digital health is estimated to be difficult IT literacy among healthcare professionals is not high. Likely to be a barrier to the introduction of digital health <ul style="list-style-type: none"> → There will be demand for effective digital health that can be used intuitively and simply.

Summary

We provide a wide range of services from outpatient treatment of COVID-19 patients to inpatient treatment of critically ill patients. Although the number of personnel is sufficient, there is a shortage of hospital beds and essential medical equipment such as ventilators.

Results of online survey and follow-up interview responses (2/6)

COVID-19 Measures	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> ■ Outpatient consultation ■ Examination (specimen collection) ■ Examination (PCR test implementation) ■ Treatment in ward (mild symptoms) ■ Treatment in ward (moderate symptoms) ■ Treatment in ward (severe symptoms) ■ Vaccination ■ Contact and management of patients with mild symptoms under home care □ Others () 	✖	No interview conducted	-
<p>What is lacks for COVID-19 response in the hospital</p> <ul style="list-style-type: none"> [Human Resources] <ul style="list-style-type: none"> □ Doctor □ Nurse □ Laboratory technician □ Other staff [Facilities, Equipment, etc.] <ul style="list-style-type: none"> ■ Capacity of general beds ■ Capacity of ICU bed ■ PCR Testing Equipment ■ ECMO (Extra-corporeal Membrane Oxygenation) ■ Ventilator □ Suction, vacuum □ Oxygen (central distribution or gas cylinder) ■ Lack of PPE (Personal Protective Equipment) [Other] <ul style="list-style-type: none"> ■ Payment problem □ Others 	✖	No interview conducted	<ul style="list-style-type: none"> • Expansion of hospital beds, etc.
<p>Problems for Infection Control in the hospital</p> <ul style="list-style-type: none"> [Software: Manual, Operation] <ul style="list-style-type: none"> □ Insufficient hand washing and hand sanitizing by staff □ Lack or low utilization of Infection prevention manual □ Weak execution of Standard precautions by staffs ■ Lack of or inappropriate use of PPE [Hardware: Facilities, Zoning] <ul style="list-style-type: none"> □ Inappropriate zoning of infection control areas □ Inadequate in-patients control [Human Resources] <ul style="list-style-type: none"> □ No staff or specialized teams for infection control □ Others 	✖	No interview conducted	-

Summary There are concerns about delays in disease detection and worsening conditions due to lack of patient education. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online questionnaire and follow-up interview (3/6)

Operational Problems	Online Questionnaire Response	Follow-up Interview Response	Implication
Prevention	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory
Screening	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in outpatient consultation <input type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input checked="" type="checkbox"/> Heavy workload for staff in reception and screening <input type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time and improve flow efficiency during hospital visits • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Too many tests. <input type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologists <input type="checkbox"/> Others () 	No interview conducted	-
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input type="checkbox"/> Unclear or not defined rules regarding bed management (bed control). <input type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • Expansion of hospital beds, reduction of workload, optimization of staffing • Patient monitoring devices in hospital beds (biometric data collection devices of the wearing type and the bed spreading type, etc.), wearable devices • Use of robots in hospital beds (automatic transport, automatic cleaning and disinfection, etc.)

Summary Although inter-professional and inter-departmental cooperation within the hospital is considered to be fine, there are issues with cooperation with external facilities, and there is demand for smooth information sharing and the establishment of a referral system.

Results of online survey and follow-up interview responses (4/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational treatment and follow-up	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient guidance to patients on medication, lifestyle, etc. <input type="checkbox"/> Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) <input checked="" type="checkbox"/> Lack of medicines for patients <input type="checkbox"/> Others () 	No interview conducted	-
Organizational cooperation	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. <input type="checkbox"/> Insufficient communication and cooperation among departments <input type="checkbox"/> Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. <input type="checkbox"/> Insufficient information sharing of food allergies and contraindicated foods due to medications. <input checked="" type="checkbox"/> Inability to share information with other medical facilities. <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • PHR • EHR • Remote diagnosis support • Doctor-to-Doctor Platform
Medical system	<ul style="list-style-type: none"> <input type="checkbox"/> Shortage of doctors (especially specialists, etc.) <input type="checkbox"/> Shortage of nurses <input checked="" type="checkbox"/> Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) <input type="checkbox"/> Shortage of other staffs <input checked="" type="checkbox"/> Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) <input type="checkbox"/> Others () 	No interview conducted	<ul style="list-style-type: none"> • VR/MR Training (Education and Training)
Equipment and Supplies	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Shortage of medical equipment <input type="checkbox"/> Inadequate maintenance and management for medical equipment <input type="checkbox"/> Shortage of medical materials and drugs <input type="checkbox"/> Inadequate management of medical materials and drugs <input type="checkbox"/> Others () 	No interview conducted	-

Digital health should be used to enhance non-contact operations.

Summary

Results of online survey and follow-up interview responses (5/6)

	Operational problems	Others	Online Questionnaire Response	Follow-up Interview Response	Implication
			<input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input checked="" type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others ()	No interview conducted	<ul style="list-style-type: none"> Need to use digital health to enhance non-contact hospital operations Contact tracing
	Collaboration Status with Other Donors		-	No interview conducted	-
	Expected support from Japan and JICA		-	No interview conducted	-
	Interest in PoC		-	No interview conducted	-

Summary The following are the digital health that have been deployed and will be deployed at the hospital. The background and details of the introduction are unknown. It is believed that there is potential demand in a wide range of digital health fields.

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	Details unknown
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

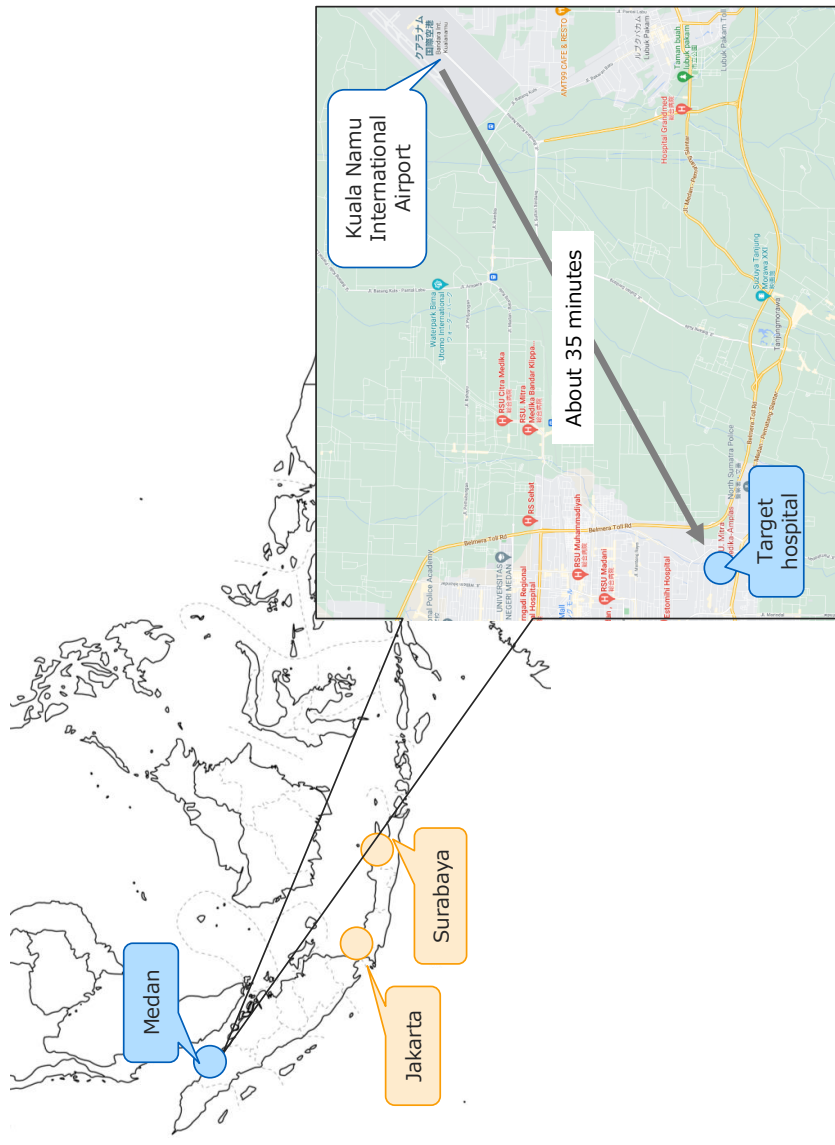
Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> ■ Digital health plan and policy <ul style="list-style-type: none"> • N/A ■ Digital health system <ul style="list-style-type: none"> • N/A ■ Digital health budget <ul style="list-style-type: none"> • N/A ■ Time of deployment of digital health <ul style="list-style-type: none"> • N/A ■ Others <ul style="list-style-type: none"> • N/A

Mitra Medika Amplas Hospital

General Information

Location	Medan, North Sumatra Province
Public/private	<input type="checkbox"/> Public <input checked="" type="checkbox"/> Private
Facility level	<input type="checkbox"/> Tertiary <input checked="" type="checkbox"/> Secondary <input type="checkbox"/> Primary
Main Functions	<input checked="" type="checkbox"/> Emergency <input checked="" type="checkbox"/> Outpatient consultation & treatment <input checked="" type="checkbox"/> Laboratory tests (clinical tests, diagnostic imaging tests, etc.) <input checked="" type="checkbox"/> Surgery <input checked="" type="checkbox"/> Perinatal <input checked="" type="checkbox"/> Ward (General) <input checked="" type="checkbox"/> Ward (Intensive care) <input checked="" type="checkbox"/> Rehabilitation <input checked="" type="checkbox"/> Pharmacy <input checked="" type="checkbox"/> Nutrition <input type="checkbox"/> Other ()
Number of beds	147
Bed occupancy rate	69.8%
Average length of hospital stay	6-9 days
Number of medical staffs	Doctors : 60 Nurses : 140 Others : Midwife 58, IT Staff 2, Pharmacist 6, Dietitian 3, Radiographer 8, Physical examination 6



[Secondary, Private] Mitra Medika General Hospital

Summary Although the environment for digital health is in place to some extent, there is a shortage of human resources who are responsible for IT operation and management.

Results of online questionnaire and follow-up interview (1/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Communication Infrastructure	Wired, connection stable	-	-
Situation of Digital Health	<ul style="list-style-type: none"> ■ Improvement of medical care quality ■ Improvement of patient services ■ Improvement of medical safety ■ Improvement of operational efficiency ■ Improvement of management □ Others () 	<p>[Reason for choosing this option]</p> <ul style="list-style-type: none"> • To improve patient satisfaction, all items are applicable. 	-
Issues on Digital Health Deployment	<ul style="list-style-type: none"> □ Financial issues for deployment □ Lack of health insurance coverage for medical practice by health ICT □ Lack of IT literacy among staff ■ Lack of IT experts in the facility who can deploy, operate, and maintain the digital health □ Lack of necessary equipment and facilities in the facility building (PC, tablet/smartphone, etc.) □ Lack of external services to deploy, operate, and maintain the digital health □ Lack of network environment (3G, 4G, etc.) □ Lack of basic infrastructure (power supply, etc.) □ Others () 	<p>[Details of issues]</p> <ul style="list-style-type: none"> • Older patients are not accustomed to accessing websites or using apps <p>[Status of government support for issues]</p> <ul style="list-style-type: none"> • Private hospitals are not supported by the government. 	<ul style="list-style-type: none"> • It is estimated that the introduction of digital health that can be completed by medical personnel and used by patients, considering the burden of data input and other simple ICT.

Summary Although it is a secondary hospital, it provides a wide range of services from outpatient care for patients with COVID-19 infection to inpatient care for critically ill patients. There is a shortage of both nurses and hospital beds.

Results of online survey and follow-up interview responses (2/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
<p>COVID-19 Measures</p> <p>What is being done for COVID-19 in the hospital</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Outpatient consultation <input checked="" type="checkbox"/> Examination (specimen collection) <input checked="" type="checkbox"/> Examination (PCR test implementation) <input checked="" type="checkbox"/> Treatment in ward (mild symptoms) <input checked="" type="checkbox"/> Treatment in ward (moderate symptoms) <input checked="" type="checkbox"/> Vaccination <input checked="" type="checkbox"/> Contact and management of patients with mild symptoms under home care 	<p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Doctor <input checked="" type="checkbox"/> Nurse <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Other staff <p>[Facilities, Equipment, etc.]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Capacity of general beds <input checked="" type="checkbox"/> Capacity of ICU bed <input checked="" type="checkbox"/> PCR Testing Equipment <input checked="" type="checkbox"/> ECMO (Extra-corporeal Membrane Oxygenation) <input type="checkbox"/> Ventilator <input type="checkbox"/> Suction, vacuum <input type="checkbox"/> Oxygen (central distribution or gas cylinder) <input type="checkbox"/> Lack of PPE (Personal Protective Equipment) <p>[Other]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Payment problem <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> PPE is now mandatory for healthcare workers Outpatient services have been limited and some departments have been closed The number of outpatients decreased significantly 	<ul style="list-style-type: none"> Tele-consultation for general patients who hesitate to visit the hospital
<p>What is lacks for COVID-19 response in the hospital</p>	<p>[Software: Manual, Operation]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Insufficient hand washing and hand sanitizing by staff <input type="checkbox"/> Lack or low utilization of Infection prevention manual <input checked="" type="checkbox"/> Weak execution of Standard precautions by staffs <input type="checkbox"/> Lack of or inappropriate use of PPE <p>[Hardware: Facilities, Zoning]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Inappropriate zoning of infection control areas <input type="checkbox"/> Inadequate in-patients control <p>[Human Resources]</p> <ul style="list-style-type: none"> <input type="checkbox"/> No staff or specialized teams for infection control <input type="checkbox"/> Others 	<p>[Effect of COVID-19]</p> <ul style="list-style-type: none"> Significant shortage of nurses Many nurses are retiring and the aging of nurses is a challenge The number of COVID-19 patients increased significantly and at times there was a shortage of ICU beds 	<p>Expansion of hospital beds, reduction of workload, optimization of personnel allocation, etc.</p> <ul style="list-style-type: none"> Patient monitoring devices in hospital beds (biometric data collection devices of clothed type and bedside type, etc.) Examination and diagnostic equipment in hospital beds (remote stethoscopes, etc.) Use of robots in hospital beds (automatic transport, cleaning and disinfection, etc.)
<p>Problems for Infection Control in the hospital</p>	<p>[Other issues]</p> <ul style="list-style-type: none"> Phlebitis is occurring as a nosocomial infection Patient refuses to have the IV replaced even though the IV is infected (Inadequate supervision of medical personnel may be the cause) <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> There is a Prevention and Infection Control Committee that develops all policies, guidelines and SOPs The committee has direct oversight of health care providers and patients The guidelines are outlined as: (1) hand washing and sterilization, (2) sneezing, (3) use of face masks 	<p>[Other issues]</p> <ul style="list-style-type: none"> Phlebitis is occurring as a nosocomial infection Patient refuses to have the IV replaced even though the IV is infected (Inadequate supervision of medical personnel may be the cause) <p>[Infection control guidelines]</p> <ul style="list-style-type: none"> There is a Prevention and Infection Control Committee that develops all policies, guidelines and SOPs The committee has direct oversight of health care providers and patients The guidelines are outlined as: (1) hand washing and sterilization, (2) sneezing, (3) use of face masks 	-

Summary

There are concerns about delays in disease detection and worsening conditions due to lack of patient education. There will be high demand for preventive care and solutions that allow patients to have contact with their healthcare providers. Crowding is an issue in outpatient clinics, and there is potential to reduce congestion by improving operational efficiency.

Results of online survey and follow-up interview responses (3/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational Problems	<ul style="list-style-type: none"> <input type="checkbox"/> Insufficient education for local residents <input type="checkbox"/> Few opportunities of pre-consultation for the local residents <input checked="" type="checkbox"/> Many patients visiting hospitals only after their disease symptoms become serious <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The patient is afraid of going to the hospital and being diagnosed with COVID-19, which delays the visit. The patient is already in a serious condition when they arrive. • People fear being diagnosed with COVID-19 due to misinformation, and some don't believe COVID-19 exists. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • We want to collaborate with primary institutions to educate residents so that they have correct knowledge about COVID-19. 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory, etc.
Screening	<ul style="list-style-type: none"> <input type="checkbox"/> Congestion in outpatient consultation <input checked="" type="checkbox"/> Lots of time to interview patients about their medical history and treatment status. <input type="checkbox"/> Heavy workload for staff in reception and screening <input checked="" type="checkbox"/> Unclear criteria for accepting emergency patients <input type="checkbox"/> Inefficient emergency transport operation for patients <input type="checkbox"/> Complicated reception and accounting procedures for patients 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • All patients are treated as possible COVID-19, and it takes time to fill out the medical questionnaire. <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Clarification of the criteria for emergency patients. • The ability to fill out a medical questionnaire form online saves time in taking a patient's medical history and treatment status. 	<ul style="list-style-type: none"> • Tele-triage (AI questionnaire) to reduce waiting time, improve reception efficiency, and reduce contact when visiting a hospital • Appointment booking system with Tele-triage
Examination and Diagnosis	<ul style="list-style-type: none"> <input type="checkbox"/> Too many tests. <input checked="" type="checkbox"/> Insufficient regular checkups for expected mothers and patients with chronic diseases <input type="checkbox"/> Shortage or absence of specialists such as radiologist 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patients with chronic diseases and pregnant women should first have a COVID-19 rapid antigen test • Surgical patients need to undergo PCR testing 	<ul style="list-style-type: none"> • Testing equipment available at home (equipment for antenatal checkups, remote stethoscopes, etc.)
Inpatient treatment	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> Congestion in the inpatient wards <input type="checkbox"/> Inadequate measurement and management of patients' biological data necessary for understanding and observing the patient's condition in a timely and appropriate manner (SPO2, heart rate, etc.) <input type="checkbox"/> Lack or low application rate of Clinical pathways <input checked="" type="checkbox"/> Unclear or not defined rules regarding bed management (bed control) <input checked="" type="checkbox"/> Patients travel to distant medical facilities if they cannot take surgical operations in your facility. 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • There is a shortage of beds for COVID-19 patients • If the bed is full, COVID patients are referred to other hospitals <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Increasing the number of beds and medical equipment so that COVID-19 patients do not have to be transferred. • Hospital management also conducted an assessment of the LOS 	<ul style="list-style-type: none"> • Wearable device • EMR

Summary

There is a problem when transferring patient information to other hospitals after treatment is completed, and the use of EHR and doctor-to-doctor platforms is expected. The education of medical staff is sufficient, and the problem is simply a lack of manpower. Simplification of business processes and substitution of robotics may make up for the shortage.

Results of online survey and follow-up interview responses (4/6)

	Online Questionnaire Response		Follow-up Interview Response	Implication
Operational problems Continuous treatment and follow-up	<ul style="list-style-type: none"> ■ Insufficient guidance to patients on medication, lifestyle, etc. ■ Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) □ Lack of medicines for patients □ Others () 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Patient's lack of awareness and self-control • Low patient awareness of the need for regular follow-up <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Doctors need to provide accurate explanations of diseases and treatments to patients and their families • When referring a patient to another hospital, the online system can be used to expedite the process 	<ul style="list-style-type: none"> • Health Promotion App • Online health advisory • Establish a smooth referral system using EMR and EHR
Organizational cooperation	<ul style="list-style-type: none"> □ Insufficient communication and cooperation among medical doctors, nurses, technicians, etc. □ Insufficient communication and cooperation among departments □ Insufficient information sharing among staffs on duplicate doses, interactions, allergies, etc. □ Insufficient information sharing of food allergies and contraindicated foods due to medications. □ Inability to share information with other medical facilities. ■ Others (N/A) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • SIMRS integration has facilitated communication between healthcare professionals • Patient data is recorded in the EMR, so there is no problem with information sharing <p>[Solutions considered by the hospital]</p>	-
Medical system	<ul style="list-style-type: none"> □ Shortage of doctors (especially specialists, etc.) ■ Shortage of nurses □ Shortage of technicians (radiology technicians, laboratory technicians, therapists, etc.) ■ Shortage of other staffs □ Insufficient education and training for medical staffs (doctors, nurses, technicians, etc.) ■ Others (Lack of IT staff) 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • Lack of staff involved in the maintenance and development of IT systems • A significant shortage and aging of nurses is a challenge due to resignation • Online training is offered, but nurse turnover is high 	<ul style="list-style-type: none"> • Optimize personnel allocation by reducing workload and improving operational efficiency, etc. → Use of EMR (digitalization of medical information), monitoring equipment, wearable devices, robots, etc.
Equipment and Supplies	<ul style="list-style-type: none"> □ Shortage of medical equipment □ Inadequate maintenance and management for medical equipment ■ Shortage of medical materials and drugs □ Inadequate management of medical materials and drugs 	✖	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • The challenge is to ensure that medicines are always available and to reduce shortages 	-

[Secondary, Private] Mitra Medika General Hospital

Summary The project has not received any support from the government or other donors and is highly motivated to cooperate with JICA.

Results of online survey and follow-up interview responses (5/6)

	Online Questionnaire Response	Follow-up Interview Response	Implication
Operational problems Others	<ul style="list-style-type: none"> <input type="checkbox"/> Inadequate cleaning <input type="checkbox"/> Too much burden of transporting goods, meals for patients <input type="checkbox"/> Exposure of infection risk, and weak counter-measurement <input checked="" type="checkbox"/> Unclear cause of outbreak due to lack of tracing methods <input type="checkbox"/> Others () 	<p>[Causes considered by the hospital]</p> <ul style="list-style-type: none"> • When COVID-19 infections occur, hospitals can track patients but cannot assess how they occurred <p>[Solutions considered by the hospital]</p> <ul style="list-style-type: none"> • Improve contact tracing by setting up a dedicated team 	<ul style="list-style-type: none"> • Contact tracing
Collaboration Status with Other Donors	-	<ul style="list-style-type: none"> • No current collaboration with donor organizations • Willing to cooperate with JICA in the future 	-
Expected support from Japan and JICA	-	<ul style="list-style-type: none"> • Funds, medical equipment, especially digital health-related support 	-
Interest in PoC	-	<ul style="list-style-type: none"> • Interested 	-

The following is a list of digital health that have been deployed and will be deployed in the hospital.

Summary

Results of online questionnaire and follow-up interview (6/6)

Deployed Digital Health	COVID-19 Measures	Main Reasons for Deployment
EMR (Electric Medical Record)	-	<ul style="list-style-type: none"> EMR Currently using a hospital information management system (SIMRS) developed by a third party/vendor Community Collaboration System (EHR) Included in SIMRS Doctor-to-Doctor Platform Included in SIMRS <p>Digital health has not been introduced to support COVID-19.</p>
PHR (Personal Health Record)	-	
EHR (Electric Health Record)	-	
Doctor-to-Doctor Platform	-	
Online health advisory	-	
Tele-triage (AI questionnaire)	-	
Tele-consultation	-	
AI imaging diagnosis support	-	
Remote diagnosis support	-	
Tele-surgery	-	
e-ICU (Remote ICU)	-	
Tele-monitoring	-	
Therapeutic applications	-	
Digital pharmacy	-	
VR / MR training	-	
Health promotion application	-	
Wearable devices	-	
Contact tracing	-	
Authentication systems	-	
Robotics	-	
Others	-	

Digital Health to be Deployed in the Future
EMR (Electric Medical Record)
PHR (Personal Health Record)
EHR (Electric Health Record)
Doctor-to-Doctor Platform
Online health advisory
Tele-triage (AI questionnaire)
Tele-consultation
AI imaging diagnosis support
Remote diagnosis support
Tele-surgery
e-ICU (Remote ICU)
Tele-monitoring
Therapeutic applications
Digital pharmacy
VR / MR training
Health promotion application
Wearable devices
Contact tracing
Authentication systems
Robotics
Others

Hospital Policy and Budget
<ul style="list-style-type: none"> Digital health plan and policy <ul style="list-style-type: none"> Planning to develop a tele-consultation platform and a digital pharmacy platform in partnership with third parties Digital health system <ul style="list-style-type: none"> 2 staff in charge of ICT Digital health budget <ul style="list-style-type: none"> Budget details cannot be disclosed Self-funded and budgeted by the hospital and the Mitra Medika Group (parent company) Time of deployment of digital health <ul style="list-style-type: none"> undecided Others <ul style="list-style-type: none"> If new technology is adopted, it will be continued after COVID-19.

Appendix 8. Details of JICA's supporting measures in digital health



Hypothesis of JICA's Supporting Measure (Brazil)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

- With the Unified Health System SUS playing a central role, DATASUS is responsible for the storage and management of medical information for all citizens, and the national health sector is being digitized.
- Innovation hubs are driving the digital health market, as incubation programs and investment funds targeting the healthcare sector have been established.



Issues to be resolved in the target country

- Brazil has a high rate of NCDs and requires a relatively high level of medical services.
- National unified health care system SUS exists and all public medical services are free of charge.
- There are large disparities in healthcare between rich and poor, and between regions, and healthcare workers are unevenly distributed. The access to quality healthcare is an issue.



Insights from Research

- Correction of healthcare disparities: While the healthcare sector is becoming increasingly digitalized, the gap due to differences in wealth and region is an issue, and digital health technology is expected to be used in public medical facility with insufficient human resource.
- Utilization of digital health solutions from Japan, a country with advanced issues: Brazil has relatively good conditions for private companies to enter the market, and as a country with advanced issues related to the aging of population, there is a high possibility that Japanese companies will find it not hard to develop business and deploy digital health technology, which is one of the strengths of Japanese companies.
- Partnerships with local innovation hubs: Although the digital health market is growing, there are many obstacles to overcome in terms of funding, development, and business scale for the startups that are driving this market. In contrast, in Brazil, innovation hubs play an important role in supporting the business development and financing of startups with digital health technologies in the digital health architecture.



- Advancement of startups and companies
- Brazil's digital health market grows by 7% even as COVID-19 pandemic
- There are various digital health solutions. Technologies that meet the medical demands of population aging are expected.
- Digital health companies and startups continue to face challenges in raising funds for R&D and business development.

JICA's interests and initiatives

- As for JICA's efforts in the health sector in Brazil, as an ODA graduate country, JICA has not provided any paid or grant aid in the recent past. However, the Brazil's national development cooperation policy aims to provide assistance in areas that promote economic growth, including the expansion of human resources, with a view to collaborating with private funds, such as the improvement of the environment to enhance the competitiveness of industries and technical assistance.
- In "JICA's Global Agenda: 6. Healthcare," it is expected that measures against NCDs and aging will be implemented in developing countries through collaboration with local governments, universities, and private companies, and that these technologies will be returned to domestic technological development.



hypothesis

In order to improve the quality of medical care caused by economic disparity and other factors, JICA encourages the expansion of the digital health market for measures against specific diseases in Brazil and the introduction of private-sector digital health solutions to medical facilities through the co-creation of Japanese and local companies, centered on local innovation partners.

Hypothesis of JICA's Supporting Measure (Kenya)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

Digital Health targeting users such as medical personnel and patients (customer touch points) are the main focus, and private platforms (collaborative areas) have been established through mobile payments. In addition to JICA's TechEmerge program, other donors are mainly supporting the private sector through acceleration programs.

Insights from Research



Issues to be resolved in the target country

- In addition to infectious diseases and NCDs, improving maternal and child health continues to be an important health care issue.
- The health system that supports the country's public health institutions used by a large population is weak.
- Public institutions have yet to catch up with digitization, and the system for introducing digital health is still immature.



- Strengthening primary care services through the use of digital health technology: Primary health care service play an important role in the health system for maternal and child health and infectious diseases. There is a high demand for introduction digital health to the primary care level, such as building e-CHIS and promoting digital health to PCN. Building a foundation for public institutions to utilize digital health: As the gap in medical services is widening between private and public facilities, it is important to create an environmental infrastructure for the utilization of digital health in public medical facility, which are used by most of the population, and may serve as a catalyst for private investment.
- Providing opportunities for co-creation between the public and private sectors: The unestablished or unclear national systems and regulations for digital health are hindering the private sector's innovation and market entry. Especially in the digital health field, provide opportunities to promote co-creation between the public and private sectors, such as matching systems, regulations, and markets, from a neutral standpoint as a development donor.



- Advancement of startups and companies
- Kenya digital health Market is expected to grow at a CAGR of 6.0% from 2019-2024 and is expected to expand further
- Many of them reflect local conditions such as weak public health care delivery systems and pharmaceutical supply chains.
- Mostly m-Health using mobile information devices due to infrastructure constraints



JICA's interests and initiatives

- In Kenya's Country Development Cooperation Policy, in the health sector, the policy is set to reduce inequalities in health services towards UHC, secure health budgets and planned expenditures by county governments, which are substantially responsible for health administration, and cooperate to realize UHC and strengthen health systems, especially under decentralization.
- JICA's Global Agenda 6. Health Care section: "To ensure access to medical services through the development and improvement of medical security systems, increase the commitment of the national government, while providing policy and institutional advice, coordination with service provision, financial support, etc. Achieving UHC is high on the priority list of issues.



hypothesis

In order to achieve UHC and strengthen the health system, JICA supports the government and public medical facilities by introducing appropriate digital health technologies at the primary care level and by building a foundation that enables private companies and startups with these technologies to enter the market.

Hypothesis of JICA's Supporting Measure (Indonesia)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

- One Data Policy has been established to centrally collect, manage, and utilize data that is distributed among ministries and organizations, including the Ministry of Health.
- Solutions such as PHR data linkage, regional medical information linkage systems, and doctor-to-doctor platforms that enable communication and collaboration among doctors are not widespread.



Issues to be resolved in the target country

- In Indonesia, a country with a large population, the rate of NCDs has been increasing since 2000 due to the declining birthrate and aging population.
- As the world's largest island nation, geographical unevenness of medical services is a serious issue.
- The government implements telemedicine programs, but most are still concentrated in the capital and urban areas.



Insights from Research

- Correction of the uneven regional distribution of doctors: Primary medical facilities are not able to provide adequate services, especially on remote islands. In the future, it will be necessary to respond to the increase in NCDs. There is a high demand for the information linkage technology to support collaboration with doctors (specialists) and digital health, especially telemedicine, to address these issues.
- Strengthening of telemedicine system and implementation organization: The government has implemented a telemedicine program through TEMENIN, but those programs have not yet spread due to various issues. It is necessary to focus on issues specific to telemedicine, such as establishing a system for health insurance, strengthening the implementation system for doctors, and collaborating with companies.
- Development of existing digital health projects: Scaling up existing JICA projects in the digital health field based on local partners and technologies will lead to sustainable development of the country's digital health ecosystem in an agile manner, as well as increase JICA's presence in the digital health field.



- Advancement of startups and companies
- In Indonesia, the digital health will grow at a CAGR of more than 60% from 2017 to 2022.
- Online consultation accounts for the largest share, followed by digital pharmacy and telemedicine services.
- There are still no regulations on personal information protection specific to the digital health sector, and it is not covered by public insurance.



JICA's interests and initiatives

- According to the Country Development Cooperation Policy for Indonesia, the basic policy priority area of ODA is to support the development of rural areas as well as major cities in order to realize a safe and fair society, focus on correcting regional disparities, and improve the quality of life.
- There is a strategy that aims to strengthen the system to continuously provide high quality services during the period from pregnancy to childbirth and the child's 5age in "JICA's Global Agenda 6." It is expected that digital health will be applied to areas such as the maternal and child health handbook, which has been supported for a long time. Since 2018, JICA has been implementing the Project for Improving the Quality of Maternal and Child Health Programs Using the Maternal and Child Health Handbook in Decentralization.



hypothesis

In order to realize the improvement of medical services in remote areas, JICA supports the Indonesian government in establishing a system and structure that enables the introduction and promotion of telemedicine-specific innovations at the national level, based on existing JICA project partners and technologies.

Appendix 9. Companies and solutions that passed the first screening



Companies and solutions that passed the first screening(Brazil)

Rank	Company	Solution	Points
1	Techlico.Inc	Rehamaru (Rehabilitation system using Mixed Reality)	62
1	Precision inc	AI Clinical decision support	62
3	Flixy,Inc.	Melp	60
4	CYBERDYNE Inc.	Wearable Cyborg HAL	50
4	HealtheeOne, Inc.	HealtheeOne Cloud	50
4	OUI Inc.	Smart Eye Camera	50
7	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

Companies and solutions that passed the first screening(Kenya)

Rank	Company	Solution	Points
1	Melody·International Ltd	Mobile Fetal Monitor iCTG	70
2	Techlico.Inc	Rehamaru (Rehabilitation system using Mixed Reality)	62
2	Precision inc	AI Clinical decision support	62
4	Flixy,Inc.	Melp	60
5	HealtheeOne, Inc.	HealtheeOne Cloud	50
5	OUI Inc.	Smart Eye Camera	50
7	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

Companies and solutions that passed the first screening(Indonesia)

Rank	Company	Solution	Points
1	MITAS Medical inc.	Remote consultation service to ophthalmology using a smartphone-based mobile slit lamp	77
2	Allm Inc.	Join	71
3	ExaWizards Inc	Remote rehabilitation service	70
4	Techlico.Inc	Rehamaru (Rehabilitation system using Mixed Reality)	62
4	Precision inc	AI Clinical decision support	62
6	PARAMOUNT BED CO., LTD.	Non-contact monitoring and workload reduction using Nemuri SCAN under the Covid-19 epidemic	61
6	Sojitz Corporation (Tetsuyu Healthcare Holdings)	CARES / CARES 4 WOUNDS	61
8	Flixy,Inc.	Melp	60
9	HealtheeOne, Inc.	HealtheeOne Cloud	52
10	CYBERDYNE Inc.	Wearable Cyborg HAL	50
10	OUI Inc.	Smart Eye Camera	50
12	Arc Planning	Online medical education program with Docquity platform	49
13	Doog Inc.	Robotic Cart THOUZER BASIC, Robotic Wheelchair Garoo	45
14	Arc Planning	Wellpass	42
15	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

*Gray cells are companies that are not selected.

Appendix 10. Medical Facilities Submitting Expressions of Interest



Medical Facilities Submitting Expressions of Interest (Brazil)

No.	Medical Facility	Interested Company
1	Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro	<ul style="list-style-type: none"> • CYBERDYNE Inc. • Oui Inc. • Flixy, Inc. • ICHIGO LLC • Techlico, Inc.
2	Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo	<ul style="list-style-type: none"> • ICHIGO LLC • CYBERDYNE Inc.
3	Hospital Santa Casa de Juiz de Fora	<ul style="list-style-type: none"> • Flixy, Inc. • Techlico, Inc. • HealtheeOne, Inc. • CYBERDYNE Inc.
4	Hospital Novo Atibaia SA	<ul style="list-style-type: none"> • OUI Inc.
5	Hospital das Clínicas da Universidade Federal de Pernambuco (HCUFPE)	<ul style="list-style-type: none"> • Oui Inc. • Flixy, Inc. • HealtheeOne, Inc. • Precision inc • ICHIGO LLC • Techlico, Inc. • CYBERDYNE Inc.

Medical Facilities Submitting Expressions of Interest (Kenya)

No.	Medical Facility	Interested Company
1	Radiant Group of Hospital	<ul style="list-style-type: none"> • Flixy, Inc. • ICHIGO LLC • Melody• International Ltd
2	Ushirika Clinic	<ul style="list-style-type: none"> • OUI Inc. • Melody• International Ltd
3	Aldama Clinic	<ul style="list-style-type: none"> • OUI Inc. • Flixy, Inc. • Precision inc • Melody• International Ltd
4	Coast General Teaching and Referral Hospital	<ul style="list-style-type: none"> • OUI Inc. • Melody• International Ltd • ICHIGO LLC
5	Nairobi Women's Hospital	<ul style="list-style-type: none"> • Melody• International Ltd
6	Moi Teaching and Referral Hospital	<ul style="list-style-type: none"> • Melody• International Ltd • Flixy, Inc. • ICHIGO LLC

Medical Facilities Submitting Expressions of Interest (Indonesia)

No.	Medical Facility	Interested Company
1	Harapan Kita National Cardiovascular Centre	<ul style="list-style-type: none"> • Allm Inc. • HealtheeOne, Inc.
2	Harapan Kita Mother and Children Hospital	<ul style="list-style-type: none"> • OUI Inc. • PARAMOUNT BED CO., LTD. • Flixy, Inc. • Allm Inc. • ExaWizards Inc • Techlico.Inc • Precision inc • HealtheeOne, Inc. • CYBERDYNE Inc. • MITAS Medical inc.
3	North Smatera University Hospital	<ul style="list-style-type: none"> • MITAS Medical inc. • Techlico.Inc • PARAMOUNT BED CO., LTD.
4	PKU Muhammadiyah Bantul General Hospital	<ul style="list-style-type: none"> • Precision inc • CYBERDYNE Inc.
5	Mitra Medika General Hospital	<ul style="list-style-type: none"> • Flixy, Inc. • Allm Inc. • PARAMOUNT BED CO., LTD.

Appendix 11. Companies and solutions that passed the second screening



Companies and solutions that passed the second screening (Brazil)



Digital
transformation

Rank	Company	Solution	Points
1	OUI Inc.	Smart Eye Camera	81.7
2	Techlico.Inc	Rehamaru (Rehabilitation system using Mixed Reality)	69.9
3	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	66.1
4	Precision inc	AI Clinical decision support	65.1
5	Flixy,Inc.	Melp	56.6

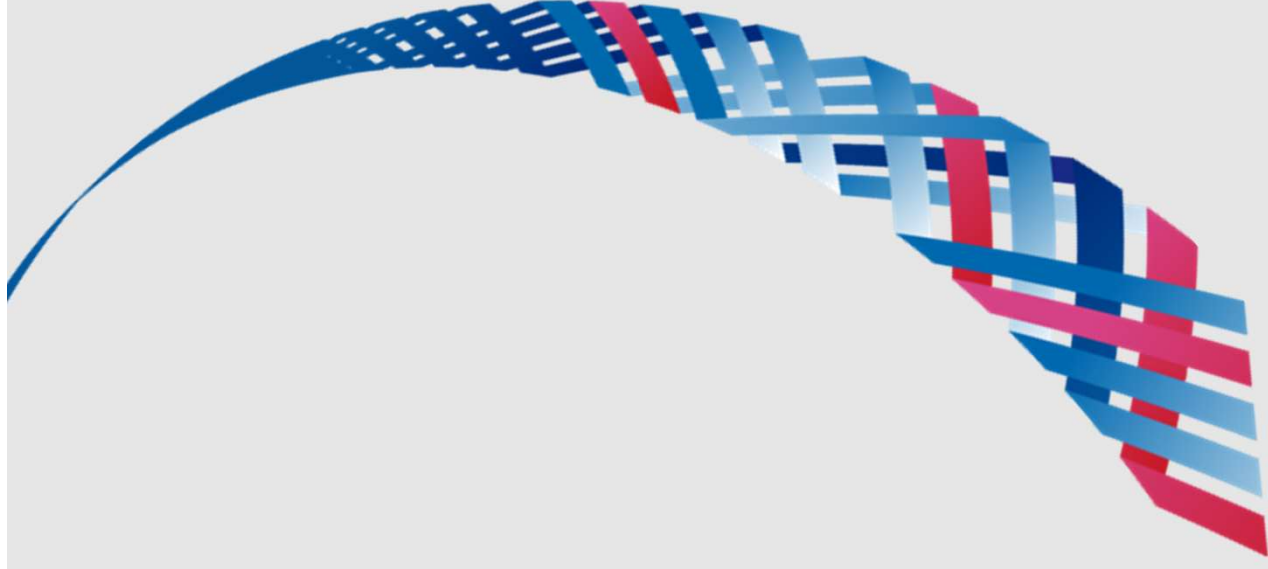
Companies and solutions that passed the second screening (Kenya)

Rank	Company	Solution	Points
1	OUI Inc.	Smart Eye Camera	85.5
2	Melody・International Ltd	Mobile Fetal Monitor iCTG	80.0
3	Flixxy,Inc.	Melp	69.0
4	Precision inc	AI Clinical decision support	63.5
5	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	62.5

Companies and solutions that passed the second screening(Indonesia) Digital transformation

Rank	Company	Solution	Points
1	OUI Inc.	Smart Eye Camera	80.8
2	MITAS Medical inc.	Remote consultation service to ophthalmology using a smartphone-based mobile slit lamp	78.8
3	Precision inc	AI Clinical decision support	76.3
4	Allm Inc.	Join	75.0
5	Flixy,Inc.	Melp	71.0
6	CYBERDYNE Inc.	Wearable Cyborg HAL	63.0
7	PARAMOUNT BED CO., LTD.	Non-contact monitoring and workload reduction using Nemuri SCAN under the Covid-19 epidemic	53.3
8	ExaWizards Inc	Remote rehabilitation service	50.5

Appendix 12. PoC Case Study



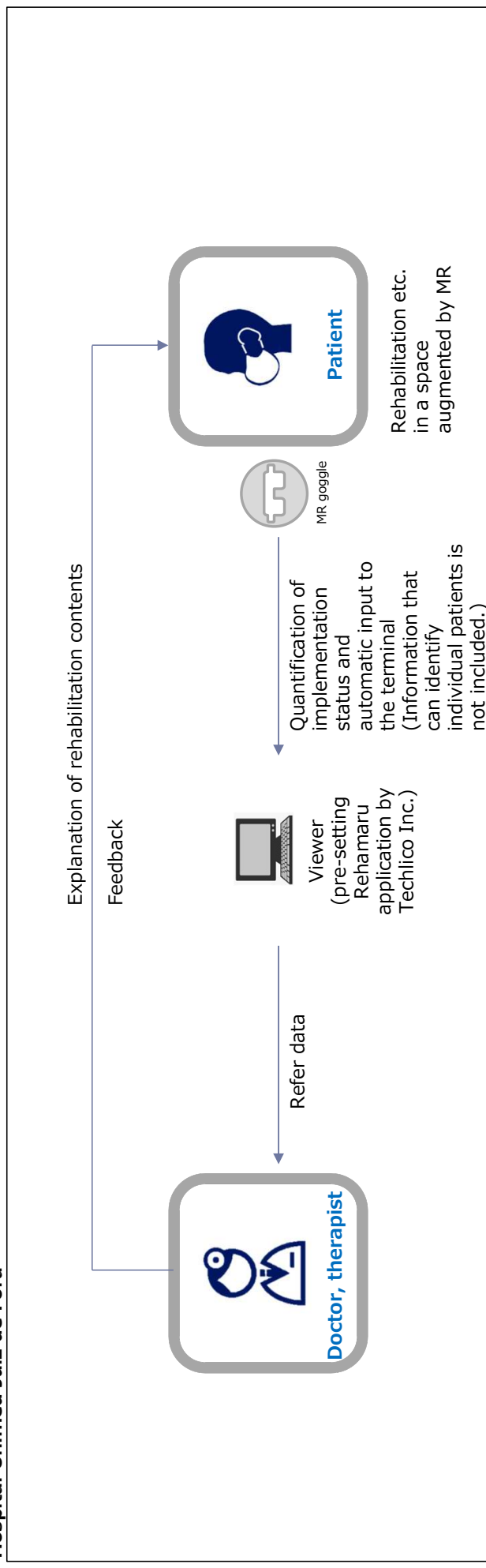
PoC Case Study (Brazil): Techlico Inc.

■ PoC Overview

Solution overview	Providing 3D rehabilitation menus using MR, supporting rehabilitation implementation, quantifying rehabilitation results, etc.
PoC location	Hospital Unimed Juiz de Fora
Main users	Doctor, therapists, and rehabilitation patients of Hospital Unimed Juiz de Fora

■ PoC Flow

Hospital Unimed Juiz de Fora



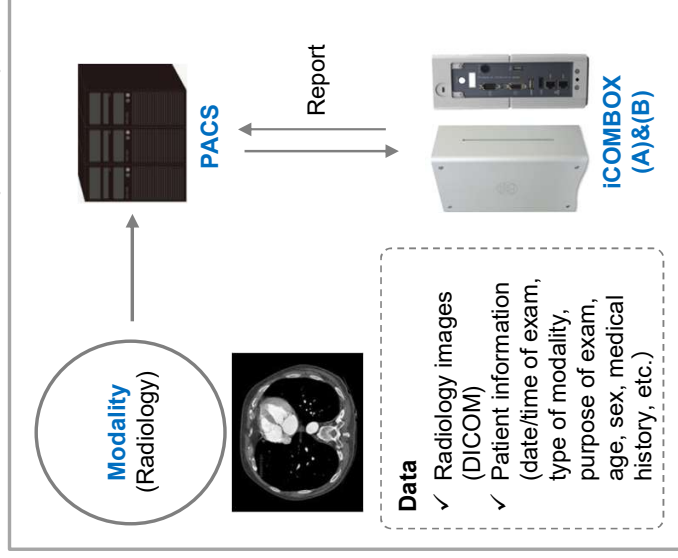
PoC Case Study (Brazil): ICHIGO LLC

■ PoC Overview

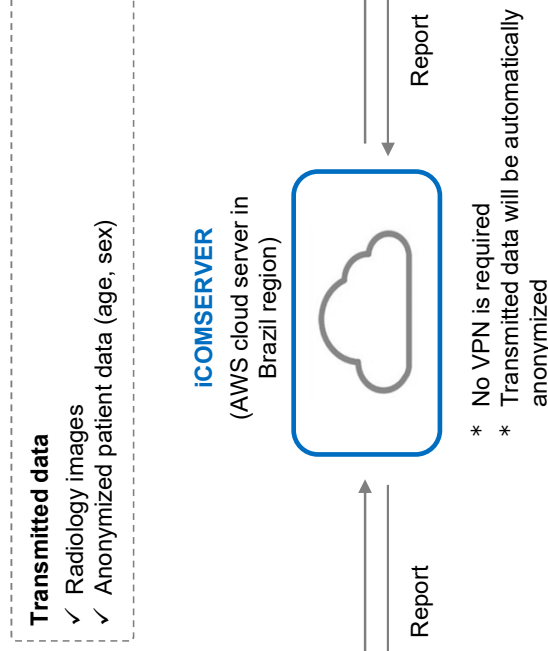
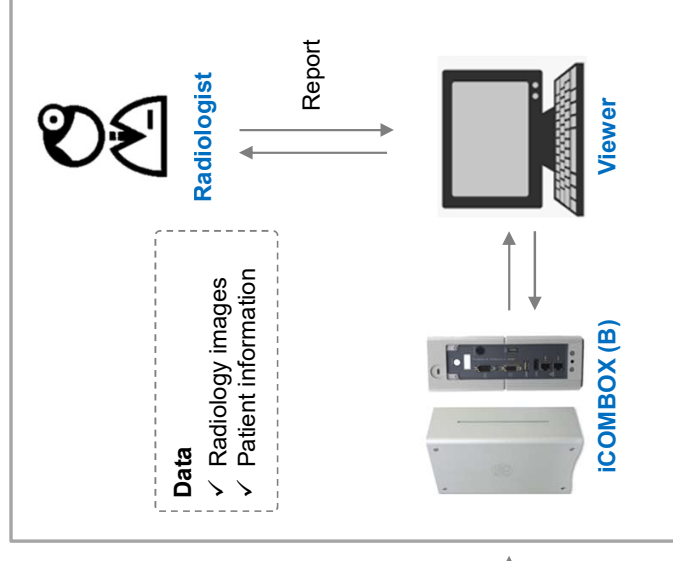
Solution overview	Network infrastructure for remote diagnostic imaging connecting multiple facilities. iCOMBOX (mini-server) enables connection using only ordinary broadband without the need for a VPN line.
PoC location	Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP), house of a doctor who belongs to HCFMUSP
Main users	Doctors who belong to HCFMUSP (radiologists)

■ PoC Flow

Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP)



Radiologist in remote place or his/her house

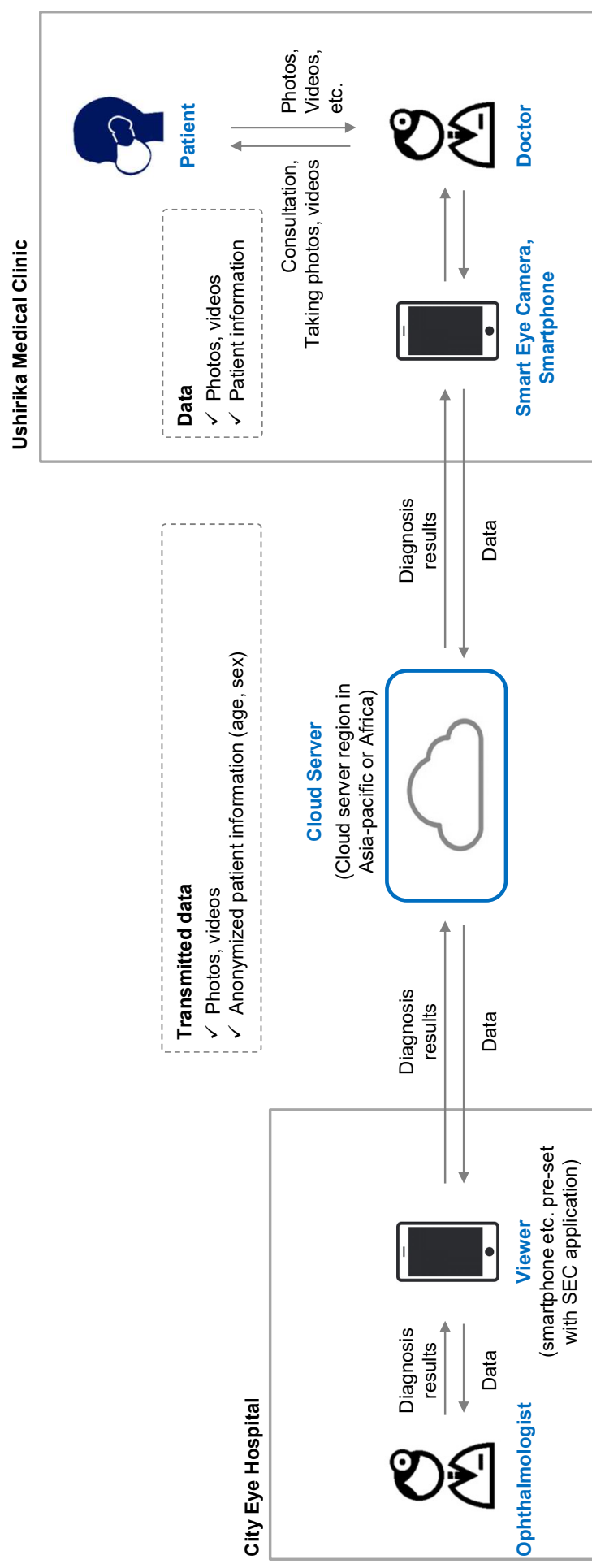


PoC Case Study (Kenya): OUI Inc.

■ PoC Overview

Solution overview	Shooting videos of patients' eyes by using Smart Eye Camera, and enabling diagnosis support in remote places
PoC location	Ushirika Medical Clinic, City Eye Hospital
Main users	Doctor and ophthalmologist in each PoC location, and patients who visit Ushirika Medical Clinic

■ PoC Flow

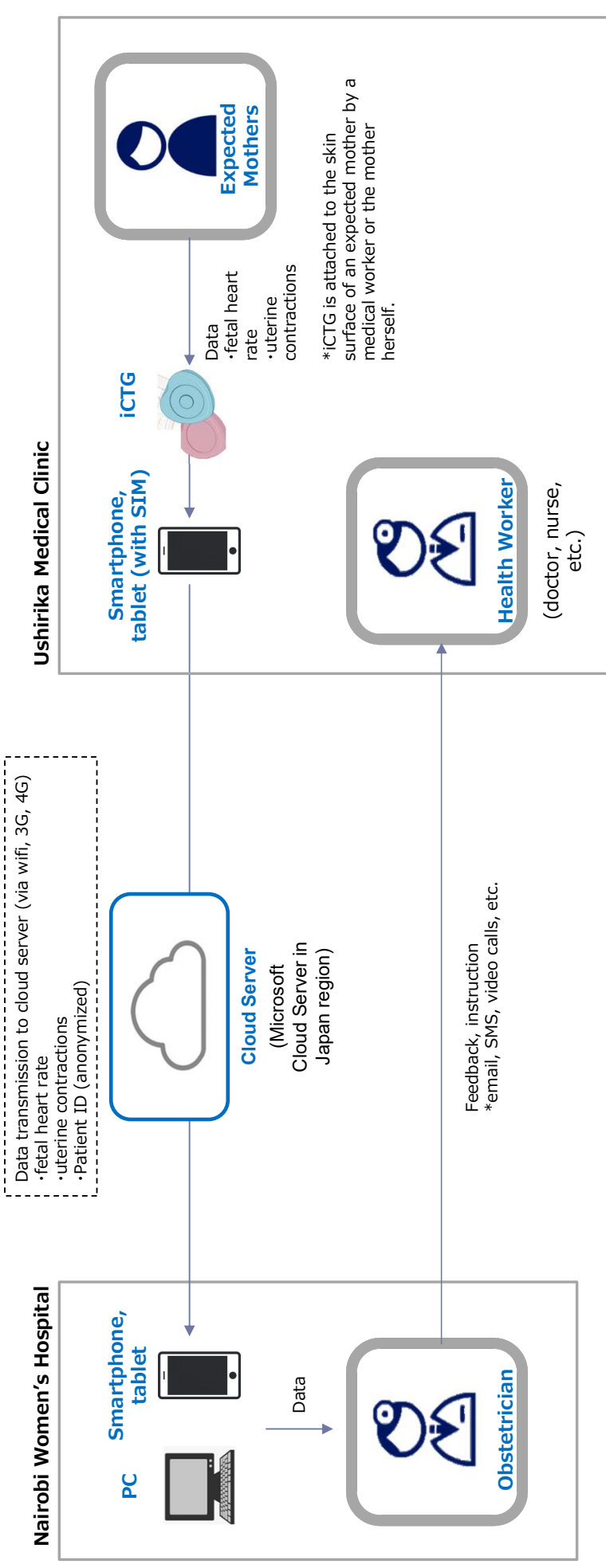


PoC Case Study (Kenya): Melody International Ltd.

■ PoC Overview

Solution overview	Mobile CTG which enables remote examination for expected mothers
PoC location	Ushirika Medical Clinic
Main users	Health workers in Ushirika Medical Clinic, expected mothers who take consultation and examination in Ushirika Medical Clinic

■ PoC Flow

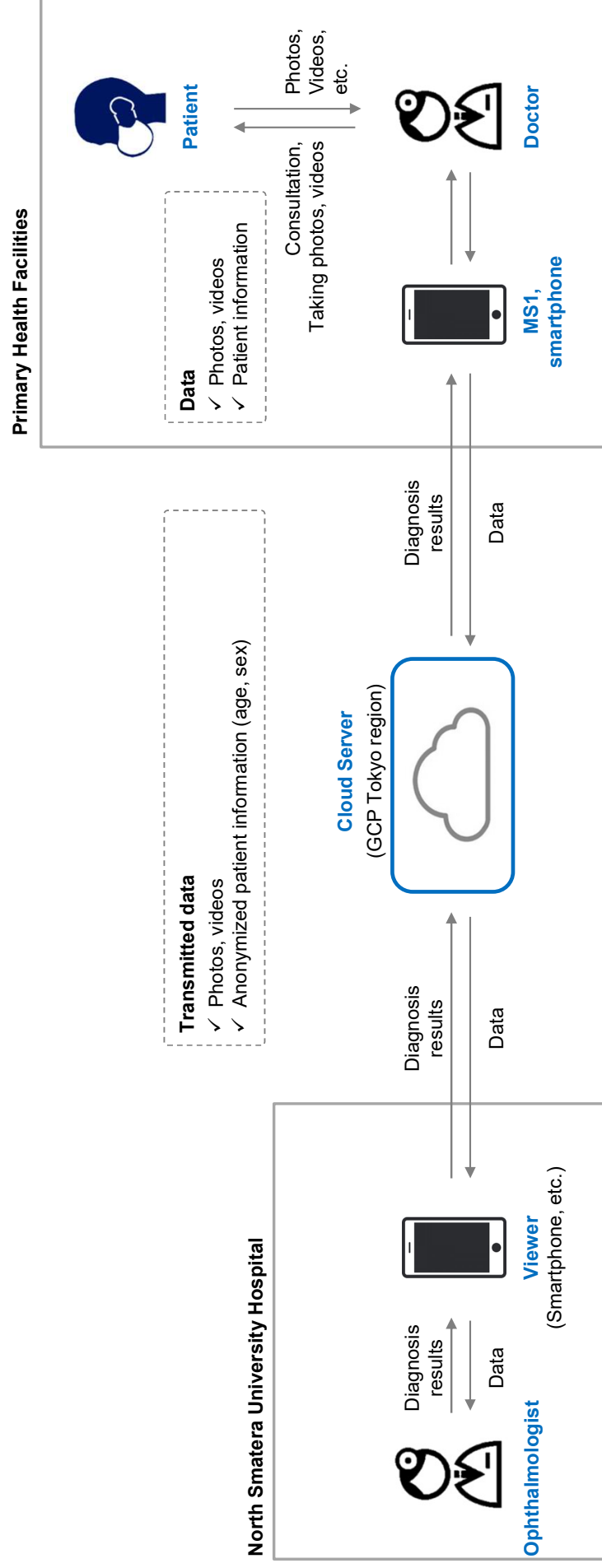


PoC Case Study (Indonesia): MITAS Medical Inc.

■ PoC Overview

Solution overview	Shooting videos of patients' eyes by using MS1, and enabling diagnosis support in remote places
PoC location	North Smatera University Hospital, and 5 primary health facilities under the referral network
Main users	Doctor and ophthalmologist in each PoC location, and patients who visit the primary health facilities

■ PoC Flow

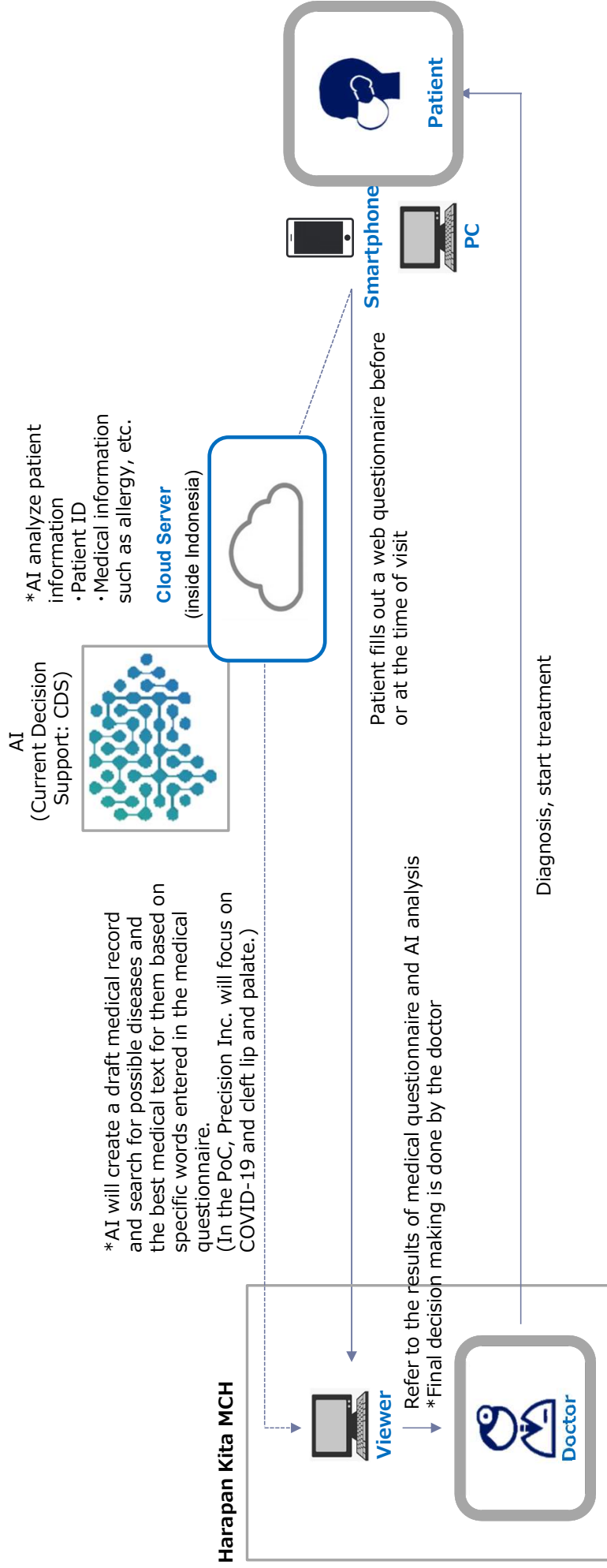


PoC Case Study (Indonesia): Precision Inc.

■ PoC Overview

Solution overview	Web-based medical questionnaire, diagnosis decision support for doctors through AI analysis, display of suitable medical text etc., standardization of provided medical services, etc.
PoC location	Harapan Kita Mother and Children Hospital
Main users	Doctors and patients in Harapan Kita Mother and Children Hospital

■ PoC Flow

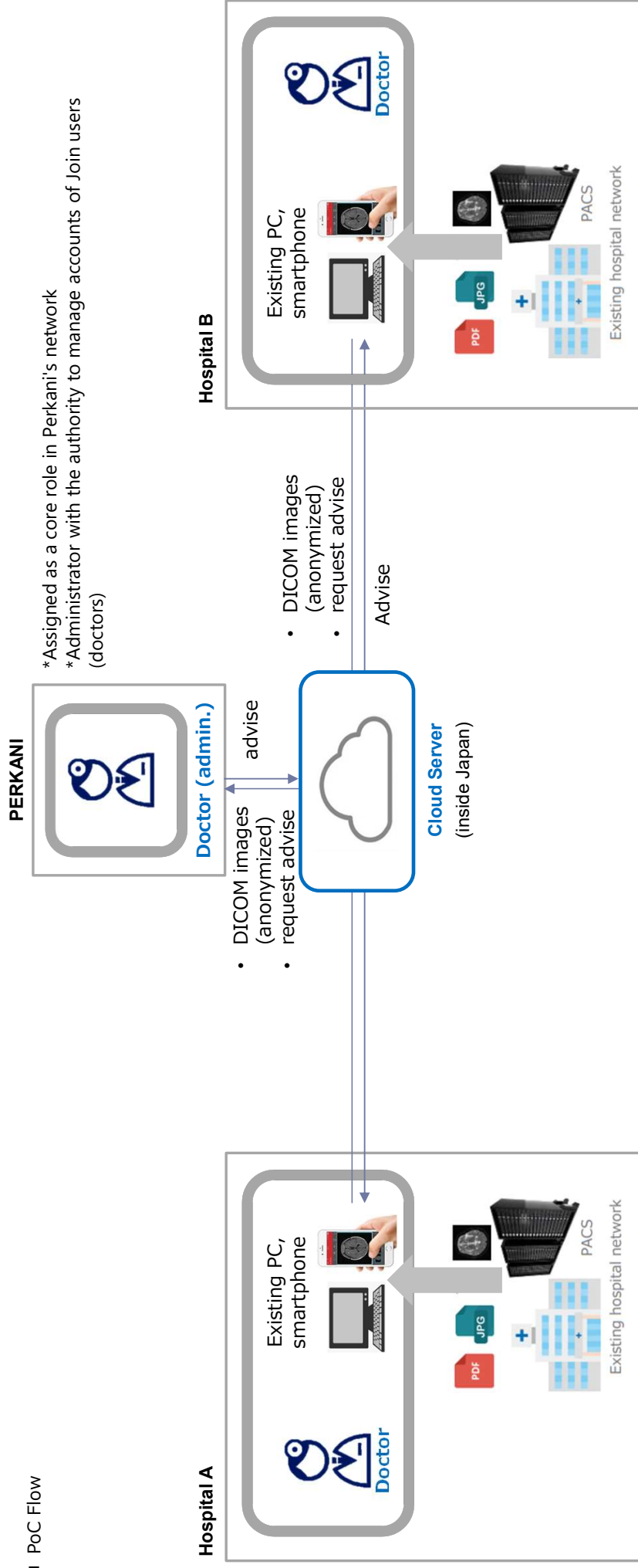


PoC Case Study (Indonesia): Allm Inc.

■ PoC Overview

Solution overview	Remote doctor-to-doctor communication platform by Join
PoC location	Medical facilities which take part in the network under PERMANI
Main users	Doctors who join PERKANI

■ PoC Flow



Summary of Final Report



**Digital
transformation**

Summary of Final Report

February 28, 2022

Data Collection Survey on the Digital Health for the COVID-19 Response

Joint Venture

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I. Outline of the Survey

II. Market Trend of Technologies and Services Related to Digital Health

- Global Digital Health Market and Impact of COVID-19
- Japanese Digital Health Market and Impact of COVID-19

III. – V. Overview of Each Country (Brazil, Kenya, Indonesia)

- A. Perspective of Target Country (Major Macro Medical Issues, Major Micro Medical Issues)
- B. Perspective of Company (Health Tech Map, Future Prospects in the Digital Health Market)
- C. Perspective of JICA (Support Status by JICA, Initiatives to Promote Digital Health by International Organizations and Governments)

VI. Hypothesis Building for JICA's Supporting Measures in the field of Digital Health

- Approaches to Support
- Hypothesis of JICA's Supporting Measures

VII. PoC in Brazil, Kenya, Indonesia

- PoC Proposal and Selection
- Results of Selection
- Assessment of PoC

VIII. Final Proposal of Supporting Measure

- Verification of Hypothesis of the Supporting Measure
- Finalizing the Supporting Measure

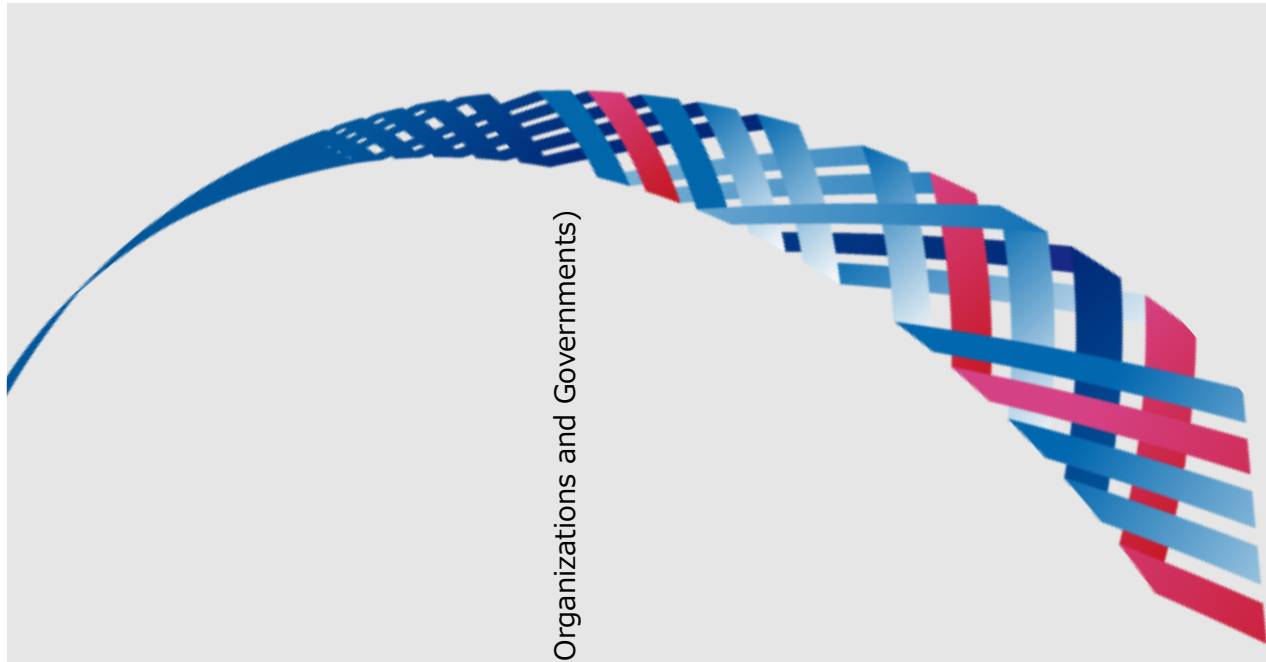


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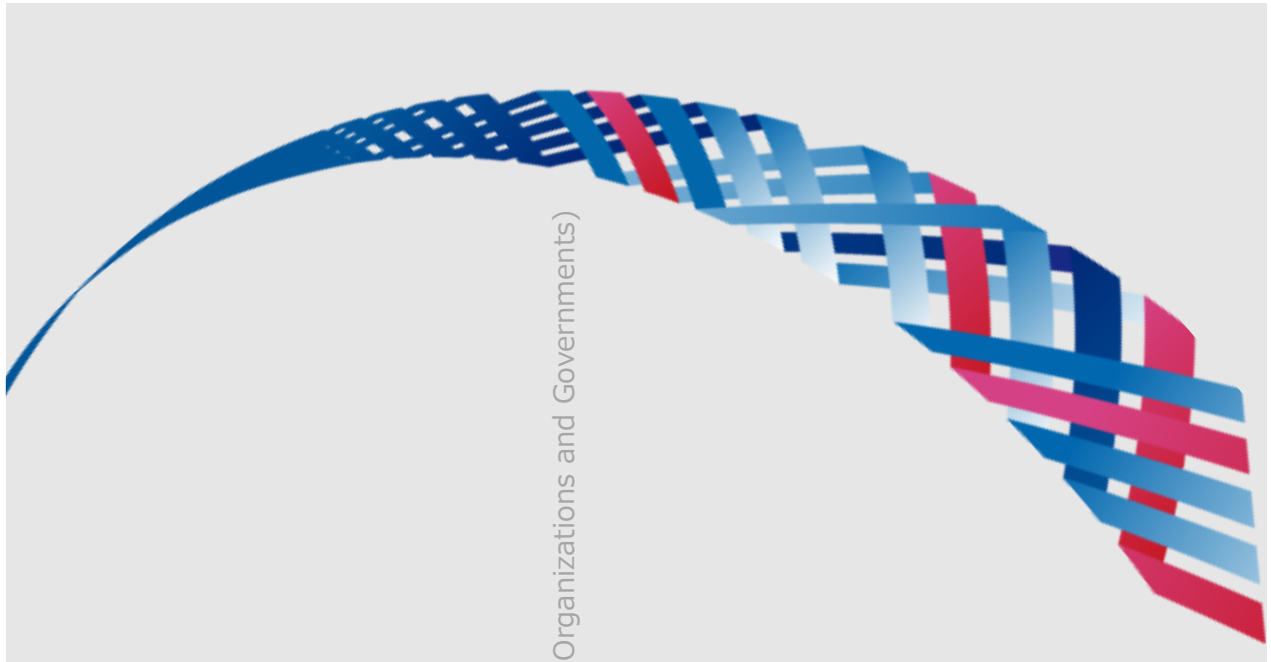
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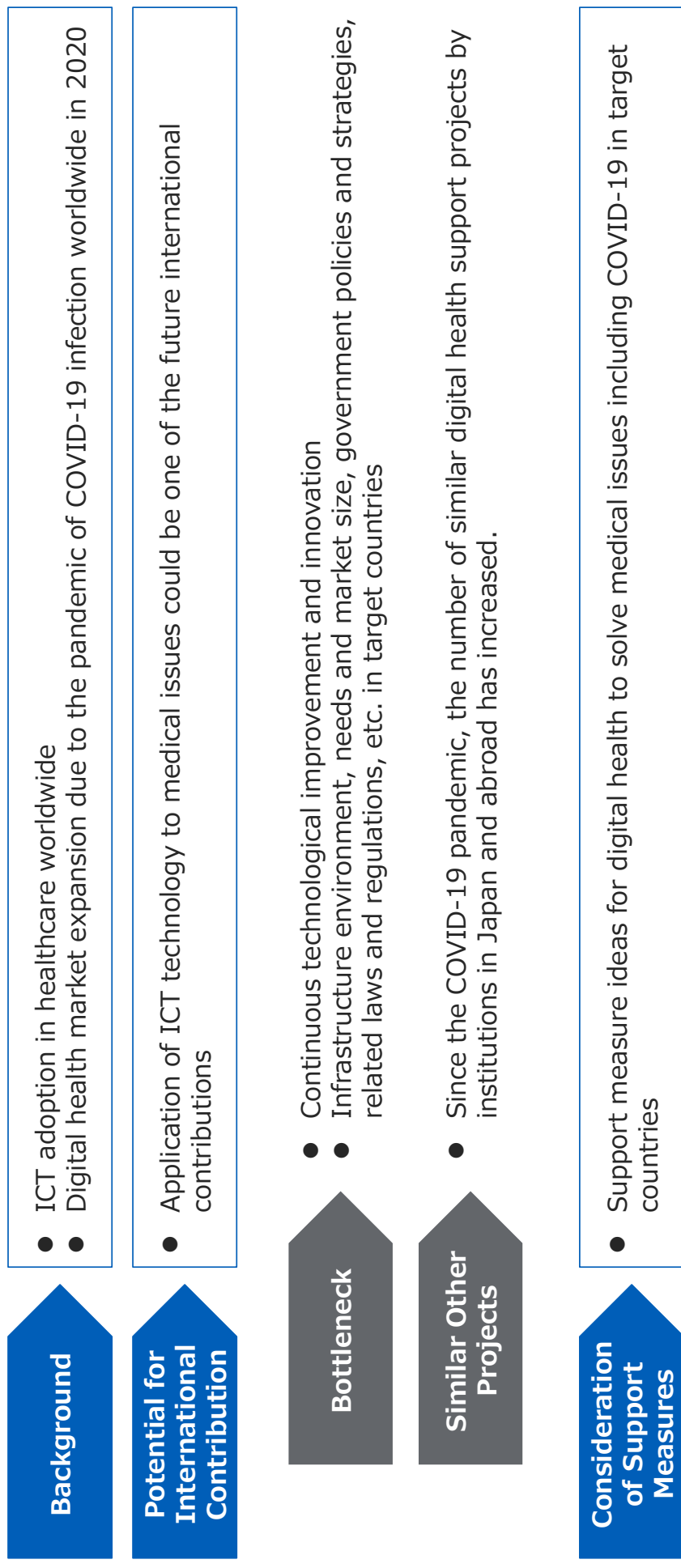
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Background of the Survey



Purpose of the Survey

Subject

What kind of support can JICA provide to partner governments and private companies (including Japanese, local, and third countries) with collaboration and co-creation with various partners to promote digitalization of the health sector and development of the digital health market in order to solve medical issues including COVID-19 in the target countries?

Secondary Questions

B. Perspective of Target Country

- What are the local medical issues?
- What are the digital health needs of the target countries and where are they located (what are the issues that can be solved by digital health)?

A. Perspective of Company

- Where are the markets in the target countries for the digital health technologies of companies (Japanese and local)?
- Are there the needs, environment, etc. to build a realistic and sustainable business model?

C. Perspective of JICA

- What kind of support does JICA plan to provide to the target countries?
- What support other donors implement / consider?

D. Support Idea Design (hypothesis)

- Are there patterns (hypotheses) that match all or any of the interests of companies, target countries, and JICA?
- Is there a gap (e.g. barriers to entry) between A and B (digital health architecture analysis), and what can JICA do to fill the gap?
- How JICA can demonstrate its future presence in the digital health market in Japan and target countries?

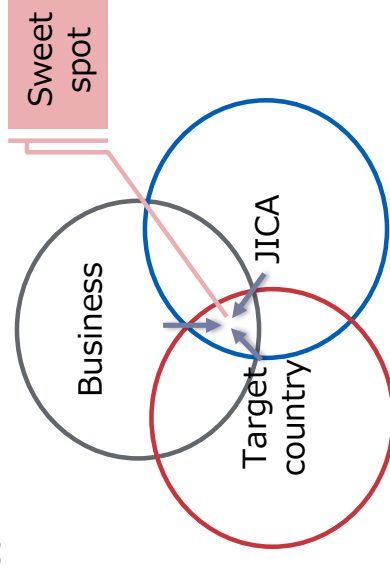
Pilot Activities

Answer. Finalization of Support Ideas

- Seek an answers to Key Question
- Extract challenges related to the implementation of the final plans and arrangement of solution ideas

Verification Step

Secondary questions (A to C) are set to verify the key question (subject). Conduct research on these questions, analyze the area where the ABCs overlap (sweet spot) and the surrounding area, and design what JICA can do (formulate a hypothesis). In order to verify these hypotheses, PoC projects will be implemented. After implementation, the hypothesis and the results will be checked and an answer to the key question (JICA's proposed measures) will be formulated.



Extraction of digital health for medical issues including COVID-19

A. Perspective of Target Countries
[Survey of Health Sector and Medical Facility's Needs/Challenges]

- Health policy and strategy
- **Healthcare system(Referral, Insurance, etc.)**
- Conducting questionnaires/
interviews on medical facilities



B. Perspective of Japanese Company
[Survey of Digital Health]

- Analyzing health tech market
 - **Health Tech Map**
- Related laws and regulations
- Extraction of bottlenecks



C. Perspective of JICA
[Survey of JICA's Assistance Policy and Similar Projects]

- Analyzing past and on-going projects / programs
- **Initiatives by target country governments**
- partners' schemes / activities

Draft ideas of JICA's supporting measures

Implementation of PoC

Evaluation / Analysis

Proposing JICA's supporting measures
(including the possibility of establishing projects)

Schedule of the Survey



- 1 Survey plan and Inception Report preparation ▲
- 2 Market trend survey of digital health contributing to COVID measures
- 3 Market trend survey of digital health in Japan, Interview for Japanese Digital Health Company
- 4 Needs survey on digital health in the 3 target countries (Online Questionnaire)
- 5 Health-Tech Needs Survey Report Preparation ▲
- 6 Survey on policies, laws, regulations related to digital health in the 3 target countries
- 7 Survey on local digital health company, VC and Donner in the 3 target countries
- 8 Progress Report Preparation ▲
- 9 Hypothesis building for JICA's supporting measures in digital health field
- 10 PoC selection, matching with local medical facility.
- 11 Detail design and implementation of PoC
- 12 Verification of the hypothesis and extraction of finalized JICA's supporting measures
- 13 Final Report Preparation ▲

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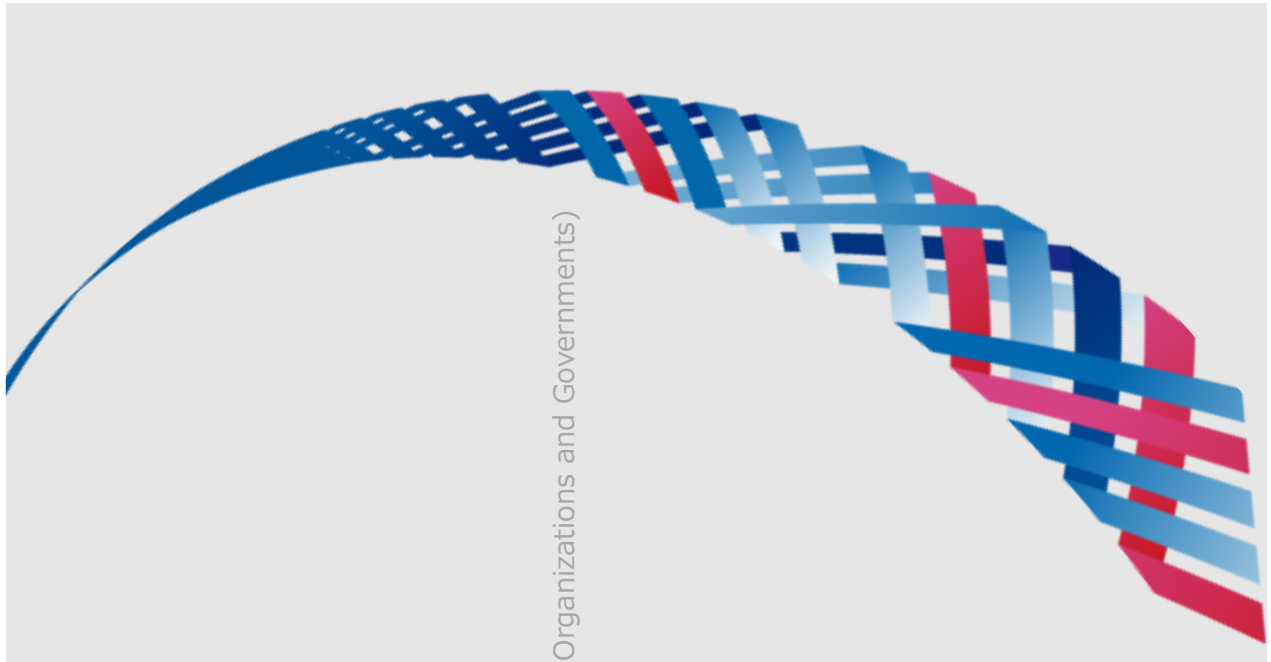
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Global Digital health Market and Impact of COVID-19

Summary Based on the investment market trends, the following digital health areas are expected to grow in the future. In addition to AI and telemedicine, which have been the focus of attention for a long time, mental illness and markets specializing in women are also attracting attention, and progress in digitization in individual domains is expected. At the same time, platform competition will intensify.

■ Future Outlook for the Digital Health Market (Global)

Main Field

1

AI

In the first quarter of 2021, the scale of investment reached US\$2.5 billion (a record high), and the number of deals is on the rise, with 111 deals. Since AI can be used not only to support diagnostic imaging, but also in a wide range of other fields such as drug discovery and applications, the scale of AI investment is likely to grow further as technology develops and big data is accumulated.

Although the impact of COVID-19 on the market may be limited due to the widespread use of the vaccine, it will not return to the level before the spread of COVID-19 infection, and demand is expected to continue over the medium to long term. In particular, there will be continued demand for improved access to medical care in areas where there is a shortage of medical personnel and on islands.

It has been gaining attention in recent years as an area of mental illness prevention and digital medicine (digital therapeutics). The size of the investment market rose from about US\$550 million to about US\$850 million in one quarter from Q4 2020 to Q1 2021, an increase rate of about 1.5 times.

The market that brings together medical apps and products that specialize in improving and managing women's health and providing medical care is likely to grow in the future. Ro, a company that provides women-specific telemedicine and online pharmacy services, has raised US\$500 million in funding for 2021, making it a market that is likely to attract attention in the future.

Companies from various industries are providing platforms in the healthcare sector, and competition is expected to increase in various fields and layers in the future. These include companies with supply chains such as convenience stores and pharmacies, as well as companies that provide digital platforms such as telemedicine and data management. In addition, major tech companies such as Google have entered the market as new entrants in recent years.

New devices utilizing Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR) have appeared, such as surgical operation navigation systems (using AR technology) and pain control technology (using VR technology). Other companies that develop and sell devices such as rehabilitation support and mobility support robots also appeared in the early stage.

2
Tele-medicine

3
Mental Disorders

4
Women's Health and Disease

5
Platform

6
Medical Equipment and Devices

Trend

Main Companies

Strive Health
Valo
Cedar, etc.

Hinge Health
Dispatch
Forward, etc.

BetterUp
Freespira
Akilli, etc.

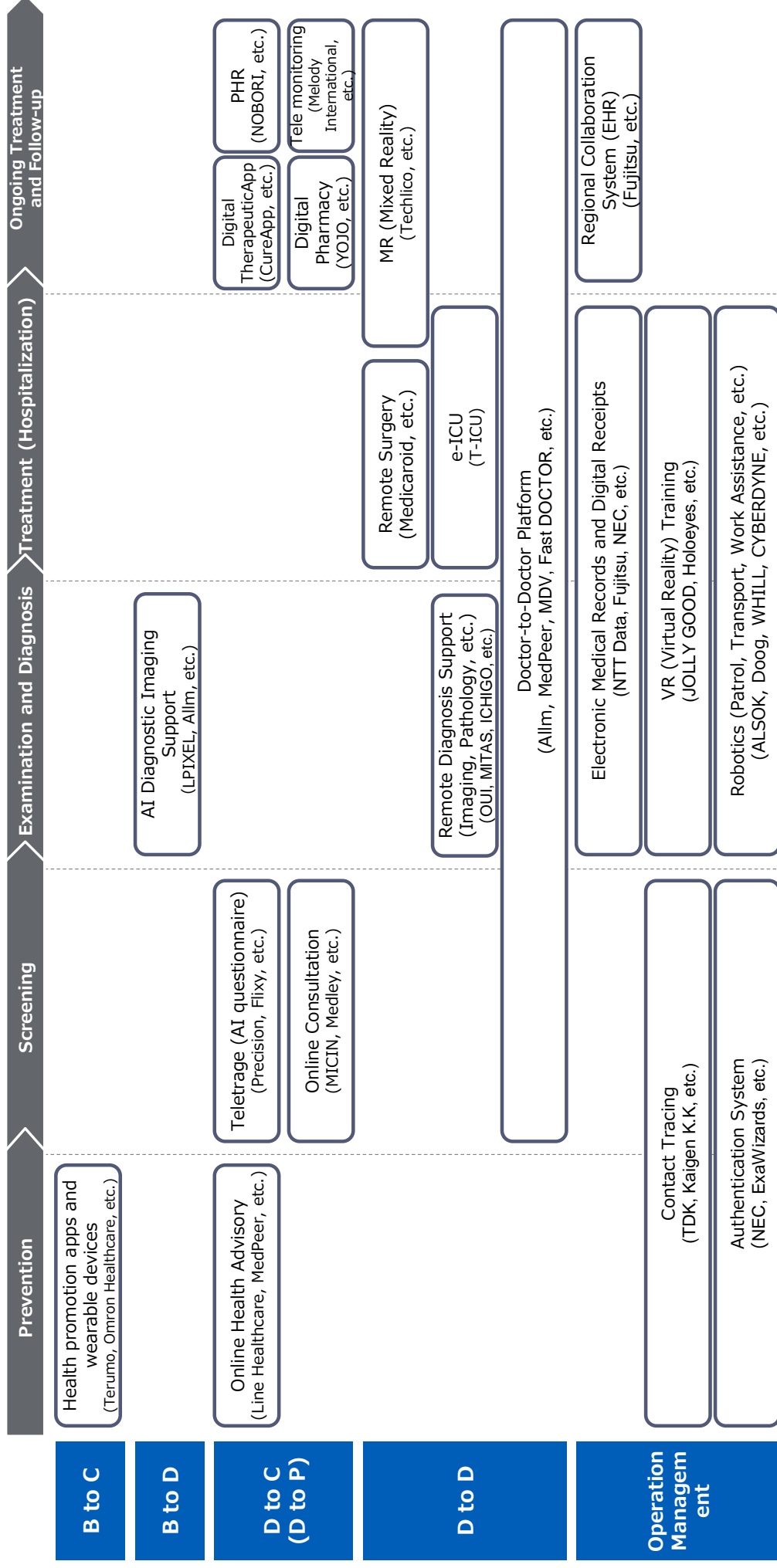
Ro, etc.

Ro
CVS
Google, etc.

Augmedics
Applied VR, etc.

Japanese Digital health Market and Impact of COVID-19

Legend: B ⇒ Business (service providers other than medical facilities), C ⇒ Customers/users (including healthy / unhealthy), D ⇒ Doctors (including medical professionals other than doctors), P ⇒ Patients (after definitive diagnosis)



Japanese Digital health Market and Impact of COVID-19



Digital transformation

In response to major domestic demand (i.e., medical issues), growth potential is expected in the following digital health domains.

Summary

Future Prospects in the Digital Health Market (Japan)

Main Demand

- Addressing uneven distribution of human resources and regional disparities
- Shortage of medical personnel, increased workload
- Dealing with depopulation and uneven distribution of human resources
- Increasing demand for contactless and non-face-to-face against the backdrop of COVID-19

Main Field

1 Automation and Efficiency (AI, etc.)

- Accelerated competition in the development of AI diagnostic imaging support and expansion of disease areas
- Automation of laboratory equipment and drug preparation equipment
- Reduction of workload for medical personnel through AI questionnaires, etc.
- Remote monitoring, automatic alerts, etc. to reduce staffing and workload, etc.

2 Telemedicine

- Permanent deregulation of online consultation (expected by the end of 2021)
- Increased demand for online consultation based on complex information (quality assurance of medical care through the use of remotely accessible devices, etc.)
- Trend toward expansion of application areas to include remote healthcare advisory (prevention), treatment progress and disease management, various types of guidance, and treatment (rehabilitation, etc.)
- Increase in product development using VR and MR
- Japan's surgical robot, HINOTORI, was launched and insurance coverage expanded; NTT docomo and Mediaroid to launch a tele-surgery demonstration experiment using commercial 5G communication for the first time in the world (2021)

3 Individualization

- Increasing health consciousness
- Increased need for post-treatment follow-up, including behavior change

4 Data Linkage and Utilization

- Increased demand for information sharing and management among facilities and personnel (due to increased demand for telemedicine)
- Increased demand for interoperability of personal information (medical information, prescription history, etc.)
- Social security cost containment

Trend

Main Companies

NTT Data
Fuji Film
LPIXEL
(indicating an approximate quote or vague suggestion) or something

medley
MICIN
Line Doctor, etc.

CureApp
suspected
Save Medical, etc.

NOBORI
(indicating an approximate quote or vague suggestion) or something

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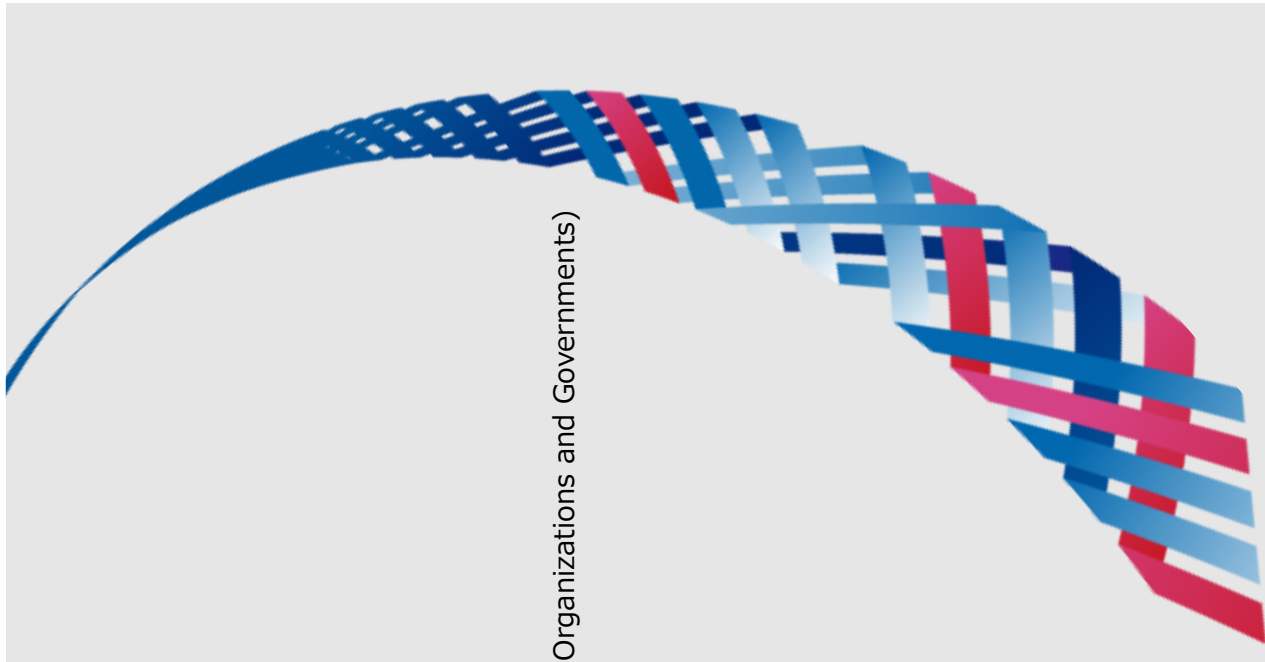
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Perspective of Target Country: Major Macro Medical issues (Brazil)

Summary In Brazil, the proportion of NCDs is high, and a relatively high level of medical services is required. On the other hand, there is a large disparity in healthcare between regions, and healthcare workers are unevenly distributed, so there are still challenges in improving access to quality healthcare.

	Medical Issues (Macro)	Major Government Measures (Policies and Strategies)
Disease Structure	<p>[Basic Health Indicators]</p> <ul style="list-style-type: none"> Life expectancy at birth is improving, and it is estimated that the demand for higher quality medical services will increase in the future. <p>[Maternal and child health-related indicators]</p> <ul style="list-style-type: none"> Under-five mortality, neonatal mortality, and maternal mortality have been improving over the past 20 years. Need for further improvement. <p>[Cause of death]</p> <ul style="list-style-type: none"> Non-communicable diseases (cardiovascular diseases, respiratory diseases, diabetes, etc.) are the main causes of death. 	<p>■ National Health Plan (2020-2023)</p> <ul style="list-style-type: none"> The goal is to ensure an appropriate flow of perinatal and infant care as a response to high quality care and maternal and neonatal mortality. Composed of localized services for cancer, obesity, diabetes medical support, etc. <p>Health promotion strategies related to cardiovascular and respiratory risk factors and risk factor reduction, such as access to health promotion activities and promotion of healthy lifestyles among the population, are recommended.</p>
Quality of Medical Care	<ul style="list-style-type: none"> There is a large disparity in medical care between regions, and issues include primary medical care in rural areas, access to highly specialized medical care, and shortages of medicines and consumables. 	<p>■ National Health Plan (2020-2023)</p> <ul style="list-style-type: none"> It aims to promote the expansion of primary and specialized medical care, improve access to medical care, and reduction of regional disparities.
Medical Service Delivery System	<p>[Number of beds]</p> <ul style="list-style-type: none"> While there has been no significant change in the number of medical institutions, the number of hospital beds per population has been on a gradual downward trend due to population growth, etc. During the pandemic of COVID-19, the shortage of hospital beds became a major problem. <p>[Human resources for health care]</p> <ul style="list-style-type: none"> Over the last 20 years, the number of nurses per 1,000 inhabitants has increased, while the number of doctors has remained almost unchanged. (As of 2018, the number of doctors per 1,000 population was the same level with the average for Latin America and the Caribbean region) <p>[Referral System]</p> <ul style="list-style-type: none"> Ineffective information sharing and coordination among the three levels (federal, state and local government) is not smooth, resulting in inefficiencies in health service delivery and public spending. Information sharing and coordination between the various levels of primary and tertiary care is not smooth, which is a barrier to efficient care delivery. 	<p>■ National Health Plan (2020-2023)</p> <ul style="list-style-type: none"> It aims to promote the expansion of primary and specialized medical care, improve access to medical care, and reduction of regional disparities. <p>■ Supervision and Assessment Plan for Digital Health Activities (PAM&A 2019-2023), Digital Health Strategy 2020-2028 (ESD28), etc.</p> <ul style="list-style-type: none"> Promote Connect SUS program, RNDS (National Network for Healthcare Data), etc. <p>■ Estratégia Saúde da Família</p> <ul style="list-style-type: none"> Policies aimed at integrating and strengthening the primary health care level as the first point of care in SUS

Perspective of Target Country: Major Micro Medical Issues (Brazil)

Summary Based on an online questionnaire survey (n=6) and follow-up interviews conducted with medical facilities, micro medical issues (issues in the medical environment) were extracted for each treatment process. The digital health fields that have the potential to contribute to these issues are shown below as "directions of solutions."

Procedure	Issues in the Medical Environment	Direction of Solution
Prevention	<ul style="list-style-type: none"> Inadequate education and guidance for local residents Few opportunities of pre-consultation for the local residents Many patients visiting hospitals only after their disease symptoms become serious 	<ul style="list-style-type: none"> Promote users' own behavior management and behavior change Behavioral change based on daily biometric data recording, AI analysis, etc. through health promotion apps Establish early contact with healthcare professionals Advice and recommendation for medical consultation by medical professionals at the stage of pre-disease through online
Screening	<ul style="list-style-type: none"> Congestion in outpatient consultation Heavy workload for staff in reception and screening (e.g., handling medical interviews) 	<ul style="list-style-type: none"> Improve operational efficiency through the use of advanced technology AI medical questionnaire, patient transport using automated wheelchair, etc.
Examination and Diagnosis	<ul style="list-style-type: none"> Large number of inspections Shortage or absence of specialists such as radiologists 	<ul style="list-style-type: none"> Collaborate with facilities and personnel outside the hospital Tests at other facilities, sharing results, remote pathology/ radiology, etc. Improving operational efficiency through the use of advanced technology AI image diagnostic support, etc.
Treatment (hospitalization)	<ul style="list-style-type: none"> Congestion in the inpatient wards (insufficient beds in general wards, ICUs, etc.) Clinical pathways have not been introduced and the application rate is low (lack of planned and homogeneous medical care) Heavy workload for staff (biometric data measurement, etc.) 	<ul style="list-style-type: none"> Collaborate with facilities and personnel outside the hospital Remote ICU, etc. Introduction of clinical pathways Introduction of electronic medical records, systematic and homogeneous provision of medical care using clinical paths, etc.
Ongoing treatment and follow-up	<ul style="list-style-type: none"> Insufficient guidance to patients on medication, lifestyle, etc. Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) 	<ul style="list-style-type: none"> Promotes patients' own behavior management and behavior change Management of patients' behavioral records through the use of therapeutic apps, automatic sending of guidance to encourage behavioral change, implementation of remote rehabilitation, etc.
Other (Operations Management)	<ul style="list-style-type: none"> Insufficient coordination of work and information within the hospital (between professions and departments) Insufficient coordination of operations and information outside the hospital (between other facilities) Inadequate education and training of staff (doctors, nurses, technicians, etc.) Inadequate infection control in the hospital (e.g. zoning of infection control areas) 	<ul style="list-style-type: none"> Promotes collaboration by introducing an information coordination framework EHR, PHR, doctor-to-doctor platforms, etc. Provide education and training opportunities using digital health VR training, etc. Zoning, non-face-to-face and non-contact to reduce opportunities for contact with infected patients Zoning of infection control areas, even within existing facilities, with limited staffing Unmanned operations using automatic transfer robots, etc. Access control for specific persons by face recognition Automatic face recognition system to control entry and exit of specific persons and trace their behavioral history, etc.

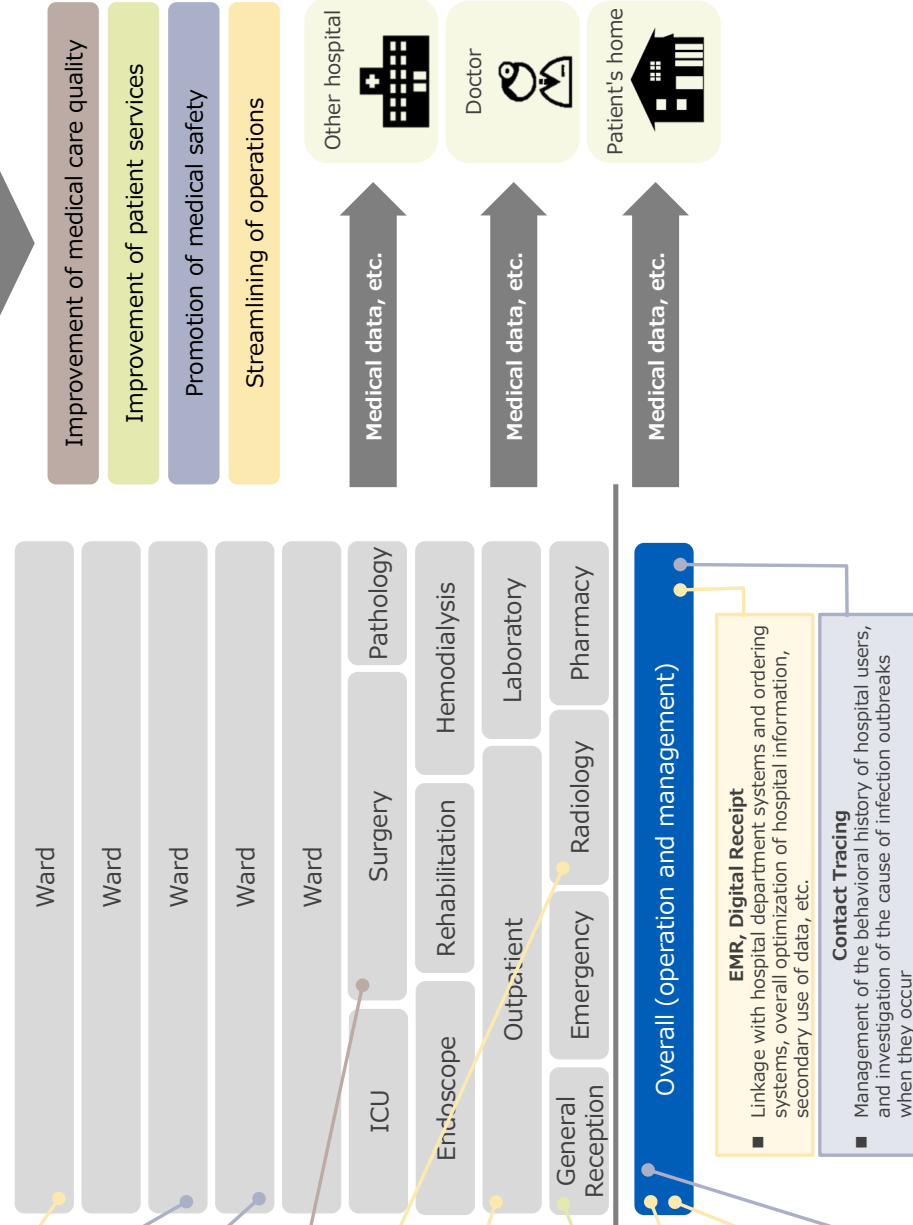
(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Brazil)

■ Image of digital health utilization in hospitals

<Examples of Application>

- **Patient transport using auto-wheelchair**
 - For long-distance transportation in facility (ward - examination room, etc.)
 - Image recognition to avoid hazards such as collisions
- **IoT medical devices / wearable devices**
 - Remote monitoring of devices' operation status, and alerting according to pre-set threshold
- **Patient monitoring sensor**
 - Detection of danger signs, dangerous states and biological abnormalities of patients by sensors
- **MR (Mixed Reality)**
 - Provision of MR-based surgical guides, etc.
- **AI diagnostic imaging support**
 - AI-based diagnostic imaging support for radiologists
- **AI medical questionnaire**
 - Automatic questionnaire for patients coming to the hospital
- **Patient guidance by robot**
 - Robotic non-face-to-face patient guidance
- **Goods transfer by robot**
 - Autonomous robot to transport drugs and specimens
- **Cleaning / disinfection in hospital by robot**
 - Automatic cleaning, disinfection, etc. in the hospital by autonomous robot
- **Authentication system**
 - Management of entry/exit/activity history of specific persons, sorting of persons who meet specific conditions by automatic temperature detection system, etc.

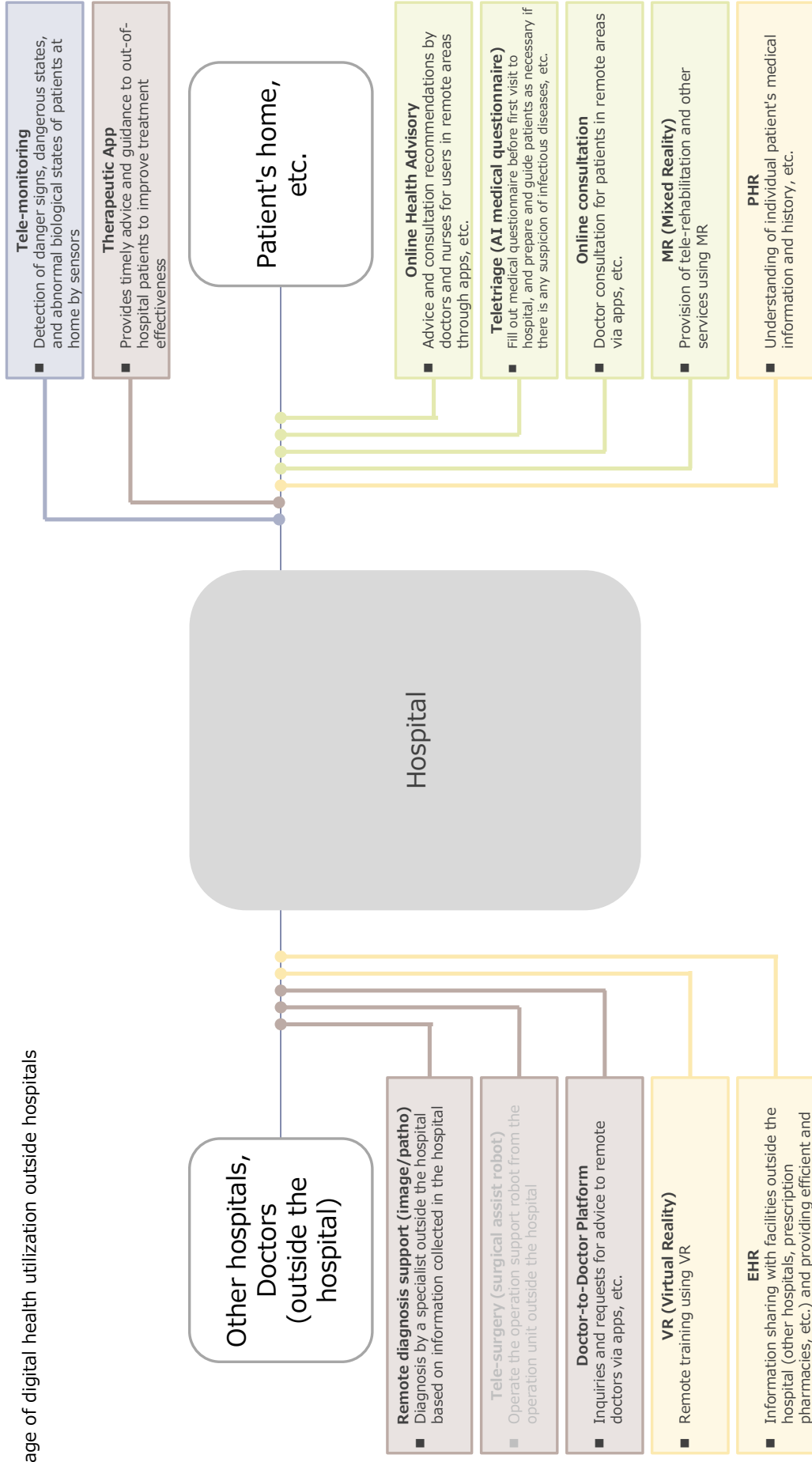
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Proactive use of digital health technology for hospital management

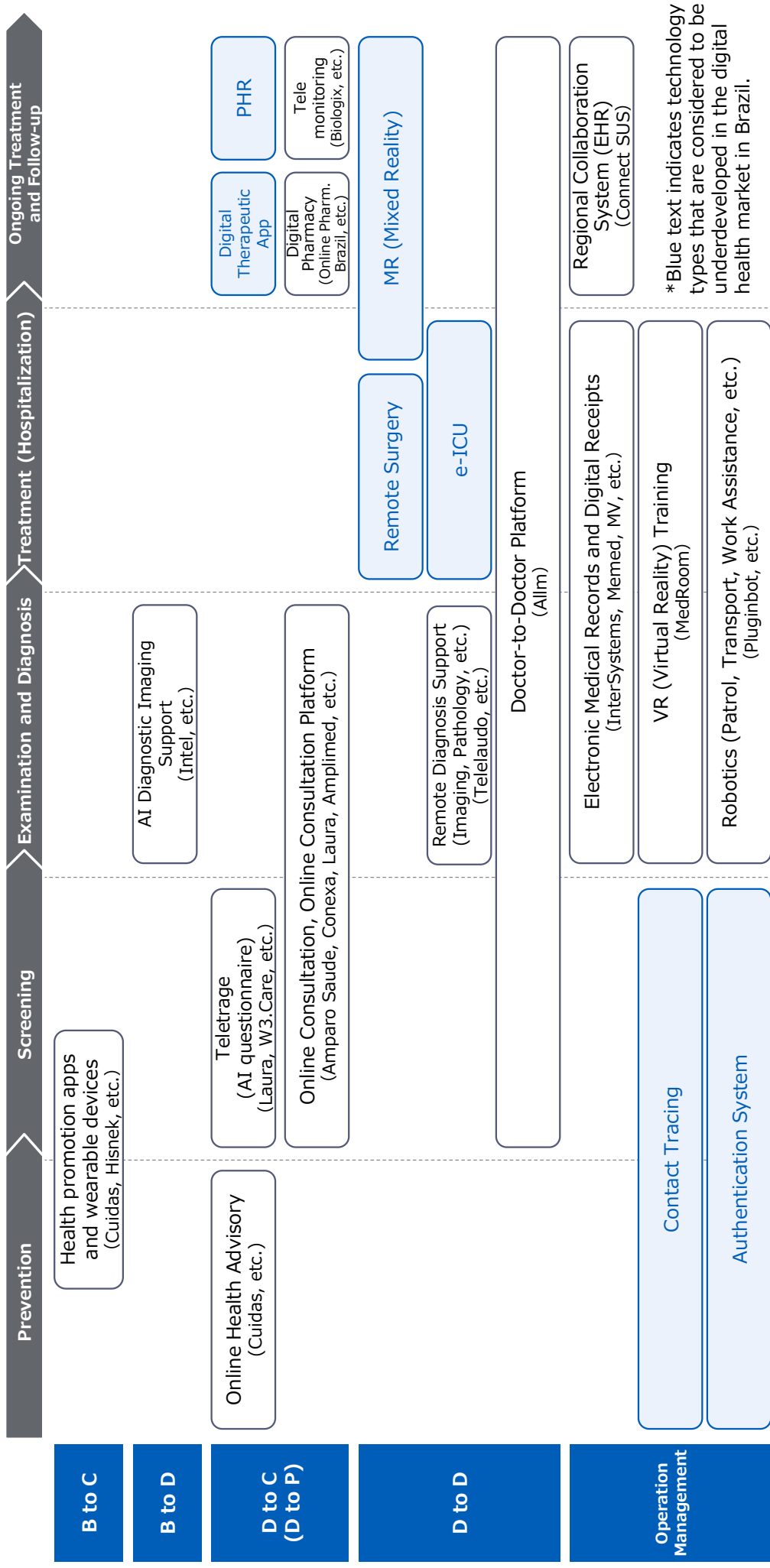
(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Brazil)

- Image of digital health utilization outside hospitals



Perspective of Company: Health Tech Map (Brazil)

Legend: B ⇒ Business (service providers other than medical facilities), C ⇒ Customers/users (including healthy / unhealthy), D ⇒ Doctors (including medical professionals other than doctors), P ⇒ Patients (after definitive diagnosis)



*Blue text indicates technology types that are considered to be underdeveloped in the digital health market in Brazil.

Perspective of Company: Future Prospects in the Digital Health Market (Brazil)

Summary Even before the spread of COVID-19, AI and blockchain had been attracting attention as technologies that could be used in the future for digital health in Brazil, and since the spread of COVID-19, telemedicine, remote monitoring of patients, and interoperability of medical data have also attracted attention.

■ Future prospects in the digital health market (Brazil)

Main Area

1 Big Data, AI, Analytics

With the progress of technological development, more and more data is being generated every year. Big data, AI, and analytics are expected to be utilized in fields such as genomics, precision medicine, diagnostic imaging, and drug discovery, as well as to provide individualized treatments tailored to patients' lifestyles and medical data.

Trend

In the healthcare sector, blockchain, a strong security technology, is expected to be a great precaution against data breaches and contribute to the protection of information in patients and healthcare institutions in the future. The main objective of the Personal Data Protection Law (Lei Geral de Proteção de Dados, LGPD) in Brazil is to guarantee the privacy of personal data by establishing clear rules for the process of collecting, storing, and sharing it. The introduction of blockchain will make it easier to meet the information protection requirements of the LGPD.

2 Blockchain (Privacy and Data Security)

The government has been reluctant to implement telemedicine in the past, but since the spread of COVID-19, the government has temporarily deregulated telemedicine due to the need to combat COVID-19. Regulation No. 467, dated March 20, 2020, permits telemedicine practices on an exceptional and temporary basis for the purpose of taking measures to address public health emergencies of international importance as provided in Article 3 of Law No. 13,9. In addition, the medical insurance system also supports telemedicine.

3 Remote Medicine

According to a report by the National Association of Private Hospitals (Associação Nacional de Hospitais Privados, ANAHP), in addition to telemedicine, remote patient monitoring is also being enhanced in response to COVID-19. Applications, chatbots, and AI-related technologies are being developed and adopted to remotely monitor COVID-19 infected patients. The scale of services providing monitoring solutions is evolving, both in terms of smartwatches and smartphone apps.

4 Remote Monitoring

The government is investing in the establishment of the RNDS to digitize the SUS. This will allow for the efficient use of patient medical information, including electronic health records. The main interoperability challenges in the Brazilian healthcare sector are technology, security and privacy, and cost, although the technical issues have already been partially solved by the adoption of the FHIR model, an international standard.

5 Interoperability

Summary: Potential Digital Health for Micro and Macro Issues and Needs (Brazil)

The following is a list of digital health that indicates the potential solutions to solve the macro and micro medical issues. In addition, for each digital health technology, the number of issues associated with each technology (the scale of the impact), the areas with relatively few competitors as shown in the health tech map, and the future prospects of digital health in Brazil are taken into account to indicate the areas where Japanese companies may enter in the future.

Medical Issue	Direction of the Solution (Digital Health Utilization)	No. of Associated Issues	Market Competition	Prospects (Keywords)	Potential Areas of Entry
Increased demand for higher quality healthcare services	Health Promotion Application	2			
U5MR, NMR and MMR have been improving over the past 20 years. Need for further improvement	Wearable Device	1			
NCDs (cardiovascular disease, respiratory disease, diabetes, etc.) are the main cause of death	Online Health Advisory	3		Remote Medicine	○
Large disparities in medical care between regions, primary medical care in rural areas, access to highly specialized medical care, shortage of medicines and consumables, etc.	Tele-triage (AI Questionnaire)	3		AI	○
Slowly declining trend in the number of hospital beds per population; shortage of beds during the expansion of COVID19 infection	Tele-consultation	4		Remote Medicine	○
The number of doctors has remained almost unchanged	AI imaging diagnosis support	4		AI, Remote	○
Lack of information sharing and cooperation between the various levels of primary and tertiary care	Remote diagnosis support (imaging, pathology, etc.)	5		Remote Medicine	○
Insufficient education for local residents	Doctor-to-Doctor Platform	6		Remote Medicine	○
Few opportunities of pre-consultation for the local residents	Remote Robotic Surgery	1	Low	Remote Medicine	
Many patients come to the hospital after becoming serious	e-ICU (Remote ICU)	4	Low	Remote Medicine	●
Overcrowded outpatient clinic, heavy burden on staff (e.g., handling medical interviews)	Tele-monitoring	5		Remote Medicine	○
High number of tests, shortage of technicians and specialists	Therapeutic Apps	4	Low	AI, Remote	●
Crowded wards (insufficient beds in general wards, ICUs, etc.)	Digital Pharmacy	1		Remote Medicine	
Clinical path not introduced, low application rate (lack of planned and homogeneous medical care)	VR/MR Training	3	Low (MR)	Remote Medicine	●
Heavy burden on staff (biometric data measurement, etc.)	Contact Tracing	1	Low		
Inadequate guidance on medication, lifestyle-related diseases, etc.	Authentication system	1	Low		
Inadequate patient follow-up during and after treatment (regular check-ups, rehab therapy, etc.)	Robotics (Patrol, Guidance, Transport, etc.)	1			
Insufficient coordination of operations and information within the hospital (between professions and departments) and outside the hospital (between other facilities)	EMR (Electronic Medical Record)	2			
Inadequate education and training of staff (Dr., Ns., Technicians, etc.)	PHR (Personal Health Record)	1	Low	interoperation	
Inadequate infection control in the hospital (e.g. zoning of areas)	EHR (Electric Health Record)	2		interoperation	

Notes : ○ Area of potential, ● Area of particular potential with few competitors

Perspective of JICA: Status of JICA Support (Brazil)



Summary Brazil is approaching the stage of "ODA Graduation" according to the World Bank standards, and there has been no paid or grant assistance by JICA in the healthcare sector in recent years. The smart health care dissemination project implemented by JICA in the private sector is expected to have relevance and potential for collaboration with this project.

- JICA's support approaches and programs in the health sector (Extracted items that end in 2015 or later)

	Healthcare Sector (No description)	ICT Sector (No description)	COVID-19 Measure (No description)
Country Assistance Policy (Priority Areas)			
Technical Cooperation	<ul style="list-style-type: none"> Project to strengthen research and reference cooperation between Brazil and Japan on the diagnosis of fungal infections, including drug resistance (August 2017 - August 2022) 	<ul style="list-style-type: none"> Pre-2015 projects <ul style="list-style-type: none"> ITS Master Plan Research Project (March 2012 - June 2013) Project on Strengthening Organizational Capacity against COVID-19 (R/D signed on September 21, 2021) 	
Official Development Assistance Loans			
Official Development Assistance Grants			
Public-Private Partnerships	<ul style="list-style-type: none"> Case study on pressure ulcer (bedsore) prevention using high-function mattresses for medical and nursing care (October 2017 - December 2018) Basic Survey on Improving the Medical Environment Using Mobile Medical Vehicles and Used Medical Equipment (April 2018 - February 2019) Smart Health Care Promotion Project in Curitiba City to Combat Lifestyle-related Diseases (June 2014 - March 2015) Project to promote the use of transradial artery catheterization for the treatment of ischemic heart disease (April 2014 - March 2016) Project to promote the spread of medical collaboration using PACS-based remote diagnostic imaging technology (March 2017 - March 2019) Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening measures against infectious diseases and improving nutrition) (October 2020 - March 2021) Information collection and confirmation survey on matching of demand from developing countries and private sector technologies for global healthcare and welfare (aging and nursing care) (June 2021 - March 2022) 		<ul style="list-style-type: none"> Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening measures against infectious diseases and improving nutrition) (October 2020 - March 2021) *Represented

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

Summary In terms of investment in research and development related to digital health, the contribution of the private sector is still low in Brazil, the state taking initiative. The following are some of the leading international organizations for the promotion of digital health in Brazil

■ Typical donors and their main support for the digital health (Brazil)

Donor	Main Support
<p>PAHO (Pan American Health Organization)</p>	<p>It is the Regional Office for the Americas of WHO, founded in 1902, and is the specialized health agency for the Americas. It has a technical team dedicated to projects focused on innovation and strengthening of the healthcare industry, and has the following activities in Brazil</p> <ul style="list-style-type: none"> • Promotion of innovation and technology transfer in public and private research institutes responsible for the production of pharmaceuticals and technology development • Strategic management of the health industrial economic complex • Encouragement of technological development for SUS and support for its dissemination to the public • Support for research and development independent of overseas markets • Strengthen the country's capacity to regulate medical technology and implement cross-cutting activities to drive development and innovation of medicines and services • Promoting the dissemination of information on the health economic industrial complex
<p>IDB (Inter-American Development Bank)</p>	<p>It works to promote trade and regional integration as well as socioeconomic development in Latin America and the Caribbean. It has implemented several projects related to digital health in Brazil.</p> <ul style="list-style-type: none"> • Open innovation in the health sector related to COVID-19 • Laura Digital Emergency Department (Laura Digital ED) with Artificial Intelligence (AI) • Allim: Cross-border Telemedicine to Strengthen Responses to COVID-19 with an Existing Digital Health Solution for Stroke Care • NeuralMed: Detection of Covid-19 Pulmonary Alterations on Chest X-rays using Artificial Intelligence
<p>World Bank</p>	<p>Based on the Country Partnership Framework, efforts have been focused on the following three pillars</p> <ul style="list-style-type: none"> • Improving financial sustainability and service delivery: financial support, including pensions and social protection schemes; improving the efficiency of public services in the education and health sectors • Productivity growth and private sector investment: reducing regulatory barriers and promoting competition, investing in infrastructure • Inclusive and sustainable development: promoting global partnerships, supporting national defined contributions

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

The main initiatives to promote digital health implemented by international organizations in Brazil are as follows

Summary

- Co-creation and collaboration among donors on the promotion of digital health (Brazil)

Program	Organization	Main support
Open innovation in the health sector related to COVID-19	IDB (Inter-American Development Bank) InovaHC, etc.	With the aim of supporting Idea.Gov, the open innovation program of the Government of the State of São Paulo, and in partnership with InovaHC and IPT, the project will identify challenges, solicit and select proposals, and finance technology solutions to address healthcare needs in the COVID-19 disaster and validation.
Laura Digital Emergency Department (Laura Digital ED) with Artificial Intelligence (AI)	IDB (Inter-American Development Bank)	Support for screening and other in-hospital processes to avoid crowding and unnecessary visits to the emergency room.
Allm: Cross-border Telemedicine to Strengthen Responses to COVID-19 with an Existing Digital Health Solution for Stroke Care	IDB (Inter-American Development Bank)	Based on an existing mobile application for stroke, develop a digital communication platform focused on dealing with COVID-19 and other acute patients in Brazil. The project leverages Japanese knowledge and experience in COVID-19.
NeuralMed: Detection of Covid-19 Pulmonary Alterations on Chest X-rays using Artificial Intelligence	IDB (Inter-American Development Bank)	AI is being used to analyze chest X-ray images to help make more accurate diagnoses in patients with suspected COVID-19.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

Summary The following is a list of major initiatives to promote digital health in Brazil by the domestic government and institutions. Domestic policies range from direct support for scientific research to tax incentives and subsidies for start-up companies.

■ Government Initiatives

Institutions, Programs, etc.

StartupsCovid19

Main support

The Ministry of Economy has invited the StartupsCovid19 campaign, launched by Comunidade Governança & Nova Economia (Gonew.co) with the support of the Brazilian Startups Association (Astartups), to Brazilian startups with innovative solutions to combat the COVID-19 crisis are invited to share their knowledge and projects in areas such as infection prevention, treatment and technological solutions for remote work.

UAITEC

Seeking solutions to analyze the financial support. The Government of the State of Minas Gerais is mapping innovative projects and ideas of companies and scientific, technological and innovation institutions located in the State of Minas Gerais that promote solutions to fight the spread of COVID-19 and overcome the social and economic losses caused by it, in order to obtain financial support. The project attempts to.

IdeiaGov

Technological Challenges Against Covid-19

It aims to select innovative solutions to solve specific challenges faced by public health institutions in the fight against COVID-19. Promoted by the Ministry of Economic Development and Impact Hub, IdeiaGov's fight against COVID-19 is being carried out in collaboration with various government agencies, including the São Paulo State Health Department, the Clinica Hospital of the University of São Paulo's Faculty of Medicine, the Institute of Technology (IPT) and the São Paulo Data Processing Company (PRODESP).

InovaSUS

An initiative of the Ministry of Health, coordinated by the Department of Health and Labour Management and Regulation (Degerts) of the Department of Labour Management and Health Education (SGTES), it aims to identify, recognise and evaluate innovative practices in health and labour management.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

■ Other initiatives (1/3)

Organization, Programs, etc.	Main support
Get off the paper	With the support of the Startup Rio Program, the Accelerator is launching the Solutions to COVID-19 challenge, which aims to encourage quick, viable and effective solutions to the problems caused by COVID-19.
Tecnopuc, PucRS-Ideia	It provides labs to support solutions on COVID-19.
Rio Startup RIO	Startups with solutions already under development for COVID-19 measures are invited to an acceleration program with special mentoring to help them improve and complete their projects.
COVID-19 Task Force - Brazil Lab	The COVID-19 Task Force aims to accelerate digital technologies that support the challenges facing government in the areas of public sector digitization, education and productivity.
Inovativa Brasil	In partnership with ABStartups, it organizes weekly demo days aimed at presenting the startups' solutions to institutions such as the Ministry of Health, Ministry of Economy, MCTIC, BNDES, Embrapii, Finep, ABDI and Banco do Brasil.
GROW+ Aceleradora de Startups	GROW+ An online hackathon conducted by Aceleradora de Startups, Grow+ is an online-only event that seeks structural ideas to mitigate the impact of COVID-19 on society.
Shell Iniciativa Jove	An acceleration program for technology startups in the areas of energy, smart cities and the fight against COVID-19, launched by Shell Brazil.
Abimed	it works with public health agencies to promote the implementation of policies and regulations that allow the public to have rapid access to new technologies and innovations in an ethical business environment.
Brazilian Association of Healthcare Startups	It was founded in 2016 with the goal of empowering entrepreneurs to join forces to develop their vision of transforming healthcare through technology.
Medical Valley	The organization, which originated in Germany and was brought to Rio Grande do Sul, aims to improve the health sector by creating synergies between the players that make up the ecosystem.
Empreendeda Saúde Award	Evaluate projects in terms of their potential to contribute to the improvement of practices, processes, technologies and management methods in the health sector; and promote solutions that affect the efficiency of health networks, patients and hospitals.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

■ Other initiatives (2/3)

Institutions, Programs, etc.	Main support
Inova HC District (São Paulo/SP)	A health complex and innovation hub that aims to bring together start-ups, large companies, investors and researchers.
Cubo Health (São Paulo/SP)	Bringing entrepreneurs, large corporations, investors and universities together in one place to discuss technology, innovation, new business models, new ways of working and how to challenge the status quo.
Biominas (Belo Horizonte/MG)	An innovation hub focusing on projects and companies in biotechnology, healthcare and information technology.
ICC Biolabs (Fortaleza/CE)	An innovation hub that aims to educate and inspire entrepreneurs to develop advanced technologies and solutions for the healthcare market, with a focus on improving the quality of human life.
Hub Mandic (Campinas / SP)	An initiative of Faculdade São Leopoldo Mandic, an innovation hub that fosters and supports the connection between the fields of science, innovation and technology and the medical sector.
Open D'Or Hub (Rio de Janeiro/RJ)	A platform to connect innovative startups with stakeholders from the ecosystem, corporations, investors and the academic health sector
BioTech Town (Minas Gerais)	A center dedicated to the development of companies, products and businesses in the field of biotechnology and life sciences
FAPESP	He directs research initiatives to combat COVID-19 and provides funding to encourage small and medium-sized businesses to develop projects that bring innovation to the diagnosis and treatment of patients.
Super challenge 100 Open Startups COVID-19	Emerging companies and the scientific community are now able to quickly and effectively confront the COVID-19 crisis and present and deliver solutions to reduce its impact as much as possible.
ENAP	Four challenges have been launched to confront COVID-19. With a total prize pool of R\$400,000, divided into two categories, individual and corporate, the Covid-19 Challenges were launched by BNDES, IDB, the Federal Audit Office, Flacso, the United Nations Development Programme (UNDP). Covid-19 Challenges is an outcome of Enap, supported by BNDES, IDB, Federal Audit Office, Flacso, UNDP.
CAPES	This action will allocate R\$ 200 million over the next four years to projects that directly or indirectly deal with work related to COVID-19 research. In addition to the amount envisaged in the scholarship concession model, 2,600 scholarships will be awarded, providing funding and capital for up to 30 studies at a maximum of R\$ 345,000 per project.
MCTIC / CNPq / FNDCT / MS / SCTIE / Dedit No.07/2020	Research to fight COVID-19, its consequences and other severe acute respiratory syndromes It will be launched in April 2021 and envisages the selection of proposals in the following themes: treatment, vaccines, diagnosis, etiology and natural history, burden of disease, health care, prevention and control CNPq received 2,219 proposals from all units of the Federation.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Brazil)

■ Other initiatives (3/3)

Institutions, Programs, etc.	Main support
Super challenge 100 Open Startups COVID-19	Companies of all sizes, government agencies, and civil society are presenting their demands so that emerging companies and the scientific community can quickly and effectively confront the COVID-19 crisis and present and deliver solutions to mitigate its impacts as much as possible.
SaúdeTechPR	An initiative of the Innovation Oversight Office of the Civic Institute and the Araucaria Foundation, it aims to promote the COVID-19 diagnosis, prevention and containment project, developed jointly by the Senai Institute of Technology and Innovation of the State of Paraná and companies and startups.
Vale + Einstein + Mater Dei	Vale, in collaboration with Albert Einstein Hospital and Mater Dei Health Network, is providing US\$1 million to expand its solutions to combat COVID-19.
First National Digital Project Contest "Use of Technology in the Fight against COVID-19" Brazilian Society for Medical Informatics (SBIS)	Under the theme "Use of Technology in the Fight Against COVID-19", the first National Digital Project Contest was held. The aim of the contest was to focus on the fight against COVID-19, to encourage high quality innovation in digital projects in the spread of infection, to stimulate the development of talent and to reward outstanding work in digital health.
Taking care of those who care for us	The program is the result of a partnership between Johnson & Johnson Brazil, Moodar, Distrito and Vitalk, whose mission is to provide spiritual support to health professionals who dedicate their lives to helping others. with Moodar's psychologists. Online therapy consultations and unlimited text chats via Vitalk, an AI-powered platform for solving mental health problems, offer tips and self-care exercises.

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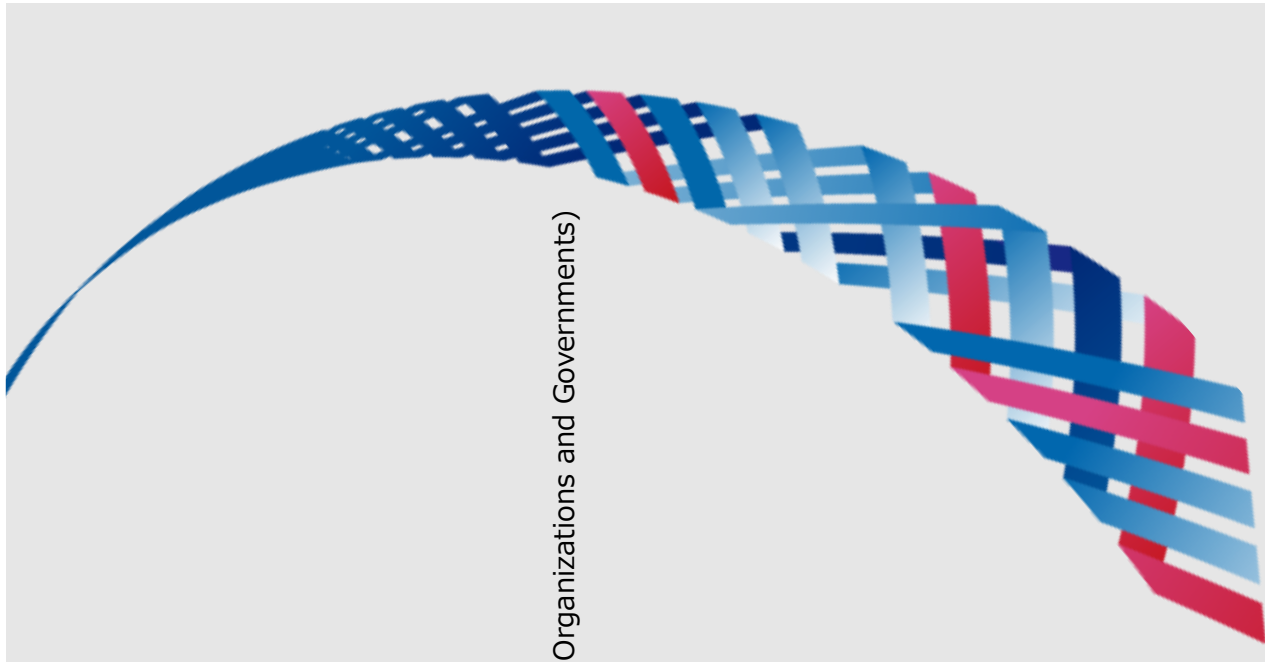
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Summary Kenya still has a high rate of communicable diseases, but the rate of non-communicable diseases has been on the rise in recent years, and the overall level of primary to tertiary health care is inadequate, so there may be local demand for technologies that can provide diagnosis and treatment, especially at the primary level.

	Medical Issues (Macro)	Major Government Measures (Policies and Strategies)
Disease Structure	<p>[Basic Health Indicators]</p> <ul style="list-style-type: none"> Life expectancy at birth improved compared to the sub-Saharan Africa regional average. <p>[Maternal and child health-related indicators]</p> <ul style="list-style-type: none"> The under-five mortality rate, the neonatal mortality rate, and the maternal mortality rate are high compared to the average for the region in which the other target countries are located. In particular, the high under-five mortality rate is largely due to communicable diseases, which are thought to be caused by lack of infrastructure and barriers to access to medical care. <p>[Cause of death]</p> <ul style="list-style-type: none"> The proportion of deaths from infectious diseases, mainly HIV/AIDS, is the highest, but the proportion from non-infectious diseases (cerebrovascular disease, ischemic heart disease, diabetes, cancer, etc.) is increasing. 	<p>Kenya Health Policy (2014-2030)</p> <ul style="list-style-type: none"> Maternal and child health, nutrition, control of infectious diseases, enhancement of measures against NCDs, provision of essential health services, promotion of public-private partnerships, etc. The policy issues to achieve these goals are health financing, governance (leadership), pharmaceuticals and technology, health information, human resources for health, service delivery systems, infrastructure development including the development of digital health, and the enhancement of research and studies. <p>KHSSP (2018-2023)</p> <ul style="list-style-type: none"> Priority disease areas include diarrhea, HIV/AIDS, malaria, tuberculosis, hypertension, diabetes, etc. <p>KHSSP (2018-2023)</p> <ul style="list-style-type: none"> The aim is to correct regional disparities through decentralization and to provide equitable health services to all citizens. <p>Kenyan National e-Health Policy (2016-2030)</p> <ul style="list-style-type: none"> Aiming to improve the quality of medical services through the use of ICT. <p>KHSSP (2018-2023)</p> <ul style="list-style-type: none"> The aim is to correct regional disparities through decentralization and to provide equitable health services to all citizens. Focus on supporting infrastructure development and enhancing ICT in the medical field. <p>Kenya Health Policy (2014-2030)</p> <ul style="list-style-type: none"> The goal is to improve health human resources and service delivery systems.
Quality of Medical Care	<ul style="list-style-type: none"> Under decentralization, each local government has different priorities and inter-county disparities exist. The quality of health care delivery is low, and human resources, drugs, and supplies do not meet basic standards. 	
Medical Service Delivery System	<p>[Number of beds]</p> <ul style="list-style-type: none"> The number of hospital beds per 1,000 population in 2010 was 1.4. In particular, the ICU has a usage rate of about 94%, and the number of beds available for advanced medical care is insufficient. <p>[Human resources for health care]</p> <ul style="list-style-type: none"> In 2018, the number of doctors and nurses/midwives per thousand population was 0.2 and 1.2, respectively, which is significantly insufficient for 4.45 (minimum SDG Index and WHO standard). <p>[Referral System]</p> <ul style="list-style-type: none"> County governments take the lead in strengthening referrals between communities, primary and secondary health care facilities. <p>[Health Financial Management]</p> <ul style="list-style-type: none"> Public health insurance coverage is low. 	<ul style="list-style-type: none"> Expansion of primary medical care system by building Primary Care Network Establishment and dissemination of planning, budgeting and evaluation management methods in primary and secondary medical facilities Improving efficiency through health financing reform Encourage informal sector membership Compulsory enrollment and free medical care for the poor, middle and high school students, the disabled, and the elderly

Perspective of Target Country: Major Micro Medical Issues (Kenya)

Summary Based on an online questionnaire survey (n=15) and follow-up interviews conducted with medical facilities, micro-medical issues (issues in the medical environment) were extracted for each treatment process. The digital health fields that have the potential to contribute to these issues are shown below as "directions of solutions."

Procedure	Issues in the medical Environment	Direction of Solution
Prevention	<ul style="list-style-type: none"> Inadequate education and guidance for local residents Few opportunities of pre-consultation for the local residents Many patients visiting hospitals only after their disease symptoms become serious 	<ul style="list-style-type: none"> Promote users' own behavior management and behavior change Behavioral change based on daily biometric data recording, AI analysis, etc. through health promotion apps Establish early contact with healthcare professionals Advice and recommendation for medical consultation by medical professionals at the stage of pre-disease through online
Screening	-	-
Examination and Diagnosis	<ul style="list-style-type: none"> Shortage or absence of specialists such as radiologists 	<ul style="list-style-type: none"> Collaborate with facilities and personnel outside the hospital Tests at other facilities, sharing results, remote pathology/ radiology, etc. Improving operational efficiency through the use of advanced technology AI image diagnostic support, etc.
Treatment (hospitalization)	-	-
Ongoing treatment and follow-up	<ul style="list-style-type: none"> Insufficient medicines for patients 	<ul style="list-style-type: none"> Pharmaceutical supply by ICT Digital pharmacy, etc.
Other (Operations Management)	<ul style="list-style-type: none"> Insufficient coordination of operations and information outside the hospital (between other facilities) Inadequate education and training of staff (doctors, nurses, technicians, etc.) 	<ul style="list-style-type: none"> Promotes collaboration by introducing an information coordination framework EHR, PHR, doctor-to-doctor platforms, etc. Provide education and training opportunities using digital health VR training, etc.

(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Kenya) | Digital transformation

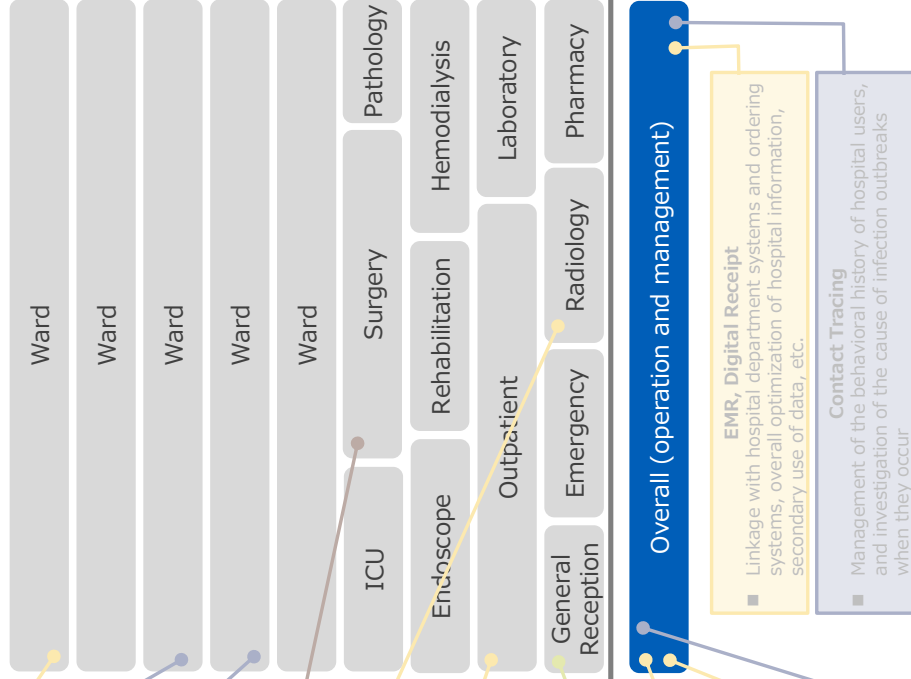


■ Image of digital health utilization in hospitals

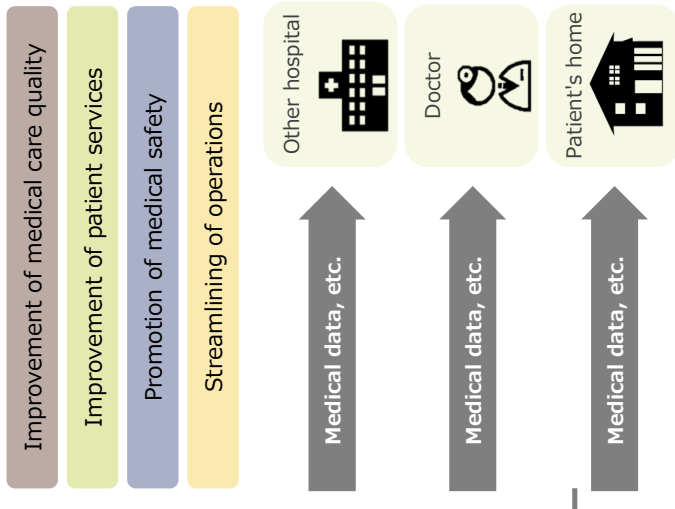
<Examples of Application>

- **Patient transport using auto-wheelchair**
 - For long-distance transportation in facility (ward - examination room, etc.)
 - Image recognition to avoid hazards such as collisions
- **IoT medical devices / wearable devices**
 - Remote monitoring of devices' operation status, and alerting according to pre-set threshold
- **Patient monitoring sensor**
 - Detection of danger signs, dangerous states and biological abnormalities of patients by sensors
- **MR (Mixed Reality)**
 - Provision of MR-based surgical guides, etc.
- **AI diagnostic imaging support**
 - AI-based diagnostic imaging support for radiologists
- **AI medical questionnaire**
 - Automatic questionnaire for patients coming to the hospital
- **Patient guidance by robot**
 - Robotic non-face-to-face patient guidance
- **Goods transfer by robot**
 - Autonomous robot to transport drugs and specimens
- **Cleaning/disinfection in hospital by robot**
 - Automatic cleaning, disinfection, etc. in the hospital by autonomous robot
- **Authentication system**
 - Management of entry/exit/activity history of specific persons, sorting of persons who meet specific conditions by automatic temperature detection system, etc.

<Hospital Building Image>

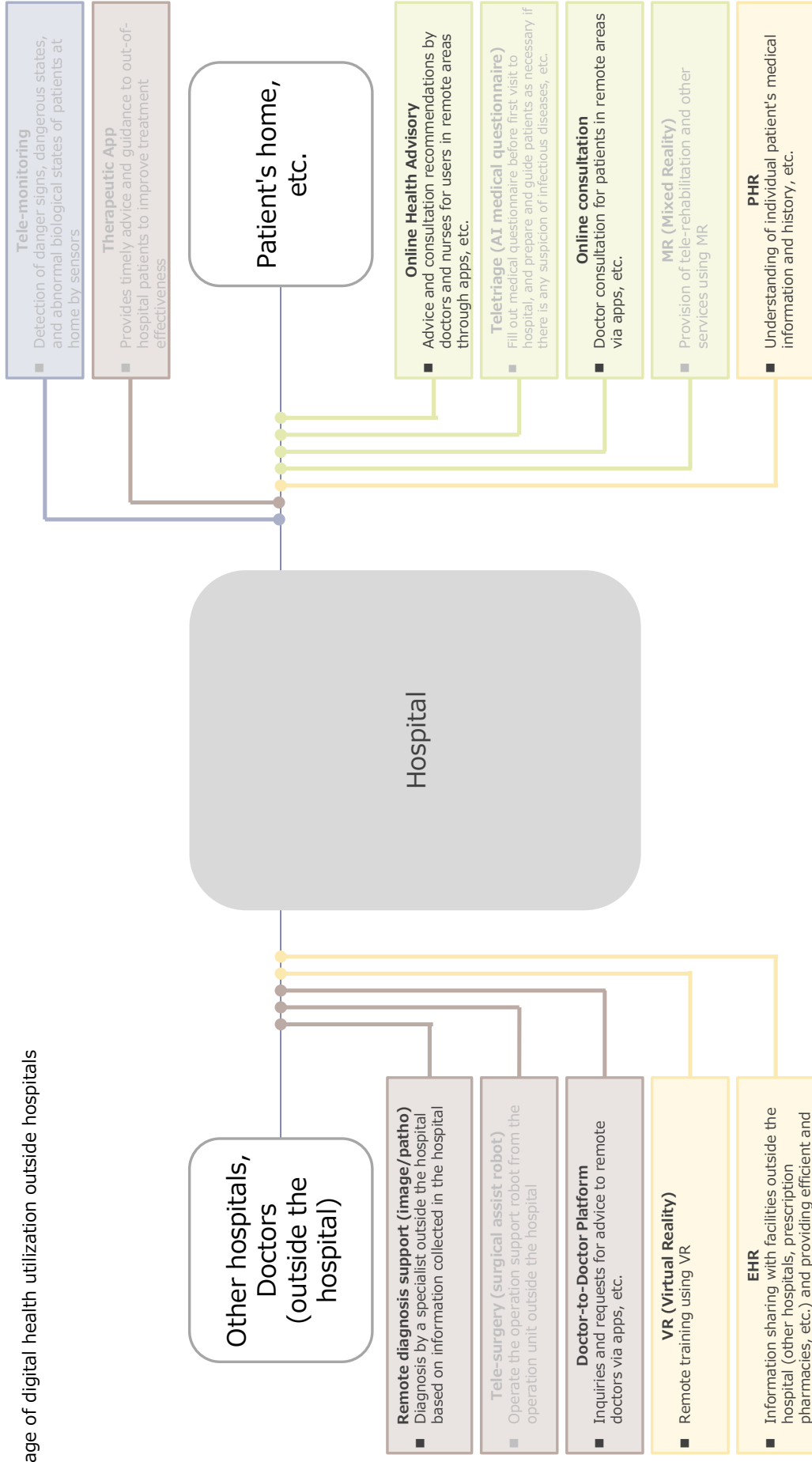


Proactive use of digital health technology for hospital management



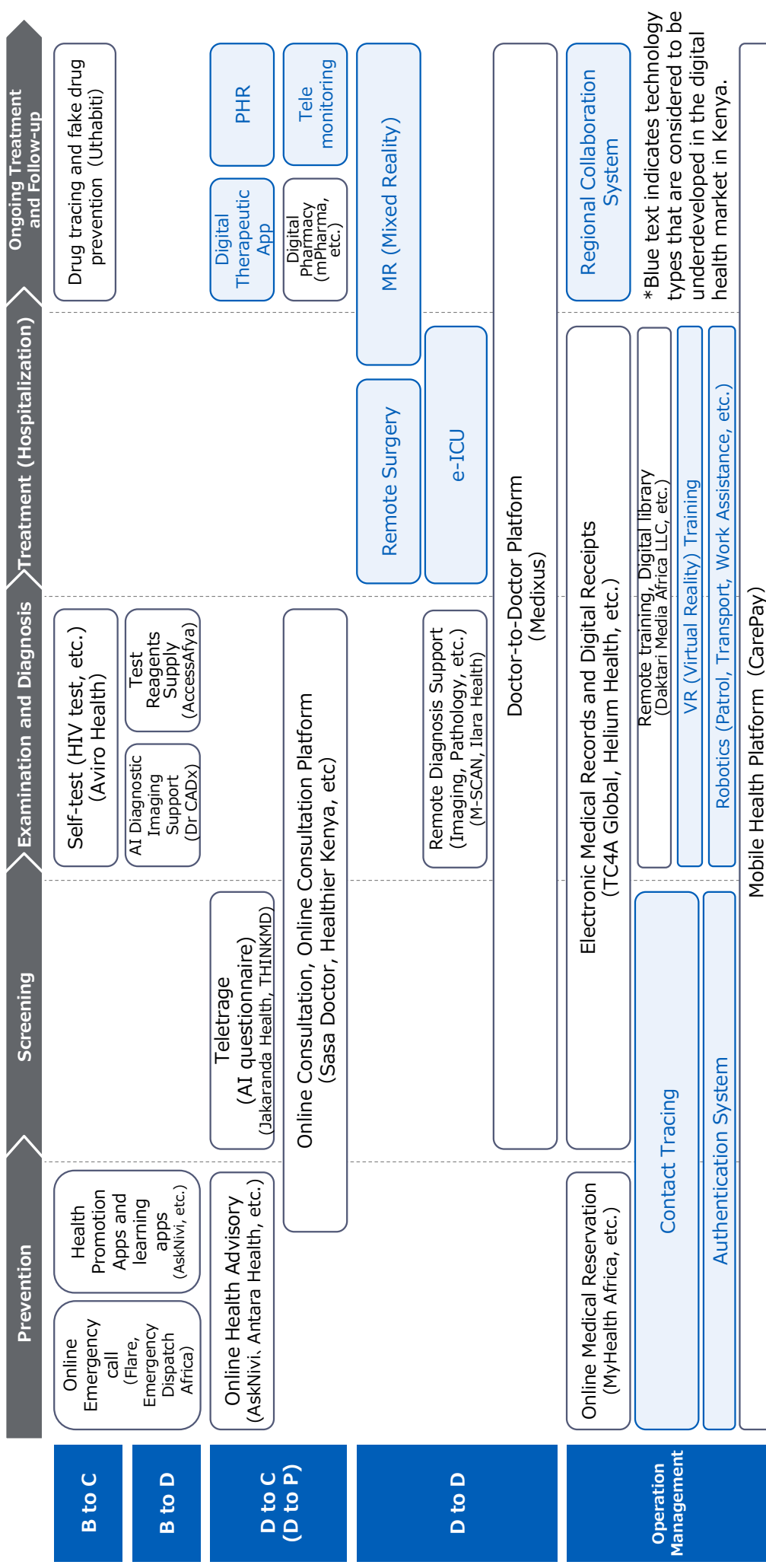
(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Kenya)

- Image of digital health utilization outside hospitals



Perspective of Company: Health Tech Map (Kenya)

Legend: B ⇒ Business (service providers other than medical facilities), C ⇒ Customers/users (including healthy / unhealthy), D ⇒ Doctors (including medical professionals other than doctors), P ⇒ Patients (after definitive diagnosis)



*Blue text indicates technology types that are considered to be underdeveloped in the digital health market in Kenya.

Perspective of Company: Future Prospects in the Digital Health Market (Kenya)

Summary The social and economic development of Kenya relies heavily on mobile communications. Kenya has a high penetration rate of mobile networks and cell phones, which has led to the growth of technologies such as telemedicine, teleradiology, e-learning, digital pharmacy, and m-Health. Open source and public civic technologies are also attracting attention.

■ Future Prospects in the Digital Health Market (Kenya)

Area

1

Mobile Health

Trend

The government continues to innovate mobile phone-based financing solutions in collaboration with institutions and companies such as Living Goods, Safaricom, CarePay, PharmAccess, and Huawei. A number of other digital health solutions have been successfully piloted and are being expanded nationwide. The following are some examples.

[m-Tiba]

It is electronic money that can be used on mobile phones to save money and receive money transfers. It can also be used to pay bills, but only to pay medical bills. The system is linked directly to users, healthcare providers and healthcare payers such as insurance companies and donors, making both treatment and payment fast, efficient and transparent.

[MyDawa]

It is an online digital pharmacy with access to thousands of original quality medicines, health, wellness and personal care products.

[Maisha Meds]

They provide digital tools that allow providers to manage sales and inventory, procure high-quality medications, and offer discounts and subsidies to help patients access impactful health products.

[Ponea Health]

It provides a platform for booking and telemedicine, including back-end services and price discovery for physicians.

[eChanjo]

The portal was developed by the Ministry of Health in response to COVID-19 and aims to monitor the progress of COVID-19 vaccination. It records the dates on which vaccinations were administered and issues vaccination certificates.

Using civic technology and open data, they are building a digital democracy where citizens have timely and free access to actionable information. It also promotes active citizenship by facilitating access to information so that citizens can reach out to their leaders and hold their governments accountable.

2

Civic Technology

Summary: Potential Digital Health for Micro and Macro Issues and Needs (Kenya)

The following is a list of digital health that indicates the potential solutions to solve the macro and micro medical issues. In addition, for each digital health technology, the number of issues associated with each technology (the scale of the impact), the areas with relatively few competitors as shown in the health tech map, and the future prospects of digital health in Kenya are taken into account to indicate the areas where Japanese companies may enter in the future.

Medical Issue	Direction of the Solution (Digital Health Utilization)	No. of Associated Issues	Market Competition	Prospects (Keyword)	Potential Areas of Entry
Macro	The U5MR, NMR, and MMR are high when compared to the average of the region where the other target countries are located. In particular, communicable diseases have a significant impact on the high U5MR, which is thought to be caused by lack of infrastructure and barriers to healthcare access	2		Mobile Health	
	Increasing proportion due to non-communicable diseases (cerebrovascular disease, ischemic heart disease, diabetes, cancer, etc.)	2		Mobile Health	
	Under decentralization, each local government has different priorities and there are disparities between counties.	2		Mobile Health	
	The quality of health care delivery is low, and human resources, drugs, and supplies do not meet basic standards.	1		Mobile Health	
	The number of hospital beds per 1,000 population in 2010 was 1.4. In particular, the ICU utilization rate is about 94%, and the number of beds available for advanced medical care is insufficient.	2		Mobile Health	
	0.2 doctors and 1.2 nurses and midwives per 1,000 population in 2018, which is significantly short of 4.45 (minimum SDG Index and WHO standard)	3	Low	Mobile Health (some)	○
	Low rate of public health insurance coverage	5	Low	Mobile Health	○
	Insufficient education for local residents	-	Low		
	Few opportunities of pre-consultation for the local residents	2	Low	Mobile Health	●
	Many patients come to the hospital after they have become serious	3	Low	Mobile Health	○
Micro	Shortage of technicians and specialists	3	Low	Mobile Health	○
	Insufficient medicines for patients	-	Low		
	Insufficient coordination of operations and information outside the hospital (between other facilities)	-	Low		
	Inadequate education and training of staff (Dr., Ns., Technician, etc.)	1	Low		



Notes : ○ Area of potential, ● Area of particular potential with few competitors

Perspective of JICA: Status of JICA Support (Kenya)

Summary The Ministry of Foreign Affairs of Japan (MOFA) has designated health and medical care as a priority area in its country assistance policy, and among the three target countries, there is an abundance of projects in the health and medical care field, mainly in the areas of technical cooperation and private sector collaboration. It is also expected to collaborate on projects that span across multiple African countries, such as the collection of information on the utilization of the private sector to improve health in six African countries.

■ JICA's support approaches and programs in the health sector (Extracted items that end in 2015 or later)

	Healthcare Sector	ICT Sector	COVID-19 Measure
Country Assistance Policy (Priority Areas)	To improve access to health care services in poor and rural areas. To this end, we will strengthen health systems and support the qualitative improvement and expansion of the coverage of basic disease prevention measures, while addressing Kenya's most pressing issues such as critical diseases.	(No description)	(No description)
Technical Cooperation	<ul style="list-style-type: none"> Project to strengthen accountability in county health services management (January 2021 - February 2027) Interdisciplinary research project for community-driven integrated strategies to sustain a malaria-free society (October 2020 - September 2025) Africa Health Systems Strengthening Partnership Project Phase 2 (November 2016 - March 2021) Strengthening County Health System Management under Decentralization Project (October 2014 - October 2019) Development of a rapid diagnostic method for yellow fever and Rift Valley fever and its outbreak alert system (January 2012 - January 2017) Community Health Strategy Enhancement Project (October 1, 2011 to September 30, 2014) Health Sector Policy Loan for Achieving Universal Health Coverage (2020/08) 	<ul style="list-style-type: none"> Development of a rapid diagnostic method for yellow fever and Rift Valley fever and its outbreak alert system (January 2012 - January 2017) Development of MSoS to improve the efficiency of infectious disease surveillance 	-
Official Development Assistance Loans	<ul style="list-style-type: none"> Preparatory Survey for the Plan to Strengthen the Research Capabilities of the Kenya Central Medical Research Institute (December 2021 - August 2022) 	<ul style="list-style-type: none"> Health Sector Policy Loan to Achieve Universal Health Coverage (August 2020) The Ministry of Health is implementing health information integration using official development loan 	-
Assistance Grants Public-Private Partnerships	<ul style="list-style-type: none"> Feasibility study on a project to improve the sanitation environment in a hospital using electrolytic water generated by ceramic electrodes (June 2015 - May 2016) Case study on the project to expand the number of people receiving health checkups (December 2017 - June 2019) Preparatory survey for the project to improve access to medicines (promotion of BOP business collaboration) (March 2018 - May 2019) Preparatory survey for the project to support the self-sustainability of local production and sales of low-cost preserved foods using sorghum (promotion of BOP business collaboration) (January 2014 - January 2015) Preparatory Survey on Nutritional Food Business Using Japanese Traditional Fermentation Technology (BOP Business Collaboration Promotion) Project to Promote Catheters for Patients with Mitral Stenosis (December 2013 - November 2016) Project for dissemination, demonstration, and commercialization of ultrasound diagnostic imaging systems through the training of local medical advisors in the field of perinatal care [Africa task Proposal Type] (February 2020 - January 2022) Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening measures against infectious diseases and improving nutrition) (October 2020 - March 2021) Report on a survey to collect and confirm information on the use of the private sector to improve health in six African countries (August 2019 - March 2020) 	<ul style="list-style-type: none"> Case study on the project to expand the number of people receiving health checkups (December 2017 - June 2019) Case study on the implementation of e-learning systems to improve the quality of education (May 2017 - June 2018) Dissemination and demonstration project for the introduction of e-learning systems to improve the quality of education (March 2019 - June 2022) 	<ul style="list-style-type: none"> Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening countermeasures against infectious diseases and improving nutrition) (October 2020 - March 2021) *Represented

Source: Compiled by the survey team based on the Ministry of Foreign Affairs of Japan (Survey of ODA Projects by Country and Region) and JICA (Search for Private Sector Collaboration Projects and Case Studies)

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Kenya)

Summary

International organizations are supporting the development and introduction of digital health in the region and its promotion by developing their own digital health solutions and supporting local companies through pilot activities.

■ Typical donors and their main support for the digital health (Kenya)

Donor	Main support
<p>IFC (International Finance Corporation)</p>	<p>It provides needed technologies to new markets in order to drive sustainable innovation. The program matches proven solutions from around the world with local partners in emerging markets, conducts pilot projects, and facilitates the development of business partnerships. In the East African market, more than 20 leading private healthcare facilities in Kenya, Uganda and Ethiopia have signed up for the program and are interested in working with digital health companies. Under the program, the shortlisted digital health companies will demonstrate their products at local medical facilities and discuss potential pilots, with the assistance of external technical advisors. The selected companies will receive funding and guidance from TechEmerge to pilot their solutions and pursue commercial deployment of the technology. The IFC will assist both innovators and health facilities in the market entry and technology transfer process. In addition, IFC will mitigate the financial and operational risks of market entry for the innovator and reduce implementation risks for the local healthcare facility.</p>
<p>■ Government Initiatives Organization, Programs, etc. e-Health Standards and Guidelines</p>	<p>Main support It is based on e-Health Policy 2016-2030, ICT Policy, and Article 31 of the Constitution of Kenya 2010, which guarantees privacy of all citizens with regard to personal information.</p>
<p>■ Other Initiatives Organization, Programs, etc. Kenyatta University Teaching, Research and Referral Hospital (KUTRRH) AAIC and Rakuten Europe</p>	<p>Main support The Medical Innovation Accelerator Hub program promotes the development, adoption, and diffusion of high-value innovations in diagnostics, therapeutics, medical devices, and medical services. AAIC and Rakuten Europe have launched the AAIC-Rakuten Africa Innovation Project to promote the growth of start-up companies across Africa, provide technical and managerial guidance, and create solutions to social issues across Africa. The project also targets medical facilities.</p>

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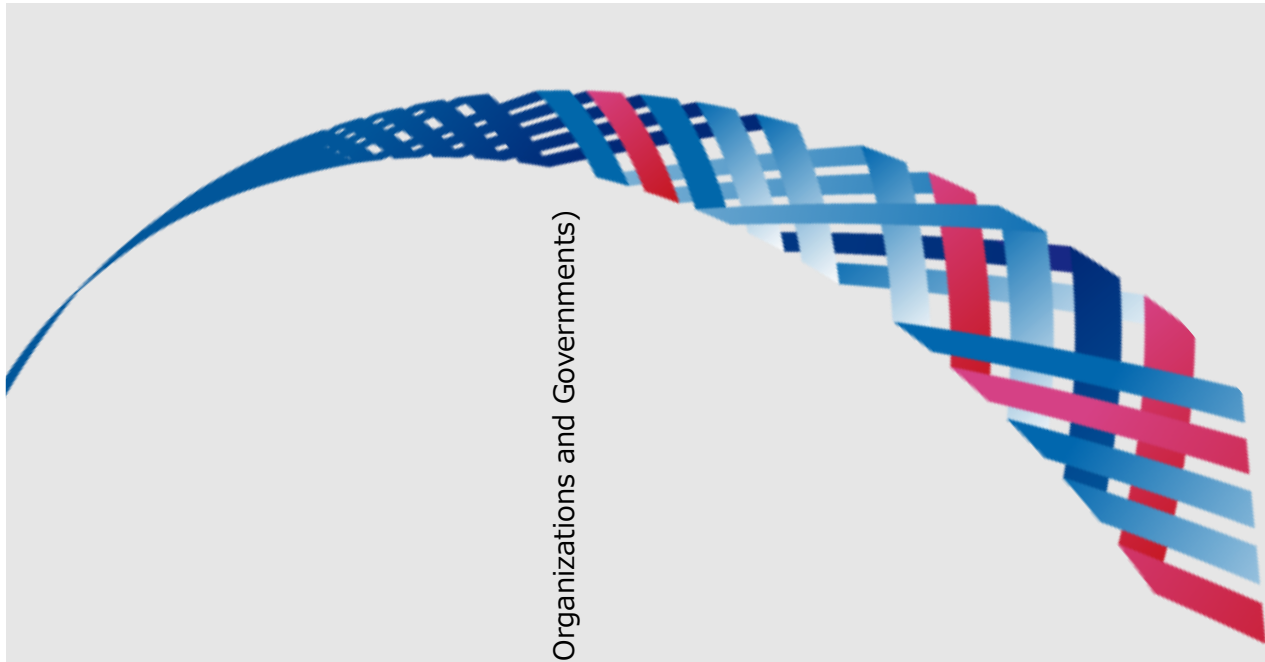
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In Indonesia, the dual burden of infectious and non-communicable diseases makes it essential to improve primary healthcare in particular. This suggests that there is a high expectation for the use of digital health technology for diagnosis and treatment, especially at the primary medical care level, since this is an island nation and medical personnel are not sufficiently deployed.

	Medical Issues (Macro)
Disease Structure	<p>[Basic Health Indicators]</p> <ul style="list-style-type: none"> Demand for high-quality medical services is expected to increase as life expectancy increases and the population ages. <p>[Maternal and child health-related indicators]</p> <ul style="list-style-type: none"> The USMR, NMR and MMR are higher than the EAP average, and the NMR and MMR have not achieved the SDG target values, so continuous improvement is necessary. <p>[Cause of death]</p> <ul style="list-style-type: none"> The proportion of NCDs has increased over the past 20 years, and is expected to increase further as the country's economic development and healthcare standards improve. Regarding the development of medical facilities, it is estimated that investment in facilities and equipment that can provide advanced medical services for NCDs will be necessary. The burden of preventable diseases on Indonesia's health system is estimated to be around US\$5.8 billion by 2020.
Quality of Medical Care	<p>[Number of beds]</p> <ul style="list-style-type: none"> The number of hospital beds per 1,000 population was 1.0 (2017), which is much lower than the EAP average of 3.7. During the COVID-19 outbreak, the occupancy rate of hospital beds was 93% at DKI Jakarta, and the national average was 72%, suggesting that there was a shortage of hospital beds. <p>[Human resources for health care]</p> <ul style="list-style-type: none"> In 2018, there were 0.4 doctors and 2.4 nurses and midwives per 1,000 population, which does not reach the EAP average (1.6 doctors and 2.7 nurses and midwives); the SDG Index (4.45 healthcare professionals per 1,000 population) has not been reached and will require continuous improvement Medical professionals such as doctors, nurses and midwives are generally concentrated in urban areas, so medical services vary by region.
Medical Service Delivery System	<p>[Referral System]</p> <ul style="list-style-type: none"> In order to receive insurance treatment at a secondary or higher medical institution, you must be seen and referred by a primary medical institution. Medical data is not centralized and utilization of medical data is an issue.

Major Government Measures (Policies and Strategies)
<ul style="list-style-type: none"> Indonesia's National Long Term Health Development Plan (RPJP-K) (2005-2025) <ul style="list-style-type: none"> Focus on lowering MMR by increasing the use of medical facilities, improving health insurance, properly allocating and improving the quality of medical personnel, providing drugs and medical equipment, strengthening the management of medical information, and community development Strategic Plan of the MOH 2020-2024 (Strategic Plan of the MOH 2020-2024) <ul style="list-style-type: none"> Aiming to improve maternal and child health and the nutritional status of the community Aims to prevent and control disease and improve management in public health emergencies
<ul style="list-style-type: none"> National Long Term Health Development Plan (RPJP-K) (2005-2025) <ul style="list-style-type: none"> Focus on health insurance enhancement, appropriate allocation and quality improvement of medical personnel, provision of pharmaceuticals and medical equipment, strengthening of medical information management, community development, etc. Strategic Plan of the MOH 2020-2024 (Strategic Plan of the MOH 2020-2024) <ul style="list-style-type: none"> Improve healthcare resources as a strategic goal, including access to medicines and medical devices, independence, quality, and a standards-based healthcare workforce and competency sufficiency Strategic Plan of the MOH 2020-2024 (Strategic Plan of the MOH 2020-2024) <ul style="list-style-type: none"> Strengthening referral health care services as a strategic goal to improve the availability and quality of basic health care and referral facilities Presidential Rule 39 on One Data (2019) <ul style="list-style-type: none"> Aiming to centrally collect, manage, and utilize data that is dispersed and managed across ministries and organizations, including the Ministry of Health

Perspective of Target Country: Major Micro Medical Issues (Indonesia) Digital transformation

Summary Based on an online questionnaire survey (n=14) and follow-up interviews conducted with medical facilities, micro-medical issues (issues in the medical environment) were extracted for each treatment process. The digital health fields that have the potential to contribute to these issues are shown below as "directions of solutions."

Procedure	Issues in the Medical Environment	Direction of Solution
Prevention	<ul style="list-style-type: none"> Inadequate education and guidance for local residents Many patients visiting hospitals only after their disease symptoms become serious 	<ul style="list-style-type: none"> Promote users' own behavior management and behavior change Behavioral change based on daily biometric data recording, AI analysis, etc. through health promotion apps Establish early contact with healthcare professionals Advice and recommendation for medical consultation by medical professionals at the stage of pre-disease through online
Screening	<ul style="list-style-type: none"> Congestion in outpatient consultation Heavy workload for staff in reception and screening (e.g., handling medical interviews) 	<ul style="list-style-type: none"> Improve operational efficiency through the use of advanced technology AI medical questionnaire, patient transport using automated wheelchair, etc.
Examination and Diagnosis	-	-
Treatment (hospitalization)	<ul style="list-style-type: none"> Congestion in the inpatient wards (insufficient beds in general wards, ICUs, etc.) Unable to operate in their own hospital, patients travel to a distant medical facility 	<ul style="list-style-type: none"> Collaborate with facilities and personnel outside the hospital Remote ICU, etc.
Ongoing treatment and follow-up	<ul style="list-style-type: none"> Insufficient guidance to patients on medication, lifestyle, etc. Insufficient patient follow-up during and after treatment (regular consultations or check-ups, rehabilitation etc.) 	<ul style="list-style-type: none"> Promotes patients' own behavior management and behavior change Management of patients' behavioral records, etc. through the use of therapeutic apps, automatic sending of guidance to encourage behavioral change, implementation of remote rehabilitation, etc.
Other (Operations Management)	<ul style="list-style-type: none"> Insufficient coordination of operations and information outside the hospital (between other facilities) Inadequate education and training of staff (doctors, nurses, technicians, etc.) Inadequate infection control in the hospital (e.g. zoning of infection control areas) 	<ul style="list-style-type: none"> Promotes collaboration by introducing an information coordination framework EHR, PHR, doctor-to-doctor platforms, etc. Provide education and training opportunities using digital health VR training, etc. Zoning, non-face-to-face and non-contact to reduce opportunities for contact with infected patients Zoning of infection control areas, even within existing facilities, with limited staffing Unmanned operations using automatic transfer robots, etc. Access control for specific persons by face recognition Automatic face recognition system to control entry and exit of specific persons and trace their behavioral history, etc.

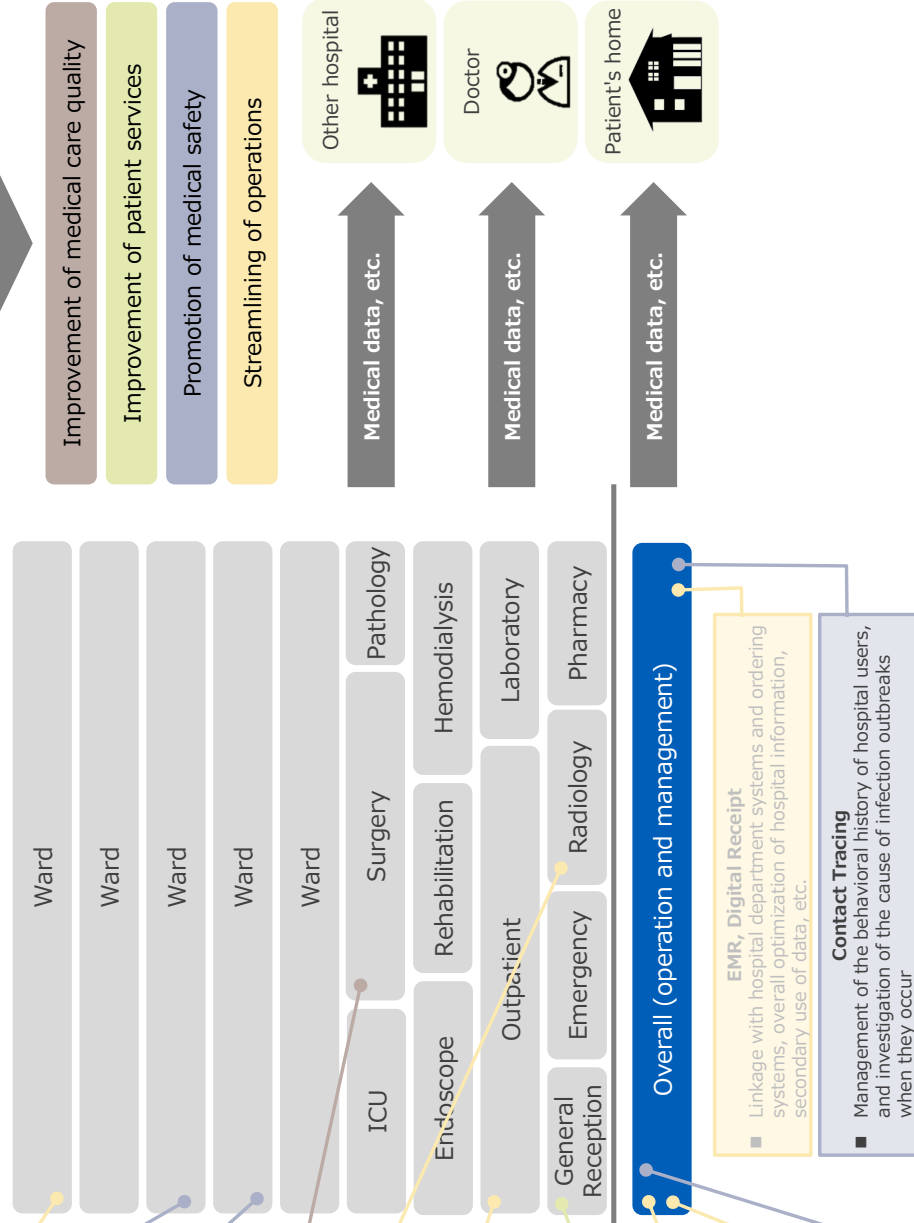
(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Indonesia)

■ Image of digital health utilization in hospitals

<Examples of Application>

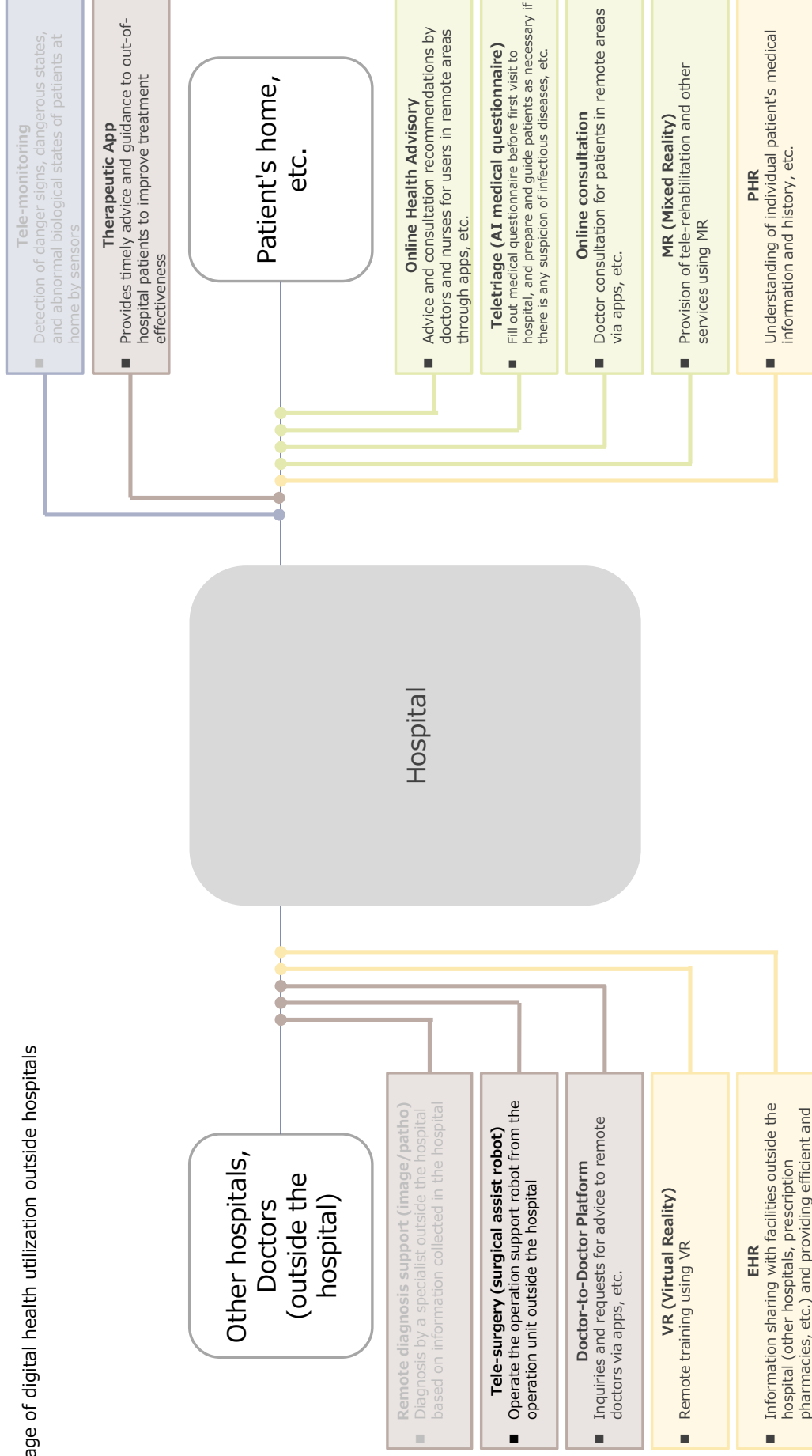
- **Patient transport using auto-wheelchair**
 - For long-distance transportation in facility (ward - examination room, etc.)
 - Image recognition to avoid hazards such as collisions
- **IoT medical devices / wearable devices**
 - Remote monitoring of devices' operation status, and alerting according to pre-set threshold
- **Patient monitoring sensor**
 - Detection of danger signs, dangerous states and biological abnormalities of patients by sensors
- **MR (Mixed Reality)**
 - Provision of MR-based surgical guides, etc.
- **AI diagnostic imaging support**
 - AI-based diagnostic imaging support for radiologists
- **AI medical questionnaire**
 - Automatic questionnaire for patients coming to the hospital
- **Patient guidance by robot**
 - Robotic non-face-to-face patient guidance
- **Goods transfer by robot**
 - Autonomous robot to transport drugs and specimens
- **Cleaning/disinfection in hospital by robot**
 - Automatic cleaning, disinfection, etc. in the hospital by autonomous robot
- **Authentication system**
 - Management of entry/exit/activity history of specific persons, sorting of persons who meet specific conditions by automatic temperature detection system, etc.

<Hospital Building Image>



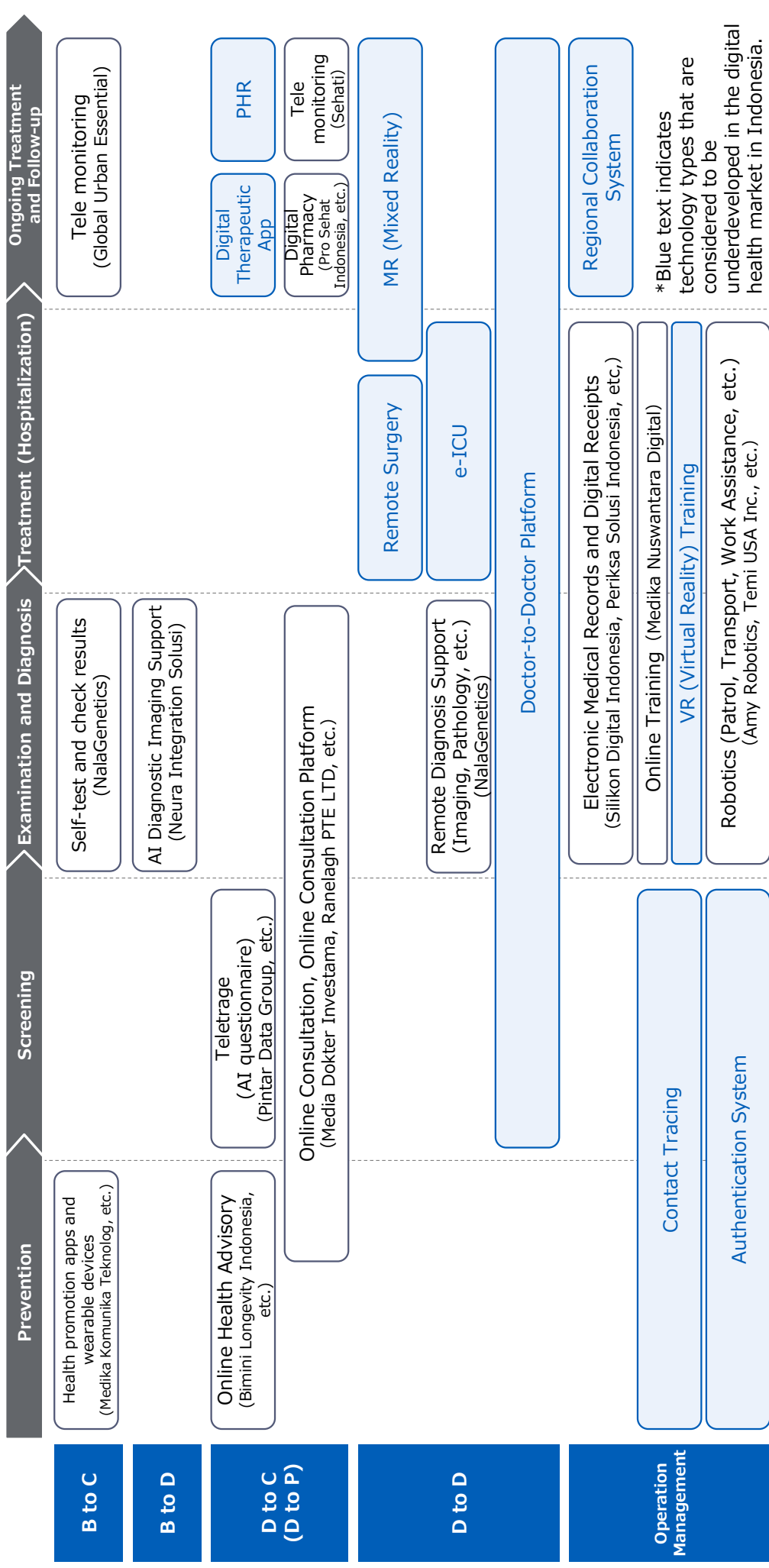
(Reference) Examples of Digital Health Utilization for Micro Medical Issues (Indonesia)

- Image of digital health utilization outside hospitals



Perspective of Company: Health Tech Map (Indonesia)

Legend: B ⇒ Business (service providers other than medical facilities), C ⇒ Customers/users (including healthy / unhealthy), D ⇒ Doctors (including medical professionals other than doctors), P ⇒ Patients (after definitive diagnosis)



*Blue text indicates technology types that are underdeveloped in the digital health market in Indonesia.

Perspective of Company: Future Prospects in the Digital Health Market (Indonesia)

Summary
There is an increasing number of small, non-invasive medical devices that consumers can easily operate at home and use along with their smartphones. In many cases, digital health companies (private) are also providing interventional services to patients and healthcare providers, combining functions such as online medical care and delivery of medicines through applications.

■ Future Prospects in the Digital Health Market (Indonesia)

Area

Trend

1 Remote Medicine

MOH has established Indonesia's own national telemedicine platform to promote telemedicine in the country. MOH launched Telemedicine Indonesia (Temenin) in 2017 and has been conducting demonstrations in remote areas of the country. Temenin has capabilities such as tele-radiology imaging, tele-ECG, tele-USG, and tele-consultation, and has partnered with about 200 hospitals and puskesmas. However, it is still not well known and is still in its infancy.

2 Digital Health Platform

It is a digital platform that takes advantage of the high penetration rate of smartphones and the Internet, thereby improving the convenience of users in receiving medical services such as digital pharmacy and online medical care. These digital platforms have been developed not only by start-ups but also by major private hospital groups, which have launched their own telemedicine services in the wake of COVID-19. (e.g. Siloam Hospital, etc.)

3 Electronic Medical Records

There is a growing demand for electronic medical record systems that cover patient records, reservation management, payment systems, staff management, supply management, and financial reporting.

4 Sharing of Medical Information

The government aims to provide medical insurance for all Indonesians, with a focus on data exchange among health care providers. The platform can take many forms, including websites, online discussion forums, and social media.

5 Mobile Health

Smartphone and tablet apps are changing the way in which patients communicate with healthcare facilities, consult healthcare professionals, monitor their health status and medications, and streamline medical appointments and medication prescriptions.

6 Wearable Device

Wearable devices that measure vital signs are widely used for diagnosis and treatment management in conjunction with smartphones and video technology.

7 AI

AI is being used to save labor in routine back-office tasks in the healthcare industry, such as transcribing doctors' notes using voice recognition technology. Data science is also being used for clinical data, contributing to the realization of personalized medicine for patients.

8 Cloud Computing

Cloud computing is in the early stages of revolutionizing the electronic health record. This technology will improve efficiency by removing silos and eliminating duplication in record management systems. It can also provide vast amounts of aggregate data for research purposes.

Summary: Potential Digital Health for Micro and Macro Issues and Needs (Indonesia)

The following is a list of digital health that indicates the potential solutions to solve the macro and micro medical issues. In addition, for each digital health technology, the number of issues associated with each technology (the scale of the impact), the areas with relatively few competitors as shown in the health tech map, and the future prospects of digital health in Indonesia are taken into account to indicate the areas where Japanese companies may enter in the future.

Medical Issue	Direction of the Solution (Digital Health Utilization)	No. of Associated Issues	Market Competition	Prospects (Keyword)	Potential Areas of Entry
Expected increase in demand for high-quality medical services due to longer life expectancy and aging population	Health Promotion Application	3		Mobile	○
U5MR, NMR and MMR need continuous improvement	Wearable Device	1		Wearable, Mobile	
Increasing proportion of NCDs; demand for advanced medical services for NCDs	Online Health Advisory	3		Remote, Mobile	○
The burden of preventable diseases on Indonesia's health system is estimated to be about US\$5.8 billion in 2020	Tele-triage (AI Questionnaire)	3		Remote, AI, Mobile	○
1.0 beds per 1,000 population (2017), lower than the EAP average of 3.7 beds; there may have been a shortage of beds in some areas during the spread of COVID-19 infection	Tele-consultation	3		Remote, Mobile	○
The number of doctors per thousand population in 2018 did not reach the EAP average and SDG Index and needs to continue to improve	AI imaging diagnosis support	5		Remote, AI	○
Medical personnel such as doctors, nurses and midwives are unevenly distributed among regions.	Remote diagnosis support (imaging, pathology, etc.)	5		Remote Medicine	○
To receive insurance treatment at a secondary or higher medical institution, you must visit a primary medical institution.	Doctor-to-Doctor Platform	6	Low	Remote	●
Medical data is not centralized and utilization of medical data is an issue	Remote Robotic Surgery	1	Low	Remote Medicine	
Inadequate education and guidance for local residents many patients come to the hospital only after they have become serious	e-ICU (Remote ICU)	2	Low	Remote Medicine	
Overcrowded outpatient clinic, heavy burden on staff (e.g., handling medical interviews)	Tele-monitoring	5	Low	Remote Medicine	
Crowded wards (insufficient beds in general wards, ICUs, etc.)	Therapeutic Apps	2	Low	Remote, AI, Mobile	○
Unable to operate in their own hospital, patients travel to a distant medical facility	Digital Pharmacy	-		Remote, Mobile	
Inadequate guidance on medication, lifestyle-related diseases, etc.	VR/MR Training	3	Low	Remote Medicine	●
Inadequate patient follow-up during and after treatment (regular check-ups, rehab therapy, etc.)	Contact Tracing	1	Low		
Insufficient coordination of operations and information outside the hospital (between other facilities)	Authentication system	1	Low		
Inadequate education and training of staff (Dr., Ns., Technician, etc.)	Robotics (patrol, guidance, transport, etc.)	1			
Inadequate infection control measures in the hospital (e.g. zoning of infection control areas)	EMR (Electronic Medical Record)	1		EMR	
	PHR (Personal Health Record)	1	Low	information sharing	
	EHR (Electric Health Record)	2		information sharing	

Notes : ○ Area of potential, ● Area of particular potential with few competitors

Perspective of JICA: Status of JICA Support (Indonesia)

Summary Although non-communicable diseases account for the highest percentage of deaths in Indonesia, communicable diseases continue to account for a high percentage of deaths, and are a priority issue in the country development cooperation policy. Relatively large amount of support has been provided for human resource development related to information and ICT.

- JICA's Support Approaches and Programs in the Health Sector (Extracted items that end in 2015 or later) (1/2)

	Healthcare Sector	ICT Sector	COVID-19 Measure
Country Assistance Policy (Priority Areas)	Help them improve their ability to deal with infectious disease issues. (No description)		
Technical Cooperation	<ul style="list-style-type: none"> Project on Improving the Quality of Maternal and Child Health Programs Using the Maternal and Child Health Handbook under Decentralization (October 2018 - October 2023) Strengthening Pharmaceutical and Food Safety Project (July 2016 - July 2021) Ecological survey of flying foxes and their involvement in rabies-related and other viral infections (August 2015 - July 2020) Project for the discovery of novel anti-malarial and anti-amoebic drug lead compounds using Indonesia's biological resource diversity (April 2015 - March 2020) Nursing Practice Capacity Enhancement Project (October 2012 - October 2017) 	<ul style="list-style-type: none"> Information Security Capacity Building Project (July 2014 - January 2017) Cyber Security Human Resource Development Project (May 2019 - May 2024) Survey on the use of sensor networks for immediate earthquake warning for local disaster prevention (September 2015 - October 2016) Pre-2015 projects <ul style="list-style-type: none"> Information Technology Advanced Human Resource Development Project, Surabaya Institute of Technology (April 2006 - March 2010) Surabaya Institute of Technology Information Technology Advanced Human Resource Development Project Phase 2 (January 2012 - December 2014) 	<ul style="list-style-type: none"> Project to strengthen capacity for early warning and response to infectious diseases (June 2021-)
Official Development Assistance Loans	<ul style="list-style-type: none"> Proactive Response to Novel Coronavirus Infections and Expenditure Support Program Loan (2020/08) 	<ul style="list-style-type: none"> Pre-2015 projects <ul style="list-style-type: none"> Yogyakarta Special Province ICT-Based Education Quality Improvement Project (March 2007) 	<ul style="list-style-type: none"> Proactive Response to Novel Coronavirus Infections and Expenditure Support Program Loan (2020/08) * Represented
Official Development Assistance Grants	-	<ul style="list-style-type: none"> Disaster Management Information System Enhancement Plan (June 2019) 	-
		<ul style="list-style-type: none"> Pre-2015 projects <ul style="list-style-type: none"> Wide Area Disaster Prevention System Improvement Plan (November 2013) 	

Perspective of JICA: Status of JICA Support (Indonesia)

Private partnerships continue to provide assistance for communicable diseases (dengue fever, tuberculosis, etc.).

Summary

- JICA's Support Approaches and Programs in the Health Sector (Extracted items that end in 2015 or later) (2/2)

	Healthcare Sector	ICT Sector	COVID-19 Measure
Country Assistance Policy (Priority Areas)	Help them improve their ability to deal with infectious disease issues.	(No description)	(No description)
Public-Private Partnerships	<ul style="list-style-type: none"> Dissemination and Demonstration Project on the Introduction of Electronic Medical Records in Antenatal Care and the Strengthening of the Community Healthcare Collaboration System (June 2018 - June 2021) Research on the business of producing and selling anti-mosquito clothing to combat dengue fever (SDGs business) Case Study on Ultrasound Microscope for Improving Quality of Cancer Examination and Expanding Opportunities for Cancer Screening [Innovation Framework from Developing Countries] (July 2018-August 2019) Basic research on promoting the introduction of mobile ultrasound systems to improve initial medical care in rural areas (contract negotiation in progress) Business of Producing and Selling Anti-Mosquito Clothing to Combat Dengue Fever (SDGs Business) Study (April 2019 - July 2021) Sanitation Project Preparatory Survey for Reducing Oral Infections through the Customary Use of Sterilizing Gel (Promoting BOP Business Collaboration) (August 2012 - July 2015) Preparatory survey for a project to improve health and hygiene using circulating waterless toilets (promotion of BOP business collaboration) (November 2013 - September 2015) Preparatory Survey for the Project on Halal Response to Medicine (Promotion of BOP Business Cooperation) (April 2017 - March 2019) Project for promotion of endoscopic diagnosis technology for lung, trachea and bronchus cancer (January 2015 - July 2016) Urological Laparoscopic Surgery Promotion Project (November 2015 - February 2019) Project to promote the dissemination of a medication compliance support system for tuberculosis patients (November 2015 - May 2018) Project for promotion of tuberculosis diagnostic kits (December 2017 - February 2022) Anti-Mosquito Clothing Production and Sales Business for Dengue Control (SDGs Business) Study (April 2019 - July 2021) Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening measures against infectious diseases and improving nutrition) (October 2020 - March 2021) Information collection and confirmation survey on matching of demand from developing countries and private sector technologies related to global healthcare and welfare (aging and nursing care) (June 2021 - March 2022) 	<ul style="list-style-type: none"> Basic research for disaster prevention information provision service business (June 2019 - February 2020) Case study for the dissemination of real-time monitoring systems using cell phone communication networks (2013) 	<ul style="list-style-type: none"> Information collection and confirmation survey on the possibility of utilizing private sector technologies in developing countries under COVID-19 in the field of health and medical care (strengthening measures against infectious diseases and improving nutrition) (October 2020 - March 2021) <p>* Represented</p>

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Indonesia)

Summary A number of policy advocacy and knowledge-sharing initiatives have been undertaken to build the digital infrastructure, environment and governance of digital health. These are being implemented by ADB, UK Government, UNDP, Australian Government, AeHIN, etc.

■ Typical donors and their main support for the digital health (Indonesia)

donor	Main support
ADB (Asian Development Bank)	It promotes the Digital Health Information Governance Architecture Framework (HIGAF) to enable the healthcare sector in developing countries to implement digital health using existing IT governance. It also implements programs such as "SIAP Data Innovation" and "Indonesia COVID-19 Observatory" to collect, manage, and analyze information related to COVID-19 in Indonesia, provide information to the Indonesian government and others, and reflect it in the policy-making process. It provides a platform for collecting, managing, and analyzing COVID-19-related information, providing information to the Indonesian government, and reflecting it in the policy-making process. In addition, the company promotes open innovation and runs programs such as hackathons and investment platforms in Indonesia.
AeHIN (Founded by WHO)	It is a digital health promotion organization established by WHO. It promotes capacity building by developing health information infrastructure for member countries in the Asian region, including digital health governance, architecture, program management, standardization and interoperability.
UNDP (United Nation Development Program)	It signed a MoU with the Indonesian Telemedicine Association (ATENSI) to collaborate on advocating for digital health services and improving the regulatory ecosystem for telemedicine. The focus of the MoU is on (1) evidence-based practice, (2) advocacy for the Indonesian government, and (3) capacity building. It is also developing Systems to Monitor Immunization Logistics Electronically (SMILE) for use by the Department of Health.
World Bank	SDGs&Her initiative in collaboration with the Wharton School of the University of Pennsylvania, UN Women and UNDP, USA. This is a competition to recognize female small-scale entrepreneurs who are supporting the UN Sustainable Development Goals (SDGs), including the health sector, and some of the winning examples are projects that have used digital health platforms to develop community health.
British government	It has conducted a series of workshops on telemedicine and digital health and is assisting the Ministry of Health to develop regulations and practices for the provision of safe and quality digital health services.
U.S. Government	Through the Digital Development Awards, we fund projects and activities across all regions that use technology to improve the digital ecosystem and development effectiveness.
Australian Government	It is promoting the Indonesia-Australia Digital Forum. The Forum is a series of discussions involving Australian and Indonesian governments, hospitals and healthcare professionals on the role of digital health in the future delivery of healthcare services in Indonesia and the potential for bilateral cooperation.
German Federal Government	Through the DevelopPPP platform, it promotes private sector activities that address development issues in developing countries.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Indonesia)

Summary

The main programs for the promotion of digital health in Indonesia and their implementing international organizations are as follows.

- Co-creation and collaboration among donors on promotion of digital health (Indonesia)

Program	Organization	Main Support
ADB-AIM Hackathon	ADB(Asian Development Bank)	A digital ideas competition to crowdsource digital solutions to address COVID-19 in developing Member States.
ADB Ventures	ADB(Asian Development Bank)	ADB's impact technology investment platform, which develops VC investments and technical assistance to support early-stage technology projects that can have an impact on the Sustainable Development Goals (SDGs), including in the health sector. The initial ADB Ventures investment fund has a fund duration of 17 years and a \$12 million technical assistance program.
Digital Health Information Governance Architecture Framework (HIGAF)	ADB(Asian Development Bank)	A framework to enable the health sector in developing countries to leverage existing IT governance to implement digital health.
Systems to Monitor Immunization Logistics Electronically (SMILE)	UNDP (United Nation Development Program)	The SMILE application is used to monitor the distribution of COVID-19 vaccine from the provincial level to each health service facility throughout Indonesia. Used by the Ministry of Health.
SIAP Data Innovation	World Bank	An open-source online tool to enhance the collection, management, and analysis of geocoded regional data to help communities, local governments, and national governments understand the socioeconomic impacts of COVID-19 and accelerate recovery.
Indonesia COVID-19 Observatory	World Bank	It is a data collection platform that aims to capture the impact of COVID-19 in near real time and feed it into the policy making process.
SDGs&Her Initiative	World Bank, Wharton School of the University of Pennsylvania, UN Women, UNDP	The competition recognizes women small-scale entrepreneurs who are supporting the United Nations Sustainable Development Goals (SDGs), including the health sector, and winning examples include projects that have used digital health platforms to develop community health.
Indonesia-Australia Digital Forum	Australian Government	A series of discussions on the role of digital health in the future delivery of healthcare services in Indonesia and the potential for bilateral cooperation are taking place with the participation of Australian and Indonesian governments, hospitals and healthcare professionals.
UK Digital Access	British government	The project aims to improve digital access for communities in Kenya, Nigeria, South Africa, Brazil and Indonesia. Through this initiative, in 2020, the British Embassy in Indonesia and the non-profit Common Room Network Foundation implemented a Rp 3.5 billion project to provide internet access to the Ciptagelar community in Sukabumi, West Java. One of the objectives of this project is to provide up-to-date and reliable information on COVID-19.
HRH2030	U.S. Government	The project provides real-time data for strategic use and to assist in the development of policies to address health workforce challenges.
DevelopPPP Platform	German Federal Government	Using the funds from this platform, in 2020, the GIZ, in collaboration with Thirona, Fullerton Health Indonesia, IDBH Senso, and the Faculty of Medicine of the University of Indonesia, will implement the AI software CAD4COVID-XRay and SAM (Screening-Analytics-Management) digital screening platform to enhance the COVID-19 screening capability.

Perspective of JICA: Initiatives to Promote Digital Health by International Organizations and Governments (Indonesia)

Summary

Major initiatives to promote digital health by the government and institutions in Indonesia are as follows. The Indonesian government, through the Ministry of Health and the BPJS Kesehatan, is promoting the digitization of the healthcare system.

■ Government Initiatives

- Regulation 82/2013 of the Ministry of Health requires all hospitals to operate an electronic medical record.
- Ministry of Health has been developed comprehensive platforms such as hospital management systems (SIMRS GOS, E-Rekam Medik, ASPAK), public knowledge and services (Aplikasi NCC 119, SehatPedia, Temenin), referral systems (Sinarap, Sisrute), quality management (KARS), etc.
- The Agency for Healthcare and Social Security has developed JKN Mobile, a mobile application that allows users to access a range of health insurance information, and VEDIKA, a digital claims verification platform with that users can claim fees for inpatient and outpatient services.
- The government's COVID-19 task force has integrated 21 telemedicine services into a digital call center called Sociomile. If a patient's condition worsens, the doctor will contact the task force, which will dispatch a medical professional to check whether the patient has been exposed to COVID-19. On the other hand, in order to provide the public with information related to COVID-19, each local government has set up a website to display the latest case distribution maps, latest news, health care education, etc. In April 2020, the Ministry of Communications and Information released PeduliLindungi, a mobile application that can track COVID-19 contacts and notify users when they are located in a risk zone. This has been updated with the ability to notify the user of their vaccination status and certificate information.

■ Other Initiatives

Organization, Programs, etc.	Main support
Indonesian Telemedicine Alliance (ATENSI)	It is a forum for Indonesian healthcare professionals engaged in digital-based medicine and telemedicine and currently consists of 28 players in the telemedicine industry.
HealthTech.id	The organization was founded by healthcare facilities, investors, insurance companies, pharmaceutical companies, medical devices and other healthcare related start-ups and currently has 80 members. It holds regular meetings with stakeholders and recommends policy development in the field of medical technology.
IndoHCF	As part of PT IDS Medical Systems Indonesia's (idsMED Indonesia) Corporate Social Responsibility (CSR), in 2017, the company held its first annual event, the Indonesia Healthcare Innovation Awards" was held for the first time in 2017. The event was attended by a variety of stakeholders, including institutions, local governments, individuals, and academics who have successfully innovated to improve healthcare services in Indonesia.

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VI. Hypothesis Building for JICA's Supporting Measures in the field of Digital Health

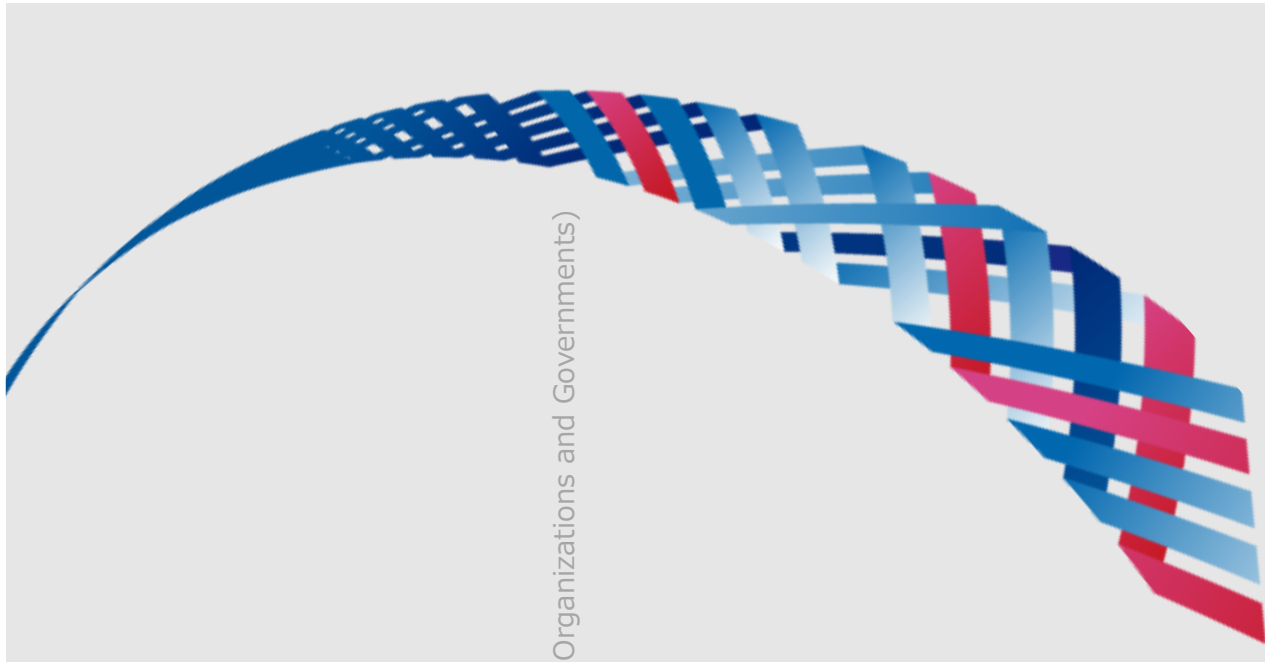
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Approaches to Support

Subject

What kind of support can JICA provide to partner governments and private companies (including Japanese, local, and third countries) with collaboration and co-creation with various partners to promote digitalization of the health sector and development of the digital health market in order to solve medical issues including COVID-19 in the target countries?

Secondary Questions

B. Perspective of Target Country

- What are the local medical issues?
- What are the digital health needs of the target countries and where are they located (what are the issues that can be solved by digital health)?

A. Perspective of Company

- Where are the markets in the target countries for the digital health technologies of companies (Japanese and local)?
- Are there the needs, environment, etc. to build a realistic and sustainable business model?

C. Perspective of JICA

- What kind of support does JICA plan to provide to the target countries?
- What support other donors implement / consider?

D. Support Idea Design (hypothesis)

- Are there patterns (hypotheses) that match all or any of the interests of companies, target countries, and JICA?
- Is there a gap (e.g. barriers to entry) between A and B (digital health architecture analysis), and what can JICA do to fill the gap?
- How JICA can demonstrate its future presence in the digital health market in Japan and target countries?

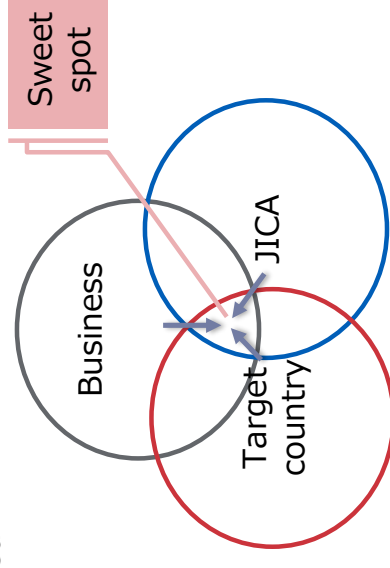
Pilot Activities

Answer. Finalization of Support Ideas

- Seek an answers to Key Question
- Extract challenges related to the implementation of the final plans and arrangement of solution ideas

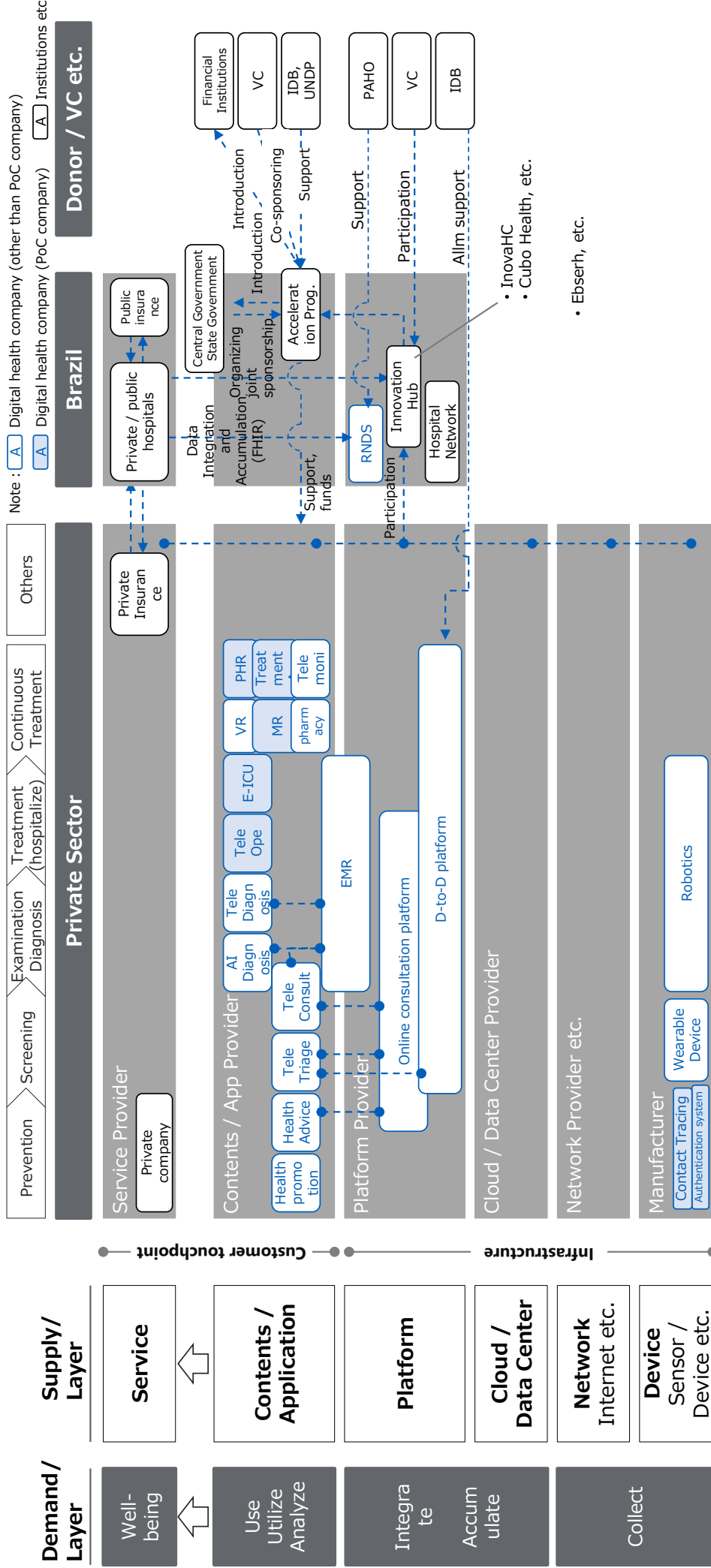
Verification Step

Secondary questions (A to C) are set to verify the key question (subject). Conduct research on these questions, analyze the area where the ABCs overlap (sweet spot) and the surrounding area, and design what JICA can do (formulate a hypothesis). In order to verify these hypotheses, PoC projects will be implemented. After implementation, the hypothesis and the results will be checked and an answer to the key question (JICA's proposed measures) will be formulated.



Hypothesis of JICA's Supporting Measure (Brazil)

Summary The environment surrounding digital health in Brazil is shown in a diagram with hierarchical structure (digital architecture). digital health solutions used by such as medical practitioners and patients (at customer touch point) are the major solutions, and individual collaboration between public and private sectors through online-consultation platforms (at collaborative domains) are under development. There are several public platforms, but issues such as insufficient connections still remain.



Hypothesis of JICA's Supporting Measure (Brazil)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

- With the Unified Health System SUS playing a central role, DATASUS is responsible for the storage and management of medical information for all citizens, and the national health sector is being digitized.
- Innovation hubs are driving the digital health market, as incubation programs and investment funds targeting the healthcare sector have been established.



Issues to be resolved in the target country

- Brazil has a high rate of NCDs and requires a relatively high level of medical services.
- National unified health care system SUS exists and all public medical services are free of charge.
- There are large disparities in healthcare between rich and poor, and between regions, and healthcare workers are unevenly distributed. The access to quality healthcare is an issue.



Insights from Research

- **Correction of healthcare disparities:** While the healthcare sector is becoming increasingly digitalized, the gap due to differences in wealth and region is an issue, and digital health technology is expected to be used in public medical facility with insufficient human resource.
- **Utilization of digital health solutions from Japan, a country with advanced issues:** Brazil has relatively good conditions for private companies to enter the market, and as a country with advanced issues related to the aging of population, there is a high possibility that Japanese companies will find it not hard to develop business and deploy digital health technology, which is one of the strengths of Japanese companies.
- **Partnerships with local innovation hubs:** Although the digital health market is growing, there are many obstacles to overcome in terms of funding, development, and business scale for the startups that are driving this market. In contrast, in Brazil, innovation hubs play an important role in supporting the business development and financing of startups with digital health technologies in the digital health architecture.



Advancement of startups and companies

- Brazil's digital health market grows by 7% even as COVID-19 pandemic
- There are various digital health solutions. Technologies that meet the medical demands of population aging are expected.
- Digital health companies and startups continue to face challenges in raising funds for R&D and business development.

JICA's interests and initiatives

- As for JICA's efforts in the health sector in Brazil, as an ODA graduate country, JICA has not provided any paid or grant aid in the recent past. However, the Brazil's national development cooperation policy aims to provide assistance in areas that promote economic growth, including the expansion of human resources, with a view to collaborating with private funds, such as the improvement of the environment to enhance the competitiveness of industries and technical assistance.
- In "JICA's Global Agenda: 6. Healthcare," it is expected that measures against NCDs and aging will be implemented in developing countries through collaboration with local governments, universities, and private companies, and that these technologies will be returned to domestic technological development.

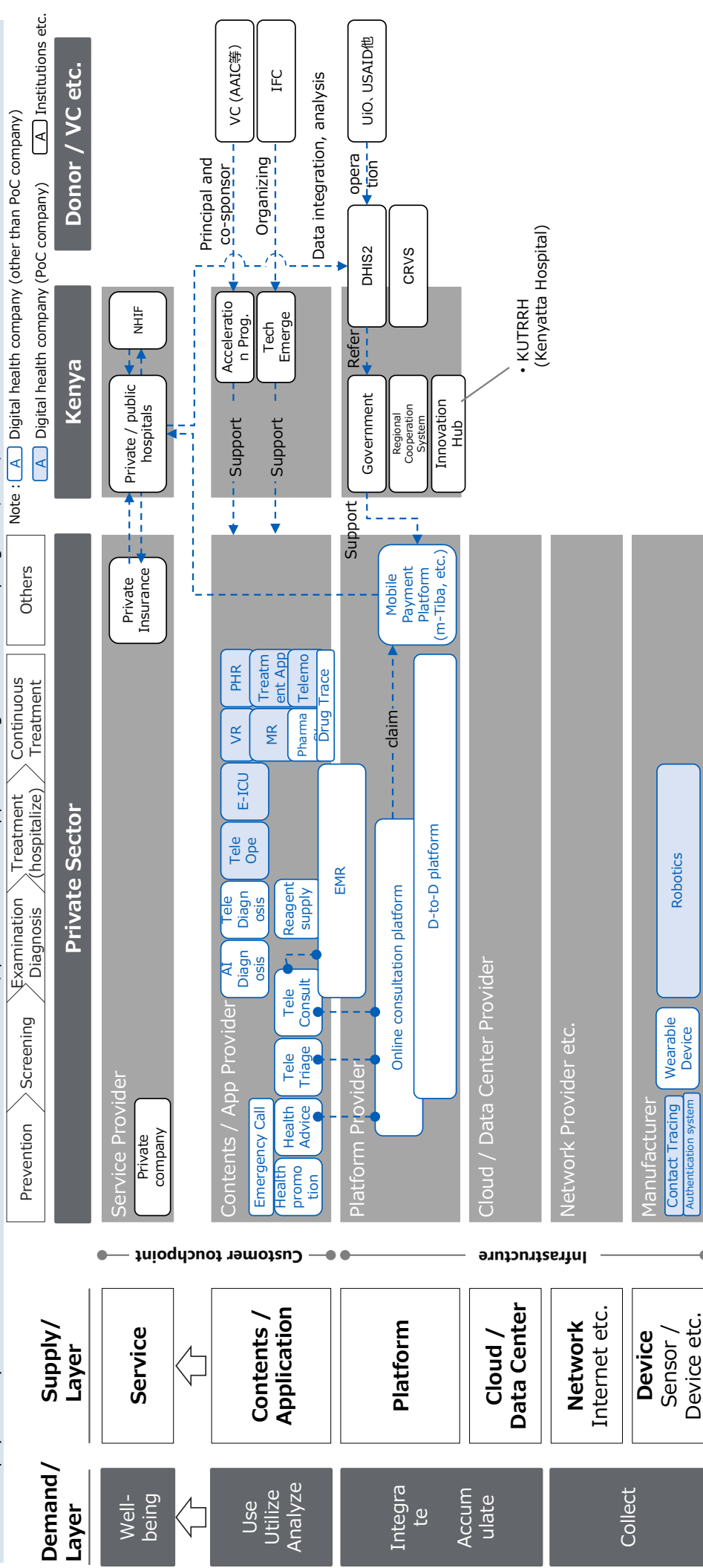


hypothesis

In order to improve the quality of medical care caused by economic disparity and other factors, JICA encourages the expansion of the digital health market for measures against specific diseases in Brazil and the introduction of private-sector digital health solutions to medical facilities through the co-creation of Japanese and local companies, centered on local innovation partners.

Hypothesis of JICA's Supporting Measure (Kenya)

Summary The environment surrounding digital health in Brazil is shown in a diagram with hierarchical structure (digital architecture). digital health solutions used by such as medical practitioners and patients (at customer touch point) are the major solutions, and a private sector platform (at collaborative domain) through mobile payment system has been established. For other donors, private sector support through acceleration programs, etc., is the main focus.



Hypothesis of JICA's Supporting Measure (Kenya)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

- Digital Health targeting users such as medical personnel and patients (customer touch points) are the main focus, and private platforms (collaborative areas) have been established through mobile payments.
- In addition to IFC's TechEmerge program, other donors are mainly supporting the private sector through acceleration programs.



Issues to be resolved in the target country

- In addition to infectious diseases and NCDs, improving maternal and child health continues to be an important health care issue.
- The health system that supports the country's public health institutions used by a large population is weak.
- Public institutions have yet to catch up with digitization, and the system for introducing digital health is still immature.



Insights from Research

- **Strengthening primary care services through the use of digital health technology:** Primary health care services play an important role in the health system for maternal and child health and infectious diseases. There is a high demand for introduction of digital health to the primary care level, such as building e-CHIS and promoting digital health to PCN.
- **Building a foundation for public institutions to utilize digital health:** As the gap in medical services is widening between private and public facilities, it is important to create an environmental infrastructure for the utilization of digital health in public medical facilities, which are used by most of the population, and may serve as a catalyst for private investment.
- **Providing opportunities for co-creation between the public and private sectors:** The unestablished or unclear national systems and regulations for digital health are hindering the private sector's innovation and market entry. Especially in the digital health field, provide opportunities to promote co-creation between the public and private sectors, such as matching systems, regulations, and markets, from a neutral standpoint as a development donor.



Advancement of startups and companies

- Kenya digital health Market is expected to grow at a CAGR of 6.0% from 2019-2024 and is expected to expand further
- Many of them reflect local conditions such as weak public health care delivery systems and pharmaceutical supply chains.
- Mostly m-Health, using mobile information devices due to infrastructure constraints

JICA's interests and initiatives

- In Kenya's Country Development Cooperation Policy, in the health sector, the policy is set to reduce inequalities in health services towards UHC, secure health budgets and planned expenditures by county governments, which are substantially responsible for health administration, and cooperate to realize UHC and strengthen health systems, especially under decentralization.
- JICA's Global Agenda 6. Health Care section: "To ensure access to medical services through the development and improvement of medical security systems, increase the commitment of the national government, while providing policy and institutional advice, coordination with service provision, financial support, etc. Achieving UHC is high on the priority list of issues."

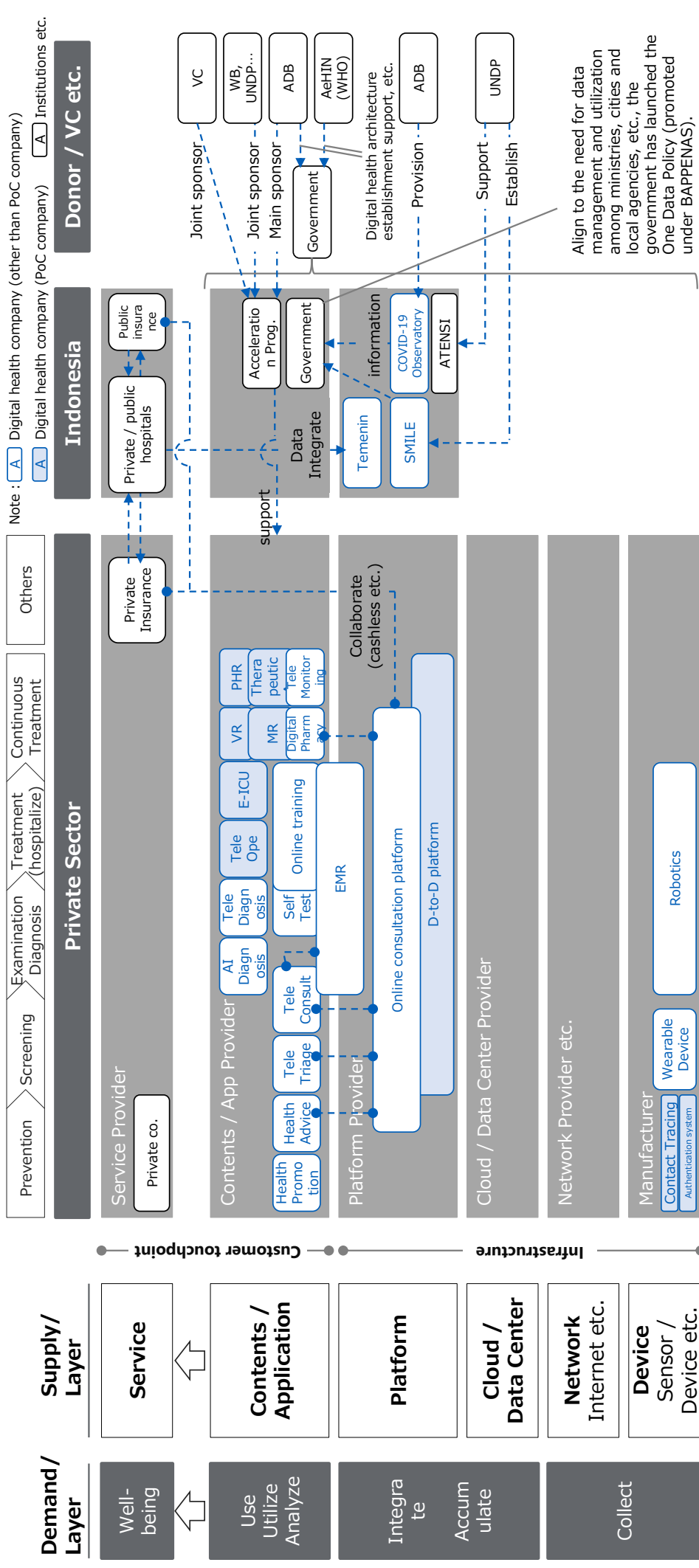


hypothesis

In order to achieve UHC and strengthen the health system, JICA supports the government and public medical facilities by introducing appropriate digital health technologies at the primary care level and by building a foundation that enables private companies and startups with these technologies to enter the market.

Hypothesis of JICA's Supporting Measure (Indonesia)

Summary The environment surrounding digital health in Indonesia is shown in a diagram with hierarchical structure (digital architecture). The main focus is on digital health as a solution (customer contact point) used by users such as healthcare providers and patients, and public-private collaboration is being promoted through online medical platforms (collaborative domain). There are some public platforms, but they face issues such as insufficient individual connections.



Hypothesis of JICA's Supporting Measure (Indonesia)

Summary As a result, the following hypotheses for the key question of this survey were extracted.



Digital Architecture

- One Data Policy has been established to centrally collect, manage, and utilize data that is distributed among ministries and organizations, including the Ministry of Health.
- Solutions such as PHR data linkage, regional medical information linkage systems, and doctor-to-doctor platforms that enable communication and collaboration among doctors are not widespread.



Issues to be resolved in the target country

- In Indonesia, a country with a large population, the rate of NCDs has been increasing since 2000 due to the declining birthrate and aging population.
- As the world's largest island nation, geographical unevenness of medical services is a serious issue.
- The government implements telemedicine programs, but most are still concentrated in the capital and urban areas.



Insights from Research

- **Correction of the uneven regional distribution of doctors:** Primary medical facilities are not able to provide adequate services, especially on remote islands. In the future, it will be necessary to respond to the increase in NCDs. There is a high demand for the information linkage technology to support collaboration with doctors (specialists) and digital health, especially telemedicine, to address these issues.
- **Strengthening of telemedicine system and implementation organization:** The government has implemented a telemedicine program through TEMENIN, but those programs have not yet spread due to various issues. It is necessary to focus on issues specific to telemedicine, such as establishing a system for health insurance, strengthening the implementation system for doctors, and collaborating with companies.
- **Development of existing digital health projects:** Scaling up existing JICA projects in the digital health field based on local partners and technologies will lead to sustainable development of the country's digital health ecosystem in an agile manner, as well as increase JICA's presence in the digital health field.



Advancement of startups and companies

- In Indonesia, the digital health will grow at a CAGR of more than 60% from 2017 to 2022.
- Online consultation accounts for the largest share, followed by digital pharmacy and telemedicine services.
- There are still no regulations on personal information protection specific to the digital health sector, and it is not covered by public insurance.



JICA's interests and initiatives

- According to the Country Development Cooperation Policy for Indonesia, the basic policy priority area of ODA is to support the development of rural areas as well as major cities in order to realize a safe and fair society, focus on correcting regional disparities, and improve the quality of life.
- There is a strategy that aims to strengthen the system to continuously provide high quality services during the period from pregnancy to childbirth and the child's 5age in "JICA's Global Agenda 6." It is expected that digital health will be applied to areas such as the maternal and child health handbook, which has been supported for a long time. Since 2018, JICA has been implementing the Project for Improving the Quality of Maternal and Child Health Programs Using the Maternal and Child Health Handbook in Decentralization.



hypothesis

In order to realize the improvement of medical services in remote areas, JICA supports the Indonesian government in establishing a system and structure that enables the introduction and promotion of telemedicine-specific innovations at the national level, based on existing JICA project partners and technologies.

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I. Outline of the Survey

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- Global Digital Health Market and Impact of COVID-19
- Japanese Digital Health Market and Impact of COVID-19

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- A. Perspective of Target Country (Major Macro Medical Issues, Major Micro Medical Issues)
- B. Perspective of Company (Health Tech Map, Future Prospects in the Digital Health Market)
- C. Perspective of JICA (Support Status by JICA, Initiatives to Promote Digital Health by International Organizations and Governments)

VI. Hypothesis Building for JICA's Supporting Measures in the field of Digital Health

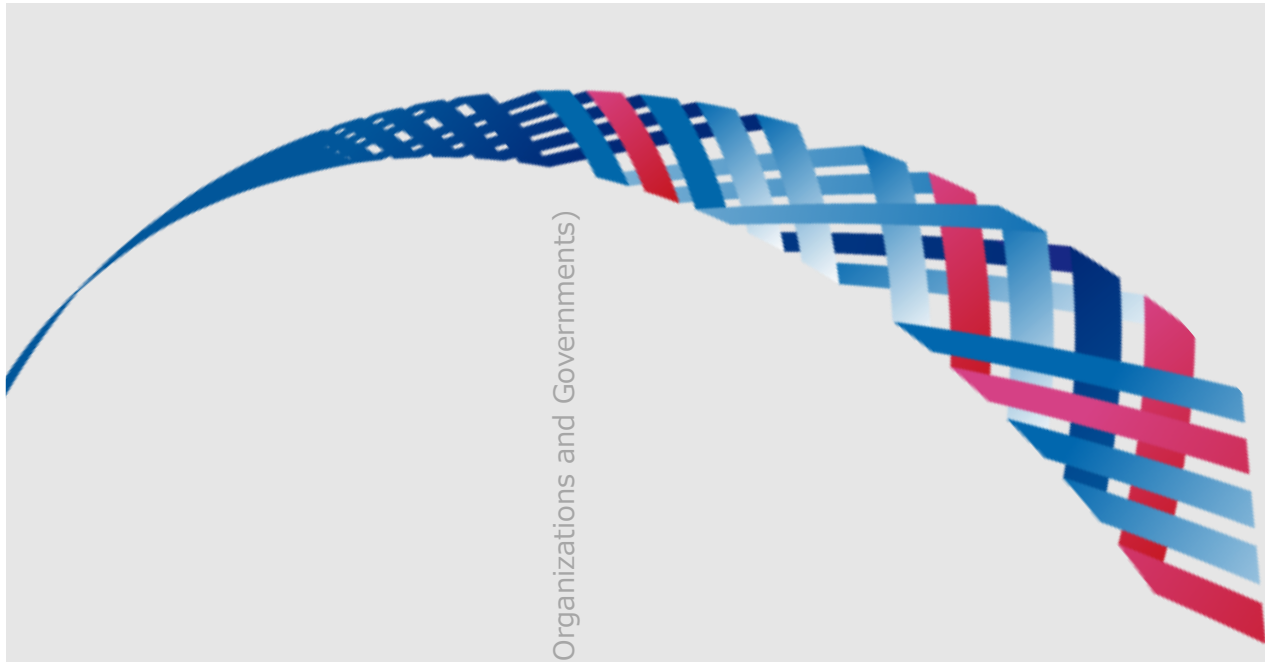
- Approaches to Support
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VII. PoC in Brazil, Kenya, Indonesia

- PoC Proposal and Selection
- Results of Selection
- Assessment of PoC

VIII. Final Proposal of Supporting Measure

- Verification of Hypothesis of the Supporting Measure
- Finalizing the Supporting Measure



Concept of PoC Proposal

Summary Based on the ideas of JICA's support measures and verification companies have the potential to enter, companies and their solutions were selected for the JICA's support measures verification through PoC.

Hypothesis of JICA's supporting measures

In order to improve the quality of medical care, which is caused by economic disparity and other factors, JICA will encourage the expansion of digital health market for disease control in Brazil and the introduction of private digital health solutions to hospitals and other facilities through co-creation among Japanese and local companies with local innovation partners.



In order to achieve UHC and strengthen the health system, JICA will introduce appropriate digital health technologies at the primary care level, and build a foundation to enable private companies and start-ups with these technologies to enter the market (e.g., by establishing systems and structures), and raise the level of government and public medical facilities.

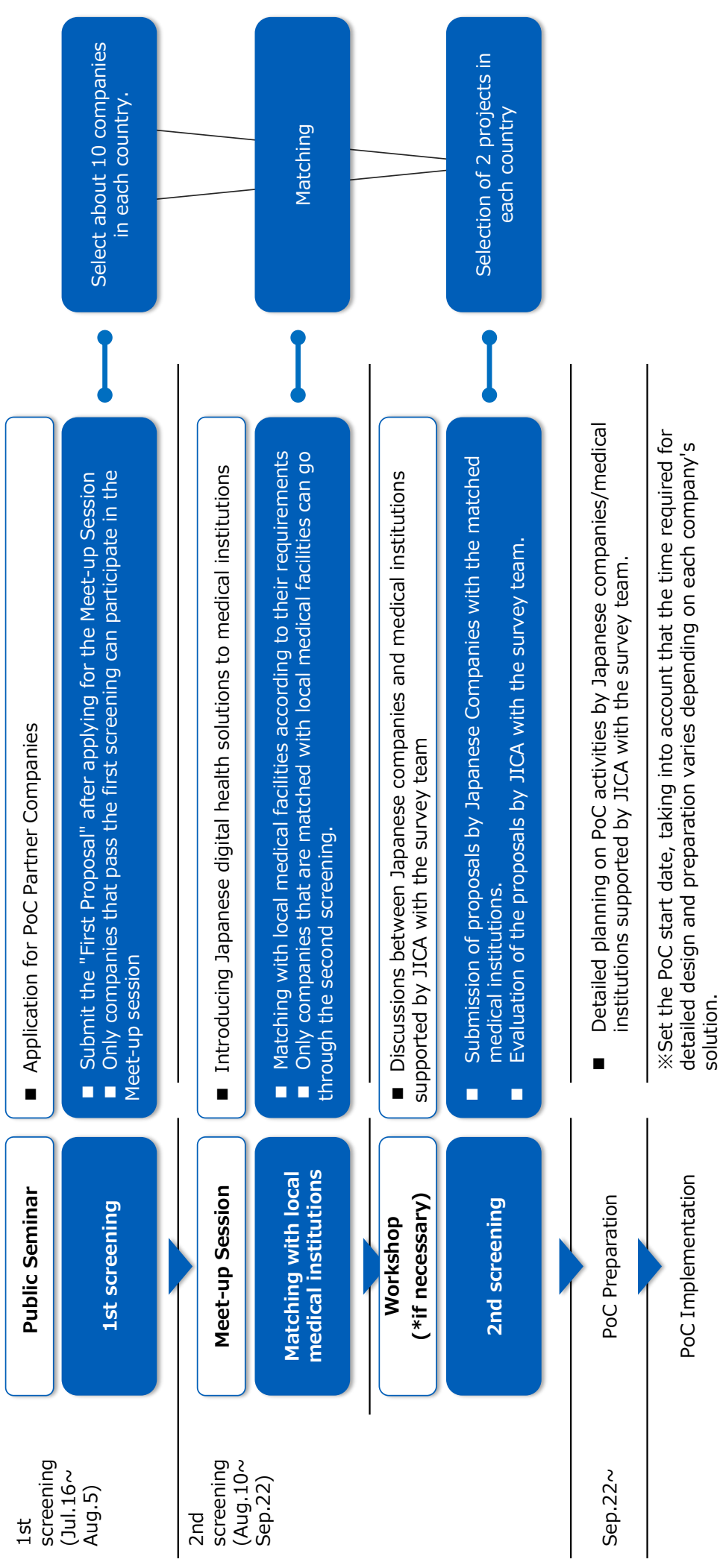


In order to realize the improvement of medical services in remote areas, JICA will support the creation of a system and structure to introduce and promote innovations specialized in tele-medicine at the national level, with the partners and technologies of existing JICA projects.



Direction of the solution (digital health utilization)	Brazil	Kenya	Indonesia
Health Promotion Application			<input type="radio"/>
Wearable Device			
Online Health Advisory	<input type="radio"/>		<input type="radio"/>
Tele-triage (AI Questionnaire)	<input type="radio"/>		<input type="radio"/>
Tele-consultation	<input type="radio"/>		<input type="radio"/>
AI imaging diagnosis support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remote diagnosis support (imaging, pathology, etc.)	<input type="radio"/>		<input type="radio"/>
Doctor-to-Doctor Platform	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Remote Robotic Surgery			
e-ICU (Remote ICU)	<input checked="" type="radio"/>		
Tele-monitoring	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Therapeutic Apps	<input checked="" type="radio"/>		
Digital Pharmacy		<input type="radio"/>	
VR/MR Training	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Contact Tracing			
Authentication system			
Robotics (patrol, guidance, transport, etc.)			
EMR (Electronic Medical Record)			
PHR (Personal Health Record)			
EHR (Electric Health Record)			

PoC Selection Process Overview



Public Seminar

Summary The public seminar, “Challenges to Medical DX in Developing Countries: Opportunities for PoC through Co-Creation with JICA,” was held online. The objective and outline of this project, and the application by private companies that will be the partners to conduct PoC were explained in the seminar.

- Objective
 - Explanation of the purpose and outline of this project, focusing on digital health companies in Japan
 - Attendance at this seminar is a prerequisite for PoC applications, and the screening process explained.
 - A recording of the seminar is available at a later date, and seminar materials and application guidelines are distributed to participants.
- Target
 - Japanese digital health companies
 - Japanese companies, institutions and organizations that are relevant to this project such as digital health and international development
- Invitation
 - Direct invitation to known companies from the survey team
 - Post information on the websites and mailing lists of JICA, Japan Medical Venture Association, United Nations Forum, Washington DC Development Forum, etc.
- Date and time
 - Friday, July 16, 2021, 14:00 - 15:20
- Program
 - Part 1: Overview of JICA Global Health Initiative and JICA-DX
 - Part 2: Overview of this project
 - Parts 3 to 5: Overview of healthcare in the 3 target countries and digital health needs in each medical facility

医療ICT関連政策（インドネシア）

保健医療改善への政策目標として、多様な機関間での連携強化や共同開発の拡大等についても重点分野となっている。医療ICT分野では、従来よりも遠隔医療の活用範囲が拡大している。

調査概要

背景 2020年に発生した世界一拡大した新型コロナウイルス感染症により、特に開発途上国では、医療現場に深刻な影響がもたらされた。

の更なる医療 目的 上記の課題を解決し、SDGsの達成に貢献する。多様な支援 多様なデジタル健康企業との連携を促進し、デジタル健康産業の発展を促す。

実施 遠隔医療、デジタル健康産業の発展を促す。

JICAのDX推進取組みの概要

Society 5.0の理念の下、国内外の多様な連携パートナーと共創し、開発途上国・地域のデジタル化推進とDX推進による社会課題解決促進を通じて、開発途上国で、持続可能性と強靭性を備え、人々の安全と安心を確保する。

医療DXへの挑戦 in 開発途上国

JICAとの共創による現地でのPoC実施機会のご案内

2021年7月16日(金) 14:00開始

主催：JICAガバナンス・平和構築部 STI・DX室

First Screening

Summary

After the public seminar, there were applications from 7 companies (7 products) in Brazil, 7 companies (7 products) in Kenya, and 14 companies (15 products) in Indonesia. Based on the first screening criteria, 7 companies from Brazil, 7 companies from Kenya, and 11 companies from Indonesia were selected.

■ Documents for screening

The first screening was based on document review, and the following three documents were required.

1. Confirmation of interest in PoC (target country, target medical facility, and target issues for PoC)
2. Proposal of companies' technologies and services for PoC
3. Draft presentation materials for explaining the companies' technologies and services to be used at the Meet-up Session

■ First screening criteria

Evaluation Points	Detailed Items	Points
Resolvability of the problem	The implementation policy is based on accurate recognition of current problems.	5
	The proposed technology/service has the potential to contribute to solving problems in the target country and target medical facility.	5
	The proposed technology/service is recognized as relevant to COVID-19 measures.	5
	Use cases are clearly stated.	5
Competitive advantage	Competitive advantage compared to other products and services in Japan and the target country is demonstrated.	5
Adequacy of the PoC plan	The items to be verified are clear.	5
	The demonstration method for the items to be verified is simple and feasible in the target country and field.	5
	It is possible to quantitatively measure and evaluate the effects after PoC.	5
Adequacy of schedule	The proposed technology/service is highly feasible, taking into account the local ICT situation and telecommunications infrastructure conditions.	5
	Risks to be considered in PoC implementation and their solutions are discussed and organized in advance.	5
	PoC detailed design and PoC implementation is appropriately scheduled.	5
Adequacy of operating structure	Necessary preparations such as localization, customization, etc. are well taken care of.	5
	The responsible person is clearly indicated, and the system for implementing the PoC is sufficiently organized.	5
	The responsible person has the necessary language skills for PoC implementation.	5
Feasibility of commercialization	Has a local subsidiary or local partner company in the target country or neighboring countries.	5
	The business scheme of the target technology/service is clearly indicated.	5
Stability as a corporation	Prospects for business development and expansion in the target country and neighboring countries after PoC.	5
	Has experience in sales and implementation of products and technologies in Japan.	5
	Has experience in sales and implementation of products and technologies overseas.	5

Results of First Screening

- List of companies and solutions that passed the first screening in Brazil

Rank	Company	Solution	Points
1	Techlico. Inc.	Rehamaru (Rehabilitation system using Mixed Reality)	62
1	Precision inc.	AI Clinical decision support	62
3	Flixy Inc.	Melp	60
4	CYBERDYNE Inc.	Wearable Cyborg HAL	50
4	HealtheeOne, Inc.	HealtheeOne Cloud	50
4	OUI Inc.	Smart Eye Camera	50
7	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

- List of companies and solutions that passed the first screening in Kenya

Rank	Company	Solution	Points
1	Melody International Ltd.	Mobile Fetal Monitor iCTG	70
2	Techlico Inc.	Rehamaru (Rehabilitation system using Mixed Reality)	62
2	Precision Inc.	AI Clinical decision support	62
4	Flixy Inc.	Melp	60
5	HealtheeOne Inc.	HealtheeOne Cloud	50
5	OUI Inc.	Smart Eye Camera	50
7	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

Results of First Screening

- List of companies and solutions that passed the first screening in Indonesia

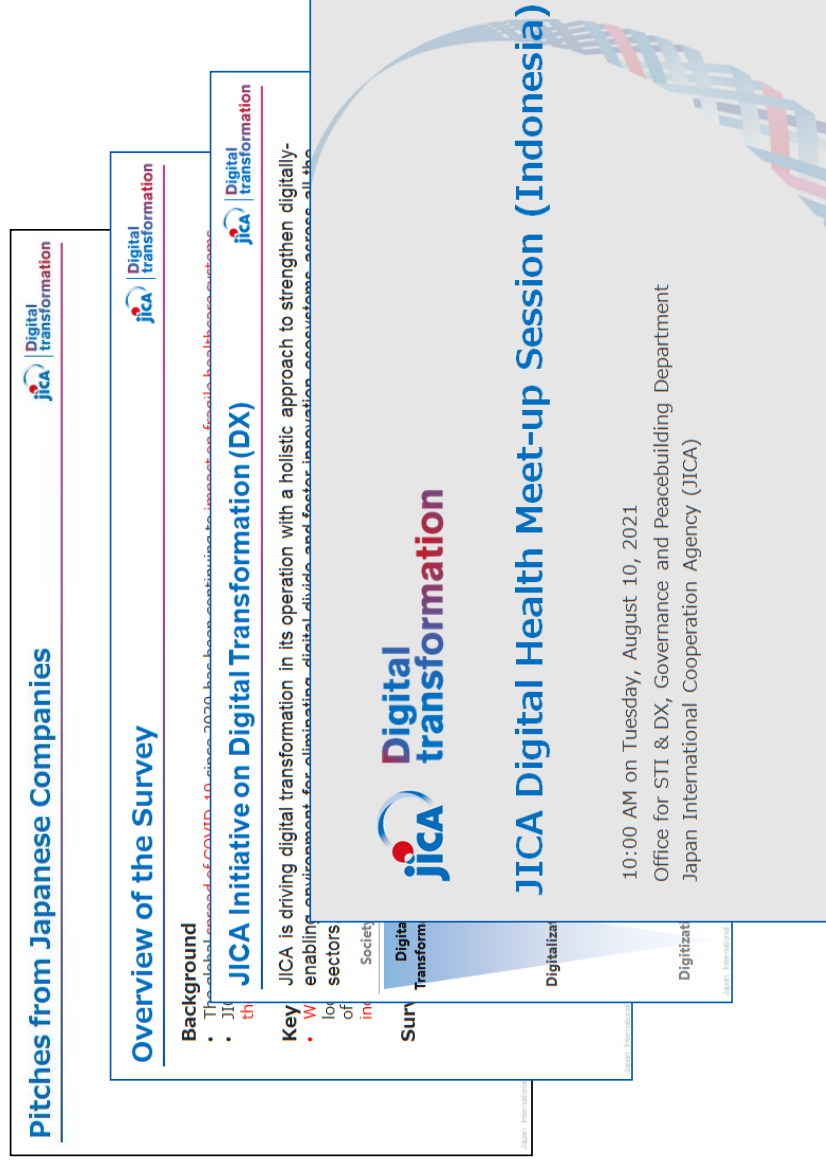
Rank	Company	Solution	Points
1	MITAS Medical Inc.	Remote consultation service to ophthalmology using a smartphone-based mobile slit lamp	77
2	Allim Inc.	Join	71
3	ExaWizards Inc.	Remote rehabilitation service	70
4	Techlico Inc.	Rehamaru (Rehabilitation system using Mixed Reality)	62
4	Precision Inc.	AI Clinical decision support	62
6	PARAMOUNT BED CO., LTD.	Non-contact monitoring and workload reduction using Nemuri SCAN under the Covid-19 epidemic	61
6	Sojitz Corporation (Tetsuyu Healthcare Holdings)	CARES / CARES 4 WOUNDS	61
8	Flixy Inc.	Melp	60
9	HealtheeOne Inc.	HealtheeOne Cloud	52
10	CYBERDYNE Inc.	Wearable Cyborg HAL	50
10	OUI Inc.	Smart Eye Camera	50
12	Arc Planning	Online medical education program with Docquity platform	49
13	Doog Inc.	Robotic Cart THOUZER BASIC, Robotic Wheelchair Garoo	45
14	Arc Planning	Wellpass	42
15	ICHIGO LLC	Teleradiology/Telepathology IT Platform Service	41

※In Indonesia, due to the large number of applicants, only the top 10 companies were allowed to pass the first screening. Since there were two companies ranked in the same tenth place, the total number of companies that passed the first screening in Indonesia was 11.

Meet-up Session

Meet-up Session was held in each country on the following schedule for the companies that passed the first screening to introduce their solutions to local medical facilities. Medical facilities were asked to submit an Expression of Interest (EOI) for the solutions they were interested in, and the companies were matched with local medical facilities. Workshops with the medical facilities were arranged for those companies that wished to participate.

- Objective
 - Japanese digital health companies that passed the first screening introduce their solutions to local medical facilities through the pitch.
 - Medical facilities submit EOI for solutions they are interested in.
- Target
 - Japanese companies that passed the first screening
 - Local medical facilities
 - ※ The local medical facilities in this screening process refer to the facilities in each country where the online questionnaire survey and follow-up interviews were conducted in this project.
 - ※ In addition, medical facilities that did not complete the online questionnaire and follow-up interviews, but newly expressed interest in the project during the selection process, were invited to this seminar and were interviewed individually about their interest in the project.
- Date and time (Japan time, in order of implementation)
 - Indonesia: August 10, 2021, 12:00~14:20
 - Kenya : August 10, 2021 19:00~20:45
 - Brazil : August 11, 2021, 20:00~21:45
- Program
 - Part 1: Overview of JICA Global Health Initiative and JICADX
 - Part 2: Overview of this survey and PoC
 - Part 3: Pitches from companies



Meet-up Session

Summary

After Meet-up Session, the local medical facilities were requested to submit their EoI in order to measure which Japanese products they are interested in. As a result, EoI were submitted by the medical facilities in the table below.

- Medical facilities that submitted EoI in Brazil (Final Candidate of PoC)

No.	Medical Facility	Interested Company
1	Complexo Hospitalar e da Saúde da Universidade Federal do Rio de Janeiro	<ul style="list-style-type: none"> • CYBERDYNE Inc. • Oui Inc. • Flixy Inc. • ICHIGO LLC • Techlico Inc.
2	Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo	<ul style="list-style-type: none"> • ICHIGO LLC • CYBERDYNE Inc.
3	Hospital Santa Casa de Juiz de Fora	<ul style="list-style-type: none"> • Flixy Inc. • Techlico Inc. • HealtheeOne, Inc. • CYBERDYNE Inc.
4	Hospital Novo Atibaia SA	<ul style="list-style-type: none"> • OUI Inc.
5	Hospital das Clínicas da Universidade Federal de Pernambuco (HCUFPE)	<ul style="list-style-type: none"> • Oui Inc. • Flixy Inc. • HealtheeOne Inc. • Precision Inc. • ICHIGO LLC • Techlico Inc. • CYBERDYNE Inc.

Meet-up Session

- Medical facilities that submitted EoI in Kenya (Final Candidate of PoC)

No.	Medical Facility	Interested Company
1	Radiant Group of Hospital	<ul style="list-style-type: none"> • Fixy Inc. • ICHIGO LLC • Melody International Ltd.
2	Ushirika Clinic	<ul style="list-style-type: none"> • OUI Inc. • Melody International Ltd.
3	Aldama Clinic	<ul style="list-style-type: none"> • OUI Inc. • Fixy Inc. • Precision Inc. • Melody International Ltd.
4	Coast General Teaching and Referral Hospital	<ul style="list-style-type: none"> • OUI Inc. • Melody International Ltd. • ICHIGO LLC
5	Nairobi Women's Hospital	<ul style="list-style-type: none"> • Melody International Ltd.
6	Moi Teaching and Referral Hospital	<ul style="list-style-type: none"> • Melody International Ltd. • Fixy Inc. • ICHIGO LLC

Meet-up Session

■ Medical facilities that submitted EoI in Indonesia (Final Candidate of PoC)

No.	Medical Facility	Interested Company
1	Harapan Kita National Cardiovascular Centre	<ul style="list-style-type: none"> • Allm Inc. • HealtheeOne Inc.
2	Harapan Kita Mother and Children Hospital	<ul style="list-style-type: none"> • OUI Inc. • PARAMOUNT BED CO., LTD. • Flixy Inc. • Allm Inc. • ExaWizards Inc. • Techlico Inc. • Precision Inc. • HealtheeOne Inc. • CYBERDYNE Inc. • MITAS Medical Inc.
3	North Smatera University Hospital	<ul style="list-style-type: none"> • MITAS Medical Inc. • Techlico Inc. • PARAMOUNT BED CO., LTD.
4	PKU Muhammadiyah Bantul General Hospital	<ul style="list-style-type: none"> • Precision Inc. • CYBERDYNE Inc.
5	Mitra Medika General Hospital	<ul style="list-style-type: none"> • Flixy Inc. • Allm Inc. • PARAMOUNT BED CO., LTD.

Second Screening

Summary Among the companies that were matched with local medical facilities, 5 companies from Brazil (5 products), 5 companies from Kenya (5 products), and 8 companies from Indonesia (8 products) applied for the second screening, and 30-minute screening interviews were held with each company on September 16, 17, and 21.

■ Documents for screening

- In the second screening, the following 8 documents were required.
 1. Business development plan
 2. PoC implementation methodology (Perspective of problem solving verification)
 3. PoC implementation methodology (Perspective of technical verification)
 4. PoC implementation methodology (Perspective of business feasibility verification)
 5. PoC schedule
 6. PoC structure
 7. PoC budget plan
 8. Cooperation Agreement of joint proposal for PoC with local medical facility (*Option)

As a result, applications from 5 companies (5 products) in Brazil, 5 companies (5 products) in Kenya, and 8 companies (8 products) in Indonesia were received. Screening interviews (30 min.) were held with each applicant company on September 16, 17, and 21. The evaluation and scoring was conducted by JICA STI/DX Office, JICA national offices, JICA Human Development Department, and the survey team based on the second screening criteria on the right.

"8. Cooperation Agreement of joint proposal" could be submitted only if the mutual agreement was made between a company and a medical facility by the proposal deadline.

■ Second screening criteria

Evaluation Items	Evaluation Points	Detailed Items	Points
Business Development Plan (30 points)	Feasibility of business development	Have a hypothesis for business development after the PoC in the target country, such as understanding the market environment, setting target customers, and growth strategy.	10
	Development impact	Contribute to the resolution of important issues in the medical field in the target country. Socioeconomic impact is expected.	10
	Risk analysis	There are no laws or regulations that may be in conflict with the PoC implementation. If there are, the solution is clearly indicated.	6
PoC Implementation Plan (50 points)	Adequacy of objectives and methods	Have a hypothesis on the main disincentive/risk in business development.	4
		The purpose of the PoC implementation is clear, specific, and feasible.	9
	Adequacy of schedule	The purpose, method, contents, and evaluation criteria for "verification of problem solving" are clear, specific, and feasible.	12
		The purpose, method, contents, and evaluation criteria for "technical verification" are clear, specific, and feasible.	12
		The purpose, method, contents, and evaluation criteria for "business feasibility verification" are clear, specific, and feasible.	12
PoC Implementation Structure (20 points)	Adequacy of operating structure	Appropriate and detailed schedule has been proposed to implement the PoC for 3 months by the end of February 2022.	5
	Other	The responsible person of the Japanese company in the target country is clearly indicated, and the system for implementing the PoC is sufficiently organized. The responsible person of the medical institution in the target country is clearly indicated, and the system for implementing the PoC is sufficiently organized. The responsibilities and roles of the workforce are clearly indicated.	8
Other	Other	A cooperation agreement has been obtained from the medical facility where the PoC will be implemented. (Points will be added if agreement has been obtained.)	5
		Total	105

Results of Selection

Summary In the second screening, 5 companies from Brazil, 5 companies from Kenya, and 8 companies from Indonesia submitted their proposals. Based on the aforementioned screening criteria, and taking into consideration the balance of companies and diversity of solutions in the three target countries, the proposals from 2 companies in Brazil, 2 companies in Kenya, and 3 companies in Indonesia were selected.

■ Results of the second screening (Brazil)

Company	Solution	Medical Facility	Affinity with Supporting Measures	Affinity with Potential Areas for Entry*
Techlico Inc.	Rehamaru (Rehabilitation system using Mixed Reality)	Hospital Santa Casa de Juiz de Fora	(to be considered)	● (MR TRAINING)
ICHIGO LLC	Teleradiology / Telepathology IT Platform Service	Hospital das Clínicas da Universidade Federal de Pernambuco (HCUFPE)	(to be considered)	○ (Remote Diagnostic Support)

■ Results of the second screening (Kenya)

Company	Solution	Medical Facility	Affinity with Supporting Measures	Affinity with Potential Areas for Entry*
OUI Inc.	Smart Eye Camera	Coast General Teaching and Referral Hospital Ushirika Medical Clinic	(to be considered)	○ (Remote Diagnostic Support)
Melody International Ltd.	Mobile Fetal Monitor iCTG	Nairobi Women's Hospital	(to be considered)	● (Remote Monitoring)

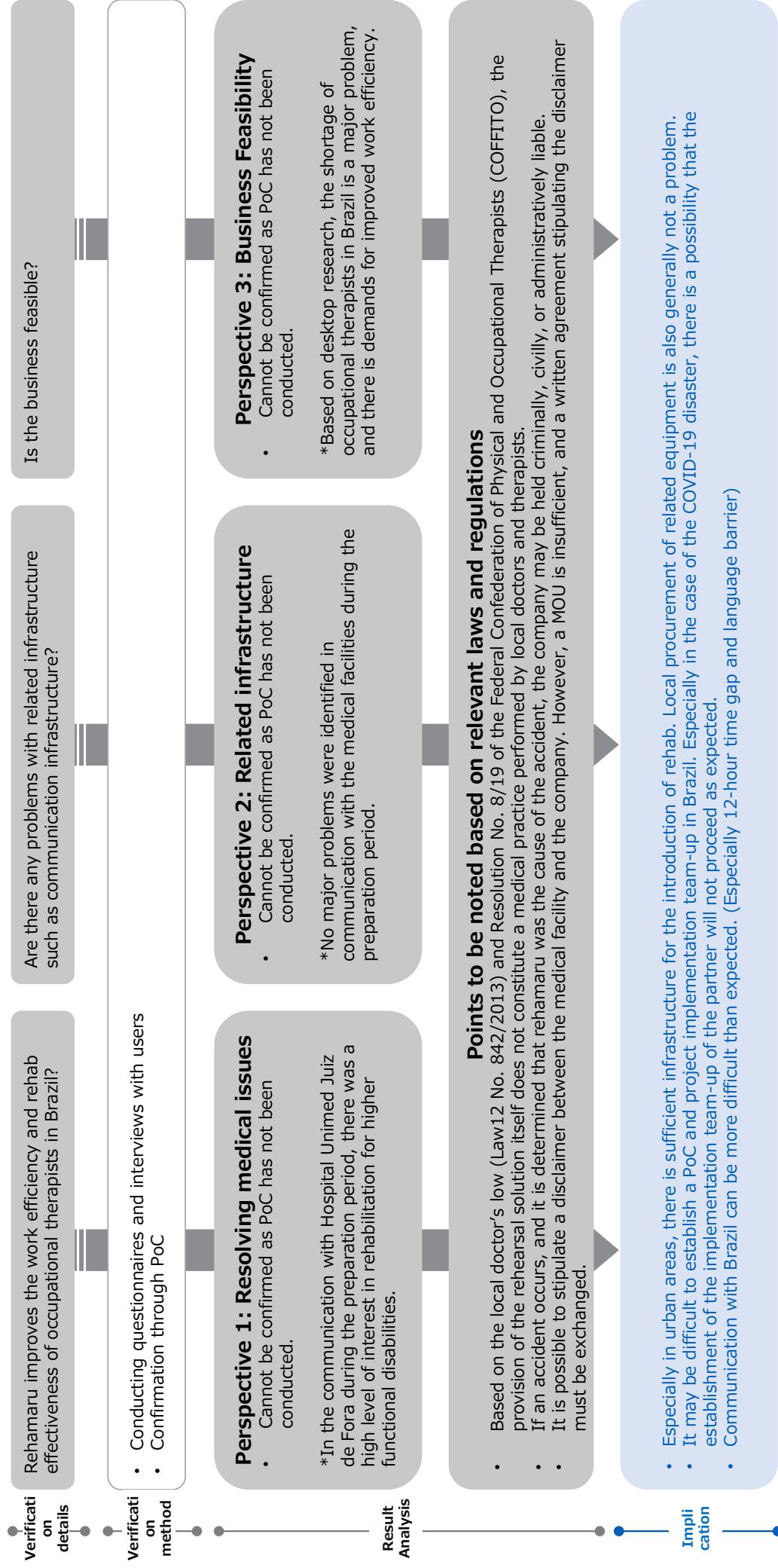
■ Results of the second screening (Indonesia)

Company	Solution	Medical Facility	Affinity with Supporting Measures	Affinity with Potential Areas for Entry*
MITAS Medical Inc.	Remote consultation service to ophthalmology using a smartphone-based mobile slit lamp	North Smatera University Hospital	(to be considered)	○ (Remote Diagnostic Support)
Precision Inc.	AI Clinical decision support	Harapan Kita Mother and Children Hospital	(to be considered)	○ (Tele-triage)
Allm Inc.	Join	Indonesian Society of Pediatric Cardiology	(to be considered)	● (Doctor to Doctor Platform)

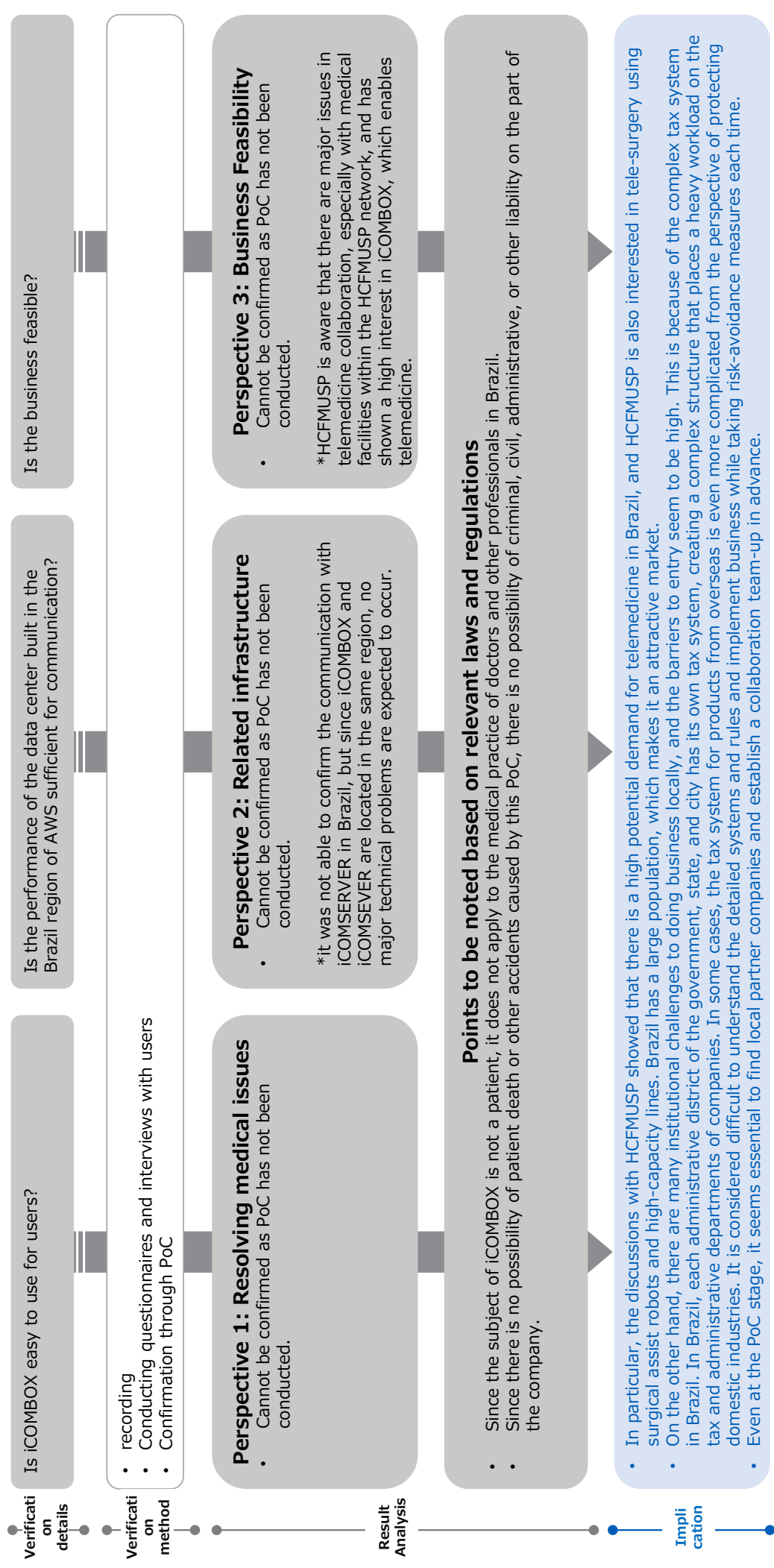
Affinity with the "potential areas for expansion" suggested in each country's "Potential Digital Health for Micro and Macro Issues and Needs" slide.

Note: ○ Area of potential, ● Area of particular potential with few competition

Assessment of PoC (Brazil): Techlico Inc.



Assessment of PoC (Brazil): ICHIGO LLC



Assessment of PoC (Kenya): OUI Inc.

Verification on details

Can primary health care facilities without ophthalmologists provide eye care to patients?

Are there any problems with related infrastructure such as communication infrastructure?

Is the business feasible?

Verification on method

- recording
- Conducting interviews with users, conducting interviews with companies, etc.
- Confirmation through PoC

Perspective 1: Resolving medical issues

- Many of the videos taken were of low quality, but many of them could be improved by improving the shooting skills of the users.
- Users commented that the introduction of mobile slitlamps improved the accuracy and efficiency of diagnosis compared to conventional examinations using torch lights.

Perspective 2: Related infrastructure

- At the beginning of the PoC, there was a problem that video upload to the cloud server was not possible, but this was resolved by changing the region of the cloud server.

Perspective 3: Business Feasibility

- Since the iPhone is not very popular in Kenya, there was a demand for a solution that could support different OS and models.
- There was also a demand for mobile slitlamps that could examine not only the anterior segment but also the fundus.
- The selling price should be considered in line with the local price level.

Result Analysis

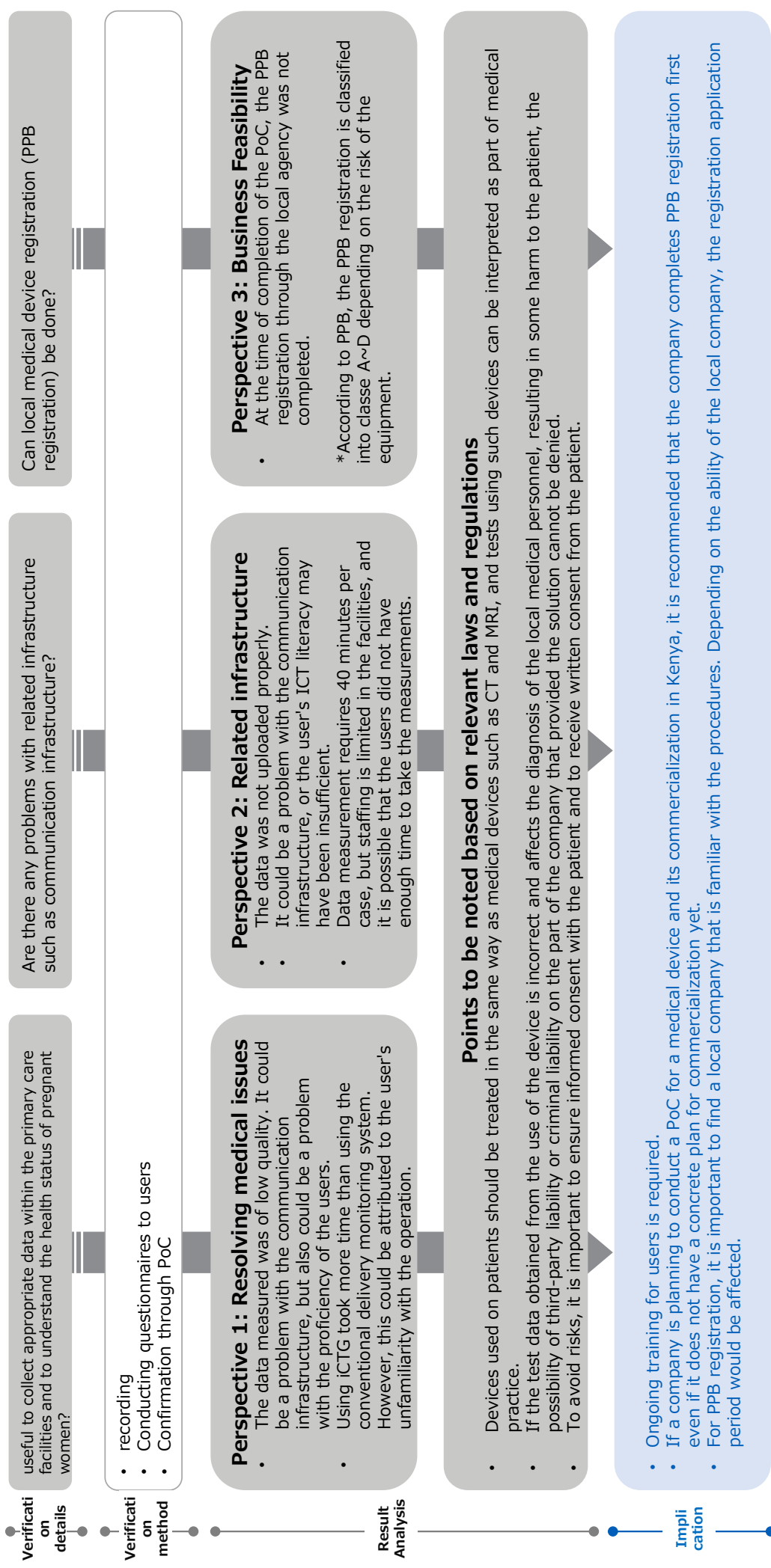
Points to be noted based on relevant laws and regulations

- Devices used on patients should be treated in the same way as medical devices such as CT and MRI, and tests using such devices can be interpreted as part of medical practice.
- If the test data obtained from the use of the device is incorrect and affects the diagnosis of the local medical personnel, resulting in some harm to the patient, the possibility of third-party liability or criminal liability on the part of the company that provided the solution cannot be denied.
- To avoid risks, it is important to ensure informed consent with the patient and to receive written consent from the patient.

Implication

- Continuous staff training is required to shoot videos of sufficient quality (one or two training sessions are not enough)
- Consideration should be given to incentives for staff to participate in training to ensure ongoing training (e.g., receive a score for certification renewal if they attend training).
- Need to increase the level of involvement of top-tier hospitals in collaborations and consider incentives for top-tier hospitals.
- Region settings are important, but careful consideration of the Data Protection Act is needed when transferring data outside Kenya.
- Since the potential demand is high, it is necessary to consider ways to reduce the price and fit the solution to the local market by examining the possibility of local production.

Assessment of PoC (Kenya): Melody International Inc.



Assessment of PoC (Indonesia): MITAS Medical Inc.

Verification on details

Does it contribute to the improvement of the quality of ophthalmic diagnosis in primary medical institutions and the productivity of ophthalmologists in upper-level medical facilities?

Verification on method

- recording
- Conducting questionnaires to users
- Confirmation through PoC

Perspective 1: Resolving medical issues

- There was a discrepancy between the diagnosis of the primary care GP and that of ophthalmologist at the higher medical facility.
In the case of cataracts, which are diseases inside eyes, and keratitis and corneal ulcers, which require detailed ocular information for diagnosis and treatment decisions, more than half of the patients showed discrepancies.
- The number of patients that the ophthalmologist at the upper medical facility can handle has increased.

Result Analysis

Points to be noted based on relevant laws and regulations

- If the role of the company is only to propose solutions, it does not constitute a local medical practice.
- There are no clear regulations regarding the responsibility of the company that provided the solution in the event of an accident, such as the death of a patient, during the PoC implementation period. However, there is a possibility that the affected patients may be held criminally or civilly liable.
- In order to avoid the risks mentioned above, it is necessary to obtain written consent from the patient as suggested by the local law firm. It is also important to agree on the disclaimer in advance with the medical facility where the PoC will be implemented, and to exchange a written document with them.

Implication

- Remote consultation using MS1 is expected to reduce the number of cases that may have been overlooked at the level of primary care facilities in the past based on the results of appropriate examinations based on the expertise of ophthalmologists, leading to early diagnosis and prevention of serious conditions.
- Teleconsultation reduces the average time per case compared to face-to-face consultations, and therefore increases the number of cases that can be handled by each ophthalmologist, which is expected to contribute to increased productivity of ophthalmologists.
- Inadequate access to the Internet in rural areas
- Non-technical issues are expected to be improved by providing necessary training to users, simplifying operations, and setting up consultation hours.
- The current insurance system has not established a payment mechanism between medical facilities under the telemedicine network. However, MOH has already started some pilot activities to make telemedicine services eligible for BPJS reimbursement nationwide, and the progress will be continuously followed.

Is the business feasible?

Are there any problems with related infrastructure such as communication infrastructure?

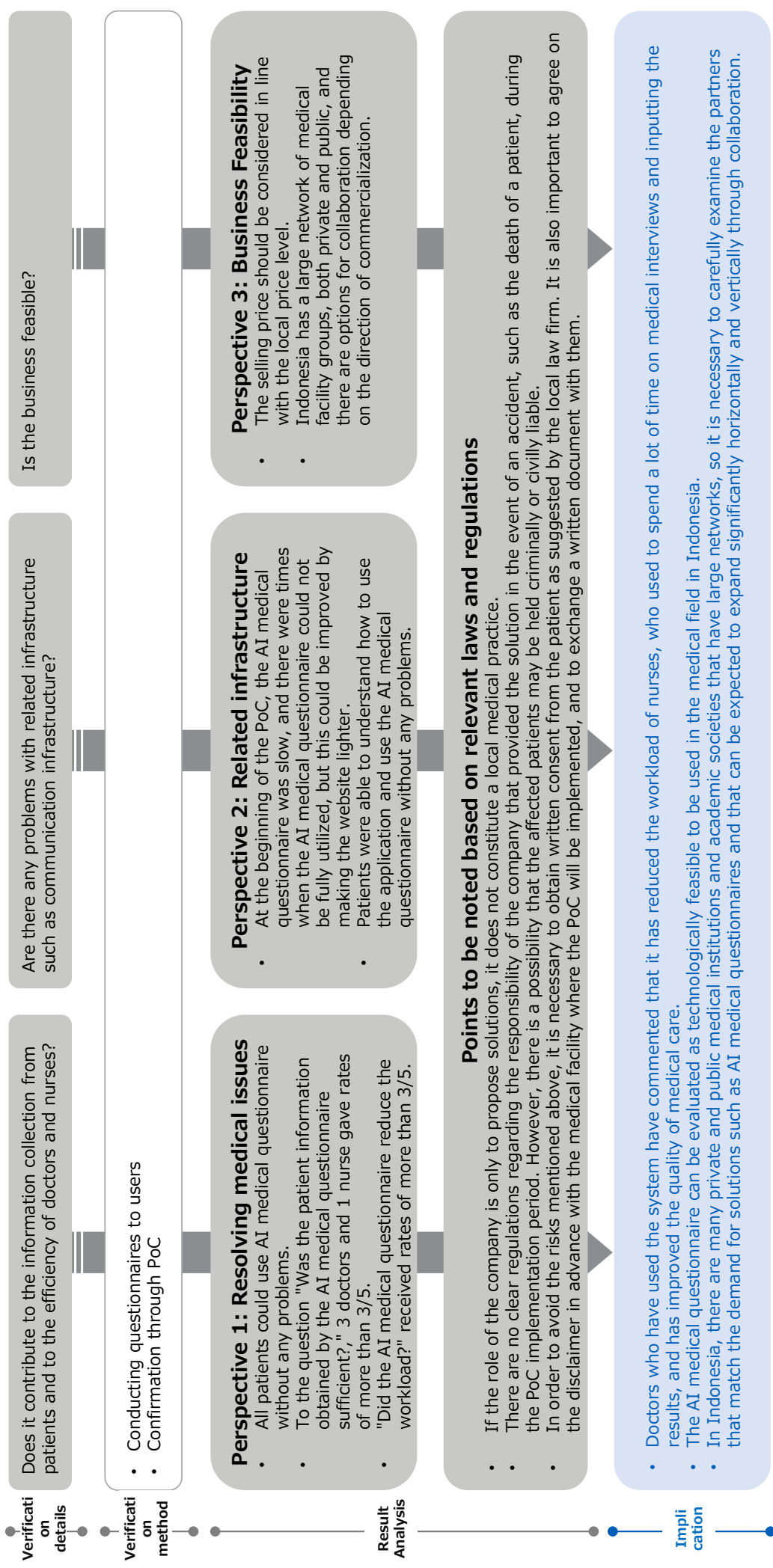
Perspective 2: Related infrastructure

- In most cases, no related infrastructure problems were identified.
In the case of remote medical facilities, internet connection was difficult and uploading was not always possible.
Some poor quality data can be expected to improve with training for the photographer.
- Of the uploaded ocular videos, more than 90% were of sufficient quality.

Perspective 3: Business Feasibility

- The selling price should be considered in line with the local price level.
A comment by user was made that since no payment is made by the primary healthcare facility to the higher level healthcare facility, it is not economically sustainable.
By improving access to healthcare and increasing the effectiveness of treatment, public and private insurance companies can expect to see demand for treatment cost containment.

Assessment of PoC (Indonesia): Precision Inc.



Assessment of PoC (Indonesia): Allm Inc.

Verification on details

Will it contribute to improving cooperation among physicians and increasing physicians' productivity?

Are there any problems with related infrastructure such as communication infrastructure?

Is the business feasible?

Verification on method

- Conducting questionnaires to users
- Confirmation through PoC

Perspective 1: Resolving medical issues

- Join is highly compatible with devices supporting DICOM such as CT and MRI, but in reality, many examinations are performed with ultrasound that may not support DICOM.
- For images that are not DICOM, it is difficult to take advantage of the FileGateway method.
- It was able to confirm the usefulness of the FileGateway method in that it can be deployed to multiple facilities simultaneously.

Perspective 2: Related infrastructure

- There are no significant problems in the communication environment.
- For images that are not DICOM, there is no compatibility with the FileGateway method, which was a technical barrier for the users.
- Medical facilities may not have sufficient archiving systems such as PACS, and may lack the infrastructure of existing systems.

Perspective 3: Business Feasibility

- Although the combination of the FileGateway system and the use of societies is effective, it would be difficult to monetize the system because the societies do not necessarily have sufficient payment capacity.

Result Analysis

Points to be noted based on relevant laws and regulations

- If the role of the company is only to propose solutions, it does not constitute a local medical practice.
- Join is a communication tool between doctors, not a direct solution for patients. There is no current law that clearly stipulates the liability of the company providing the solution in the event of an accident such as a patient death.
- While the relevant risks are not clear as described above, a suggestion from a local law firm is that it is important to agree on a disclaimer of possible risks between the company and the medical facility where the PoC will be implemented and to exchange a written document in advance.

Implication

- In fact, it was not the performance or function of the File Gateway itself, but the problem with the equipment at the medical facility that forced them to import images that could not originally be uploaded with Join. Due to this background, the problem of the File Gateway is not working arose. However, it is necessary to be aware of the possibility that this may be the current situation in Indonesia and Southeast Asia.
- From the perspective of network establishment, it is meaningful to collaborate with societies such as PERKANI. On the other hand, from the perspective of commercialization and monetization, it is more realistic to approach individual medical facilities that may have the available budgets. One idea is to first collaborate with an society with a network such as an academic society, and then proceed with individual discussions with specific medical facilities participating in that network.
- When proposing Join, it would be also an idea to propose solutions from other companies that contribute to improving the systems and infrastructure of medical facilities.

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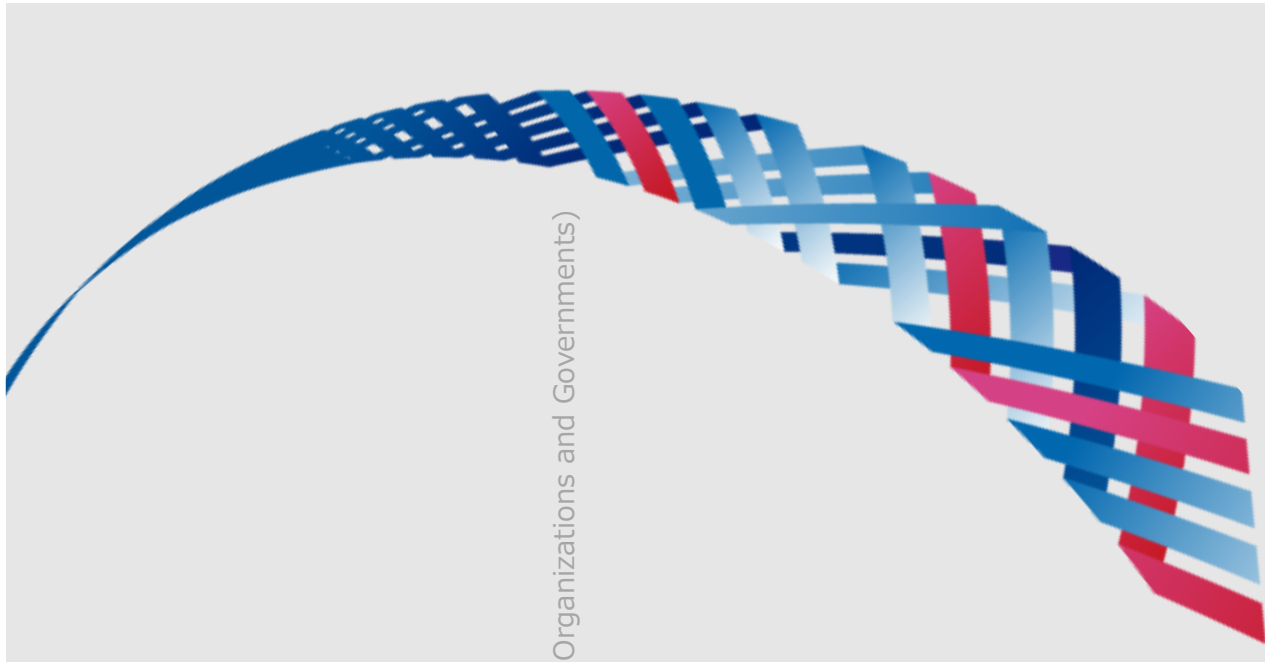
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Hypothesis Verification of Supporting Measures(Brazil)

Summary As a result of interviews, it can be said that collaboration with the innovation partners proposed in the Brazil's hypothesis was generally appropriate as it is expected to have a high impact on the autonomous development of digital health market and ecosystem. However, there are new implications that selection of innovation partners and targeting of companies and technologies are necessary to address the disparity in healthcare quality.

Interviewees

InovaHC	Innovation Hub in University Hospital of Sao Paulo
Eberth	Public corporation that centrally manages 40l university hospital in Brazil
NTT DATA Brazil (Everis)	Member of Innovation Hub (CUBO)
Mindify	Local Startup Company
FUJIFILM	Japanese companies entering Brazilian market
Canon Medical Systems do Brasil	Japanese companies entering Brazilian market
Mitsubishi Corporation (Brazil)	Japanese trading companies in Brazilian market
Santa Cruz Hospital	Nikkei private hospital in Brazil



Hearing Outline

- InovaHC's emphasis is on multidisciplinary collaboration with diverse companies that have products and technologies to address issues in medical field. In the future, InovaHC aims to collaborate with other medical facilities such as university's network in order to reduce regional disparities in healthcare access.
- Eberth, which centrally manages 40 university hospitals around the country, started working on the use of digital technology even before the spread of COVID-19, and is highly interested in using digital technology owned by companies in other countries.
- CUBO is an innovation hub with about 250 startups and 30 major companies. CUBO is one of the largest innovation hubs in the world and provides a rich environment. There are benefits of collaboration in bringing together open innovation for complex cross-sectoral issues.
- In Brazil, local startups have advanced digital health technology and are aiming to expand their business not only in Brazil but also in the global market.
- For Japanese companies, innovation partners also play an important role in overcoming institutional challenges unique to Brazil, especially in the early stages of entering the Brazilian market, verifying local adaptability and business potential, and expanding business.



Verification Results

- ✓ **In Brazil, medical facilities are leading transformation similar to DX by adopting solutions from the private sector and providing new value to solve healthcare issues.**
- ✓ **The collaboration with innovation partners presented in the hypothesis is expected to have a high impact on autonomous development of digital health market and ecosystem.**
- ✓ **By collaborating with Innovation Hub, it is highly likely that co-creation will be realized not only with medical facilities, but also with diverse stakeholders such as companies, start-ups, research institutions, and government agencies.**
- ✓ **In Brazil, in particular, the direction of supporting measure is to encourage companies to expand their business. According to the interviews, it is highly significant to target start-ups, small and medium companies with new digital health technology.**
- ✓ **In order to improve quality of healthcare that are occurring due to economic disparities, it is important for innovation partners to choose partners that have a potential to develop into more of a healthcare challenge for the country.**

Hypothesis Verification of Supporting Measures(Kenya)

Summary

As a result of interviews, Kenya's hypothesized ICT infrastructure development for the government and mainly public healthcare facilities, which was the main axis of the hypothesis, is likely to contribute to the improvement of public healthcare services, the achievement of UHC, and the development of digital health market in the target country. However, the validity of the hypothesis of supporting primary health care was not confirmed.

Interviewees

Kenya Association of Private Hospitals	Hospital association mainly composed of private hospitals
Ministry of Health	Ministry of Health
Ministry of Treasury and Planning	Financial Planning Ministry's Medium and Long Term Plan
National Hospital Insurance Fund	State-owned company of Kenyan government that provides public health insurance
The Council of County Governors	National Governors Association of Counties
Pharmacy and Poisons Board	Medical Devices and Drugs Regulatory Authority, Government of Kenya
IFC	International Financial Corporation
Population Services Intl.	Registered international non-profit organization
My Daw, Daktari Afrika	Local Startup
Nairobi Women's Hospital, Metropolitain Hospital	Private hospital
Asia Africa Investment & Consulting (AAIC)	Strategy Consulting & Investment Fund
Development Partners for Health in Kenya	Donor Coordinating Agency



Hearing Outline

- According to KAPH, the use of digital health solutions is widespread in private hospitals.
- According to private hospitals, the system is digitalized, but each system is independent and inefficient.
- Most public medical facilities are not yet digitalized, and the necessary infrastructure for the introduction of digital health technology is not yet in place.
- MoH is promoting digital health, which is part of the Action Plan, using a development policy loan from Japanese government. Most emphasis will be placed on the development of a Digital Health Platform (DHP) to integrate payment systems and EMR to enable seamless sharing of medical data, both public and private.
- NHIF recognizes the importance of linking to each healthcare provider's EMR and basic personal information for health insurance payment.
- Fears that weak data linkage between private sector, medical facilities and NHIF will reduce healthcare demand
- MoH strongly insisted on the need for consensus building and initiative building to share and consult with a wide range of stakeholders, as the DHP covers many modules
- Digitalization of community health is being implemented in parallel with the new Primary Care Network (PCN) initiative.

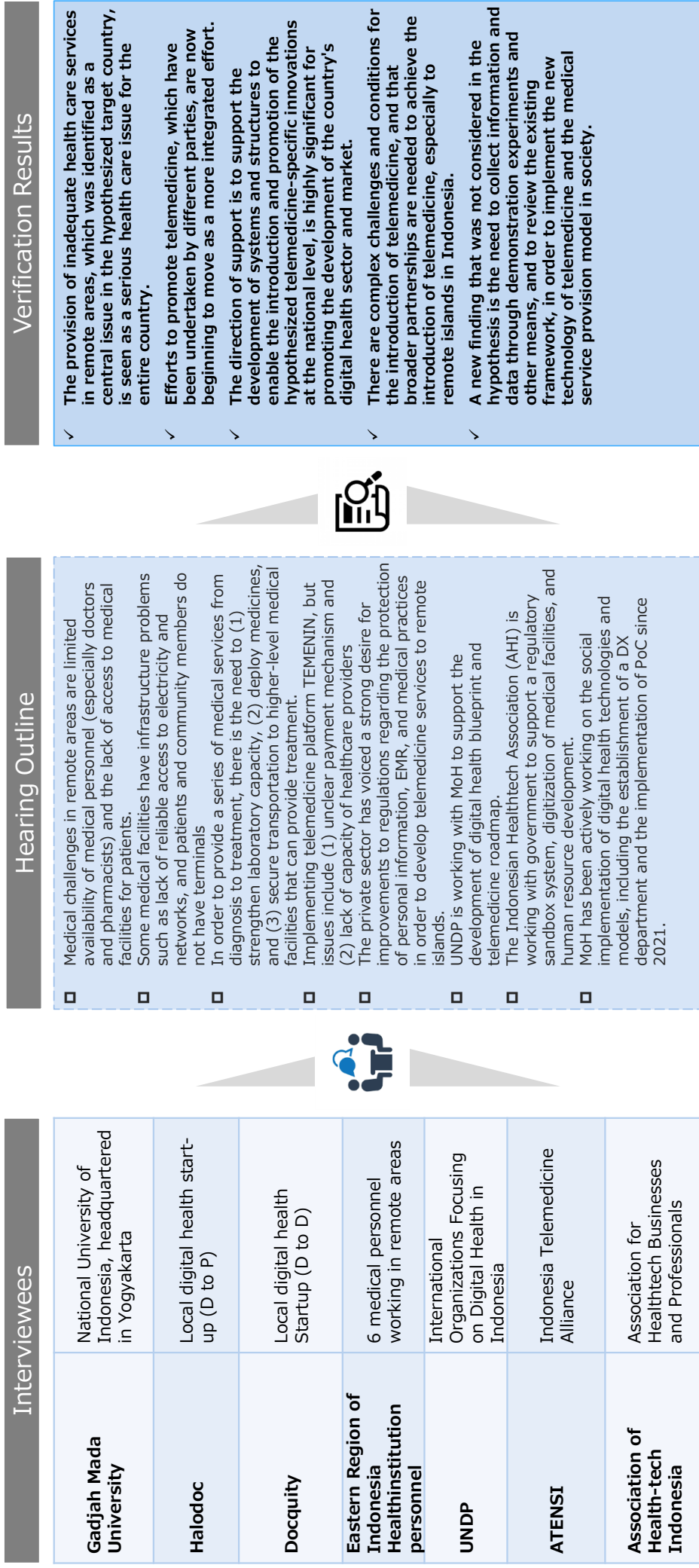


Verification Results

- ✓ **The direction of support, such as the creation of infrastructure for the introduction of digital health technology, targeting the government and mainly public medical facilities, which was the central axis of the hypothesis, is likely to contribute to the improvement of public medical services and the achievement of UHC, which are issues in the target country, as well as to the development of the digital health market in the country, although not directly.**
- ✓ **In general, public facilities in Kenya are lagging behind in digitization and need more support.**
- ✓ **This is an important initiative for universal health coverage, as it will improve the environment for medical information infrastructure and insurance systems, and will promote the development of private digital health technologies and demand for the use of these technologies.**
- ✓ **Regarding the establishment of a foundation for the system, there is a high need for opportunities for co-creation between public and private sectors through dialogues, etc. for the establishment of DHPs.**
- ✓ **Regarding the use of digital health technology for primary health care as presented in the hypothesis, although the use of digital technology for referral systems is expected in line with the new PCN framework, it could not be fully confirmed how exactly it will be introduced.**

Hypothesis Verification of Supporting Measures (Indonesia)

Summary As a result of interviews, the hypothesis of supporting the introduction and promotion of telemedicine at the national level in Indonesia is highly plausible, as new initiatives in telemedicine have increased the need for support and will enable the promotion of the development of digital health sector and market. However, due to the complexity of the issues, co-creation with a broader range of partners is needed than assumed in the hypothesis.



Final Supporting Measure (Brazil)

Summary Based on the results of hypothesis verification, Brazil proposes the following final measures: "Establish a collaboration system and implementation framework with InovaHC, a local innovation hub, to agiley verify and improve the technologies of Japanese start-up companies for medical issues faced by hospitals, introduce ICT We will propose "introduction of ICT solutions that contribute to solving local medical issues, and support for Japanese companies to enter the Brazilian market."

Overview	Main issue	<ul style="list-style-type: none"> ✓ Improving disparities in the quality of medical services
	Gap between the current situation and what to achieve	<ul style="list-style-type: none"> ✓ Current situation (as is) : Although Japanese companies would like to consider introducing new solutions using their digital health technologies to address the medical issue in Brazil, the number of companies operating in the Brazilian market is limited, and they are not able to reach out sufficiently. Similarly, Japanese companies are also interested in Brazilian market, but are hesitant to expand their business because they do not know what kind of regulations and business practices exist. ✓ Objective (to be) : To quickly resolve issues faced by Brazilian medical facilities by introducing aging-related technologies and the latest technologies owned by Japanese companies in a timely manner. ✓ Gap: There are no platforms or frameworks for collaboration between Japanese companies with digital health technologies and Brazilian medical facilities.
	JICA's value proposition/strengths	<ul style="list-style-type: none"> ✓ JICA has a track record of supporting many Japanese private companies, especially in the health care sector, through private sector partnership schemes centered on research work. ✓ We have connections with private companies with digital health technologies developed in this research and have experienced procedures to conduct demonstration experiments with InovaHC.
	Possible clients	<ul style="list-style-type: none"> ■ InovaHC University Hospital of Sao Paulo ■ Japanese companies and startups ■ Doctors and researchers in the medical field
	Possibilities for collaboration and co-creation	Social implementation of digital health technology with InovaHC, business collaboration with Japanese start-ups, and spread of digital health technology through InovaHC's hospital network.
	Final beneficiary	Patients receiving improved medical services through ICT technology introduced through demonstration experiments, etc.
	Consistency with JICA policy	<ul style="list-style-type: none"> ■ JICA's Global Agenda: 6. Strengthening core hospital diagnosis and treatment in "Health and social Care", ■ JICA's Global Agenda:15 "Promotion of Digitalization" to solve problems and increase development impact by promoting digitalization in each area and field of development (cross-sectoral DX mainstreaming) ■ Country-specific development cooperation policy for Brazil: Support in areas that promote economic growth
	JICA Support Form	<ul style="list-style-type: none"> • Support for demonstration experiments by Japanese companies through information collection and confirmation surveys, etc.
	Counterpart	<ul style="list-style-type: none"> • InovaHC, University Hospital of Sao Paulo
	Project Site	<ul style="list-style-type: none"> • University Hospital of Sao Paulo
Detail Is	Implementation period	<ul style="list-style-type: none"> • March 2022- March 2024
	Input and activitie	<ul style="list-style-type: none"> • Personnel: Consultants (agreement coordinators, demonstration experiment accelerators) • Funds: Demonstration experiment support funds
	Possibility of collaboration with existing projects	<ul style="list-style-type: none"> • Information collection and confirmation survey on support for countermeasures against novel coronaviruses by global digital health • Tsubasa project
	Future action	<ul style="list-style-type: none"> • Conclusion of Consensus Agreement • Establishing a demonstration framework with InovaHC • Establishing medical issue themes with InovaHC • Collaborate with the Ministry of Economy, Trade and Industry (METI) to identify Japanese companies for the Health Care Innovation Hub and Tsubasa project, and create a pooling list of Japanese health tech companies. • Support for PoC implementation by Japanese companies that match the theme of medical issues

Final Supporting Measure (Kenya)

Summary Based on the results of the hypothesis testing, the following measure is proposed: "Facilitate dialogue between policy making/regulatory government agencies, health administration implementing agencies, public/private medical institutions, public/private insurance institutions, and private tech companies for the establishment of a digital health platform as stated by the Ministry of Health for the introduction of health ICT technology."

Overview	Main issue Gap between the current situation and what to achieve	<ul style="list-style-type: none"> ✓ Health system inefficiencies due to lack of health information sharing among health administrators/health service providers ✓ Current status (as is) : Information sharing is difficult due to weak interoperability of health-related information (disease information, medical services, PHR, insurance-related information, drug consumables information, health human resources information, etc.). ✓ To be: To build a foundation DHP that enables health information to be shared to improve the efficiency and quality of health services. ✓ Gap: Each of the parties involved in handling patient information, drug information, insurance information, human resource information, etc. are developing and operating their own digital technologies, and opportunities for consultation do not exist.
	JICA's value proposition/strengths	<ul style="list-style-type: none"> ✓ More than half a century of cooperation in the health sector in Kenya ✓ Strong relationships with Kenyan stakeholders through being a major donor in the area of health systems strengthening aimed at UHC
	Possible clients	<ul style="list-style-type: none"> ■ Ministry of Health ■ County government ■ NHIF ■ Public and private health care institutions
	Possibilities for collaboration and co-creation	<ul style="list-style-type: none"> ■ Ministry of Health ■ County Government ■ NHIF ■ Public and Private Healthcare Institutions ■ Private Insurance Institutions, Tech Companies ■ Kenya Healthcare Federation ■ HEALTH NGOS NETWORK (HENNET) and others
	Final beneficiary	<ul style="list-style-type: none"> ➢ Direct beneficiaries • Department of Health, County Government: Enables accurate and immediate aggregation of medical information. • Public and private medical institutions: Information coordination within hospitals will be possible, which will lead to more efficient medical practices. ➢ Indirect beneficiaries • Residents using medical institutions (patients, etc.): Reduction of waiting time and explanation time to medical institutions, and improvement of convenience when changing medical institutions
	Consistency with JICA policy	<ul style="list-style-type: none"> ■ JICA's Global Agenda :6 Development and Improvement of Health Security System in "Health and Medical Care" ■ JICA's Global Agenda:15 Development of Digital Infrastructure in "Promoting Digitalization ■ Kenya Country Assistance Plan: Realization of UHC
	JICA Support Form	<ul style="list-style-type: none"> • Dispatch of experts in the field of digital health • Support for organizing workshops and forums
	Counterpart	<ul style="list-style-type: none"> • Planning Department, Ministry of Health, Kenya
	Project Site	<ul style="list-style-type: none"> • Ministry of Health, Kenya (Nairobi)
	Implementation period	<ul style="list-style-type: none"> • July 2022 – Jun 2026
Detail	Input and activitie	<ul style="list-style-type: none"> • Personnel: Expert (digital health field) IT coordinator experience • Funding: WS and forum support for DHP construction
	Possibility of collaboration with existing projects	<ul style="list-style-type: none"> • Health Sector Policy Loan for Achieving Universal Health Coverage (Phase2 I) • Project to Strengthen Accountability in County Health Service Management (Study Subject)
	Future action	<ul style="list-style-type: none"> • Confirmed the results of the digital health gap analysis with the Ministry of Health • Selection of dialogue stakeholders based on stakeholder analysis • Conducting gap analysis WS on digital health architecture (forming the initiative of various stakeholders, formulating specific implementation plans, etc.)

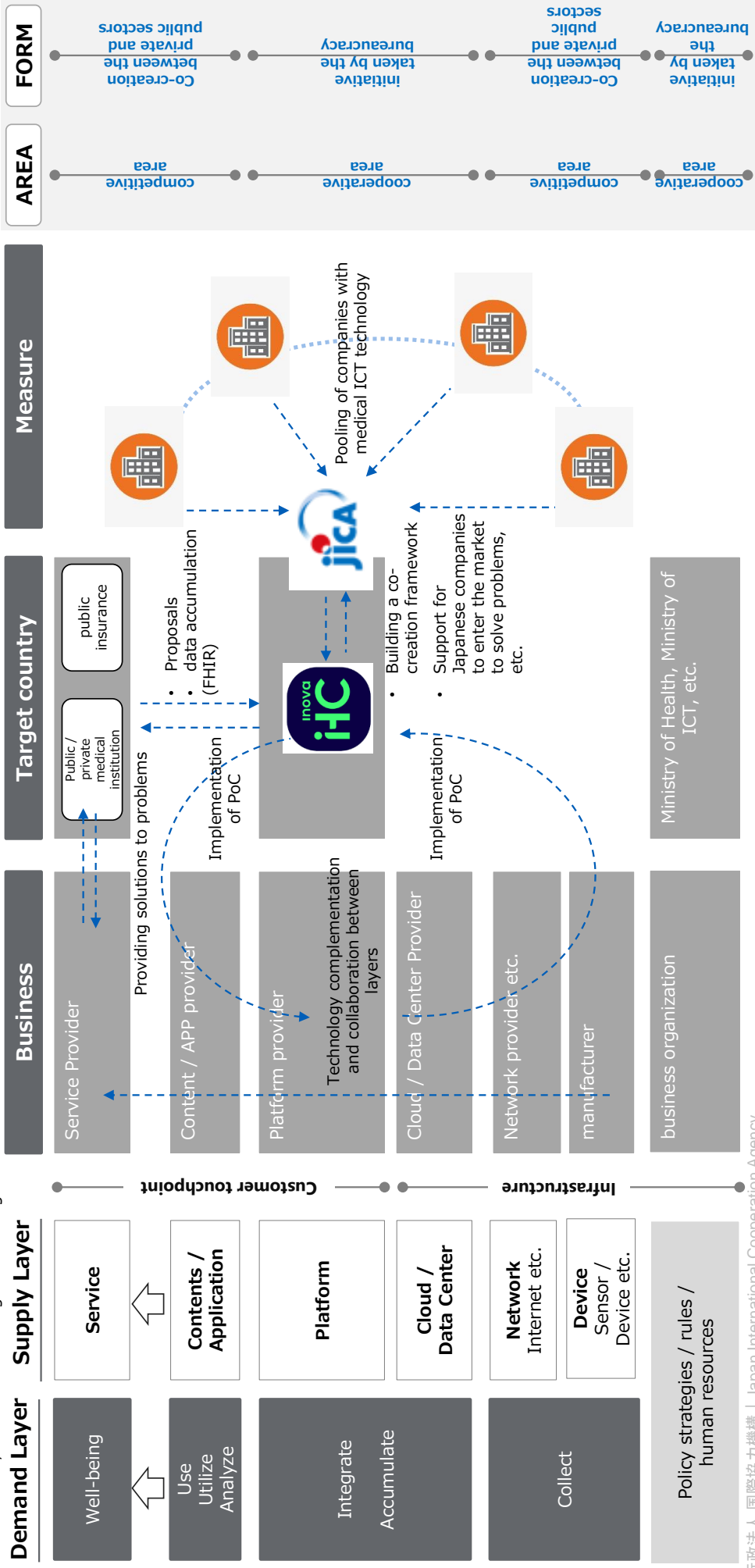
Final Supporting Measure (Indonesia)

Summary Based on the results of the hypothesis verification, the following final measure is proposed: "Support the implementation of the Indonesian government's telemedicine strategy as a center of excellence specializing in telemedicine that co-creates with players related to various issues for the introduction of telemedicine in remote areas and provides evidence for social implementation through PoC."

Overview	Main issue	<ul style="list-style-type: none"> ✓ Correcting disparities in health services in remote islands ✓ Current Status (as is) : The implementation of telemedicine in remote islands is hampered by a number of issues, including (1) insurance coverage, (2) payment mechanisms, (3) regulations, (4) infrastructure, and (5) human resource development, as well as the need to develop pharmaceutical logistics, laboratory facilities, and mobile access for residents in order for them to receive a full range of services using telemedicine technology. In addition, in order for residents of remote islands to receive a series of services using telemedicine technology, there are issues such as the development of pharmaceutical logistics, laboratories, and mobile access for residents, which prevents the implementation of the strategy. ✓ To be : Telemedicine will be implemented in remote islands. ✓ Gap: Pilot projects to establish new technologies and regulations for telemedicine have not been implemented.
	JICA's value proposition/strengths	<ul style="list-style-type: none"> ✓ Track record of numerous projects in Indonesia in the health care sector and building relationships with key stakeholders ✓ Experience with remote ICU and other ICT related projects
	Possible clients	Ministry of Health.
	Possibilities for collaboration and co-creation	[Regulation]: Ministry of Health, UNDP, ATENSI [Payment Mechanism]: BPJS, GMU [Capabilities]: Indonesian Healthtech Association (AHI) Technology and business collaboration: Japan and local startups Existing project counterparts: University Hospital of Indonesia, West Java, and Hasanuddin University Hospital, South Sulawesi
	Final beneficiary	Patients in remote islands and remote areas
	Consistency with JICA policy	<ul style="list-style-type: none"> ■ JICA's Global Agenda:6 "Development and improvement of medical security system" in "Health and Social Care", ■ "JICA's Global Agenda: 15 "Development of infrastructure for digitalization" in "Promotion of Digitalization". ■ Country Development Cooperation Policy for Indonesia: "To support the development of rural areas as well as major cities in order to improve the quality of life.
	JICA Support Form	<ul style="list-style-type: none"> • Technical cooperation projects • Support for demonstration experiments through information collection and confirmation surveys, etc.
	Counterpart	<ul style="list-style-type: none"> • DX Department, Ministry of Health, Indonesia
	Project Site	<ul style="list-style-type: none"> • Jakarta, West Papua Province, etc.
	Implementation period	<ul style="list-style-type: none"> • July 2022- December 2024 (Blueprint for Digital Health Transformation Strategy Target Year)
Detail	Input and activitie	<ul style="list-style-type: none"> • Personnel: center of excellence operation secretariat, local collaboration coordinator • Funds: Demonstration experiment support funds
	Possibility of collaboration with existing projects	<ul style="list-style-type: none"> • Project for Enhancing Intensive Care Capacity Using Remote Technology in a Novel Coronavirus Epidemic • Information collection and confirmation survey on support for countermeasures against novel coronaviruses by global digital health
	Future action	<ul style="list-style-type: none"> • Consultations with the Ministry of Health (e.g., agreement on issue areas where empirical data is required) • Problem area mapping and pilot technology selection for telemedicine • Human Resource Development] Introduction of AI medical interview technology from Japanese startups and enhancement of Doctor to Doctor diagnostic capabilities • [Payment mechanism] Verification of inter-agency payment mechanism using TEMENI with BPJS and GMU • Regulation] Feasibility of Halodoc's D-to-P service and verification of the implementation model for remote islands, etc. • Agreements with collaborative partners and implementation of pilot projects
	Is	

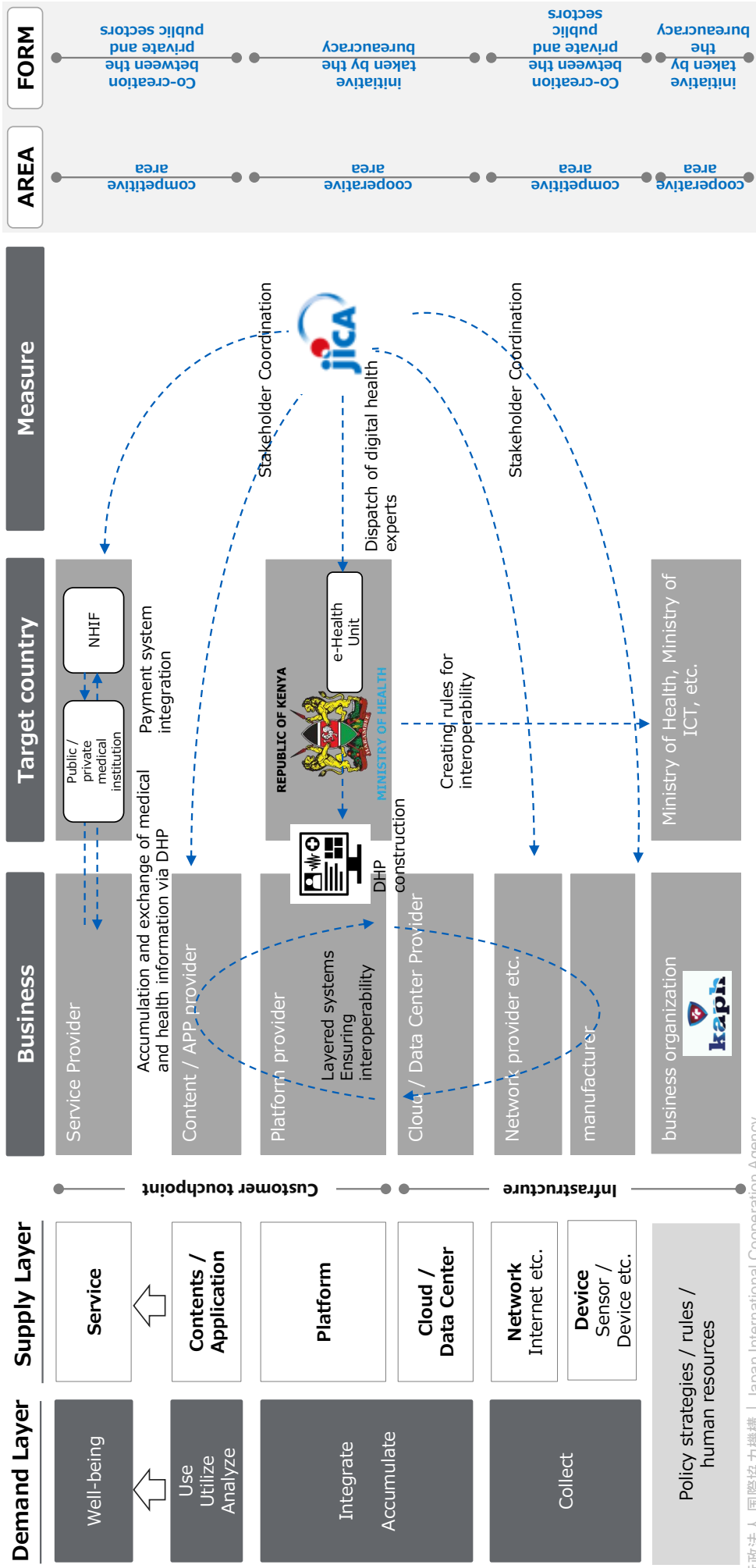
Proposed Final Measures in Digital Health Architecture (Brazil)

Summary By partnering with Inova HC, which plays an important role in the collaborative platform, the technologies and solutions of companies in the supply layer that have not been connected individually by architecture will be able to complement each other or create a synergistic impact through inova HC with the common goal of solving medical issues in the field. Inova HC will enable the technologies and solutions of companies in the supply layer that were previously unconnected by architecture to complement each other or create synergistic impact through inova HC, with the common goal of solving healthcare issues in the field.



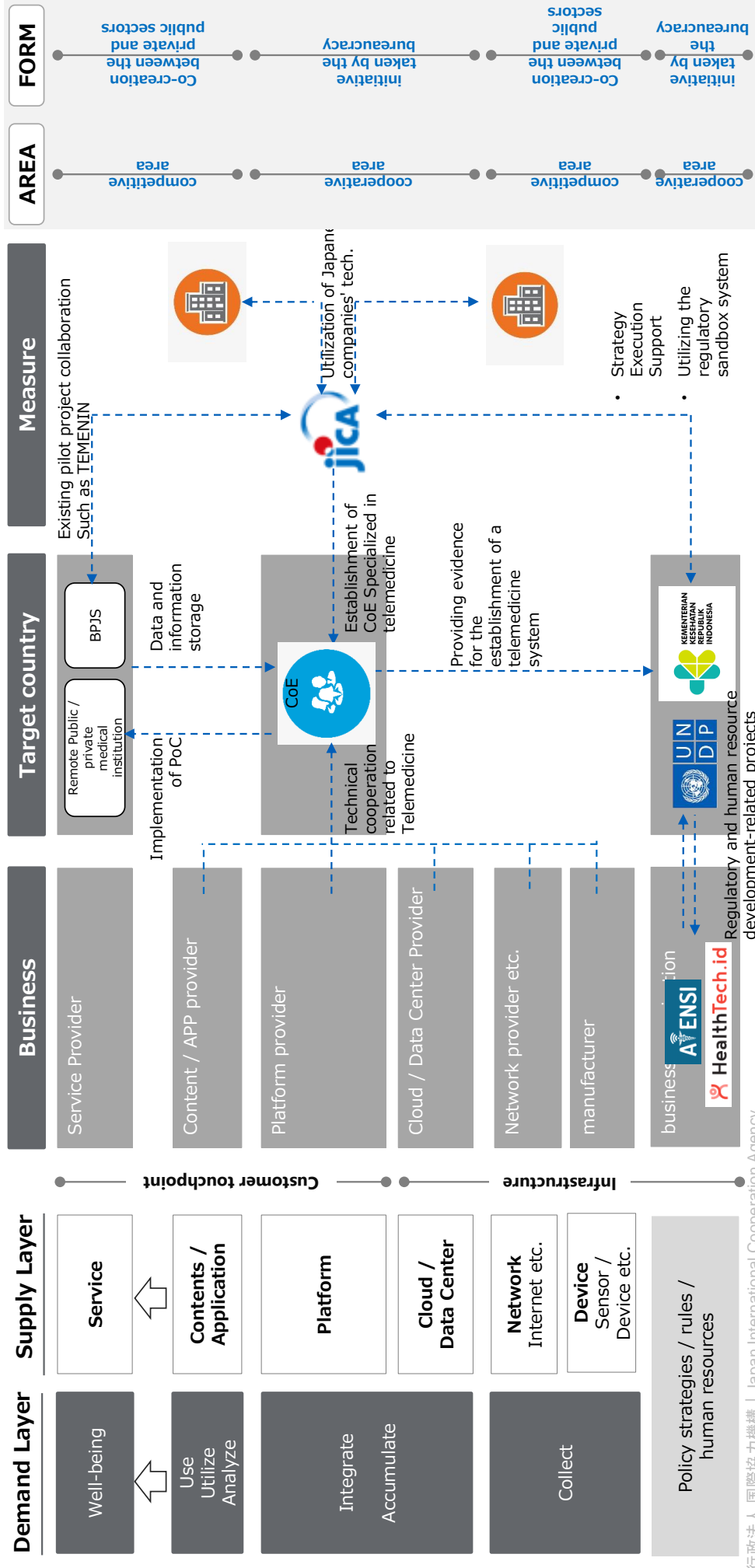
Proposed Final Measures in the Digital Health Architecture (Kenya)

Summary Since the information platform that forms the core of the digital health architecture is not yet mature in Kenya, this measure will support the establishment of a DHP, which is expected to be tackled by the government as a collaborative area. This measure will support the construction of DHP, which is expected to be a collaborative area for the public sector, and realize seamless medical and health information coordination through interoperability between layers that have not been vertically linked.



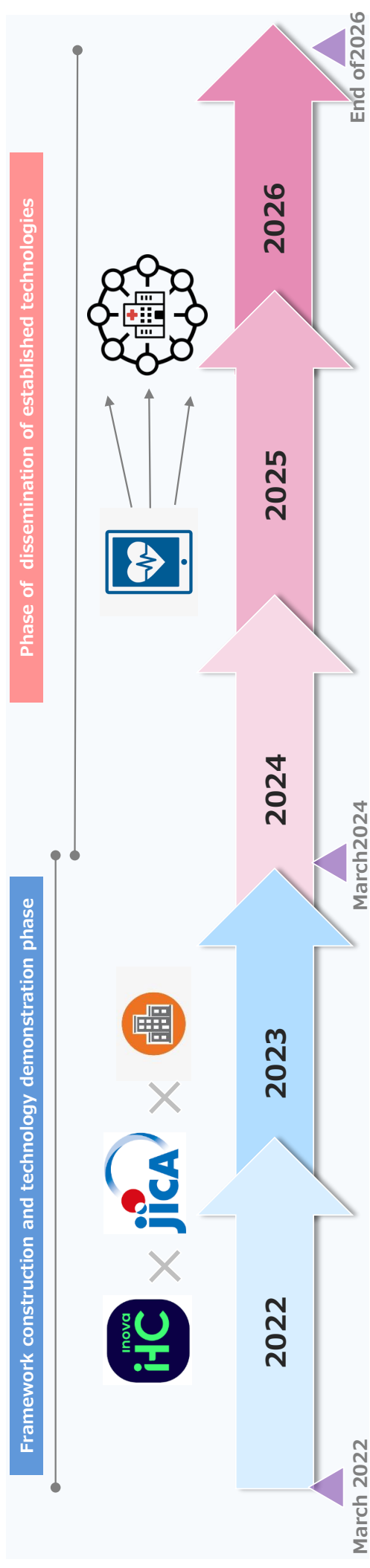
Proposed Final Measures for Digital Health Architecture (Indonesia)

Summary In Indonesia, although TEMENIN and others exist in the platform layer in the use of telemedicine, these have not been fully disseminated and utilized due to weaknesses in the policy strategy, rules, and organizational human resource layer. This measure will strengthen the platform in the digital health architecture by establishing a center of excellence, also through collaboration with the private sector in the competitive domain.



Five-Year Roadmap for Proposed Measures (Brazil)

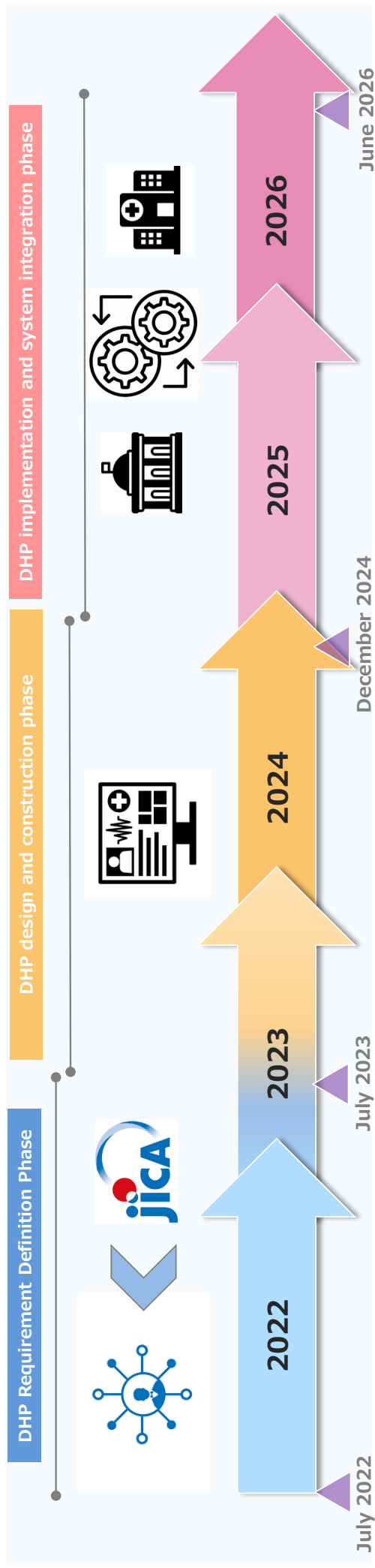
summary The five-year (2022-2026) concept of Brazil's final proposal envisages the establishment of solutions to health issues in the field through demonstration experiments of new health ICT technologies in the year 1 and 2, and the spread of the demonstrated and improved health ICT technologies to subordinate medical institutions and regional hospitals in the year 3 to 5.



Goal	<ul style="list-style-type: none"> New health ICT technologies will be studied to address medical issues in the field, and solutions will be established through demonstration experiments. 	<ul style="list-style-type: none"> The demonstrated and improved health ICT technology will be spread to subordinate medical institutions and regional hospitals through the network of the Sao Paulo hospital, and the quality of medical services will be improved.
JICA support direction	<ul style="list-style-type: none"> Establish an agreement and a framework for collaboration with Inova HC to promote the technological advancement of Japanese companies. 	<ul style="list-style-type: none"> The project will develop service models for the widespread deployment of established technologies, program collaboration with the government and other donors, and financial and technical support for newly introduced medical institutions.
Ecosystem Partners	<ul style="list-style-type: none"> Sao Paulo Hospital inova HC Japanese startups, companies, and Japan's innovation hub 	<ul style="list-style-type: none"> São Paulo Hospital inova HC, Referral collaboration with São Paulo Hospital, Regional University Hospital, and Japanese startups and companies

Five-Year Roadmap for Proposed Measures (Kenya)

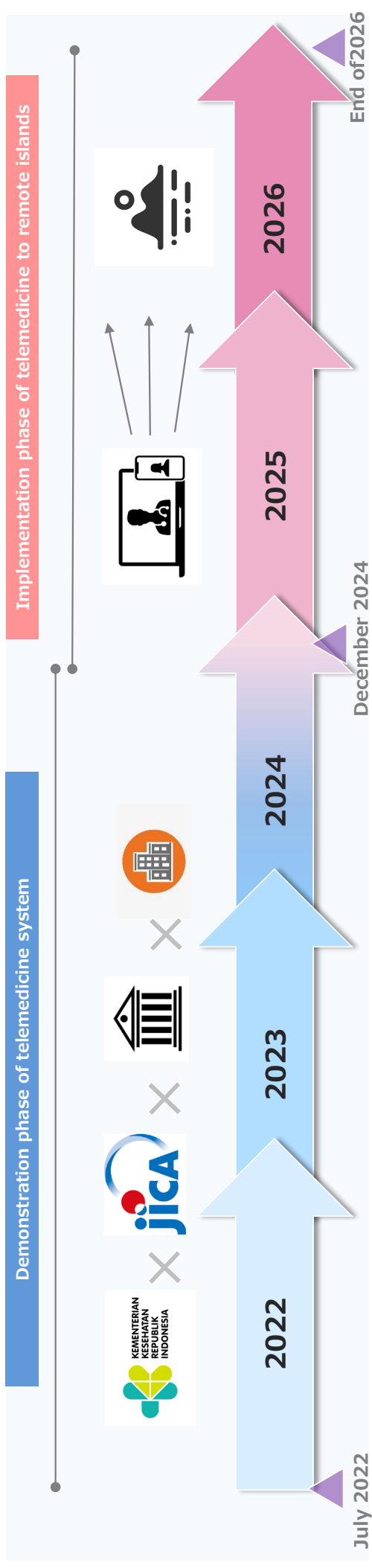
summary The five-year (2022-2026) concept of Kenya's final proposal is as follows: in the first year, DHP requirements will be defined in consultation with various stakeholders; in the second and third years, DHP requirements will be defined and program design will be implemented. The implementation of the DHP in the fourth and fifth year will enable interoperability between health insurance and other systems, and strengthen the health system.



Goal	<ul style="list-style-type: none"> • Consultations with various stakeholders to identify needs and define requirements for the DHP. • Based on the requirements definition, the DHP is constructed, including requirements definition and program design related to the design of the DHP. • The introduction of DHP will strengthen the health system by enabling interoperability between systems with health insurance and other systems.
JICA support direction	<ul style="list-style-type: none"> • Facilitate dialogue and consensus building among stakeholders. • Provide technical and financial support to promote digitization and build DHPs in medical institutions. • Provide technical support for the full-scale introduction of DHP, including development of implementation and maintenance operation guidelines, user training, etc.
Ecosystem Partners	<ul style="list-style-type: none"> • Government agencies, including the Ministry of Health • Medical institutions, private sector, NPOs, etc. • Ministry of Health, NHIF, medical institutions • Private companies involved in digitization • Other donors who are implementing the system, etc.

Five-Year Roadmap for Proposed Measures (Indonesia)

summary The five-year (2022-2026) concept of Indonesia's final proposal is as follows: it is assumed that in the year 1 to 3, the issues related to the introduction of telemedicine in remote areas will be examined and the system will be developed in accordance with the government strategy. From the fourth year to the fifth year, telemedicine services will be launched for residents of remote islands under the established telemedicine system, and that health service disparities in remote areas will be improved.



Goal

JICA support direction

Ecosystem Partners

- In line with the government's digital health and telemedicine strategy, the challenges of introducing telemedicine in remote areas will be examined and a telemedicine system will be established.
- Establish a center of excellence specializing in telemedicine and provide evidence for social implementation through PoC to build a system.
- Ministry of Health, ATENSI, BPJS, AHI, GMU, UI, UNHAS
- Japan, local startups, UNDP
- As a center of excellence for telemedicine, the company will conduct demonstration tests of its cutting-edge technologies and optimal solutions on remote islands, and apply them to the national telemedicine service.
- Under the established telemedicine system, DtoD and DtoP telemedicine services will be launched nationally for residents of remote islands to improve medical disparities in remote areas.
- Ministry of Health, Ministry of the Interior to coordinate local administration, universities, academic societies
- Japan, local startups