Federal Republic of Nigeria
Nigeria Center for Disease Control and Prevention (NCDC)

The Project for Strengthening Detection of and Response to Public Health Threats in Nigeria

Project Completion Report

July 2024

Japan International Cooperation Agency

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Project Completion Report

Project Title: Strengthening Detection of and Response to Public Health Threats in Nigeria

Name: Ifedayo Adetifa
Title: Project Director

Name: Toru Kondo
Title: Chief Advisor

Submission Date: 30th November 2023

Abbreviation

AFENET	African Field Epidemiology Network
Africa CDC	Africa Centres for Disease Control and Prevention
AMDA-Minds	Association of Medical Doctors of Asia Multisectoral and Integrated Development Services
AMR	Antimicrobial resistance
APM	Action Plan Matrix
BSL3	Biosafety Level 3
C/P	Counter Part
CPHL	Central Public Health Laboratory
CSM	Cerebrospinal meningitis
DG	Director General
DPRS	Department of Planning, Research and Statistics
ECOWAS	Economic Community of West African States
EQA	External Quality Assessment
FCT	Federal Capital Territory
GF	Global Fund
IHVN	Institute of Human Virology Nigeria
IHR	International Health Regulations
ISO	International Organization for Standardization
JATA	Japan Anti-Tuberculosis Association
JCC	Joint Coordinating Committee
JEE	Joint External Evaluation
JPY	Japanese Yen
LGA	Local Government Area
M&E	Monitoring and Evaluation
MLSCN	Medical Laboratory Science Council of Nigeria
NAPHS	National Action Plan on Health Security
NCDC	Nigeria Centre for Disease Control and Prevention
NGN	Nigerian Naira
NIID	National Institute of Infectious Diseases (Japan)
NRL	National Reference Laboratory

PDM	Project Design Matrix
PHEIC	Public Health Emergency of International Concern
PHLN	Public Health Laboratory Network
PHLS	Public Health Laboratory Services
PO	Plan of Operation
PREPARE	Partnership for Building Resilience against Public Health Emergencies through Advanced Research and Education
QMS	Quality Management System
R/D	Record of Discussions
RCC	Regional Collaborating Centres
REDISSE	Regional Disease Surveillance Systems Enhancement (World Bank)
RSSH	Resilient and Sustainable Systems for Health (Global Fund)
RTSL	Resolve to Save Lives
SATREPS	Science and Technology Research Partnership for Sustainable Development
SLIPTA	Stepwise Laboratory Improvement Process Towards Accreditation
SLMTA	Strengthening Laboratory Management Toward Accreditation
SOP	Standard Operating Procedure
TAT	Turn Around Time
TWG	Technical Working Group
UKHSA	United Kingdom Health Security Agency
USCDC	U.S. Centers for Disease Control and Prevention
WB	World Bank
WHO	World Health Organization

I. Basic Information of the Project

I-1. Country

Nigeria

I-2. Title of the Project

Strengthening Detection of and Response to Public Health Threats in Nigeria

I-3. Duration of the Project

3rd December 2019 – 2nd December 2023 (Both Planned and actual)

I-4. Background

The number of deaths caused by infectious diseases in Nigeria compares to neighbouring African countries is large. Also, the risk of infection is high in Nigeria, in particular poliomyelitis and Lassa fever.

In 2005, the Nigeria Centre for Disease Control (NCDC) was established to fill the leadership gap through coordination of efforts in Laprevention and control of communicable diseases, in mitigating the impact of disasters, pandemic preparedness and in conducting effective surveillance system. The weak management and diagnostic capacity of NCDC have been hindrances to prompt and accurate detection. In fact, Nigeria could not respond quickly when the recent Ebola Virus Disease (EVD) outbreak in West Africa including Nigeria in 2014.

The Nigeria government states the health sector as important in the "Nigeria Vision 20:2020", and it recognizes infectious disease prevention and control as one of the most important challenges in the "National Health Policy 2016". Moreover, the Nigerian government is making efforts to strengthen laboratory functions and human resources development according to the "Nigeria Medical Laboratory Services Policy" and the "Nigeria Medical Laboratory Strategic Plan 2015-2019".

In order to accelerate the strengthening of the diagnostic capacity of NCDC, JICA has been requested by the Government of Nigeria to implement a technical cooperation project entitled "Strengthening Detection of and Response to Public Health Threats in Nigeria" (hereinafter referred to as "the Project"). The Project will strengthen the laboratory network, BSL3 management and program management capacity.

In 2017, Nigeria has undergone its first JEE (Joint External Evaluation) and Nigeria's capacities under the International Health Regulations (IHR) to combat public health threats were assessed.

The National Action Plan for Health Security, Federal Republic of Nigeria (NAPHS 2018-2022), which was a comprehensive multi-sectoral plan that integrates multiple work plans including REDISSE (by WB), NCDC Strategy Plan, Antimicrobial resistance (AMR), Action Plan, and immunizations plans, was collaboratively developed to address the major gaps identified by JEE 2017 and post-JEE recommendations.

I-5. Overall Goal and Project Purpose

Overall Goal

Original PDM (Dec 2017)	PDM Ver.1 (Jul 2019)	PDM Ver.2 (Jun 2022)
All public health threats regarding 5 prioritized infectious diseases are well controlled in their initial phases.	All public health threats regarding 8 prioritized infectious diseases are well controlled in their initial phases.	All public health threats regarding infectious diseases are well controlled.

Project Purpose

Original PDM (Dec 2017)	PDM Ver.1 (July 2019)	PDM Ver.2 (June 2022)
Capacities of NCDC for early response to public health events regarding 5 prioritized infectious diseases are enhanced.	Capacities of NCDC for early response to public health events regarding 8 prioritized infectious diseases are enhanced.	Capacities of NCDC for the management of prioritized infectious diseases are enhanced.

Reason for the modification:

PDM Ver.1

Three infectious diseases, Monkeypox, Influenza and AMR were added to the original 5 prioritized diseases (Cholera, Yellow fever, Meningitis, Measles, and Viral hemorrhagic fevers). Monkeypox and AMR had become more important due to the recent outbreak of Monkeypox in Nigeria and the increases of AMR cases. In addition, by considering the necessity of improving Influenza surveillance, the NCDC requested to include these three as prioritized infectious diseases.

PDM Ver.2

There was no need to specify the prioritized diseases for whole activities. As for Activity 2, the Cholera and CSM were targeted. Additionally, the word of “initial phase” was deleted because the activities for early response in Activity 3 were deleted.

I-6. Implementing Agency

Nigeria Centre for Disease Control and Prevention

II. Results of the Project

II-1. Results of the Project

II-1-1 Input by the Japanese side

(1) Amount of input by the Japanese side: JPY 375 (million Japanese Yen)

(2) Expert dispatch: 5 persons

Title	Inputs	Duration
Chief Advisor	Dr KONDO Toru	April 2022 – November 2023
Project Coordinator	Ms ASATANI Miki	December 2019 – February 2022
Project Coordinator / Infectious Disease Control	Ms TASAI Aiko	February 2022 – November 2023
Short-term Expert from JATA (Laboratory Management)	Mr MIURA Takashi	1. December 2019 2. February – March 2020 3. April – August 2021 4. September – December 2021 5. January – March 2022 6. April – September 2022 7. January – February 2023 8. June – July 2023 9. October – November 2023
Short-term expert from AMDA-MINDS (IDSR, M&E)	Mr OTANI Satoshi	October 2023– November 2023

(3) Receipt of training participants in Japan: 6 persons

No.	Purpose	Facilities	Period	Number of Trainees
1	Technical training of cell culture and isolation of virus (Developing research capacity)	NIID	Jan 2020 – July 2020	1
2	Training of Biosecurity and Biosafety	NIID, Kagoshima University, Kagoshima Prefectural Institute for Environmental Research and Public Health	June 2023	5

(4) Receipt of training or workshop participants in Nigeria

No.	Name of the Training	Period	Number of Trainees or Participants of C/P
1	Surveyors Training for baseline survey with SLIPTA	Jun- Jul 2021	14
2	Analyzing Workshop for QMS implementation	Nov 2021	23
3	Planning Workshop for QMS implementation	Feb 2022	29
4	QMS Training (1st)	Feb 2022	28
	Refresher Mentorship Training	July 2022	7
5	Mentorship program (1st) for QMS implementation	Aug – Dec 2022	8 labs
6	Basic Monitoring and Evaluation Training	May 2023	32
7	Mentorship program (2nd) for QMS implementation	June – Sep 2023	8 labs
	Stepdown Training for Biosafety/Biosecurity training	Aug 2023	
8	Internal Audit Training	Aug 2023	22
9	QMS Training (2nd) and Biosecurity and Biosafety, Equipment Management Training <Combined training>	Sep 2023	44
11	Sample Collection and Transportation Training	Oct 2023	42
12	Pre data analysis Workshop	Sep 2023	12
13	Situational Analysis and Planning Workshop	Oct 2023	33
14	Support for International Conference on Health Advances, Innovation and Research organized by Nigerian Institute of Medical Research (Presentation by NCDC researchers, Professors in Japan receiving NCDC scholars for Ph.D	Nov. 2023	1
15	Support for “Situational Analysis Workshop: Multisectoral Public Heath Strategic Plan for Point of Entry in Nigeria” in collaboration with West African Health Organization under ECOWAS and WHO	Nov 2023	51~~XX~~

(5) Receipt of business traveler in Japan

No.	Purpose	Facilities	Period	Traveler
1	Seeking future research collaboration. Learning of BSL-3 lab management in Japan.	NIID, Nagasaki University, Hokkaido University,	Dec 2022	Head of Genomic sequencing lab, NRL

(6) Equipment Provision: JPY 58 (million Japanese Yen) (including around 2 million Japanese Yen approved during the COVID-19 pandemic for emergency. The Goods purchased were RNA Extraction Kit and Personal Protective Equipment (PPE))
The Japanese side purchased equipment worth up to JPY 56 million yen in total, which included laboratory equipment for cell culture, a Biosafety cabinet, a DNA sequencer, a Deep freezer, PC sets, etc. The details of the equipment are listed on Annex 1: Equipment Provision.
Emergency procurement of goods in response to COVID-19 was out of the scope of the project which should be assessed separately at the ex-post evaluation.
The planned provision of equipment had the following challenges as below.

1. COVID-19 pandemic
2. Delay of the construction of BSL-3 Lab.

- For tackling COVID-19, NRL repurposed the rooms that would be used for the gene sequencing works, which our project was supporting, to another project for COVID-19. The procured items from JICA were installed into the smaller rooms. NRL has tried best to produce the results of sequencing of COVID-19 variant, Monkey pox, Lassa virus, and so on. The planned training for cell culture was suspended because there was not enough space to do cell culture safely without contamination.
- This project was designed to be aligned with two Grant Aid Projects which were BSL3 Lab Grant Aid Project and the Network Lab Grant Aid Project. However, the selection of contractor took considerable time, therefore the BSL3 labs were not constructed during the period of this project. In addition, the importation of cell lines took longer to deliver due to Nigerian customs procedures.

(7) Overseas activities cost: JPY 130 million (Mention the contents of major inputs.)

II-1-2 Input by the Nigeria side

(1) Counterpart assignment

As for the member of NCDC, the Director of the department of Subnational Support will be added because that department was newly established in 2022.

Position	Name	Designation
Project Director	Dr Chikwe Ihekweazu (- Oct.2021)	Director General
	Dr Ifedayo M. O Adetifa (Oct. 2021-)	
Project Manager	Mr Anthony Ahumibe (-Sep. 2022)	Senior Laboratory Technical Advisor, NRL
	Mr Popoola Michael Oladotun (Sep 2022-)	Head of bacteriology laboratory, NRL
Focal Person	Dr Yakubu Y.Abdullahi	Director of Administration
	Mrs Nwando Mba (-2022)	Director of Public Health Laboratory Services (PHLS)
	Mrs Olajumoke Babatunde (2022-)	
	Mrs Elsie Ilori (- Nov 2022)	Director of Surveillance and Epidemiology Department
	Mrs Oyeladun Okunromade (2023-)	
	Mr Anthony Okon (-Oct 2023)	Quality Control Manager, NRL
	Mr Bamidele Oluwafemi (Oct 2023-)	
	Dr Nnaemeka Ndodo (-Oct 2023)	Head of Genomics and Sequencing Research Lab, NRL
	Dr Olusola Anuoluwapo Akanbi (Oct 2023 -)	
	Mr James Onwuka	Head of Sample Collection, NRL
	Mrs. Josephine Ogbazi	Assistant Director, Quality Manager, CPHL
	Mrs. Ijeoma Onyibo	Senior Medical Laboratory Scientist, CPHL
	Dr Abubakar Jafiya (-Aug 2023)	Head of Epidemiology & Feedback Division
	Dr Nwachukwu Williams	

	(Aug 2023 -)	
	Mr Olugbenga Akinbiyi (2021-)	Head of M&E Unit, Surveillance and Epidemiology Department
	Mr Sebastian Jennan	Director of Subnational Department
	Mr John Oladejo	Director of Health Emergency, Preparedness and Response Department

(2) Provision of offices, etc.:

As planned, the Nigeria side provided the Project office with necessary furniture and equipment at NCDC HQ Annex at Jabi including Internet.

(3) Other items borne by the counterpart government: N/A

II-1-3 Activities

For the original plan of operation and actual result of the Project activities, see the **Annex 1-2** (Revised Plan of Operation).

History of PDM is described at Ⅲ.

II-2. Achievements of the Project

II-2-1 Outputs and indicators

History of PDM is described at **II-2-3**.

The achievement level of each output is determined High (≥ 80% accomplished), Fair (50-80% accomplished), or low (< 50% accomplished).

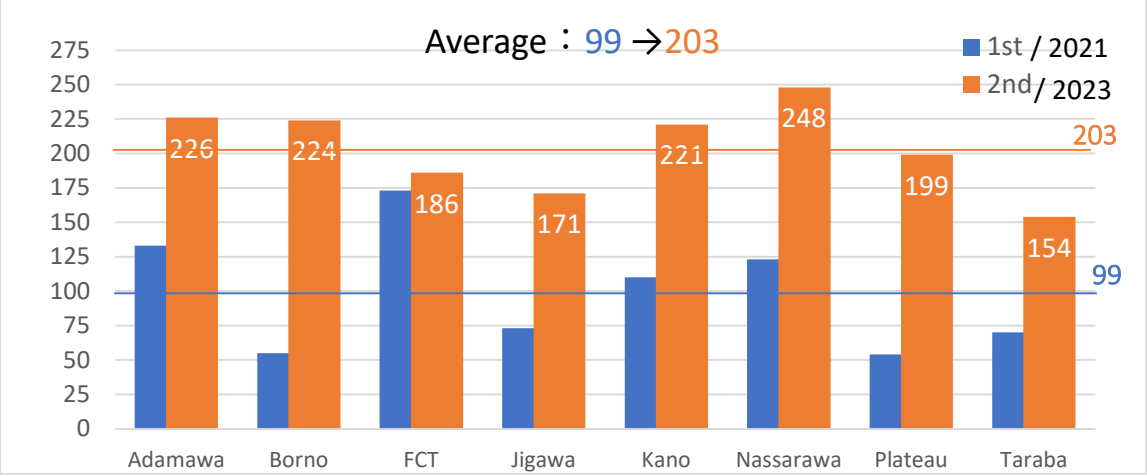
Output 1	
The capacity for management and research of NRL is enhanced.	
INDICATORS	**ACHIEVEMENT**
At least 10 staff of NRL will be able to perform cell culture.	There are at least 5 staff with prior experience with cell culture techniques. The research lab has not been able to start the cell culture lab due to space constraints, however, the construction of new BSL will enable more staff to be involved in researches which use cell culture technique.
	The achievement level is fair.

Output 2	
Laboratory network for infectious diseases is strengthened to carry out safe and reliable diagnosis and confirmation of Cholera and Cerebrospinal meningitis (CSM).	
INDICATORS	**ACHIEVEMENT**
2-1 Average of QMS implementation level (SLIPTA score) improves from 88 to more than 180 in the selected public health laboratories for Cholera and CSM.	The average SLIPTA score of 8 selected laboratories in 2023 was 203.
	As the average score in 2023 is more than 180, the achievement level is high.
2-2 Required documents for QMS implementation are developed in selected public health laboratories for Cholera and CSM.	It has not achieved 100%, however, progress of development document achieved 88%.
	The achievement level is high.

List of the 8 targeted public health laboratories

	Facility Name	Facility Level	LGA	State
1	Adamawa State Specialist Hospital	Secondary	Yola North	Adamawa
2	Maiduguri University Teaching Hospital	Tertiary	Jere	Borno
3	General Hospital Maitama	Secondary	Abuja	FCT
4	Rasheed Shekoni Specialist Hospital	Tertiary	Dutse	Jigawa
5	Kano Infectious Diseases Hospital	Secondary	Sabon Gari West	Kano
6	Dalhatu Araf Specialist Hospital	Secondary	Lafia	Nassarawa
7	Plateau State Specialist Hospital	Secondary	Jos	Plateau
8	State Public Health Laboratory Jalingo	Secondary	Jalingo	Taraba

Comparison of SLIPTA scores between 1st (Baseline / 2021) and 2nd (Exit / 2023)

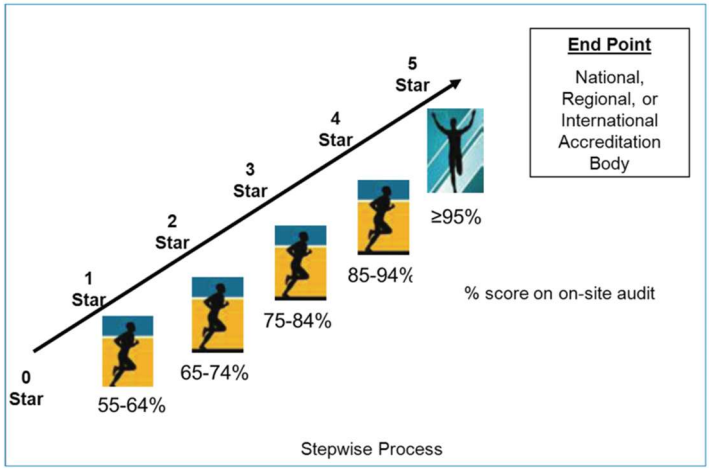


Adjusted SLIPTA score on the 2nd (Exit) Audits

Facility	Score/Adjusted Total	Star level	Not Applicable Requirement (reducing scores)
Adamawa	226/265	4 (85.2%)	5.4 Measurement uncertainty of measured quantity test: -2 8.1 Quality Control Data: -2 9.7 Information Management System: -2 9.9 Verification of Electronic Laboratory Information System: -2 9.10 Is the Laboratory Information System properly maintained to ensure continued functioning: -2 Reducing Scores Total: -10
Borno	224/269	3 (83.3%)	5.4 Measurement uncertainty of measured quantity test: -2 8.6 Does the laboratory select and evaluate referral Labs and Consultants?: -2 9.4 Analytic System/Method Tracing: -2 Total Reducing Scores:6
FCT	186/273	2 (68.1%)	5.4 Measurement uncertainty of measured quantity test: -2
Jigawa	171/263	2 (65.0%)	5.4 Measurement uncertainty of measured quantity test: -2 8.11Comparability of Examination Results: -2 9.4 Analytic System/Method Tracing: -2 9.7 Information Management System: -2 9.9 Verification of Electronic Laboratory Information System: -2 9.10 Is the Laboratory Information System properly maintained to ensure continued functioning: -2 Reducing Scores Total: -12

Facility	Score/Adjusted Total	Star level	Not Applicable Requirement (reducing scores)
Kano	221/267	3 (82.7%)	5.4 Measurement uncertainty of measured quantity test: -2 9.7 Information Management System: -2 9.9 Verification of Electronic Laboratory Information System: -2 9.10 Is the Laboratory Information System properly maintained to ensure continued functioning: -2 Reducing Scores Total: -8
Nasarawa	248/267	4 (92.9%)	5.4 Measurement uncertainty of measured quantity test: -2 5.8 Obsolete Equipment Procedures: -2 9.4 Analytic System/Method Tracing: -2 12.11 Hazardous Chemicals: -2 Reducing Scores Total: -8
Plateau	199/267	2 (74.5%)	5.4 Measurement uncertainty of measured quantity test: -2 9.7 Information Management System: -2 9.9 Verification of Electronic Laboratory Information System: -2 9.10 Is the Laboratory Information System properly maintained to ensure continued functioning: -2 Reducing Scores Total: -8
Taraba	154/265	1 (58.1%)	5.4 Measurement uncertainty of measured quantity test: -2 8.11 Comparability of Examination Results: -2 9.4 Analytic System/Method Tracing: -2 9.7 Information Management System: -2 9.9 Verification of Electronic Laboratory Information System: -2 Reducing Scores Total: -10

SLIPTA tiers of recognition of laboratory quality management



Output 3	
The capacity for Monitoring and Evaluation of NCDC is enhanced.	
INDICATORS	**ACHIEVEMENT**
The plans for improving the M&E program at all levels is developed based on the survey.	Action Plan Matrix for surveillance activities and Task List of M&E cycle were developed during the Situational Analysis and Planning Workshop using the secondary data from the states.
	The achievement level is fair.
At least 5 staff in each unit of the Surveillance and Epidemiology department receive training on M&E including capacity for integrated supportive supervision and data management.	At least 2 staff of each unit in total 15 staff of the Surveillance and Epidemiology department participated in the basic training of M&E. At least 1 staff of each Unit in total 13 staff of the Surveillance and Epidemiology department participated in the Situational Analysis and Planning Workshop. The capacity for ISS and Data management is enhanced through the basic M&E Training and Situational Analysis and Planning Workshop.
	The achievement level is fair.
At least 2 staff of each department excluding surveillance and epidemiology receive M&E training.	At least 2 staff from 3 departments (Subnational, DPRS, PHLS) out of 6 departments and Special Duties participated in the basic training of M&E. One staff from 2 departments (HEPR, Administration), Procurement, and Office of DG participated in the basic training of M&E. In total 14 Staff of 4 other departments <HEPR(4), DPRS(2), PHLS(1), Subnational support(7)> and 2 staff of Special Duties participated in the Situational Analysis and Planning Workshop.
	The achievement level is fair.

II-2-2. Project Purpose and Indicators

PROJECT PURPOSE	
Capacities of NCDC for the management of prioritized infectious diseases are enhanced.	
INDICATORS	**ACHIEVEMENT**
1. At least one international collaboration research is launched.	Virtual workshop was held and NCDC/NRL is seeking a seed of research collaboration. International collaborative research has already been initiated to take control of measles using the procured sequencer.
	The achievement level is fair.
2. Number of public health laboratories in the NCDC network with enhanced capacity to diagnose and confirm the prioritized infectious diseases is increased (From 0 to 6).	The eight targeted laboratories have improved SLIPTA scores. Among them, 6 laboratories achieved the score of more than 180.
	The achievement level is high.
3. Surveillance and Epidemiology department in NCDC initiates the Monitoring and Evaluation (M&E) program using the developed plans and tools with the other departments.	Acquired fundamental knowledge of planning M&E activity especially in the Surveillance and Epidemiology department is limited. For other departments, It could have contributed to set the edge of M&E activity.
	It was partially achieved.

II-3. History of PDM Modification (from Ver.1 to Ver.2)

PDM Ver.0, Ver.1 and Ver.2 are attached at **Annex 3**

II-3-1. Background:

- Due to the COVID-19 pandemic and the delay of the construction of BSL3 laboratory in NRL by Grant Aid Project, the framework of the Project needed to be modified.
- Many activities has already been conducted or started by NCDC with the support of other partners.

II-3-2. Modification of Activities

<table>
<tr><td colspan="2">ACTIVITY 1-1</td></tr>
<tr><td colspan="2">Reasons for the modification:
The construction of BSL3 Laboratories has not started because the biddings were not successful in 2020, 2021 and 2022. Under this situation, it was impossible to start the activities linked to the development of BSL3 Laboratories in this project period.</td></tr>
<tr><td>PDM Ver.1 (Jul 2019)</td><td>PDM Ver.2 (Jun 2022)</td></tr>
<tr><td>1-1. Strengthening capacity of NCDC to manage National Reference Laboratory (NRL) with BSL3 Laboratories</td><td>1-1 Capacity development for BSL3 management</td></tr>
<tr><td>1-1-1 Conducting training on BSL3 Laboratories management and biosafety in Japan.</td><td>1-1-1 Conducting training on BSL3 Laboratories management and biosafety.</td></tr>
<tr><td>1-1-2 Developing the operational and management manual for BSL3 Laboratories including preventive maintenance of equipment</td><td rowspan="3">Deleted</td></tr>
<tr><td>1-1-3 Organizing the management team of BSL3 Laboratories</td></tr>
<tr><td>1-1-4 Conducting training for the team staff organized in 1-1-3 by using the operational and management manual for BSL3 Laboratories developed in 1-1-2</td></tr>
</table>

<table>
<tr><td colspan="2">ACTIVITY 1-2</td></tr>
<tr><td colspan="2">Reasons for the modification:
The construction of BSL3 Laboratories has not started. Under this situation, it was impossible to start the activities linked to the development of BSL3 Laboratories in this project period.</td></tr>
<tr><td>PDM Ver.1 (Jul 2019)</td><td>PDM Ver.2 (Jun 2022)</td></tr>
<tr><td>1-2 Strengthening scientific research capacity of NCDC to utilize BSL3 Laboratories</td><td>1-2 Capacity development for research activity</td></tr>
<tr><td>1-2-1 Identifying research needs and capacity to be strengthened</td><td>1-2-1 Conducting training on routine diagnostic testing and research activities of NRL.</td></tr>
<tr><td>1-2-2 Developing the short term and mid-term training plans based on the results of 1-2-1</td><td rowspan="3">Deleted</td></tr>
<tr><td>1-2-3 Providing training opportunities (in Japan)</td></tr>
<tr><td>1-2-4 Conducting research according to the plans developed 1-2-2</td></tr>
</table>

ACTIVITY 2-1	
Reasons for the modification: NRL applied the quality management system (QMS) as laboratory management protocol; thus, Activity 2-1-1 and 2-1-2 were unnecessary. NRL staff had the capacity to develop the SOPs; thus, Activity 2-1-3 and 2-1-4 were unnecessary. Moreover, the mentioned equipment was not introduced because the implementation of grant aid project was severely delayed.	
PDM Ver.1 (Jul 2019)	**PDM Ver.2 (Jun 2022)**
2-1 Strengthening the public health laboratory network for 8 prioritized infectious diseases.	2-1 Building capacity of laboratory quality management in public health laboratories on the NCDC laboratory network.
2-1-1 Developing the protocol for laboratory management.	2-1-1 Conducting a survey on the current state of public health laboratories.
2-1-2 Conducting training for laboratory managerial staff on the protocol developed in 2-1-1.	2-1-2 Holding an analysis workshop to analyze the results of the survey on activity 2-1-1 and identify gaps/needs.
2-1-3 Developing the SOP for newly introduced equipment by the Japanese grant-aid project such as ELISA, PCR and Real-time-PCR.	2-1-3 Conducting a planning workshop to develop a laboratory quality management improvement plan for each public health laboratory based on the outputs on activity 2-1-2.
2-1-4 Conducting training for the laboratory staff on the SOP developed in 2-1-3.	2-1-4 Conducting quality management system training on understanding of ISO 15189 and implementation of QMS Class 2[1] to support the individual plan developed on activity 2-1-3.
2-1-5 Developing the plan and protocol for biosafety and biosecurity based on the assessment.	2-1-5 Conducting the training for capacity building of staff in the selected laboratory on internal audit based on SLIPTA requirements and certification of the participants on internal auditing.
2-1-6 Conducting training for members of biosafety committee on the protocol developed in 2-1-5 at NCDC network laboratories.	2-1-6 Conducting training for staff on biosafety and security requirements according to ISO15189 standard.
2-1-7 Developing the communication mechanism among laboratories in the network including reporting system.	2-1-7 Conducting training on equipment user maintenance and verification.
	2-1-8 Organizing mentorship program to address all identified nonconformances in the selected public health laboratories during baseline assessment on activity 2-1-1.
	2-1-9 Conducting follow up assessment to the selected laboratories to monitor performances on post mentorship activities.
	2-1-10 Holding the review meeting to share the progress of activities' implementation in the developed plan on activity 2-1-3 and outputs on activity 2-1-9.

<table>
<tr><td colspan="2">ACTIVITY 2-2</td></tr>
<tr><td colspan="2">Reasons for the modification:
Medical Laboratory Science Council of Nigeria (MLSCN) is the accredited EQA provider in Nigeria. In addition, NRL is not the agency to provide the EQA program. NRL recognized that retesting was not urgently needed because of budget issues and sustainability.</td></tr>
<tr><td>PDM Ver.1 (Jul 2019)</td><td>PDM Ver.2 (Jun 2022)</td></tr>
<tr><td>2-2 Introducing External Quality Assurance (EQA) mechanism into the laboratory network for 8 prioritized infectious diseases.</td><td rowspan="6">Deleted</td></tr>
<tr><td>2-2-1 Developing the protocol for EQA.</td></tr>
<tr><td>2-2-2 Conducting training for laboratory staff on the protocol developed in 2-2-1 in selected laboratories.</td></tr>
<tr><td>2-2-3 Conducting pilots of EQA in the selected laboratories in 2-2-2.</td></tr>
<tr><td>2-2-4 Reviewing results of the pilots in 2-2-3 and finalizing the protocol for EQA.</td></tr>
<tr><td>2-2-5 Introducing EQA into all laboratories in the network.</td></tr>
</table>

<table>
<tr><td colspan="2">ACTIVITY 2-3 (Activity number was changed from 2-3 to 2-2 in the Ver2.)</td></tr>
<tr><td colspan="2">Reasons for the modification:
NRL/NCDC developed the sample collection and transportation system and disseminated the system nationwide; thus, 2-3-1, 2-3-2, and 2-3-3 were unnecessary.
However, public health laboratory staff had not been aware of sample collection and transportation. Thus, the target for intervention in Activity 2-3 changed from RRTs to laboratory staff in the network. Similarly, the courier service staff lack knowledge of Infection Prevention and Control (IPC); thus, they needed the training.</td></tr>
<tr><td>PDM Ver.1 (Jul 2019)</td><td>PDM Ver.2 (Jun 2022)</td></tr>
<tr><td>2-3 Strengthening sample collection and transportations system for prioritized infectious diseases.</td><td>2-2 Strengthening sample collection and transportation system for infectious diseases.</td></tr>
<tr><td>2-3-1 Developing the protocol for sample collection and transportation.</td><td>2-2-1 Developing documents and records on sample management in public health laboratory.</td></tr>
<tr><td>2-3-2 Conducting training for master trainers on the protocol developed in 2-3-1.</td><td>2-2-2 Conducting training on sample collection and transport in selected public health laboratories.</td></tr>
</table>

2-3-3 Conducting training for staff of rapid response teams (RRTs) on the protocol by master trainers in target states.	2-2-3 Conducting training on sample transport and IPC to courier service in selected states where the project supporting facilities are located.

ACTIVITY 2-4	
Reasons for the modification: NCDC had already gained the capacity to conduct genomic analysis and molecular epidemiology for routine work and research.	
PDM Ver.1 (Jul 2019)	**PDM Ver.2 (Jun 2022)**
2-4 Introducing molecular epidemiology to the NRL	Deleted
2-4-1 Introducing genetic typing technique by using DNA sequencer.	
2-4-2 Developing the protocol for molecular epidemiology for selected diseases.	
2-4-3 Conducting the molecular epidemiology for selected diseases in target areas.	

ACTIVITY 3-1	
Reasons for the modification: The M&E unit was newly established in Surveillance and Epidemiology Department in 2021. Thus, the activities were revised. The new staff of the unit needed the training for leading the M&E activities.	
PDM Ver.1 (Jul 2019)	**PDM Ver.2 (Jun 2022)**
3-1 Enhancing capacity for Monitoring and Evaluation of the program	3-1 Enhancing capacity for M&E of the program
3-1-1 Developing proper feedback mechanism to target states/LGAs based on results of regular program monitoring and evaluation.	3-1-1 Conducting a survey on implementing situations for the M&E program at NCDC, States, LGAs levels.
3-1-2 Identifying needs of operational researches to enhance program performance in target states/LGAs.	3-1-2 Developing plans for improving the M&E program at NCDC, State and LGA levels based on the findings of 3-1-1.
3-1-3 Conducting operational researches in 3-1-2.	3-1-3 Conducting training to develop capacity for M&E including capacity for integrated supportive supervision and data management.
3-1-4 Evaluating results of operational researches in 3-1-3 and reflecting them into program implementation.	3-1-4 Developing data quality assessment tool.
	3-1-5 Conducting training on the tool developed in 3-1-4 for all related staff.

	3-1-6 Conducting evaluation of the tool at field levels.

ACTIVITY 3-2	
Reasons for the modification: These activities had already conducted or started by NCDC with the other donors and the universities.	
PDM Ver.1 (July 2019)	**PDM Ver.2 (June 2022)**
3-2 Enhancing capacity for preparedness and response to public health emergencies regarding prioritized infectious diseases	Deleted
3-2-1 Developing distribution system for necessary equipment and items for public health emergencies.	
3-2-2 Developing the manual for preparedness and response to 5 prioritized infectious diseases.	
3-2-3 Conducting training on the manual in 3-2-4 to develop master trainers.	
3-2-4 Conducting training for staff of Rapid Response Teams (RRTs) on the manual by master trainers in target states/LGAs based on hazard risk assessment.	

ACTIVITY 3-3	
Reasons for the modification: NCDC has already conducted the assessment and made recommendations. Additionally, it became impossible to dispatch Japanese experts for these activities due to the situation of COVID-19 in Japan.	
PDM Ver.1 (July 2019)	**PDM Ver.2 (June 2022)**
3-3 Enhancing communication mechanism with hospitals/clinical laboratories to increase surveillance coverage	Deleted
3-3-1 Conducting assessment on surveillance coverage for prioritized infectious diseases[1] in target states/LGAs.	
3-3-2 Developing mechanism to increase surveillance coverage based on the results in 3-3-1 and implement it in target states/LGAs.	
3-3-3 Rolling out the mechanism to target states/areas.	

II-4. Others

II-4-1. Results of Environmental and Social Considerations

Not Applicable

II-4-2. Results of Considerations on Gender/Peace Building/Poverty Reduction, Disability, Disease infection, Social System, Human Wellbeing, Human Right, and Gender Equality

In Activity 2, when the targeted laboratories in 16 states were divided into two groups, northern and southern, priority for QMS training was given to the northern states, where people suffered from outbreaks of infectious disease more often than southern states, and the northern states are unsafe and economically underdeveloped due to the threat of terrorism.

III. Results of Joint Review

III-1. Results of Review based on DAC Evaluation Criteria

III-1-1. Relevance

Relevance: High

The project is positioned in line with Japan's Basic Policy for Peace and Health, Basic Policy and Plan for Strengthening the Fight against Internationally Threatening Infectious Diseases, and Country Development Cooperation Policy for Nigeria (September 2017), which has 'Development of Inclusive and Resilient Health and Medical Systems' as one of its priority areas. And at the first JEE (2017), Nigeria received low ratings of "no competence" or "limited capability" in several categories, including biosafety and biosecurity. In response to the results, NAPHS (2018-2022) stated that efforts would be made to strengthen the functions of laboratories and develop human resources related to infectious diseases. The project was designed to align with Nigeria's national health priorities and contribute to achieving the United Nations' Sustainable Development Goals, particularly Goal 3 (Good Health and Well-being) by supporting the strengthening of international infectious disease control capacity post-Ebola, and strengthening the implementation of WHO's IHR through improving testing and diagnostic techniques and strengthening research capacity.

The QMS implementation plan is consistent with one of NCDC's key activities included in the NAPHS 2018-2022: "Implement SLMTA in all laboratories within the public health laboratory network."

III-1-2. Coherence

Coherence: High

The Project was designed and conducted in line with the global strategies and national strategies. The Ex-Ante Evaluation report for the two grant aid projects described this technical cooperation project, scheduled to start in 2019. This project was planned to strengthen the testing and research capacity of NCDC and public health laboratories under the NCDC laboratory network, as well as human resource development for laboratory management, and the combination of this project and the two grant aid projects was expected to improve the functioning of central and regional laboratories and strengthen the national laboratory network. in addition, the Project demonstrates coherence by working with international organizations such as WHO, UKHSA, USCDC, Global Fund (GF; RSSH (Resilient and Sustainable Systems for Health) Project) and World Bank (WB；REDISSE (Regional Disease Surveillance Systems Enhancement) Project).

Furthermore, NCDC is the West Africa Regional Coordinating Centres (RCC) of Africa CDC. The RCC serves as the focal point for Africa CDC surveillance, preparedness and emergency response activities and coordinates regional public health initiatives by Member States in consultation with the Africa CDC headquarters.

As part of Africa CDC activities, we were able to co-organise a Point of Entry stakeholder workshop with WAHO in November 2023.

The Project had been originally planned along with two Grant Aid Projects which were “The Project for Strengthening the Diagnostic Capacity of Nigeria Center for Disease Control” and “The Project for Strengthening the Capacity of Nigeria Center for Disease Control Network Laboratories”. However, due to delay in Grant Aid Projects, the synergistic effect between the Grant Aid and Technical Cooperation Project was not generated.

III-1-3. Effectiveness

Effectiveness: Moderate

The Project purpose was mostly achieved except for the strengthening of M&E for which the intervention of the Project started late. Achievements of indicators of Output 1, 2, and 3 are mostly high and fair.

As for Indicator 2, QMS implementation activities have also been conducted collectively with other partners, such as GF, WB, IHVN, Jhpiego, and so on. Although the target facilities for QMS activities were scaled down, the Project was able to produce an expected outcome. In the initial planning, 16 selected laboratories were supposed to receive support

from the Project, however, due to the delay of the Project, the target laboratories were narrowed down to only 8 public health institutes in 8 states and the planned number of cycles of implementation program was reduced from 3 to 2.

III-1-4. Efficiency

The Efficiency of the Project is evaluated as **Moderate**.
The actual cost is lower than the planned cost because the originally planned dispatches of the short-term experts from NIID were cancelled. Originally, NIID was supposed to dispatch short-term experts in various areas such as research capacity development, surveillance, biosafety/biosecurity, and emergency response. Because of the COVID-19 outbreak and its response in Japan, the experts from NIID were not able to participate in the Project activities, except receiving training participants in Japan.
In order to reflect the limited resources secured by the Japanese side, the PDM was modified in May 2022 during the visit of the Consultation Mission from JICA Head Quarters. The planned Output 1 '*The newly constructed BSL3 Laboratories are properly managed and safely operated.*' was modified to '*The capacity for management and research of NRL is enhanced.* ' and the activities for Output 1 were amended and reduced to be feasible.

III-1-5. Impact

The Impact of the Project is evaluated as **Moderate**.
The project produced the positive impacts such as integration of QMS activities in NCDC's new 5 Year Plan and increase in JEE score.
During the Project implementation, the QMS of the laboratories has received a great deal of attention from NCDC management as well as development partners. Currently, NRL has a plan to introduce QMS to all network laboratories nationwide with support from development partners. In addition, the concept of reorganization and introduction of cascade of laboratories has been under preparation.
Furthermore, Nigeria had voluntarily requested to participate in the second JEE held in August 2023, as a follow-up to the NAPHS 2018-2022 implementation. The score improved from 39 per cent (2017) to 54 per cent (2023), 10% in the area of prevention, 8% in the area of detection, and 18% in the area of response. QMS in the laboratory also increased the score from 2 to 3.

III-1-6. Sustainability

The Sustainability of the Project is evaluated as **Moderate**.

● Policy and System aspects

The NCDC was established by Act in November 2018 as an agency of FMOH, to lead the prevention, preparedness, detection and response to infectious disease outbreaks and public health emergencies.

The Vision of NCDC is "A healthier and safe Nigeria through the prevention and control of diseases of public health importance."

The mission of NCDC is "To protect the health of Nigerians through evidence-based prevention, integrated disease surveillance and response activities, using a one health approach, guided by research and led by a skilled workforce".

Nigeria signed the IHR (2005) including the commitments under the provisions of the IHR Monitoring and Evaluation Framework for the voluntary Joint External Evaluations (JEE) that assesses country-specific status and progress in developing the required capacity to prevent, detect and rapidly respond to public health threats.

Nigeria had a baseline JEE in 2017.

The "National Action Plan on Health Security (NAPHS) 2018-2022", developed in 2018 to address identified gaps and in response to recommendations following the 2017 JEE, states the importance of strengthening the capacity of laboratories as well as developing human resources engaged in infectious disease control. The NCDC is mandated by law to develop a network of highly specialized reference laboratories across the nation to contribute to national health security.

"Strategy and Implementation Plan 2023 - 2027" was launched by NCDC in November 2023. One of the Strategic Goals is "Enhance laboratory capacity to detect and support infectious disease surveillance systems and response through detection, prevention, and control" and the Outcome is set as "A public health laboratory service and network, effectively supporting the detection, prevention and response to infectious diseases of public health importance in Nigeria and contributing to regional public health capacity"

For this Outcome, the seven Objectives are set as below.

1. Expand the capacity of the Public Health Laboratories to ensure improved service delivery.
2. Institute a tiered laboratory network structure to ensure expanded diagnostic capacity across the country.
3. Improve quality management system in NCDC laboratories and its network respectively.

4. Standardise and decentralise equipment maintenance and calibration in NCDC labs and network.
5. Improve and institute biosafety, biosecurity and specimen management at NCDC labs and network respectively.
6. Establish a National Genomic Centre of Excellence.
7. Strengthen and expand research capacities at NCDC laboratories and its network.

In the 2nd JEE, held in August 2023, the evaluation of Biosecurity and Biosafety remained unchanged from the first JEE and is reflected as one of the strategic objectives as above.

Another Strategic Goal of “Strategy and Implementation Plan 2023 - 2027” is “Establish a research-driven and evidence-based agency for disease prevention, health promotion, and health planning”. “Institute mechanisms to strengthen planning, policy development and monitoring and evaluation systems within the NCDC” is one of the objectives of the outcome “Evidence-based policies and programmes with integrated health promotion activities”.

● **Institutional/Organizational aspects (organizational framework, human resources)**
For the response to COVID-19, the number of network public health laboratories had increased rapidly. NCDC has started to develop a structure through regional centres, led by Sub-National support departments, to strengthen supervision and technical assistance by the NCDC. The NCDC’s implementation of its tiered laboratory network is intended to establish an effective network of testing laboratories for diseases of public health importance. As part of taking forward lessons learnt from the global COVID-19 pandemic and its impact on Nigeria, the NCDC has designated and commenced the establishment of Zonal Reference Laboratories (ZRLs) across the 6 geopolitical zones. These ZRLs will bring NCDC reference laboratory functions to States and serve as hubs for the Region, facilitate sample transportation, reduce turnaround time for testing and release of results, support the implementation of quality management systems including national and international accreditation of PHLN, and contribute to resilience in emergency and preparedness efforts at the subnational level. As QMS is already implemented in the laboratories supported by this project, those labs might be nominated as one of the ZRLs. The Monitoring and Evaluation (M&E) unit of NCDC was recently established in the Surveillance and Epidemiology Department in 2021, aiming to monitor and evaluate all the activities of surveillance such as the implementation of IDSR, response to outbreaks and so on, and also to demonstrate outcomes and impacts to inform better decisions in the

department. Those surveillance activities have been supported by partners (WHO, Jhpiego, RTSL etc.) and the APM developed under this project will be utilized by partners for support planning, in line with the NCDC's new “Strategy and Implementation Plan 2023 – 2027”.
After the Department of Planning, Research, and Statistics (DPRS) was established as a dedicated department for cross-organisational M&E in January 2023, the UKHSA is supporting the creation of the M&E framework.

●Technical aspect

Regarding Output 1, basic training for cell culture could not be carried out due to space constraints, but technicians who have received training abroad are returning to NRL. It is essential to ensure that there will be sufficient space for research work, especially in the BSL-3 laboratory to be built.
In addition, through the COVID-19 outbreak response, the introduction of molecular diagnostic equipment into the state level laboratory has progressed. The establishment of a genome sequencing network using this introduced equipment is envisaged, and NRL was designated as the Central training center of using this equipment.
The research capacity is relatively improved by not only this project but also by JICA’s PREPARE scholarship program or other partners’ projects.
Regarding Output 2, NRL is planning to obtain international accreditation for QMS implementation. NRL is also receiving support from partners to obtain certification to carry out EQA.
QMS implementation program has also been implemented by other partners, so NRL staff are able to further brush up their knowledge by facilitating similar training. The Project contributed to the implementation of number of QMS related trainings. In order to ensure the sustainability of QMS activities, those who received trainings from the Project should play a role of lecturers so that QMS will be taught to more staff in network laboratories.

● Financial aspect

National programmes for infectious diseases such as HIV/AIDS[*1], TB[*2], Malaria[*3], NTDs[*4] and so on are operated by the Public Health Department of the Federal Ministry of Health.
NCDC has been an independent body for only six years and is a government agency specializing in the control and prevention of infectious diseases requiring outbreak response, the continuously secured budget is limited.
The immediate training, staffing, supplies, reagents, personnel costs, and other items required to respond to a sudden outbreak depend mainly on funding from partners.

In addition, as projects are set up for each pathogen, the projects set up at NCDC in response to COVID-19 were scaled down as the pandemic came to an end.
As continuous QMS training is needed to maintain laboratory quality, and for outbreak response, there is a need to introduce continuous monitoring and evaluation systems and human resource development. It is important to work with the Ministry of Health to ensure continued budgetary resources.

*1 HIV/AIDS & Viral Hepatitis Programme.
*2 National Tuberculosis & Leprosy Control Programme (NTBLCP)
*3 National Malaria Elimination Programme (NMEP)
*4 Neglected Tropical Diseases (NTDs)

● Preventive measures to risks

Brain drain is an issue, and an attractive research environment, such as the BSL-3 lab, needs to be developed to encourage personnel trained abroad to return and settle in.

III-2. Key Factors Affecting Implementation and Outcomes

(1) COVID-19 Pandemic

- The COVID-19 Pandemic significantly affected the plan and implementation of the project activities.
- On March 29 2020, the Government of Nigeria announced a cessation of movement in two States and in the Federal Capital Territory to reduce the spread of COVID-19.
- JICA decided to suspend all overseas business trips of its employees as well as experts/consultants/contractors under the direct contract with JICA.
- The Project Coordinator returned to Japan in April 2020 but returned to Nigeria in October 2020 to resume project activities.
- Local staff worked remotely and reported the general situation of COVID-19 in Nigeria by attending weekly meetings held by WHO.
- Short-term expert (Laboratory Management) worked remotely from Japan. That caused the delay of Activity 2.
- For tackling with COVID-19 Pandemic, NRL repurposed the rooms that were supposed to be used for the gene sequencing works and cell culture training, which our project was supporting, to another project for COVID-19.

- Even though the procured items have been installed in the smaller rooms, NRL has tried its best to produce the results of sequencing of COVID-19 variant, Monkey pox, Lassa virus, and so on.

(2) Security situation

- In October 2022, following the raise of safety measure for FCT by the United States and the United Kingdom, other countries including Japan also raised their safety measures, which led to significant restrictions on activities, including domestic travel.

(3) Delay of the construction of BSL-3 Labs

- This technical cooperation project was originally planned, aligned with BSL3 Lab Grant Aid Project and the Network Lab Grant Aid Project.
- The selection of contractor took considerable time, therefore the BSL3 labs were not constructed during the period of this project.
- This not only affected the activities related to the BSL3 laboratory in Outcome 1, but also may have reduced the motivation of the NCDC side for the project.

(4) Shortage of human resources at NRL

- Not enough trained staff are available in the NRL due to the time taken to develop human resources.
- NCDC is still a young organization and the number of public health laboratories in the NCDC network rapidly increased during the response to COVID-19 pandemic.
- NRL's mid-level and experienced staff play a central role in day-to-day operations. In addition, NRL needs to be ready to respond to outbreaks on an emergency basis at any time as part of its mission as a national laboratory.
- It was difficult to send staff as mentors to states for more than one week at a time.
- Training young staff and building up their experience is a challenge.

(5) Slowness of approval procedures

- The approval process within NCDC was often taking a long time and activities needed to be pushed back, so arrangements were made with counterparts to share and discuss the schedules well ahead of time.
- Executives are busy attending international conferences, making field visits to outbreak response sites and doing a lot of approval works.

III-3. Evaluation on the results of the Project Risk Management

- For building the research capacity of NCDC/NRL, virtual conferences for exchanging research topics with PREPARE students in Nagasaki University and Hokkaido University were held.
- To make communication easier, monthly meetings with the senior staff of NRL and the project manager were held.
- JICA continues the conversation with NIID. During the visit of a director of NCDC administration and a director of PHLN to Japan, a courtesy visit to NIID was realized after WHO lifted the Public Health Emergency of International Concern (PHEIC) for COVID-19.
- NIID supported the Biosafety and Biosecurity training in Japan by providing lectures and organizing the site visit to the BSL-3 Laboratory.
- QMS Implementation plans were also conducted by the other partners for other states. Even though there had been not enough senior staff for mentorship and follow up assessment, the number of trained staff has been increasing through the various QMS implementation activities. That is why our project was able to utilize the pooled human resources for the last follow-up assessment.

III-4. Lessons Learnt

- This was the first time that NCDC had implemented a JICA-supported technical cooperation project, and JICA's approach, which is to work with the C/P to foster ownership, was not fully understood. It took a lot of time and effort to repeatedly explain for example the concept of allowances, causing various difficulties in the progress of the project. Some NCDC staff gradually came to understand the basic policy and key features of JICA's technical cooperation projects, such as supporting the autonomy of counterpart agencies and emphasising continuity and independent development.
- The project was severely affected by the suspension of the project due to the COVID-19 pandemic and the limited availability of short-term experts as expected as resources on the Japanese side.
- And It was not feasible to provide all the mentors from NRL, so it would have been better to consider implementing the program jointly with other partners or securing at least one mentor in each state government. The State Laboratory Focal Person is one of the most promising human resources in the states.

- From the point of view of laboratory in states, though it required a lot of arrangement by NRL and the Project to dispatch staff to the states, the Mentorship programs were very great opportunities for junior lab staff to get hands-on training and learn QMS effectively and for mentors to have the opportunity to learn by reviewing and teaching them the QMS requirements.
- World Bank, Global Fund, WHO, USCDC, UKHSA, AFENET and other partners have similarly provided support for QMS implementation. The concept of QMS is considered to have been further disseminated within PHLN due to the synergistic effect with other partners.
- Continued efforts are needed to deepen NCDC's understanding of JICA's approach, including more effective engagement of human resources developed through country-focused training and long-term training programs such as PREPARE.

III-5. Performance

Despite external factors such as the COVID-19 pandemic and the deteriorating security situation, (1) the dispatch of Mr.Miura, short-term expert(Laboratory Management), on a total of nine times resulted in improved QMS implementation and a visible increase in SLIPTA scores in the target laboratories, and (2) the APM was developed for smooth implementation of surveillance activities in the field through a workshop with a short-term consultant (Strengthening of Monitoring and Evaluation of Infectious Disease Surveillance) from Japan, Mr Otani, in the final stages of the project.
And the senior advisor of JICA HQ, Dr.Isono, involved in setting up the project, visited NCDC several times and provided input on the project's course correction, which helped the Project to build a good working relationship through good communication with NCDC, USCDC and other partners.
As many NRL activities are running in parallel with other partners, meetings were held from time to time with the Director of PHLS, the Project Manager and staff from the JICA Nigeria office to ensure smooth coordination of NRL staff deployment plans.

III-6. Additionality

Online knowledge-sharing conferences were organised; through the presentation of the research of colleagues studying in Japan and discussions with their supervisors, it was

expected that these would lead to the identification of NCDC staff with a research mindset. It was also a good opportunity for PREPARE students to present their findings to NCDC.

IV. For the Achievement of Overall Goals after the Project Completion

IV-1. Prospects to Achieve Overall Goal

See III-1-6. Sustainability in detail

IV-2. Plan of Operation and Implementation Structure of the Nigeria side to achieve Overall Goal

To achieve Overall Goal, WHO recommended that there is a need to create a five-year risk-based NAPHS with realistic costing proposals for priorities, based on the JEE report, and after-action reviews, using the guidance from WHO.
As NCDC/NRL is the central national authority, it is the role of NCDC/NRL to collect and analyze information in the event of an outbreak, decide what strategy to take as a result, and provide feedback to the field. The aim is to have a system in which outbreaks are routinely dealt with within the geographical zone, and when an outbreak actually occurs, the response can be completed within the zone. It is essential to improve the accuracy of local laboratories and establish a surveillance system at the State or LGA level.

IV-3. Recommendations for the Nigeria side

Continuing the annual online research meetings with PREPARE students studying at Japanese universities would provide a good opportunity to build a foundation for international research collaboration and identify future opportunities to challenge JICA's SATREPS.

In expectation of further introduction of the QMS implementation plan to the whole of Nigeria, it will be important to continuously train quality managers of the labs.
For ensuring the continued implementation of QMS training in the state, active involvement of the heads of the public hospitals with their respective Public Health Laboratories is also recommended, for example by personally explaining and encouraging the state government first on the importance of QMS training.
More importantly, for implementation at the state level, sub-national NCDC staff could be utilized to advocate the importance of QMS implementation to state governors.

For example, strategies could include joint training of state laboratory focal persons, together with other partners, using sub-national departments to promote the introduction of the QMS in each state.

Reflecting on the results of the Situational Analysis and Action Planning Workshop held in October 2023, it is recommended that the action plan matrix (APM) developed through the analysis of objectives and problems be followed up autonomously and sustainably, and that structured M&E activities and systems are organised across NCDC.

IV-4. Monitoring Plan from the end of the Project to Ex-post Evaluation

The 'Infectious Disease Control Advisor', who is to be deployed from JICA to NCDC in February 2024, is expected to provide support in strengthening organisational capacity to make the activities implemented under this project sustainable.

Regarding Activity 1, advanced research activities are expected to be expanded after the opening of the BSL-2/3 laboratories. Even before that, as developing research mindsets is very important, so annual event of information-sharing event with PREPARE students would be a good opportunity to keep updated on the latest research topics. Conducting a virtual meeting doesn't cost so much, so it can be one of the cost-effective option.

Regarding the QMS implementation program, ISO 15189 was UPDATED from the 2012 edition to the 2022 edition during this program period. There is no updated SLIPTA, but technical guidance for the new ISO 15189 is required.

Regarding M&E activity, the development of the framework of M&E for the whole NCDC has just started. M&E activities of the Surveillance department would be followed up with support from DPRS.

Those three implemented activities is going to be monitored closely by the
' Infectious Disease Control Advisor.'

Annex

Annex 1: Results of the Project

- Annex 1-1 Equipment Provision
- Annex 1-2 Revised Plan of Operation

Annex 2: List of Products Produced by the Project

- Annex 2-1: A Report of Situation Analysis in Public Health Laboratories on the NCDC network in 2021
- Annex 2-2: Short Report: Review of Laboratory Performance at Measles Laboratory in Maitama District Hospital from 2020 to 2023
- Annex 2-3: Basic M&E End of Training Report
- Annex 2-4: Completion Report on Nigeria IDSR M&E

Annex 3: PDM (All versions of PDM)

- Annex 3-1　PDM Original (August 2017)
- Annex 3-2　PDM Ver.1 (July 2019)
- Annex 3-3　PDM Ver.2 (June 2022)

Annex 4: R/D, M/M, Minutes of JCC (copy)

- Annex 4-1　R/D (2017)
- Annex 4-2　R/D (2019)
- Annex 4-3　R/D (June 2023)
- Annex 4-4　Minutes of 1st JCC (June 2022)
- Annex 4-5　Minutes of 2nd JCC (July 2023)
- Annex 4-6　Minutes of 3rd JCC (November 2023)

Annex 5: Monitoring Sheet (copy)

(Remarks: Annex 4 and 5 are internal reference only.)

- Annex 5-1　Monitoring Sheet 1st (Dec 2019 – May 2020)
- Annex 5-2　Monitoring Sheet 2nd (June 2020 – November 2020)
- Annex 5-3　Monitoring Sheet 3rd (December 2020 – May 2021)
- Annex 5-4　Monitoring Sheet 4th (June 2021 – November 2021)
- Annex 5-5　Monitoring Sheet 5th (December 2021 – May 2022)
- Annex 5-6　Monitoring Sheet 6th (June 2022 – November 2022)
- Annex 5-7　Monitoring Sheet 7th (December 2022 – May 2023)

Equipment List

Project for Strengthening detection of and response to public health threats in Nigeria/JICA

30/11/2023

	Name of Equipment	Maker's name	Reference brand/serial No./Product No.	Purpose of use (Please specify)	Date	Quantity	Unit
1	Applied Biosystems™ 3500 Genetic Analyzer	Thermo scientific	3500GA	Sequencing	28/03/2023	1	set
2	Fluorescence Inverted Microscopy	Optika	IM-3LD2	Cell culture	28/03/2023	1	set
3	C02 Incubator (include the unit, the stand, the stacking adaptor)	NUVE	EC160	Cell culture	28/03/2023	2	set
4	Deep Freezer -80℃	PHC	MDF-DU502VH-PE	Strage of specimen and/or reagents	28/03/2023	1	set
5	Freezer -30℃	PHC	MDF-MU539	Strage of reagents	28/03/2023	1	set
6	Bio safety cabinet Class II TypeA2	NUAIRE	NU-540-400E	Provision for biohazard	28/03/2023	1	set
7	Thermal cycler	eppendorf	Mastercycler® nexus GSX1	for PCR testing	28/03/2023	1	set
8	Electrophoresis equipment	OPTIMA	Mupid®-2plus	for electrophoresis on PCR	28/03/2023	2	set
9	LED transilluminator with observing Dark box	Cleaver Scientific	Problue	Observing electrophoresis	28/03/2023	1	set
10	Incubator	AS ONE	COOL INCUBATOR FCI-280G	Culture	28/03/2023	2	set
11	Water bath with thermal system	Biobase	SY-2L4H	Incubation	28/03/2023	1	set
12	Heat/cooling block bath	AS ONE	Dry Bath MyBL-10C	Incubation	28/03/2023	1	set
13	Block 0.2ml for heat/coolong block bath	AS ONE	Block A-10	Incubation	28/03/2023	1	pcs
14	Block 1.5ml for heat/coolong block bath	AS ONE	Block D-10	Incubation	28/03/2023	1	pcs
15	Micro-volume Spectrophotometer	OPTIMA	NanoEX Lite	Spectrophotometer	28/03/2023	1	set
16	Hybrid Refrigereated Centrifuge(with all required rotors covered	eppendorf	5804R	Centrifugation	28/03/2023	1	set
17	ELISA microplate Absorbance Reader	DIASOURCE	DIA2000	Microplate reader for ELISA	28/03/2023	1	set
18	ELISA Microplate washer	DIASOURCE	DIA3000	Plate washer for ELISA	28/03/2023	1	set
19	Inverted Microscopy with Phase contrast	Optika	IM-3	to obseeve cell culture	28/03/2023	1	set
20	Autoclave	Biobase	BKM-P24(D)	to sterialize	28/03/2023	1	set
21	Water Purify System	Merck Millipore	ZRQSVP3WW	to make RO and Ultra Purified water produce both RO pure (Type 3) and ultrapure (Type 1) water	28/03/2023	1	set
22	UPS 3000VA	APC	APC Smart UPS SMC 30001	to backup electric power	28/03/2023	4	set
23	UPS 1000 VA	APC	APC Smart UPS SMC 10001	to backup electric power	28/03/2023	2	set
24	Laboratory table	SHIMAZU JAPAN	SK1-B18	for laboratory works	28/03/2023	1	set
25	Notebook PC	Hewlett Packard	1925UAR#ABA	to develop the communication mechanism	28/03/2023	8	set
26	Notebook PC	Hewlett Packard	J9H22UA#ABAR	to develop the communication mechanism	28/03/2023	2	set

27	Laser printer	Hewlett Packard	4RY26A	to develop the communication mechanism	28/03/2023	10	set
28	Toner	Hewlett Packard	W1103-00013	to develop the communication mechanism	28/03/2023	30	set
29	UPS	Mercury	MAVERICK1550	to backup electric power	28/03/2023	10	set
30	Monitor	Hewlett Packard	3KS64AA	to develop the communication mechanism	28/03/2023	10	set
31	Software	Microsoft	x20-88852-01	to develop the communication mechanism	28/03/2023	10	set
32	Refrigerated Show-case	LABCOLD	RLDG1019	for Strage of specimen and/or reagents	19/07/2023	1	set
33	UPS 1500 VA	APC	APC Smart C1500VA	to backup electric power	24/11/2023	3	set
34	HP Laptop PC	Hewlett Packard	209Q9UA	for Monitoring and Evaluation activity	24/11/2023	5	set

Annex 1-2

Reveised Plan of Operation

Activities	Year	2019	1st Year 2020	2nd Year 2021	3rd Year 2022	4th Year 2023
Sub-Activities		12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11
Output 1: The capacity for management and research of NRL is enhanced.						
1-1. Capacity development for BSL3 management						
1-1-1 Conducting training on BSL3 Laboratories management and biosafety	Plan					
	Actual					
1-2 Capacity development for research activity						
1-2-1 Conducting training on routine diagnostic testing and research activites of NRL.	Plan					
	Actual					
Output 2: The laboratory network for infectious diseases is strengthened to carry out safe and reliable diagnosis and confirmation of Cholera and CSM.						
2-1 Building capacity of laboratory quality management in public health laboratories on the NCDC laboratory network.						
2-1-1 Conducting a survey on the current state of public health laboratories.	Plan					
	Actual					
2-1-2 Holding an analysis workshop to analyze the results of the survey on activity 2-1-1 and identify gaps/needs	Plan					
	Actual					
2-1-3 Conducting a planning workshop to develop a laboratory quality management improvement plan for each public health laboratory based on the outputs on activity 2-1-2.	Plan					
	Actual					
2-1-4 Conducting quality management system training on understanding of ISO 15189 and implementation of QMS Class 2** to support the individual plan developed on activity 2-1-3.	Plan					
	Actual					
2-1-5 Conducting the training for capacity building of staff in the selected laboratory on internal audit based on SLIPTA requirements and certification of the participants on internal auditing.	Plan					
	Actual					
2-1-6 Conducting training for staff on biosafety and security requirements according to ISO15189 standard.	Plan					
	Actual					
2-1-7 Conducting training on equipment user maintenance and verification.	Plan					
	Actual					
2-1-8 Organizing mentorship program to address all identified nonconformances in the selected public health laboratories during baseline assessment on activity 2-1-1.	Plan					
	Actual					
2-1-9 Conducting follow up assessment to the selected laboratories to monitor performances on post mentorship activities.	Plan					
	Actual					
2-1-10 Holding the review meeting to share the progress of activities' implementation in the developed plan on activity 2-1-3 and outputs on activity 2-1-9.	Plan					
	Actual					
2-2 Strengthening sample collection and transportation system for infectious diseases						
2-2-1 Developing document and records on sample management in public health laboratory	Plan					
	Actual					
2-2-2 Conducting training on sample collection and transport in selected public health laboratories	Plan					
	Actual					
2-2-3 Conducting training on sample transport and IPC to courier service in selected states where the project supporting facilities are located.	Plan					
	Actual					
Output 3: The capacity for Monitoring and Evaluation (M&E) of NCDC is enhanced.						
3-1 Enhancing capacity for M&E of the program						
3-1-1 Conducting a survey on implementing situations for the M&E program at NCDC, States, LGAs levels.	Plan					
	Actual					
3-1-2 Developing plans for improving the M&E program at NCDC, State and LGA levels based on the findings of 3-1-1.	Plan					
	Actual					
3-1-3 Conducting training to develop capacity for M&E including capacity for integrated supportive supervision and data management.	Plan					
	Actual					
3-1-4 Developing data quality assessment tool.	Plan					
	Actual					
3-1-5 Conducting training on the tool developed in 3.1.4 for all related staff.	Plan					
	Actual					
3-1-6 Conducting evaluation of the tool at field levels	Plan					
	Actual					

Annex 2-1

A Report of Situation Analysis in Public Health Laboratories on the NCDC network in 2021, Nigeria

I Background

Nigeria Center for Disease Control (NCDC) has led to infectious disease control since 2011. In 2017, Joint External Evaluation (JEE) was conducted by World Health Organization in line with IHR and recommended four (4) prioritized actions as the following;

1. Enhance the laboratory infrastructure and available resources to sustain an integrated national laboratory network.
2. Implement Strengthening Laboratory Management Toward Accreditation (SLMTA) Programme for the national laboratory network focusing on biosafety, biosecurity, and quality assurance.
3. Develop a robust sample and vaccine transportation system which ensures the cold chain.
4. To adopt a basic laboratory information-sharing system among the relevant stakeholders.

The Public Health Laboratory Network (PHLN), in which the number of collaborating laboratories became 41 across the country, was reformed in 2018. As a result, the collaborating laboratories were designated with different functions in Table 1.

Table 1 Disease-oriented laboratory network

Targeted disease	Number of labs designated
VHF (Lassa fever)	4
Yellow Fever/Measles	6
CSM/Cholera	20
Influenza	5 (1: lab, 4: sentinel site)
Monkeypox	1
AMR	9 (sentinel site)

Source: Nigeria Center for Disease Control Annual Report 2018

Japan International Cooperation Agency (JICA), in cooperation with NCDC identified areas of support to strengthen the Quality Management System (QMS) capacity of public health

laboratories (PHLs) on the NCDC network, referring to the prioritized recommendations of JEE in 2017. As a result, the importance of QMS support was highlighted with the concept of quality being central to the delivery of laboratory services after all considerations based on the QMS implementation in the PHLs on the NCDC network were done.

Thus, the survey of the situation of the 20 public health laboratories on the NCDC network has been conducted.

II. General Objective

To determine laboratory QMS implementation level and collect laboratory performance data in the PHLs on the NCDC network.

III. Specific Objectives

Regarding laboratory examinations for the eight (8) prioritized infectious diseases;

- evaluate the implementation level of QMS,
- collect information about laboratory performance, such as enabling the External Quality Assessment (EQA) program, sample collection and transportation, workload, sample rejected rate, positivity rate, Turn Around Time (TAT), and all others.

IV. Justifications

The following points justify this activity;

- to be in line with the NCDC key activities for implementation as contained in the National Action Plan for Health Security, Federal Republic of Nigeria (NAPHS 2018-2022); "Implement SLMTA in all labs in the public health laboratory network."
- To be in line with the Japanese Grant Aid named "The Project for Strengthening the Capacity of Nigeria Centre For Disease Control Network Laboratories in the Federal Republic of Nigeria.
- To have linkage with; Outputs: 2. Laboratory network for infectious diseases is strengthened to carry out safe, accurate, and reliable diagnosis and confirmation of eight (8) prioritized infectious diseases; and following activities 2-1, 2-2, and 2-3 according to a project design matrix version 1 (PDM ver1 2019),
- To be in line with Japanese Grant Aid named "THE PROJECT FOR STRENGTHENING THE CAPACITY OF NIGERIA CENTRE FOR DISEASE

CONTROL NETWORK LABORATORIES IN THE FEDERAL REPUBLIC OF NIGERIA" according to a project design matrix version 1

- To harvest baseline data to monitor the progress of the project,
- To support NCDC in identifying gaps from the 20 selected PHLs on the NCDC network, develop and implement corrective actions.

V. Methodology

1. Study design and Target public health laboratories

This survey was a cross-sectional study for intentionally selected public health laboratories on the NCDC network. 20 PHLs that conducted the survey were chosen;

- PHLs on the NCDC network, which have never been supported quality management system implementation by any organizations/ institutions

2. Survey materials

SLIPTA checklist [1] was applied to evaluate the implementation level of the quality management system.

The project developed a laboratory performance collecting form (Annex 1) and a manual to fill out. The form contained the following aspects;

- General information
- Equipment condition
- Reagent supply
- Sample collection and transportation
- Turn-Around-Time (TAT)
- Workload, rejected sample, and EQA participation

3. Protocol conducting the field survey in the targeted PHLs

Figure 1 shows the surveyor's daily activities. Surveyors called courtesy to the State Ministry of Health and Hospital Management Board to share the matter of the survey. Also, before the surveyors left the targeted public health laboratory, they reported the survey results.

4. Formulating the survey team

Seven (7) survey teams were formulated to conduct the field survey. Each group consisted of two members selected from NRL and CPHL staff.

[1] Stepwise Laboratory quality Improvement Process Towards Accreditation (SLIPTA) Checklist Version 2:2015 For Clinical and Public Health Laboratories, WHO regional office for Africa

	Secondary	Tertiary
Monday	Move to State	
	Briefing with the SMoH, HMB, Hospital management	Hospital management
Tuesday	Survey (Quality management, Laboratory performance) • Review laboratory documents • Review laboratory records • Observe laboratory operation • Ask open-ended questions • Follow a specimen through the laboratory • Confirm that each results or batch can be traced • Confirm PT results • Evaluate the quality and efficiency of supporting work areas • Take pictures	
Wednesday		
Thursday	Reporting and debriefing to the Lab/Hospital management, HMB and SMoH	Lab/Hospital management
Friday	Move to Abuja	

Figure 1 Daily activities of the field survey

5. Training for surveyors:

The preparatory training for the surveyors was conducted to share information regarding the objectives of the field survey, how to use the SLIPTA checklist and laboratory performance collection form, and observing points in the laboratory.

6. Surveying schedule:

The field survey was scheduled as two teams moved to planned facilities and conducted the field survey. Then, the following two groups would do it in the next week. After each team surveyed two facilities, the midterm review meeting was held to review the survey progress.

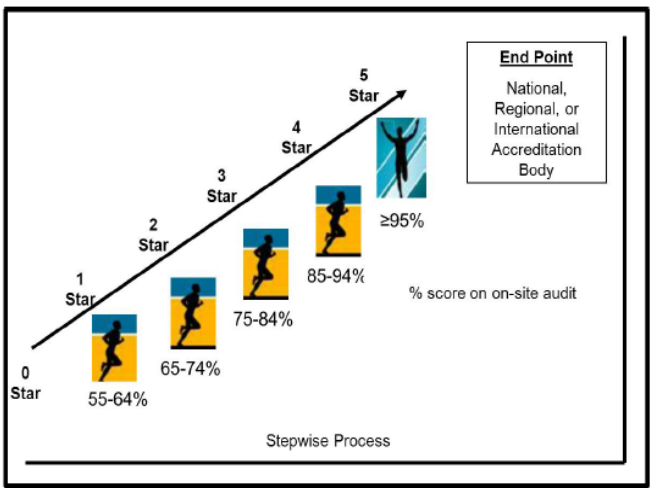


Figure 2 Stepwise process with five-star tiered approch

7. Quality Management System Implementation Level

SLIPTA's five-star tiered approach[1] was applied to evaluate the QMS implementation level. A score on the SLIPTA checklist corresponds to a number of stars, as shown in Figure 2[2].

[2] Guide for the Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) in the WHO African Region - Revision 2, WHO Regional Office for Africa 2020

VI Results

1. The field survey implementation

The field survey was conducted from August to November 2021, shown in Figure 3. The midterm review was held in the middle of October 2021 to evaluate the progress of the ongoing survey across the targeted 20 PHLs on the NCDC network. While it was confirmed that the survey was done the proper way by using the approved protocol and SLIPTA checklist, the following concerning points were raised;

- Some laboratories on the NCDC network were yet to commence testing of disease,
- Target laboratories included PHLs not to be on the NCDC network,
- The security situation was getting worth in some states

Four targeted facilities were delisted to respond to the above concerning points, and 16 facilities completed the field survey.

2. General Information of the Surveyed Public Health Laboratories

Table 2 shows the facilities that conducted the field survey. 12 out of 16 public PHLs belonged to secondary health facilities managed by the State Ministry of Health, and four (4) were tertiary facilities managed by the Federal Ministry of Health. The surveyed laboratories included 16 collaboration laboratories for CSM, 14 for Cholera, one (1) for Yellow Fever and Measles. Six (6) laboratories provided AST as routine work. The collaboration laboratory of VHF, Influenza and Monkypox were not included.

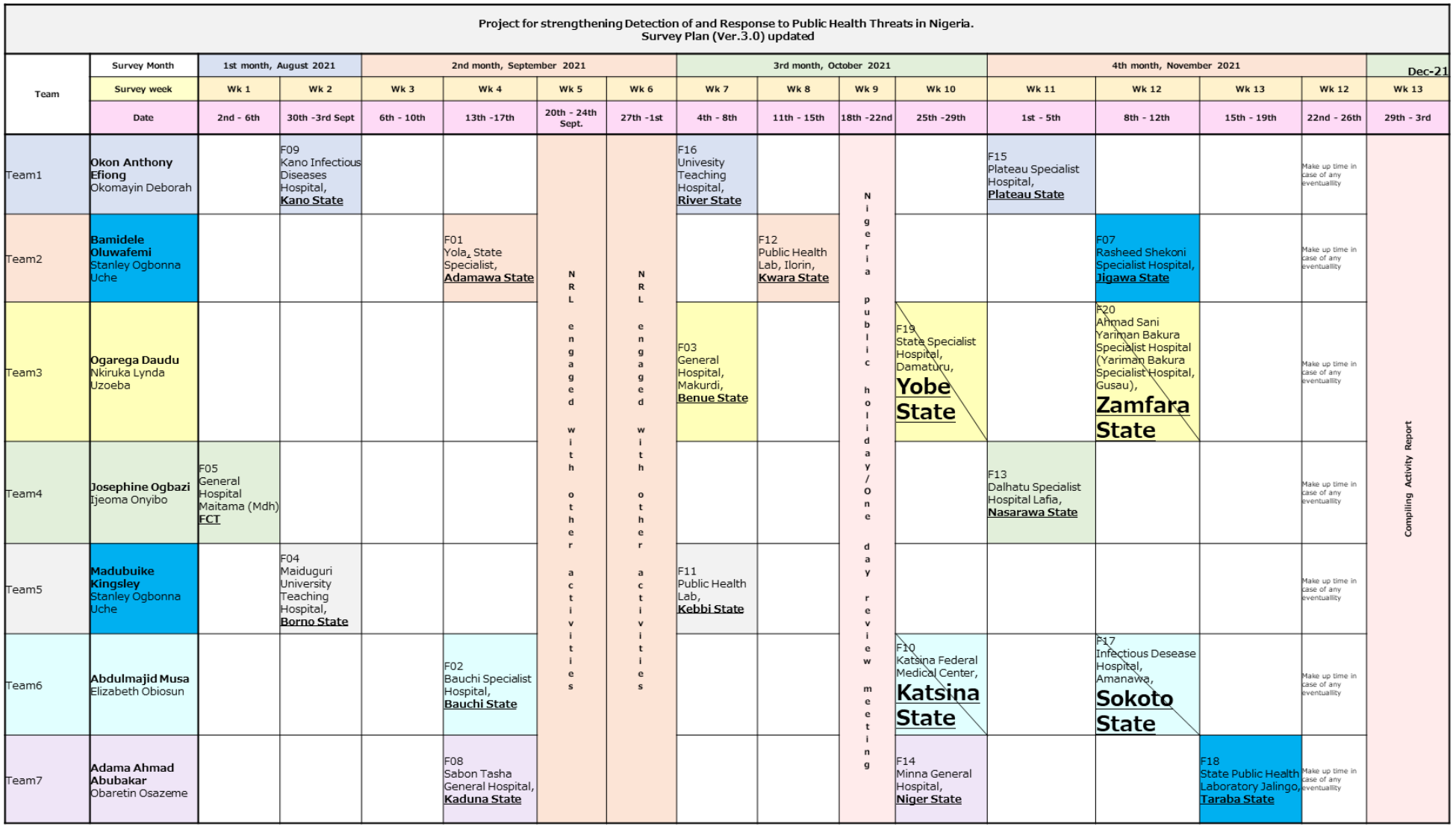
2.1 Power supply

Figure 4 shows the availability of power supply in 16 PHLs. Electronic power was available 18-24 hrs/day:9, 12-18 hrs:12, 6-12 hrs: 3, less than 6 hrs: 1.

Power resources were public supply:11, generator: 10, and solar system:4 (one facility did not answer). It seemed that many facilities used more than one resource combined.

2.2 Water supply

Table 3 shows water resources that supply to PHLs. Again, 12 out of 16 facilities were available to use tap water, while four (4) PHLs used other water resources.



Project for strengthening Detection of and Response to Public Health Threats in Nigeria.
Survey Plan (Ver.3.0) updated

Team	Survey Month	1st month, August 2021		2nd month, September 2021				3rd month, October 2021				4th month, November 2021				Dec-21
	Survey week	Wk 1	Wk 2	Wk 3	Wk 4	Wk 5	Wk 6	Wk 7	Wk 8	Wk 9	Wk 10	Wk 11	Wk 12	Wk 13	Wk 12	Wk 13
	Date	2nd - 6th	30th -3rd Sept	6th - 10th	13th -17th	20th - 24th Sept.	27th -1st	4th - 8th	11th - 15th	18th -22nd	25th -29th	1st - 5th	8th - 12th	15th - 19th	22nd - 26th	29th - 3rd
Team1	**Okon Anthony Efiong** Okomayin Deborah		F09 Kano Infectious Diseases Hospital, **Kano State**			NRL engaged with other activities	NRL engaged with other activities	F16 Univesity Teaching Hospital, **River State**		Nigeria public holiday/One day review meeting		F15 Plateau Specialist Hospital, **Plateau State**			Make up time in case of any eventuality	Compiling Activity Report
Team2	**Bamidele Oluwafemi** Stanley Ogbonna Uche				F01 Yola, State Specialist, **Adamawa State**				F12 Public Health Lab, Ilorin, **Kwara State**				F07 Rasheed Shekoni Specialist Hospital, **Jigawa State**		Make up time in case of any eventuality	
Team3	**Ogarega Daudu** Nkiruka Lynda Uzoeba							F03 General Hospital, Makurdi, **Benue State**			F19 State Specialist Hospital, Damaturu, **Yobe State**		F20 Ahmad Sani Yariman Bakura Specialist Hospital (Yariman Bakura Specialist Hospital, Gusau), **Zamfara State**		Make up time in case of any eventuality	
Team4	**Josephine Ogbazi** Ijeoma Onyibo	F05 General Hospital Maitama (Mdh) **FCT**										F13 Dalhatu Specialist Hospital Lafia, **Nasarawa State**			Make up time in case of any eventuality	
Team5	**Madubuike Kingsley** Stanley Ogbonna Uche		F04 Maiduguri University Teaching Hospital, **Borno State**					F11 Public Health Lab, **Kebbi State**							Make up time in case of any eventuality	
Team6	**Abdulmajid Musa** Elizabeth Obiosun				F02 Bauchi Specialist Hospital, **Bauchi State**						F10 Katsina Federal Medical Center, **Katsina State**		F17 Infectious Desease Hospital, Amanawa, **Sokoto State**		Make up time in case of any eventuality	
Team7	**Adama Ahmad Abubakar** Obaretin Osazeme				F08 Sabon Tasha General Hospital, **Kaduna State**						F14 Minna General Hospital, **Niger State**			F18 State Public Health Laboratory Jalingo, **Taraba State**	Make up time in case of any eventuality	

Figure 3 (☑: a facility which was delisted)

Table 2. Available laboratory testing in target facilities

Testing Diseases in Surveyed Public Health Laboratories

No	State	Facility name	F.Lv.	CSM	Cho	(AST)	VHF	YeF	Msl	Inf	Mxp
1	Adamawa	State Specialist Hospital	2nd	○	○	○					
2	Bauch	State Specialist Hospital	3rd	○							
3	Benue	General Hospital Makurdi	2nd	○	○						
4	Borno	University of Maiduguri Teaching Hospital	3rd	○	○	○					
5	FCT	Maitama District Hospital	2nd	○		○		○	○		
6	Cross River	General Hospital Calabar	2nd	○	○						
7	Jigawa	Rasheed Shekoni Specialist Hospital	3rd	○	○	○					
8	Kaduna	General Hospital Sabon Tasha	2nd	○	○						
9	Kano	Infectious Disease Hospital	2nd	○	○						
10	Kebbi	State Public Health Laboratory	2nd	○	○						
11	Kwara	State Ministry of Health Public Health Laboratory	2nd	○	○	○					
12	Nasarawa	Dalhatu Araf Specialist Hospital	2nd	○	○	○					
13	Niger	PHL General Hospital Niger	3rd	○	○						
14	Plateau	Plateau State Specialist Hospital	2nd	○	○						
15	Rivers	Rivers State University Teaching Hospital	2nd	○	○						
16	Taraba	State Public Health Laboratory Jalingo	2nd	○	○						
		Total		16	14	6	0	1	1	0	0

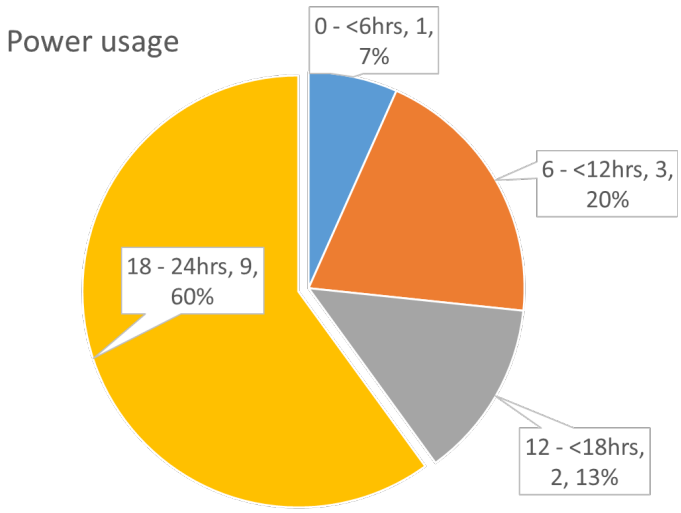


Figure 4 The availability of the power supply

Table 3 Water resources

Resources	Number	Remarks
Tap	12	
Well	0	
Rain	0	
River	0	
Others	4	• Buying (1) • Fetch in a bucket (1), borehole (2)

2.3 Waste management

Table 4 shows the availability of incineration facilities for infectious waste. Eight (8) out of 16 facilities (50%) had the facility. In other eight (6) facilities, various discarding ways are employed for infectious waste. Two facilities did not answer.

Table 4 The availability of the incineration facility

Incineration facility	Number	Remarks
Yes	8	
No	6	• Burning in a pit (2) • Using a State waste system • Disposing of the open dumpsite • Waste disposable contractor • Infectious disease center

2.3 Management of Equipment

Table 5 shows laboratory equipment out of order in the surveyed PHLs. Equipment is listed in chronological order of the number of units broken.

Table 5. Laboratory Equipment out of order

No	Facility No.* / Equipment	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Sub T.
1	Microscope	2	4			2		2	2			3	2			6		**23**
2	Autoclave		2		1	1		1	1		1	2	1		1	2		**13**
3	Incubator		1		1				1				1	1	1	3		**9**
4	Refrigerator		1		1	2			3									**7**
5	Centrifuge	1										1		2		2		**6**

* "Facility No". shows in Table XXX

The survey did not investigate what led to equipment failure, but some facilities claimed that power surges were the cause, especially for autoclaves.

During the field survey, inappropriate equipment was identified, including incubator and sterilizers with low capacity compared to the daily workload and a centrifuge with an angled rotor (see Photo 1 to 3).

Phot 1. Angle type centrifuge

Phot 2. Low capacity incubator

Phot 3. Low capacity sterilizers

Table 6 shows the reasons for not using equipment for more than three months. A major issue is whether inspection equipment can be used appropriately and effectively in rural areas with poor electrical conditions. It is important to conduct a preliminary investigation before procuring a machine.

Table 6. Reasons stopped using equipment

Equipment	Reason
Microscope	no reagent for staining.
Biosafety Cabinet, 3 sets	functional but not in use
Incubator	not installed
Hot air oven	not installed
Tabletop autoclave	not commissioned
Freezer	faulty
Autoclave	faulty
Biosafety Cabinet	Supplied with error

2.4. Reagent supply

Table 7 shows institute/organization supply reagents for Cholera and CSM. NRL/NCDC is a major supplier of these reagents; however, some facilities are supplied by SMOH.

2.5. Workload

The data on workload was collected directly using email. But it was challenging and took a long time to receive the replay. It seems to be a lack of interest in this kind of data.

There have been no outbreaks of CSM since 2017, so the number of specimens was low. Other hands, there were more than 100,000 suspected cases of Cholera in 2021, but the number of samples tested was a few.

Table 7. Reagent Supply

N=16 / ORG	Cholera				CSM			
	RDT	Culture	Identifi-cation	AST	RDT	Culture	Identifi-cation	AST
International	2	1	1	0	1	1	1	0
NRL/NCDC	9	6	4	2	2	6	6	3
FMoH	0	1	1	0	0	1	1	0
SMoH	0	2	1	3	0	2	2	2
Nil	1	1	0	0	0	0	1	3
No answer	2	3	7	0	13	6	5	8

Table 8. Workload for CSM and Cholera in 2019, 2020 and 2021

	CSM			Cholera		
Year / State (Lab)	**2019**	**2020**	**2021†**	**2019**	**2020**	**2021†**
1 Adamawa	3	2	No answer	565	3	202
2 Bauchi	0	0	No answer	0	0	314
3 Benue	Not started			Not started		
4 Borno	0	0	0	30	0	41
5 FCT	41	29	12	n.a.	n.a.	n.a.
6 Cross River	0	0	No answer	0	0	6
7 Jigawa	13	0	No answer	13	2	80
8 Kaduna	Not started			Not started		
9 Kano	0	0	No answer	78	0	38
10 Kebbi	45	10	4	27	46	187‡
11 Kwara	7	0	0	7	0	89
12 Nasarawa	100	52	27	0	0	40‡
13 Niger	15	1	0	0	0	183‡
14 Plateau	5	5	No answer	5	10	No answer
15 Rivers	0	7	No answer	0	0	No answer
16 Taraba	1	0	9	0	0	22
Total	**230**	**106**	**52**	**725**	**61**	**1,183**

† by September 2021, ‡ whole year 2021

3 Quality Management System Implementation Level

The quality management system (QMS) implementation level for 16 PHLs is shown in Figure 6. One (1) public health laboratory out of 16 marked one Star according to SLIPTA's five-star tiered approach. Five (5) PHLs received support for improving QMS from donors. Those laboratories got one to three stars while the support was ongoing. However, those public health laboratories' Star level is downward in the survey. Only one (1) laboratory keeps one-star level (Figure 7).

Figure 8 shows the achievement level by 12 elements. Overall, the achievement levels were low, with all elements below 50 percent, especially 2:management reviews, 6:evaluation and audits, and 10: identification of non-conformities were below 20 percent.

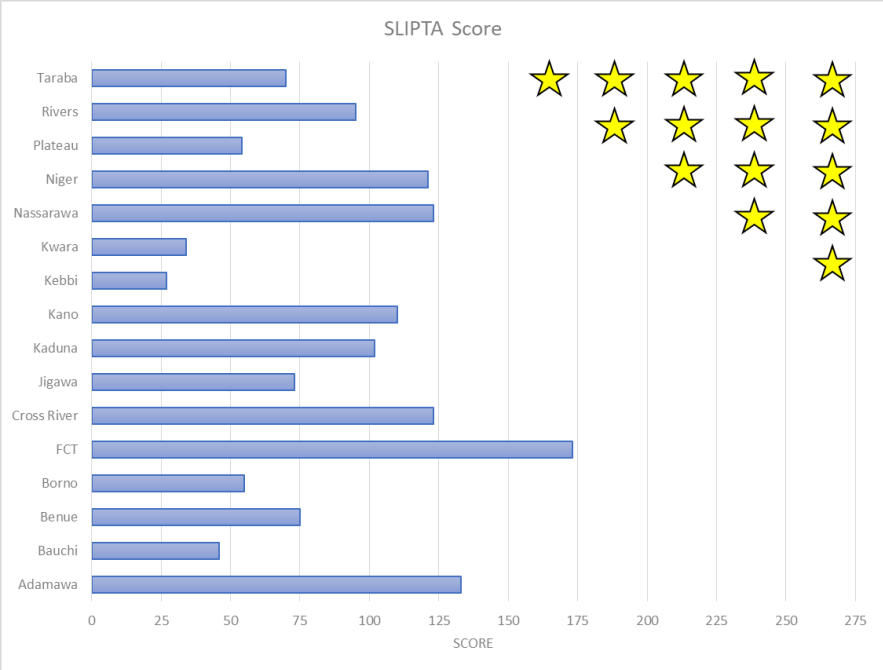


Figure 6. QMS Implementation Level

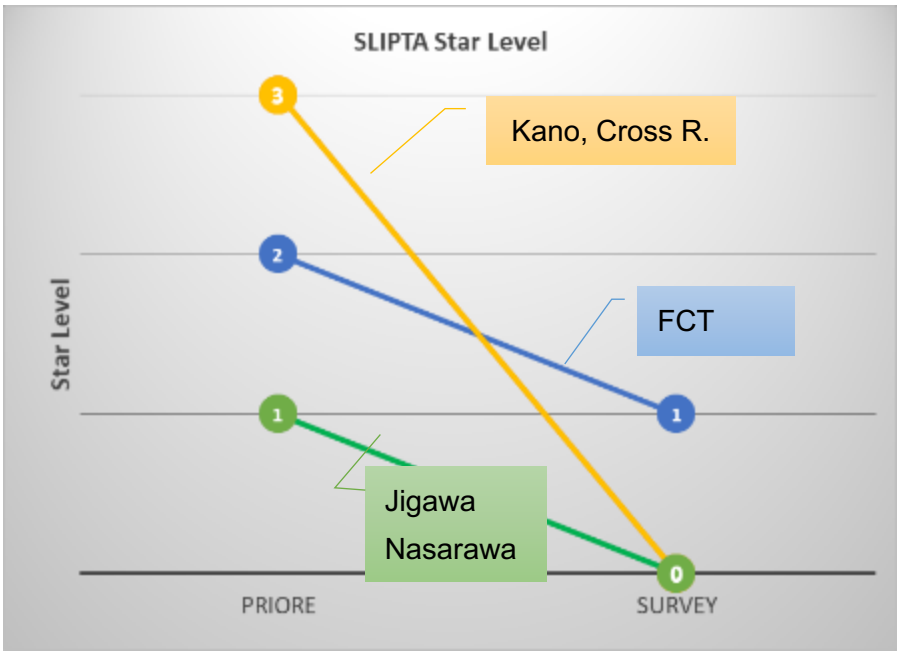


Figure 7. QMS Implementation Level among three labs used to be supported

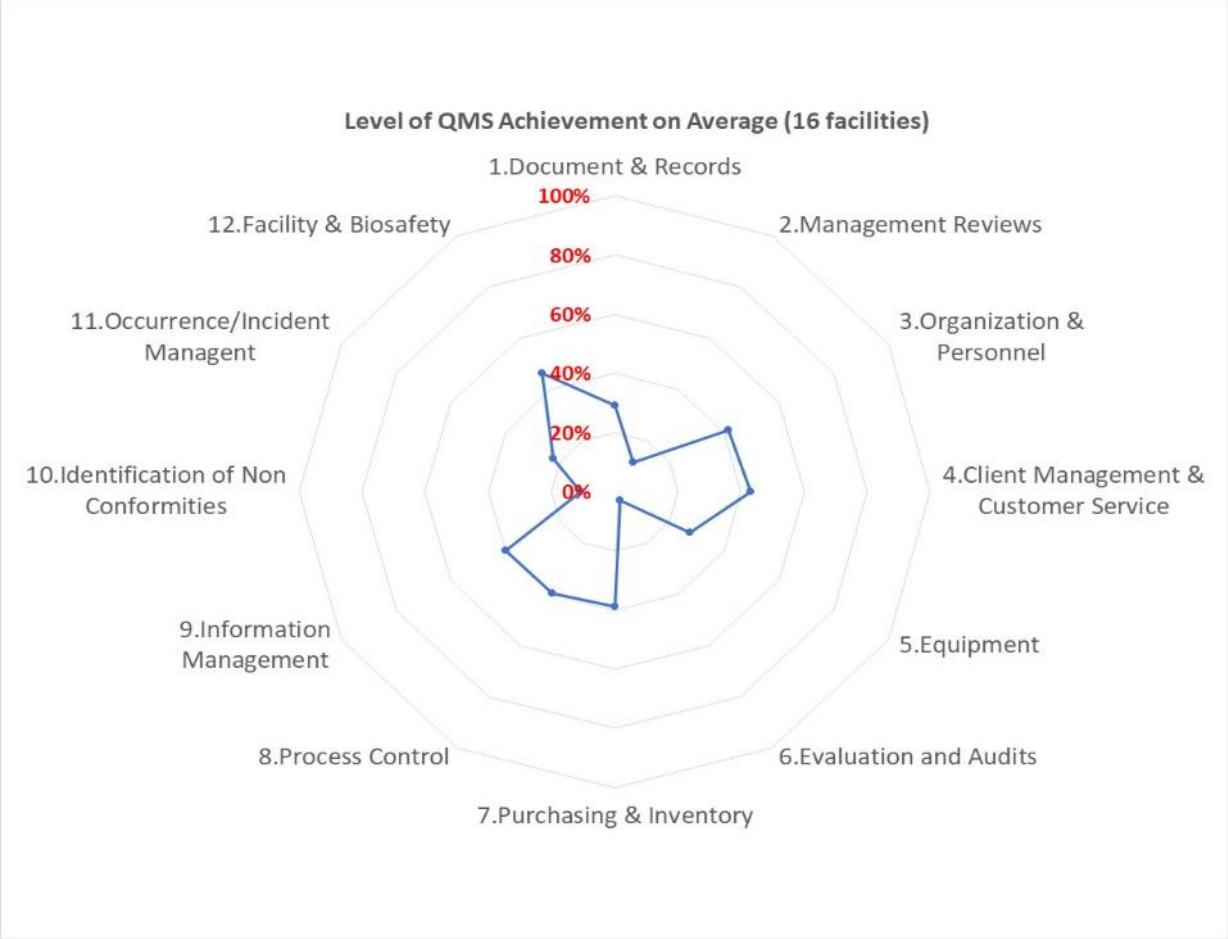


Figure 8. QMS achievement on average of 16 labs

VII Discussions and Recommendations

Quality Management Implementation Level

As shown in Figure 6, the quality management system (QMS) implementation level in the surveyed laboratories was low, with an average of 88. However, it was expecting results because those laboratories were selected since laboratories had no support regarding laboratory quality management systems from any partners. Although a remarkable result in this context, it is hard to maintain the same level of quality management and improve it, as shown in Figure 7.

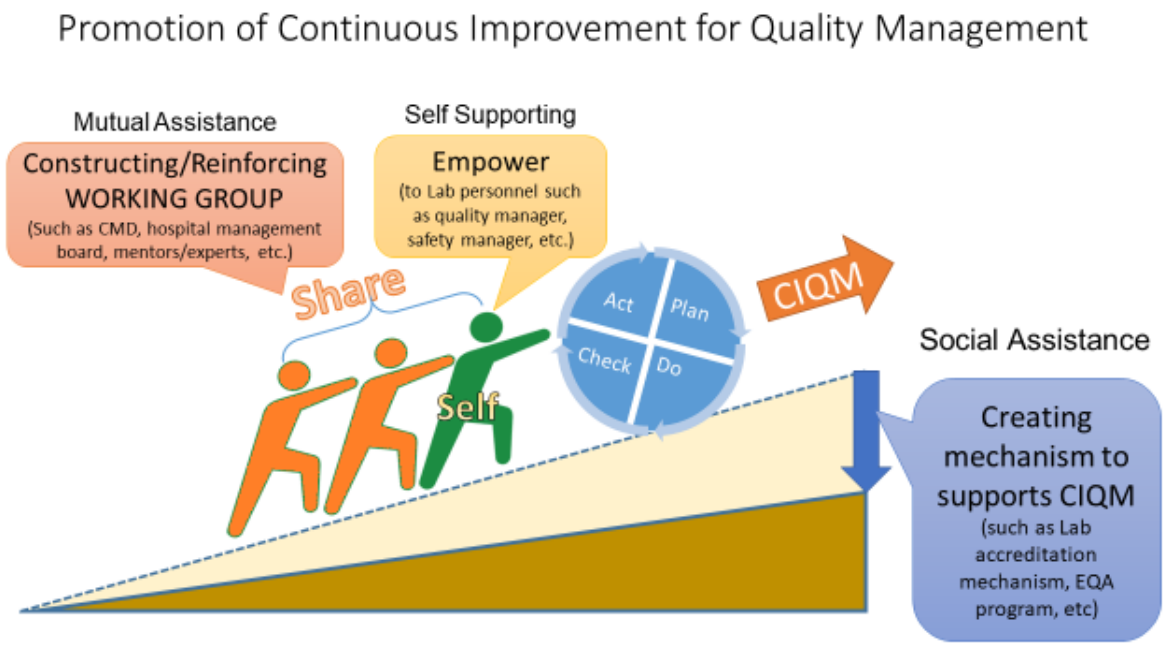


Figure 9. Promotion of Continuous Improvement for Quality Management

Figure 9 shows a concept of continuous improvement for quality management. The PDCA cycle illustrates the critical principle of continuous improvement and the Quality is not a static thing. The cycle of continually planning (P), doing (D), checking (C) and acting (A) is essential to ensure that the quality cycle keeps turning and that quality improves. The important point about the PDCA cycle (Deming cycle)is that it illustrates the need for continual momentum to go forwards and upwards. If there is no progress forward the pressure is to fall backwards - down the slope - with the consequent loss of quality. The only way to prevent the backward movement is to support the cycle continually - this is the function of the quality management system that has been put in place.[3]

[3] Guidelines for Peripheral and Intermediate Laboratories in Quality Assurance in Bacteriology and Immunology, WHO Regional Publication, South-East Asia Series No.28, WHO Reginal Office for South-East Asia, New Delhi 2003

There need to be three parties to go forwards and upward PDCA cycle. The first is the quality manager or individual laboratory personnel working on the laboratory bench. It depends on how much they are empowered in terms of Knowledge, Attitude and Practice (KAP) to determine how fast the PDCA cycle moves forwards and upwards. The second is a facility management member and mentor/expert. It gets easier to move the PDCA cycle continuously supported by the second party. The third is social assistance which the slope makes gradual by putting in place social mechanisms to support CIQM.

The results of the survey are consistent with this concept. After the survey, a workshop with heads of the laboratory department/ laboratory manager of the surveyed laboratories was held to analyze the survey results. Participants raised why QMS implementation level is low because there was no support from the hospital management board (in other words, the second party) regarding laboratory quality management in the workshop.

Therefore, when developing a plan for improving laboratory quality management, it is necessary to include not only capacity building for the first party but also advocacy and awareness-raising for the second party. In addition, it is practical to maintain their motivation by conducting M & E activities from the third party.

Basic Infrastructure

Power supply:

The power supply is an urgent issue. Culture examination requires at 35℃-37℃ for 18-24hrs[4]. As shown in Figure 4, 40% of the surveyed facilities is not clear this minimum requirement. The culture examination is a golden standard for diagnosing bacteriological infectious diseases including Cholera and CSM; however, culture examination in these laboratories is not the golden standard. In some cases, this can lead to misdiagnosis.

As a countermeasure to this situation, it is recommended to use PCR method because the incubation time of PCR method is less than the culture examination needs of 18-24hrs. Even if a blackout happens during the assay, UPS can cover the power supply for the incubation time. Another hand PCR method has the disadvantage that one PCR assay detects a single pathogen. Again,3-4 pathogens can be examined in a single PCR assay by using the multiplex method[5][6].

[4] Manual for the Laboratory Identification and Antimicrobial Susceptibility Testing of Bacterial Pathogens of Public Health Importance in the Developing World. WHO 2003

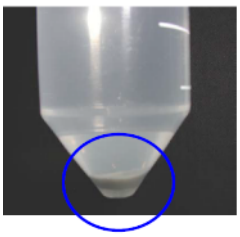
[5] Jie Liu *et al*: Simultaneous Detection of Six Diarrhea-Causing Bacterial Pathogens with an In-House PCR-Luminex Assay, J.Clin.Microbiol., 50, 98-103(2012)

[6] P.Radstrom *et al*: Detection of bacterial DNA in cerebrospinal fluid by an assay for simultaneous detection of *Neisseria meningitides*, *Haemophilus influenza*, and *Streptococci* using a seminested PCR strategy. J.Clin.Microbiol. 1994: 32:2738-2744

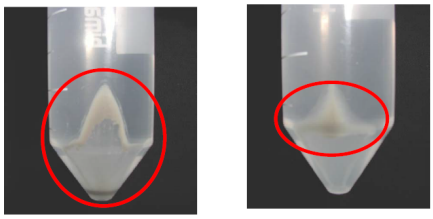
Water supply:
Four out of 16 PHLs are not available to use tap water. It is inconvenient for laboratory work such as washing glassware, making distilled water, etc. In smear examination, a false positive may happen by foreign substances in unclean rinse water during the washing procedure for staining[7].

Equipment

Inappropriate Centrifuge:
The swing rotor is more appropriate for pelleting than angle rotors (see Phot 1), especially when the amount of sedimentation is tiny[8]. So, the swing rotor is recommended for bacteriological examination use.



by swing rotor: pellets settle at the bottom of the tube for easy collection



by angle rotor: pellets slide down tube wall (L). pellets get stuck in tube corners (R).

Phots by courtesy of Koki Holding Co.,Ltd Japan (Hitachi Koki Co., Ltd)

Incubator:
In case the inside of the incubator is full, the temperature is unstable. Due to avoid this problem, it is necessary to place the specimens at intervals to improve airflow in the chamber. Therefore, when procuring an incubator, it is necessary to select one with an appropriate capacity for the volume of samples.

Sterilizer:
At least two autoclaves are needed in the laboratory, one for sterilizing instruments and culture media and one for sterilizing tested samples and culture media before discarding them. Moreover, it is desired that the capacity of the autoclave for discarding is bigger than another one.

Out of order for equipment:
The following malfunctions are popular reasons of out of order for microscopes;

1) malfunction of the x-y mechanical stage
2) fail of the power assembly
3) fungus growing up in the lens or ocular head

From another point of view, the equipment that is out of order and impossible to repair should be discarded properly because the equipment occupies vast space in the laboratory. Otherwise, it will not be easy to replace the new one.

[7] https://www.aphl.org/programs/infectious_disease/tuberculosis/TBCore/TB_AFB_Smear_Microscopy_TrainerNotes.pdf

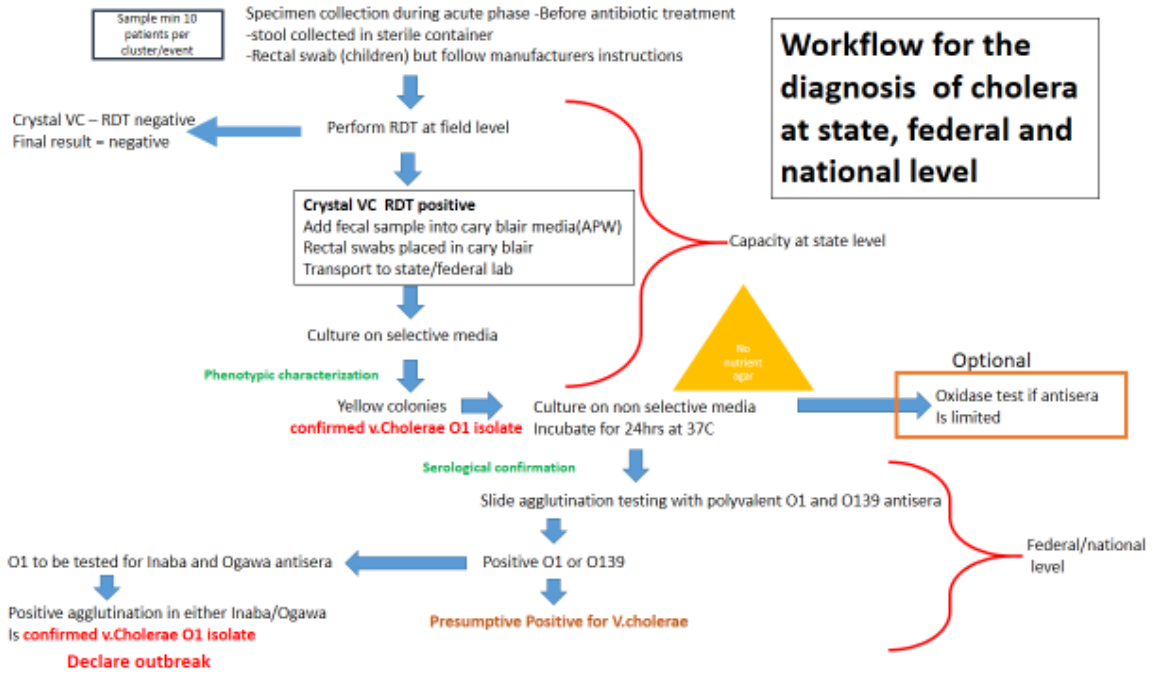
[8] https://www.himac-science.jp/application/pdf/life/blue146.pdf

Laboratory Performance

For CSM

The number of examined sample for CSM was very low because the outbreak did not occur in the last three years. This is good for infectious control in public health. However, on the other hand, it might be difficult for the laboratory staff to maintain proficiency in the bacteriological examination for CSM[9]. Therefore, the brush-up training might be a practical countermeasure to this issue at the appropriate moment.

For Cholera



By courtesy of the quality management section of NRL

Figure 10. Process for Cholera examination

Figure 10 shows the national guideline for the process of the Cholera examination. According to the guideline, the collected sample is tested by RDT then the positive sample transports to the laboratory for applying culture examination, including identification, serotyping, and AST. However, as Figure 11-1 shows, several laboratories do not follow this procedure. It may not affect routine work while the suspect case is a few but might exceed the capacity of culture examination when the outbreak occurs.

Figures 11-1 and 11-2 show high RDT negative results (46%, 49% respectively). This negative rate by RDT has a wide range from 0% to 73% in 2021 (n=9 Labs) to the collected data for the survey and 0% - 98% in 2021 (n=30 States) according to Cholera Situation Report WEEKLY EPIDEMIOLOGICAL REPORT 29 (Epi Week: 52 2021) by NCDC[10]. The following matters need to be considered;

[9] Laboratory Services in Tuberculosis Control Part I: Organization and Management, WHO, 1998

[10] An update of Cholera outbreak in Nigeria_251221_52.pdf

- Definition of suspected Cholera case or usage of the guideline
- The procedure of sample collection
- Usage of RDT kit

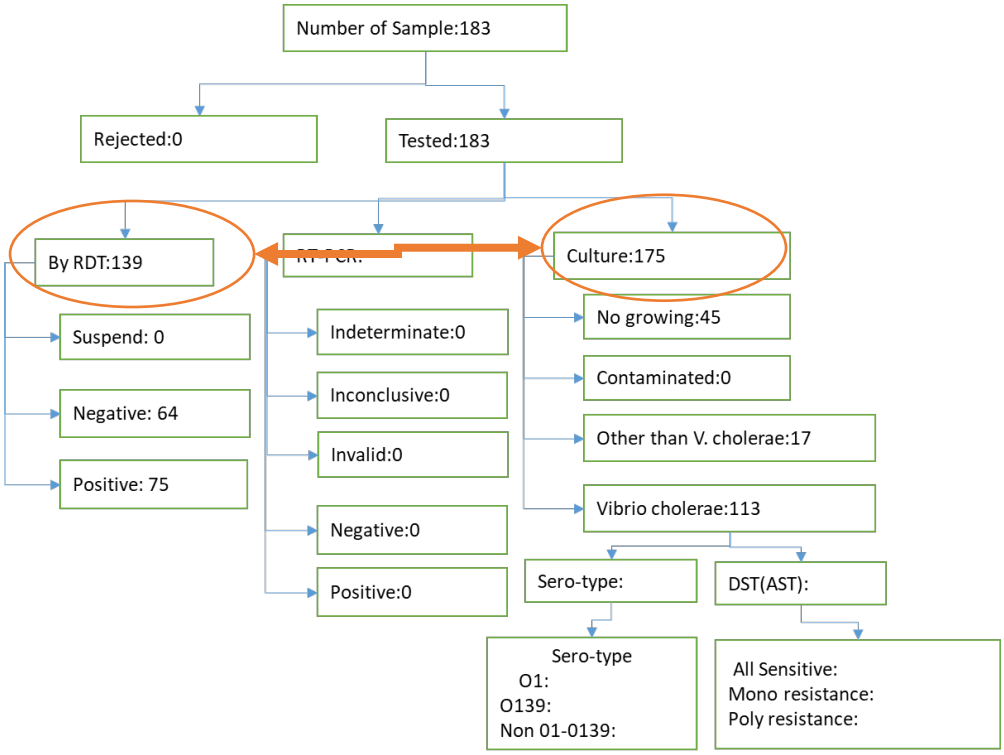


Figure 11-1 Working performance of Cholera examination in a public health laboratory in 2021,

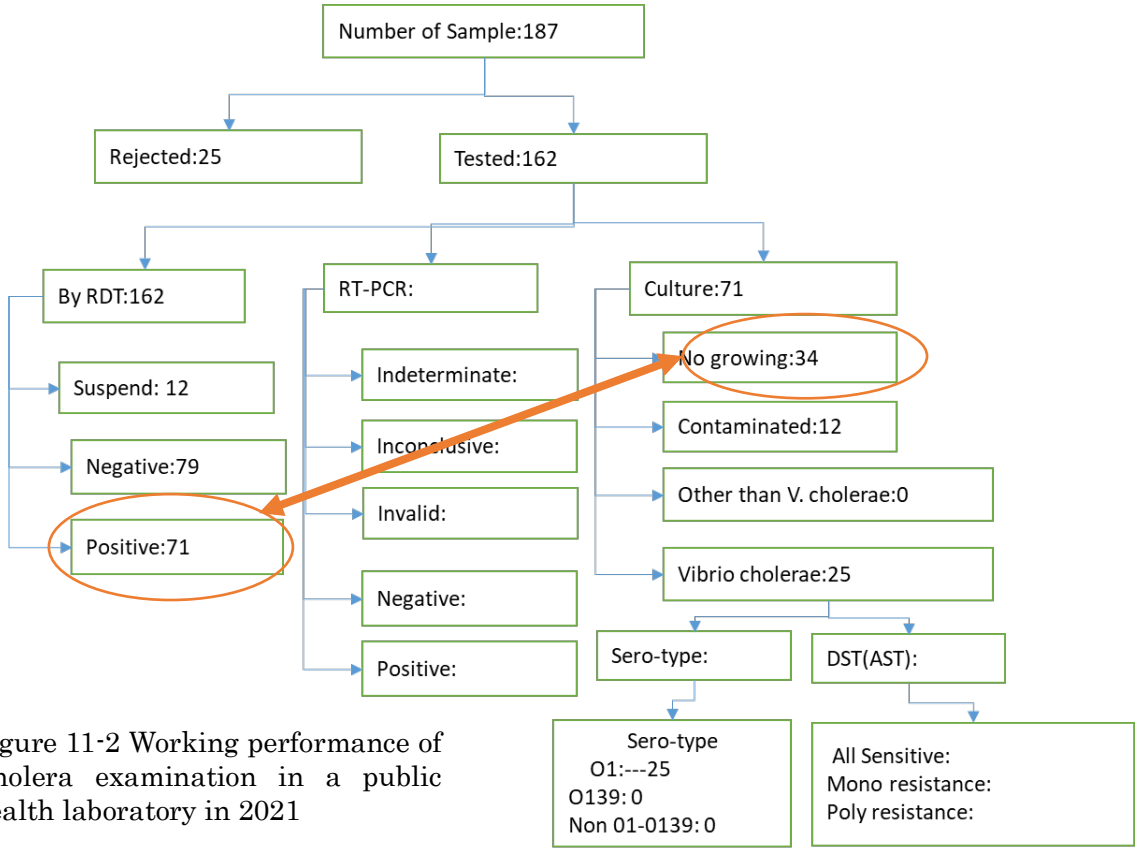


Figure 11-2 Working performance of Cholera examination in a public health laboratory in 2021

Despite the reported high specificity of RDT[11], there are many culture-negative among RDT-positive samples, as shown in Figure 11-2. Several causes are considered, such as limitations of the culture examination as a gold standard due to unstable power supply, taking antibiotics before collecting the sample, conditions of sample storage and transportation, and so on. This is one of the research topics related to laboratory examination for Cholera diagnosis.

Conclusion:

The survey was conducted to analyze the current situation of the public health laboratories on the NCDC network in 2021. The security situation in Nigeria is one of the challenges to conducting a field survey. In this survey, two facilities could not perform the survey due to the worse security of the States.

The survey collected two kinds of data: QMS implementation level and laboratory performance. Clearly, the QMS implementation level was low and difficult to maintain and improve. Laboratory performance in Cholera and CSM was also low; even though the outbreak was occurring sample number for laboratory testing was a few. It found discordant between RDT and culture method for Cholera diagnosis. EQA program for Cholera and CSM was not in place regularly because there is no domestic facility to provide PT.

Improvement of laboratory quality management and increasing quantity and quality of laboratory testing in Cholera and CSM diagnosis is urgent issues for the public health laboratories on the NCDC network.

[11] Muzembo, B.A.; Kitahara,K.; Ohno, A.; Debnath, A.; Okamoto, K.; Miyoshi, S.-I. Cholera Rapid Diagnostic Tests for the Detection of Vibrio cholerae O1: An Updated Meta-Analysis. Diagnostics 2021, 11, 2095. https://doi.org/10.3390/diagnostics11112095

Appendix 1

Study of Turn-Around Time for Measles and Yellow Fever in Maitama District Hospital

Objective:

To determine the turn-around time (TAT) of the laboratory tests for Measles and Yellow Fever diagnosis in Maitama District Hospital in 2020 and to identify the influence of long TAT

Method:

Study type:
Cross-sectional study

Data source:
The study data was applied to the sample for Measles and Yellow fever received at Maitama District Hospital from the first January to the 31 December 2020. EpiInfo and SPSS were employed to analyze the data.

Operational definition:
Operational definitions of components of the TAT in the study were set up as below (Figure App1);

- Total TAT: from the date of onset of symptoms to the date of laboratory sent-out results to LGA/Health facilities.
- Specimen collecting time: from the date of onset to the date of specimen collection
- Storage period at collection point: from the date of specimen collection to the date of specimen sent to the laboratory
- Transportation period: from the date of specimen sent to the laboratory to the date of specimen received in the laboratory
- Analysis period: from the date of specimen received in the laboratory to the date of the laboratory sent out results LGA/Health facilities

Operational definition of “Proper sample” (ref. National Technical Guideline for Integrated Disease Surveillance and Response Third edition 2019 NCDC)

- Measles: collecting specimens between the 3 day of the rash and 28th day after onset of rash, and the specimen arrive at the laboratory within 3 days of being collected.
- Yellow fever: within 14 days of onset of first symptoms, and the specimen arrive at the laboratory within three (3) days of being collected.

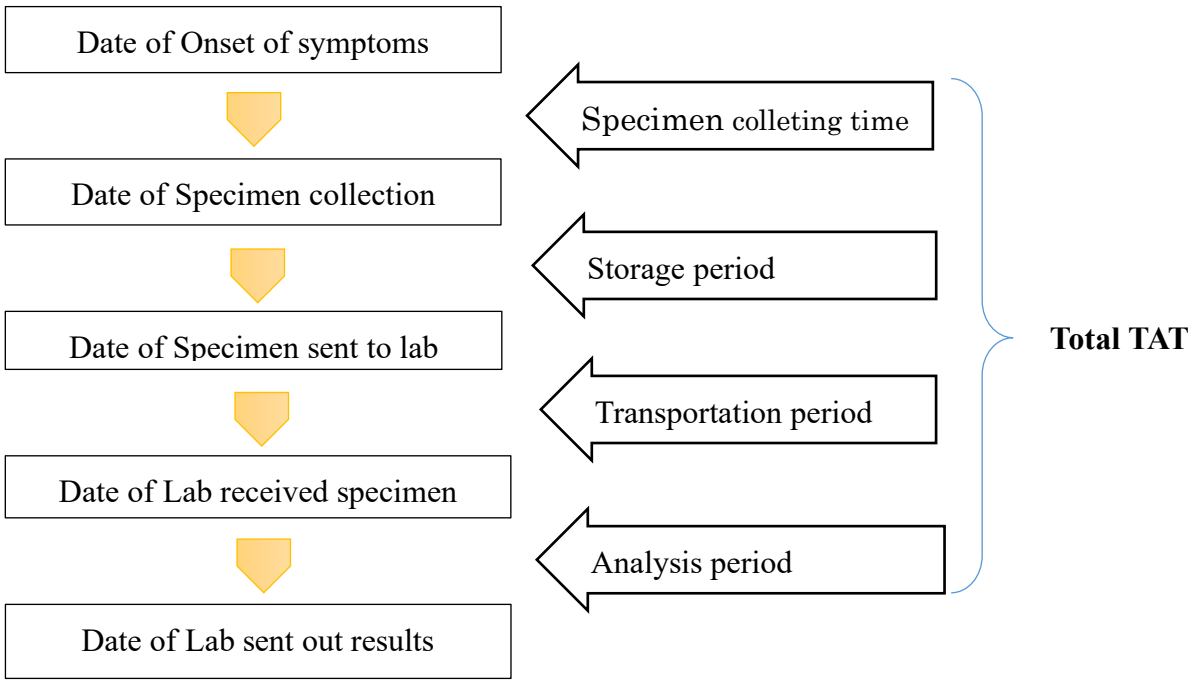


Figure App1. Operational definition on time line of Total TAT

Results:

The number of the received sample in a particular period shows in Table App1. The specimens were transported from seven (7) States; a total sample was Measles: 836 and Yellow fever: 389.

Table App1 Received a sample in 2020

Seq	State	Measles	Yellow fever
1	Benue	103	122
2	FCT	37	6
3	Kogi	141	21
4	Kwara	132	73
5	Nasarawa	107	49
6	Niger	222	54
7	Plateau	94	64
	Total	**836**	**389**

Figure App2 shows the distribution of total TAT for Measles. The average TAT was 23.3 days (S.D.= 19.6 days) for Measles and 28.62 days (S.D. = 22.5 days) for Yellow fever, shown in Figure App3.

Figure App4 shows the average of days for each TAT component. Specimen storage accounts for approximately 50%-60% of TAT (Measles:61.3%, Yellow fever: 53.3%).

Table App2 shows the proper sample for Meases and Yellow fever, and the percentage of the proper sample was 19% and 15%, respectively.

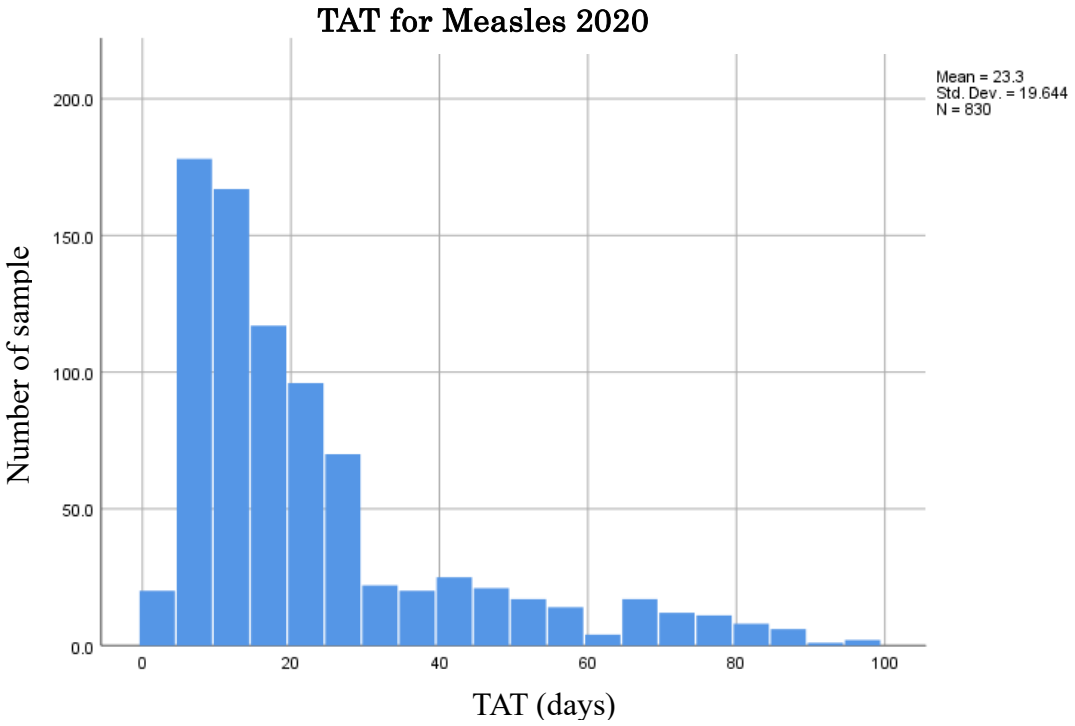


Figure App2. TAT of Meases 2020

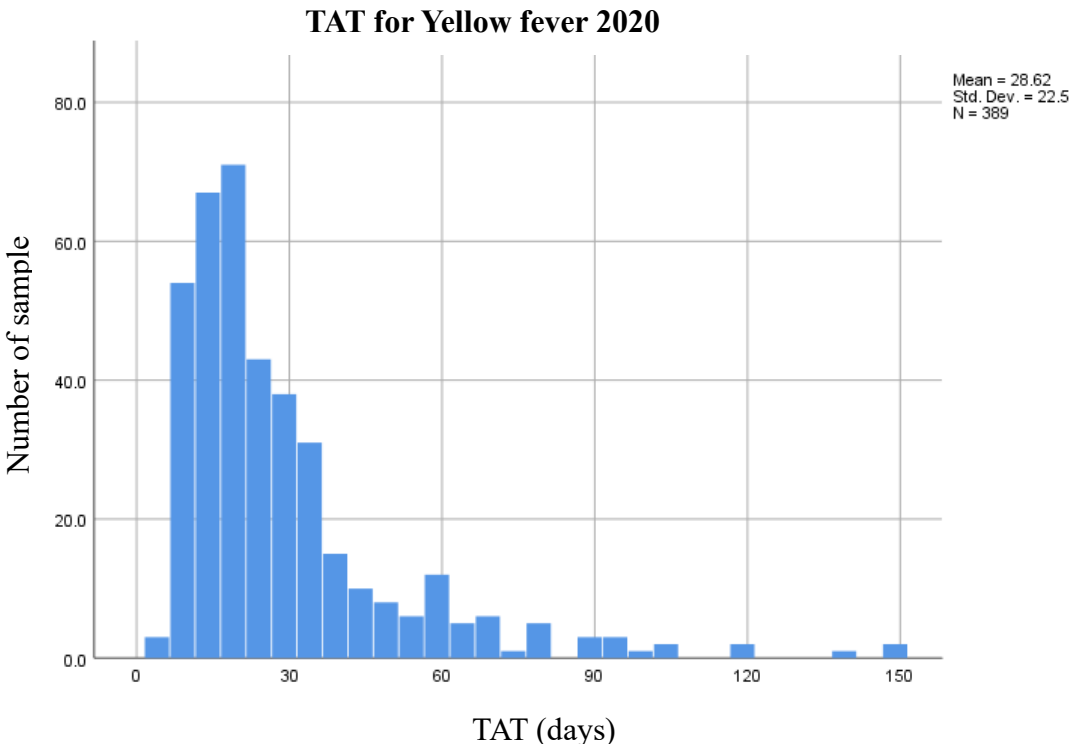


Figure App3. TAT of Yellow fever 2020

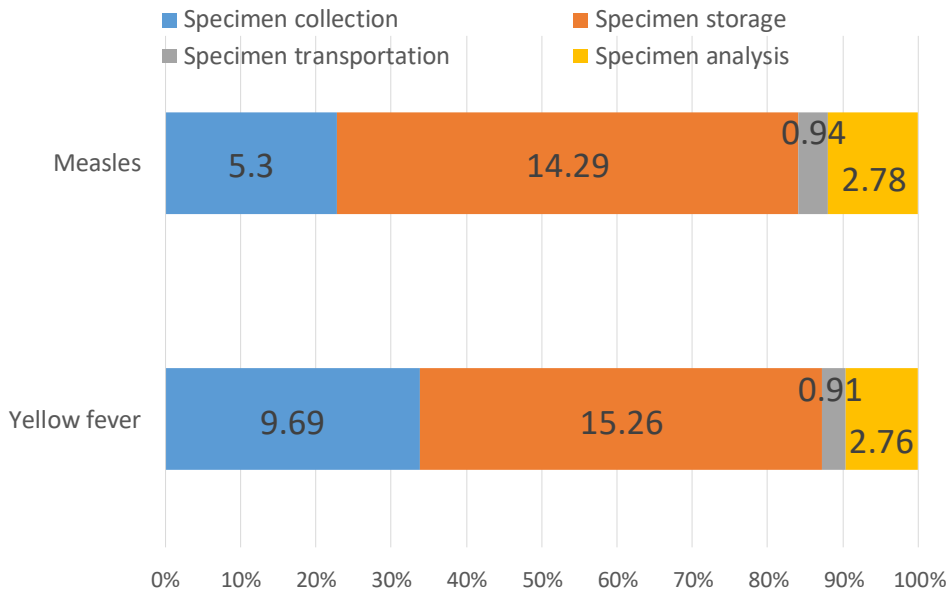


Figure App4. Average of TAT components

Table App2. Proper sample

No	State	Measles		Yellow fever	
		All	Proper (%)	All	Proper (%)
1	Benue	103	3 (3%)	122	10 (8%)
2	FCT	37	28 (76%)	6	5 (83%)
3	Kogi	141	6 (4%)	21	2 (10%)
4	Kwara	132	19 (14%)	73	10 (14%)
5	Nasarawa	107	22 (21%)	49	10 (20%)
6	Niger	222	60 (27%)	54	9 (17%)
7	Plateau	94	16 (17%)	64	13 (20%)
	G. total	836	158 (19%)	389	59 (15%)

Table App3. Comparison of positivity rate between the improper and proper sample in Measles

	Positive (%)	Negative	Total
Improper sample	256 (38.7%)	404	660
Proper sample	73(49.7%)	74	147
Total	329	478	807[a]

The positivity rate of the improper and proper sample in Measles was compared in Table App3. The positivity rate of the proper sample was significantly higher than the improper sample and was approximately 10% higher (p=0.015).

Discussion

1) Time from a specimen collected to the specimen sent to the lab (time of store at collection points/facilities) mainly contributes to the delay of TAT.
2) The proper sample rate is low, likely relative to the distance between the collection points/facilities and the laboratory.
3) The properness of the sample seems to affect the positivity rate of Measles tested by ELISA method.
4) It is required to check the condition of specimen keeping at collection points/facilities to ensure which factors (timing of specimen collection and store of the specimen) more affect the positivity.

Conclusion

TAT is one of the quality indicators to evaluate the laboratory quality management and the sample referral system. Ordinally, TAT is defined by laboratory personnel from when they receive specimens at the laboratory to the results sent out. However, it is not enough for the public health laboratory because the specimens are usually transferred from other facilities or areas. Therefore, the study covered TAT from the onset of the disease to the results sent out in the laboratory.

The specimen storage period at the collection point was the primary factor of the delay for TAT. Moreover, the time the specimen reaches the laboratory may affect the positivity rate.

It is crucial to monitor TAT from time to time to early detect outbreak of infectious diseases and take corrective actions. And it is necessary to develop an electronic system to access relative information about TAT anytime.

Annex 2-2

Short Report: Review of Laboratory Performance at Measles Laboratory in Maitama District Hospital from 2020 to 2023

I. Introduction

The laboratory of Maitama district hospital has been a public health laboratory on the NCDC network since 2018. The laboratory provides laboratory tests for CSM, measles, and yellow fever as the public health laboratory services.
The project has been supporting the improvement of QMS implementation at the laboratory.
The project conducted an on-site evaluation during the second mentorship in collaboration with NRL. As a part of the on-site evaluation, a review of laboratory performance was done.

II. Objective

A general objective is defined to review the performance of the Maitama District Hospital Laboratory in testing for measles from 2020 to 2023.

Specific objectives are;

1) To determine workload, positivity rate, and Turn-Around-Time (TAT),
2) To compare TAT by year,
3) To assess the rate of proper sample
4) To compare the positivity rate between proper and improper sample.

III. Methods

1) Target

Tested results of measles by ELISA from 11 Jan 2020 to 17 Jun 2023 were applied for review.
The following computer applications were utilized to summarize and to analyze the test results;

- Microsoft Access
- Microsoft Excel
- SPSS

2) Operational definitions

In this review, four laboratory processes are defined below (see Figure 1);

- The pre-analytic process includes A: collecting, B: keeping, and C: transporting phases. Each phase is generated formula shown in Figure 1.
- Analyzing (A) is the analytic process in the laboratory. Ordinary, the analytic process is the process of the assay. However, here it is generated by "[Date results sent out] minus [Date specimen received in the laboratory].
- TAT (E) is a total of A, B, C, and D.
- The post-analytic process is not included in this review.

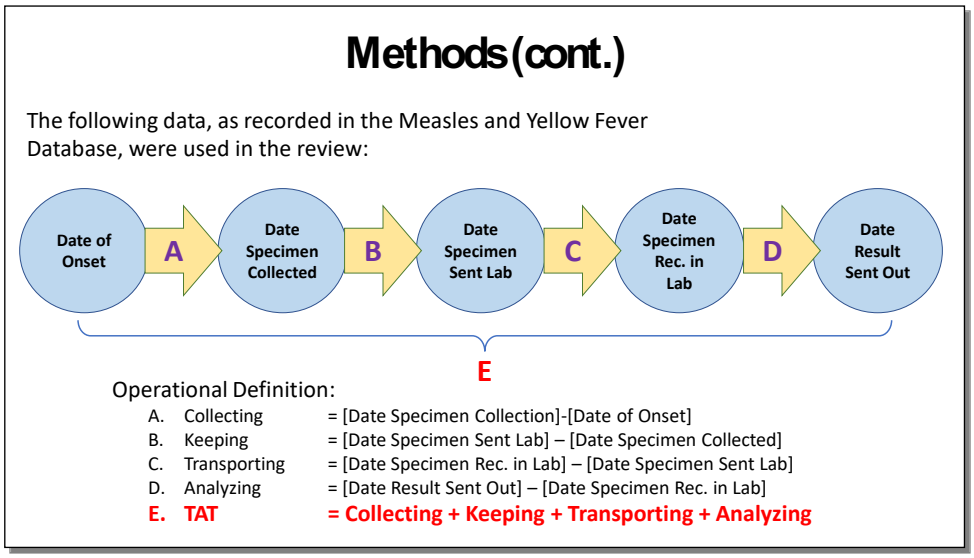


Figure 1. Operational definition

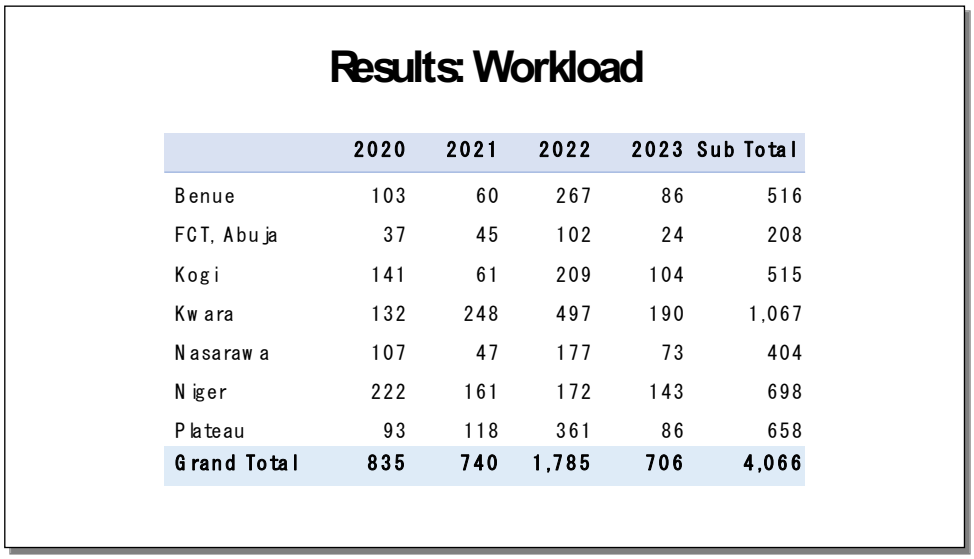
IV. Results

1) Workload and Positivity rate

Figure 2 shows the number of sample which the laboratory received from seven (7) states in 2020, 2021, 2022, and 2023 (by 17 June).
Kwara State had the highest number of samples. Niger and Plateau States followed this. In 2022, due to a national measles outbreak, the number of samples was higher than in 2020 and 2021.

Figure 3 shows the results of the ELISA test for measles. [Not done] reflects a lack of reagents. The positivity may fluctuate in an outbreak situation.

Figure 4 shows the positivity rate of the respective state.
The positivity rate may vary according to the incidence of the diseases in a particular state.



	2020	2021	2022	2023	Sub Total
Benue	103	60	267	86	516
FCT, Abuja	37	45	102	24	208
Kogi	141	61	209	104	515
Kwara	132	248	497	190	1,067
Nasarawa	107	47	177	73	404
Niger	222	161	172	143	698
Plateau	93	118	361	86	658
Grand Total	**835**	**740**	**1,785**	**706**	**4,066**

Figure 2. The workload of the laboratory in 2020, 2021, 2022 and 2023

Testing Results -Measles-

Year / Results	2020 N	2020 (%)	2021 N	2021 (%)	2022 N	2022 (%)	2023 N	2023 (%)
Positive	328	(39.3%)	285	(38.5%)	818	(45.8%)	181	(25.6%)
Negative	478	(57.2%)	397	(53.6%)	848	(47.5%)	435	(61.6%)
Indeterminate	23	(2.8%)	45	(6.1%)	79	(4.4%)	16	(2.3%)
Not done	6	(0.7%)	13	(1.8%)	40	(2.2%)	2	(0.3%)
Pending	0	(0%)	0	(0%)	0	(0%)	72	(10.2%)

Figure 3. The results of the ELISA test for measles

Positivity Rate in State -Measles-

States	Year 2020 N	2020 (%)	2021 N	2021 (%)	2022 N	2022 (%)	2023 N	2023 (%)
Benue	29	(28.2%)	22	(36.7%)	151	(56.6%)	32	(37.2%)
FCT, Abuja	15	(40.5%)	20	(44.4%)	63	(61.8%)	6	(25.0%)
Kogi	58	(41.1%)	22	(36.1%)	92	(44.0%)	28	(26.9%)
Kwara	47	(35.6%)	108	(43.5%)	219	(44.1%)	36	(18.9%)
Nasarawa	28	(26.2%)	8	(17.0%)	83	(46.9%)	24	(32.9%)
Niger	130	(58.6%)	77	(47.8%)	73	(42.4%)	39	(27.3%)
Plateau	21	(22.6%)	28	(23.7%)	137	(38.0%)	16	(18.6%)

Figure 4. The positivity rate of the state

2) TAT

A technique was used to convert the non-normal distribution to a normal distribution to generate the mean and S.D. for the distribution of days at each phase.

Common and natural logarithms and square roots were applied, and the skewness was compared.

The skewness of the common logarithm conversion was the lowest of the three conversions (see Figure 5).

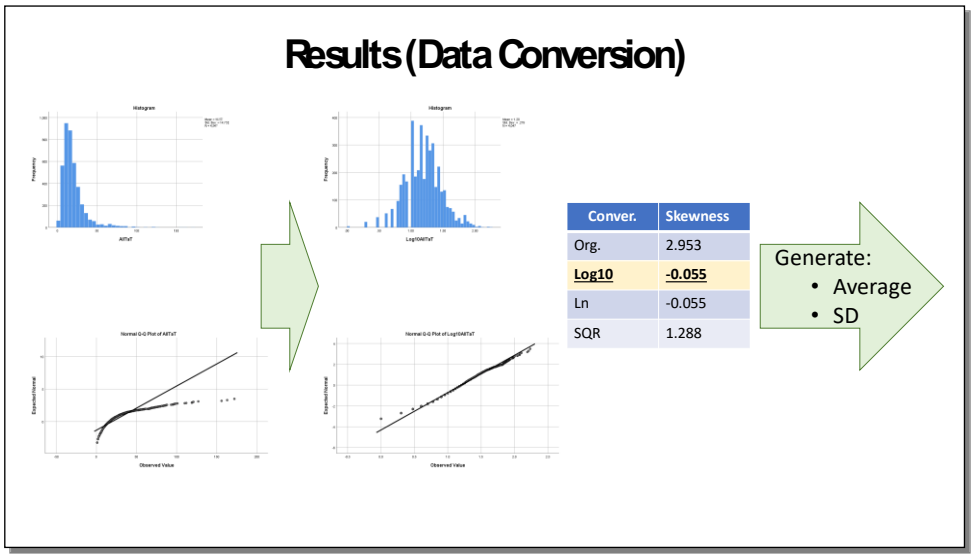


Figure 5. Data conversion

TAT of 2020, 2021, 2022, and 2023 were compared by Kruskal-Wallis test[1] at a significant level of $\alpha = 0.05$.
TAT between 2020 and 2023, 2021 and 2023, 2021 and 2022, 2022 and 2023 was significantly different.

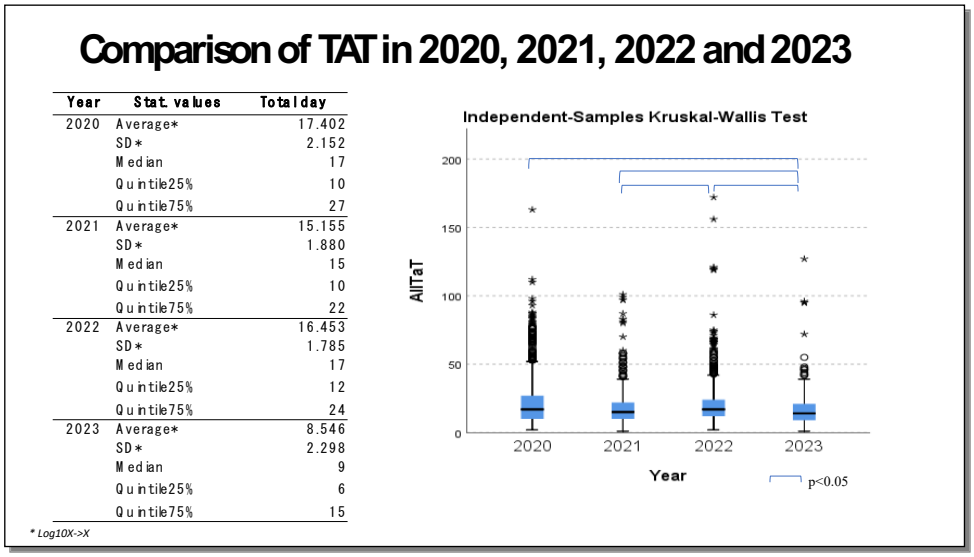


Figure 6. Coparisson of TAT in 2020, 2021, 2022 and 2023

The keeping phase is a major component of TAT. However, it has improved remarkably in four years (see Figure 7).

[1] https://en.wikipedia.org/wiki/Kruskal%E2%80%93Wallis_one-way_analysis_of_variance

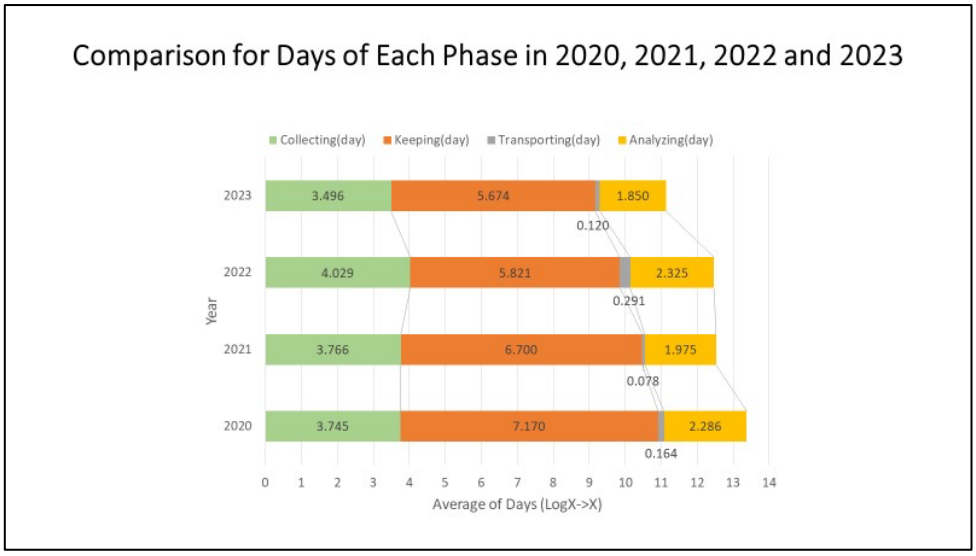


Figure 7. Comparison for period of each phase

3)Properness of the sample

A proper sample for measles test is defined in NCDC IDSR Guideline 2019 as "Collect specimens between the 3rd day of the rash and 28th day after the onset of rash" and "The specimen should arrive at the laboratory within three days of being collected".

Figure 8 shows that FCT maintains a high percentage of proper sample at around 80%. Niger State has improved from less than 30% to 40% since 2022. Other States have recorded less than 20%.

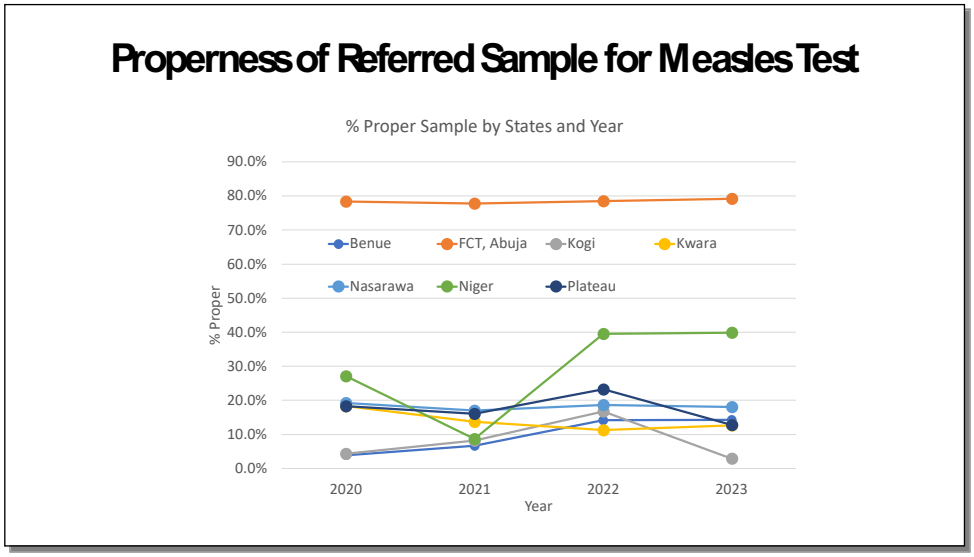
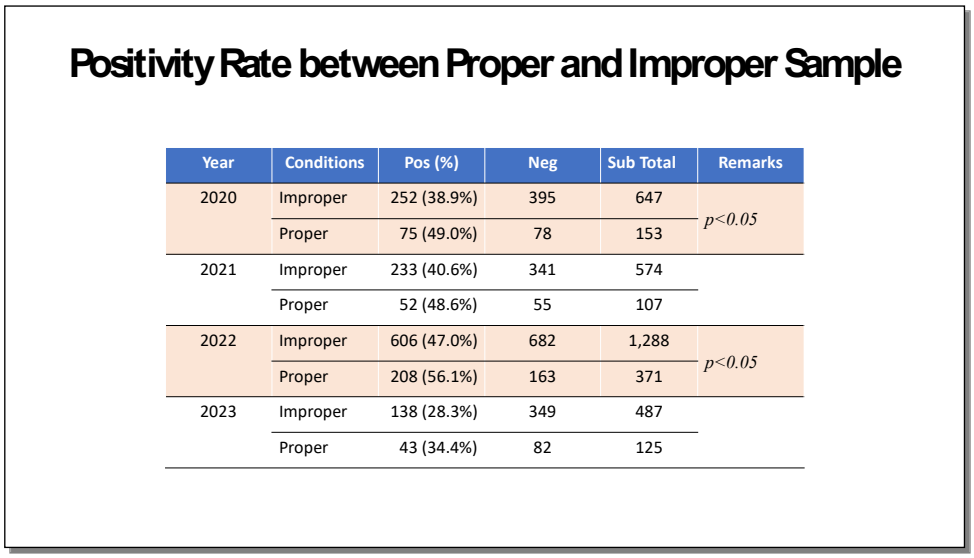


Figure 8. Percentage of proper sample referred

The positivity rate between the proper sample and the improper one in 2020 and 2022 is significantly difference.



Year	Conditions	Pos (%)	Neg	Sub Total	Remarks
2020	Improper	252 (38.9%)	395	647	$p<0.05$
	Proper	75 (49.0%)	78	153	
2021	Improper	233 (40.6%)	341	574	
	Proper	52 (48.6%)	55	107	
2022	Improper	606 (47.0%)	682	1,288	$p<0.05$
	Proper	208 (56.1%)	163	371	
2023	Improper	138 (28.3%)	349	487	
	Proper	43 (34.4%)	82	125	

Figure 9. Comparison the positivity rate between proper and improper sample

V. Recommendations

Through the report, the following discussions are needed:

- Why has the TAT of 2023 become shorter? And how about other measles labs and other diseases?
- Is the positivity rate indeed different between proper and improper samples? If so, what are the associated factors?
- Do hemolysis, high lipid, or high bilirubin affect the ELISA reaction?
- Are there any ways to shorten the TAT to meet the 7-1-7 target for outbreak detection, notification, and response? If so, how?

Annex2-3

BASIC MONITORING & EVALUATION TRAINING

END-OF-TRAINING REPORT

ORGANIZED BY

NIGERIA CENTRE FOR DISEASES CONTROL

AND

JAPAN INTERNATIONAL COOPERATION AGENCY

PREPARED BY

FRANSTEL NIG ENTERPRISES

MAY 2023

SUMMARY

The role of timely and quality data in health information systems has increased globally in the last decade. Besides providing information for disease surveillance, especially during disease outbreaks, Monitoring and Evaluation (M&E) provides vital information on the effectiveness, efficiency, as well as impact of health programmes. To meet the demand and the expectations of M&E operations in disease surveillance in Nigeria, a team of highly experienced personnel must be assembled for M&E units and allied units/departments. The need to build the capacity of members of staff of the newly established M&E unit of the Surveillance and Epidemiology Department (SED), at the Nigeria Centre for Disease Control (NCDC) in 2021 necessitated the training of M&E personnel to understand the basics of M&E. M&E competency is required to quickly gather data from many sources during disease outbreaks and rapidly turn data into information that can be used to make quick health intervention decisions.

The M&E unit of the SED of NCDC, collaborated with the Japan International Cooperation Agency (JICA) Nigeria through the Technical Cooperation Project for Strengthening Detection of and Response to Public Health Threats to carry out capacity-building in M&E.

This training in particular is aimed at building the capacity of M&E staff, specifically to develop firm foundation in the basics of M&E, to develop the staff's competencies and skills in M&E that can enable the trainees to be more effective and create sustainability of the current demands and skill transfer. This will potentially increase the provision of adequate and timely data in surveillance for meaningful decision-making both in the short and long time.

Given these objectives, the agenda for the training focused on building the capacity of the trainees in the creation of M&E plans and frameworks, developing indicators, being knowledgeable in evaluation designs, methods and approaches, understanding the techniques of data sampling, collection,

management and analysis, triangulation in M&E, M&E report writing and dissemination, and stakeholder management.

JICA/NCDC engaged Franstel Enterprise Nigeria to conduct the training in Abuja from May 15th to 19th 2022. A total of 41 individuals, including 32 NCDC employees, 2 partners, 3 consultants, and 4 JICA project staff, attended the programme.

From the 32 NCDC staff who participated in the training, 28 were trainees. The mean (standard deviation (SD)) age of the trainees was 34.05 (1.13) years ranging from 24 years to 44 years. Thirteen (46.4%) of the twenty-eight trainees were females. Feedback and evaluation conducted among trainees showed a very high level of satisfaction with the training as well as the overall high level of usefulness of the modules/topics taken during the training.

The trainees attempted the quasi-experimental pre and post-test that was conducted to assess the impact of the training and how it has changed the trainees' knowledge of M&E. The tests showed that the mean (SD) scores for the pretest and the post-test were 50.9% (10.7) and 73.2% (12.0) respectively. Further analysis to determine if the recorded 22.3% change in knowledge between the two tests was significant or not showed that the post-training knowledge was significantly higher than the trainees' knowledge of basic M&E prior to the training ($p<0.0001$).

Based on the post-training need assessment and the facilitators' observation, we recommend further training in advanced M&E, which will focus on data management. It is important to repeat this basic M&E training as NCDC recruits or deploys more staff to the unit in the future. The trainees should also be considered for international exchange as they will be given opportunities to learn on the job in different international settings.

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ABBREVIATIONS

IDSR	Integrated Disease Surveillance and Response
IHR	International Health Regulations
JEE	Joint External Evaluation
JICA	Japan International Cooperation Agency
M&E	Monitoring & Evaluation
MOU	Memorandum of Understanding
NCDC	Nigeria Centre for Disease Control
SD	Standard Deviation
SED	Surveillance and Epidemiology Department
UKHSA	UK Health Security Agency
RTSL	Resolve to Save Lives

1. Background

As new diseases are being discovered, pandemics are imminent in the absence of adequate, accurate, and timely information for informed decision-making and programme implementation. There is a need for human resources that can rapidly collect data from diverse sources and swiftly transform such data into useful information for prompt decision-making based on timely and reliable evidence.

The M&E unit of the NCDC was recently established in the SED in 2021, aiming to monitor and evaluate all the activities in the SED such as the implementation of Integrated Disease Surveillance and Response (IDSR), response to outbreaks and demonstrate outcomes and impacts to inform better decision in the department.

1-1. Situation Before the Training and Challenges

There is a shortage of staff with adequate M&E skills in the SED of NCDC. This is despite the need to cross-carpet M&E skills across relevant departments providing M&E services to enhance the general delivery of NCDC's mandate. Secondly stakeholder identification and management are necessary as M&E interlinks several activities, units, departments, and organizations.

The M&E unit of SED of NCDC is relatively new, with the task of monitoring and evaluating all the activities within NCDC and be able to propose more concrete evidence-based advice effectively. To position the unit to deliver on its mandate, the need to develop its human capacity to meet the current need for M&E activities in disease surveillance in Nigeria is imminent.

As the principal beneficiary, the M&E unit of the SED of NCDC partnered with JICA Nigeria through the Project for Strengthening the Detection and Response to Public Health Threats to conduct a series of capacity building including basic M&E training, gap analysis workshop, and planning workshop.

The Project started the implementation of M&E capacity building plans in 2019, as such the completion of the basic M&E training, one of the project activity is a huge step in achieving the long-term goals of the project.

The facilitation of the Basic M&E Training was carried out by Franstel Nigeria Enterprises, led by Dr Adeniyi Fagbamigbe.

1-2. Aims, Goals, and Expected Outcomes

1-2-1. Aims

The training aims to build the capacity of NCDC staff in designing M&E plans and frameworks, data collection, data management and analysis, triangulation in M&E, report writing and stakeholders management.

1-2-2. Overall Goal

The goal is to increase the potential for the provision of adequate and timely data in the surveillance of infectious diseases for prompt and meaningful decision-making in NCDC.

1-2-3. Training Goals

The goals of the training are to

(1) Build the capacity of the trainees in the M&E of infectious disease surveillance in NCDC.

(2) Increase the knowledge of the trainees in the basic concepts, and methodologies of M&E activities for infectious disease surveillance.

(3) Enhance the capacity of M&E personnel in the formulation of M&E frameworks.

1-2-4. Expected Outcomes of The Training

The expected outcomes of the training are to have at least 25 NCDC staff who

(1) Understand and apply the basics of M&E.

(2) Formulate and design M&E frameworks.

(3) Conduct M&E stakeholders' identification, analysis, engagement, and management.

(4) Carry out effective oral, written, and visual communication and dissemination of M&E reports.

(5) Design, develop, and measure M&E indicators.

(6) Select and design appropriate M&E data collection instruments.

2. Methodologies

2-1. Time and Place of Training

The training was held from May 15th to 19th 2023 at De Silver Green Luxury Hotel, Gudu Area, Abuja, Nigeria.

2-2. Specific Activities

1. Drawing of agenda, consisting of the training curriculum and timetable.
2. Inception report
3. Preparation of pre and post-test materials
4. Preparation of course materials
5. Training & facilitation
6. Training evaluation
7. Feedbacks
8. Training report writing

2-3. Training Approaches

1. Facilitation methods were adopted. These methods are preferred to the traditional one-way lecturing approach because it allows the active participation of the trainees, thereby creating an improved learning experience.

2. Pre and Post-tests were conducted to ascertain baseline knowledge and knowledge gained after the training t measure trainees' achievements. This was also used to ascertain if the training outcomes were achieved or not.

3. The facilitation consisted of didactic sessions and hands-on group work sessions. The didactic sessions were held in the morning while the group work and exercise sessions were scheduled after lunch.

4. PowerPoint presentations were used during the didactic sessions through which trainees made contributions by asking questions and sharing experiences. The slides were printed and given to the trainees so they could make notes and comments as the training

progressed on the first day of the training but reverted to the provision of electronic lecture materials at the end of each of the subsequent days.

5. Trainees were divided into five (5) groups and given hands-on exercises which they presented to the larger house using flip sheets. The trainees were supported in different ways while attempting the exercises. These included immediate clarifications of any concerns raised by the facilitators, thought-provoking questions, and critiques by the facilitators as the trainees attempted the questions etc.

6. Trainees' Feedback: At least three participants voluntarily gave verbal feedback on the training at the end of the day.

7. Training evaluation by Trainers: Training evaluation questions were shared with the trainees via Google form at the end of each day and at the end of the training. This enabled the trainers harvest responses in real-time, analyse difficulties and use them for improvements for each succeeding day of the training. This was done.

2-4. Training Modules and Components

The training modules were put together to ensure that the trainees learn the rudiments of basic M&E and be able to enhance their performance on the job. The modules were arranged to ensure a smooth flow in learning and understanding of the trainees.

Day 1:

a. The introduction and definition of concepts in M&E and understanding the concept of M&E.
b. Four distinct types of frameworks in M&E.

Learning Outcomes

i. Distinguish between Monitoring and Evaluation.
ii. Distinguish activities from inputs, outputs, and outcomes.
iii. Understand the four types of frameworks and when to use the different frameworks.
iv. Design frameworks for M&E of health interventions.

Day 2:

a. What M&E plans are.
b. The significance of M&E systems in workplaces.
c. How to build and develop M&E plans and systems.
d. Theory of change, linkages between objective, problem trees and the logic of causal inference.

Learning Outcomes

i. Distinguish between M&E systems and plans.
ii. Understand how to develop M&E plans and M&E systems.
iii. Understand the theory of change.
iv. Understand the linkages between objective and problem trees and the logic of causal inference.

Day 3:

a. Types of M&E Approaches
b. Methods of M&E Designs
c. Evaluation methods
d. Qualitative and quantitative methods
e. Sampling methods
f. Key evaluation questions

Learning Outcomes

i. Understand different types of M&E approaches.
ii. Understand different methods of M&E designs including evaluation methods, qualitative and quantitative methods.
iii. Understand how to select evaluation methods under different data scenarios.
iv. Aware of sampling methods in M&E.
v. Understand data triangulation in M&E.
vi. Understand key evaluation questions.

Day 4:

a. Methods of Data Collection in M&E
b. Data Sources
c. Data Quality
d. Questionnaire design and administration in M&E
e. Proforma development in M&E
f. Development of M&E indicators

Learning Outcomes

i. Understand different data collection methods from different sources.
ii. Know how to ensure data quality and integrity.
iii. Know how to design questionnaires.
iv. Understand different methods of M&E designs including evaluation methods.
v. Design, develop and measure M&E Indicators.

Day 5:

a. Data management methods
b. Stakeholder identification and management
c. M&E reporting and dissemination
d. The linkage between communication and advocacy in M&E

Learning Outcomes

i. Understand data management methods.
ii. Understand stakeholder analysis, identification, engagement, and management.
iii. Ensure data quality and integrity.
iv. Know how to report and disseminate M&E findings.

2-5. Data Sources

The facilitators focused on theoretical exercises. These exercises were to show an understanding of framework designing and development whereas data management is more of an intermediate M&E. The details of the exercises are provided in the exercise section.

2-6. Timeline: Work Schedule and Planning for Deliverables

No	Activity	Week						
		0	1	2	3	4	5	6
1	Preparation of Agenda							
2	Drawing of Training Curriculum and Timetable							
3	Preparation of Pre and Post-Test Materials							
4	Preparation of Course Materials							
5	Inception Report							
6	Administration of Pretest							
7	Training and Facilitation							
8	Feedbacks							
9	Administration of Post-test							
10	Training Evaluation							
11	Report Writing							
12	Report Submission							

2-7. Facilitators

Franstel Nigeria Enterprises, an indigenous M&E organization with rich experience in capacity building, facilitated the training with 3 of their M&E experts. The facilitators were

i. Dr Adeniyi Francis Fagbamigbe - Lead Facilitator
ii. Prof Ayo S. Adebowale - Facilitator
iii. Mr Oyewole Oyedele - Facilitator

Figure 1: A Cross-section of the Facilitators and Staff of the Project & NCDC

3. Characteristics of the Trainees

Out of 32 participants from NCDC, 3 staff were observers while 29 were trainees. Out of the 29 trainees, 28 staff responded to the pre and post-test. The mean (SD) age of 28 trainees was 34.05 (1.13) years ranging from 24 years to 44 years. Thirteen (46.4%) of the 28 trainees were females. Half of the participants are from the SED, 6 (21.4%) from the Subnational Support Department while the Departments of Administration/HRM, DPRS, Health Emergency Preparedness/Research, National Reference Laboratory, Planning, Research and Statistics, Procurement Department/Unit, Public Health Laboratory Services and Special Duties, Office of the DG had only 1 representative each.

Six (21.4%) of the 28 trainees were scientific officers, 4 (14.3%) were senior scientific officers, and 2 (7.1%) were surveillance officers. Others included data analysts, M&E specialists etc. as shown in Table 1. Of the 28 trainees, 10 (35.7%) had less than 1 year experience in M&E, 10(35.7%) had one year experience in M&E, 4 (14.3%) had two years' experience and 4 (14.3%) had more three years' experience in M&E as shown in Table 1 and Figure 3.

Figure 2: A Cross-section of Trainees, Facilitators, Partners, and Staff of the Project & NCDC

Table 1: Distribution of the Participants

Characteristics	n	%
Age		
Mean (SD)	34.05(1.13) years	
Sex		
Female	13	46.4%
Male	15	53.6%
Department		
Administration/HRM	1	3.6%
Department of Planning Research and Statistics	2	7.1%
Health Emergency Preparedness/Research	1	3.6%
National Reference Laboratory	2	7.1%
Procurement Department/Unit	1	3.6%
Special Duties, Office of the DG	1	3.6%
Subnational Support Department	7	25.0%
Surveillance & Epidemiology	13	46.4%
Current Roles		
DC/SSD	1	3.6%
Data Analyst	1	3.6%
Data Clerk Nasarawa Sub National supp..	1	3.6%
Epi-fellow	1	3.6%
M&E Specialist	1	3.6%
M&E Trainee	1	3.6%
Public health practitioner	1	3.6%
Senior Health Emergency Response Officer	1	3.6%
Surveillance Officer	2	7.1%
Senior Scientific Officer	4	14.3%
Scientific Officer	6	21.4%
Missing	8	28.6%
Years of Experience in M&E		
<1 year	10	35.7%
1 year	10	35.7%
2 years	4	14.3%
3 or more years	4	14.3%
Total	28	100

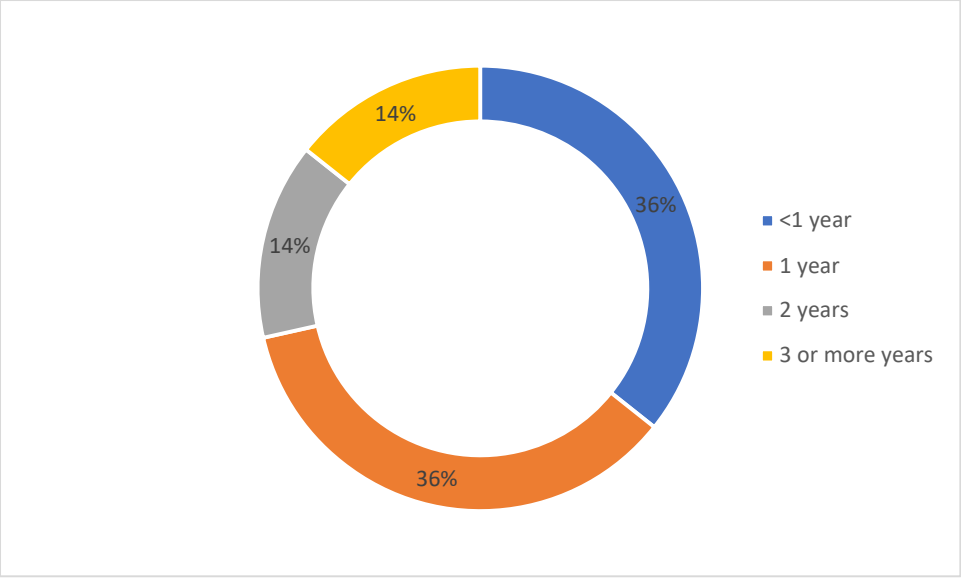


Figure 3: Trainees' Years of Experience in M&E

4. Practical Sessions and Exercises

4-1. General Observation

The trainees were randomly grouped into 5 groups for hands-on sessions and exercises that held in the afternoons of days 1, 2, 3, and 4. The trainees were instructed to provide their answers and responses on flip charts and paste their works on the wall for peer review and learning.

The goals of the exercises were to transform the didactic lectures into hands-on experiences ensuring the trainees can demonstrate what they learnt through team collaboration. The exercises focused on the development of different types of frameworks with indicators, measurements of the indicators and the development of questionnaires for data collection.

Figure 4 shows cross-sections of practical sessions and some outputs from the trainees. The facilitators identified a few challenges faced by the trainees while attempting their exercises. This included the inability to differentiate activities from outputs, outcomes from impacts, mixing questions with indicators, setting indicators, creating a steady flow in frameworks, and inappropriate use of conceptual frameworks. These challenges were promptly addressed by the facilitators, who assisted the trainees with the correct ways of going through the exercise.

4-2. Daily Group Exercises

Day 1: The Federal Ministry of Health has raised serious concerns about the aftermaths of intergenerational sex among young girls. Your organization has been engaged to create an awareness campaign among secondary school girls as a way of reducing the trend so that the incidence of HIV and other sexually transmitted diseases can be curtailed. Draw an M&E framework of your choice to guide you in monitoring and evaluating the intervention.

Day 2: Using another type of framework, develop a framework to guide you in monitoring and evaluating an intervention for the health challenges described in the Day 1 exercise.

Develop a framework to understand the reasons for COVID-19 vaccine hesitancy in

Nigeria and design a framework to monitor and evaluate an intervention aimed at improving COVID-19 vaccine uptake in Nigeria using any framework of your choice.

Day 3: Using your developed frameworks on COVID-19 vaccine uptake during Day 2 exercises, state the indicators for the inputs, activities, outputs, outcomes, and goals, including their metrics and how the indicators will be measured.

Day 4: Drawing from your developed framework on Day 2 and the indicator on Day 3 exercises, prepare a 2 page questionnaire to be administered to key stakeholders of the intervention to assess the success of the intervention.

Figure 4: Cross-sections of Practical Sessions and Some Outputs from the Sessions

4-3. Grading of the Exercises

Each group of trainees were given opportunities to present their group works from the Day 1, Day 2, Day 3 and Day 4 exercises. These exercises were graded by a team of four evaluators (Chief advisor and Project coordinator of the project and 2 Facilitators) on the last day of the training. The exercises were grouped into 3 thematic areas: (i) Development of frameworks (Day 1 and Day 2), (ii) Development of indicators (Day 3) and (iii) development of questionnaires (Day 4). Each of these thematic areas was graded for content (10 marks), coherence (5 marks) and appearance (5 marks). The total obtainable score for each group by each evaluator was 60 marks (20 marks ×3). The summary of the scores obtained is presented in Figure 5 while the details of scores awarded by the evaluators are presented in Appendix 11-3. Figure 6 shows a cross-section of facilitators and training organizers reviewing trainees' evaluations.

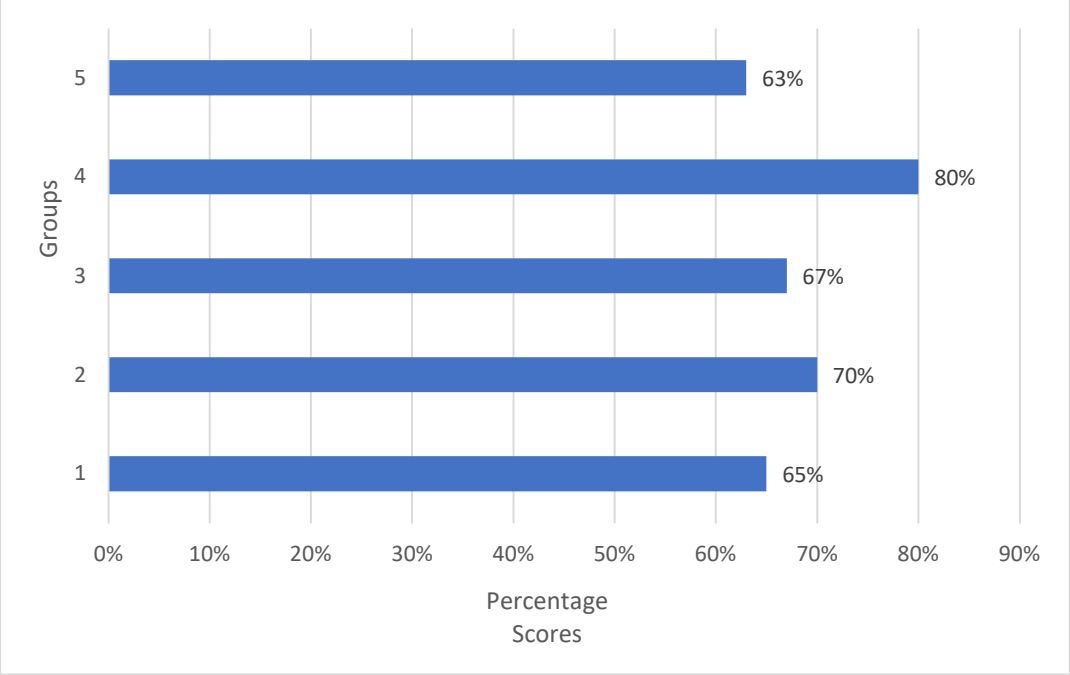


Figure 5: Scores of the Trainees' Exercises by Groups

Figure 6: A Cross-Section of Facilitators and Training Organizers Reviewing Trainees' Evaluation

5. The Training's Outcome Measurement

Several measures were taken to monitor and evaluate the training. These include:

1. Pre and post-tests.
2. Daily feedback from organizers: NCDC represented by the head of the M&E unit of SED and the Project;
3. End of training evaluation by trainees and
4. End of training feedback from trainees.

5-1. Pre and Post Tests

Twenty-five multiple-choice questions were administered to the trainees before the delivery of the training started (See Appendix 11-4). The same set of questions was administered to them at the end of the training. A total of 28 trainees responded. The results of the two tests are summarized in Table 2. The mean (SD) scores for the pretest and the post-test were 50.9% (10.7) and 73.2% (12.0) respectively while the range was 28% to 68% and 48% to 92% respectively. Paired *t-test* was used to determine if the 22.2% difference recorded between the means of the two tests was significant or not. The statistical test showed that the post-training knowledge was significantly higher than the trainee's knowledge of Basic M&E before the training ($p<0.0001$). This is a clear indication that the basic knowledge of M&E among the trainees increased as a result of the training. A comparison of the differences between the trainees' scores at the post-test and pre-test showed that while most trainees had a big increase in knowledge, a few had only a little increase, while a trainee had no change in the knowledge base, but none had a decrease in knowledge. The little or no change in the level of knowledge among a few trainees could be due to individual learning abilities and differences in participation. The exact reasons could not be ascertained because there wasn't time to engage the trainees one-on-one after the post-test.

Table 2: Summary of the Pre-test and Post-tests

Statistics	Pre-test	Post-test	Difference

Number of participants	28	28	28
Mean (SD)	50.9(10.7)	73.2(12.0)	22.2(12.2)
95% CI around the mean	46.7 - 55.1	68.5 - 77.9	17.5 - 27.0
Minimum	28	48	0
Maximum	68	92	52
Paired t-test			<0.001

5-2. Daily Feedback from Organizers (NCDC & The Project)

The team of facilitators and the organizers held daily review meetings to discuss how the day went, review trainees' feedback, and come up with ways of improving the delivery of the training. Generally, the organizers were happy with the delivery mode and delivery phase, but they requested more attention on the hands-on exercises as they observed some trainees needed more support in the practical. For example, we observed that some trainees struggled harnessing their thoughts on distinguishing between the outputs and outcomes of the intervention, drawing indicators etc. This was swiftly addressed as the facilitators created more time by reducing time spent on the didactics by 30 minutes every day. The facilitators had more one-on-one support for the trainees that seemed to be struggling. This contributed to the improvement in the performance of the trainees in the succeeding days and exercises.

The organizers suggested the need to create more avenues that will further encourage the trainees to share their experience as it relates to the specific training content. This suggestion was accepted and adopted. The approach did improve trainees' commitment and interest in the training sessions.

As for training materials, printed materials were distributed on the first day. After considering the need for the trainees to better concentrate on the lecture and reduce distractions caused by the availability of hard copies of the materials and the ease with which trainees could access the materials electronically, both the facilitators and organizers decided that going forward, only electronic lecture materials should be distributed at the end of each day.

5-3. End of Training Evaluation

5-3-1. Trainees' Most Useful Training Contents

The trainees highlighted that the interactive sessions which included practical sessions were the most interesting part of the training, followed by the development of indicators, development of frameworks, theory of change, stakeholder management and sampling as shown in Table 3. Interestingly, two trainees stated that they found all contents of the training very interesting. The distribution of the most useful training content suggested that the trainees have been empowered fundamentally and are now better positioned to deliver their duties efficiently and effectively. If the knowledge acquired during the training is put to substantial use, M&E of surveillance activities will contribute towards achieving the NCDC mandate.

Table 3: Trainees' Most Useful Training Contents

Most Interesting Contents	N*	% of responses*	% of cases*
Data Analysis	1	3.23	4.55
Evaluation designs	1	3.23	4.55
Questionnaire developments	1	3.23	4.55
All of the training contents	2	6.45	9.09
Sampling in M&E	3	9.68	13.64
Stakeholders in M&E	3	9.68	13.64
Theory of Change (TOC)	3	9.68	13.64
Indicators	5	16.13	22.73
Frameworks	6	19.35	27.27
The interactive sessions	6	19.35	27.27
Total	31	100	

*Multiple responses

5-3-2. Length of Training

Regarding the length of training, 64% believed that the duration was right but 14% stated that the length of time was too long while 23% stated that it was too short as shown in Figure 7.

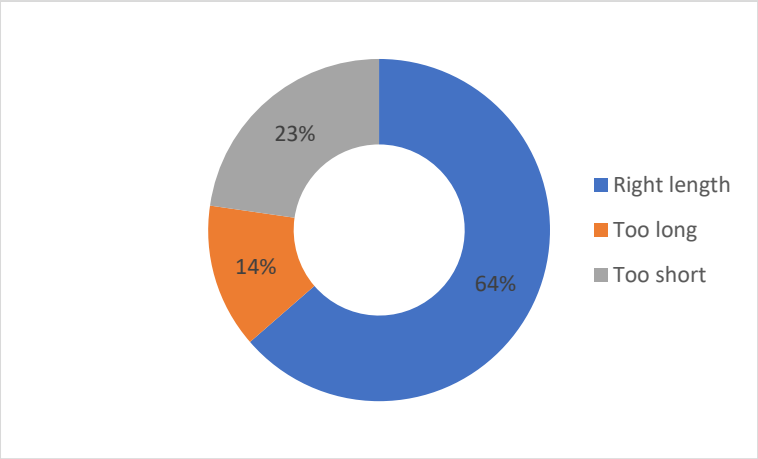


Figure 7: Appropriateness of the Length of the Training

5-3-3. Appraising the Usefulness of the Training

About two-thirds (64%) and a third (36%) answered “strongly agreed” or “agreed” for the indicators that the training applied to their day-to-day activities. Sixty-eight percent of each answered “strongly agreed” for the indicators that the facilitators were knowledgeable and that the knowledge and information gained from their participation in the training will be useful and/or applicable to their works as shown in Figure 8.

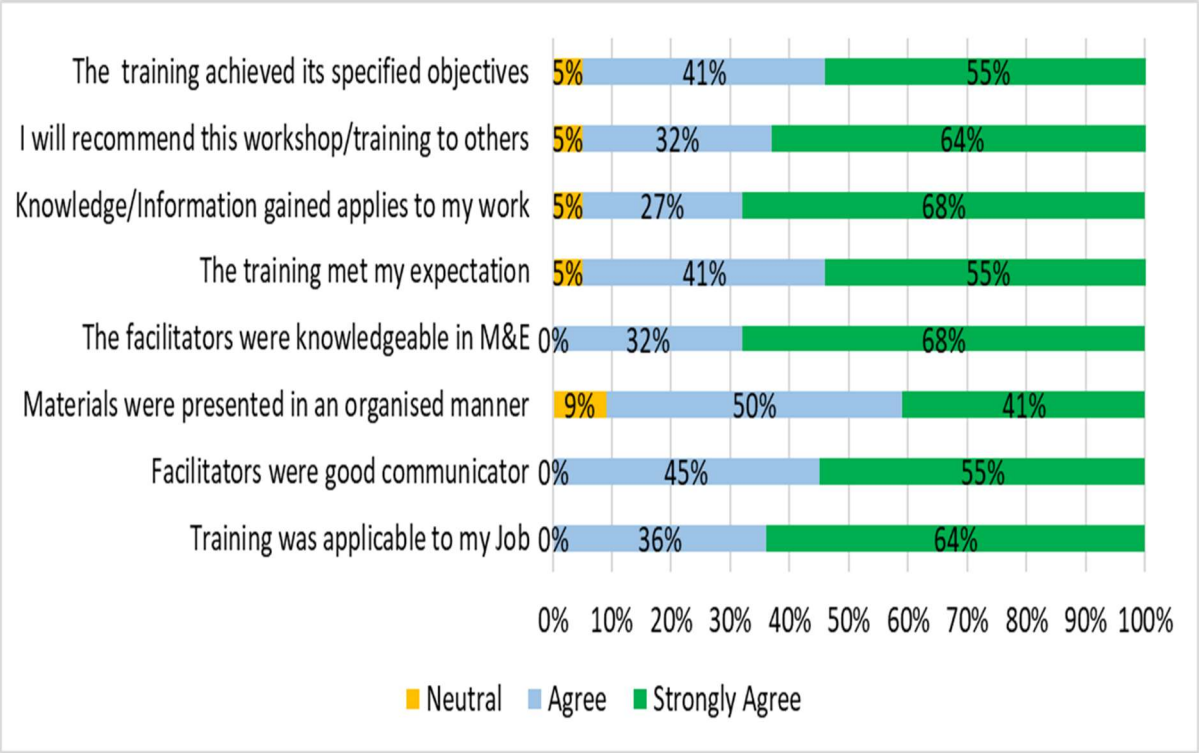


Figure 8: Appraising the Usefulness of the Training

5-3-4. Suggestions for Improvement

The trainees suggested a wide range of propositions to improve on the training.

1. "The training should be made residential because of the distance from home, traffic, and other unforeseen conditions, to encourage group work and interaction after everyday training, and to allow early closing and early resumption of activities". The facilitators agreed with this suggestion because residential training has been shown to be more beneficial to trainees than non-residential training since they can spend their commuting time on learning.
2. "The duration should be increased, and more days should be added so that the lectures can be spread across these more days and thereby shorten the daily length of training and more time for practices to keep us engaged" as shown in Figure 9. The facilitators do not agree that it is necessary to increase the number of days for Basic M&E training. Rather, the facilitators opined that another level of training such as training in intermediate M&E that will include data management and data analysis will be more beneficial to the trainees.
3. Other trainees suggested that the trainers should use more examples that speak to their daily work to be able to easily adapt what they learn to their jobs. The facilitators agreed with the use of examples that speak to their daily work. The facilitators used several examples of related data, such as cholera data, measles data, COVID-19 surveillance, reporting and tracking as well as COVID-19 vaccination uptake and hesitancy. However, it is not possible to mention data that pertains to all the trainees' daily work schedules as they work in different departments and on different diseases. The facilitators however agreed with the use of more related examples.
4. The trainees "wanted slides to be shared and the training to be more granular, while more training is offered on the use of Microsoft Excel and Advanced M&E". Some materials were shared in hardcopies while others were shared electronically. There is an obvious need for higher-level training in data management. This will cover the use of Microsoft Excel and Advanced M&E. The partners also suggested, "having a session on their job

tasks as subject matter for M&E practice, to see how it relates directly to our work". This suggestion also aligned with the need to relate training content to trainees' daily tasks.

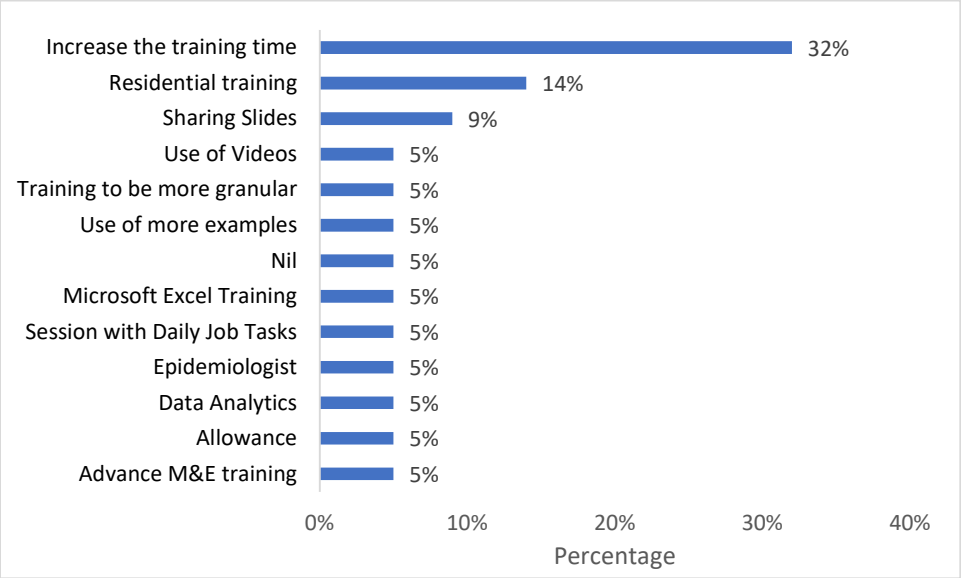


Figure 9: Suggestions for Improvement in the Delivery of the Training

5-3-5. Visuals, Acoustics, the Meeting Place, and Training Materials

The end-of-training evaluation showed that 91% (excellent: 27% and good: 64%) of the trainees affirmed that the training materials were either excellent or good while 95% described the visual effects of the learning materials as excellent or good (See Figure 10).

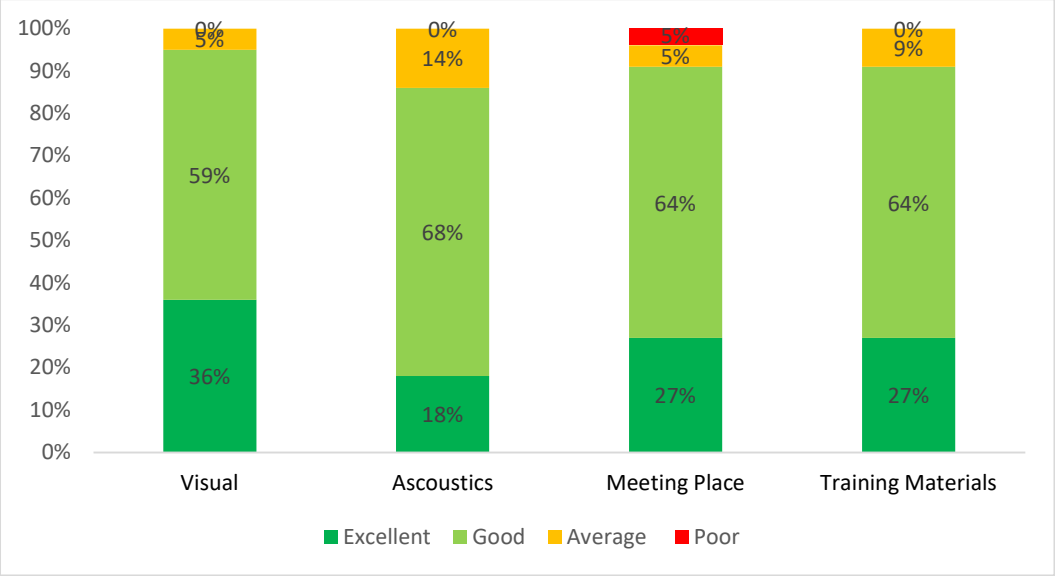


Figure 10: Trainees' Satisfaction with Visuals, Acoustics, the Meeting Place and Training materials

5-3-6. Other Feedback from Trainees

Other feedback at the end of the training showed that the trainees appreciated the sessions and found the contents very useful. For instance,

1. A trainee stated that "the training came at a good time" and commended the training organizers and the facilitators.

2. "The training was well conducted and it matched expectations". The trainees believed that their expectations of the training were met and that what they learnt would further enhance their job performance.

3. A female trainee stated that what she learnt will be put to use in her daily work in her role as an M&E officer.

6. Post-Training Need Assessment among the Trainees

The facilitators conducted a need assessment among the trainees to understand what type of training they look forward to after the completion of the training in Basic M&E. Of the 22 respondents that completed the question "What kind of skill/capacity for M&E is needed for your current work as next step?", 10 (46%) stated that they yearned to be trained in data analysis and 4(18%) wanted training on data management and Advanced M&E such as the use of inferential statistics, as shown in Table 4. Others suggested methods of evaluation, data management, M&E framework development, data collection stakeholder management, Intermediate M&E, analysis and interpretation of M&E data derived from a surveillance project, the use of an indicator to measure activities and interventions as well as gap analysis workshop. The needs highlighted by the trainees suggest that the trainees need further training in data management and data analysis which are core skills needed in data auditing (one of the 12 key components of M&E systems) as well as in Advanced M&E Methods amongst others.

Table 4: Distribution of M&E Skill/Capacity Required by the Trainees

M&E capacity Needed	**N***	**%**
Advanced-Data Management	1	5%
Stakeholder Management	1	5%
GAP Analysis Workshop	1	5%
Intermediate M&E	1	5%
M&E of several projects and activities.	1	5%
Methods of Evaluation	1	5%
Data Collection	2	9%
Framework Development	2	9%
Indicators	2	9%
Data Management	4	18%
Advanced M&E Training	4	18%
Data Analysis	10	46%

*Multiple responses.

7. Facilitators' Observations

7-1. Trainees' Attitudes to Learning

As observed by facilitators, the trainees demonstrated enthusiasm to learn new things in M&E. Most of the trainees followed the sessions with complete attention and participated actively in most activities. Thought-provoking questions were asked. The trainees were mostly eager to learn and reflect on how the modules learnt can be applied to their day-to-day work. However, a few of the trainees resumed up to an hour after the day's sessions had started and the same set departed the training hall earlier than others. They ascribed their punctuality challenges to the distance between the training center and their residences. This problem could be averted by making the training a residential one.

7-2. Learning Environment

The environment is very suitable for learning, and the challenges and issues noticed with the cooling system on the first day were promptly addressed. The learning environment was generally quiet and conducive to learning. The hall was big enough and the public address system worked reasonably.

8. Recommendations

In order of priority, the facilitators recommend the followings based on the training need assessment among the trainees and reflections on the trainees' feedback and desired training opportunities:

1. Training in advanced M&E: The basic training in M&E only covered the introductory part of M&E. A such, there is a need for training in advanced M&E. This will contain modules such as the spatial-temporal analysis of disease outbreak, time series analysis for M&E, M&E budgeting, health programme evaluation, incorporating learning into M&E, project management amongst others. These will require the use of software such as SPSS, STATA, Epi info, R and Tableau.
2. Training in data management: Of all the components of M&E, data management, regarded as an integral part of advanced M&E and holds a major position in M&E. As demanded by most participants, the unit needs to have strong data management skills. For the next step, more details of data management including practical sessions are needed, hence the need for training in data management, analysis and analytics in M&E. This will contain modules such data cleaning, coding and recoding, renaming and saving new variables, descriptive statistics, performing summary statistics, normal probability distribution, significance level, confidence interval and p-value, data visualization; bar chart, histogram, boxplot, etc, measure of disease frequency, rate, ratio and proportion, disease incidence and prevalence, measures of association and causation, test of statistical hypothesis - chi-square test, student *t-test*, one way analysis of variance, two way analysis of variance, linear correlation and regression, logistic regression, survival analysis of time to event and outbreak investigation, data analytics and visualization using power BI/QGIS.
3. At this time, the unit needs to have a SWOT analysis and start using the knowledge gained to develop a framework, indicators, and plan with a timeline to gradually enhance the M&E system. Trainees will benefit from international exchange, during which they gain on the job experiences over 4 weeks to 6 months at international health organisations focused on M&E.
4. For NCDC to sustain a training program for members of staff, we recommend that the completed training in basic M&E be repeated periodically as new M&E staffs are recruited or deployed to the unit.

9. Partners

Two partners attended the training as observers.

9-1. UK Health Security Agency (UKHSA)

The United Kingdom through its national public health institute, UKHSA and NCDC have signed a Memorandum of Understanding (MOU) to strengthen health security in Nigeria.

The International Health Regulations (IHR) strengthening programme in Nigeria is part of a project funded by the UK Department of Health, to support the capacities of national public health institutes in five countries. In Nigeria, this project will focus on the key pillars within the mandate of NCDC, including disease surveillance, emergency preparedness and response, public health laboratory services as well as workforce development.

9-2. Resolve to Save Lives (RTSL)

NCDC formally launched its collaboration with RTSL on 05 August 2019, an initiative of Vital Strategies. RTSL is a global public health initiative that works with governments to implement strategies for epidemic prevention and improved national health security. RTSL supports M&E in the surveillance Department of NCDC Since 2017, RTSL has supported key areas of work carried out by NCDC, especially following Nigeria, Joint External Evaluation (JEE) of IHR in 2017.

10.Financial Reports

Item	Breakdown, Rate	Amount
Payment for the hotel ① Venue ② Accommodation for staff from states and consultants	・Hall: 400,000/day×5days ・Lunch: 6,000×5days×45people ・Tea Break: 3,500×5days×45people 25,000/night×6nights×8people + 25,000/night×5nights×1person	6,327,375₦
Allowance for staff from states	per diem: 8000/day/person, 4000/day/person (with lunch) transportation fee	359,220₦
Airfare for staff from states	5 staff from Katsina, Abia, Oyo, Akwa Ibom and Yobe state	622,000₦
Transportation for staff from Abuja	4,000/day/person	484,000₦
Data for internet	1 month 30GB Wifi Data	8,000₦
Banner	3 banners	59,812₦
Total		**7,860,407₦**

11.Appendix

11-1. Training Agenda

Agenda for Basic M&E Training

Organized by NCDC and JICA

Venue: De Silver Green Luxury Hotel, Abuja, Nigeria

Date: 15th – 19th May 2023.

Day 1: Monday, 15th May 2023		
8:30 – 9:00 AM	Arrival and Registrations	JICA
9:00 – 9:30 AM	Opening Remarks	NCDC and JICA
9:30 – 9:40 AM	Introduction of participants, facilitators, JICA & NCDC personnel	All participants
9:40 – 9:50 AM	Workshop Objectives and JICA/NCDC Project	JICA
9:50 – 10:00 AM	Pre-Test	All participants
10:00 – 11:30 AM	**Didactic Sessions** **Introduction to M&E** · What is M&E · Why M&E? · Foundation of M&E · Concepts of M&E · Components of M&E · Types of M&E · Triangle of M&E	Consultant
11:30 – 12:00 PM	**Tea Break**	
12:00 – 2:30 PM	**Didactic /Hands-on Class** **Frameworks in M&E** · Goals and objectives of frameworks · Conceptual Framework · Result Framework · Logical Framework · Logic Models	Consultant
2:30 – 3:30 PM	**Lunch Break**	
3:30 – 4:55 PM	**Hands-on/Practical** **Group work:** · Develop different M&E Frameworks for increasing COVID-19 vaccine uptake in Nigeria with a target of 75% among 18+ years old	Consultant/All participants
4:55 - 5:00 PM	**Wrap-up of the day**	JICA

Day 2: Tuesday, 16th May 2023		
8:30 - 9:00 AM	Arrival and Registration	JICA
9:00 - 9:10 AM	Recap of Day 1	Rapporteur
9:10 - 11:00 AM	**Didactic Sessions** **M&E Plans** · How to formulate M&E plans **M&E Systems** · Steps in M&E Systems · Checklist of Good M&E System	Consultant
11:00 - 11:30 AM	**Tea Break**	
11:30 – 2:30 PM	**Didactic /Hands-on Class** **Programme theory** · Theory of Change · Objective Tree · Problem Tree · Logic of Causal Inference · Monitoring approaches · Evaluation Approaches	Consultant
2:00 – 3:00 PM	**Lunch**	
3:00 – 4:55 PM	**Hands-on/Practical** **Group work:** · Develop a theory of Change to achieve 95% COVID-19 vaccine uptake in Nigeria	Consultant/All participants
4:55 - 5:00 PM	**Wrap-up of the day**	JICA

Day 3: Wednesday, 17th May 2023		
8:30 – 9:00 AM	Arrival and Registration	JICA
9:00 – 9:10 AM	Recap of Day 2	Rapporteur
9:10 – 10:30 AM	**Didactic Sessions** **M&E Designs** · Objectives of M&E Designs · Evaluation Methods · Quantitative methods · Qualitative methods · Mixed Method & Triangulation in M&E	Consultant
10:30 – 11:00 AM	**Tea Break**	
11:00 – 11:05 AM	Remarks from JICA Nigeria Office	Senior Representative (Mr Yamamoto)
11:05 – 11:30 AM	**Special Session** "Surveillance Reporting System in Japan"	JICA/NCDC Project Chief Advisor (Dr Kondo)
11:30 – 2:00 PM	**Didactic /Hands-on Class**	Consultant

	M&E Designs · Sampling in M&E · Selecting the right evaluation methods · Implementation of M&E designs · Key Evaluation Questions	
2:00 - 3:00 PM	**Lunch**	
3:00 – 4:55 PM	**Hands-on/Practical** **Group work:** · Design M&E methods for · KAP surveys · Population-based surveys · Routine Surveys · Population-based survey	Consultant/All participants
4:55 – 5:00 PM	**Wrap-up for the day**	JICA

Day 4: Thursday, 18th May 2023		
8:30 – 9:00 AM	Arrival and Registration	JICA
9:00 – 9:10 AM	Recap of Day 3	Rapporteur
9:10 – 10:30 AM	**Didactic Sessions** **Data Collection in M&E** · Data Sources · Data Collection Methods · Data Quality · Questionnaire design and administration in M&E · Proforma development in M&E	Consultant
10:30 – 11:00 AM	**Tea Break**	
11:00 – 1:30 PM	**Didactic /Hands-on Class** **M&E Indicators** · Components of M&E indicators · Types of indicators · Design of M&E indicators · Quality of M&E indicators · Indicator pyramids · Selection of M&E indicators	Consultant
1:30 - 2:30 PM	**Lunch**	
2:30 – 4:00 PM	**M&E Indicators** · Computation, interpretation, and reporting of indicators	Consultant
4:00 – 4:55 PM	**Hands-on/Practical** **Group work:** · Assess and compare SDG indicators. · Develop Indicators for COVID-19 vaccine uptake in Nigeria	Consultant/All participants
4:55 – 5:00 PM	**Wrap-up for the day**	

Day 5: Friday, 19th May 2023		
8:30 – 9:00 AM	Arrival and Registration	JICA
9:00 – 9:10 AM	Recap of Day 4	Rapporteur
9:10 – 10:30 AM	**Didactic Sessions** **Data Management** · Data Exploration · Data cleaning and coding · Summarizing Data · Presenting Data · Infographics · Data auditing	Consultant
10:30 – 11:30 AM	**Tea Break**	
11:30 – 1:00 PM	**Didactic** **Stakeholder Management** · Stakeholder Identification · Stakeholder Engagement · Stakeholder Communication	Consultant
1:00 – 2:00 PM	**Didactic** **Communication & Dissemination in M&E** · Reporting M&E · Modes of dissemination · Contents of dissemination · Advocacy and Communication	Consultant
2:00 - 3:00 PM	**Hands-on Class** **Group Work:** · Prepare dissemination materials on COVID-19 vaccine uptake for different Stakeholders in Nigeria	Consultant
3:00 - 3:30 PM	Post-Test/Evaluation	All participants
3:30 - 3:45 PM	Feedback from participants	At least 3 participants
3:45 – 4:00 PM	Group photograph	All
4:00 – 4:10 PM	Closing Remarks	NCDC
4:10 – 5:00 PM	**Lunch/Afterparty**	All

11-2. Attendance List

S/N	Organisation	Name	Sex	State	Designation	Trainees	Pre/Post-test
1	NCDC	Ladun Okunromade	F	FCT	HOD, SED		
2	NCDC	Akinbiyi OluGbenga	M	FCT	Head of **Unit M&E**/ISS, SED	○	○
3	NCDC	Ebere Onuebunwa	F	FCT	AD, **M&E Unit**, SED	○	○
4	NCDC	Ladan Ahmed Mohammed	M	FCT	M&E Officer, **M&E Unit**, SED	○	○
5	NCDC	Francisca Gibah	F	FCT	Surveillance Officer, **M&E Unit**, SED	○	○
6	NCDC	Abdulaziz Babatunde Oyero	M	FCT	Surveillance Officer, **M&E Unit**, SED	○	○
7	NCDC	Obageli Nebolisa (Beatrice Obyemma)	F	FCT	Surveillance Officer, SED	○	○
8	NCDC	Metuh Ebelechukwu Chinwe	F	FCT	Surveillance Officer, SED	○	○
9	NCDC	Ayodele Arinola	F	FCT	Epid Fellow, SED	○	○
10	NCDC	Francis Ola	M	FCT	SED, Surveillance Officer	○	○
11	NCDC	Judith Nwodo Chukwunomnso	F	FCT	SED	○	○
12	NCDC	John Olatunde Adewale	M	FCT	Administration, HRM, PAO		
13	NCDC	Vivian Nwechi	F	FCT	Surveillance Officer, SED	○	○
14	NCDC	Enoch Agwu Ojenya	M	FCT	NRL, Data Manager/Statistician	○	○
15	NCDC	Jessica Akinrogbe	F	FCT	HEPR, DCEHO	○	○
16	NCDC	Tunde Jegede	M	FCT	DPRS, Project Manager	○	○
17	NCDC	Onwoene Favor	F	FCT	DPRS, Corps Member	○	○
18	NCDC	Mayowa Jibril Alliu	M	FCT	Surveillance Officer, SED	○	○

19	NCDC	Saddiqa Garba Sani	F	FCT	Surveillance Support Officer, SED	○	○
20	NCDC	Edidiong Evans	F	FCT	Subnational department, Surveillance Officer	○	○
21	NCDC	Abdulrahman Maigari	M	FCT	SED, AOU	○	○
22	NCDC	Emmanuel Mordi	M	FCT	NRL	○	○
23	NCDC	Farida Mohammed Munir	F	FCT	Special Duties	○	○
24	NCDC	Eliot Dikoru	M	FCT	Special Duties	○	
25	NCDC	Dr Isaiah Owolobi	M	FCT	Technical Assistant to DG NCDC		
26	NCDC	Okoli Collins Obidi	M	FCT	Procurement Department, Senior Procurement Officer	○	○
27	NCDC	Adulmumin Abdullahi	M	KATSINA	Subnational department, Surveillance Support Officer	○	○
28	NCDC	Princewill Chigozirim	M	ABIA	Subnational department, Surveillance Support Officer	○	○
29	NCDC	Ayuba Martins	M	NASA RAWA	Subnational department, Data Clerk	○	○
30	NCDC	John Akinoye Iyanu	M	OYO	Subnational department, Data Clerk	○	○
31	NCDC	Victoria Akpan	F	AKWA IBOM	Subnational department, Data Clerk	○	○
32	NCDC	Mohammed Abdullahi	M	YOBE	Subnational department, Surveillance Support Officer	○	○
33	UKHSA	Jerry Pantuvo	M	FCT	Technical Advisor		
34	RTSL	Joseph Odu	M	FCT	MEL Advisor		
35	Consultant	Adeniyi Fagbamigbe	M	OYO	Consultant		
36	Consultant	Wole Oyedele	M	OYO	Consultant		
37	Consultant	Ayo Adebolwale	M	OYO	Consultant		
38	JICA Nigeria	Tetsuya Yamamoto	M	JICA Nigeria	Senior Representative		

39	JICA Nigeria	Konan Saori	F	JICA Nigeria	PFA		
40	JICA Nigeria	Ajibike Adewole	F	JICA Nigeria	PC Health		
41	JICA Nigeria	Uchegbu Lorrine	F	JICA Nigeria	Logistics		
42	JICA/NCDC project	Toru Kondo	M	JICA/NCDC	Chief Advisor		
43	JICA/NCDC project	Aiko Tasai	F	JICA/NCDC	Project Coordinator		
44	JICA/NCDC project	Sheriff Gbadamosi	M	JICA/NCDC	Operation Manager		
45	JICA/NCDC project	Comfort Emmanuel	F	JICA/NCDC	Laboratory Support		

11-3. Assessment of Exercises Given to the Trainees in Groups

Group	Thematic Area		Evaluator 1	Evaluator 2	Evaluator 3	Evaluator 4	Total/60
1	1	Content	6	8	5	7	
		Appearance	3	3	4	3	
		Coherence	2	3.5	3	3	
	2	Content	6	7	5	7	
		Appearance	3	3.5	3	3	
		Coherence	3	4	4	3	
	3	Content	5	7	6	8	
		Appearance	3	3.5	4	4	
		Coherence	2	3.5	4	4	
		Total	33	43	38	42	39.0
2	1	Content	5	7	6	7	
		Appearance	2	4	4	4	
		Coherence	3	4	4	3	
	2	Content	7	7.5	7	7	
		Appearance	4	4	5	4	
		Coherence	3	3.5	4	4	
	3	Content	6	7	7	7	
		Appearance	3	3	5	3	
		Coherence	3	3.5	4	3	
		Total	36	43.5	46	42	41.9
3	1	Content	6	6.5	6	7	
		Appearance	3	3	4	3	
		Coherence	3	3	4	4	
	2	Content	6	6.5	8	7	
		Appearance	4	3.5	4	3	
		Coherence	3	3	4	3	
	3	Content	6	7	7	8	
		Appearance	4	3	3	3	
		Coherence	3	3	4	3	
		Total	38	38.5	44	41	40.4
4	1	Content	7	8.5	7	10	
		Appearance	4	4	5	5	
		Coherence	3	4	4	5	
	2	Content	6	8	7	8	
		Appearance	3	4	5	5	
		Coherence	3	4	4	4	
	3	Content	7	8	7	8	
		Appearance	4	4	5	4	
		Coherence	4	4	4	4	
		Total	41	48.5	48	53	47.6
5	1	Content	6	6.5	5	8	
		Appearance	3	3.5	3	3	
		Coherence	3	3	4	3	
	2	Content	5	7	7	7	
		Appearance	2	3.5	3	4	
		Coherence	3	4	4	3	
	3	Content	6	6	5	8	
		Appearance	3	3	3	3	
		Coherence	2	3	4	3	
		Total	33	39.5	38	42	38.1

11-4. Pre and Post Tests Questions

Most correct answers are highlighted in bold and underlined

1. Evaluation is a measure of
   a. Outputs
   b. Effectiveness
   c. Efficiency
   d. Outcomes
2. Which of the followings is not a type of monitoring?
   a. Input monitoring
   b. Process monitoring
   c. Goal monitoring
   d. Output monitoring
3. Which of these is not a component of M&E
   a. Output
   b. Impact
   c. Activities
   d. Plans
4. During one of the NCDC sessions to review efforts been taken to combat the spread of COVID-19, one of the stakeholders asked, "Are we doing things right"? Which of the following is not applicable to the question?
   a. He referred to converting inputs to outputs.
   b. He is referring to the tactics been used.
   c. He is concerned about the effectiveness of the process.
   d. He is looking at short term results.

Concerned about poverty among young girls in Nigeria, the Federal Ministry of Women Affairs believed that increasing the financial prosperity of girls in the country could make the attainment of the sustainable development goals – in terms of gender equality, health care access and education - more realistic. The ministry is therefore planning to carry out an intervention to achieve her goal.

5. Which of these choices is an input that could help the Ministry to achieve its goal?
   a. Girls are able to buy household goods
   b. Vitamin supplements
   c. Girls become financially independent
   d. Money for small loans
6. Which of these is not an activity that could help the Ministry to achieve its goal?
   a. Small loans given to the girls
   b. Girls spend their money wisely
   c. Microfinance experts give advice
   d. Girls learn financial skills
7. Which of these choices is an output that could help the Ministry to achieve its goal?
   a. Girls receive small loans
   b. Girls spend their money wisely
   c. Microfinance experts give advice
   d. Girls learn financial skills
8. Which of the following choices is an outcome that could help the Ministry to achieve its goal?
   a. Vaccines are given to children
   b. Girls upgrade their existing businesses' equipment
   c. Girls live happier lives
   d. Girls move out of their state
9. What is one risk or assumption that has to be made or assessed for the impact of the intervention?
   a. The girls' businesses might not make any money.
   b. There will not be enough money to give any microloans.
   c. The girls might not want microloans.
   d. There might be too many girls who want microloans.
10. Which of the following is not a monitoring question
    a. Are enough inputs being provided?
    b. How well do your inputs lead to your outputs?
    c. How well do your outputs lead to outcomes?
    d. What are the changes in the childhood mortality in the community?
11. Which of the following is not a evaluation question?
    a. Do your inputs produce enough outputs and outcomes?
    b. How well did your project create impact?
    c. Did any risks or assumptions affect this project?
    d. What has changed as a result of your intervention?
12. An organization is running a program which seeks to train nurses in post-abortion care. Which of the indicators in the list below would be MOST helpful for monitoring the progress of this project
    a. Percentage of nurses who report successful uptake of post-abortion care in their facilities.
    b. The number of nurses who are skilled in post-abortion care.
    c. The number of pencils used by the trainees in the program.
    d. The average score on a standardized post-abortion care knowledge test given quarterly.
13. You are a part of team assessing the outcome of this training. If your team does not specify which indicators will be used for M&E of the training, there is a serious risk that…
    a. Your targets will be too ambitious
    b. Your targets will be not ambitious enough
    c. You will not know how to measure progress and results correct
    d. You will not know who is responsible for collecting data
14. A government program is trying to reduce infectious diseases throughout the country by installing modern lavatories. Which of the following indicators would

be **MOST** helpful for evaluating the success of the program?

a. The number of lavatories built during the course of the program
b. <u>The percentage of residents who are reported to have contracted infectious diseases</u>
c. The number of individuals employed by this project
d. The ten most popular lavatory brands used by this project

15. All the followings except ……. is not an indicator
a. <u>By 2030, more than 80% of the students in this city will graduate from high school on time.</u>
b. The proportion of local women who report that they are "very confident" that their opinion is valued by their local government officials.
c. Number of solar energy systems installed.
d. % of households whose drinking water contains 0 fecal coliforms per 100 ml sample

16. All the followings except ……. is not a target
a. Fewer than 4 in 1000 neonatal deaths in the country
b. At least 45% of primary school students will be female.
c. <u>% of students who enrolled but did not complete grade 11 in this school year</u>
d. 85% of residents will be able to cover their nutritional requirements in 2024

17. Which of the following pairs is incorrect?
a. INPUT: $100,000 in loans given
b. OUTPUT: Vaccinated 1,200 children
c. INDICATOR: Number of M&E staff trained
d. <u>GOAL: 122 educational workshops provided</u>

18. Which of the followings is not a quantitative indicator?
a. <u>How people feel about the M&E training</u>
b. How many backpacks were distributed at the M&E training.
c. How many people participated in the M&E training.
d. Number of additional modules would trainees like to be included

19. Which of the following is not an ideal mode of disseminating M&E results
a. Workshops
b. <u>Walk show</u>
c. Reports
d. Town hall meetings

20. Which of the following is not a stakeholder in COVID-19 Uptake
a. Community Members
b. Government
c. <u>Primary school children</u>
d. Healthcare workers

21. Which of the following does not belong to the triangle of M&E
a. Quality
b. Quantity
c. Time
d. <u>Personnel</u>

22. Probability sampling does not include
a. Simple random sampling
b. Cluster sampling
c. Systematic random sampling
d. <u>Haphazard sampling</u>

23. The non-probability sampling equivalent of Stratified random sampling is
a. Haphazard sampling
b. <u>Quota sampling</u>
c. Judgemental sampling
d. Snowball sampling

24. Which of the following is not a component of data management?
a. Data Cleaning
b. Recoding
c. Data analysis
d. <u>Data simulation</u>

25. Which of the following is not a data collection method in M&E?
a. Interviews
b. Observations
c. Survey
d. <u>Timing</u>

11-5. Evaluation Form

EVALUATION FOR BASIC M&E TRAINING

All Participants at the M&E Basic training are expected to complete this form

* Indicates required question

1. Date of the training *

Example: January 7, 2019

2. Title of the training *

3. Location of the training *

4. Name of the Organisation *

5. Role/Designation *

6. Gender

Mark only one oval.

- ◯ Male
- ◯ Female

7. Age as at last birthday (in years) *

8. Please Rate the following questions *

Mark only one oval per row.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The event was applicable to my Job	◯	◯	◯	◯	◯
The facilitators were good communicators	◯	◯	◯	◯	◯

The materials were presented in an organised

	◯	◯	◯	◯	◯
The facilitators were knowledgeable	◯	◯	◯	◯	◯
The event met my expectation	◯	◯	◯	◯	◯
Knowledge and manner information gained from participation at this event will be useful/applicable to my work	◯	◯	◯	◯	◯
I will recommend this workshop/event to others	◯	◯	◯	◯	◯
The event achieved its speci ed objectives	◯	◯	◯	◯	◯

9. How do you think the event could have been made more effective? 'If we run this training again, what would you like us to include? *

10. Rate the accommodation provided (optional)

Mark only one oval.

- ◯ Excellent
- ◯ Good
- ◯ Average
- ◯ Poor
- ◯ Very Poor

11. Considering the topics, the training was *

Mark only one oval per row.

	Too short	Right length	Too long
	◯	◯	◯

12. The Length of the Event *

Mark only one oval per row.

	Too short	Right length	Too long
Considering the topics, the trianing was	◯	◯	◯

13. Please rate the following *

Mark only one oval per row.

	Excellent	Good	Average	Poor	Very poor
Visual	◯	◯	◯	◯	◯
Ascoustics	◯	◯	◯	◯	◯
Meeting space	◯	◯	◯	◯	◯
Handouts	◯	◯	◯	◯	◯

14. What extra skill/capacity do you need to perform on your role? *

15. Which contents of the training was most interesting for you? *

16. What part of the training would you like us to improve on *

17. Rate the accommodation provided (optional)

Mark only one oval.

- Excellent
- Good
- Average
- Poor
- Very Poor
- Not applicable

18. How would you rate the quality of the food Provided *

Mark only one oval.

- Excellent
- Good
- Average
- Poor
- Very Poor

Annex 2-4

Completion Report

on the Project for Strengthening Detection of and Response to Public Health Threats in Nigeria

Strengthening the Monitoring & Evaluation of Infectious Disease Surveillance

November 2023

Nigeria Center for Disease Control and Prevention (NCDC)
and
Japan International Cooperation Agency (JICA)

Table of Contents

1. Background

Despite Nigeria having Africa's largest economy, infectious diseases remain the leading cause of death. No new case of polio has been confirmed since 2016; however, Ebola virus disease occurred in 2014, and Lassa fever is endemic every year. During the Lassa fever outbreak in 2019, the death toll climbed to 130 out of 581 confirmed cases.

Under these circumstances, Nigeria Center for Disease Control and Prevention (NCDC) was established in 2011 to improve infectious disease surveillance, prevention, emergency response and research capabilities, and strengthen the capacity of network laboratory. However, NCDC faces challenges such as delays in rapid and accurate detection of infectious diseases, difficulty in management and laboratory capacity, insufficient number of laboratories, which meet the standards of Bio Safety Level 3, for testing and diagnosing highly infectious pathogens etc.

The Nigerian government has designated the health sector as one of the priority sectors in its National Development Plan "Nigeria Vision 20: 2020", and placed infectious disease control among the key issues in its “National Health Policy 2020”. Furthermore, “National Action Plan on Health Security 2018-2022”, formulated in 2018, states the importance of strengthening the capacity of laboratories as well as developing human resources engaged in infectious disease control.

Based on the above situation, in 2016, the Japanese government was requested to provide technical cooperation to strengthen the capacities of overall management, laboratories, disease surveillance as well as to develop human resources of NCDC. Thus, the technical cooperation project named “Project for Strengthening Detection of and Response to Public Health Threats in Nigeria” has been implemented from December 2019 to December 2023. Currently, two long-term experts, “Chief Advisor” and “Project Coordinator”, and one short-term expert in “Laboratory Management” are active. This time, short-term expert in “Strengthening the Monitoring & Evaluation of Infectious Disease Surveillance” (Japanese consultant) will join.

Main responsibility of Monitoring & Evaluation (M&E) unit in the Surveillance and Epidemiology department (SED) of NCDC is to monitor and evaluate the implementation status of Integrated Disease Surveillance and Response (IDSR) in all States including Federal Capital Territory (FCT) and Local Government Areas (LGAs) across the country, and compile them into various reports. However, they face some challenges in analyzing contents of report and extracting the recommendations and lessons learned.

It is for this reason that, in accordance with NCDC’s policy to strengthen M&E, the Japanese consultant is expected to assess the contents of existing M&E reports and understand the implementation status of M&E activities to assist M&E unit in developing their action plans aiming at improving the M&E Plan-Do-Check-Action (PDCA) cycle.

2. Outline of Work

(1) Objectives: <1> To conduct a situational analysis on the surveillance activities & M&E activities conducted by SED and develop action plans to solve the issues.

<2> To develop the task list for properly managing the PDCA cycle of M&E activities by the SED.

(2) Counterpart (C/P): M&E unit in SED of NCDC

(3) Duration in Nigeria: From October 12th to November 2nd

3. Implementation Process

(1) To confirm the implementation status and challenges on IDSR activities in Nigeria

Japanese consultant examined the summary of analysis by the local consultant on the qualitative data of various M&E reports and on the quantitative data collected through the past Integrated Supportive Supervision (ISS). The Table 1 below shows the reports & data analyzed during the preliminary data analysis workshop held on September 28th & 29th, 2023.

Table 1: Reports & Data Analyzed During the Preliminary data Analysis Workshop

Data Source	Number of Report
ISS Checklist Data Report	52
ISS Activity Report	52
IDSR Health Facility Assessment	1
Integrated Training for Surveillance Officers in Nigeria ("ITSON") Report	1
Measles Assessment	1
COVID-19 Active Case Search	1
Yellow Fever AAR	1
Cholera AAR	1
Lassa Fever AAR	1
CSM AAR	1
Data from Public Health Laboratories	8

Thereafter, interviews with the department & division heads of NCDC, Disease Surveillance and Notification Officer (DSNO) at the LGA level, and Disease Surveillance Focal Person (DSFP) at the health facility level were conducted, as shown in the Table 2 below. Japanese consultant conducted complementary interviews with Japanese experts too, especially Mr. Miura who has been in charge of strengthening laboratory services

Table 2: Interviewees and questions related to IDSR activities

Interviewees	Questions
SED (Surveillance Division Head)	Implementation status and challenges on the activities by the Surveillance Division

SED (M&E Section Head)	Implementation status and challenges on the activities by the Surveillance and Epidemiology Department
Abuja Municipal Area Council Garki Village PHC (DSNO) Garki Family Health Clinic (DSFP)	1) Implementation status, challenges, and workload of DSNOs and DSFPs, 2) Types, contents, and availability of reporting tools, 3) Training history, 4) Challenges on electronic surveillance system (SORMAS)
Sub-national Support Department (Department Head)	1) Implementation status and challenges on the activities by the Sub-national Support Department, 2) The organizational structure and budget of the State and LGA, 3) Characteristics of the six regional zones in Nigeria
Health Emergency Preparedness and Response Department (Department Deputy Head)	Implementation status and challenges on the activities by the Health Emergency Preparedness and Response Department
Planning, Research & Statistics Department (M&E Division Head)	1) Implementation status and challenges on the activities by the M&E division of Planning, Research & Statistics Department, 2) Progress of the supervisory functions by the Department for the entire NCDC's M&E activities

In addition, Japanese consultant conducted and utilized literature reviews on the various health-related documents such as "National Technical Guidelines for IDSR", "National Action Plan on Health Security 2018-2022", "NCDC Strategic Plan", "Joint External Evaluation report of the International Health Regulations (IHR). In the end, implementation status and challenges on IDSR activities were compiled & summarized according to the categories in "Surveillance loop", which correspond to "Detection / Reporting", "Analysis / Interpretation", and "Response". The Table 3 below shows the major challenges on IDSR activities.

Table 3: Major Challenges on IDSR Activities

Category in Surveillance loop	Major Challenges on IDSR Activities
Detection / Reporting	✓ Key informants & DSFPs work on a voluntary basis, which lower their motivation. (<2>) ✓ Some paper-based reporting forms among IDSR 001a/b/c, 002, and 003 are neither available nor updated. (<1>, <2>, <3>, <4>) ✓ There is a shortage of well-maintained transportation for surveillance activity especially to remote and hard-to-reach areas. (<1>, <2>, <3>, <4>) ✓ Quality of packing of collected samples needs to be improved. There is no established system about the transportation of collected samples between the LGA and State. (<2>) ✓ There are insufficient opportunities & amount of remuneration as well as activity budget for surveillance activities by the sub-national government and development partners (DPs) for State Epidemiologists (SEs), State DSNO, and DSNOs, which lower their motivation. (<2>, <3>) ✓ There is no enough assistant staff to support SEs and DSNOs. Only 65% of SEs and 56% of DSNOs have assistant staff, which cannot reduce their workload. (<3>) ✓ The effect of trainings for SEs, DSNOs, & DSFPs can be reduced by transfer & attrition of staff as well as insufficient preparation for a training such as short

	notice & clashes with other programs. (<2>, <3>) ✓ There are issues related to SORMAS such as poor network connection & interruption, long time for synchronization, application crashes & errors, personal payment for data bundles, and damage & loss of device. (<3>) ✓ The feedback system from the higher level to the lower levels on surveillance results needs to be improved. Only 49% of States produced the weekly epidemiological bulletin, newsletters, & briefs summarizing data on selected priority diseases. 70% of LGAs received any written feedback by higher levels. (<3>) ✓ Private health facilities neither have an access to SORMAS nor fully participate in surveillance system. (<2>, <3>)
Analysis / Interpretation	✓ It is very difficult to conduct a laboratory test stably due to a power shortage, which give an impact on the test results. (<2>) ✓ External Quality Assessment (EQA) is not conducted at public health laboratories of sub-national level, which give an impact on the test results.(<2>) ✓ Quality Management System (QMS) of public health laboratories needs to be improved. (<2>)
Response	✓ Emergency preparedness & response can be delayed at the sub-national level in terms of the meeting of ERP committee, set-up of EOC, involvement of different MDAs etc. (<1>, <2>, <3>) ✓ Capacity of human resources on emergency preparedness & response at the State level is not good enough. (<2>) ✓ The State depend on NCDC on emergency preparedness & response in terms of commodities, human resources, and funds. (<2>)

Information sources: <1> Literature review, <2> Interview, <3> Review of M&E reports (mainly ISS data from 24 states visited in 2021 & 2022), <4> Physical observation

(2) To identify the implementation status and challenges on M&E activities by the SED

Japanese consultant conducted interviews with the C/P and DPs about the 1) implementation status and challenges on the activities by C/P and supports by DPs, and 2) contents & rooms for improvement of ISS checklist developed by WHO as well as action plan tracker developed by Resolve to safe live (RTSL). Furthermore, Japanese consultant examined the summary of analysis on the qualitative data of various M&E reports and on the quantitative data collected through the past ISS, checked the contents of "National Technical Guidelines for IDSR", and utilized his ISS work experience in Seirra Leone. In the end, implementation status and challenges on M&E activities were compiled & summarized according to the categories of PDCA cycle of M&E activities, which correspond to "Planning / Preparation", "Implementation of M&E", "Report Writing", and "Provision of Feedback / Implementation and M&E of Action Plans". The Table 4 below shows the major challenges on M&E activities.

Table 4: Major Challenges on M&E Activities

Category in M&E PDCA Cycle	Major Challenges on M&E Activities
Planning & Preparation	✓ The implementation system to conduct M&E on Surveillance (e.g. M&E logical framework, human resource, fund) has not been established at the SED. (<2>, <3>) ✓ ISS checklists (ODK tool) are not necessarily user friendly. (e.g. many questions,

	no automatic data analysis) Therefore, it needs to be scrutinized and improved. (<1>, <2>, <3>) ✓ Surveillance training program M&E checklist has not been developed yet. (<2>)
Field Visits / Conducting M&E	✓ The frequency of supervisory visit from the higher level to the lower level is not enough. Only 70% of SEs & 75% of DSNOs received any supervisory visit from the higher level. (<2>, <3>)
Post-visit Meeting / Report writing	✓ Several causes of an issue are not analyzed in detail leading to action plans which are difficult to be implemented. (<1>) ✓ Action plans are not prioritized for implementation. (<1>)
Provision of feedback / Implementation and M&E of action plans / Reflection to Annual Work Plan	✓ The feedback of the past national ISS results to the sub-national level has not been provided at all. (<2>, <3>) ✓ Action plans developed during the past national ISS have not been implemented at all. (<2>, <3>) ✓ The extent of implementation of action plans at the sub-national level from any supervisor visit is not even high. Only 62% of States & 72% of LGAs implemented action plans from any supervisory visit. (<3>)

Information sources: <1> M&E experiences in other countries, <2> Interview, <3> Review of M&E reports (mainly ISS data from 24 states visited in 2021 & 2022)

(3) To prepare for the situational analysis and action planning workshop on surveillance and M&E activities

Based on the information obtained from the above work process (1) & (2), Japanese consultant discussed with project experts and C/P to determine the core issues to be analyzed during the workshop and how to moderate the workshop effectively and efficiently. After the discussion, Japanese consultant reconsidered and arranged the workshop as seen in the Table 5 below.

Table 5: Overview of Situational Analysis and Action Planning Workshop

Item	Contents
Objectives	✓ To conduct a situational analysis on the surveillance activities & M&E activities conducted by SED and develop action plans to solve the issues. ✓ To develop the task list for properly managing the PDCA cycle of M&E activities by the SED.
Schedules	✓23rd to 24th October: Problem analysis ✓25th October: Objective analysis ✓26th October: Development of Action Plan Matrix (APM) ✓27th October: Development of M&E cycle task list
Participants	✓ 32 NCDC staff, 5 DPs' staff, 5 Project staff
Core issues	[Surveillance activities] ✓ Detecting and reporting suspect cases by Indicator-based surveillance system has not been completely functioning. ✓ Detecting and reporting suspect cases by Event-based surveillance system has not been fully functioning at the sub-national level. ✓ The written feedback of analyzed surveillance data from higher level to lower level (Federal, States, LGAs, and Health Facilities) has not been completely provided.

	[M &E cycle] ✓ The implementation system to conduct M&E on Surveillance (e.g. M&E logical framework, human resource, tool, fund) has not been well established at the SED. ✓ The feedback on the ISS results has not been well provided to the sub-national level. ✓ Action plans to solve the issues identified through ISS have not been well implemented both at the national and sub-national level.
Points of attention	✓ Workshop was conducted in a participatory approach as much as possible to bring out the experiences, ideas, and motivation of the participants. ✓ Project staff & DPs' staff paired off with C/P staff to moderate the group work of problem analysis, objective analysis, and development of APM, which fostered the ownership and strengthened the capacity of C/P. ✓ The framework of APM is almost the same as the existing ISS action plan tracker. Since it is better to utilize an existing tool, we discussed with RTSL and C/P and agreed to add necessary items of APM to the existing ISS action plan tracker.

(4) To implement the situational analysis and action planning workshop on surveillance and M&E activities

Japanese consultant managed the workshop as an overall moderator in consultation with C/P and conducted following sessions together with other moderators who manage a group work.

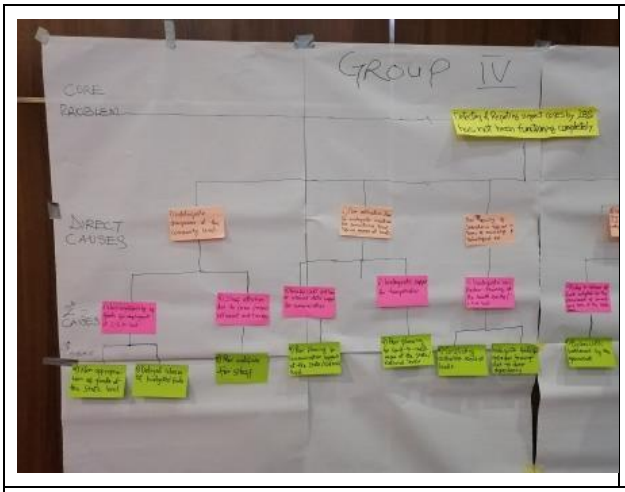
1) Development of action plans to improve surveillance and M&E activities managed by C/P

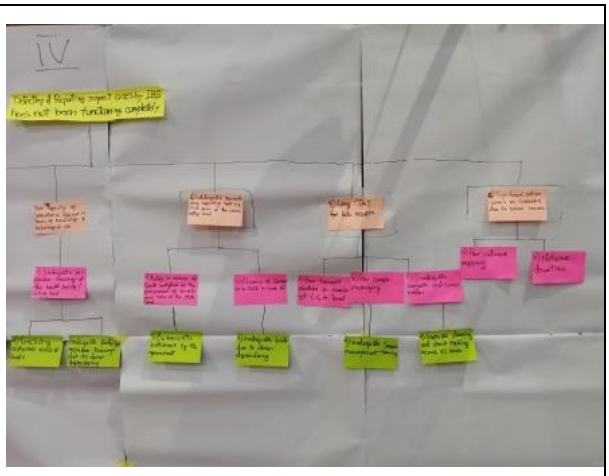
[Problem Analysis]

Problem analysis is the analysis that sorts out existing problems and clarifies relationship between existing problems and their causes in the form of "Causes and Effects" relationship. In this session, the core issues about "Surveillance activities" and "M&E cycle" described in the above Table 5 were assigned to 4 groups, and causes of the core issues were discussed & analyzed in each group.

	
Discuss & analyze the causes of core issues	Presentation on the problem tree

Achievement is that all groups could identify various causes from different perspectives and conduct a deeper analysis to secondary & tertiary level causes. On the other hand, the room for improvement is that participants could not write issues & their causes specifically in detail though they can verbally explain specifically in detail. Also, logical analysis about the "Causes and Effects" relationship needs to be further improved in some parts by some groups.



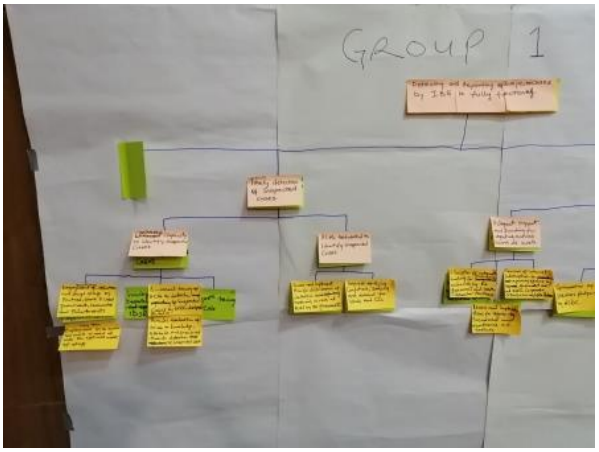


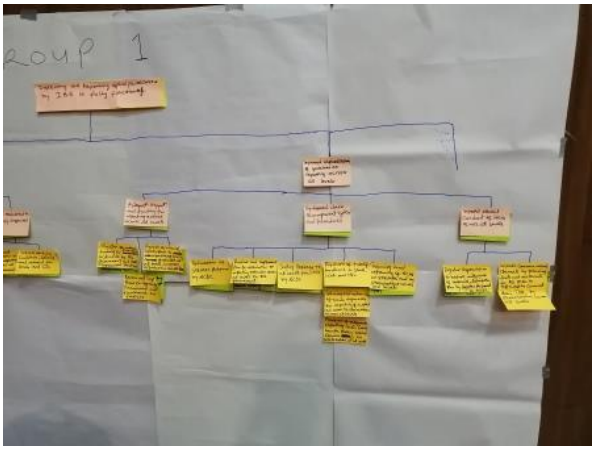
Identify various causes from different perspectives and conduct a deeper analysis to secondary & tertiary level causes

[Objective Analysis]

Objective analysis is the analysis that clarifies relationship between the desired situations solving problems and the means that lead to the desired situation in the form of "Means and Ends" relationship. In this session, each group was expected to change problem / negative statement of "Causes and Effects" relationship to objective / positive statement of "Means and Ends" relationship adding all other possible solutions.

Achievement is that most groups & participants could change statements and write solutions specifically with keeping "Feasibility of Solutions" in mind. However, some participants still write solutions briefly by just reversing the simply written issues & their causes, which make it difficult for third parties to properly understand the solutions. In addition, some groups are slightly confused about the distinction between desired situations and means that lead to the desired situation.





Change statements and write solutions specifically with keeping "Feasibility of Solutions" in mind

[Development of APM]

APM was formulated based on the results of problem analysis and objective analysis together with additional information such as responsible person and target date. It is composed of the categories of "Problems", "Root Causes / Reasons", "Short-term / Alternative Action Plans", "Mid & Long-term Action Plans", "Responsible Person both at the National & Sub-national Level", "Target Date both for Immediate / Alternative Action Plans and Mid & Long-term Action Plans",

and “Status of Action”.

Achievement is that more than half of groups & participants could properly come up with short-term / alternative action plans, which can be more easily implemented, with keeping 4W (What, Who, Where, When) and 1H (How) in mind. This is very important and key in this APM since most of the past action plans are mid & long-term which takes longer time and needs a lot of funds. On the other hand, the room for improvement is that This APM is developed based on the aggregate results of the past ISS conducted in 2021 & 2022. Therefore, the most updated & detail situation in each State need to be double checked with each responsible department in NCDC before it is presented to the outside of NCDC.

Problems	Root causes / Reasons	Short-term / Alternative Action Plans	Mid & Long-term Action Plans	Responsible Person(s) at National	Responsible Person(s) at Sub-national	Target Date (Short-term / Alternative Action Plans)	Target Date (Mid & Long-term Action Plans)
Poor attitude of personnel in providing feedback	Inadequate synergy between surveillance and laboratory personnel	Closing the gap of communication by establishing platforms, such as: WhatsApp Messenger Group, Zoom Calls, and physical meetings when/where necessary to discuss differences and harmonise information.	Ensure SORMAS deployment to all levels for real-time feedback.	NCDC, SORMAS unit/ Partner.	The State Government-State Epidemiologists/ State Liaison Officers.	December, 2023	May, 2024
	Insufficient knowledge of personnel in the proper feedback mechanism	Conduct orientation program for personnel to increase expected knowledge. Provide onsite training during supervision.	Training and retraining of personnel in the proper feedback mechanism by NCDC data management unit. Develop/Adopt feedback mechanism guidelines and SOPs.	NCDC. Feedback and training Unit.	The State Governement-Department of planning and research.	December, 2023	May, 2024
Inadequate working tools for surveillance data analysis	Insufficient data bundle	Advocacy to relevant actors (at the appropriate level) to provide imprest data subscriptions to DSNOs and facility focal persons	Provision of adequate data bundle by government, cooperate organisations and development partners.	NCDC/Partner/ Network Provider.	The State Government-State Epidemiologists/ Partner.	November, 2023	March, 2024
	Insufficient working tools	Advocacy to relevant actors (at the appropriate level) to provide working tools to DSNOs and facility focal persons Provision of working tools by government and development partners such as creating data collection tools using ODK, KoboToolbox, and printing IDSR forms etc	Provision of working tools by government and development partners such as tablets, laptops etc	NCDC/Epidemiology Units	The State Governement-Department of planning and research.	December, 2023	July, 2024

Figure 1: Extract of APM on ISS Action Plans not Implemented

At this moment, C/P is responsible for managing & updating this APM in consultation with various departments, and reporting to the office of Director General (DG) through the office of Head of Department (HoD). For more details on APM, please see the Annex 1.

2) Development of task list to manage the M&E cycle

The task list to manage the M&E cycle was drafted mainly based on the “National Technical Guidelines for IDSR” and interview with C/P in addition to the ISS experience of Japanese consultant in Sierra Leone to ensure that all M&E activities along the PDCA cycle shown in the Figure 2 below are implemented without omission.

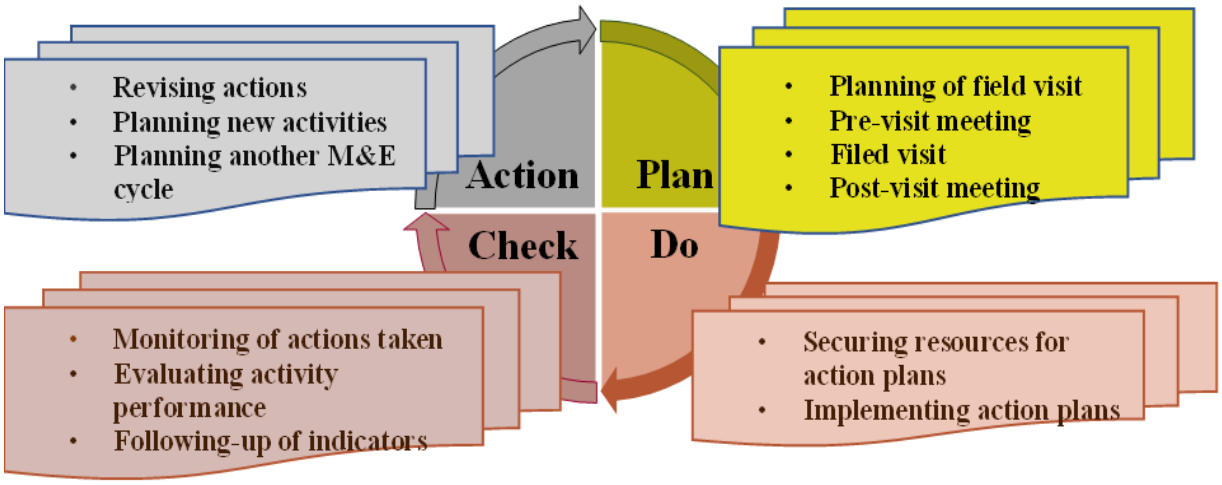


Figure 2: Expected M&E Cycle

The task list is composed of the categories of "Planning & Preparation", "Pre-visit Meeting", "Field Visits / Conducting M&E", "Post-visit Meeting / Report Writing", and "Provision of Feedback / Implementation and M&E of Action Plans / Reflection to Annual Work Plan". Although the contents focus more on ISS, it is designed to be applicable to M&E on training activities. During the workshop, it was reviewed one by one by all participants and completed as “Version 1”, which needs to be continuously updated and enhanced by C/P. For more details on the task list to manage the M&E cycle, please see the Annex 2

4. Status of Achievement of Work

(1) Development of action plans to improve surveillance and M&E activities managed by C/P

1) Although it was the first time for participants to conduct the problem analysis & objective analysis using the Project Cycle Management method, they tried to identify various causes of an issue from different perspectives and conduct a deeper analysis to secondary & tertiary level causes in the problem analysis. In the objective analysis, participants tried to write solutions specifically with keeping “Feasibility of Solutions” in mind. Similarly, in developing the APM, participants could come up with short-term / alternative action plans, which can be more easily implemented, with keeping 4W (What, Who, Where, When) and 1H (How) in mind.

2) C/P will present the APM and task list to manage the M&E cycle developed during the workshop to the DG. After the approval by the DG, the APM will be presented to the DPs. DPs, who participated in this workshop, also appreciated the APM to a certain extent. JHPIEGO mentioned that they would like to consider providing or seeking for support if the significant issues to be resolved in event-based surveillance are identified in the APM. WHO also said that DPs will provide supports in various manners including technical supports if NCDC puts issues & solutions in the APM and present it to the DPs.

3) The situational analysis and action planning workshop not only resulted in developing action plans but also in building the capacity of NCDC staff. Compared to the action plans developed during the past ISS, the action plans developed this time have been greatly improved in terms of “specific description”, “feasible solutions”, and “short-term / alternative action plans”. Furthermore, we received the feedback comments from about 10 participants such as ”This workshop gave me a new

perspective", "I understood the importance of writing specifically", "I understood the importance of thinking out of box", and "I understood the importance of properly analyzing problems and connecting them to solutions".

(2) Development of task list to manage the M&E cycle

4) In the workshop this time, all groups pointed out that "the lack of ISS implementation plan and guidelines" would be one of the major reasons why ISS action plans have not been implemented. Therefore, it was beneficial to have reviewed the task list to manage the M&E cycle, which could serve as the basis for "ISS implementation plan and guidelines", together with C/P staff, who is responsible for ISS, other participants, who play a role of ISS supervisors, and DPs' staff, who could support the implementation of ISS & its action plans.

Annex-III

Project Monitoring Sheet I （Revision of Project Design Matrix）

Project Title: Strengthening detection of and response to public health threats in Nigeria

Version 0

Dated Aug, 25, 2017

Implementing Agency: Nigeria Centre for Disease Control (NCDC)

Target Group: NCDC and its affiliated institutes and organizations

Direct Beneficiaries: Staff of NCDC and its affiliated institutes and organizations

Indirect Beneficiaries: General population in Nigeria

Period of Project: (4 years)

Project Site: Abuja and Lagos **Model Site: To be decided by activities**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
All public health threats regarding 5 prioritized infectious diseases[1] are well controlled in their initial phases.	All outbreaks of prioritized infectious diseases[1] are controlled not to spread to outside of the Local Government Areas of origin.	NCDC report			
Project Purpose					
Capacities of NCDC for early response to public health events regarding 5 prioritized infectious diseases[1] are enhanced.	For more than *XX%*[2] of public health events[3] regarding 5 prioritized infectious diseases[1], proper responses are done within 24 hours from the onset.	NCDC report	・Operational cost for public health laboratories is allocated appropriately by FMOH.		
Outputs					
1.The newly constructed BSL3 Laboratories is fully utilized. 2. Laboratory network for infectious diseases is strengthened to carry out safe, accurate and reliable diagnosis and confirmation of 5 prioritized infectious diseases. 3. Program management capacity of NCDC is enhanced to cope with public health emergencies due to 5 prioritized infectious diseases[1]	1-1 More than *XX*[2] researchers are properly trained and are able to use the BSL 3 laboratories routinely. 2-1 All public health laboratories do not face with biosafety/biosecurity related accidents. 2-2 All public health laboratories participate in external quality assessment scheme and are assessed regularly. 2-3 More than XX[2]% of cases of 5 prioritized infectious diseases[1] receive confirmed diagnosis. 3-1 The entire program and 5 prioritized diseases[1] control programs are monitored annually according to the M&E framework with proper feed back to lower levels. 3-2 All RRTs in target areas are able to take proper measures against public health emergencies regarding 5 prioritized infectious diseases[1]. 3-3 The intervention to increase surveillance coverage is rolled out in designated states and areas.	NCDC report Project monitoring sheets/Project completion report	・The construction of the P3 laboratory at NRL is not interrupted by security issues or natural disasters. ・The Nigeria government does not change the policy to prioritize infectious disease control.		

Activities	Inputs		Important Assumption
	The Japanese Side	**The Nigerian Side**	
1-1. Strengthening capacity of NCDC to manage National Reference Laboratory (NRL)with BSL3 Laboratories			
1-1-1 Conducting training on BSL3 Laboratories management and biosafety in Japan.	1. Long-term experts: 1) Project management 2) Laboratory management 3) Project Coordinator 2. Short-term experts: 1) Chief Advisor 2) Surveillance 3) Molecular Epidemiology 4) Risk assessment 5) Emergency response 3. Training in Japan Trainings in Japan which are mutually agreed between Japan and Nigeria sides 4. Equipment Office equipment Training equipment Other equipment mutually agreed on as necessary (including DNA sequencer to NRL) 5. Necessary expenses Administration costs Domestic travel expenses Transportation costs Training expenses	1. Counterparts and administrative personnel (1) Project Director (2) Project Manager (3)Counterpart personnel and administrative personnel for the Project 2. Facilities, equipment and materials (1)Suitable office space with necessary furniture and equipment; 3. Necessary expenses (1) Running expenses which are not covered by the Japanese side, but necessary for the implementation of the Project; 4. Others (1)Support to visa renewal for Japanese Experts (2) Information as well as support in obtaining medical service;. (3) Custom exemption procedure for machinery and equipment to be provided by JICA;	・Trained staffs do not leave their position.
1-1-2 Developing the operational and management manual for BSL3 Laboratories including preventive maintenance of equipment			
1-1-3 Organizing the management team of BSL3 Laboratories			
1-1-4 Conducting training for the team staff organized in 1-1-3 by using the operational and management manual for BSL3 Laboratories developed in 1-1-2			
1-2 Strengthening scientific research capacity of NCDC to utilize BSL3 Laboratories			
1-2-1 Identifying research needs and capacity to be strengthened			
1-2-2 Developing the short term and mid-term training plans based on the results of 1-2-1			
1-2-3 Providing training opportunities (in Japan)			
2-1 Strengthening the public health laboratory network for 5 prioritized infectious diseases[1]			**Pre-Conditions** ・The Nigeria government puts high priority on infectious disease control as public health matters.
2-1-1 Developing the protocol for laboratory management			
2-1-2 Conducting training for laboratory managerial staff on the protocol developed in 2-1-1			
2-1-3 Developing the plan and protocol for biosafety and biosecurity based on the assessment[4]			
2-1-4 Conducting training for members of biosafety committee on the protocol developed in 2-1-3 at all 10 network laboratories			
2-1-5 Developing the communication mechanism among laboratories in the network including reporting system			
2-1-6 Upgrading equipment and facilities of the Central Public Health Laboratory in Lagos			
2-2 Introducing External Quality Assurance (EQA) mechanism into the laboratory network for 5 prioritized infectious diseases[1]			**<Issues and countermeasures>**
2-2-1 Developing the protocol for EQA			
2-2-2 Conducting training for laboratory staff on the protocol developed in 2-2-1 in selected laboratories			
2-2-3 Conducting pilots of EQA in the selected laboratories in 2-2-2			
2-2-4 Reviewing results of the pilots in 2-2-3 and finalizing the protocol for EQA			
2-2-5 Introducing EQA into all laboratories in the network			
2-3 Strengthening sample collection and transportations system for prioritized infectious diseases[1]			
2-3-1 Developing the protocol for sample collection and transportation			
2-3-2 Conducting training for master trainers on the protocol developed in 2-3-1			
2-3-3 Conducting training for staff of rapid response teams (RRTs) on the protocol by master trainers in target states			
2-3-4 Conducting pilots of prototype sample collection and transportation system			
2-3-5 Reviewing results of the pilots in 2-3-4 and finalizing the protocol for sample collection and transportation			
2-4 Introducing molecular epidemiology to the NRL			
2-4-1 Introducing genetic typing technique by using DNA sequencer			
2-4-2 Developing the protocol for molecular epidemiology for selected diseases			
2-4-3 Conducting the molecular epidemiology for selected diseases in target areas			
3-1 Enhancing capacity for Monitoring and Evaluation of the program			
3-1-1 Developing proper feedback mechanism to target states /LGAs based on results of regular program monitoring and evaluation			
3-1-2 Identifying needs of operational researches to enhance program performance in target states/LGAs			
3-1-3 Conducting operational researches in 3-1-2			
3-1-4 Evaluating results of operational researches in 3-1-3 and reflecting them into program implementation			
3-2 Enhancing capacity for preparedness and response to public health emergencies regarding prioritized infectious diseases			
3-2-1 Developing the operational protocol of Incident Coordination Center (ICC) for emergency response			
3-2-2 Developing hazard risk assessment and resource mapping for 5 prioritized infectious diseases[1]			
3-2-3 Developing distribution system for necessary equipment and items for public health emergencies			
3-2-4 Developing the manual for preparedness and response to 4 prioritized infectious diseases[5]			
3-2-5 Conducting training on the manual in 3-2-4 to develop master trainers			
3-2-6 Conducting training for staff of Rapid Response Teams (RRTs) on the manual by master trainers in target states/LGAs based on hazard risk assessment			
3-3 Enhancing communication mechanism with hospitals/clinical laboratories to increase surveillance coverage			
3-3-1 Conducting assessment on surveillance coverage for prioritized infectious diseases[1] in target states/LGAs			
3-3-2 Developing mechanism to increase surveillance coverage based on the results in 3-3-1 and implement it in target states/LGAs			
3-3-3 Rolling out the mechanism to target states/areas			

1; Cholera, Yellow fever, Meningitis, Measles, Viral hemorrhagic fevers

2. Exact number shall be defined after the initiation of the Project after assessing base line information.

3; Public health events include all incidents of suspect case or solitary case.

4. This indicate the assessment done by NCDC in September 2017.

5. Cholera, Yellow fever, Meningitis, Measles

Annex 3-2

Project Design Matrix

Project Title: Strengthening detection of and response to public health threats in Nigeria

Version 1

Implementing Agency: Nigeria Centre for Disease Control (NCDC)

July 26th, 2019

Target Group: NCDC and its affiliated institutes and organizations
Direct Beneficiaries: Staff of NCDC and its affiliated institutes and organizations
Indirect Beneficiaries: General population in Nigeria

Period of Project: (4 years)

Project Site: Abuja and Lagos

Model Site: To be decided by activities

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
All public health threats regarding 8 prioritized infectious diseases[1] are well controlled in their initial phases.	All outbreaks of prioritized infectious diseases[1] are controlled not to spread to outside of the Local Government Areas of origin.	NCDC report			
Project Purpose					
Capacities of NCDC for early response to public health events regarding 8 prioritized infectious diseases[1] are enhanced.	For more than *XX*%[2] of public health events[3] regarding 8 prioritized infectious diseases[1], proper responses are done within 24 hours from the onset.	NCDC report	・Operational cost for public health laboratories is allocated appropriately by FMOH.		
Outputs					
1.The newly constructed BSL3 Laboratories are **properly managed and safely operated.** 2. Laboratory network for infectious diseases is strengthened to carry out safe, accurate and reliable diagnosis and confirmation of 8 prioritized infectious diseases. 3. Program management capacity of NCDC is enhanced to cope with public health emergencies due to 8 prioritized infectious diseases[1]	1-1 More than *XX*[2] researchers are properly trained and are able to use the BSL 3 laboratories routinely. 2-1 All public health laboratories do not face with biosafety/biosecurity related accidents. 2-2 All public health laboratories participate in external quality assessment scheme and are assessed regularly. 2-3 More than XX[2]% of cases of 8 prioritized infectious diseases[1] receive confirmed diagnosis. 3-1 The entire program and 8 prioritized diseases[1] control programs are monitored annually according to the M&E framework with proper feed back to lower levels. 3-2 All RRTs in target areas are able to take proper measures against public health emergencies regarding 8 prioritized infectious diseases[1]. 3-3 The intervention to increase surveillance coverage is rolled out in designated states and areas.	NCDC report Project monitoring sheets/Project completion report	・The construction of the P3 laboratory at NRL is not interrupted by security issues or natural disasters. ・The Nigeria government does not change the policy to prioritize infectious disease control.		

Activities	Inputs		Important Assumption
	The Japanese Side	**The Nigerian Side**	
1-1. Strengthening capacity of NCDC to manage National Reference Laboratory (NRL)with BSL3 Laboratories			
1-1-1 Conducting training on BSL3 Laboratories management and biosafety in Japan.	1. Long-term experts: 1) Chief Advisor 2) Laboratory management 3) Project Coordinator 2. Short-term experts: 1) Research Capacity Development 1 2) Research Capacity Development 2 3) Surveillance 4) Biosafety/Biosecurity 5) Emergency response 3. Training in Japan Trainings in Japan which are mutually agreed between Japan and Nigeria sides 4. Equipment Office equipment Training equipment Other equipment mutually agreed on as necessary (including DNA sequencer to NRL) 5. Necessary expenses Administration costs Domestic travel expenses Transportation costs Training expenses	1. Counterparts and administrative personnel (1) Project Director (2) Project Manager (3)Counterpart personnel and administrative personnel for the Project 2. Facilities, equipment and materials (1)Suitable office space with necessary furniture and equipment; 3. Necessary expenses (1) Running expenses which are not covered by the Japanese side, but necessary for the implementation of the Project; 4. Others (1)Support to visa renewal for Japanese Experts (2) Information as well as support in obtaining medical service; (3) Custom exemption procedure for machinery and equipment to be provided by JICA;	・Trained staffs do not leave their position.
1-1-2 Developing the operational and management manual for BSL3 Laboratories including preventive maintenance of equipment			
1-1-3 Organizing the management team of BSL3 Laboratories			
1-1-4 Conducting training for the team staff organized in 1-1-3 by using the operational and management manual for BSL3 Laboratories developed in 1-1-2			
1-2 Strengthening scientific research capacity of NCDC to utilize BSL3 Laboratories			
1-2-1 Identifying research needs and capacity to be strengthened			
1-2-2 Developing the short term and mid-term training plans based on the results of 1-2-1			
1-2-3 Providing training opportunities (in Japan)			
1-2-4 Conducting a research according to the plans developed 1-2-2			**Pre-Conditions**
2-1 Strengthening the public health laboratory network for 8 prioritized infectious diseases[1]			・The Nigeria government puts high priority on infectious disease control as public health matters.
2-1-1 Developing the protocol for laboratory management			
2-1-2 Conducting training for laboratory managerial staff on the protocol developed in 2-1-1			
2-1-3 Developing the SOP for newly introduced equipment by the Japanese grant-aid project such as ELISA, PCR and Real-time-PCR			
2-1-4 Conducting training for the laboratory staff on the SOP developed in 2-1-3			
2-1-5 Developing the plan and protocol for biosafety and biosecurity based on the assessment[4]			
2-1-6 Conducting training for members of biosafety committee on the protocol developed in 2-1-5 at NCDC network laboratories			
2-1-7 Developing the communication mechanism among laboratories in the network including reporting system			
2-2 Introducing External Quality Assurance (EQA) mechanism into the laboratory network for 8 prioritized infectious diseases[1]			**<Issues and countermeasures>**
2-2-1 Developing the protocol for EQA			
2-2-2 Conducting training for laboratory staff on the protocol developed in 2-2-1 in selected laboratories			
2-2-3 Conducting pilots of EQA in the selected laboratories in 2-2-2			
2-2-4 Reviewing results of the pilots in 2-2-3 and finalizing the protocol for EQA			
2-2-5 Introducing EQA into all laboratories in the network			
2-3 Strengthening sample collection and transportations system for prioritized infectious diseases[1]			
2-3-1 Developing the protocol for sample collection and transportation			
2-3-2 Conducting training for master trainers on the protocol developed in 2-3-1			
2-3-3 Conducting training for staff of rapid response teams (RRTs) on the protocol by master trainers in target states			
2-4 Introducing molecular epidemiology to the NRL			
2-4-1 Introducing genetic typing technique by using DNA sequencer			
2-4-2 Developing the protocol for molecular epidemiology for selected diseases			
2-4-3 Conducting the molecular epidemiology for selected diseases in target areas			
3-1 Enhancing capacity for Monitoring and Evaluation of the program			
3-1-1 Developing proper feedback mechanism to target states /LGAs based on results of regular program monitoring and evaluation			
3-1-2 Identifying needs of operational researches to enhance program performance in target states/LGAs			
3-1-3 Conducting operational researches in 3-1-2			
3-1-4 Evaluating results of operational researches in 3-1-3 and reflecting them into program implementation			
3-2 Enhancing capacity for preparedness and response to public health emergencies regarding prioritized infectious diseases			
3-2-1 Developing distribution system for necessary equipment and items for public health emergencies			
3-2-2 Developing the manual for preparedness and response to 5 prioritized infectious diseases[5]			
3-2-3 Conducting training on the manual in 3-2-4 to develop master trainers			
3-2-4 Conducting training for staff of Rapid Response Teams (RRTs) on the manual by master trainers in target states/LGAs based on hazard risk assessment			
3-3 Enhancing communication mechanism with hospitals/clinical laboratories to increase surveillance coverage			
3-3-1 Conducting assessment on surveillance coverage for prioritized infectious diseases[1] in target states/LGAs			
3-3-2 Developing mechanism to increase surveillance coverage based on the results in 3-3-1 and implement it in target states/LGAs			
3-3-3 Rolling out the mechanism to target states/areas			

1; Cholera, Yellow fever, Meningitis, Measles, Viral hemorrhagic fevers, Monkeypox, Influenza, Antimicrobial Resistance
2. Exact number shall be defined after the initiation of the Project after assessing base line information.
3; Public health events include all incidents of suspect case or solitary case.
4. This indicate the assessment done by NCDC in September 2017.
5. Cholera, Yellow fever, Measles, Monkeypox, Antimicrobial Resistance

Annex 3-3

Project Design Matrix **Annex 3**

Project Title: Strengthening detection of and response to public health threats in Nigeria **Version 2**

Implementing Agency: Nigeria Centre for Disease Control (NCDC) **3rd June, 2022**

Target Group: NCDC and its affiliated institutes and organizations
Direct Beneficiaries: Staff of NCDC and its affiliated institutes and organizations
Indirect Beneficiaries: General population in Nigeria

Period of Project: 03/12/2019 - 02/12/2023 (4 years)

Project Site: Abuja and Lagos **Model Site: To be decided by activities**

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption	Achievement	Remarks
Overall Goal					
All public health threats regarding infectious diseases are well controlled.	All outbreaks of infectious diseases are controlled not to spread to outside of the Local Government Areas of origin.	NCDC report			
Project Purpose					
Capacities of NCDC for the management of prioritized infectious diseases are enhanced.	1. At least one international collaborative research is launched. 2. Number of public health laboratories in the NCDC network with enhanced capacity to diagnose and confirm the prioritized infectious diseases is increased (From 0 to 6). 3 Surveillance and Epidemiology department in NCDC initiates the Monitoring and Evaluation program using the developed plans and tools with the other department.	NCDC report	・Operational cost for public health laboratories is allocated appropriately by FMOH.		
Outputs					
1. The capacity for management and research of NRL is enhanced. 2. Laboratory network for infectious diseases is strengthened to carry out safe and reliable diagnosis and confirmation of Cholera and Cerebrospinal meningitis (CSM). 3. The capacity for Monitoring and Evaluation (M&E) of NCDC is enhanced.	1. At least 10 staff of NRL will be able to perform cell culture. 2. ・Average of QMS implementation level (SLIPTA score) improves from 88[1] to more than 180 in selected public health laboratories[2] for Cholera and CSM. ・Required documents[3,4] for QMS implementation are developed in selected public health laboratories for Cholera and CSM. 3. ・The plans for improving the M&E program at all levels is developed based on the survey. ・At least 5 staff in each unit of the Surveillance and Epidemiology department receive training on M&E including capacity for integrated supportive supervision and data management. ・At least 2 staff of each department excluding Surveillance and Epidemiology receive M&E training.	NCDC report Project monitoring sheets/Project completion report	・The construction of the P3 laboratory at NRL is not interrupted by security issues or natural disasters. ・The Nigeria government does not change the policy to prioritize infectious disease control.		

Activities	Inputs		Important Assumption
1-1 Capacity development for BSL3 management	**The Japanese Side**	**The Nigerian Side**	
1-1-1 Conducting training on BSL3 Laboratories management and biosafety 1-2 Capacity development for research activity 1-2-1 Conducting training on routine diagnostic testing and research activites of NRL. 2-1 Building capacity of laboratory quality management in public health laboratories on the NCDC laboratory network. 2-1-1 Conducting a survey on the current state of public health laboratories. 2-1-2 Holding an analysis workshop to analyze the results of the survey on activity 2-1-1 and identify gaps/needs 2-1-3 Conducting a planning workshop to develop a laboratory quality management improvement plan for each public health laboratory based on the outputs on activity 2-1-2. 2-1-4 Conducting quality management system training on understanding of ISO 15189 and implementation of QMS Class 2[5] to support the individual plan developed on activity 2-1-3. 2-1-5 Conducting the training for capacity building of staff in the selected laboratory on internal audit based on SLIPTA requirements and certification of the participants on internal auditing. 2-1-6 Conducting training for staff on biosafety and security requirements according to ISO15189 standard. 2-1-7 Conducting training on equipment user maintenance and verification 2-1-8 Organizing mentorship program to address all identified nonconformances in the selected public health laboratories during baseline assessment on activity 2-1-1. 2-1-9 Conducting follow up assessment to the selected laboratories to monitor performances on post mentorship activities. 2-1-10 Holding the review meeting to share the progress of activities' implementation in the developed plan on activity 2-1-3 and outputs on activity 2-1-9.	1. Long-term experts: 1) Chief Advisor 2) Project Coordinator 2. Short-term experts: 1) Laboratory management 3. Training in Japan Trainings in Japan which are mutually agreed between Japan and Nigeria sides 4. Equipment Office equipment Training equipment Other equipment mutually agreed on as necessary (including DNA sequencer to NRL) 5. Necessary expenses Administration costs Domestic travel expenses Transportation costs Training expenses	1. Counterparts and administrative personnel (1) Project Director (2) Project Manager (3)Counterpart personnel and administrative personnel for the Project 2. Facilities, equipment and materials (1)Suitable office space with necessary furniture and equipment; 3. Necessary expenses (1) Running expenses which are not covered by the Japanese side, but necessary for the implementation of the Project; 4. Others (1)Support to visa renewal for Japanese Experts (2) Information as well as support in obtaining medical service; (3) Custom exemption procedure for machinery and equipment to be provided by JICA;	**Pre-Conditions**
2-2 Strengthening sample collection and transportation system for infectious diseases 2-2-1 Developing document and records on sample management in public health laboratory 2-2-2 Conducting training on sample collection and transport in selected public health laboratories 2-2-3 Conducting training on sample transport and IPC to courier service in selected states where the project supporting facilities are located.			・The Nigeria government puts high priority on infectious disease control as public health matters.
3-1 Enhancing capacity for M&E of the program 3-1-1 Conducting a survey on implementing situations for the M&E program at NCDC, States, LGAs levels. 3-1-2 Developing plans for improving the M&E program at NCDC, State and LGA levels based on the findings of 3-1-1. 3-1-3 Conducting training to develop capacity for M&E including capacity for integrated supportive supervision and data management. 3-1-4 Developing data quality assessment tool. 3-1-5 Conducting training on the tool developed in 3-1-4 for all related staff. 3-1-6 Conducting evaluation of the tool at field levels			

From 2-1-1 to 2-1-3 have done.

On 2-1-4, the QMS training had planned 3 courses. The first course has done in March 2022.

1: According to "A Report of Situation Analysis in Public Health Laboratories on the NCDC network in 2021, Nigeria" in the process of writing

2: There are 16 public health laboratories. 1.State Specialist Hospital (Adamawa), 2.University of Maiduguri Teaching Hospital (Borno), 3.Maitama District Hospital (FCT: Federal Capital Territory), 4.Rasheed Shekoni Specialist Hospital (Jigawa), 5.Infectious Disease Hospital (Kano), 6.Dalhatu Araf Specialist Hospital (Nasarawa), 7.Plateau State Specialist Hospital (Plateau), 8.State Public Health Laboratory Jalingo (Taraba), 9.State Specialist Hospital (Bauch), 10.General Hospital Makurdi (Benue), 11.General Hospital Calabar (Cross River), 12.Generl Hospital Sabon Tasha (Kaduna), 13.State Public Health Laboratory (Kebbi), 14.State Ministry of Health Public Health Laboratory (Kwara), 15.PHL General Hospital Minna (Niger), 16.Rivers State University Teaching Hospital (Rivers)

3: Stepwise Laboratory Quality Improvement Process Towards Accreditation (SLIPTA) Checklist Version 2:2015 Section 1: DOCUMENT AND RECORDS

4: INTERNATIONAL STANDARD ISO15189:2012

5: Including technical requirement