Data Collection Survey on Current Situation and Countermeasures Concerning Non-Communicable Diseases in the Pacific Region

Final Report

January 2013

Japan International Cooperation Agency
(JICA)

KRI International Corp.

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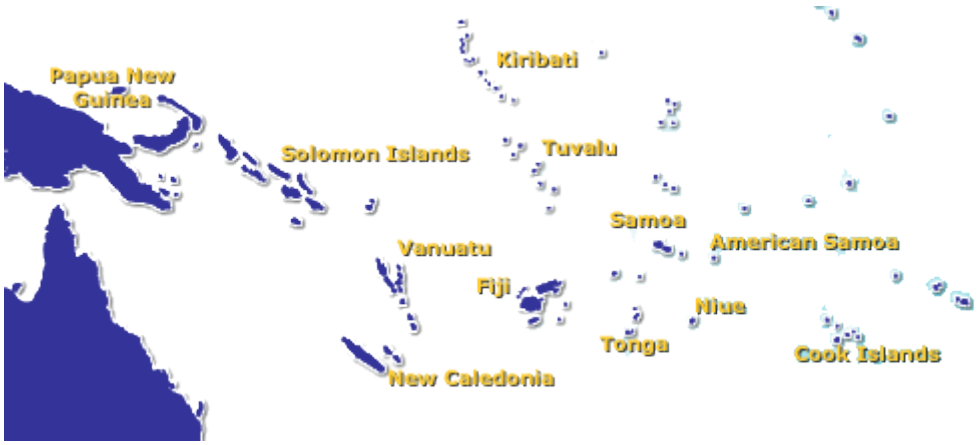
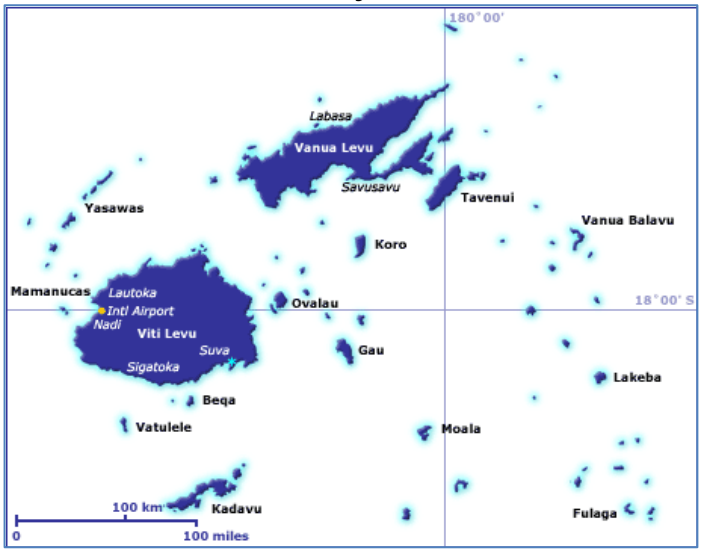
Map



Fiji



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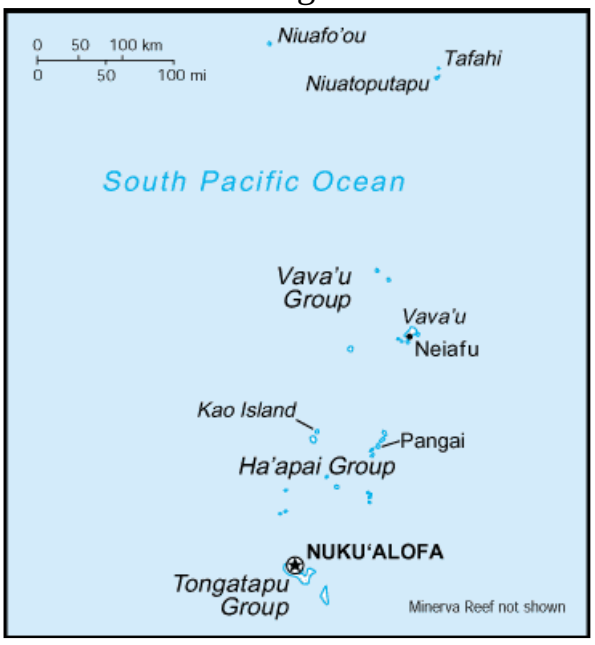
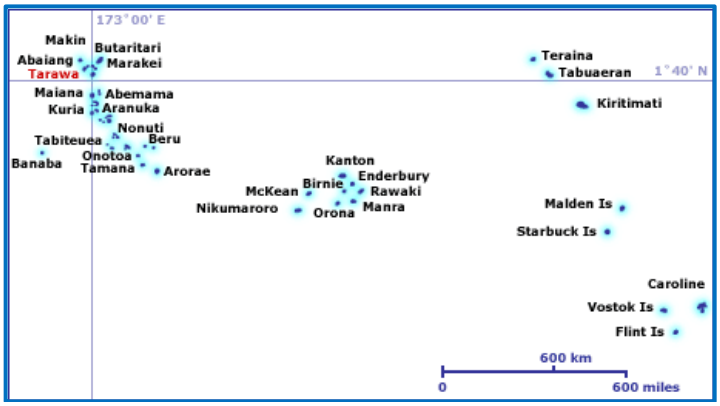


Kiribati



Source: Fiji and Kiribati - http://www.spto.org/spto/export/sites/spto/japanese/destinations/
Tonga - Joint Country Strategy 2009-2013, SPC

Abbreviations and Acronyms

2-1-22 Programme	2-1-22 Pacific NCD Programme
ADB	Asian Development Bank
AIDS	Acquired Immune Deficiency Syndrome
AKA	Above Knee Amputation
Aus$	Australian Dollar
AusAID	Australian Agency for International Development
BCC	Behavior Change Communication
BKA	Below Knee Amputation
BMI	Body Mass Index
CAT	Computerized Axial Tomography
CK-MB	Creatine Kinase-MB
CRA	Community Rehabilitation Assistant
CRD	Chronic Respiratory Disease
CSN	Clinical Service Network
CT	Computed Tomography
CVD	Cardiovascular disease
CWMH	Colonial Memorial War Hospital
ChinaAID	China Aid Association
CoC	Continuum of Care
DALY	Disability Adjusted Life Years
DF/R	Draft final report
DOTS	Directly Observed Therapy Short-course
Diabetes Centre	National Centre for Diabetes and Cardiovascular Diseases
ECG	Electro CardioGraph
EH	Environmental Health
EU	European Union
F$	Fiji Dollar
FAME	Fisheries, Agriculture and Marine Ecosystems
FHSSP	Fiji Health Sector Support Program
FPBSC	Fiji Pharmaceutical and Biochemical Supplies Centre
FTCT	Framework Convention on Tobacco Control
GDM	Gestational Diabetes Mellitus
GDP	Gross Domestic Product
GNI	Gross National Income
GOT	Government of Tonga
GYTS	Global Youth Tobacco Survey
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HBV	Hepatitis B Virus
HDL	High density lipoprotein
HI	Health Inspector
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HP	Health Promotion
HPO	Health Promotion Officer
HPU	Health Promotion Unit
HPV	Human Papilloma Virus
HRH	Human Resource(s) for Health
HRIS	Human Resource Information System
HSS	Health System Strengthening
HbA1c	Hemoglobin A1c
I-Kiribati	the demonym for native people of Kiribati
IARC	The International Agency for Research on Cancer
IC/R	Inception report
ICD10	The 10th version of International Classification of Diseases
JICA	Japan International Cooperation Agency

JOCV	Japan Overseas Cooperation Volunteers
KDP	Kiribati Development Plan
KRA	Key Results Areas
LBW	Low Birth Weight
LDL	Low density lipoprotein
MA	Medical Assistant
MAFFF	Ministry of Agriculture, Forestry, Food and Fisheries
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MELAD	Ministry of Environment, Lands and Agriculture Development
MET	Metabolic Equivalent
MHMS	Ministry of Health and Medical Services
MISA	Ministry of Internal and Social Affairs
MOA	Ministry of Agriculture
MOE	Ministry of Education
MOF	Ministry of Fisheries
MOFED	Ministry of Finance and Economic Development
MOFNP	Ministry of Finance and National Planning
MOH	Ministry of Health
MOS	Ministry of Sports
MOTEYS	Ministry of Training, Employment, Youth and Sports
MRI	Magnetic Resonance Imaging
NA	National Advisor
NB-IST	Needs-Based In-Service Training
NCD	Noncommunicable disease/ Non-Communicable disease
NGO	Non Government Organization
NHN	National Health Number
NP	Nurse Practitioner
NSPF	National Strategic Planning Framework
NZ$	New Zealand Dollar
NZAP	New Zealand Aid Programme
OHA	Oral Hypoglycemic Agent
OPD	Outpatient Department
OPIC	Obesity Prevention in Communities
PALM5	5th Pacific Islands Leaders Meeting
PATIS	Patient Information System
PC	Primary Care
PEI	Pacific Eye Institute
PEN	Package of Essential Noncommunicable Disease
PH	Public Health
PHIS	Public Health Information System
PICTs	Pacific Island countries and territories
POLHN	Pacific Open Learning Health Net
PTCA	Percutaneous Transluminal Coronary Angioplasty
PTCR	Percutaneous Transluminal Coronary Recanalization
RDSSED	Roadmap for Democracy and Sustainable Social-Economic Development
RH	Reproductive Health
RPH	Reproductive Health Nurse
SDP8	Strategic Development Plan 8
SOPAC	Pacific Islands Applied GeoScience Commission, Applied Geoscience and Technology Division of Secretariat of the Pacific Community
SOPD	Special Out-Patient Department
SPC	Secretariat of Pacific Community
STEPS	STEPwise approach to Surveillance
T$	Tonga Pa'anga
TCC	Tonga Communications Corporation
TCH	Tungaru Central Hospital
THSPMP	Tonga Health Planning and Management Project

THSSP	Tonga Health Systems Support Program
TNQAB	Tonga National Qualification and Accreditations Board
TSDF	Tonga Strategic Development Framework
TTM	Taiwan Technical Mission
The Survey	Data Collection Survey on Non-communicable Diseases in Pacific Region
The Survey Team	A team of consultants for the Survey
Tongan Health	Tonga Health Promotion Foundation
Tonga's PATH	Physical activity, Alcohol harm reduction, Tobacco control and Healthy eating
Top killer	Leading cuases of death
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WB	World Bank
WHO	World Health Organization
WHO/ISH	WHO International Society of Hypertension
WMO	Water Maintenance Officer
WPRO	Western Pacific Regional Office (WHO)
i-Taukei	the demonym for indigenous Fijians

Executive Summary

Introduction

According to the World Health Organization (WHO), it is well established that non-communicable diseases (NCDs) are the leading cause of death in the world, responsible for 63% of the 57 million deaths that occurred in 2008. The majority of these deaths numbered to 36 million were attributed to cardiovascular diseases (CVD), diabetes, cancer and chronic respiratory diseases. In developing countries, 79% of total NCDs related deaths occurred and 41% of these were attributed to premature deaths (under 60 years old). In the Pacific Region, NCDs are the primary causes of death in ten countries[1], where 8 countries are among the top-ten countries with high rates of obesity.

In September 2011, the Political Declaration on the Prevention and Control of Non-communicable Diseases was annexed to the present resolution of the United Nations (UN) High-level Meeting of the General Assembly that mentioned a concerted action and a coordinated global response to address the prevention and control of NCDs worldwide, with a particular focus on developmental and other challenges and social and economic impacts, particularly for developing countries. In the Pacific Region, it was recognized that NCDs are emerging health threats during the Pacific Health Ministers' Meeting held in July 2011.

As the UN System Task Team on the Post-2015 UN Development Agenda identified NCD as one of numbers of priorities of a post-2015 development framework, commitment for NCD prevention and control could be strengthened in near future.

As the Japan International Cooperation Agency (JICA) also recognizes the above challenges on NCDs in the region, the Data Collection Survey on Current Situation and Countermeasures Concerning Non-Communicable Diseases in the Pacific Region (hereinafter referred to as the Survey) is being conducted to collect relevant information on the latest situation of NCDs, current status of the implementation of relevant policies and programs, and major stakeholders' activities.

The objectives of the Survey are:

- To collect information on international and regional efforts against NCDs, as well as latest situation of NCDs in target countries like Fiji, Tonga and Kiribati; and
- To analyze the collected information to be able to make suggestion for JICA future assistance for NCDs prevention and control particularly in the target countries.

There are four target countries of the Survey are four, Fiji, Tonga, Kiribati where NCDs have become the leading cause of death.

[1] Global Health Observatory, WHO (http://www.who.int/gho/en/)

The collected data and information were organized and analyzed according to the structures of the Health System Strengthening (HSS) and Continuum of Care (CoC) in determining the future direction and cooperation on NCD by JICA.

The report consists of seven chapters. Chapter 2 describes the methodology. Chapter 3 summarizes global, regional and the Pacific countries' trends as well as the overview of health status in the target countries. The NCD situation and relevant health system in each country based on the Survey results are compiled in Chapters 4 (Fiji), 5 (Tonga) and 6 (Kiribati). Then, conclusion and suggestions for future JICA's support for NCDs prevention and control are presented in Chapter 7.

NCD Situation and Countermeasures in the Target Countries

NCD related death is 70% to 80% of total death in three countries. In Fiji and Kiribati, MDGs related health issues such as under-nutrition, child mortality, and tuberculosis are still concerned. Despite various measures since Healthy Island Initiative in 1995, mortality and morbidity have been getting worse, and people with risk factors have been increasing.

NCD specific implementation agencies have been established in three countries. The Tonga Health established in 2007 is the first health promotion foundation in the Pacific Region. NCD committee in Tonga and Kiribati involves cross-sectoral stakeholders to promote multi-sector approach. In Fiji, although the national NCD taskforce was formulated in 1991, it is not functioning regularly.

Relevant legislations and guidelines have been or are being prepared. Implementing organizations of NCD prevention and control have been established and playing important roles in each country. In Tonga, the Tonga Health has shared experiences with other similar setting countries such as Kiribati. However, coordination capacity needs to be strengthened as NCD related activities require multi-sectoral collaboration and more assistance might be provided in the future.

Fiji and Tonga provide primary to tertiary services and up to secondary in Kiribati. Advanced diagnosis and treatment are provided through receiving specialized medical services from foreign countries and supporting for overseas referral. Regarding the quality of services, one of the reasons why the measures are not much effective might be low awareness of the service providers, health workforces. Although they have training and carry out the planned activities, the low awareness might reduce seriousness of the activities and put more priority to more familiar activities such as MCH. Awareness of the users is also concerned as many people still do not understand NCD is a life-long disease and the complications could be serious. Many patients come to health facilities at very late stage or stop taking medication without any advice from the doctors.

Human resources are concerned in both quality and quantity despite retention strategy and various trainings. Such insufficient human resource is one of the critical backgrounds of delay of in both the implementation of activities and progress of accomplishments. Regarding curriculum for future NCD work forces, NCD nursing curriculum is under development in Tonga, while the curriculum modification at tertiary education institution has not been progressed in Fiji.

Regarding finance, it seemed that necessary budgets are allocated in Fiji and Tonga. However, the financial sources mostly depend on the external support and the disbursement needs to be improved.

Medicines and medical technology are under development. In Fiji, advanced technology has been introduced to provide advanced diagnosis and treatment within the country. Some are intended to promote medical tourism, like dialysis centers. In terms of the referrals from other countries to Fiji, it seemed that quite a few patients came to Fiji from limited number of countries. Most of the Pacific countries send their patients to Australia, New Zealand or India.

Health information needs to be improved and strengthened to provide evidences for monitoring and evaluation as well as decision making that are relevant to NCDs. In Fiji and Tonga, immunization coverage is reported for monitoring of EPI monthly basis. Progress of NCD screening could be monitor with similar system. In Fiji, monthly report of NCD new cases could be used for demand forecasting system for drug supply.

In terms of CoC, Tonga and Kiribati clearly stated that they focus on the primary prevention to improve NCD situation with limited resources. In Fiji, most of health workforces have been involved in the primary and secondary preventions, especially in screening recently. At the same time, the Government of Fiji has committed to introduce advanced medical technologies for tertiary prevention.

Considering the resources and possible beneficiaries in each country, the current strategy seems to be quite appropriate. However, there are certain numbers of patients who need treatment and/or rehabilitation. Research on health economics at the country level could support future decision making of the government on how far they should be equipped and how they weigh their priorities.

Regarding time of CoC, intervention for children and adolescents should be enhanced while nutrition education has been provided in maternal and child health activities and awareness raising and screening have been mainly focus on adult population. In Tonga, primary prevention needs to be more promoted while in Fiji, it seemed to be still initial stage of integration of NCD prevention into school health.

Multisector approach is being applied in the primary prevention such as promotion of physical activity in school, as well as healthy diet through cooking classes and vegetable garden. In Tonga, the Tonga Health provide grant to MOE and MOA. In Kiribati, MHMS collaborate with MOE, MELAD and other concerned ministries. In Fiji, although relevant agencies have been working on the necessary measurements, these seem not to be well linked each other.

Objective information on accomplishments of these prevention activities such as coverage of awareness raising and screening was not available in the Survey, as routine monitoring system of the programs or activities are not well established. As mentioned in Section 3.1.3 (1), these measures tended to be concentrated at the national level and urban areas. Therefore, even awareness raising might not cover all people in rural or remote communities. Such tendency is pointed in the field survey in Tonga and Kiribati. Also in Eastern Division in Fiji where consists of small islands, the relevant activities might not reach to all community.

Development Partners on NCDs

Regarding the development assistances, the major support for NCDs in the Pacific Region is the 2-1-22 program. It is mainly focus on the capacity development at the national level.

In terms of HSS, AusAID provides holistic support for health system in Fiji and Tonga. In Fiji, NCDs are streamlined into all program activities and the main focus is diabetes screening and care. In Tonga, the main focus of the program is NCDs and the program will support to expand quantity and quality of human resources such as NCD nurses. In Kiribati, Taiwan will provide financial support for NCD Center in 2013 after completion of SPC's support at the end of 2012. Although many stakeholders recognize that regular monitoring and evaluation system is important, there are no specific assistance on NCDs monitoring and evaluation. In terms of CoC, the development assistance tends to be concentrated to the primary prevention and community level.

Recommendations

In terms of HSS, human resource development and health information seem to have opportunity for future assistance. Regarding CoC, community level assistance for the primary prevention could help increasing effectiveness of the existing activities or expanding the coverage. The tertiary prevention at community level such as peer educator of diabetes patients might help to prevent serious complication and disability. It also might be linked with the primary prevention. As a result, the following possibilities could be suggested.

- Trainings in Japan:
  The existing group training or country focused training are to be modified to include various activities relevant to the primary prevention in Japan not only public sector but also private sector and activities at various level.

- Trainings or Experience Sharing among the Pacific Countries:
  Although NCD situation and environment of implementation of countermeasures vary among the countries, it could be useful to share some experiences or know how among or between countries which have similar concern, limitation or condition.

  Kiribati has learned from Tonga about health promotion foundation. As those countries have similar size of population, experience sharing in Tonga could be effective for Kiribati counterparts. As nurses in Fiji and Kiribati have rather similar function in NCD prevention and control, Fiji could transfer their experiences to Kiribati in terms of nursing services.

  It might be also possible to dispatch JOCVs as a focal point of each country for the regional program. They could help NCD focal points to share experiences within and beyond the country and introduce concepts and tools relevant to the program.

- Community Support:

  To enhance awareness raising and patient education in community, peer educator system for diabetes patients which is under trial in Central Division in Fiji could be supported. When the model was developed, it could be applied to other areas in Fiji or other countries. JOCVs could be dispatched to collaborate with stakeholders in the community, health personnel, and development partners to support the trial and sustainability of the activity after the extensive phase. As it takes quite long period to have outcome of such community intervention, the dispatch should be continuous for long term.

- Multisector Approach

  To reduce NCD burden in future, it is important to involve children and adolescence to the primary prevention, because they might be future patients without effective measures. Schools could be one of the best places of intervention for these groups. Actually, the respective ministries of health in the target countries and development partners have been coordinating and collaborating with the respective ministries of education.

  In Kiribati, it could be considered to develop or introduce innovative vegetable production or found the way to intake necessary vitamins from available foods with cheaper cost for improvement of diet.

- Monitoring and Evaluation System

  Common monitoring and evaluation framework on NCD among the countries in the Region could contribute to improve regional collaboration and implementation of the regional program like 2-1-22. To strengthen monitoring and evaluation system of NCD programs, health information management system of each country should be reviewed carefully because necessary data should be easily taken from the regular health information management system. Especially in Fiji, it will be complicated work as various forms are actually used at operational level.

- Research Activity

  Research to have evidences of cost effectiveness of interventions for NCD could be useful for decision making of investment for infrastructure and human resource development for NCD prevention and control. Also, research on innovative vegetable production could help some countries like Kiribati.

- Regional Program/ Project

  It could be difficult for NCD prevention and control to apply a common package similar to EPI or to simply expand a particular model to surrounding countries because NCD epidemics and progress of interventions varied. It might be possible to share good practices among the countries. However, this will depend on each country to decide whether they will apply these best practices and how it will be implemented. In this regards, the technical advice or cooperation might be effective to link the countries in order to provide broader point of view. It might be efficient to establish or strengthen a regional monitoring framework at the regional level. It should be done in close corporation with SPC and WHO.

Data Collection Survey on Current Situation and Countermeasures Concerning Non-Communicable Diseases in the Pacific Region

Final Report

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Figures and Tables

Chapter 1 Outline of the Survey

1.1 Background of the Survey

Non-communicable diseases (NCDs) are considered "neglected chronic diseases"[2] since communicable diseases and maternal and child health are more prioritized under the Millennium Development Goals (MDGs) although several global responses had taken place to address the problem. According to the World Health Organization (WHO), it is recognized that NCDs are the leading cause of death in the world, responsible for 63% of the 57 million deaths that occurred in 2008. The majority of these deaths numbered to 36 million were attributed to cardiovascular diseases (CVD), diabetes, cancer and chronic respiratory diseases. Economic burden of NCDs has been increasing in developing countries and further doubling the burden of communicable diseases especially in low income countries. In developing countries, 79% of total NCDs related deaths occurred and 41% of these were attributed to premature deaths (under 60 years old). In the Pacific Region, NCDs are the primary causes of death in ten countries[3], where 8 countries are among the top-ten countries with high rates of obesity.

In September 2011, the Political Declaration on the Prevention and Control of Non-communicable Diseases was annexed to the present resolution of the United Nations (UN) High-level Meeting of the General Assembly that mentioned a concerted action and a coordinated global response to address the prevention and control of NCDs worldwide, with a particular focus on developmental and other challenges and social and economic impacts, particularly for developing countries. In the Pacific Region, it was recognized that NCDs are emerging health threats during the Pacific Health Ministers' Meeting held in July 2011.

The respective ministries of health in the Pacific Regions have implemented NCDs prevention and control in cooperation with WHO, the Secretariat of the Pacific Community (SPC), the Australian Agency for International Development (AusAID), the New Zealand Aid Programme (NZAP)[4] and other partners since 2008. As a result, although some outcomes have been obtained especially in terms of policies, there are challenges in terms of policy implementation to halt the increasing burden of NCDs which can affect on health finance, productivity and quality of life of the people.

As the UN System Task Team on the Post-2015 UN Development Agenda identified[5] NCD as one of numbers of priorities of a post-2015 development framework[6], commitment for NCD prevention and control could be strengthened in near future.

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2 NCD Japan Forum 2011～Chronic diseases control and NCD Agenda～、Health and Global Health Policy Institute (http://www.hgpi.org/handout/NCD_14Final_120118.pdf, in Japanese, accessed in October 2012)

3 Global Health Observatory, WHO (http://www.who.int/gho/en/)

4 NZAID changed name in 2011.

5 Realizing the Future We Want for All – Report to the Director General, UN System Task Team on the Post-2015 UN Development Agenda, June 2012

6 The report recommended that the future framework rest on three core values: human rights, equality, and sustainability, and identifies four key dimensions of development: inclusive social development, inclusive economic development, environmental sustainability, and peace and security. NCDs are identified as one of a number of priorities that would support the overall focus of decreasing morbidity and mortality under health dimension.

As the Japan International Cooperation Agency (JICA) also recognizes the above challenges on NCDs in the region, the Data Collection Survey on Current Situation and Countermeasures Concerning Non-Communicable Diseases in the Pacific Region (hereinafter referred to as the Survey) is being conducted to collect relevant information on the latest situation of NCDs, current status of the implementation of relevant policies and programs, and major stakeholders' activities.

1.2 Objectives of the Survey

The objectives of the Survey are as follows:

- To collect information on international and regional efforts against NCDs, as well as latest situation of NCDs in target countries like Fiji, Tonga and Kiribati.
- To analyze the collected information to be able to make suggestion for JICA future assistance for NCDs prevention and control particularly in the target countries.

1.3 Scope of the Survey

There are four target countries of the Survey are four, Fiji, Tonga, Kiribati where NCDs have become the leading cause of death (top killer), and lastly, New Caledonia[7] where the SPC headquarters is located. SPC is an international organization that provides technical assistance, policy, advice, training and research services to Pacific Island countries and territories (PICTs). It is a unique Pacific organization that has worked with PICTs for long time.

In response to the NCD crisis, SPC and WHO have served jointly the 2-1-22 Pacific Non Communicable Disease Program[8] funded by AusAID and NZAP (Figure 1-1). Therefore, target organizations to the Survey will be SPC, WHO, AusAID, NZAP and MOH of the target countries accordingly.

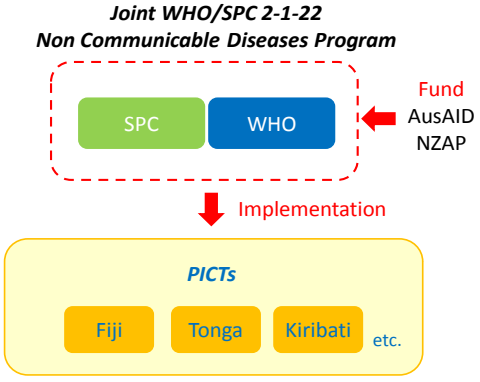


Figure 1-1 Implementing Structure of 2-1-22 Program

[7] The Survey Team occasionally conducted interview survey with SPC personnel in Fiji, the field trip to New Caledonia was canceled.

[8] To be described in Chapter 3.

At the later stage of the 2-1-22 program, SPC has adopted a multi-sectoral approach for NCD response, therefore the ministries of education, agriculture and fisheries, and so forth could be the targets of the Survey depending on the coordination among themselves.

Notably in Tonga, the Tong Health Promotion Foundation (Tonga Health), established in 2007 is the core of NCD related activities, developing partner will also be included in the Survey target organizations.

1.4 Structure of the Report

The report consists of seven chapters. Chapter 2 describes the methodology. Chapter 3 summarizes global, regional and the Pacific countries' trends as well as the overview of health status in the target countries. The NCD situation and relevant health system in each country based on the Survey results are compiled in Chapters 4 (Fiji), 5 (Tonga) and 6 (Kiribati). Then, conclusion and suggestions for future JICA's support for NCDs prevention and control are presented in Chapter 7.

Chapter 2 Methodology of the Survey

2.1 Overall Flow of the Survey

Overall flow of the survey is shown in Figure 2-1 and the work schedule is presented in Annex 1.

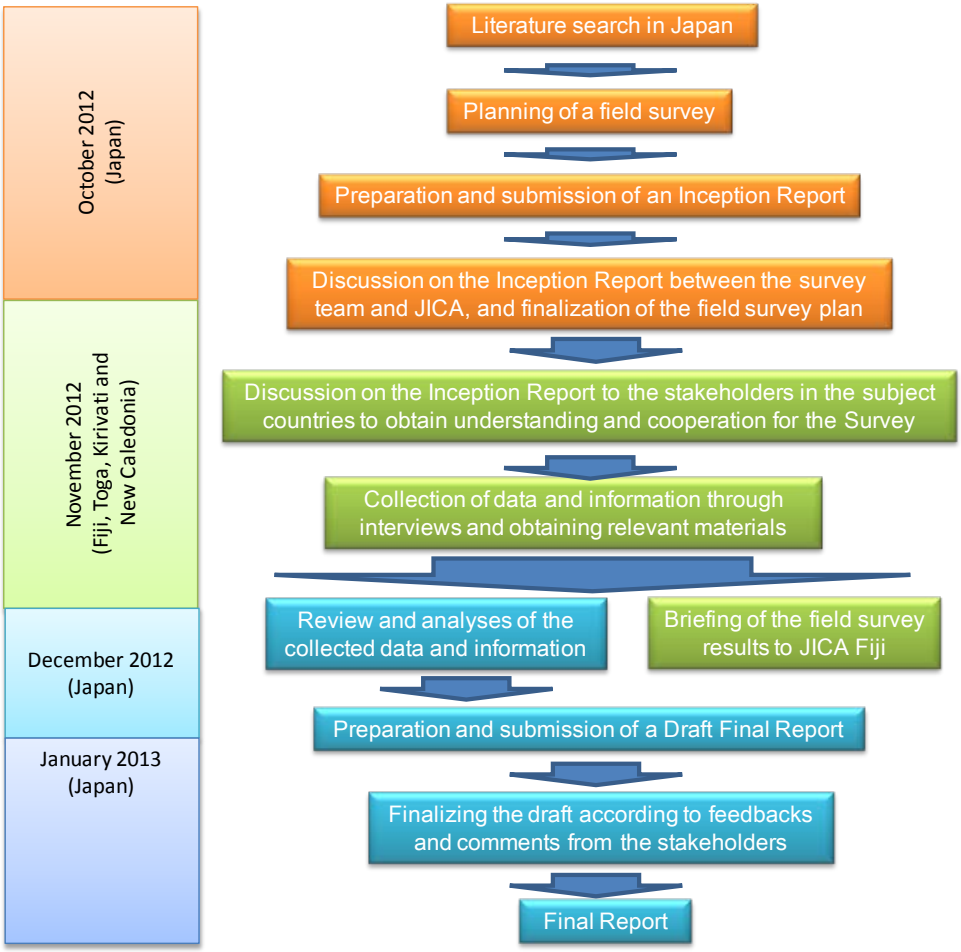


Figure 2-1 Overall Flow of the Survey

2.1.1 Works in Japan

The Survey Team identified the survey items for each target country and prepared the survey plan through the literature review.

(1) Literature Review

The Survey Team collected data and information which are available in Japan and through websites of the relevant organizations and agencies. The reference materials collected in the Survey are listed in Annex 4.

(2) Planning of the Field Survey

Through research of related literature, the Survey Team identified data and information to be collected in the target countries, and then prepared the field survey plan.

(3) Inception Report (IC/R)

The results of the literature study and field survey plan were compiled into the Inception Report (IC/R). The IC/R was submitted to JICA to discuss the detailed methodology and field survey plan, and also was presented to the stakeholders in the target countries.

2.1.2 Field Survey

The Survey Team conducted the field survey in Fiji, Tonga and Kiribati in November 2012. The survey itinerary and list of major interviewees are presented in Annex 3.

(1) Discussion on the Inception Report to the Stakeholders in the Target Countries

The Survey Team presented the IC/R to JICA offices and stakeholders in the respective target countries to enrich their understanding and request cooperation for the Survey.

(2) Data Collection

The Survey Team collected relevant data and information through interviews and obtaining materials such as statistical data, as well as relevant documents and papers.

(3) Brief Discussion with JICA Fiji Office

Upon completion of the field survey, the Survey Team discussed the results with JICA Fiji Office. The comments and feedbacks were considered in formulating the draft final report.

2.1.3 Organizing and Analyzing of Data and Information and Reporting

(1) Organizing and Analyzing of Data and Information

The collected data and information were organized and analyzed according to the structures of the Health System Strengthening (HSS) and Continuum of Care (CoC) in determining the future direction and cooperation on NCD by JICA (Figure 2-2).

HSS is used to analyze of central government interventions because the effective functioning of the health systems is a prerequisite to cost-effective intervention in reducing disease burden and achieving health goals, where JICA has rich experience in this field. On the other hand, CoC is used to analyze the lifestyle and clinical interventions. CoC has two dimensions, i.e., time and place. Time of CoC is an individual life stage from pre-pregnancy to elderly, and a place is a linkage of various levels of care given among family, community, and health facilities.

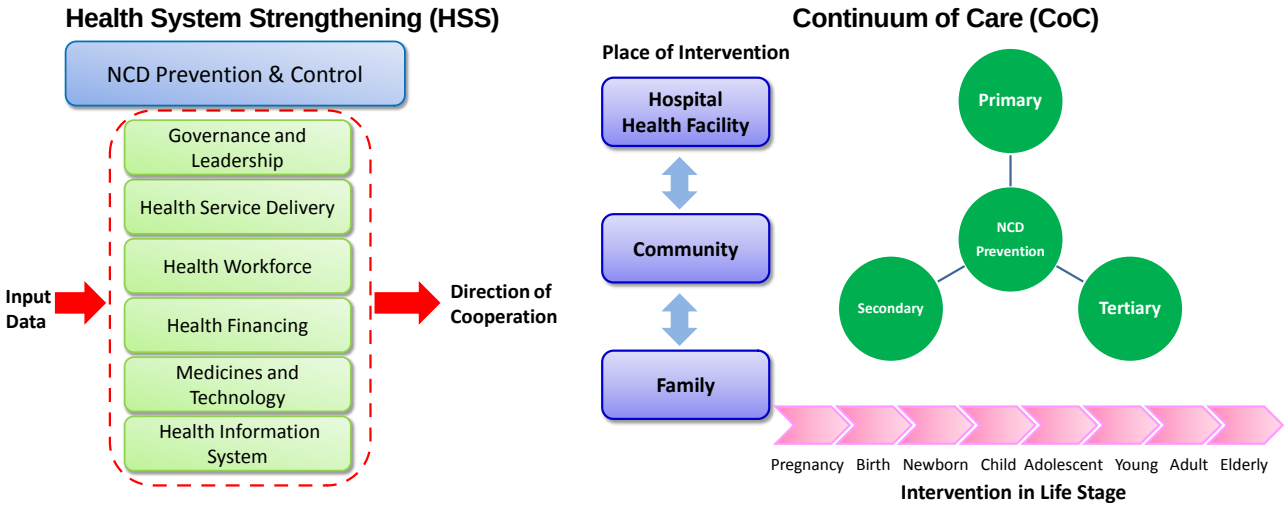


Figure 2-2 Two Structures used for Analysis

Most NCDs are acquired due to unhealthy life style and poor living conditions. From birth, a person may adopt a lifestyle practiced by the family or a lifestyle influenced by the community. Even if one's lifestyle is unhealthy, given a teaching on healthy lifestyle and/or clinical intervention for each life stage, one can possibly enjoy a long and healthy life and/or reduce disease burden.

In general, there are three stages of preventions on NCDs, i.e., primary, secondary, and tertiary preventions. And the primordial prevention could be added to these three preventions as a new concept.

Primordial prevention consists of actions to minimize future hazards to health, and hence, inhibit the establishment factors (environmental, economic, social, behavioral, and cultural) known to increase the risk of disease. An example of primordial prevention is the alcohol ban.

Primary prevention seeks to prevent the onset of specific diseases via risk reduction by altering behaviors or exposures that can lead to disease or by enhancing resistance to the effects of exposure to a disease agent. Examples include smoking cessation and vaccination. Primary prevention reduces the incidence of disease by addressing disease risk factors or by enhancing resistance. Further, health promotion as used for behavior change of host resistance. WHO defined health promotion is the process of enabling people to increase control over, and to improve, their health. It moves beyond a focus on individual behavior towards a wide range of social and environmental interventions.

Secondary prevention is to detect and treat pre-clinical pathological changes and thereby control disease progression. It is known as screening for disease such as routine blood sugar testing to detect diabetes mellitus, mammography to detect early stage breast cancer, and so forth.

Lastly, tertiary prevention seeks to soften the impact caused by the disease on the patient's function, longevity, and quality of life. It can include modifying risk factors, such as assisting a cardiac patient to lose weight and stop smoking and where the condition is irreversible, tertiary prevention focuses on rehabilitation, assisting the patient to accommodate his disability.

Therefore, for more detailed study and presentation of comparative advantage for JICA cooperation, the Survey Team combined the two structures and the three stages of disease prevention particularly focusing on NCDs in the data and information analysis.

The Survey Team takes views into consideration and provides recommendations for JICA cooperation on NCDs, in the following order of priority.

1) Which contents of the cooperation could be the most effective measure to reduce disease burden on NCDs?
2) With regards to the NCDs activities supported by major development partners, how JICA cooperation could avoid duplication of assistance to further enhance aid effectiveness or maximize aid effectiveness under cooperation and coordination?
3) How could human resources be utilized in the target countries which involved ongoing and past JICA cooperation?

(2) Draft Final Report

The results of the Survey and analysis were compiled in this draft final report (DF/R). Discussions on the DF/R with JICA and other relevant stakeholders were held with JICA and other relevant stakeholders for finalization.

(3) Final Report

The DF/R was finalized according to the discussion with and feedbacks from the stakeholders. The final report was submitted to JICA.

2.1.4 Reports

Table 2-1 shows the list of outputs of the Survey.

Table 2-1 Reports Submitted by the Survey

Reports	Timeline	Copies	
		Japanese	English
Inception Report (IC/R)	Late October 2012	5	5
Draft Final Report (DF/R)	Early January 2012	2	2
Final Report (F/R)	30th January 2012	7	7
		3 CD-ROMs	

2.2 Organization of the Survey Team

Figure 2-3 shows the structure of the Survey Team. JICA contracted KRI International Corp. to carry out the survey. It formed the Survey Team consisting of three members to cover the field survey in three target countries. The Team Leader is responsible for the final outputs of the Survey.

Schedule of the Survey Team members is presented in Annex 2.

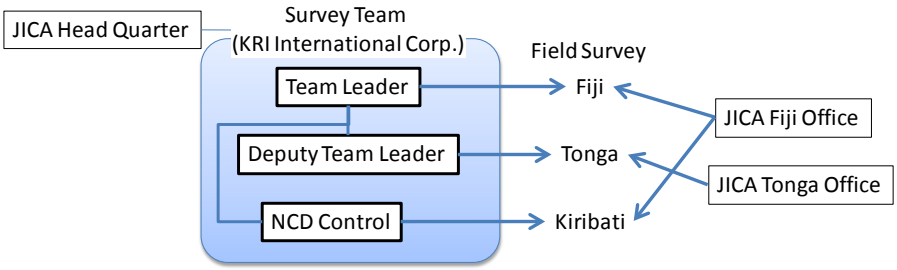


Figure 2-3 Organizational Structure of the Survey Team

Chapter 3 Context of the Survey Target

3.1 Global and Regional Trends on Noncommunicable Diseases (NCDs)

3.1.1 Global Trend

Four NCDs, namely, CVD, cancer, respiratory disease, and diabetes are the world's leading cause of death, with an estimated 35 million deaths accounted each year. Around 60% of deaths worldwide are due to NCDs – where 80% of it comes from low and middle income countries. These diseases are preventable. Up to 80% of heart diseases, stroke, and type 2 diabetes, and over one third of cancer cases could be prevented by eliminating the shared risk factors, mainly tobacco use, unhealthy diet, physical inactivity, and harmful use of alcohol. Unless addressed, the mortality and diseases burden from these health problems will continue to increase. WHO projected that, worldwide NCD deaths will increase by 17% over the next ten years. The greatest increase will be seen in the African Region (27%) and Eastern Mediterranean Region (25%). The highest absolute number of deaths will occur in the Western Pacific and South-East Asia regions.

At the global level, recognizing the need to provide urgent and effective public health responses, WHO's member states adopted the Global Strategy for the Prevention and Control of Noncommunicable Diseases in 2000. After that, to enhance global discussions on NCDs, various guiding documents (both general and specific) were endorsed as follows;

- Global Strategy on Diet, Physical Activity and Health, 2002
- WHO Framework Convention on Tobacco Control (FTCT), 2003
- WHO STEPwise Approach to Surveillance of NCD (STEPS), 2003
- Preventing Chronic Diseases: A Vital Investment, 2005
- Cancer Control: Knowledge into Action, WHO Guide for Effective Programmes, 2006
- Stop the Global Epidemic of Chronic Diseases: Advocacy Toolkit, 2007
- Prevention of Cardiovascular Diseases: Guidelines for Assessment and Management of Cardiovascular Risk, 2007
- Prevention and Control of Noncommunicable Diseases: Implementation of the Global Strategy, 2007, 2008
- Strategies to Reduce the Harmful Use of Alcohol, 2008
- Package of Essential Noncommunicable (PEN) Diseases Interventions for Primary Health Care in Low-Resource-Settings, 2010
- From Burden to "Best Buys": Reducing the Economic Impact of Non-Communicable Diseases in Low-and Middle-Income Countries, 2011

However, NCD prevention and control programs remain dramatically under-funded at the national and global levels. Because NCD was not included in MDGs (the target year is 2015) and it has been discarded in the global development agenda, commitment of development partners and governments have been lower than the MDGs

related issues[9][10]. WHO has, therefore, developed the Action Plan for the Global Strategy for Prevention and Control of Noncommunicable Diseases (2008-2013). This Action Plan is based on the Prevention and Control of Noncommunicable Diseases in 2000 and aim to build the guideline for implementation. The Action Plan consists of the following six (6) objectives.

Six objective of the Action Plan for the Global Strategy for Prevention and Control of Noncommunicable Diseases (2008-2013)

1) To raise the propriety accorded to NCD in development work at global and national levels, and to integrate prevention and control of such diseases into policies across all government departments
2) To establish and strengthen national policies and plans for the prevention and control of communicable diseases
3) To promote intervention to reduce the main shared modifiable risk factors for NCD
4) To promote research for the prevention and control of NCD
5) To promote partnerships for the prevention and control of NCD
6) To monitor NCD and their determinants, and evaluate progress at the national, regional and global levels

3.1.2 Trend in the Western Pacific Region

NCDs represent a major public health threat in the Western Pacific Region[11]. Western Pacific Regional Office (WPRO) estimated that about 26,500 people die every day from NCDs in the region with over 20,000 of these deaths occurring in the region's developing countries[12]. Nearly half of the NCD deaths are under the age of 70. Four notable NCDs, namely, CVD, respiratory diseases, cancer and diabetes, accounted for almost eight out of ten deaths, and the situation is getting worse in respective countries. Since these diseases could also affect the productivity and economic development, urgent measurements should be in place. The region has developed a lot of regional guiding documents over the past decade, after the adoption of the Global Strategy for the Prevention and Control of Noncommunicable Diseases in 2000. These documents are presented as follows;

- Prevention and Control of Noncommunicable Diseases, 2000
- Tobacco Free Initiative Regional Action Plan 2005-2009
- Making Health Systems Work for Chronic Diseases,2006
- Regional Strategy to Reduce Alcohol-related Harm, 2006
- Noncommunicable Diseases Prevention and Control, 2006
- Plan of Action for the Western Pacific Declaration on Diabetes: from Evidence to Action, 2006-2010
- A Proposal for a Pacific Regional Framework for the Prevention and Control of Noncommunicable Diseases, 2007
- Noncommunicable Diseases and Poverty: The Need for Pro-poor Strategies in the Western Pacific Region: A Review, 2007
- Integrating Poverty and Gender into Health Programmes: A Sourcebook for Health Professionals (Module on Noncommunicable Diseases), 2007

[9] Health related MDGs are; Goal 4: Reduce child mortality, 5: improve maternal health, and 6: combat with HIV/AIDS, malaria and other diseases.
[10] The NCD Alliance（http://www.ncdalliance.org/node/50, accessed in January 2013）
[11] It is one of the six regional offices of WHO. It covers 37 countries and stretches with total population of 18 billion, over a vast area, from China in the north and west, to New Zealand in the south, and French Polynesia in the east. It includes highly developed countries such as Australia, Japan, New Zealand, the Republic of Korea and Singapore.
[12] Western Pacific Regional Action Plan for NCD, WPRO, 2009

In September 2008, the Western Pacific Regional Action Plan for Prevention and Control of Noncommunicable Diseases aligned with the Global Strategy 2008-2013 was adopted. The vision is to free a region from avoidable NCD deaths and disability. The plan has the following six objectives and focuses on practical, cost-effective, and evidence-based interventions that the member states can adapt their own strategies in order to achieve reduction in risk factors, mortality and morbidity of NCD and the development partners should support such activities.

Six Objectives of the Western Pacific Regional Action Plan for Prevention and Control of Noncommunicable Diseases	
OBJECTIVE 1:	To raise the priority accorded to NCDs in development work at global and national levels, and to integrate prevention and control of such diseases into policies across all government departments
OBJECTIVE 2:	To establish and strengthen national policies and plans for the prevention and control of NCDs
OBJECTIVE 3:	To promote interventions to reduce the main shared modifiable risk factors for NCDs: tobacco use, unhealthy diets, physical inactivity and harmful use of alcohol
OBJECTIVE 4:	To promote research for the prevention and control of NCDs
OBJECTIVE 5:	To promote partnerships for the prevention and control of NCDs
OBJECTIVE 6:	To monitor NCDs and their determinants, and evaluate progress at the national, regional and global levels

3.1.3 Trend in Pacific Island Countries and Territories (PICT)

In June 2011, the Pacific Ministers for Health issued the Honiala Communiqué, which highlighted the impact of the rapid increase of NCD prevalence in the Pacific Island countries. Following the communiqué, the forum leaders have recognized the seriousness of the threat of NCDs, which made them declare that the "Pacific is in an NCD Crisis" in September 2011 in Auckland. An estimated 75% of all adult deaths in the Pacific were due to NCDs, with the majority of the deaths occurring in adults in the economically-active age bracket. The leaders acknowledged the huge economic losses due to NCDs and the resultant impact on national health budgets. Also they are concerned that NCD could hinder the achievement of MDGs in the region.

In the Pacific Island countries, the efforts to address NCDs began in 1995[13], with the Healthy Pacific Islands Initiative, a programme that emerged from the first meeting of the Ministers for Health of the Pacific Island countries. The initiative has evolved over successive meetings towards a focus on health protection and health promotion reducing risks and creating healthy environments and lifestyles. In spite of these efforts and the work by WHO and SPC, NCD crisis has been growing.

WPRO approved and SPC applied the Pacific Framework for Prevention and Control of NCD in 2007. Based on the framework, WHO and SPC have been jointly implementing "2-1-22 Pacific NCD Programme[14]" (2-1-22 Probgramme) with financial support from AusAID and NZAP.

[13] It was stated in the Yanuca Islands Declaration on Health in the Pacific in the 21st Century. The concept was based on "healthy cities" advocated by WHO.

[14] Two organizations (WHO and SPC) in one team serving to 22 countries (American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Pitcairn Islands, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna)

(1) Regional Framework for PICT

In June 2008, the 2-1-22 Programme commenced after an inception phase. Conceptually, the programme is aligned with the Pacific Framework for Prevention and Control of NCD. The goal of the programme is to reduce morbidity, disability and mortality of NCDs and their risk factors within the Pacific, and thus, will contribute to the global goal of reducing death rates from NCDs by 2% a year over and above the existing trends until 2015.

Based on the framework, the programme of support provided:

- Technical assistance through the 'NCD Team' of technical experts from SPC, WHO and other partners.
- Financial support for implementation of respective NCD plan in each country.
- Aligning development partner funding for the programme and PICTs needs and priorities with aid harmonization agreements and guidelines.

The programme was initially funded for a four-year period (2008-2011) and extended up to June 2013without additional fund. Table 3-1 summarizes the funds for the programme. According to the draft completion report prepared by WHO and SPC, fund disbursement for the large country grant had been delayed.

Table 3-1 Funding for 2-1-22 Pacific NCD Programme

Funding source	Budget	Expenditure	Disbursement
SPC	A$24,036,161	A$16,037,307.80	66.7%
WHO	US$1,781,400	US$1,781,400	100.0%
Australia	US$5,337,519	US$8,285,437	100.7%
New Zealand	US$2,890,234		

Source: 2-1-22 Pacific NCD Programme Draft Completion Report 2008-2012, WHO and SPC

Table 3-2 shows achievements of program goals, impacts and outcomes of the program assessed in the Draft Completion Report. Although the program aims to reduce mortality and morbidity of NCDs as well as prevalence of risk factors, the indicators focus on the reporting system.

National NCD strategies have been generally established and implemented (Objective 1 and 2). The sustainable finding mechanisms (Objective 3) have been adopted in Tonga by establishing Tonga Health[15]. Fiji and Tonga have the budget item for NCDs and allocate the budget. Regarding health system for NCDs (Objective 4), according to the Draft Completion Report, the inventory established in 8 countries was on pharmacy through support for PEN. However, according to the field survey, there was not clearly found in target countries. The workforce and training needs assessment have been conducted in 11 countries, but it was not clear in the target countries. The monitoring and evaluation system (Objective 5) was operated at the regional level and routine surveillance system at country level has not been established.

Table 3-2 Progress of 2-1-22 Program

Program Goals/ Impacts/ Purpose/ Objectives and Verifiable Indicators	Results	Fiji	Tonga	Kiribati
Goal: To reduce death rate from NCDs by 2% per year over and above existing trends by 2015				
Number of countries reporting NCD mortality data (cause and sex disaggregated)	15	-	✔	✔
Number of countries reporting NCD morbidity rate (cause and sex disaggregated)	0	-	-	-
Number of countries reporting DALY (Disability Adjusted Life Years)	14	✔	✔	✔

[15] Refer Section 5.4 and 5.5.4.

Program Goals/ Impacts/ Purpose/ Objectives and Verifiable Indicators	Results	Fiji	Tonga	Kiribati
Impact: Reduction in morbidity rated of NCDs (cancer, diabetes, CVD, chronic respiratory disease)				
Number of countries reporting NCD prevalence (sex disaggregated)	0	-	-	-
Number of countries reporting newly diagnosed cases of specific NCDs (sex disaggregated)	14	✔	✔	✔
Number of countries reporting hospital in-patient admissions for NCDs (sex disaggregated)	6	-	-	✔
Impact: Leveling or reduction in rates of NCD risk-factors (tobacco, physical inactivity, diet alcohol and obesity)				
Number of countries reporting NCD risk factor prevalence (sex disaggregated)	11	✔	-	✔
Number of countries reporting per-capita consumption of alcohol, tobacco, fruits and vegetables	0	-	-	-
Number of countries reporting sentinel surveillance data on NCDs (sex disaggregated)	4	-	-	✔
Number of countries with rural/ outer island sites receiving formal interventions	2*			
Purpose: Assist countries in the Pacific to built capacity in NCD prevention and control by establishing a comprehensive approach profiling, planning, implementation and evaluation				
Number of countries adopting the framework and utilizing comprehensive approach	12	-	✔	✔
Objective 1: To strengthen the development of comprehensive, multisectoral national NCD strategies				
1.1 Comprehensive multisectoral national NCD strategies in place				
At least 15 countries with documented national NCD strategies in place	15	✔	✔	✔
At least 12 countries have established dedicated NCD coordinators to drive implementation of national strategies	15	✔	✔	✔
1.2 Advocacy on NCD issues at national and regional level				
Advocacy on NCD issues at national and regional level	-			
1.3 Improved multisectoral coordination mechanism and coordinators for NCDs established				
At least 12 countries have established coordination mechanisms to guide NCD implementation	14	✔	✔	✔
Objective 2: To support countries to implement their NCD strategies				
2.1 Grant funds are effectively supporting national implementation of NCD strategies				
At least 15 countries have successfully implemented at least one grant funded NCD activity	21	✔	✔	✔
2.2 National legislative and policy framework in place to support NCD implementation				
At least 10 countries have national legislation in place which meets FCTC obligations	14	✔	✔	-
At least five PICTS have reviewed legislation pertaining to food standards	7	✔	-	-
2.3 Healthy lifestyle interventions targeting risk factors implemented (behavioral and environmental)				
At least 17 countries are effectively implementing at least one diet and physical activity intervention	21	✔	✔	✔
At least 12 courtiers with at least one tobacco free jurisdiction	>12	✔	✔	✔
At least six countries with alcohol intervention project	>11	✔	✔	✔
2.4 Clinical interventions targeting prevention support				
At least 15 countries have effective clinical programs targeting NCD prevention and control	11	✔	✔	✔
2.5 Effective communication and social marketing strategies to promote healthy lifestyles				
At least 15 countries have implemented at least one national social marketing campaign targeting NCD risk factors	15	✔	✔	✔
Objective 3: To support the development of sustainable funding mechanisms to deliver NCD strategies				
3.1 Sustainable mechanisms are used to deliver NCD activities				
At least five countries have adopted sustainable mechanisms to deliver their NCD activities	3	-	✔	-
3.2 Sustainable resources are secured to fund NCD programmes				
At least 15 countries have funding allocated for NCDs in national health budgets	8	✔	✔	-
Objective 4: To strengthen national health systems and capacity to address and prevent NCDs				
4.1 Infrastructure and systems to address NCDs strengthened				
At least four countries with established inventory system	8*			
4.2 National capacity development needs for NCD implementation identified				
At least 10 countries have assessed NCD workforce capacity needs	11**			

Program Goals/ Impacts/ Purpose/ Objectives and Verifiable Indicators	Results	Fiji	Tonga	Kiribati
4.3 Targeted training and professional placements provided to meet identified capacity needs				
Qualitative assessments shows evidence that training provided is effective and meeting identified capacity needs	11	-	-	-
4.4 Regional information sharing and networking on NCDs supported				
Regional meeting on NCDs held every two years	Annually	n.a.		
Qualitative assessment of the benefits/ coverage of regional NCD information and networking forums	Continue	n.a.		
Objective 5: To strengthen regional and country level M&E and surveillance systems				
5.1 Framework to monitor and assess regional progress in addressing NCDs established				
Framework to monitor and assess regional progress in addressing NCDs established	In place	n.a.		
5.2 Surveillance data on NCDs available to inform national planning and delivery				
At least 12 countries have published STEPS reports	12	✔	✔***	✔
At least four programs supported interventions assessed using mini-STEPS each year	14	✔	✔	✔
5.3 NCD surveillance systems established				
At least 12 countries undertaking routine surveillance of NCDs (e.g., diabetes, rheumatic heart diseases, cancer registries)	n.a.			
5.4 NCD research priorities identified and supported				
Regional research agenda for NCDs identified and supported	6	✔	✔	-

Note: *- no country name mentioned and the inventory is for pharmacy.
**- not all country names are mentioned.
***- published in November 2012

Source: 2-1-22 Pacific NCD Programme Draft Completion Report 2008-2012, 2012, SPC and survey results

The draft final report also draws the following lessons learned for the future program:

- NCD prevention and control activities were rather concentrated at the national level and in the urban areas.
- Secondary prevention needs to be strengthened.
- Health system strengthening should be considered more and integrated in supporting primary and secondary preventions.
- Effective interventions should be identified based on evidences.
- NCD committees are not sustainable in many countries; the multi-sector approach was rather weak.
- Regular and reliable screening or surveillance system should be established and integrated into the health information system to provide evidence for policy formulation.
- Although most of the activities could be done within the county, some should be done at the regional level.
- Inputs should be concentrated in accordance with evidence based approaches such as the Best Buys.
- To promote long term effectiveness of the interventions, youth should be enjoined.

(2) Interventions

Under the above framework, WHO supports the Pacific countries to introduce and implement interventions for NCD prevention and control which are effective in the limited resource settings.

WHO formulated a comprehensive guideline, entitled "Package of Essential Noncommunicable (PEN)" in 2010. Accounting to WHO, PEN is the minimum standard for NCDs to strengthen national capacity to integrate and scale up care of heart disease, stroke, cardiovascular risk, diabetes, cancer, asthma and chronic obstructive pulmonary disease in primary health care in low-resource settings. WHO has been supportive in introducing PEN to the Pacific countries. According to SPC[16], it was introduced in 10 countries (Fiji, Kiribati, Marshall Islands, Cook Islands,

[16] 2-1-22 Pacific NCD Programme Draft Completion Report 2008-2012, 2012, SPC

Vanuatu, Tonga, Federal State of Micronesia, Palau, Samoa and Solomon). Among those countries, five (underlined) have initiated the implementation. The support includes primary health facility assessments, community mobilization, development of tools for best practices training and supervision for delivery of integrated services at the grassroots level[17].

The Best Buys interventions are evidence-based and are not only highly cost-effective but also feasible and appropriate to implement in lower resource setting as shown in Table 3-3. WHO supports to promote the interventions in the Pacific countries.

Table 3-3 Best Buys Interventions

Risk Factor / Disease	Interventions
Tobacco use	- Tax increases - Smoke-free indoor workplaces and public places - Health information and warnings - Bans on tobacco advertising, promotion and sponsorship
Harmful alcohol use	- Tax increases - Restricted access to retailed alcohol - Bans on alcohol advertising
Unhealthy diet and physical inactivity	- Reduced salt intake in food - Replacement of trans fat with polyunsaturated fat - Public awareness through mass media on diet and physical activity
Cardiovascular disease (CVD) and diabetes	- Counseling and multi-drug therapy for people with a high risk of developing heart attacks and strokes (including those with established CVD) - Treatment of heart attacks with aspirin
Cancer	- Hepatitis B immunization to prevent liver cancer (already scaled up) - Screening and treatment of pre-cancerous lesions to prevent cervical cancer

Source: Global Status Report on NCD 2010, WHO, 2011

3.2 Overview of the Target Countries

Table 3-4 shows changes in some development indicators of the three target countries and the region in the Survey, and other health indicators are presented in Annex 4. Life expectancy at birth for both Fiji and Tonga is approximately 70 years old, however, percentages of elderly people (65 years old and above) in Fiji and Tonga are 4.8% and 5.9%, respectively. It may be said that these countries are still far from the aging society (more than 14% of total population are the age 65 and above) which NCD becomes a major burden. The three countries are classified under the lower-middle income countries by the World Bank according to Gross National Income (GNI) per capita, with the range of US$2,000 to US$3,600.

[17] Outlines of PEN intervention in each country is described in Chapter 4 (Fiji), 5 (Tonga) and 6 (Kiribati).

Table 3-4 Changes in the Main Development Indicators of the Three Target Countries and the Region

Indicator	Country／Year	1995	2000	2005	2010
Population, total (people)	Fiji	775,651	811,718	822,553	860,623
	Tonga	95,907	97,935	100,926	104,058
	Kiribati	77,248	84,010	91,988	99,546
	Pacific Islands Countries*1	2,679,269	2,781,946	3,050,860	3,363,010
Life expectancy at birth (years)	Fiji	66.6	67.6	68.5	69.2
	Tonga	70.1	70.8	71.5	72.2
	Kiribati	59.4	59.5	60.9	-
	Pacific Islands Countries	60.6	63.4	65.2	66.7
GNI per capita (current US$, Atlas Method*2)	Fiji	2,460	2,230	3,590	3,610
	Tonga	2,010	2,030	2,470	3,340
	Kiribati	1,160	1,380	1,780	2,010
	Pacific Islands Countries	1,389	1,408	1,950	2,751

Note： *1Fiji, Samoa, Kiribati, Solomon Islands, Marshals Islands, Tonga, Federated States of Micronesia, Tuvalu, Palau, and Vanuatu
*2A method used by the World Bank to estimate the size of the economy in term sof gross national income (GNI) in U.S dollars
Source： World Development Indicators, World Bank (accessed September 2012)

The main health indicators in three target countries are shown in Table 3-5. Under-five morality rate (U5MR) and adult mortality rate in Kiribati are higher compared to those in Fiji, Tonga, and the West Pacific Region. It probably contributes to lower life expectancy at birth of this country. Notably, tuberculosis (TB) prevalence in Kiribati is the highest in the Pacific Region. Many TB patients were reported in South Tarawa, a large and densely populated area.

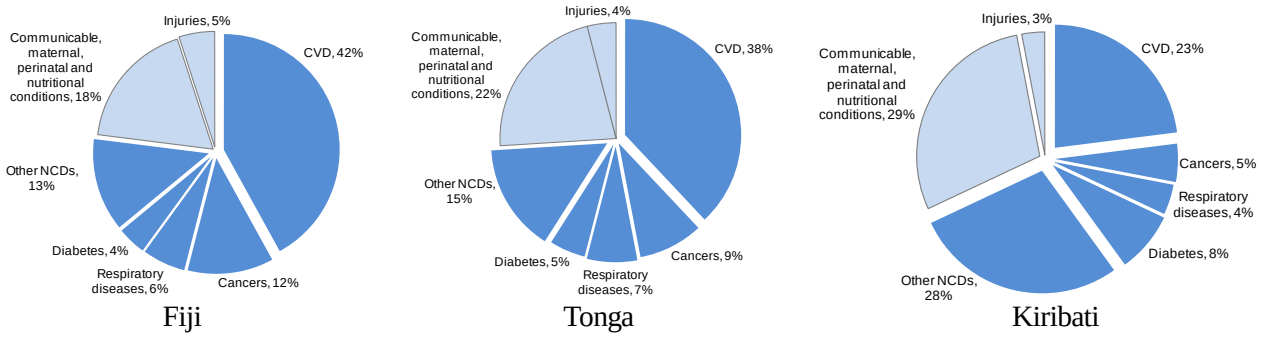
Table 3-5 Main Health Indicators in Three Target Countries (2010)

Main Indicators	Fiji	Tonga	Kiribati	WPRO
Under 5 Mortality Rate (per 1,000 live births)	17	16	49	19
Adult Mortality Rate (between 15-60 years per 1,000 population)	212	187	253	116
Maternal Mortality Ratio (per 100,000 live births)	26	110	NA	49
TB Prevalence Rate (per 100,000 population)	40	29	550	139

Note： Cells in red show the poorest indicators among the three countries.
Source: Country health profile, WHO (accessed August 2012)

3.2.1 NCD Situation in Fiji, Tonga and Kiribati

As shown in Figure 3-1, NCDs cases are estimated at around 70% in all three countries (Fiji 77%, Tonga 69%, and Kiribati 74%). CVD accounted for about 40% of deaths in Fiji and Kiribati.



Source： Country NCD profile, WHO (accessed August 2012)

Figure 3-1 Percentage of NCD (blue part) in the Total Deaths in the Target Three Countries (2010)

Table 3-6 presents the NCD situation in the target countries and the regional data in the Western Pacific Region. Percentages of metabolic risk factors, such as raised blood pressure, raised blood glucose, and obesity, are above the average in the West Pacific Region. Especially, 70% of Tongan women over 25 years old are overweight.

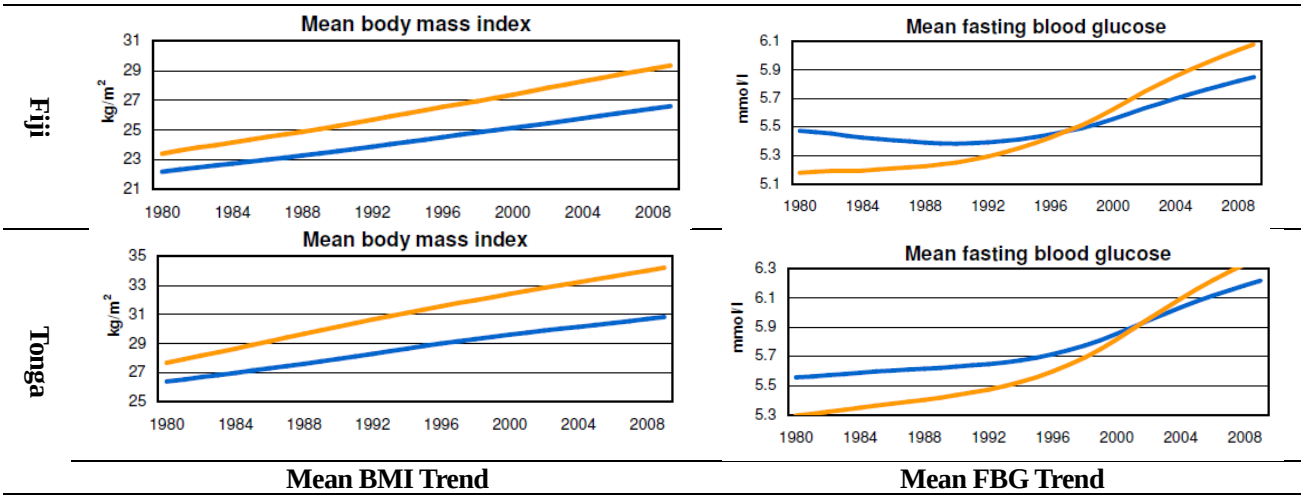
Table 3-6 NCD Situation in Three Target Countries (2010)

Item		Sex	Fiji	Tonga	Kiribati	WPRO average
Age-standardized death rate per 100,000 [1]	CVD and diabetes	Male	579.9	395.9	425.9	-
		Female	328.2	395.0	228.3	-
	Cancer	Male	106.2	67.4	39.0	-
		Female	121.6	93.9	64.2	-
	Chronic respiratory diseases	Male	91.1	68.8	61.8	-
		Female	44.2	53.2	19.1	-
NCD Deaths under age 70[2] (%)		Male	71.5	45.9	77.7	-
		Female	61.1	53.0	66.5	-
Metabolic Risk Factors (over 25 years) [1] (%)	Raised blood pressure	Male	32.5	34.1	39.1	28.7
		Female	29.7	27.0	28.7	23.7
	Raised blood glucose	Male	13.2	17.0	22.0	9.2
		Female	16.4	19.3	22.8	8.6
	Obesity	Male	21.3	49.1	37.7	5.1
		Female	42.2	70.3	53.8	6.8

Note： Cells in red show the poorest indicators among the three countries.

Source： [1]Country NCD profile, WHO (accessed August 2012),
[2]ICR of Pacific Regional 2-1-22 Non Communicable Diseases Program (Final Report)

Figure 3-2 shows the increasing trends in obesity and fasting blood glucose as metabolic risk factors in Fiji and Tonga. Notably, the mean body mass index (BMI) of Tongan women is already in the category of obesity. And comparing the fasting blood glucose (FBG) of male and female, the female's mean FBG has exceeded the male since 2000 in Fiji and 2004 in Tonga. However, there is no sex difference in mortalities of CVD and diabetes in Tonga, while a high percentage of men still die from CVD and diabetes in Fiji.



Note： Data is not available for Kiribati

Source： Country NCD profile, WHO (accessed August 2012)

Figure 3-2 Metabolic Risk Factors Trends in Fiji and Tonga 2011 (Orange: Female, Blue: Male)

Chapter 4 Situational Analysis in Fiji

4.1 NCDs Situation

As shown in Table 4-1, diseases of the circulatory system and endocrine, nutritional and metabolic diseases and immunity disorders occupy nearly half of the recorded deaths in 2011. Although the circulatory system diseases include not only NCDs, the most common causes of cardiovascular disease are congestive heart failure, essential hypertension and unstable angina.

Table 4-1 Major Causes of Mortality in 2011

Causes	Proportion Among All Deaths
Diseases of the Circulatory System	40.3%
Infection and Parasitic Diseases	10.0%
Endocrine, Nutritional and Metabolic Diseases and Immunity Disorders	9.3%
Disease of the Respiratory System	8.1%
Injury and Poisoning	6.4%

Source: MOH Annual Report 2011 (Draft) , November 2012

Admission rate of NCDs, amputation rate of diabetes sepsis and cancer mortality have been increasing since 2009. Data on the prevalence of diabetes and cancer were not taken since 2010 (Table 4-2). Sepsis and blindness are common complication of diabetes and 200 people die every year from kidney related diseases which may include diabetes complication.

Table 4-2 NCD Related Indicators for National Health Outcomes

Indicators	2009	2010	2011
Prevalence rate of diabetes (per 1,000 population)	18.4	-	-
Admission rate for diabetes and its complications, hypertension and cardiovascular diseases (per 1,000 admissions)	42.5	77.3	83.1
Amputation rate for diabetes sepsis (per 100 admission for diabetes and complications)	46.9	38.3	43.2
Cancer prevalence rate (per 1,000 population)	8.45	-	-
Cancer mortality (per 100,000 population)	73.9	68.6	80.7
Cardiovascular disease mortality rate (per 100,000 population)	205.5	282.0	239.17

Source: MOH Annual Report 2009
MOH Annual Repor2011 (Draft) , November 2012

Table 4-3 shows that NCD related deaths were around 3,000 in 2010 and 2011, and 67% of these were below the age of 70 years. Especially, deaths related to diabetes have been doubled.

Table 4-3 NCD Related Deaths in 2010 and 2011

Cause of Death	2010	2011
Acute Myocardial Infarction	343	180
Cancer	613	717
Diabetes	768	1,434
Hypertension	843	870
Kidney Disease	163	152
Stroke	203	135
Grand Total	**2,933**	**3,488**

Source: Presentation of Dr Shrish Acharya, CWM Hospital, May 31, 2012

MOH[18] is concerned with the alarming rate of diabetes on women, that majority of those diagnosed with diabetes are women within the age of 50-59 years.

Table 4-4 presents the major cancer sites in women and men. The main cancer sites in women are found in the cervix, breast, and uterus which includes the endometrial. As for men in 2011, most cancer sites are found in the liver, prostate, lung, and skin.

Table 4-4 Major Cancer Sites

Female			Male	
Age-standardized incidence per 100,000 person-years 2002-2005[1]		2011 (Number)[2]	Age-standardized incidence per 100,000 person-years 2002-2005[1]	
Cervix	50.7	233	Prostate	21.1
Breast	47.7	164	Lymphoid and Hematopoietic	12.5
Uterine	17.7	167	Liver	11.7
Ovary	13.3	22	Lungs	8.3

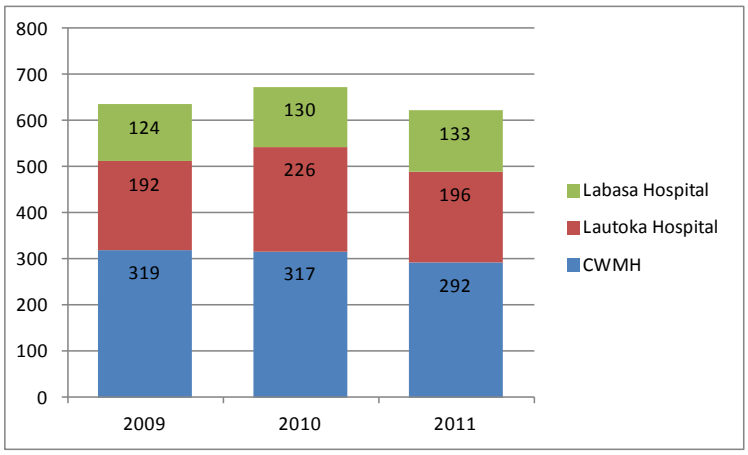
Source: 1 - Cancer Incidence in Four Pacific Countries: Tonga, Fiji Islands, Cook Islands and Niue, Sunia Foliaki et al., Pacific Health Dialog, March 2011, Vol 17, No.1
2 - MOH Annual Report 2011 (Draft) , November 2012

4.2 Burden of NCDs

Disability

The 2002 STEPS Survey[19] results showed that 16% of adults aged from 24 to 64 had diabetes. According to MOH 2009 Annual Report, patients at their reproductive age (15 to 64 years) are 80.7% of neoplasm cases, 73.7% of endocrine, nutritional and metabolic disease cases, and 63.7% of diseases of circulatory system cases.

According to 2007 census, 5,888 (1% of people aged 15 or more) were disabled. And around 70% to 90% with disabilities were caused by above-knee amputation (AKA). The number of disabled has increased from 3,117 in 1996. As shown in Figure 4-1, more than 600 amputations occurred annually in the past three years.



Source: MOH Health Information Unit, December 2012

Figure 4-1 Number of Amputations in the Divisional Hospitals in 2009, 2010 and 2011

Amputees' admissions in Tamavua Rehabilitation Hospital were 16 in 2004 and 37 in 2005 (Table 4-5). In 2008, among the 98 new admissions, there were 37 amputations and 38 paralysis cases, which were accounted as the

[18] MOH Annual Report 2011 (Draft)
[19] Refer to Section 4.3

largest number. Although 30% of the amputees obtained artificial limbs, many of them do not maximize its daily use but only for special occasions such as church services.

Table 4-5 Admission by Disability in Tamavua Rehabilitation Hospital, 2005

Disability	Number
Paraplegia	17
Tetraplegia	15
Hemiplegia	6
Above knee amputation (AKA)	7
Below knee amputation (BKA)	30
Traumatic Brain Injury	2
Fracture Neck of Femur	3
Total	**80**

Source: MOH Annual Report 2005

Costs

According to an estimation made by a CWMH doctor in 2012, cost for amputation per patient was around F$125,000 for surgery and admission with meals[20]. Cost of artificial limbs for below-knee amputation (BKA) is F$750 and for AKA is F$1,700. Since 2011, Fijians can be provided with the artificial limb free of charge.

In Fiji, medical services in government health facilities are basically free when you have a National Health Number (NHN). NHN is issued to almost all applicants including non-Fiji citizens and currently, is not strictly managed[21]. Therefore, the patients are not required to pay for the above mentioned surgery and admission cost as long as they have NHA except for some paid services such as special treatment and special wards. When chronic diseases are increasing, the financial burden of the government becomes bigger and longer.

Also, overseas referral could be another burden for the government. Cardiac diseases, cancer and kidney diseases are more than 50% (Table 4-6). Although focused data on NCD was not available, NCD related cases might be included.

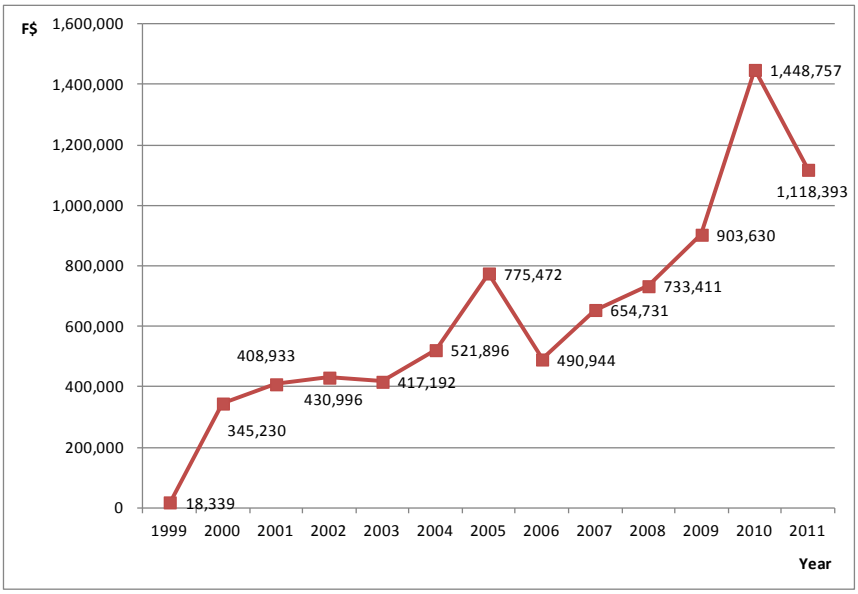
Table 4-6 Diagnosis of Overseas Referral Cases in 2009-2011

Cases	2009	2010	2011	Total
Cardiac	39 (47.5%)	45 (48%)	97 (47.8%)	181 (47.9%)
Cancer	14 (17%)	26 (28%)	50 (24.7%)	90 (23.9%)
Kidney	6 (7.3%)	2 (2%)	7 (3.4%)	15 (3.9%)
Knee/hip replacement	6 (7.3%)	11 (11.8%)	14 (6.9%)	31 (8.3%)
Tumor	8 (9.7%)	4 (4.3%)	0	12 (3.1%)
Eye	9 (10.9%)	5 (5.3%)	25 (12.3%)	39 (10.3%)
Others	0	0	10 (4.9%)	10 (2.6%)
Total	**82**	**93**	**203**	**378**

Source: MOH Annual Report 2011 (Draft) , November 2012

Figure 4-2 shows the trends of MOH expenditure for the overseas referral cases. In 2011, it was 1% of total MOH operational expenditure (F$118,887,100).

[20] Minor, intermediate or major surgery and 27 days (average length of stay) in general ward.
[21] According to MOH, the double acquisition and the abuse have been occurring.



Source: MOH Annual Report 2011 (Draft) , November 2012

Figure 4-2 Actual Committed Amount for Overseas Referrals from 1999 to 2011 (F$)

4.3 Major Surveys on NCD Risk Factors

The STEPS[22] survey done in 2002 and the 2004 National Nutrition Survey (NNS) were both used as reference for the risk factors of NCDs (Table 4-7). Another round of STEPS survey was conducted in 2010 and the report will be published in 2013 while the next NNS will be done in 2014.

Table 4-7 Major NCD Risk Factors Surveys

Survey	Data Collection	Report Published	Sampling	Target Ages	Samples	Next Survey
STEPS Survey	2002	-	Cluster sampling	15 to 64	6,763 (1% of target population)	2010 (the report will be published in 2013)
National Nutrition Survey	2004	2007	Cluster sampling	all, NCD risk factors were surveyed for age of 12 and more	7,372 in 1,696 households, (1% of total population)	2014

Source: Fiji Non-Communicable Diseases (NCD) STEPS Survey 2002, MOH (STEPS 2002)
2004 Fiji National Nutrition Survey Main Report, National Food and Nutrition Centre, September 2007 (FNNS 2004)

Other than the above, the Pacific Research Centre for Prevention of Obesity and NCD (C-POND) of the Fiji National University, College of Medicine, Nursing and Health Sciences (FNU-CMNHS) also plays an important role in NCD related surveys. It has research network with the ministries of health in seven countries like Tonga, Kiribati, Cock Islands, Solomon, and Samoa. C-POND has been analyzing large scale obesity survey conducted in Fiji, Tonga, Australia, and New Zealand from 2004 to 2009 and further collaborates with STEPS.

4.3.1 Behavioral Risk Factors

Table 4-8 shows that men are more at risks due to smoking and alcohol consumption while women are at risk due to insufficient physical activities. Vegetable and fruits consumption seem not to be enough in both men and women. NNS 2004 showed smoking (daily and non-daily) among youth (12-17 years old) has increased from 0.7% in 1993

[22] STEPwise approach to NCD Surveillance established and supported by WHO

to 4.7% in 2004. Kava consumption is an associated risk factor for smoking and alcohol drinking. According to the STEPS 2002, 57.6% of men and 27.4% of women were likely to smoke after kava consumption.

In terms of ethnicity[23], more i-Taukei (indigenous Fijian) people smoke tobacco on a non-daily basis but drink alcohol more frequently. They also consume less vegetables and fruits than Indo-Fijians.

Table 4-8 Behavioral Risk Factors

Risk Factors		1993*		2002**		2004*	
		Men	Women	Men	Women	Men	Women
Daily smoking		-	-	26.0	3.9	22.2	4.5
Current alcohol consumption	(past 12 months)	-	-	39.9	5.5	-	-
Binge or frequent alcohol drinking among the current alcohol consumption	***	93.3	88.2	79.5	58.6	95.5	98.2
Current kava consumption	(past 30 days)	55.7	15.7	88.6	63.1	63.9	31.2
Vegetable and fruits consumption	1 to 4 servings per day	-	-	70.8	72.3	-	-
	< 1 serving per day	-	-	26.3	26.5	-	-
Insufficient physical activity	Work	25.7	67.1	30.7	62.2	61.0	71.8
	Transport	-	-	12.3	17.6	-	-
	Leisure	-	-	66.7	86.6	34.2	68.7

Note***:Data of 2002, Male ≧5 units and Female ≧4 units per drinking day
> 5 days a week for 1993 and 2004

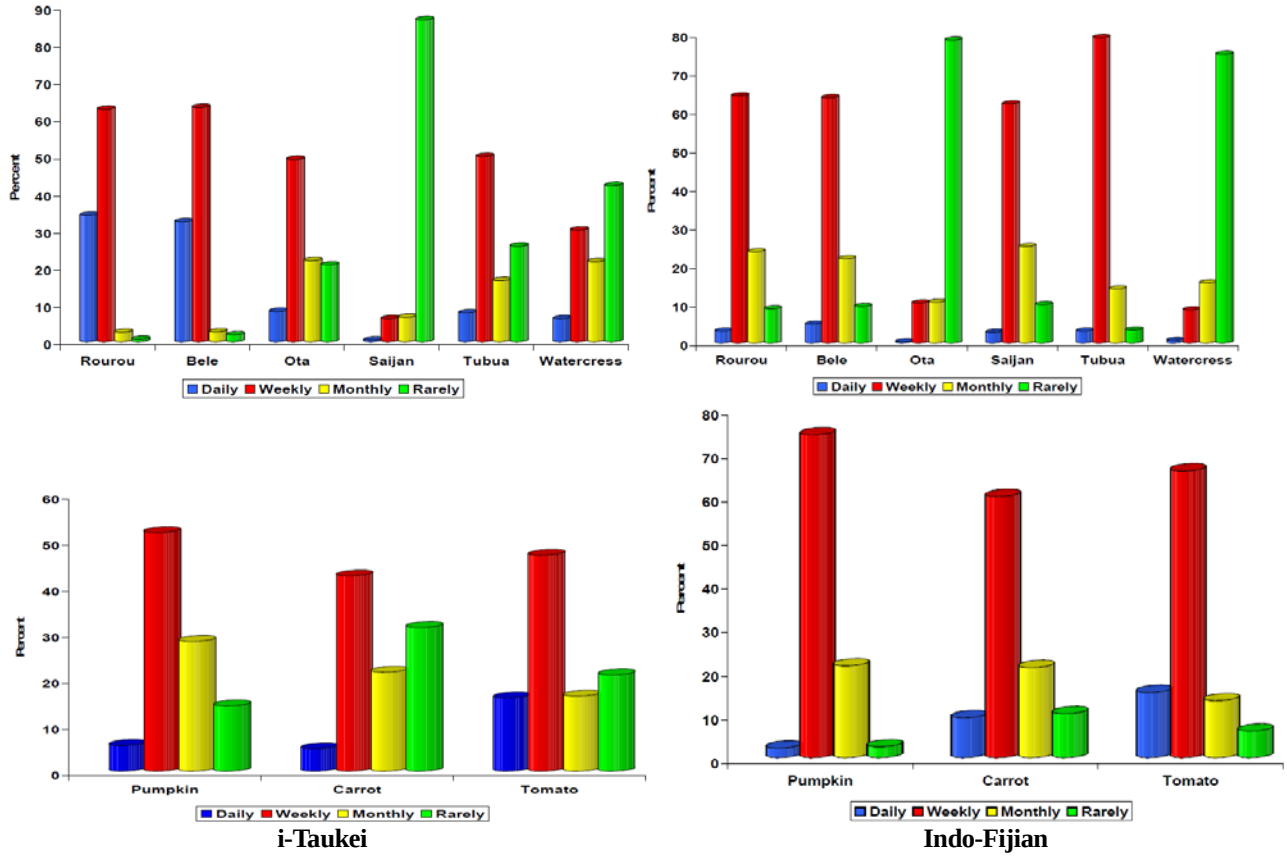
Source: *FNNS 2004, **STEPS 2002

Regarding diet pattern, FNNS 2004 pointed that in comparing with 1993 results, consumptions of animal protein, fat, sugar, and cereals were generally increased while fruits, vegetables and traditional starchy root crops consumptions were decreased. Regarding family food garden, 78% of the households have food garden, especially, it was 96.2% among rural households.

Figure 4-3 shows vegetable consumption of i-Taukei and Indo-Fijian people. Generally, Indo-Fijians consume different kinds of vegetables more frequently than i-Taukei people.

FNNS 2004 also showed that the most common source of health and nutrition information is through the radio at 49.1% in urban and 41.6% in rural areas. Health workers are also important source of health information for rural households (45.7%) while television is not common at 15.1% in urban and 3.4% in rural.

[23] According to 2007 Census, i-Taukei were 56.8%, Indo-Fijian were 37.5% and others were 5.7% in total population. Regarding religions which affect on diets, i-Taukei people are generally Christian and Indo-Fijians are Hindu or Muslim.



Source: FNNS 2004

Figure 4-3 Green Leafy Vegetables (Upper) and Red and Yellow Vegetables (Lower) Consumptions

4.3.2 Biomedical Risk Factors

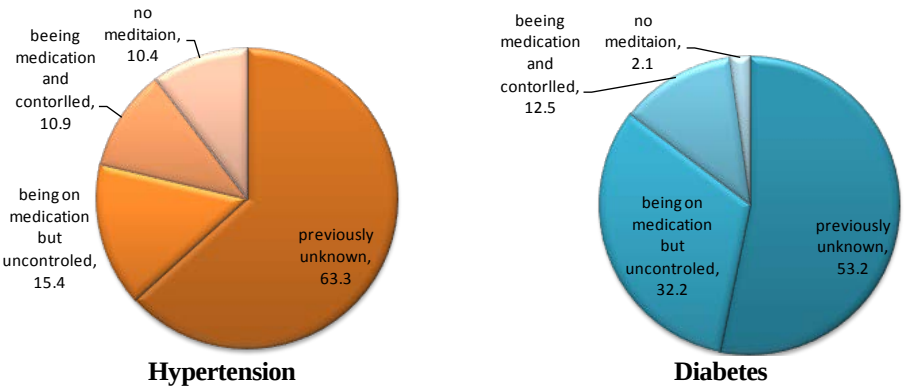
Table 4-9 shows that generally men have more biomedical risk factors than women except for obesity and waist-hip ratio.

Table 4-9 Biomedical Risk Factors (STEPS 2002)

Risk Factors		Men	Women
Total fasting cholesterol	≧5.2mmol/L	49.1	37.8
Triglycerides	e1.7mmol/L	29.6	23.3
HDL cholesterol	≦0.9mmol/L	30.9	35.3
Atherogenic dyslipidemia		19.4	15.9
Obesity	BMI ≧29.9	9.8	26.4
Waist-hip ratio	>1.0 men, >0.85 women	4.0	44.6
Hypertension	Systolic >139mmHG or diastolic >89mmHG	19.8	18.3
Diabetes	Fasting blood testing glucose ≧6.1mmol	14.6	17.6

Source: STEPS 2002

As shown in Figure 4-4, more than half of the hypertension and diabetes cases were known by the patient before diagnosis. Around 15.4% of patients experienced uncontrolled hypertension and 32.2% have uncontrolled diabetes. About 10% of hypertension patients do not take medication.

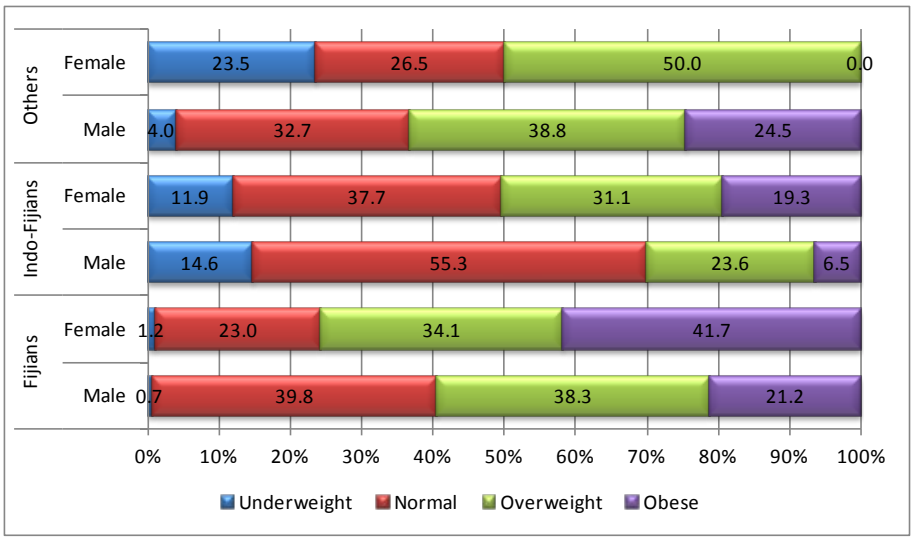


Source: STEPS 2002

Figure 4-4 Previous Diagnosis and Treatment Status of Identified Cases

Regarding the nutritional status, FNNS 2004 indicated that more than 10% of Indo-Fijians (14.6% of men and 11.9% of women) were underweight while i-Taukei people, especially 75.8% among women were overweight or obese (Figure 4-5).

As shown in Table 4-10, underweight cases generally decreased from 1993 to 2004, however, around 30% of Indo-Fijian children are still underweight. Percentage of overweight among Indo-Fijian children is almost doubled. More than 20% of i-Taukei girls are overweight.



Source: FNNS 2004

Figure 4-5 Health Status of Adults Assessed by BMI by Ethnicity and Gender

Table 4-10 Children: 10-17 Age Weight for Age

		Underweight (<80%)		Overweight (>120%)	
		1993	2004	1993	2004
i-Taukei	Boys	18.5	11.3	7.3	11.0
	Girls	12.0	7.0	13.4	21.9
Indo-Fijian	Boys	57.6	31.8	2.9	13.0
	Girls	45.4	31.0	4.0	10.2

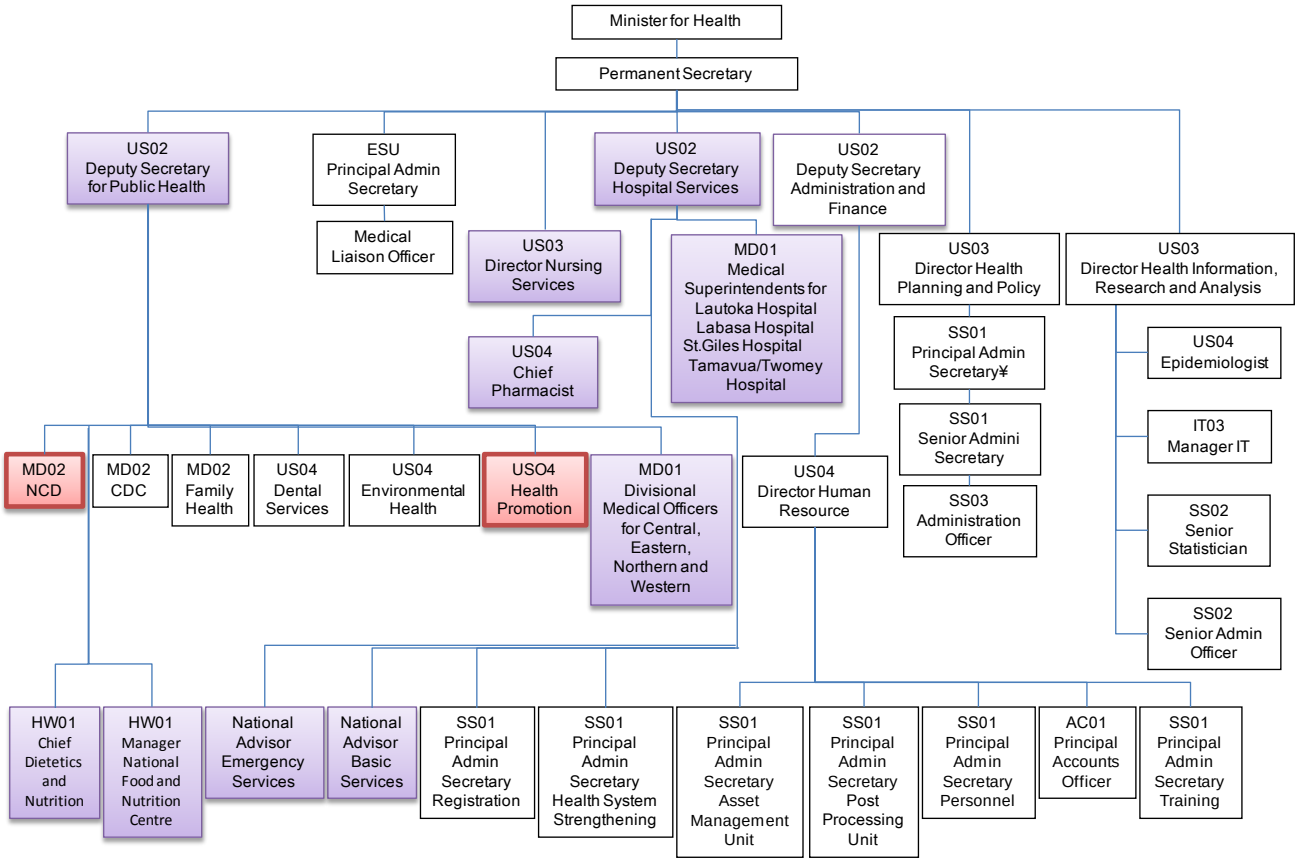
Source: FNNS 2004

4.4 Organizational Arrangement for NCD Prevention and Control

The first national survey on NCDs (the main focus was diabetes) was conducted in 1980 and after the survey, the National Diabetes Centre[24] was established and a national NCD Taskforce was formed in 1991. Then, Fiji adopted the Healthy Islands concept as the unifying theme for health promotion.

Currently, the National Non-Communicable Diseases Programme/Unit is responsible for the planning, coordinating and implementing various activities of the NCD Prevention and Control National Strategic Plan 2010-2014 and the MOH NCD Prevention and Control Strategic Plan 2010-2014. The unit coordinates these activities to the national level and works with the divisions and subdivisions in striving to achieve the goals and objectives of the program.

In the MOH structure shown in Figure 4-6, the colored posts represent strong concern to NCD prevention and control. Especially, the Deputy Secretary Public Health, the National Advisor NCD, and the National Advisor Health Promotion are responsible for the primary prevention and screening coordinated by the National Wellness Center[25].



Note: The colored posts are concerned about to NCD prevention and control.

Source: MOH Annual Report 2011 (Draft), November 2012

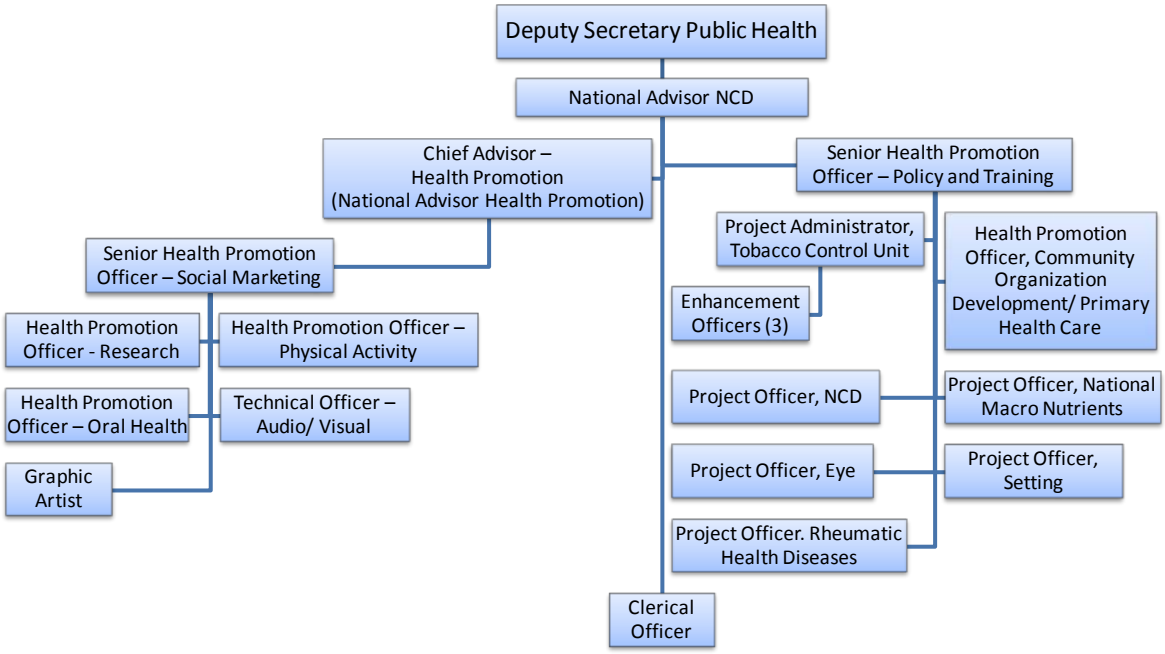
Figure 4-6 Organizational Structure of MOH

The Center was established based on the National Health Promotion Centre taking healthy setting approaches. As shown in Figure 4-7, the National Wellness Center is responsible not only for NCD but also the prevention of

[24] Currently, Diabetes Hub in Suva

[25] Its establishment was approved at the National Health Executive Committee (NHEC) and to be officially launched in 2013.

communicable diseases through awareness campaign, health education, environmental health, and other relevant activities.



Source: National Wellness Centre, MOH, November 2012

Figure 4-7 Organizational Structure of the National Wellness Centre

4.5 Analysis used Health System Strengthening (HSS) Six Blocks for NCDs

4.5.1 Governance and Leadership

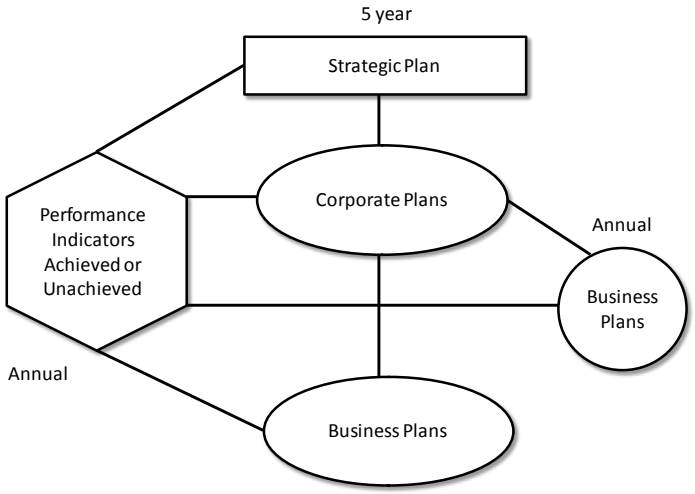
(1) Decentralization and Recentralization

In Fiji, the health system reform has been taken seriously since 1999. It mainly aimed to a) decentralize the Ministry's management operations, b) improve the management capacity in the central office and in the divisions, and c) strengthen specific aspects of the Ministry's management systems, that include updating health legislation, developing management and health information systems, enhancing planning and policy capacity, formulating standards and guidelines for management, and improving asset management and maintenance systems. However, in 2008, the decentralization reform was reversed. The health system was recentralized and the divisional management structures were reverted to its prior form. It was due to the higher cost of the decentralized structure and a belief that recentralization of power would improve the efficiency of the services. There are four divisional health services namely; Central (mainly covers Eastern part of Viti Levu Island including Suva), Eastern (covers islands area which spreads to the east of Viti Levu Island), Western (mainly covers Western part of Viti Levu Island including Nadi), and Northern (mainly covers Vanua Levu Island) which aim to provide and supervise health services in subdivisions.

(2) Development Plans

The Ministry of Finance and National Planning (MOFNP) formulated the 20-Year Development Plan 2001-2020. As recognized in the plan, there is an increase in the number of NCDs cases and downward trend of life expectancy (during 1986-1996) associated with NCDs probably. MOFNP mentioned that the National Centre for Health Promotion and National Health Promotion Council have been established to coordinate and promote health improvement activities.

The short-term strategic development plan (2007-2011) ended last year but during the validity term of the plan, NOFNP formulated the Roadmap for Democracy and Sustainable Social-Economic Development (RDSSED) 2009-2014. This document stated that NCD continues to be the major cause of morbidity and mortality and controlling diabetes and CVD remains a priority focus of MOH. The Fiji government is fully committed to safeguarding for the people's health, and MOH has developed its own Strategic Plan 2011-2015 parallel to the RDSSED. The planning cycle of MOH is shown in Figure 4-8.



Source： Strategic Plan 2011-2015, MOH

Figure 4-8 Planning Cycle

As shown in Table 3-4, NCDs reduction is mentioned as the first primary outcome in the MOH strategic plan.

Table 4-11 MOH Strategic Plan 2011-2015

Strategic Goals	Outcomes
1. Communities are served adequate primary and preventive services thereby protecting, promoting and supporting their well being (through localized community care) 2. Communities have access to effective, efficient and quality clinical health care and rehabilitation services 3. Health system strengthening is undertaken at all levels in MOH	1. Reduced burden of Non-Communicable Diseases
	2. Begun to reverse spread of HIV/AIDS and preventing, controlling or eliminating other communicable diseases
	3. Improved family health and reduced maternal morbidity and mortality
	4. Improved child health and reduced child morbidity and mortality
	5. Improved adolescent health and reduced adolescent morbidity and mortality
	6. Improved mental health care
	7. Improved environmental health through safe water and sanitation

Source: Strategic Plan 2011-2015, MOH

At present, the Government of Fiji is implementing Non-Communicable Diseases Prevention and Control National Strategic Plan 2010-2014 as a succession to the NCD Strategic Plan 2004-2008 (Table 4-12).

Table 4-12 NCDs Prevention and Control National Strategic Plan 2010-2014

Goal：	Fiji with a healthy lifestyle population
Aim：	Improve Fiji National NCD status by 5% in 2014
Objectives： By 2104	・ Reduce the prevalence of common risk factors by 5% ・ Reduce the prevalence of intermediate risk factors by 5% ・ Reduce the prevalence of major NCDs in Fiji by 5% ・ Improve early detection and 3M[26] management of NCDs in 80% of primary health care Facilities ・ Improve 3M management of NCD admissions in 80% of sub divisional and divisional hospitals in Fiji

Source： NCDs Prevention and Control National Strategic Plan 2010-2014, Government of Fiji

Under the national strategic plan, MOH is responsible in the implementation of the NCDs Prevention and Control Strategic Plan 2010-2014. These plans adopted 3M approach[27] towards the implementation of a comprehensive prevention and management of NCDs. Towards achieving the goal, aim, and objectives above, these strategic plans set intervention methods and indicators for each modifiable behavioral risk factor (smoking, nutrition, alcohol and physical activity), each NCD (diabetes, CVD and cancer), by age, by place (environment, lifestyle and clinical), guideline for reference, annual budget, and so forth.

The Annual Corporate Plan 2013 will be organized according to the six health system strengthening blocks and NCD related strategies will be included in the service delivery block (Table4-13).

Table 4-13 NCD Related Strategies in Draft Annual Corporate Plan 2013

Output	Strategy	Indicators	Budget	Resp.
Population Wellness Promotion - Public Health	Systematic mainstreaming of the Wellness approach into public awareness and promotions.	- 2 health facilities per division be declared wellness centres (8 /2013)	F$100,000	NA NCD PH EH
	To advocate for the empowerment of the communities and settings towards Wellness.	- 2 schools per division be declared wellness settings (8/2013)	F$100,000	NA NCD PH EH
NCD Prevention and Control	Strengthen prevention of diabetes, hypertension and other NCD's.	- 80% of all health facilities(health centres / nursing stations) in each division will be trained and issued a NCD Toolkit	F$300,000	NA NCD
	Upgrade SOPD facilities and standard treatment guidelines to improve management of NCDs.	- 10 sub- divisions are assessed per year, for multidisciplinary level approach to management of NCDs at SOPD's - Improve control of diabetes and hypertension	F$100,000 F$100,000	NA NCD PH
	Strengthening Mental Health services through Primary Health Care.	- 5% reduction in the number of mental health readmission (62) - Establish regular mental health wellness clinics in Sub Divisions	F$100,000	PH CSN

Note: NA NCD= National Advisor for NCD, PH= Public Health Division, EH= Environmental Health Division, CSN= Clinical Service Network
Source: Draft MOH Annual Corporate Plan 2013, November 2013

4.5.2 Health Service Delivery

(1) Health Service Providers

1) Overview

Table 4-14 shows the list of government health facilities. In general, preventive and home cares are provided at level A to B health centre, and patient in need of clinical treatment is referred to the hospitals. The Colonial War

[26] Integrated approach by muscle, mouth and medicine.
[27] 3M, mouth, muscle and medicine, means every stakeholders and every measures for NCD prevention and control.

Memorial Hospital (CWMH) functions as the national referral hospital. MOH referred some special cases to Australia and New Zealand for overseas medical treatment.

Table 4-14 Government Health Facilities in Fiji

Health Facility	Central	Western	Northern	Eastern	Total
Specialized Hospitals/ National Referral.	3*	0	0	0	3
Divisional Hospital	1**	1	1	0	3
Sub divisional Hospital [level 1]	0	3	1	-	4
Sub divisional Hospital [level2]	4	2	2	5	13
Health Centre [level A]	7	4	1	0	12
Health Centre [level B]	2	4	3	1	10
Health Centre [Level C]	11	17	16	14	58
Nursing Stations	20	25	21	30	96
Private Hospital***	2	1	0	0	3
Total	**50**	**58**	**43**	**51**	**202**

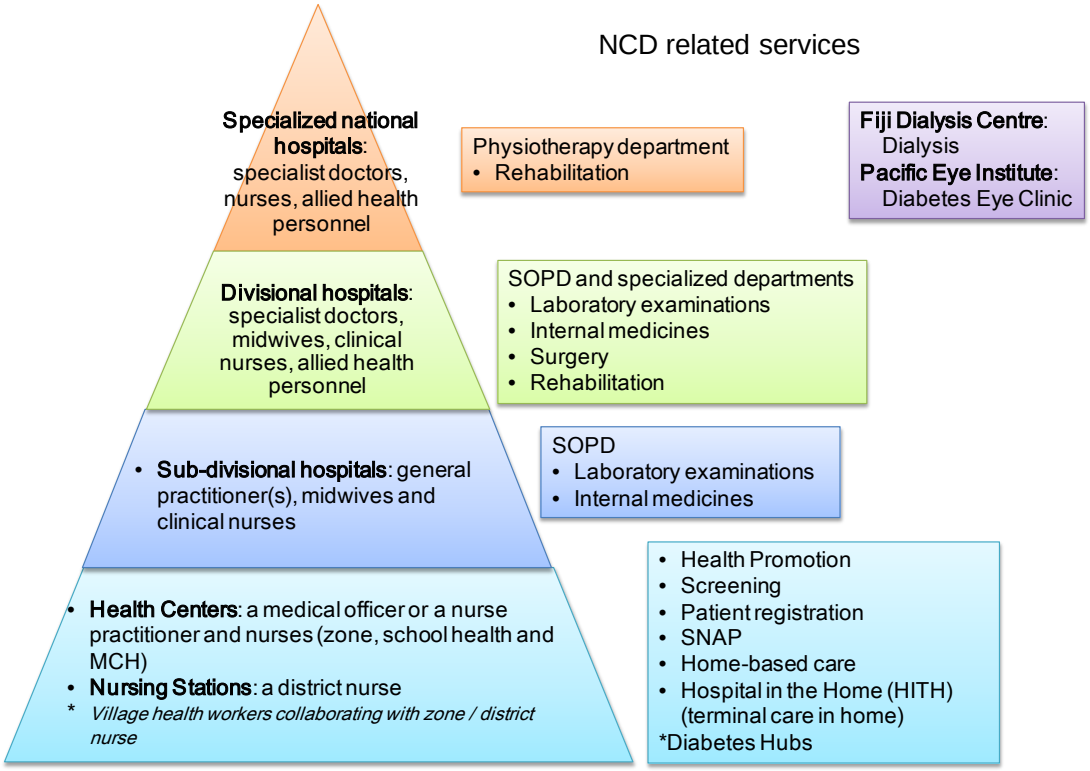
Note: *Specialized Hospitals are Tamavua Rehabilitation Hospital, St Giles Psychiatric Hospital and PJ Twomey Hospital (tuberculosis and leprosy)
**CWMH in Central Division is also the national referral
***Ra Maternity Unit (Hospital) is co-financed and staffed by MOH and supervised by Western Health Service.
Source: Health Service Delivery Profile, Fiji, 2012, WHO and MOH, 2012

Emergency transportation services are under the responsibility of the National Fire Authority. The St. John's Ambulance Service provides services in some areas. There are 130 private general practitioners registered in Fiji providing primary health care mainly in urban areas and the Suva Private Hospital and some medical centers in Nadi provide both outpatient and inpatient care services.

Figure 4-9 shows the service delivery structure. Regarding NCDs, health promotion, screening, patient education, foot care for patient with diabetes, and home based care support are provided at the primary level. Diabetes Hubs in Suva, Lautoka, and Labasa are basically under the public health division though these are located within the divisional hospitals. The hubs provide one-stop services mainly for newly diagnosed patients and patients who are in difficulty controlling blood glucose level.

Basic laboratory examinations and internal medicine are provided in the Special Outpatient Department (SOPD) at the secondary level. Then, the patients who need advanced examination or medication will be referred to the tertiary level. In CWMH, advanced examinations and treatments are provided. There is a separate septic theatre operating seven days a week to perform an amputation. Few patients from neighboring countries such as Kiribati, Solomon, and Tuvalu come to the said hospital for CT scan and surgical treatment. Guidelines on NCD diagnosis and treatment are used for cardiovascular diseases and diabetes. Emergency drug guidelines provides initial response in emergency situation and medication for cardiac arrest, cardiogenic shock, unstable angina, acute myocardial infarction, hypertensive emergency diabetic ketoacidosis, hyperosmolar, and hyperglycaemic state.

Rehabilitation services are provided at the physiotherapy units in three divisional hospitals and the special hospital in Suva. Generally, after the patients completed medications in these health facilities, they are referred back to their nearest health centers or nursing stations for home-based care and Hospital in the Home (HITH), i.e., terminal care for cancer patients at home.



Source: Prepared by the Survey Team based on Health Service Delivery Profile, Fiji, 2012, WHO and MOH, 2012 and field survey results

Figure 4-9 Service Delivery Structure and NCD-related Services

Rehabilitation is provided mainly in physiotherapy department (Figure 4-10) in the divisional hospitals and Tamavua Rehabilitation Hospital both for in-patients and out- patients.

Tamavua Hospital

Labasa Hospital

CWMH

Figure 4-10 Physiotherapy Facilities

2) Specialized Services in the Private Sector

Dialysis is provided in Fiji Dialysis Centre with eight dialysis machines which opened in March 2008 by Fiji Kidney Foundation[28]. The centre can serve for about 14 patients per day. The patients are required to pay around F$255 per session and undergo dialysis three times per week. According to Migration Review Tribunal Australia MRT Research Response October 2009, half of the patients were foreigners (majority were former Fijian residences) and the rest were mainly Fiji nationals with health insurance. In May 2012, the 40K Dialysis Centre

[28] The foundation was established through a donation coming from the governments of Fiji and India in May 2003.

was opened in the private medical center in Nadi. The cost per session is F$250. As of December 2012, 13 patients were receiving the services[29].

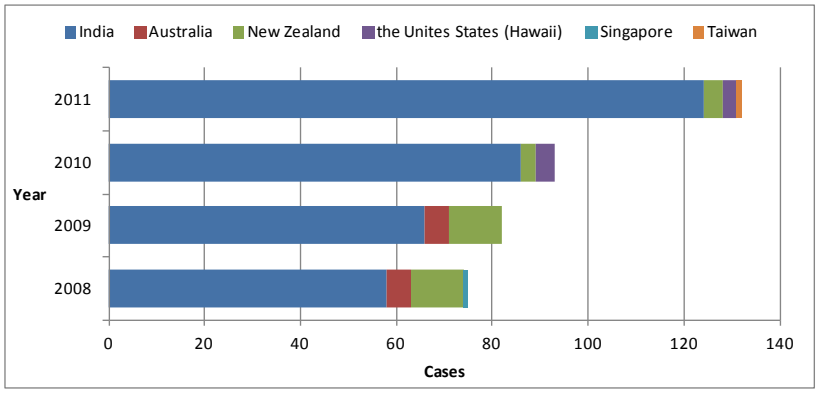
Diabetic Eye Clinic in Pacific Eye Institute (PEI)[30] provides free services. In 2010, there were 5,155 patients served and 2,676 surgical procedures including 545 laser procedures performed. PEI offers training courses for health personnel such as postgraduate certificate in diabetes eye care.

3) Specialized Services from Overseas

Specialized clinical service providers from Australia, New Zealand, and the United States visit Fiji for advanced medical services on cardiac, pediatric, ENT, urology, ophthalmology, etc. Nine (9) teams visited Fiji during 2010.

4) Overseas Referral

Patients who cannot have diagnostic and/or treatment interventions in Fiji or cannot be treated by visiting team can be considered for overseas referral[31]. The patients also need to have prognosis of a healthy life for at least three to five years following the treatment. The patients are assisted mainly for treatment costs and some sponsored their airfares. As described in Section 4.2, overseas referral cases have been increasing. As shown in Figure 4-11, most of the cases go to India as treatment costs are lower. According to CWMH, most of NCD cases referred overseas are cancer, kidney transplant and cardiac diseases.



Source: Administration, MOH, November 2012

Figure 4-11 Countries to be Referred from 2008 to 2011

(2) Users of Health Services

Several interviewees of the field survey have been facing challenges on the behavior change of patients such as medication compliance and change of diet pattern. They pointed that, particularly in remote islands, even patients with complication of NCD tend to be reluctant to have treatment due to fears on the high cost of transportation, family member attendance and medical treatment, and then most of the cases resulted in blindness and amputation of lower and upper limbs. Especially, the poor[32] relies on traditional medicines and stop taking medication without any advice from the doctor. Stock out of medicines in the health facilities also contribute to medication termination or noncompliance, i.e., interval of accessing health care of chronic disease patients are rather long and if there are

[29] According to relevant reports by FKF and medias, these dialysis centers seem to be more focused on medical tourism.
[30] The institute was established by the Fred Hollows Foundation New Zealand in 2006
[31] However, chronic conditions including renal failure and advanced cancer are basically excluded.
[32] According to the estimate of Fiji Statistics Bureau, the poor were 35.2% in 2008-2009.

no medicines at their visit, they stop taking it until the medicines are available in their next visit, a month later. Therefore, it may cause the patient's blood glucose level uncontrollable or complications get worse.

In Central Division, there is an ongoing pilot activity to enhance awareness raising and behavior change at community level in collaboration with local police. The coverage area of the local police is smaller as compared to the zone nurse. Furthermore, the relationship between the police and the community is deeper than the nurse. It is expected that the relevant activities could be more effective when the health office have the cooperation of the local police. Also, peer educator system among diabetes patients will be initiated under this pilot acivity.

4.5.3 Health Workforce

(1) Overview

Table 4-15 shows the status of staff establishment in 2011. Most human resource for health (HRH) has been trained in Fiji, and the Fiji National University accepts students from neighboring countries in the Pacific Region.

Table 4-15 Staff Establishment Status (2011)

Cadres [grade]	Approved No.	No. Filled	No. Vacant	Vacancy rate
Medical Officers [MD01 - MD06]	425	353	72	16.9%
Medical Assistants [MD07]	9	6	3	33.3%
Nursing [NU01 – NU06]	2,056	1,941	115	5.6%
Orderlies [NU07 – NU08]	71	58	13	18.3%
Dental Officers [DE01- DE03]	51	49	2	3.9%
Para-Dental [DE03 – DE04]	150	132	18	12.0%
Laboratory Technicians [HW02 – HW07]	130	121	9	6.9%
Radiographers [HW02 – HW06]	67	60	7	10.4%
Lab/X-ray Assts [HW06]	10	7	3	30.0%
Physiotherapists [HW02 – HW06]	35	34	1	2.9%
Dieticians [HW01 – HW06]	56	46	10	17.9%
Pharmacists [PH01 –PH05]	86	62	24	27.9%
Environmental Health [HW01 – HW06]	119	111	8	6.7%
Administrative Staff [SS01 – SS05]	162	122	40	24.7%
Accounting Staff [AC01 – AC04]	20	15	5	25.0%
Secretary/Typist [SS03 – SS05]	52	36	16	30.8%
Telephone Operator [SS05]	10	8	2	20.0%
Statisticians [SS02 – SS05]	13	9	4	30.8%
Information Technology Staff [IT03 – IT07]	9	6	3	33.3%
Stores Officers [SK01 – SK05]	31	21	10	32.3%
Upper Salaried Staff [US01-US04 & HR02]	17	13	4	23.5%
Bio-Medical Staff [ES02 – ES06]	10	5	5	50.0%
Other Classifications*	41	21	20	48.8%
Established Staffs Total	**3,630**	**3,236**	**394**	**10.9%**
Government Wage Earner (GWE) Staffs Total	1,294	849	445	34.4%
OVERALL TOTAL	**4,924**	**4,085**	**839**	**17.0%**

* Other Classifications include HR/US [HQ], SS [Info. Officers], Librarians [IR], TG Cadre, Bio-Med [ES] & Other, HW [Welfare Officers, National Emergency Coordinator, Orthotist, Research Assistant]

Source: Draft Annual Report 2011, MOH

Insufficient human resources have been a serious issue in MOH especially after the reduction of the retirement age from 60 to 55 in 2009. MOH lost approximately 331 experienced staff including 15 doctors and 97 nurses. Medical,

nursing and allied health professionals employed by the public sector in Fiji are eligible for a 'country allowance' if they work in a rural area. Doctors are also offered an on-call allowance if they work in a rural or remote area. In these locations, housing is also provided. Public and private sector doctors are allowed to undertake locum work, with some working up to 20 hours per week in the hospitals. Despite of such efforts, one of the most significant issues facing Fiji's health workforce is the emigration of skilled health professionals from the public sector to the private sector, tourism operations or other countries in the region.

Fiji has a National Health Workforce Plan - 1997-2012. The plan is not yet fully implemented due to resource constraints and has been under review for some time. According to the MOH Strategic Plan 2011-2015, staff retention is a major challenge and to be tackled by capacity building across all levels, and also increasing the intake of allied health students enrolled in the university.

(2) Health Workforce for NCD

Regarding NCD, as there is no local formal education opportunity[33] to become specialist doctors, registered specialist doctors had been trained overseas. MOH is working on the modification of the curriculum of the Fiji National University to be more relevant in order to produce more qualified workforces.

According to the situational analysis done by the Fiji School of Medicine, there are a number of Fijian doctors registered as specialists in Fiji Medical and Dental Council; seven are specialized in cardiology, six in ophthalmology, three in pathology, and three in radiology.

CWMH has three consultants and nine senior registrars with special interest in cardiology (2), nephrology (1), gastroenterology (4), and neurology (2). There are specialized nurses in cardiology, gastroenterology (endoscopy) and nephrology.

Nurses who are responsible for NCD prevention (primary to tertiary) are no exception. In the community, they are working in cooperation with village health workers to provide awareness campaigns, screening, and home based care. In hospitals, especially at the tertiary level, nurses are also required to have specialization to care for NCD patients. MOH is trying to provide specialization trainings for clinical nurses. Currently, CWMH has nurses working with special interests in cardiology, gastroenterology (endoscopy), nephrology, echo, and theatre.

Allied health personnel are also inadequate. The Survey Team observed that there is only one physiotherapist in Labasa and Tamavua[34] hospitals. And only one prosthetist is in the Tamavua Hospital in Fiji. In response to the increasing number of the disabled and rehabilitation needs, Community Rehabilitation Assistants (CRAs) were graduated in 2011 following to the first graduates about ten years ago. However, most of the positions have not been established and the curriculum still focuses on child disability.

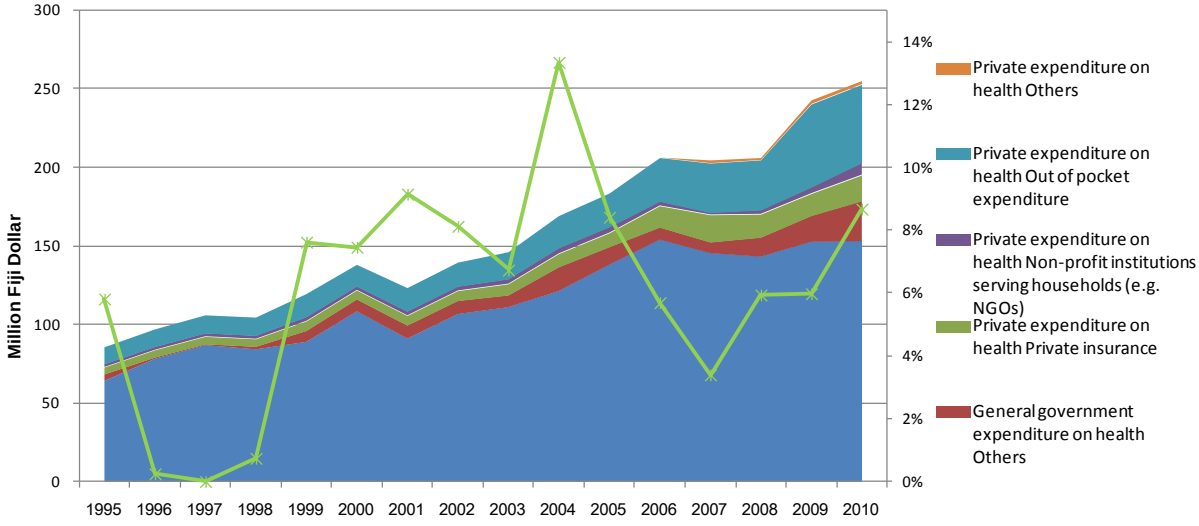
Continuous professional education opportunities are being utilized to upgrade knowledge and skills of these health workforces and various short-term trainings were conducted on NCD related topics such as foot care by various training providers such as MOH, local, and overseas partners.

[33] Pacific Open Health Learning Network (PHOLN) provides diabetes self-paced course in 2012.
[34] A Japan Overseas Cooperation Volunteer (JOCV) in physiotherapy is dispatched to assist the physiotherapist.

Not only quantity but also quality of such health personnel for NCDs needs further improvement. Although the Diabetes Hubs were established, the one in Labasa was temporally closed because there were no physicians available. In Suva, currently, only one doctor worked with some nurses. Some doctors, nurses, and allied personnel trained overseas left their workplace or the country for better working condition. Some nurses who received foot care training in 2011 transferred to other workplace therefore, foot care services cannot be provided in some health centers.

4.5.4 Health Financing

The total health expenditure trend during 1995-2010 suggested that the general government expenditure and private expenditure are keeping 70%-80% and 30%-20%, respectively. The external funding resources as percentage of total health expenditure shows a slight increase in trend from 5.8% in 1995 to 8.7% in 2010 (Figure 4-12). According to the 2013 Budget Speech, MOH budget will be increased by 7.3% (F$167 million.)



Source: Based on WHO Global Health Expenditure Database (accessed 15 Oct 2012)

Figure 4-12 Total Health Expenditure in Fiji, 1995-2010

As shown in Table 4-16, expenditure exceeded the revenue in the past three years. The revenue drastically decreased because of the decline in the state revenue. Each department, divisional health office, and hospital of MOH requested their respective budgets, however, the allocation of budget was not performance-based. The development partner usually supports in the shortage of funds in response to MOH request[35].

[35] Undisbursed budget can be also allocated to cover a deficit.

Table 4-16 Receipts and Expenditure in 2009, 2010 and 2011[36] (F$)

	2009	2010	2011		
RECEIPTS					
State Revenue					
Operating Revenue	3,292,242	585,771	1,539,198		
Total State Revenue	**3,292,242**	**585,771**	**1,539,198**		
Agency Revenue					
Health Fumigation & Quarantine	148,133	191,412	1,564,660		
Hospital Fees	766,408	1,020,470	1,743,889		
License & Others	0	527,769	1,025,088		
Fiji School of Nursing	673,774	405,966	299,095		
Total Agency Revenue	**1,588,315**	**2,145,167**	**4,632,732**		
TOTAL RECEIPTS	**4,880,557**	**2,731,388**	**6,171,775**		
EXPENDITURE			**Budget**	**Actual Expenditure**	**Lapsed Appropriation**
Operating Costs					
Established Staff	72,009,535	71,249,021	61,835,100	72,989,484	-11,154,384
Government Wage Earners	14,982,759	12,617,553	9,571,089	12,909,145	-3,338,056
Travel &Communications	3,296,804	3,292,880	3,483,348	3,408,206	75,142
Maintenance & Operations	9,001,340	9,992,150	10,654,287	10,465,683	188,604
Purchase of Goods & Services	24,800,646	25,678,965	25,699,824	27,161,305	-1,461,481
Operating Grants & Transfers	22,949,312	6,286,607	865,377	535,273	330,104
Special Expenditure	2,835,545	3,635,770	5,861,973	4,590,805	1,271,168
Total Operating Costs	**149,875,941**	**132,752,946**	**117,970,998**	**132,059,991**	**-14,088,993**
Capital Expenditure					
Capital Construction	5,698,306	5,044,490	5,306,274	5,275,078	31,196
Capital Purchase	17,268,994	6,580,228	5,802,676	5,861,255	-58,579
Capital Grants & Transfers	1,555,199	200,000	0	0	0
Total Capital Expenditure	**24,522,499**	**11,824,718**	**11,108,950**	**11,136,334**	**-27,384**
Value Added Tax	6,386,120	9,252,515	8,368,451	6,587,707	1,780,744
TOTAL EXPENDITURE	**180,784,560**	**153,830,178**	**137,448,399**	**149,784,032**	**-12,335,633**

Note: Figures were cited as those in the sources.

Source: Annual Report 2010 and Draft Annual Report 2011, MOH

The MOH NCDs Prevention and Control Strategic Plan 2010-2014 requires an annual budget of F$500,000. According to the Budget Estimate 2012 presenting actual expenditure in 2011, the expenditures for NCD programs is shown in Table 4-17. The total was 0.9% of the MOH expenditure in 2011.

Table 4-17 NCD Related Expenditure in 2011

Explanation		Amount
Special Expenditure for policy and administration	Support for NCD programme	F$368,121
Purchases of goods and services for public health services	NCD prevention and control	F$400,000
	NCD Best Buys	F$400,000
Special expenditure for public health services	Community Rehabilitation Assistance Programme	F$90,000
	Cardiac diseases programme	F$40,000
	Oncology and Cancer programme	F$40,000
Total		**F$1,338,121**

Source: Fiji Budget Estimate 2012, the government of Fiji

In 2012, although same amount was allocated to NCD prevention and control and NCD Best Buys (F$400,000 each), around 32% of NCD Best Buys budget was not disbursed at the end of October 2012.

[36] Fiscal year of Fiji is from January to December.

4.5.5 Medicines and Technology

(1) Medicines

There are 444 medicines in the essential medicine list of Fiji. The Fiji Pharmaceutical and Biomedical Supplies Centre (FPBSC) provides five core services which are i) logistics function of MOH on pharmaceutical, ii) medical and biomedical supply for government health facilities, iii) procurement, iv) warehouse and distribution, and v) production of medicines, clinical and biomedical products, from their centre with an average of F$15 million budget annually.

Although there are five pharmaceutical industries in Fiji, FPBSC imports all medicines and medical supplies mainly from India[37], Australia and New Zealand as the current legislations on procurement anticipate import through intermediate agents. The legislations and procurement system are considered to be modified to make direct procurement possible and to encourage local industries to enter.

Generally, the distribution is made upon the request of each health facility. The medicines and supplies are delivered bi-weekly or monthly to divisional hospitals; monthly, bi-monthly, or quarterly to sub-divisional hospitals; bi-monthly, or quarterly to health centers (level A[38]); and quarterly to other health centers and nursing stations. Medicines and supplies for family planning are distributed based on the registration of acceptors reported from the health centers. Vaccines for the Expanded Programme of Immunization (EPI) are supplied according to the number of target children which is also reported by the health centers.

Although there is no specific statistics on the pharmaceutical services for NCDs, medicines for hypertension, cardiovascular and mental illness have been increasing recently. Patient compliance on medication is one of the concerns in NCD control. It might be caused by low awareness and unstable stocks (stock-out and expiration) of medicines in the health facilities. Therefore, demand forecasting system is being considered introducing for NCDs based on the number of patient registration. At the same time, patient education should be enhanced to improve compliance on medication and information management system on NCDs should be strengthened to improve the data quality and provide the necessary data on time to FPBSC.

(2) Technology

1) Diagnosis

Diabetes is initially detected by a rapid test and diagnosed by HbA1c. The HbA1c machines were installed in three divisional hospitals. In 2011, five HbA1c machines were distributed and installed in subdivisional hospitals in Western Division (Ba, Lautoka and Nadi), Central Division (Wainibokasi), and the National Diabetes Hub. In CWMH, examination of blood glucose and renal function is available in pathology department.

In subdivisional hospital, cardiovascular diseases are usually detected by the use of electrocardiogram (ECG), medical history of the patient, and keen observation of health personnel, and then, referred to divisional hospitals as

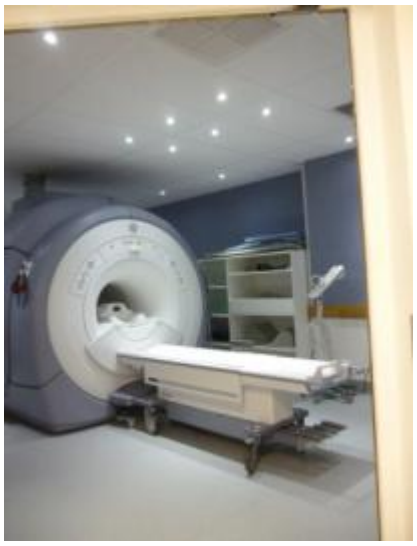
[37] The most of medicine imported from India are generic medicines.
[38] Level A health centers are usually in the urban areas.

necessary. At divisional hospital, examination of troponin[39], Echocardiogram, exercise stress test and coronary angiograpm[40] are available. Regarding cancer, the following diagnoses are available at the divisional hospitals.

- Pathology: tumor markers and blood counts
- Endoscopy: gastroscopy, colonoscopy and bronchoscopy
- Imaging: Ultrasound scans, CT scan[41], MRI[42], mammography[43] (Figure 4-13)

MOH is in the process of purchasing computerized axial tomography (CAT) scanners for Central Division and liquid cytology equipment.

CT Scan in Labasa Hospital (Single dimension)



MRI in CWMH

Figure 4-13 Medical Equipments

2) Curative Approach

Table 4-18 shows curative approaches generally taken in CWMH.

Table 4-18 Curative Approaches for NCDs in CWMH

Pharmaceuticals	Acute myocardial infarction:	Streptokinase, aspirin, heparin, nitrates, atenolol, simvastatin, enalarpil
	Diabetes:	- Oral hypoglycemic agents (glipizide, glibenclamide, metformin) - Insulin: soluble insulin, isophane insulin, mixtard insulin - ACE inhibitors: enalapril
Chemotherapy for some cancers		lymphoma, myeloma, myeloproliferative disorders, breast cancer
Surgical		tumor resections

Source: CWMH, November 2012

According to MOH, the following treatments are or will be available.

- Oncology service was initiated in the hospice in Suva.
- Cytotoxic are available at all divisional hospitals.
- Radiotherapy is available at CWMH and Labasa.

[39] According to the interview results, it is not much commonly used especially for emergency cases.
[40] It is a paid service. The patient will pay ranging from F$500 to F$3,000 depending on his/her health insurance.
[41] CT scans in Lautoka and Labasa hospitals were installed in 2010. Patients referred from private clinics should pay F$200 in CT scan in CWMH.
[42] The first MRI was installed in CWMH in 2011. Patients referred from private clinics should pay F$920 – F$1,035 and for non-Fijians the price is double.
[43] Mammography was to be installed in Lautoka and Labasa hospitals in 2010.

- Eye department was opened in Lautoka Hospital in 2011.
- Catheterization laboratory was installed in Lautoka Hospital in 2011.
- Kidney transplant surgery and open heart surgery will be started in CWMH in 2014.

4.5.6 Health Information System

Health information is managed by the Health Information Unit. Under the health management information system (HMIS) of Fiji, Patient Information System (PATIS) obtains and manages data from clinical fields while the Public Health Information System (PHIS) treats data from public health (Table 4-19). Human Resource Information System (HRIS) is also being operated.

Table 4-19 Health Information Systems

System	Targets	Major Data Submitted	Submission		Remarks
PHIS	- Nursing stations - Health centers - Subdivisional hospitals without online connection	- Service accomplishments - Demography - Child nutrition - Registration of family planning, diabetes and hypertension	Paper based	Monthly	It was introduced in 2008. The new system will be introduced in January 2013. To be online in the future
PATIS	- Hospitals	- Personal information of patients including medical history	Online	Monthly	The new system was introduced in 2009. More than 1 million data are stored.

Source: The Health Information Unit, MOH

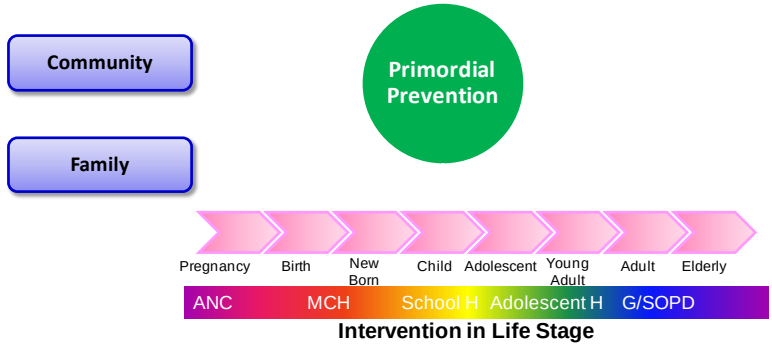
The Health Information Unit compiles and analyzes the collected information and issues "Health Information Bulletin" quarterly as a feedback. Although wide and general situation can be shared in the bulletin, according to some interviewees, staff at the operational level would like to have more specific feedback focusing on their working areas.

Regarding data and information on NCDs, such routine feedback system has not been established. It might be useful for more efficient implementation of the relevant programs and activities to compile relevant data such as prevalence, incidence, number of newly registered cases of NCDs, accomplishment of relevant activities, and budget disbursement at the subdivisional and divisional levels. Also, over and under reporting of diabetes registration was pointed during the Survey. MOH is considering to include NCDs into notifiable diseases reporting system to improve the information management on NCDs.

4.6 Analysis used Continuum of Care (CoC) for NCDs

4.6.1 Primordial Prevention

Figure 4-14 shows the place and life stage interventions in the primordial prevention of NCDs. According to the 2013 Budget Speech in November 2012, the Government of Fiji will increase tobacco and alcohol taxes by 10% and the revenue will be utilized for NCD prevention and control. Whereas, tax for imported vegetables not produced in Fiji will decline to 5% to promote vegetable consumption.



Note: The rainbow colored bars shows opportunity of intervention in health sector for each life stage indicated in the National Strategic Plan.

Figure 4-14 Primordial Prevention

Regarding tobacco control, the following legislations have been issued.

- Tobacco Control Act1998
- Tobacco Control Regulation 2000
- Tobacco Control Decree 2010

According to WHO[44], the WHO Framework Convention on Tobacco Control (WHO FCTC) was signed in October 2003. As of 2010, direct baning of tobacco advertisement in local media is generally set and among the public spaces, only health facilities are smoke-free. The NCD Strategic Plan aims to increase smoke-free places.

4.6.2 Primary Prevention

Figure 4-15 shows the place and life stage interventions in the primary prevention of NCDs. The Deputy Secretary for Public Health is responsible for the primary prevention that will be coordinated by the National Wellness Centre.

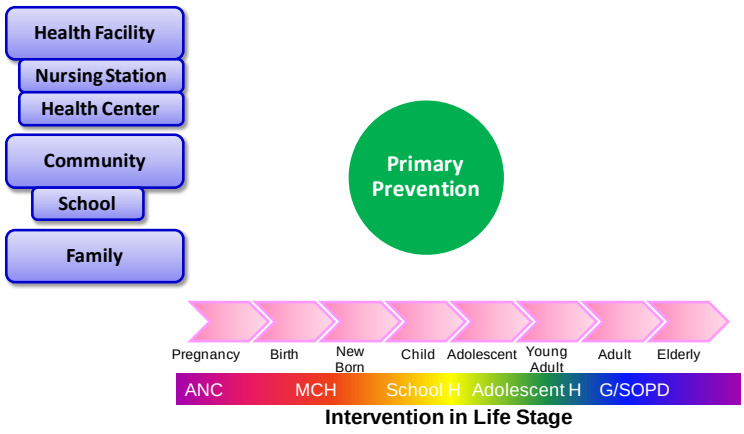


Figure 4-15 Primary Prevention

For healthy settings, the National Advisor for Environmental Health is also involved. Regarding healthy diet, the Chief Dietician and Nutrition and Manager of the National Food and Nutrition Centre are involved.

[44] WHO Report on the Global Tobacco Epidemic, 2011, Country profile, Fiji

Major focal areas for the primary prevention are tobacco control, nutrition (healthy diet), alcohol and physical activity with the following strategies (Table 4-20).

Table 4-20 Strategies for Primary Prevention

Areas	Strategy	Annual Budget
Common	- To mainstream the relevant concept into activities in the nursing stations and health centers - To introduce healthy setting concept to school curriculum (healthy setting school: 81, as of November 2012) - To establish school health policy	
Smoking	- To increase the number of non-smoking public places	F$40,000
Nutrition	- To increase the proportion of population consumption of 3-5 servings of vegetables and/or fruits - To reduce salt, oil and sugar consumption in the population - To improve school meal	F$80,000
Alcohol	- To reduce the prevalence of binge drinking in Fiji adult population - To increase proportion of responsible drinking in Fiji adult population	F$20,000
Physical Activity	- To adopt and implement the Pacific Physical Activity Guidelines for Adults aged 18-65 years - Formulate health related Physical Activity Guidelines for people under 18 years old	F$200,000

Source: MOH NCD Prevention and Control Strategic Plan 2010-2014, MOH
NCD Prevention and Control National Strategic Plan 2010-2014, the Government of Fiji
Field survey results

For public awareness raising, visual materials have been provided. Figure 4-16 (left) shows posters found in most of health facilities. Community health nurses bring these flyers to shift clinics in the village for health education. The poster in the right is intended for the event sponsored by private companies and AusAID. Some private companies seem to diligently support such health promotion activities.

Posters in nursing stations and health centers

Weight-loss competition sponsored by private companies

Figure 4-16 Awareness Raising Materials

4.6.3 Secondary Prevention

In the MOH NCD Prevention and Control Strategic Plan 2010-2014, secondary and tertiary preventions are combined focusing on the three NCDs, namely, diabetes, cardiovascular diseases and cancer. For these strategies, around F$130,000 is required annually.

Figure 4-17 shows the places and life stage interventions in the secondary prevention of NCDs. The secondary prevention aims for early detection and management of patients with common and intermediate risk factors of diabetes, cardiovascular diseases and cancers through the NCD Toolkit Programme. The Deputy Secretary for Public Health is responsible for the secondary prevention and will be coordinated by the National Wellness Centre. Divisional health offices implement relevant activities.

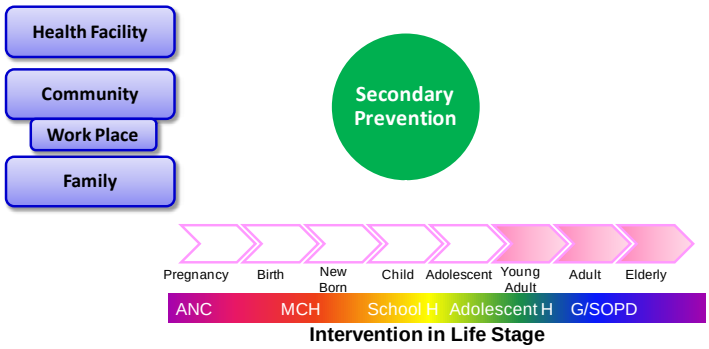
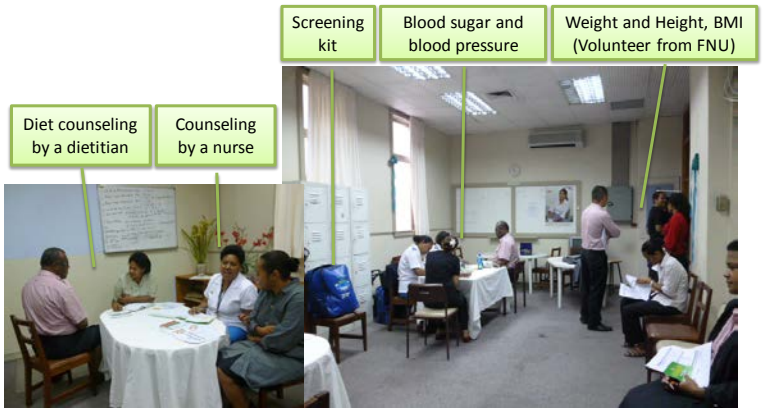


Figure 4-17 Secondary Prevention

NCD screening has been undertaken for people aged 25 years and above for both communities and workplaces. According to MOH, 20% of the target population will be covered each year, and all of them will be screened by 2014. The screening includes measurements of BMI, blood sugar, and blood pressure, as well as counseling by a nurse and a dietician. The cost will be borne by MOH except consumables such as strips for blood sugar measurement in the workplace screening. Figure 4-18 presents the workplace screening in Suva.



Screening was done in a room in the office building.

Healthy eating handbook was provided to some patients after diet counseling.

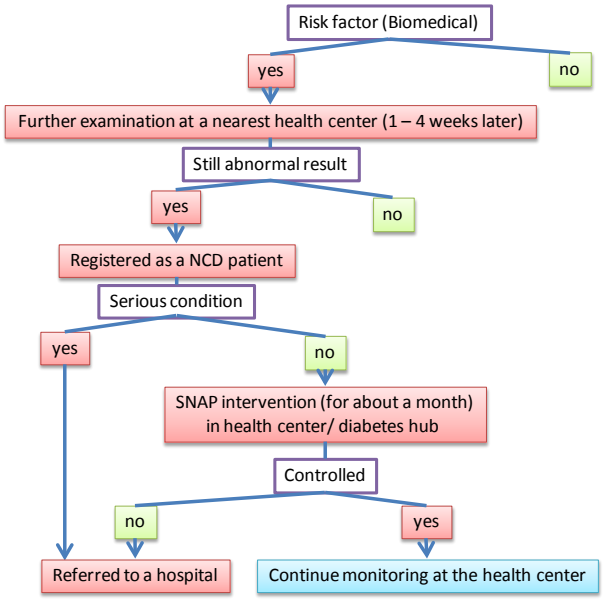
Figure 4-18 Screening in a Workplace (November 2012)

The Survey Team observed that follow up needs to be strengthened to make sure that the risk patient access to the health facilities complies with the health personnel's advice. The existing formats for NCD screening do not include the follow up record. In Labasa Health Center, zone nurses keep records of follow up after screening in another format and in case the patient did not show up, they contact him/her through phone or during the shift clinic.

Regarding cancer, screening programs for cervical (Pap smear) and breast cancer women aged between 30-59 years of age at sub-divisional levels have been conducted more in collaboration with private partners.

As shown in Figure 4-19, when the patient is found having biomedical risk factors, nurse advices him/her to come to the nearest health centers for further examination. If the laboratory result still exceed the standard, he/she will be

registered as a NCD patient and start the Smoking, Nutrition, Alcohol and Physical Activity (SNAP) intervention. The SNAP intervention is a sort of behavior change communication. The patient will make a statement to change his/her risk behavior such as stop smoking or reduce fat intake, while the community health nurses monitor the implementation and biomedical condition.



Source: The Survey Team

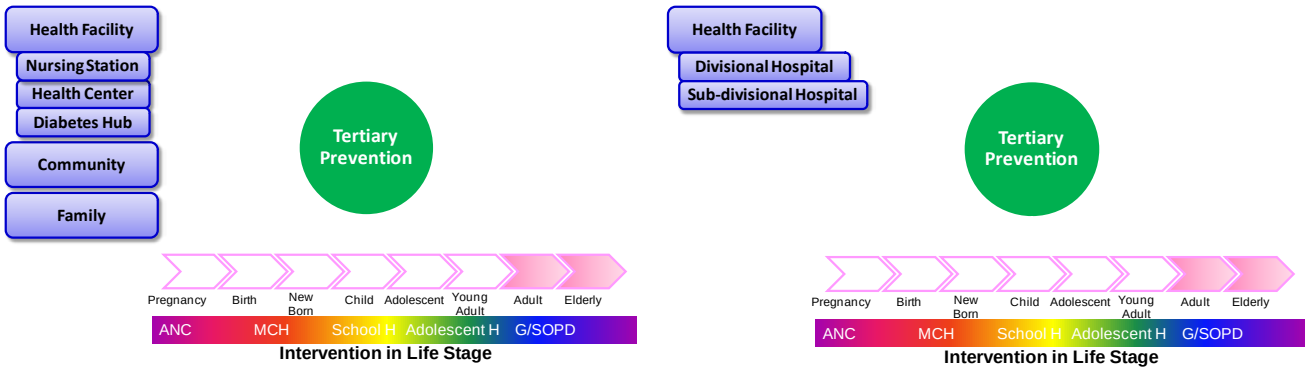
Figure 4-19 Follow-up after Screening

If the test values pertaining to blood sugar or blood pressure cannot be controlled through a few sessions or during a month, or complications are found, the patient will be referred to a hospital to initiate medication.

4.6.4 Tertiary Prevention

The Deputy Secretary for Hospital Services and Deputy Secretary for Public Health are responsible for the tertiary prevention and the National Wellness Centre coordinates the relevant activities.

Figure 4-20 and 4-21 show the places and life stage interventions in the treatment of NCD as tertiary prevention.



Early stage treatment and home-based care Treatment in later stage

Figure 4-20 Tertiary Prevention - Treatment

Regarding treatment, MOH aim to improve early referral of orange and red cases, establish the “one stop concept” for diabetes in diabetes hubs and for others in SOPDs, improve Hospital in the Home (HITH) services for terminal cancer cases, as well as improve capacity building in disease management in all clinical service facilities.

As shown in Figure 4-21, rehabilitation is taken place mainly in divisional hospitals and specialized hospital. They provide physiotherapy and support for home-based care for patients' family. When roles and functions of CRA are strengthened more, rehabilitation in community could be more active.

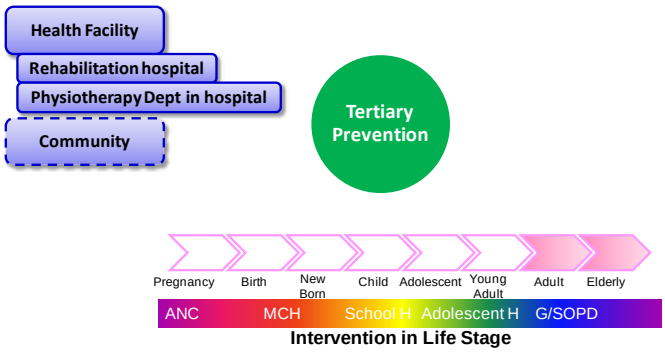


Figure 4-21 Tertiary Prevention – Rehabilitation

According to Tamavua Hospital, it generally takes long time to cure bedsore of patients before starting rehabilitation program and it makes the average length of stay longer.

4.7 Multisector Approach

In the NCDs Prevention and Control National Strategic Plan 2010-2014, multisectoral collaboration and partnership is emphasized and government organizations are needed to collaborate with other sectors in each area in the strategy. The National Wellness Centre coordinates with relevant stakeholders such as the Ministry of Education, the Ministry of Agriculture, Fiji National University, and funding donors. The Survey Team observed the mainstreaming of NCDs prevention and control into other sector within and out of MOH seemed to be at the initial stage except for some outputs such as tobacco control. However, it could be said that the existing programs of other ministries have already include some effective activities for NCD prevention and control. For example, the Ministry of Agriculture promotes vegetable production and the Ministry of Education is developing a school health policy including NCD concept.

4.8 Development Partners on NCDs

In Fiji health sector, AusAID provides holistic assistance through Fiji Health Sector Support Program (FHSSP). JICA has also been assisting in EPI, human resource development through technical cooperation project, the group training and country focused trainings as well as infrastructure. The Global Fund to Fight AIDS, Tuberculosis and Malaria supports strengthening of the health information management system and monitoring aiming at health sector strengthening. WHO supports human resource development and UNICEF mainly supports maternal while child health (MCH).

SPC and WHO are the leading donors in the NCD field. As described in Chapter 3, these organizations have been jointly implementing 2-1-22 Programme.

Major relevant activities are summarized below.

(1) SPC

SPC provides technical and financial assistance which include;

- Developing and managing comprehensive multi-sectoral national NCD strategies;
- Improving adolescent health and reducing adolescent morbidity and mortality;
- Strengthening the capacity of Pacific Island countries and territories to provide an adequately resourced continuum of treatment, care and support for people living with and affected by HIV and other STIs providing technical assistance to improve epidemic and disaster preparedness and response;
- Assisting and strengthening the health sector's capacity to ensure that communities have access to effective, efficient and quality clinical health care and rehabilitation services;
- Assisting in the development of a monitoring and evaluation surveillance framework;
- Providing human resource development training;
- Strengthening health information systems; and
- Improving access to effective, efficient and quality clinical health care and rehabilitation services.

(2) WHO

WHO provide technical and financial support mainly for human resource development through scholarship and Pacific Open Heath Learning Network (POLHN), and surveys such as STEPS and joint study with local institutes.

Regarding PEN, WHO currently supports pilot activities in Suva, Rewa and Lautoka as follofws:

- Facility assessment completed and analyzed
- Discussion with community and key stakeholders
- Defining the package
- Organizational changes in NCD services
- Records and information
- Supply and demand consideration
- National consideration

(3) AusAID

FHSSP covers various topics i.e., prevention of diabetes and hypertension, health system strengthening in sub divisional health office, infant and child health, safe motherhood, and primary health care through community health worker strengthening. Assistance for NCD prevention and control is streamlined into most of the activities under NCD technical advisor. The main focus is health education, especially diabetes screening and foot care.

4.9 Findings

Through the analyses in the previous sections, the advantages and weaknesses of NCD prevention and control in Fiji could be summarized as follows.

(1) Leadership

In Fiji, policy and legislation for NCD prevention and control have been mostly established. The service delivery systems are also in place from primary to tertiary prevention. However, the implementation seems to be rather weak.

The relevant policy and strategies indicated wide range of interventions, but it requires too many activities without strict prioritizing at the operational level which has to conduct all activities with regards to the seven health outcomes including NCDs. Although the budget is allocated according to the plan, the disbursement seemed to be delayed, i.e., the implementation might be behind the schedule.

The National Wellness Centre will to play as a coordinator of NCD prevention and control activities. However, there are too many stakeholders within the government agencies as well as private sectors to coordinate or to promote collaborations well. Since the center has just initiated their new functions, it should be strengthened for successful implementation.

(2) Mindset of Health Service Providers and Users

Human resources should be improved in terms of both quality and quantity. In Fiji, MDGs related health issues such as maternal and child health, under-nutrition, and communicable diseases still serve as challenges other than NCDs. At the operational level, health workers actually tend to rather focus on such "familiar" activities than NCDs because more pre- and in- service trainings as well as materials are provided for such issues, and in reality, more patients come to seek care. Maximum utilization of trained staff is another concern as many trained staff left MOH or transferred to other sections soon after the training.

Users of the services also need to change their mindset. As NCDs do not show acute and sever symptoms in the initial stage, people hardly understand the importance of primary and secondary preventions. By virtue of primary prevention activities, people especially in urban areas seem to be more aware on the NCD risk factors. However, many patients access to health facilities at very late stage after relying on traditional medicine and they expect a doctor to cure everything. Even the patient who is currently in medication is sometimes not keen on continued treatment. Some interviewees understood that although it could take a long time to change such ways of thinking, it is the most essential and effective way for the prevention and control of NCDs.

(3) Finance

Currently, most health services including medicines provided in the government health facilities are free for NHA holders. Although some advanced medical examinations and treatments are not free of charge, and the advanced medical treatments entail a huge cost. This could create more financial burden on the government when the number of patients that suffer from chronic disease NCDs increases and the advanced treatments become more frequent in future.

(4) Information Management

The Survey Team observed that the NCD programs are not well monitored based on the evidences in terms of both epidemiological and managerial aspects. Although the data on NCDs have been collected through existing health information management systems, the data quality needs to be improved, and regular feedback system should be established.

Health information system could help to increase efficiency of relevant activities when it provides regular NCD statistics to all stakeholders within and out of MOH. It can be a source of monitoring and evaluation, evidences for

modification or establishment of relevant policy and plans. Also, it can provide vital data for drug demand forecasting system.

In Fiji, health information system has had frequent minor and major changes until it occasionally brings confusion at the operational level. Some staff are not sure of the current format and which should be submitted.

(5) CoC

In Fiji, primary and secondary preventions seem to be more a priority in line with the Best Buys. In the strategic plan, continuous intervention for life-long (CoC of time) is clearly mentioned. However the linkage among the places from primary (e.g., community and primary level health facilities) to tertiary (e.g., hospitals) preventions should be more strengthened. Especially from screening in the community or work places (secondary) to treatment in the health facilities (tertiary), mechanism to make sure the risk patients access to the health facilities should be strengthened.

4.10 Recommendations

Based on the results of the Survey, it might be possible for JICA to provide assistance for human resource development to strengthen the implementation of relevant policies and programs, establishment of monitoring and evaluation system of the concerned programs, and community based activities.

In NCD prevention and control field in Fiji, many alumnus or ex-/current counterparts of JICA's assistance play leading or important roles. The head of the National Wellness Centre, one of the key persons, is an alumni of the group training on NCD prevention and control. Counterparts of the current technical cooperation projects[45] include community health nurses who are one of the key cadres. Therefore, such resources could contribute to effective and efficient implementation of the future assistance.

(1) Human Resource Development

The existing group and country focused trainings could be upgraded by the needs assessment and expand the targets as well as enhance the support for follow up activities. Also, the need-based in-service training mechanism could be utilized to penetrate training opportunities into the operational level.

(2) Monitoring and Evaluation

The previous project for community health nurses[46] included information management for community health nurses and the current project supports to establish monitoring and evaluation system from the operational level to the national level. These experiences could be applied to establish the monitoring and evaluation system on the relevant programs.

[45] The Project for Strengthening The Need-Based In-Service Training for Community Health Nurses, 2010-2014
System Improvement of Expanded Programme on Immunization in the Pacific Region, 2011-2014, and
Pacific Programme to Eliminate Lymphatic Filariasis (PacELF), 2005-2015

[46] Project for In-Service Training of Community Health Nurses in Fiji, 2004-2008

(3) Community-based Activities

JICA has provided support for behavior change communication (BCC) in various countries. Support for BCC might be effective to contribute awareness raising and behavior change of general population as well as diabetes and hypertension patients who need life-long disease management when it is combined with transferring Japan's experiences in NCD prevention and control.

Chapter 5 Situational Analysis in Tonga

5.1 NCDs Situation

The prevalence of NCD keeps on increasing and it was estimated to be 7% in1973, 15% in 1999 and 18% in 2004. Mortality rates of specified NCDs (cardiovascular diseases, cancer, type 2 diabetes and chronic respiratory diseases) among working age population (15-64 years old) in the last five years (2006 to 2010) is shown in Table 5-1 (except unpreventable CVD, acute respiratory diseases and so forth). It is shown with the number of death, not the mortality rate because it is concerned with the highest absolute number of deaths that will occur in the Western Pacific Region.

In 2007, the Tongan MOH introduced a new policy on reporting deaths as part of a comprehensive effort to improve vital registration. This policy requires all deaths to be certified by a medical practitioner. Tonga uses the medical certification form that is consistent with the international form of medical certificate of cause of death from the 10th version of the International Classification of Diseases (ICD-10).

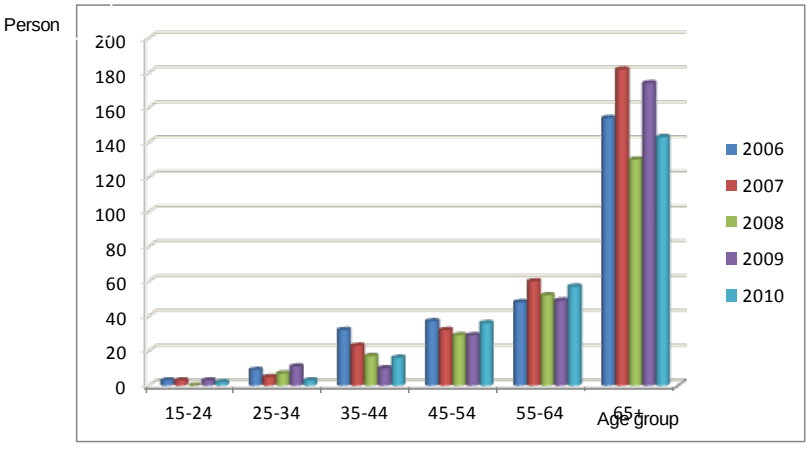
Table 5-1 Death from NCDs in Adults Aged 15-64 Years (2006-2010)

Year	All Causes	CVD	Cancer	Type 2 Diabetes	CRD
2006	514	83	38	3	5
2007	541	83	28	5	5
2008	520	63	32	5	5
2009	571	60	33	4	5
2010	553*	66	42	1	4

Note: *Seven (7) cases of unknown age are included

Source: Report of the Minister for Health 2006-2010

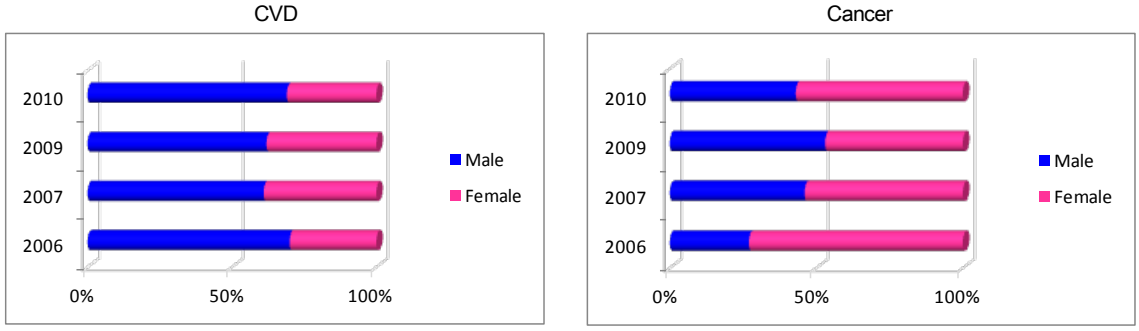
Of the annual fatalities, deaths from four NCDs among population aged 15-64 years account for 20% to 25%. The deaths from CVD are significant, followed by cancer, type 2 diabetes and CRD have small number. In total deaths among adults aged 15-64 years and over, 30% to 40 % of deaths occurred in 25-64 age group and the greater part of deaths (60% to 50%) was dominated by over age 65 years. However the number of deaths gradually increased from 35 to 44 age group (Figure 5-1).



Source: Report of the Minister for Health 2006-2010

Figure 5-1 Number of NCDs Deaths by Age Group (2006-2010)

The data indicated that CVD is the leading cause of adult male deaths and the number is double as much as adult female, while cancer is the leading cause of adult female deaths and the number is larger than male. Most of the deaths from type 2 diabetes occurred in adult female (Figure 5-2).



Note: Data in 2008 was excluded because there is no data by sex

Source: Report of the Minister for Health 2006-2010

Figure 5-2 Number of Deaths from CVD and Cancer by Sex (2006-2010)

The MOH approved the establishment of a Cancer Registry in 2005, using the International Agency for Research on Cancer (IARC) CANREG-4 (software). According to the report on cancer incidence for the years 2000-2005, there were 759 cases of cancer (432 female, 327 male). The leading cancer sites among males were lung (14.4%), prostate (12.8%) and liver (11.3%). However, it could be expected that the introduction of hepatitis B vaccination two decades ago, should in the future be reflected a declining rates of liver cancer in the next few decades.

Among females, the leading cancer sites were the breast (22.9%), uterus (12.0%), cervix (7.6%) and ovary (6.3%). The high incidence rate of cervical cancer is due to the high rates of human papilloma virus (HPV) infection caused by not using condoms and non-introduction of the HPV vaccine.

Table 5-2 shows the three leading types of cancer deaths by sex. In the data for the years 2006-2010, the three leading types of cancer deaths among men are the same as those of cancer incidence for the years 2000-2005, in different places. Among women, deaths from breast cancer remain high, and lung and liver cancers are rising as well.

Table 5-2 Three Leading Types of Cancer Deaths by Sex (2006-2010)

	Year	First Place	Second Place	Third Place
Male	2006	Prostate	Liver	Lung/Bronchus
	2007	Lung/Bronchus	Prostate	Liver
	2009	Lung/Bronchus	Liver	Head/Face/Neck
	2010	Liver	Lung/Bronchus	Prostate
Female	2006	Breast	Lung/Bronchus	Liver, Brain
	2007	Lung/Bronchus	Breast	Liver
	2009	Breast	Uterine	Brain
	2010	Breast	Liver	Stomach

Source: Report of the Minister for Health 2006-2010

5.2 Burden of NCDs

Disease burden is the impact of a death problem in an area measured by financial cost, mortality, morbidity or other indicators. NCDs mortality and incidence are already mentioned in Section 5.1 and therefore financial costs for NCDs are explained mainly in this part. Once NCDs have been developed, this will require not only expensive

medical costs but also continuous medical care and lifetime treatment for the rest. The economic costs of the burden of NCDs in Tonga are as follows (Table 5-3);

Table 5-3 Burden of NCDs

Overseas patient referral cost	NCDs cases spent 53% (2009), and 38% (2010) of total governmental fund expense for overseas patient referral
Medicine cost	Medical drugs and supplies for NCDs accounted for 25% of its total cost and 2.5% of MOH recurrent expenditure
Hospital cost	NCDs accounted for10.4% of admission, but 19.6% of hospital costs Average NCD hospital cost was T$1,442 per NCD patient in 2002, but it went up T$2,591 (estimated) per patient (the latest)
Ambulance utilization	More than 50% of ambulance dispatches (totalled to 194 in 2010, and 234 in 2011) were for NCDs cases in Tongatapu

Source: MOH

It is said that one of the reasons for economic inactivity is due to disability. In Tonga, the National Disability Identification Survey was conducted in 2006. The report stated that the most significant cause of disability was the NCDs of diabetes, heart diseases and high blood pressure (810 combined disabilities out of the identified 2,782 people). About 95% of people with disability caused by NCDs were over the age of 40 years. These conditions often result in physical disabilities (80%) such as strokes (20%) and amputations (12%), as well as vision impairments (63%). Amputation (of lower limbs) due to diabetic sepsis remains a major problem and has been increasing over the years (Table 5-4).

Table 5-4 Number of Amputations by Year (2004-2011)

Year	Number of Amputations
2004	11
2005	18
2006	19
2007	17
2008	29
2009	37
2010	46
2011	27

Source: Diabetes Centre Annual Report 2011

As described above, NCDs have drained the limited national budget but it is unlikely to have an impact on household budgets. In Tonga, medical services are provided free of charge and even the transportation cost from outer island to Tongatapu (the cost is supported by the hospital board in outer islands). According to the Household Income and Expenditure Survey 2009, the average monthly household expenditure (total of urban and rural) was T$1,770 and, of this amount, medical and health was only T$6.

5.3 Major Surveys on NCD Risk Factors

In Tonga, the essential studies for NCDs have been implemented in a decade. The list of surveys and the results are shown in Table 5-5.

Table 5-5 NCDs Relevant Studies and Major Findings

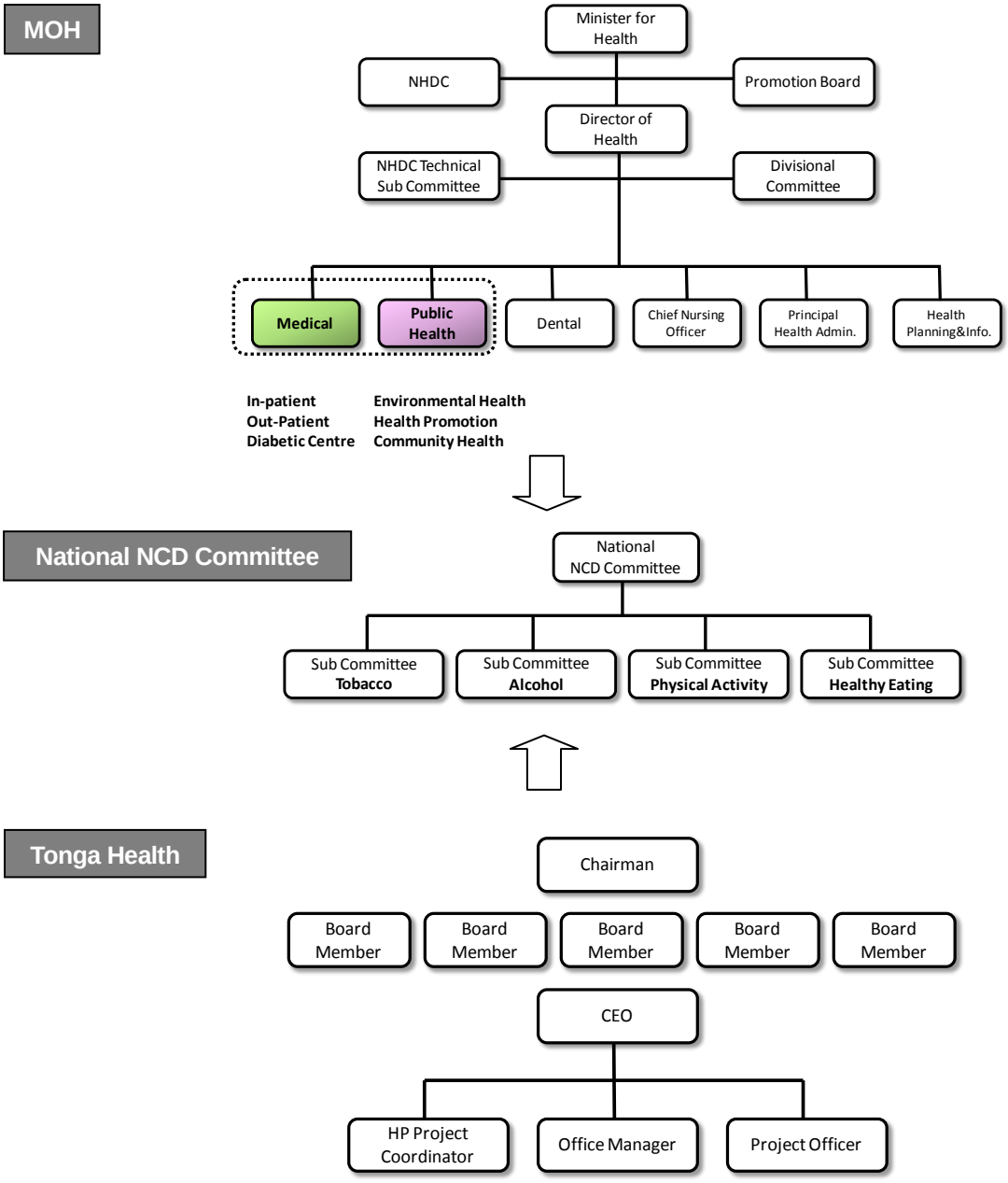
Surveys	Targets	Results
Nutrition Risk Factors for NCDs Survey 2004	Ages 12-15	- 13% preferred to bring lunch prepared home - 12% preferred to purchase their lunch food at nearby shop - 75% preferred to purchase their food at the school canteen and/or food stalls, however majority of the food and drinks available at the school contained high levels of sugar, and/or fats with little nutritional value
STEPS Survey 2004	Ages 15-64	Behavioral Risk Factors - 27.6% of the population preferred to smoke tobacco daily - 13.4% of the population are current alcohol drinkers - 92.8% of the population consumed less than five combined servings of fruits and vegetables per day Physical Risk Factors - 43.9% of the population have low level of physical activities
	Ages 25-64	Biochemical Risk Factors - The prevalence of overweight in the population was 92.1% - The prevalence of obesity was 68.7% - The prevalence of hypertension was 23.1% - The prevalence of raised blood glucose in the population was 16.4% - 60.7% of the surveyed population were at high risk of NCDs - 39.2% of the surveyed population were at moderate risk.
STEPS Survey 2010-11	ditto	Report now in progress
Global Youth Tobacco Survey (GYTS) 2010	Ages 13-15	- 45.1% of students had ever smoked cigarettes - 27.1% are currently smoking cigarettes - 59.3% bought cigarettes in a store were that does not restrict the minor - 57.6% had been taught in the class, during the past year, about the dangers of smoking
Global School-Based Student Health Survey (GSHS) 2010	Ages 13-15	- 70.5% of students had ever drunk alcohol (other than a few sips) before age 14 years - 81.2% of students had ever smoked cigarettes before age 14 years - 59.6% of students were overweight - 21.9% of students were obese - 25.6% of students were physically active for a total of at least 60 minutes per day in five or more days during the past seven days
Tobacco Survey for Retail Stores in Tonga 2010	Retail stores	- 63% (374) were selling tobacco separately - At least 23% were selling tobacco to minor children - Only 1% was found selling tobacco with incorrect label - The general price elasticity of demand tobacco is 0.61 which is considered to be an inelastic demand.

Source: MOH

The MOH and relevant organizations decide settings, targets and activities for interventions of the four modifiable risk factors (alcohol, tobacco, physical activity, and healthy eating) based on the results of the NCDs mentioned above.

5.4 Organizational Arrangement for NCD Prevention and Control

There are three organizations which have worked for NCDs prevention and control, i.e. MOH, National NCD Committees and Tonga Health (Figure 5-3).



Source: Corporate Plan 2008/09-2011/12, MOH
Tonga Health Annual Report 2010/12

Figure 5-3 Three Organizations Concerned about NCDs Prevention and Control

MOH;

The medical division provides tertiary prevention (early treatment and rehabilitation) in order to delay disease progression, minimize complications at the OPD (outpatient department), hospital wards and diabetic centers. The diabetic centers provide secondary prevention (screening). In the public health division, environmental health section, health promotion unit and community health section cover primary and/or secondary and/or tertiary preventions at the community level.

National NCD Committee;

The Director of Health serves as chairman of the National NCD Committee. This committee consists of four sub committees corresponding to risk factors. The committee includes many members from not only MOH but also from the Ministry of Finance and National Planning, Ministry of Education, Ministry of Agriculture, Tonga Health

and NGOs. SPC emphasizes the need for cross-sectoral approach on NCDs. In Tonga, multi sectors have already tackled primary prevention (health promotion) trough the committee.

Tonga Health;
Tonga Health is established by the Health Promotion Foundation Act 2007 as an independent body that is accountable to the Government of Tonga through MOH. Tonga Health is governed by a five-member Board of Governance and is managed by a Chief Executive Officer. They started health promotion activities in 2009 and have covered fully four risk factors and four island groups in 2011.

5.5 Analysis used Health System Strengthening (HSS) Six Blocks for NCDs

5.5.1 Governance and Leadership

(1) Governance

The previous Strategic Development Plan 8 (SDP8) which covered the years 2006/07-2008/09 was the right one at that time. This new National Strategic Planning Framework (NSPF) 2010-2014, SDP8 successor has a longer term view and focuses on selected national or the entire government priorities out of the long listed development issues. The government has always placed NCDs on its propriety list. In NSPF, improvement of the health of the people by minimizing the impact of NCD is mentioned as one of the primary outcome objectives. The Government of Tonga recognized the increased prevalence of NCDs such as diabetes which has become a major problem in recent years like most other Pacific Island countries. Preventive health measures are more cost-effective than curative services and in the Tonga context, it must focus on lifestyle related diseases.

Linkage between NSPF and MOH's Corporate Plan is shown in Figure 5-4.

Source: Corporate Plan 2008/09-2011/12, MOH

Figure 5-4 Linkage between NSPF and Corporate Plan

The fourth Corporate Plan 2008/09-2011/12 which is aligned with SDP8 has been implemented. MOH identified six strategic key results areas (KRA) and its goals. The first KRA is to build capacity and effectiveness in preventive health services to fight against NCD epidemic and communicable diseases. The goal is "We will fight the NCD epidemic and communicable diseases using effective preventive health measures, being good role models and developing public participation and commitment".

(2) Leadership

MOH shows strong leadership to counter NCDs. In 2004, Tonga was the first country in the Pacific to launch its National Strategy to prevent and control NCDs which has covered the period 2004-2009. The second National Strategy 2010-2015 (Tonga's PATH: Physical activity, Alcohol harm reduction, Tobacco control and Healthy eating) has also been implemented. The goal and targets are as shown in Table 5-6.

Table 5-6 Goal and Targets of Tonga's PATH

Goal	: To reduce death rate from NCDs by 2% per year over and above existing trends by 2015
Targets	: By 2015 to have ■ Reduced the prevalence of diabetes by 10% ■ Reduced the prevalence of adult/children obesity by 2% ■ Improved the rate of moderate intensity (600METS) Physical Activity per day on most days of the week by 10% ■ Improved the rate of consumption of five servings of fruits and vegetables per day on most days of the week by 10% ■ Reduced the prevalence of current tobacco smokers by 2%, and ■ Reduced the prevalence of binge alcohol drinking amongst the youth by 10%

Source: Tonga National Strategy to Prevent and Control NCDs 2010-2015, MOH

In addition, Tonga was the first country in the Pacific to establish Health Promotion Foundation in 2007 as well. As mentioned above, the Director of Health is the National NCD Committee's chair. The Government of Tonga has formulated guideline and enacted legislations to ensure NCDs activities so far.

- Guidelines for the Prevention and Management of Diabetes in Tonga, 2000
- Tobacco Control Act, 2000 (Amendment 2004, Amendment 2008)
- Health Promotion Foundation Act, 2007
- School Health Policy 2012-2015
- Intoxicating Liquor Act 1998 (Amendment 1995, Amendment 2010)

In Tonga, a total of four MOH staffs have had ProLead training[47] and are currently working for health promotion and NCDs (team leader of healthy pacific lifestyle section of SPC, head of health promotion unit, health promotion officer and acting medical superintendent of Vaiola Hospital).

The mid-term review for National Strategy to Prevent and Control NCDs 2010-2015 was conducted in 2012. This review indicated that National NCD coordinator is necessary to manage the activities among concerned organizations on NCDs.

Table 5-7 shows a set of evidence-based "best buy" interventions identified by WHO and its status in Tonga. Most of the items are marked with "Yes".

[47] ProLead is a nine-month leadership training programme consisting of three modules. It seeks to strengthen infrastructure and financing for health promotion. ProLead leadership training is directed at health promotion decision-makers and representatives from ministries of finance and civil society, who work together in project development. This programme was developed by the WHO Regional Office for the Western Pacific and further expanded to the Eastern Mediterranean.

Table 5-7 Best Buys in Tonga

Risk Factor / Disease	Interventions	Status
Tobacco use	■ Tax increases ■ Smoke-free indoor workplaces and public places ■ Health information and warnings ■ Bans on tobacco advertising, promotion and sponsorship	Y Y Y Y
Harmful alcohol use	■ Tax increases ■ Restricted access to retailed alcohol ■ Bans on alcohol advertising	Y Y Y
Unhealthy diet and physical inactivity	■ Reduced salt intake in food ■ Replacement of trans fat with polyunsaturated fat ■ Public awareness through mass media on diet and physical activity	N N Y
Cardiovascular disease (CVD) and diabetes	■ Counseling and multi-drug therapy people at high risk of developing heart attacks and strokes (including those with established CVD) ■ Treatment of heart attacks with aspirin	Y Y
Cancer	■ Hepatitis B immunization to prevent liver cancer (already scaled up) ■ Screening and treatment of pre-cancerous lesions to prevent cervical cancer	Y N

Source: MOH

5.5.2 Health Service Delivery

(1) Overview

In terms of geographic management, Tonga is divided into four health districts, namely Tongatapu, Vava'u, Ha'apai and 'Eua. The Tongatapu Health District and MOH are also responsible for the services in the two Niua's (Niuafo'ou and Niuatoptapu). The health service is decentralized in accordance with the long-standing government commitment to primary health care provision. Figure 5-5 shows the referral system and Figure 5-6 shows the locations, numbers and types of health facilities in each island. There is no hospital in Niua's.

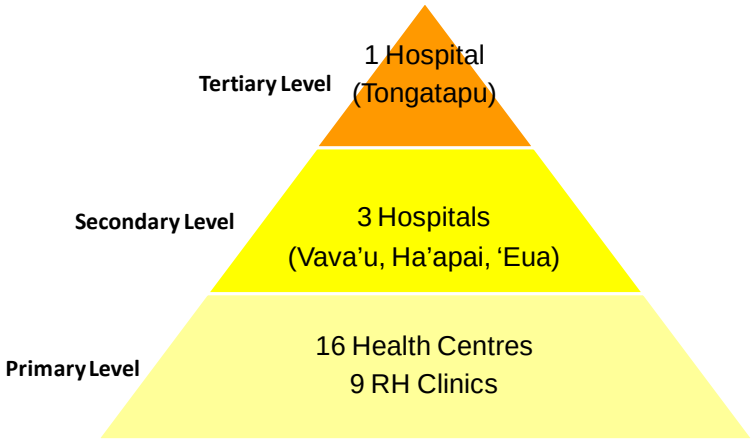


Figure 5-5 Referral System

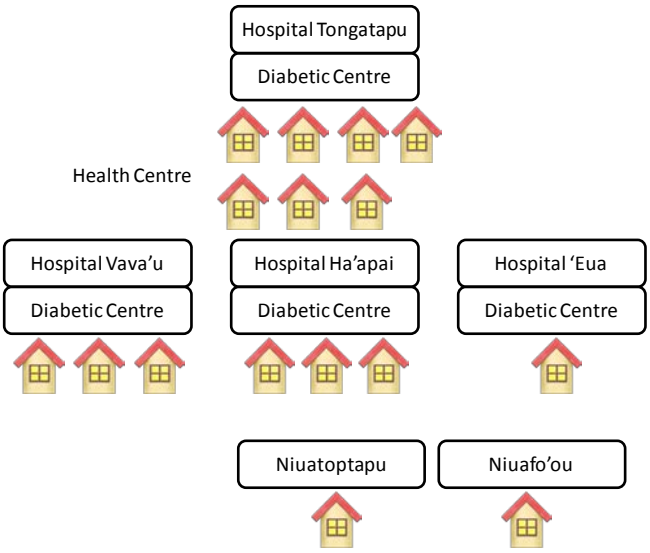
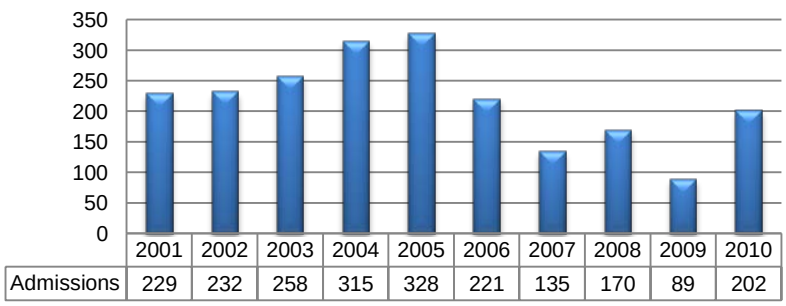


Figure 5-6 Locations, Numbers and Types of Health Facilities in Each Island

The diabetic centre is set up as an annex to each hospital in four districts. Medical services (diagnosis and treatment) for NCDs are provided in hospitals, diabetic centres and health centres but they have limitations due to lack of medical equipment.

A total of 34 reproductive health nurses (RHNs) are working in all 16 health centres and nine reproductive health (RH) clinics. Even though they are engaged mainly in maternal and child health care services and take small part in NCDs, they play an important role for NCDs prevention and control in the long term perspective i.e. HBV administration for newborn babies for liver cancer prevention, consultation on condom use for HPV transmission prevention and gestational diabetes referrals to hospital for prevention of diabetes developing after delivery. Many NCDs have their origins before births therefore health education by RHNs is crucial for women during pregnancy and the postpartum period as well. Low birth weight defined as the birth weight of newborns less than 2,500g is associated with increased rate of hypertension, diabetes, stroke and heart disease. Also, babies born to women who developed diabetes during pregnancy, termed as gestational diabetes, are at increased risk of developing obesity and type 2 diabetes as they grow up. Furthermore, breastfeeding has long-term benefits. Adults who were breastfed as babies often have lower blood pressure and lower cholesterol, as well as lower rates of overweight, obesity and type 2 diabetes.

Figure 5-7 shows the trend of the number of LBW admission to Special Care Nursery in Vaiola Hospital during 2002-2010.



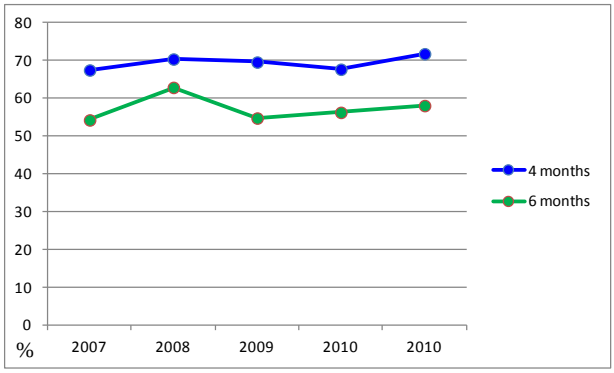
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Admissions	229	232	258	315	328	221	135	170	89	202

Source: Report of the Minister for Health 2010

Figure 5-7 Trend of LBW at Vaiola Hospital (2001-2010)

It has been on a decreasing trend for 2006-2009, but reversed temporarily in 2010. The prevalence rate of LBW at Tongatapu is 3.6% and it is estimated to be 2.8% for the whole nation.

Figure 5-8 shows percentages of exclusive breastfeeding rate of infants six months and four months old in the past five years.



Source: MOH

Figure 5-8 Rate of Exclusive Breastfeeding (2007-2010)

In the past five years, the exclusive breastfeeding rate of infants four months and six months old have been about 70%, and 60% respectively and there is no significant improvement.

(2) Standard Treatment Guidelines and Essential Drug List

In 1985, WHO provided a definition of rationale use of medicines as "Patients receive medications appropriate to the clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community". To address this very important issue, MOH formulated Standard Treatment Guidelines and Essential Drug List in 2007.

This guideline describes diagnosis and treatments for a total of 130 diseases and symptoms. Most typical NCDs such as myocardial infarction, stroke, diabetes mellitus, prostate cancer, breast cancer and palliative cancer are included. However, diagnosis and treatments are generally left to the doctor's discretion.

(3) Hospitals and Health Centres

Table 5-8 shows status of hospitals and health centres dealing with the diagnosing and treating of NCDs.

Table 5-8 Status of Health Facilities on Diagnosis and Treatment

	Health Facilities	CVD	Type 2 Diabetes	CRD	Cancer
Diagnosis	Tongatapu HP	○	○	○	○
	Vava'u HP	△	○	○	×
	Ha'apai HP	△	○	○	×
	'Eua HP	×	○	×	×
	Health Centre	×	○	×	×
Treatment	Tongatapu HP	○	○	○	○
	Vava'u HP	○	○	○	×
	Ha'apai HP	○	○	○	×
	'Eua HP	○	○	○	×
	Health Centre	○	○	○	×

Note: ○: available, △: partially, ×: unavailable

Source: MOH

Even the hospitals in outer islands do not provide the patients with proper diagnosis and treatment sufficiently. Therefore the hospitals refer them to Tongatapu, particularly for amputation. The number of referral cases on NCDs from outer island to Tongatapu is shown in Table 5-9.

Table 5-9 Referral Cases from Outer Islands (2006-2010)

Year	'Eua	Ha'apai	Vava'u
2006	5	n.a.	n.a.
2007	10	n.a.	n.a.
2008	2	n.a.	n.a.
2009	3	3	n.a.
2010	5	9	n.a.

Note: In Ha'apai, the admission record from 2006 to 2007 was lost during the temporary evacuation of hospital due to earthquake in 2007

Source: MOH

The hospital's Accident and Emergency Department takes charge of ambulance services. 'Eua and Ha'apai are equipped with one ambulance but the car in 'Eua is out of order, while Tongatapu and Vava'u have two. The two ambulances in Tongatapu were donated by an NGO in Japan and they serve as emergency transport (Figure 5-9). The number of ambulance dispatches was 194 in 2010 and 234 in 2011, and NCDs cases accounted more than half of the number.

Figure 5-9 Ambulance in Tongatapu

(4) Diabetic Centres

The official name of the diabetic centre is the National Centre for Diabetes and Cardiovascular Diseases and it was opened in 1993. In the diabetic centre in Tongatapu, there is one physician, one NCD supervisor, five nurses, one dietitian/nutritionist and one secretary are working. Four out of five nurses are employed by AusAID support (Tonga Health Sector Support Project). This centre is part of the hospital's OPD in 'Eua and Ha'apai, but there is a diabetic centre separated from the hospital in Vava'u provided by a grant from China. Table 5-10 shows the health staff of the diabetic centre in outer islands. There is no diabetic centre in Niua's.

Table 5-10 Staff Allocation in Diabetic Centre

Island Group	Doctor	Nurse
'Eua	1	1
Ha'apai	1	1
Vava'u	2	2

Source: MOH

This centre covers services of screening and diagnosis, clinical management, dressing (wound/ulcer) and outreach to home, health centre and outer island hospitals.

Table 5-11 shows the number of screening, new cases and detection rate in the past nine years. The detection rate has been approximately 40% to 50% constantly. Nearly 100% (98% to 99 %) of the diabetic population are categorised as type 2 diabetes.

Table 5-11 Number of Screening, New Cases and Detection Rate (2003-2011)

Year	Screenings	New Cases	Detection Rate (%)
2003	758	270	36
2004	508	246	48
2005	443	209	47
2006	460	190	41
2007	427	176	41
2008	423	193	46
2009	377	193	51
2010	438	201	46
2011	325	151	46

Source: Diabetes Centre Annual Report 2011

Table 5-12 shows the number of screening conducted for gestational diabetes mellitus (GDM), cases and detection rate in the last four years.

Table 5-12 Number of Screening of GDM, Cases and Detection Rate (2008-2011)

Year	Screenings	Cases	Detection Rate (%)
2008	332	23	7
2009	600	82	13
2010	609	90	15
2011	736	67	9

Source: Diabetes Centre Annual Report 2009-2011

The clinical management of diabetes are medical diet (Figure 5-10), therapeutic exercise, OHA (oral hypoglycaemic Agent) and Insulin Therapy.

Figure 5-10 Materials for Medical Diet in Ha'apai

The mode of each management in the past three years is shown in Table 5-13. More than 80 % of the patients require drug therapy.

Table 5-13 Modes of Clinical Management (%) (2009-2011)

Mode of Management	2009	2010	2011
Diet only	13.1	10.5	13.0
OHA only	64.9	64.5	64.0
Insulin + OHA	18.0	22.4	20.0
Insulin only	4.0	2.6	3.0

Source: Diabetes Centre Annual Report 2009-2011

Table 5-14 shows the number of wound dressing in the last three years.

Table 5-14 Number of Dressing (2009-2011)

Dressing	2009	2010	2011
Old Cases	277	269	286
New Cases	464	623	553
Total	741	892	839

Source: Diabetes Centre Annual Report 2009-2011

Table 5-15 shows the number of outreach activities.

Table 5-15 Number of Outreach Activities (2009-2011)

Place	2009	2010	2011
Home Visit	3	3	2
Health Centre	3	2	1
Outer Island Hospital	1	1	0

Source: Diabetes Centre Annual Report 2009-2011

Home visit and health centre visits (community outreach) are scheduled quarterly and monthly respectively however these have not been conducted as scheduled due to shortage of staff. Namely, diagnosis and treatment are provided but the adequate care for NCDs does not reach the community level.

(5) Overseas Treatment Scheme

Initially the scheme was designed to benefit civil servants however the scheme has evolved over many years and has extended its coverage to all Tonga subject. In conformity with MOH's Corporate Plan (2008/9-2011/12), Referral for Overseas Treatment Policy was established in 2009 to ensure equitable access for all Tongan citizens for secondary and tertiary overseas treatment. The process to make a referral is indicated in the Guideline for Overseas Treatment Policy. Medical criteria and exclusions for overseas treatment are shown in Box 5-1.

Box 5-1 Medical Criteria and Exclusion of the Overseas Treatment Scheme

Medical Criteria

- Appropriate skills, expertise or facilities to treat the condition are not available in Tonga
- Consideration has been given to whether the condition can be treated in-country by a planned visit of a medical specialist team within a time frame unlikely to jeopardize clinical outcomes and well-being of the patient
- The referral has been made on the advice of an appropriate specialist and supported by the the Overseas Referral Committee, and
- There is a good prognosis for the patient having a healthy life for at least five years after treatment

Exclusions

- Any costs related to patients who have accessed treatment overseas prior to the approval being granted
- Chronic cardiac failure, chronic renal failure, chronic neurological conditions and conditions requiring heart, renal or bone marrow transplants
- Patients who have significant medical conditions other than that for which are being referred (e.g. co-existing advanced cancer), and
- Conditions that will incur on-going costs that are unable to be met by Tonga government health funds i.e. renal dialysis

Source: Referral for Overseas Treatment Policy, MOH

The GOT funds of T$600,000 and NZAP supports of NZ$500,000 are being used for the scheme every year. The amount of T$600,000 from GOT is 2.6% to 2.8% of annual health recurrent expenditure. Referral countries are Australia and New Zealand. This scheme is included not only in treatment but also in detailed examinations.

Table 5-16 shows the number of all cases and NCDs cases referred overseas treatment and its proportion.

Table 5-16 NCDs Cases for Overseas Treatment (2008/09-2010/11)

Year	GOT Funds NCDs Cases/All Cases (%)		NZAP Funds NCDs Cases/All Cases (%)	
2008/09	10/25	(40%)	2/22	(11%)
2009/10	6/20	(30%)	1/12	(11%)
2010/11	5/19	(26%)	1/ 8	(13%)

Source: MOH

NCDs cases accounted 30% to 40% of all cases in GOT funds while it is very small in NZAP fund. Most of the NCDs cases were cancer treatment. The total estimated amount of disbursement of GOT fund were about T$ 346,000 (2008/09), T$ 213,000 (2009/10) and T$ 323,000 (2010/11) and the percentages of funds used for NCDs were 53%, 38% and 11%.

5.5.3 Health Workforce

The health workforce engaged in NCDs medical and health services by district is shown in Table 5-17.

Physicians for NCDs is throughout Tonga are less than ten. Health officers provide diagnosis and treatment in health centre to cover the shortage of physician at the community level. Of the 16 health centres, 12 health officers and three nurse practitioners (NPs) are working for 14 health centres and two are neither occupied with NPs nor health officers but with RHN. The number of nurses engaged in NCDs is comparatively large because NCDs patients are given care and treatment in almost all clinical departments and words other than paediatric.

Table 5-17 Health Workforce for NCDs

Occupation	Tongatapu	Vava'u	Ha'apai	'Eua	Niuas
Physician	5	2	1	1	0
Surgeon	4	0	0	0	0
Nurse	203	21	7	11	1
RH Nurse		2	3	1	0
Health Officer	7	0	2	2	1
Radiologist	1	0	0	0	0
X-ray Technician	6	1	0	0	0
Ultrasound Technician	2	0	0	0	0
Pharmacist	27	2	1	1	0
Laboratory Technician	29	1	1	1	0
Nutritionist	3	0	0	0	0
Speech-Language-Hearing Therapist	0	0	0	0	0
Physiotherapist	1	0	0	0	0
Occupational Therapist	0	0	0	0	0
Prothetist	0	0	0	0	0

Occupied Vacant

Source: MOH

One physiotherapist is employed in Vaiola Hospital however he does not provide rehabilitation services to stroke and diabetic patients due to lack of space and shortage of equipment and prosthetist as well (Figure5-11). The patients are under constraint to use wheelchairs.

Figure 5-11 Room and Equipment of the Physiology Building

NCDs trainings provided by development partners are shown in Table5-18 but the list does not cover all because the registration system has not been established by MOH.

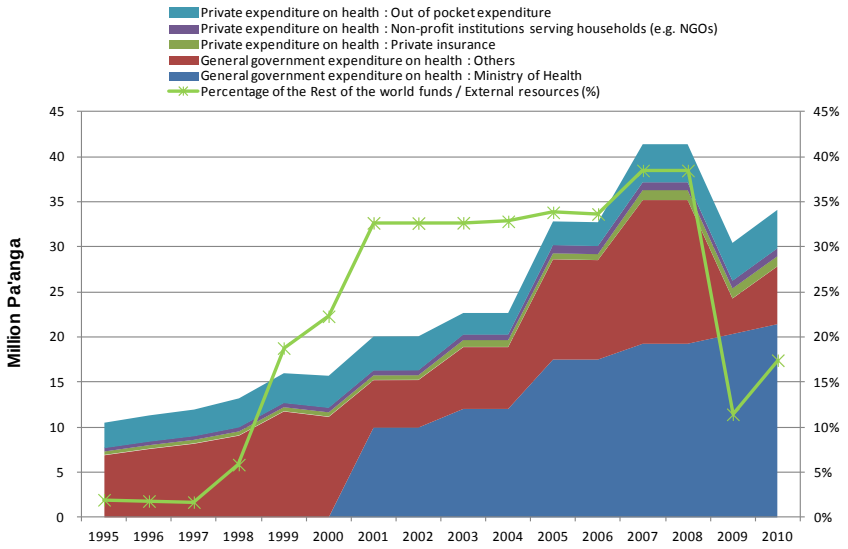
Table 5-18 Training on NCDs (2007-2011)

Year	Training	Donor
2007	■ Production of TV program ■ Program research and social marketing concepts ■ Training at SPC ■ Japan-WHO international visitors program on NCD prevention and control ■ Prolead health promotion	NZAP AusAID SPC Japan/WHO WHO
2008	■ Health promotion ■ Media ■ Training at SPC ■ ProLead ■ Diabetes Epidemiology and Education	AusAID TFHA SPC WHO La Trobe Univ. IDF/WPR
2009	■ Health promotion ■ Cooking demonstration ■ Diabetes	AusAID MAFFF WDF
2010	■ Cooking demonstration ■ Global school health survey	MAFFF WHO
2011	■ Lifestyle related diseases prevention and control	JICA

Source: MOH

5.5.4 Health Financing

Figure5-12 shows the total expenditure on health from 1995 to 2010. The trend during 1995-2010 shows that general government expenditure on health is increasing year by year; however, private expenditure on health is decreasing.



Source: Based on WHO Global Health Expenditure Database (accessed Oct 15 2012)

Figure 5-12 Budgetary Allocation for Health (1995-2010)

After the NSPF approved by previous government in 2009/10, a new strategy entitled Tonga Strategic Development Framework 2011-2014 (TSDF) was prepared by the Ministry of Finance and National Planning (MOFNP). TSDF provides the guiding principles and direction of the present administration over the four years. In this strategy, three new objectives (education, improved governance and safe and secure society) were added to the original six. One of the six objectives was on health sector, i.e., to improve health of the people, by promoting healthy lifestyle choice with particular focus on addressing NCDs, and providing quality, effective and sustainable

health services. MONFP has allocated 10% to 11% of government expenditure and T$ 600,000 for the overseas treatment scheme to MOH in the past four years (Table 5-19).

Table 5-19 Expenditure of Government and MOH (2008-2012)

Unit: T$ (Tonga Pa'anga)

Fiscal Year	Health Service Expenditure	Total Gov. Recurrent Expenditure	% of Total Gov. Expenditure
2011-2012	22,100,000	210,400,000	10.5
2010-2011	22,500,000	220,064,744	10.2
2009-2010	21,375,000	182,596,569	11.7
2008-2009	21,580,000	215,639,239	10.0
2007-2008	17,760,981	235,608,737	7.5

Source: MOFNP, MOH

As described in Sections 5.4 and 5.5, three sections (environmental health, health promotion and community health) in Public Health Division, Tonga Health and Diabetic Centre are in charge of NCDs prevention. Budget allocation to relevant sections and organizations in the past three years is shown in Table 5-20. Tonga Health accepted an initial fund of Aus$ 500,000 through the 2-1-22 program and it provides T$ 400,000 as ongoing fund through MOH yearly

MOH attached an action plan and estimated cost to the National Strategy to Prevent and Control NCDs however budget was not provided to them.

Table 5-20 Budget Allocation to Relevant Section and Organization (2009/10-2011/12)

Unit: T$

Year	Environmental Health	HP Unit	Community Health	NCD	Diabetic Centre	Tonga Health
2009/10	22,850	403,750	1,539,120	4,500	3,000	253,750
	0.1%	1.9%	7.2%	<0.1%	<0.1%	1.2%
2010/11	417,872	116,009	335,759	200,101	3,000	446,250
	1.9%	0.5%	1.5%	0.8%	<0.1%	2.0%
2011/12	748,257	117,729	376,033	47,311	3,000	399,998
	3.4%	0.5%	1.7%	0.2%	<0.1%	1.8%

Source: MOH, Tonga Health

A fixed budget was provided to the diabetic centre and Tonga Health but the budget for the other sections varied every year. As a whole, 7% to 10% of budget was allocated to the relevant sections and organization from MOH recurrent expenditure.

Other financial resources are from SPC, WHO AusAID and so forth. Table 5-21 shows the income statement of Tonga Health from 2009 to 2011.

Table 5-21 Income Statement of Tonga Health (2009-2011)

Unit: T$

Item	2009	2010	2011
Government of Tonga	253,750	446,250	399,998
SPC Funds	-	320,000	340,000
Interest-Dr Tapa Fund	-	76,203	98,647
Interest-Term Deposit ANZ	-	6,880	22,380
Other Income	-	845	20,099
Total	253,750	850,178	881,124

Source: Tonga Health Annual Report 2009-2011

5.5.5 Medicines and Technology

(1) Medicines

In Tonga, all medicinal drugs are imported based on the Therapeutic Goods Act 2001. Almost all of them are generic drugs that aim at improving health finance and selected from the Essential Drug List formulated in 2007 based on WHO guidelines. Anti-cancer drug are not included. Item description of NCD drugs is as shown in Table 5-22.

Table 5-22 Item Description of NCDs Drugs

Aminophylline	Atenolol	Beclomethasone
Captopril	Flixotide Inhalers	Frusemid
Glibenclamide	Gryceryl Trinitrate	Hydralazine
Hydrochlorothiazide	Insulin Isophane	Insulin Mixtard
Insulin Soluble	Insulin Syringe	Ipratropium
Isosorbide Dinitrate	Labetalol	Mannitol
Metformin	Methyldopa	Nifedipine
Prazocin	Salbutamol	Spironolactone
Streptokinase	Theophylline	Cloxacillin

Respiratory Disease Cardiovascular Disease Diabetes Mellitus

Source: Medical Store, MOH

The total costs for the NCD drugs listed above are shown in Table 5-23.

Table 5-23 Costs of NCD Drugs in the Past Five Years (2007-2012)

Unit: T$

Year	NCD Drugs Cost
2007	342,282
2008	576,016
2009	624,714
2010	520,364
2011	561,433
2012	598,698

Source: Medical Store, MOH

The share of NCD drugs cost was 26.6% in the T$ 2,250,000 of the total budget for medicinal drugs and supplies. NCD drugs are transported directly from medical store to hospitals and health centres once every two months by motor in Tongatapu, and by ferry or boat to outer islands (Figure 5-13).

Figure 5-13 Medical Store

WHO formulated a comprehensive guideline entitled "Package of Essential Noncommunicable (PEN)" in 2010. WHO PEN is the minimum standard for NCDs to strengthen national capacity in integrating and scaling up care of heart disease, stroke, cardiovascular risk, diabetes, cancer, asthma and chronic obstructive pulmonary disease in primary health care in low-resource settings.

Table 5-24 shows a core list of medicines required for implementing essential NCD intervention in primary care and its status at the health centre in Tonga. The list is for primary care (PC) facilities with physicians. For PC facilities with only non-physician health care workers most of the medicines listed below are required for refill of prescriptions issued by physicians at a higher level of care.

Table 5-24 Available NCD Medicine in Health Centre

× Thiazide diuretic	× Spironolactone	○Hydrocortisone
× Calcium channel blocker	○Salbutamol	○Epinephrine
× Amlodipine	× Prednisolone	× Heparin
× Beta-blocker (atenolol)	× Beclometasone	× Diazepam
○Angiotensin inhibitor (enalapril)	○Aspirin	× Magnesium sulphate
× Statin (simvastatin)	○Paracetamol	○Promethazine
× Insulin	○Ibuprofen	○Senna
○Metformin	× Codeine	○Dextrose infusion
○Glibenclamide	× Morphine	○Glucose injectable solution
× Isosorbide dinitrate	○Penicillin	○Sodium chloride infusion
○Glyceryl trinitrate	○Erythromycin	△Oxygen
× Furosemide	○Amoxicillin	

○: available, △: partially, ×: unavailable

Source: MOH

Out of 35 items, 18 items are allowed to be administered by health officers or NP at the health centre.

(2) Technology - Diagnosis

Even in tertiary hospital, availability of advanced NCDs diagnosis is limited due to lack of medical devices. Vaiola Hospital is equipped with four X-ray machines (Figure 5-14), two ultra sounds machines, three to four endoscopes, several electrocardiogram and spirometer, however they lack magnetic resonance imaging (MRI) machine and schintigram. A patient in need of proper diagnosis with both CT and MR scans is sent to New Zealand or Australia using the overseas treatment scheme. The Government of China donated one CT scanner and its facility in 2012. Only one radiologist in Tonga has completed the three months formal CT scan training in Australia. CT diagnosis imaging services will start at the beginning of 2013 (after completion of building construction, Figure 5-15). In outer islands, there is one X-ray machine in Vava'u and none in 'Eua and Ha'apai.

Figure 5-14 X-ray Machine

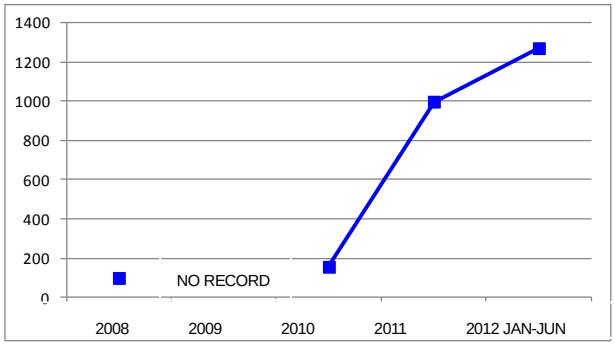
Figure 5-15 CT Scan Facility

Biochemical examination of blood and tumor blood marker test are available only at Vaiola Hospital but not at the hospitals in outer islands. If their patients need the said tests, doctors send blood sample to Tongatapu. The, the Creatine kinase-MB (CK-MB), the most often used blood marker of acute myocardial infarction is available at Viola Hospital but troponin T test is used selectively and blood samples are sent to New Zealand for value measurement.

The use of HbA1c for diagnosis of type 2 diabetes was not recommended by WHO (2006)[48]. Before introducing the machine (Figure 5-16), blood samples were sent to New Zealand for HbA1c tests.

Figure 5-16 HbA1c Machine

Figure 5-17 shows the trend of the number of HbA1c tests by year. HbA1c tests are not applied to all diabetic screening however the number has been increasing recently.



Source: MOH

Figure 5-17 Annual Number of HbA1c Tests (2008- first half of 2012)

(3) Technology-Treatment

Medical treatments of NCD provided in tertiary hospitals are shown in Table 5-25.

[48] The reason cited in the 2006 report included that HbA1c measurement was not widely available in many countries throughout the world, global consistency in its measurement was problematic, and that the HbA1c result is influenced by several factors including anemia and abnormalities of hemoglobin. In recent years, WHO consultation concluded that HbA1c can be used as a diagnostic test for diabetes. Laboratory introduced two HbA1c machines (Roche Cobas C111) in 2009.

Table 5-25 Available NCD Therapy in the Tertiary Hospital

CVD	Type 2 Diabetes	CRD	Cancer
○Antiplatelet drug	○Medical diet	○Drug therapy	○Surgical treatment
○Anticoagulant drug	○Therapeutic Exercise	○Oxygen inhalators	○Chemotherapy
○Removal of hematoma	○OHA		○Hormone therapy
○Ventricular drainage	○Insulin therapy		×Thermo therapy
○Antihydropic therapy	×Dialysis		×Immuno therapy
○Blood Pressure Control			×Radiation therapy
×Crebroprotective therapy			×Proton therapy
×Clipping			×Heavy ion RT
×Coil embolization			×Marrow transplant
×PTCA			
×PTCR			
×Stent			
×Bypass surgery			

○: available, ×: unavailable

Source: MOH

Patients in need of chemotherapy and radiation therapy are sent to Australia or New Zealand through the overseas treatment scheme.

Table 5-26 shows a list of essential technologies and tools by WHO PEN for implementing essential NCD interventions in primary care and its status at health centre in Tonga.

Both THSSP (AusAID) and WHO showed concern in the preparation NCD's essential technologies and tools. WHO consultants visited Tonga for PEN assessment on November 2011 because Tonga is the last country for PEN in the Pacific region. The Government of China constructed several health centers equipped with medical devices, as a result, some health centers already have pulse oximeter, defibrillator and so forth.

Table 5-26 Technology and Tools in Health Centre

Technologies	Add when resources permit	Tools
×Thermometer	○Nebulizer	×WHO/ISH risk prediction charts
○Blood pressure measurement device	△Pulse oximeter	○Evidence based clinical protocols
○Stethoscope	×Blood cholesterol assay	○Flow charts with referral criteria
○Measurement tape	×Lipid profile	○Patient clinical record
○Weighing machine	×Serum creatinine assay	○Medical information register
×Peak flow meter	×Troponin test strips	×Audit tools
×Spacers for inhalers	×Urine microalbuminuria test strips	
○Glucometer	×Tuning fork	
○Blood glucose test strips	△Electrocardiograph(if training to read and interpret electrocardiograms is available)	
○Urine protein test strips	△Defibrillator	
×Urine ketones test strips		

○: available, △: partially, ×: unavailable

Source: MOH

5.5.6 Health Information System

The Health Information Section under Health Planning and Information Division (See Figure 5-4) collects NCDs data from both health centres and hospitals on a monthly basis and manages them. Figure 5-18 shows the information flow.

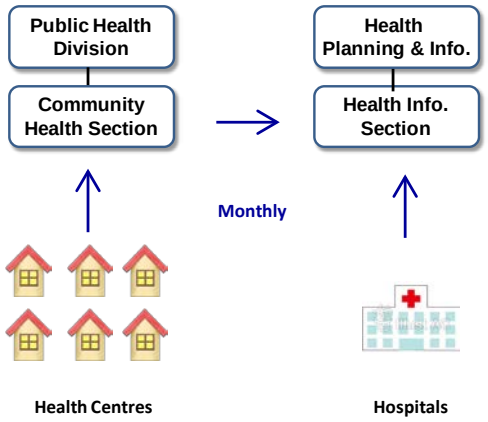


Figure 5-18 NCD Information Flow

5.6 Analysis used Continuum of Care (CoC) for NCDs

5.6.1 Primordial Prevention

Place and life stage interventions in primordial prevention are shown in Figure 5-19.

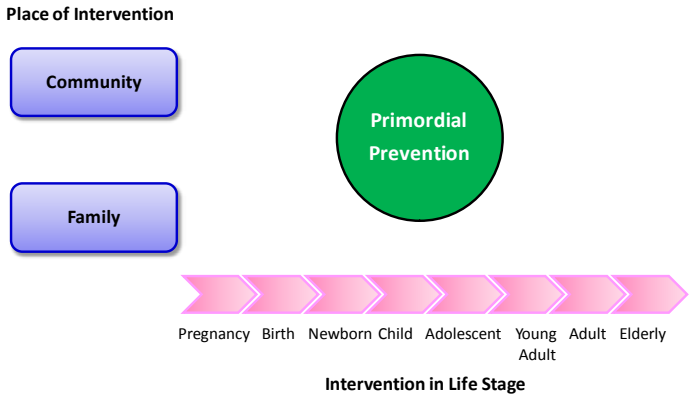


Figure 5-19 Place and Life Stage Interventions in Primordial Prevention

In Tonga, the executing agencies for primordial prevention are the Ministry of Police and Ministry of Revenue and their interventions are for tobacco, alcohol and health eating of risk factors.

(1) Tobacco

Tobacco Survey for Retail Stores in Tonga 2010 indicates that there has been an average increase of 13% in retail price of cigarettes, a decrease in tobacco sales and consequently, a reduction in cigarette consumption of 8%.

The Ministry of Revenue has increased gradually the tax of imported or locally manufactured cigars, cheroots and cigarillos and containing tobacco from 2008 to 2011 as shown in Table 5-27.

Table 5-27 Tax Increases for Tobacco (2008-2011)

Unit: T$

Year	Tax (Imported)	Tax (Local)
2008	150	150
2010	200	200
2011	210	200

Source: Ministry of Revenue

Table 5-28 shows quantity and value of tobacco imported for the last six years.

Table 5-28 Quantity of Tobacco Imported by Year (2006-2011)

Year	Qty (Kg)	Value (T$)
2006	187,424	2,762,599
2007	146,322	4,789,641
2008	205,133	7,723,225
2009	143,278	5,955,869
2010	875,242	5,010,461
2011	90,399	3,167,019

Source: Tonga Department of Statistics

The Tonga Department of Statistics does not have the data on tobacco consumption, as an alternative, they provided the quantity of tobacco imported. The data showed sharp decline in 2011 however the effect of tax increases was obscure due to large fluctuation of quantity by year.

(2) Alcohol

The Ministry of Police enforces the increases of liquor licence fees for alcohol tax increase based on the Intoxicated Liquor Act. This act has been amended twice in 1995 and 2010. In the latest act, licence fees increased suddenly and opening hours were shortened. Those access restrictions to alcohol seem to produce a similar effect on tax increase. Table 5-29 shows the lists of liquor license fee in 1988 and 2011.

Table 5-29 The List of Liquor License Fees (1998 and 2011)

1998 Unit: T$

Category	Licence Fee
Wholesale	200.00
Bottle	200.00
Publican	400.00
Packet	300.00
Club	300.00
Occasional	20.00
Restaurant	175.00
Transfer	20.00
Duplicate	10.00

2011 Unit: T$

Category	Licence Fee
Wholesale	5,750.00
Retail Bottle Store	2,300.00
Club	3,450.00
Special Events	287.50
Bar	2,300.00
Restaurant	1,437.50
Night Club	3,450.00
Transfer	172.50
Duplicate	115.00
Late Renewal	575.00
Manufacture	1,150.00

Source: Ministry of Police

The opening hours of night clubs were shortened from 8:00 p.m.-4:00a.m. (old act) to 8:00 p.m.-12:30 a.m. Mondays to Fridays, and 8:00 p.m.-11:30 p.m. on Saturdays (amended act).

The quantity and value of alcohol imported for the last six years are shown in Table 5-30.

Table 5-30 Quantity of Alcohol Imported by Year (2006-2011)

Year	Qty (L)	Value (T$)
2006	130,068	664,771
2007	162,184	1,049,122
2008	143,750	988,011
2009	113,649	849,955
2010	37,594	322,570
2011	18,073	410,548

Source: Tonga Department of Statistics

Since the act was amended, the quantity of imported alcohol has decreased drastically and the effect is apparent.

(3) Healthy Eating

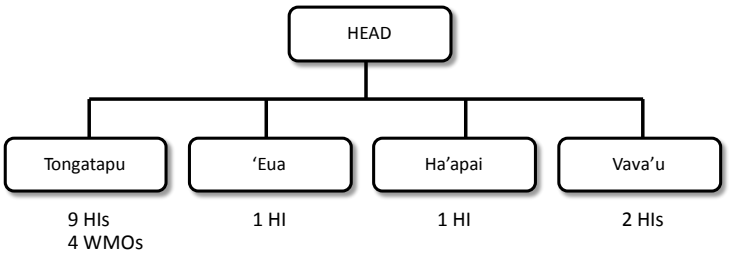
The Ministry of Revenue is considering a prohibition on the importation of three specified food items i.e. hard fat (lard and beef tallow etc.), tin fish (can of tuna etc.) and sweet drink although it is still under discussion.

5.6.2 Primary Prevention

The operation of primary prevention is executed by the Environment Health Section and Health Promotion Unit of the Public Health Division in MOH and Tonga Health.

(1) Environment Health Section

The organizational chart of the section is shown in Figure 5-20. There are 13 health inspectors and four water maintenance officers throughout Tonga. Health Inspectors are engaged in NCD prevention and control.



HI: Health Inspector, WMO: Water Maintenance Officer

Figure 5-20 Organizational Chart of the Environment Health Section

Figure 5-21 shows the places and life stage interventions by the environment health section in primary prevention.

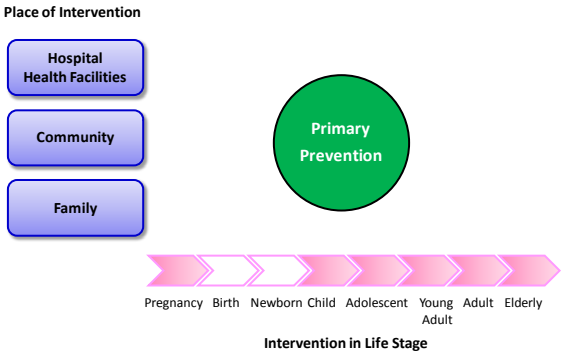


Figure 5-21 Places and Life Stage Interventions by the Environment Health Section in Primary Prevention

The said section is working for the enforcement of the Tobacco Control Act. They were engaged in the tobacco survey conducted in 2010. Long term exposure to second hand smoke may increase the risk of lung cancer and chronic respiratory diseases therefore they are promoting a ban on smoking in public places. Tonga Health prepared a lot of "no smoking" sign plates (Figure 5-22) and the section will install them in different places.

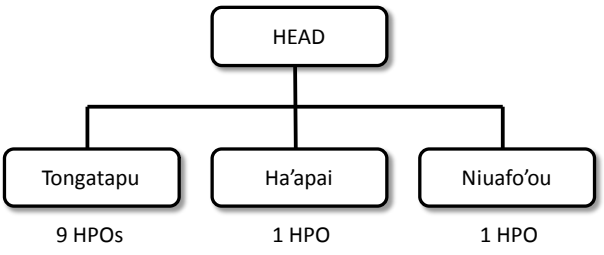
Figure 5-22 No Smoking Sign Plate

It is revealed that 63% of retail stores were selling tobacco individually. In the tobacco survey, approximately 23% were selling tobacco to under age children and 59.3% of the students aged 13-15 years bought cigarettes in a store that allow them to purchase even at their young age. The WB reported that there is one tobacco outlet in every 29 households on average. In Tonga, tobacco is easily available for both adults and children. These environments explained the similar results of smoking rates among the population i.e., 27.6% are from population aged 15-64 years and 27.1% are 13-15 year old students. To respond to the situation, this section advocates the ban on selling cigarettes individually and selling cigarettes to children under 18 years old (Figure 5-23)

Figure 5-23 Posters of Health Promotion on Tobacco

(2) Health Promotion Unit (HPU)

The organizational chart of the section is shown in Figure 5-24.



HPO: Health Promotion Officer

Figure 5-24 Organizational Chart of the Health Promotion Unit

Eleven health promotion officers (HPO) are working for this unit. Most of them are in Tongatapu and none in 'Eua and Vava'u. The responsibilities of the nine HPOs in Tongatapu are in the HP workplace, HP school, HP church, tobacco, radio program, media television, television technician, nutrition and communicable diseases respectively. Figure 5-25 shows the places and life stage interventions by HPU in the primary prevention

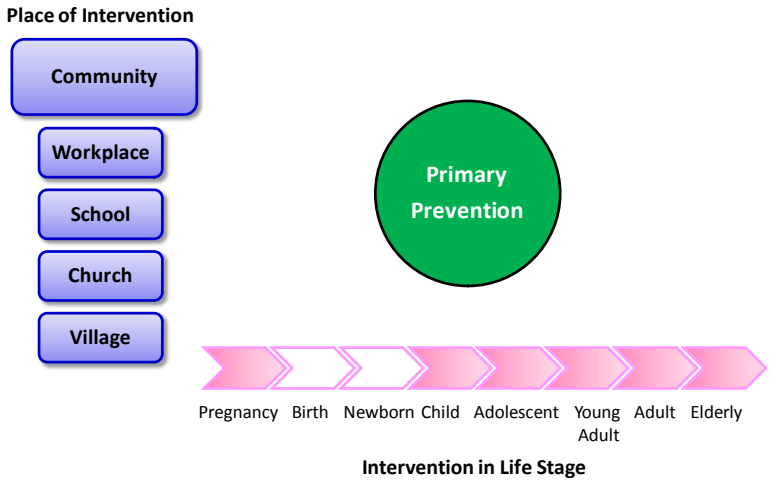


Figure 5-25 Places and Life Stage Interventions by the Health Promotion Unit in Primary Prevention

HPU is working on all four risk factors targeting at communities. According to the National NCDs strategy, a community is classified into four intervention settings i.e., workplace, school, church and village.

Tobacco

HPU held activities on tobacco control for the World No Tobacco Day on December 31 targeting the youth etc. It is revealed in the tobacco survey that only 1% was found to sell tobacco in their correct label. HPU confiscated tobaccos that did not comply with the Tobacco Act (Figure 5-26).

Figure 5-26 Tobacco in Correct Labels

Health Promotion at the Workplace, School, Church and Village

Table 5-31 shows the number of health promotion programs implemented by HPU at various level in the past five years.

Table 5-31 Number of HP Programs by Year (2006/07-2010/11)

	2006/07	2007/08	2008/09	2009/10	2010/11
Workplace	5	8	8	10	10
School	4	4	4	4	4
Church	-	1	1	1	1

Source: MOH

The HP church program has covered four risk factors since its started all islands in 2010/11. The HP workplace and church programs has been implemented in Tongatapu and covered three risk factors i.e. physical activity, healthy eating and tobacco. The frequency of one program is held twice a month. HP activity in each setting is shown in Table 5-32.

Table 5-32 Health Promotion Activity in Each Setting (2007-2010)

Setting of HP	Health Promotion Activity
Workplace	■ Aerobic exercise in MOH (Figure 5-27) ■ Weight reduction competition in MOH ■ Sports event (Fiefia Tonga Sports), participants were from 24 government departments and companies in 2009, 20 in 2010 for touch rugby, volleyball, netball tennis, table tennis, aerobics, and walk for health, etc. ■ Internal department sports event (Figure 5-27)
School	■ Putting up "No Smoking" signs and displaying tobacco and alcohol free zone at the secondary schools in Tongatapu (Figure 5-27) ■ Health talks to school teachers about smoking
Church	■ Healthy lifestyle program - alcohol misuse, tobacco control and health promotion
Village	■ Kinder-garten health program ■ Healthy breakfast program with obesity prevention in communities (OPIC) ■ Organic vegetable garden with Ma'alahi Organic Committee, OPIC, and MAFFF ■ Open space aerobics session on a daily basis every Monday to Friday (185 session, average attendance 10 persons in 2007) ■ Walk for health ■ Bicycle use program

Source: MOH

The companies that participated in the HP workplace were Tonga Communications Corporation (TCC), National Reserve Bank, Westpac Bank, ANZ Bank, Western Union and so forth.

Table 5-33 shows the name of departments and the frequency of sport events in 2007.

Table 5-33 Inter- Ministry Departmental Sports Event in 2007

Department	Touch Rugby			Basketball			Volleyball			Aerobic		
	M	F	M/F	M	F	M/F	M	F	M/F	M	F	M/F
Health	2	1	1	0	2	1	1	1	1	0	0	1
Survey	1	1	0	0	1	1	2	1	2	0	0	1
TEYS	1	0	1	0	1	0	1	0	1	0	0	1
Fisheries	1	0	1	1	1	1	1	1	1	0	0	1
Palace Office	1	0	1	0	0	0	0	1	1	0	0	1
Prime Minister Office	0	0	1	0	0	1	0	0	1	0	0	1
PSC	0	0	1	0	0	0	0	0	1	0	0	0
Labor	1	1	1	0	1	1	0	0	1	0	0	1
Custom Division	1	0	1	0	0	1	0	0	1	0	0	1
Tourism	1	0	1	1	1	1	1	0	1	0	0	1
Agriculture/Forest	1	0	1	0	2	1	1	1	2	0	0	1
Audit	1	0	1	0	1	1	1	1	1	0	0	1
Post Office	0	0	1	0	0	1	0	0	1	0	0	1
Finance	1	1	2	0	1	2	1	1	2	0	0	1
Works	2	0	1	0	1	1	1	0	1	0	0	1
Statistics	0	0	1	0	0	0	0	0	0	0	0	1
Inland Revenue	1	1	1	0	2	0	1	1	1	0	0	1
Justice	1	1	1	0	1	0	1	1	0	0	0	1
Foreign Affair	0	0	1	0	1	1	0	0	1	0	0	1
Marine/Transport	1	0	1	0	1	0	1	1	1	0	0	1
Education 1	1	0	0	1	1	0	1	1	0	0	0	1
Education 2	0	0	1	0	0	1	0	0	1	0	0	1

Department	Touch Rugby			Basketball			Volleyball			Aerobic		
	M	F	M/F	M	F	M/F	M	F	M/F	M	F	M/F
Education 3	1	1	1	0	1	1	2	1	1	0	0	1
Education 4	0	0	0	0	1	0	0	0	1	0	0	1
Education 5	0	0	1	0	1	0	0	0	1	0	0	1
Education 6	1	0	1	0	1	0	1	1	1	0	0	1
Total	20	7	24	3	22	16	17	13	26	0	0	25

Source: MOH

Open Space Aerobics

No Smoking Signs in the Schools

Internal Department Sports Event

Source: MOH

Figure 5-27 Activities by Health Promotion Unit

Television and Radio Broadcasting

HPU advocates NCDs prevention and control using radio and television. The number of programs by media in the past five years is shown in Table 5-34.

Table 5-34 NCDs Program (2006-2010)

	Program	2006	2007	2008	2009	2010
Television	NCDs (diabetes, foot care, foot sepsis, risk factor etc.)	26	5	1	4	4
	General health (nutrition, physical activity, tobacco and alcohol)	30	27	13	15	15
	OPIC intervention	2	4	0	0	0
	Alcohol problem	0	0	1	0	0
	Tobacco awareness	0	0	0	4	4
	Exercise aerobics at waterfront	0	0	1	0	0
	Total	58	36	16	23	23
Radio	NCDs (diabetes, foot sepsis heart diseases, hypertension etc.)	35	38	15	0	0
	General health promotion (nutrition, physical activity, health warning etc.)	31	0	13	0	0
	Live talk back (foot sepsis, diabetes etc.)	22	10	26	10	10
	Tobacco control	10	20	0	0	0
	Total	98	68	54	10	10

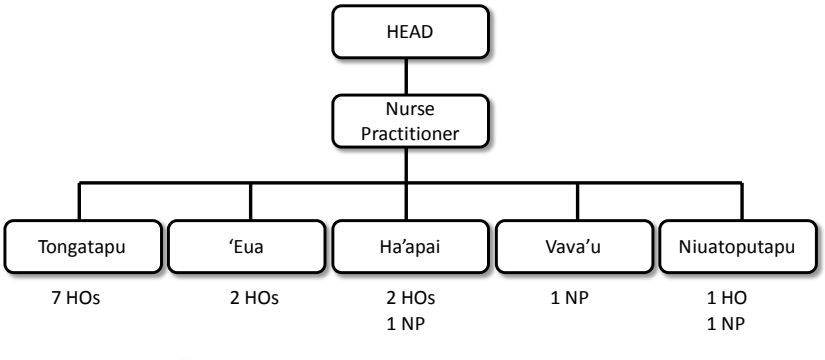
Source: MOH

The number of programs produced by HPU has been decreasing recently. Air time is 10-15 minutes for radio programs, one hour every fortnight for radio live talkback, and 15 minutes every Monday morning for TV programs.

(3) Communication Health

The organizational chart of the section is shown in Figure 5-27.

Twelve health officers and three nurse practitioners are working for this section. This section is working closely with HPU for health talks at diabetic centers, primary schools, and villages in primary prevention.



HO: Health Officer, NP: Nurse Practitioner

Figure 5-28 Organizational Chart of the Community Health

(4) Tonga Health

Tonga Health acts as a link between the community, NGOs and the government to promote health and to reduce harm from NCDs by working on capacity building of all organizations through programs and advocacies. It covers all four risk factors with the activities listed below.

- Healthy Eating and Physical Activity Grant
- Partnership
- Sponsorship, and
- Advocacy

Healthy Eating

STEP Survey 2004 revealed that 92.8% of the population consumed less than five combined servings of fruits and vegetables per day. In response to the poor result, Tonga Health produced education material for five serving intake a day (Figure 5-29). They have started the Grant Scheme Program since 2009 to ensure that people will have fruits and vegetables regularly at the community level. People can easily obtain fruits and vegetables at the local markets; however, its quantity and varieties are not stable throughout the year (Figure 5-30).

Figure 5-29 Education Material

Figure 5-30 Local Market

Table 5-35 shows the recipients of grants, amounts, and beneficiaries etc., in 2009/10 and 2010/11. The healthy eating program has more than tripled in number from the previous year.

Table 5-35 Grant Scheme Program for Healthy Eating (2009/10-2010/11)

2009/10

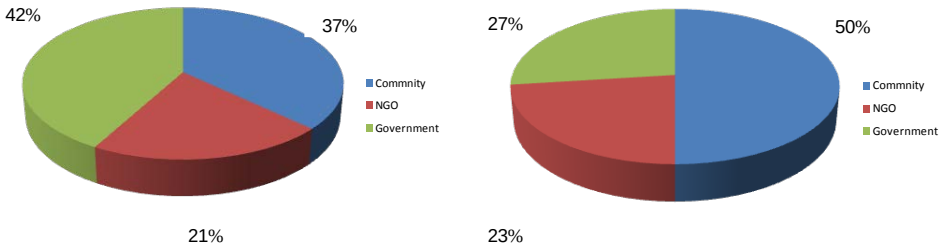
Organization	Category	Amount	Setting	Beneficiaries
Siasi To ‘a e ‘Ofa ki Tonga	Community	T$ 3,000	Church	n.a.
Talafungai ‘o Va’epopua	Community	T$ 3,000	Village	14 members of the women’s group and their families
Peauma’a Ma’alahi Community Oganics	Community	T$ 3,000	Village	15 members of the women’s group with 100 family members
Komiti Fale’i Mo’ui	NGO	T$ 5,000	Church	392 village people
MAFFF	Government	T$10,000	Village	50 women and youths
Total		**T$24,000**		

2010/11

Organization	Category	Amount	Setting	Beneficiaries
Fanga o pilolevu	Community	T$ 3,000	Village	30 members of the youth group and their families
Talafo’ou Women’s Group	Community	T$ 3,000	Village	35 members of the women’s group and their families
‘Apifo’ou College	Community	T$ 3,953	School	230 household
Vaevaemanava-Sopu’o Taufa	Community	T$ 3,000	Village	11 members of women’s group and their family
Talafungani ‘o Va’epopua	Community	T$ 3,000	Village	18 members of the women’s group with 94 family members
Hala ‘One’oneleva Block	Community	T$ 3,000	n.a.	n.a.
Siasi Uesiliana Tau’ataina ‘o Tonga-Hala o’Maui	Community	T$ 3,000	Church	17 members of the church group with 98 family members
Kulupu Fetokoni’aki Fe’ofo’ofani ‘a ‘Ahonono	Community	T$ 3,000	Village	9 members of the women’s group with family members
Kulupu C1 Fua’amotu	Community	T$ 3,000	Village	9 members of the women’s group with 49 family members
Kulupo A1 Fua’amotu	Community	T$ 3,000	Village	8 members of the women’s group with 53 family members
Kulupu Faivavale-Kolonga	Community	T$ 3,000	Village	n.a.
Kala’au Village	Community	T$ 2,228	n.a.	n.a.
Amatakiola-Tonga Community Development Trust	NGO	T$ 3,000	Village	134 groups in Vava’u 53 groups in Ha’apai 22 groups in ‘Eua
‘Ahopanilolo Technical School	NGO	T$ 3,400	School	14 staff and 137 students
Niutoua Village	NGO	T$10,007	n.a.	n.a.
MAFFF	Government	T$10,000	Village	n.a.
MOH/HPU	Government	T$10,000	MOH School	PH nurses and schools
Total		**T$72,589**		

Source: Tonga Health

Half of the grant was allocated to community in 2010/11(Figure 5-31). The grant recipients (church, school, and individuals in the village) purchased soil, fence, seeds, gardening tools, watering cans and chicken manure with the grant money.



Source: Tonga Health

Figure 5-31 Grant Allocation by Recipient (2009/10-2010/11)

Subsequently, they grew their vegetable gardens (Figure 5-32) at church, school, and homes backyard.

Home Church

Source: Tonga Health

Figure 5-32 Vegetable Garden

The outcome of the programs seems to be satisfactory since consumption of vegetables increased to 60% of the members from once a week to 6-7 days a week, 80% of the groups are eating vegetables daily and market expense for vegetables is decreasing.

Timeline of the project cycle was not strictly followed. One of the causes of delay was due to the quality of the proposals that were received. Most of the proposals were incomplete and did not meet the standard requirement. Out of the 44 applicants, only five proposals for healthy eating were accepted in 2009/10.

Physical Activity

Various surveys showed poor results on physical activity such as 43.9% of the population had low level of physical activities, 25.6% of students were physically active only for a total of at least 60 minutes per day in five or more days during the past seven days, and so forth.

Tonga Health has supported organizations to increase the number of people who exercise regularly (Table 5-36). Out of the 37 applicants, nine proposals for physical activity were accepted in 2009/10.

The number of physical activity program has decreased in 2010/11 compared with the preceding year.

Table 5-36 Grant Scheme Program for Physical Activity (2009/10-2010/11)

2009/10

Organization	Category	Amount	Setting	Beneficiaries
Fiefia Tonga	Community	T$ 3,000	Workplace	300 persons
Sia ‘atoutai Theological College Fitness	Community	T$ 3,000	School	250 staff and members
Ako Takimo’ui Kalisitiane-Kolonga	Community	T$ 2,000	Church	112 members and 252 children

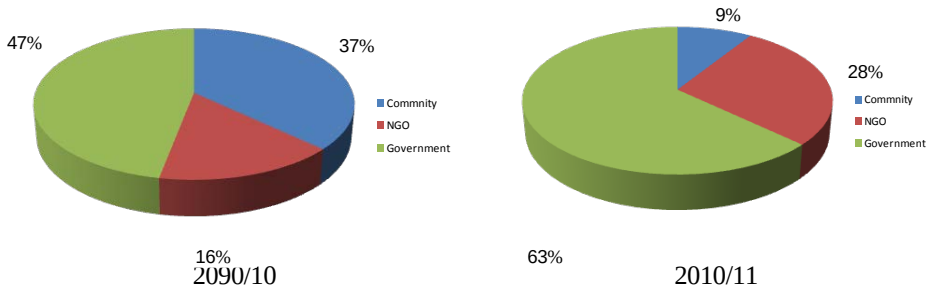
Haofaki Mou'i	Community	T$ 700	Church	n.a.
Lapha Council Incorporated	Community	T$ 3,000	Village	n.a.
Lulunga Youth-Ha'apai	Community	T$ 300	Village	275 youths
Nukunuku Town Committee	NGO	T$ 5,000	Village	n.a.
NCDs and HPU	Government	T$10,000	Village	n.a.
MOTEYS	Government	T$ 5,000	School	2 colleges
Total		T$32,000		

2010/11

Organization	Category	Amount	Setting	Beneficiaries
Kala'au Village	Community	T$ 3,000	Village	18 households with 126 members
Friendly Island Group Fitness Instructors	NGO	T$ 8,981	Village	5 member groups of fitness instructors
MOTEYS	Government	T$10,000	n.a.	Tupou High School
MOH-Community Health	Government	T$10,000	n.a.	Village people
Total		T$31,981		

Source: Tonga Health

Over half of the grant was allocated to the government in 2010/11 (Figure 5-33).



Source: Tonga Health

Figure 5-33 Grant Allocation by Recipient (2009/10-2010/11)

The grant recipients used the grant money for sports equipment and transport, and implemented physical activities and exercises such as touch rugby, volleyball, walking and so forth at the church, school, and workplace (Figure 5-34).

Sport Equipment

Exercise

Source: Tonga Health

Figure 5-34 Physical Activity

Tobacco

Tonga Health supported the tobacco control subcommittee to print 3,000 posters, pamphlets and other advocacy materials like 800 t-shirts to assist the advocacy and awareness campaign on tobacco (See Figure 5-22 and 5-23)

Alcohol

Alcohol harm reduction is the new area that Tonga Health addressed in this financial year (2010/11). It focused on building capacity of the alcohol subcommittee through funding a retreat for the members of the subcommittee. Other activities included support to produce printed educational materials on Liquor Act and other awareness materials on the harmful effects of alcohol and on making better choices.

Other

Figure 5-35 shows the place and life stage interventions at health facilitties in the primary prevention. It is known that breastfeeding reduce the risks of hypertension, hyper cholesterol, type 2 diabetes, and so on for breastfed grown-ups. The rate of six months of exclusive breastfeeding is 58.1% in 2011.

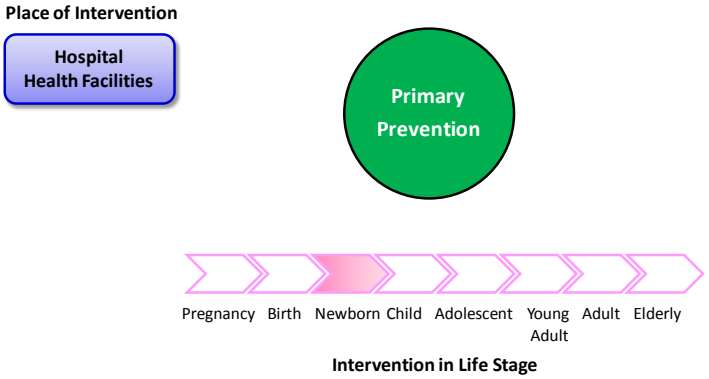


Figure 5-35 Places and Life Stage Interventions at the Health Facilities in Primary Prevention

One of the examples of primary prevention is immunization. To prevent liver cancer, Hepatitis B vaccine is being administered to newborn babies at the health facilities. The coverage of HBV is nearly 100% in Tonga. However HPV has not been introduced in Tonga yet, this vaccine prevents cervical cancer.

5.6.3 Secondary Prevention

The operation of secondary prevention is executed by Diabetic Centre and Community Health Section and Health Promotion Unit in Public Health Division in MOH. Place and life stage interventions by relevant sections are shown in Figure 5-36.

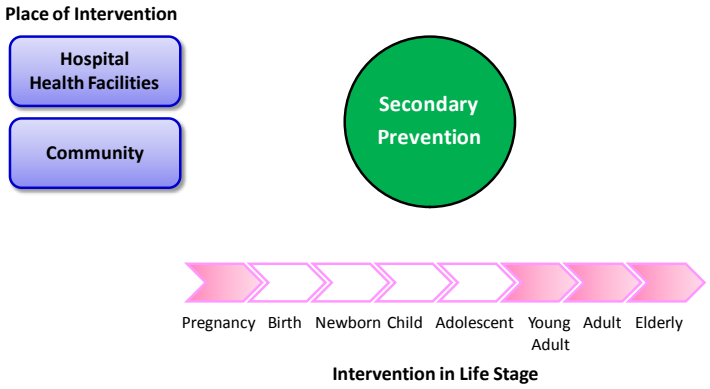


Figure 5-36 Places and Life Stage Interventions by Relevant Sections in Secondary Prevention

(1) Diabetic Centre

The diabetic centre conduct screening of diabetes (include gestational diabetes) and hypertension.

(2) Community Health Section

This section has played a central part in screening for STEPS Survey conducted in 2004 and 2010/11. Also they have conducted screening of diabetes and hypertension at the community level but only on small scale.

(3) Health Promotion Unit

This unit has regularly conducted Mini STEPS (screenings of weight, height and blood sugar) at the workplace i.e., MOFNP, Airport Services, National Reserve Bank, ANZ Bank, TCC etc.

(4) Other

Although the incidence of genital organ cancer has been high in female adults, screening for cervical and breast cancer has not been introduced in Tonga yet (since there is no mammography machine).

5.6.4 Tertiary Prevention

The diabetic centre and health centre execute tertiary prevention. They work for early treatment of NCDs, recurrence prevention, and minimizing complications after the onset. As mentioned above, rehabilitation service has not been provided in Tonga. Sepsis is one of the most common existing complaints among diabetics in Tonga which may lead to amputation. Therefore foot care is very important for diabetes.

Figure 5-37 shows the places and life stage interventions by diabetic centre and health centre in tertiary prevention.

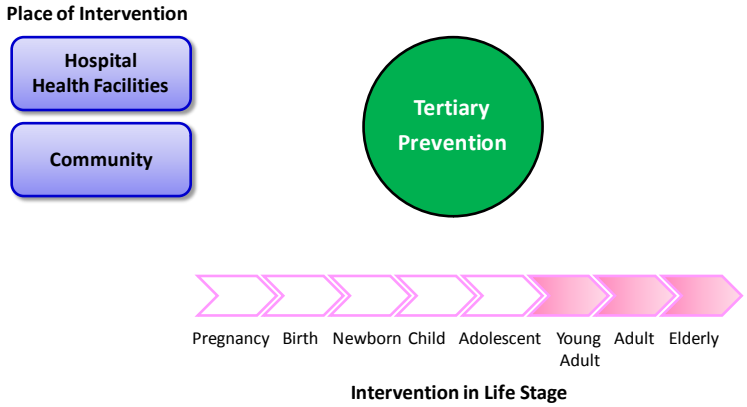


Figure 5-37 Places and Life Stage Interventions by the Diabetic Centre and the Health Centre in Secondary Prevention

Diabetic Centre and health center has provided counseling (medical diet, foot care etc.) and multi-drug therapy for NCDs. The various materials for counseling are shown in Figure 5-38.

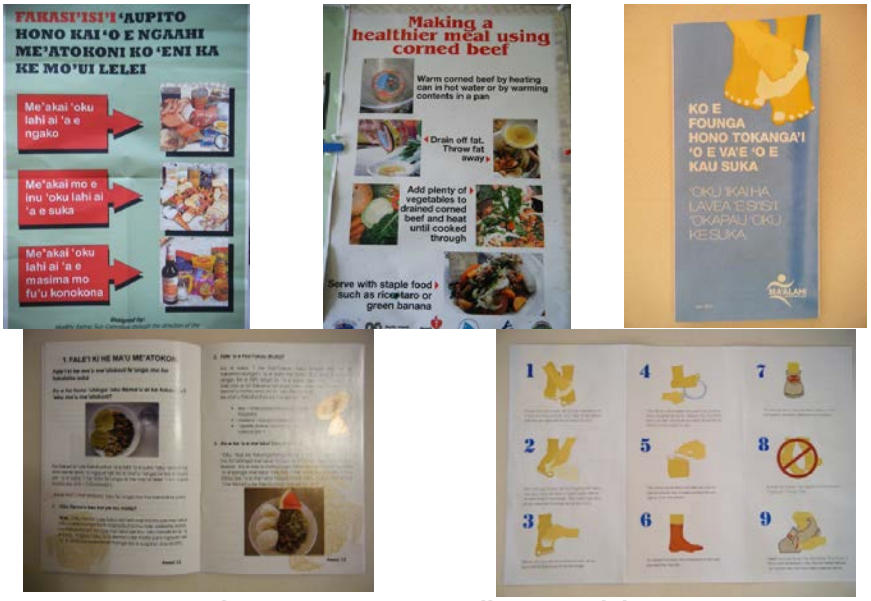


Figure 5-38 Counseling Materials

5.7 Multisector Approach

SPC stated the importance of multi-sector approach to bring together multiple disciplines, sectors, and partners to address the challenges of NCDs. However in Tonga, various sectors and development partners have already worked together at the policy and implementation level. MOFNP, MOE, and MOA, etc., are members of the National NCDs subcommittee and MAFFF and MTEYA are working on health promotion with Tonga Health grant scheme at the community level. Also MOR and MOP are executing primordial prevention on tobacco control and alcohol harm reduction.

(1) Ministry of Education (MOE)

MOE does not have the budget for NCD. They use external resources such as Tonga Health grant scheme and contribution from parents. GSHS Survey revealed that 25.6% of students were physically active for a total of at least 60 minutes per day in five or more days during the past seven days. According to an interview with the Deputy Director for Schools, 30 minutes of physical education class is taught twice a week in primary school and a 50-minute class is taught twice a week. To increase physical activities for students, schools set sports and exercises after school and sports competitions on Fridays in secondary schools modeled after the New Zealand curriculum. MOE has challenges on sports equipment and qualified human resource.

Nutrition Survey 2004 showed that 75% of students purchased food from the school canteens and/or food stalls. However, majority of the food and drinks available at the school contained high levels of sugar, and/or fat with little nutritional value. In response to this situation, MOH implemented the first school policy in 2007 and it was revised in 2012. The policy 2012-2015 is being conducted in schools. Table 5-37 shows the list of "No" Foods and "Yes" Foods for school canteens. Sushi is included in the list as one of the healthy foods.

Table 5-37 "No" and "Yes" Foods for School Canteen

"No" Foods	"Yes" Foods
- Foods high in fat, sugar, and/or salt - Chips or related snacks - Biscuits - Sweets or candy/lollies, Chinese lollies - Chocolates - Deep fried food - Fried cakes - Chocolate cake - Uncooked noodles - Meat pies/sausage rolls - Sugar-added sweet or fizzy drinks including cordials - Ice blocks or ice cream	- Foods low in fat, sugar, and/or salt - Vegetables and fresh salads - Fresh fruits and fruit salad - Coconut juice - Bottled pure water/empty bottle for water filling at school - Sushi - Roti - Fish cakes - Meat and vegetable dishes - Steamed dumplings - Sandwiches (with nutritious fillings) - Filled rolls (with nutritious fillings) - Baked foods - Hamburgers - Grilled chicken pieces - Cooked noodles - Banana/carrot/pumpkin cake - Manioke tama - To'okutu - Tongan staples foods (Me'akai Tonga)

Source: School Food Policy 2012-2015

(2) Ministry of Agriculture

The head of the Agricultural Extension and Women Division in MOA is the chairperson of the healthy eating sub-committee. MOA does not have its own budget for NCD. NCD activities are conducted through the NCD activity with Tonga Health grant scheme, with contribution coming from participants. The division provides not only technical support for vegetable gardening, fruit-bearing tree planting, and poultry raising at churches, schools and villages but also cooking demonstration of its harvests.

(3) Ministry of Fisheries

MOF produced two TV programs and four radio programs for NCDs to promote intake of fresh and variety shells and fishes. However, the broadcasting of these programs occurs in small frequency, such as TV viewing of the programs can be watched once a month while educational plugs can be heard twice a month for radio due to budget constraint.

5.8 Development Partners on NCDs

(1) SPC

SPC and GOT formulated the Joint Country Strategy 2009-2013 in support of Tonga's Strategic Development Plan 9 2009-2013. SPC consists of six technical division i.e. Applied Geoscience and Technology Division (SOPAC), Economic Development Division, Education, Training and Human Development Division, Fisheries, Aquaculture and Marine Ecosystems (FAME) Division, Land Resources Division and Public Health Division. In Tonga, the five SPC divisions support SDP 9, with its cos by division and year shown in Table 5-38. From the table, it can be seen that the total amount has been allocated to public health during 2009-2011.

Table 5-38 Costing for SPC Joint Country Strategy Activities (2009-2013)

Unit: T$

Division	2009	2010	2011	2012	2013
Land Resource	734,907	581,203	192,130	197,894	67,245
Marine Resource	341,991	378,495	242,083	219,028	-
Public Health	1,181,204	721,829	477,824	10,949	5,764
Social Resource	475,532	276,296	143,704	48,032	-
Economic Development	653,240	115,278	470,718	393,866	393,866
Total	3,386,874	2,073,101	1,526,459	869,769	466,875

Source: Joint Country Strategy 2009-2013

SPC applied direct funding system and made available substantial cash payments to GOT and civil society organizations to support NCD initiatives such as the Tonga Health Fund. NCDs activities are included in the public health and its fund from the 2-1-22 program.

Main Activities (2009-2012) on NCDs are as follows:

- High level advocacy meetings,
- Meeting with the Legislative Assembly, Prime Minister, MOH, MOS and CEO agriculture and fisheries,
- Support national meetings/capacity building,
- Tonga food summit, obesity training, NCD risk factor training and so forth,
- Support regional NCD meetings, and
- NCD forum, NCD and media training and diabetes capacity training.

Financial supports (2009-2012) are as follows:

- Small grant schemes for lifecycle (bicycles), Inter-government departments sports (Fiefia sports) , Women's garden and beauty (Aus$ 40,000),
- Large country grant for setting Tonga Health, assist in the implementation of Tonga National NCD Strategy (Aus$525,000), and
- In kind support for the activities above (Aus$100,000).

(2) WHO

The annual budget provided by WHO in the past three years is shown in Table 5-39.

Table 5-39 WHO Annual Budget (2008/09-2010/11)

Unit: US$

Item	2008/09	2009/10	2010/11
Immunization	12,100	12,000	14,000
Vector Control and Environment	21,500	20,000	20,000
NCD	293,126	200,000	111,000
Health Promotion	166,000	150,000	180,200
RHD/Health Emergency	18,000	22,500	35,000
Health System/HIS	70,000	44,000	98,000
Training of Health Workforce	389,700	400,500	405,000
Planning	12,000	32,000	22,000
Health Finances	0	5,000	9,000
Medical Product/Drugs	37,800	120,000	21,000
Total	1,020,226	1,006,000	915,200

Source: MOH

WHO provides more than 30% to 40% of the total budget to NCD and health promotion during 2008/09-2010/11. Apart from these, WHO supports training on NCD and supplies reagent of HbA1c test and glucose testing strips. WHO has dispatched consultants to Tonga for PEN protocol assessment in November 2012.

(3) AusAID

AusAID has supported the development of MOH over the years. From 1999 to 2007, Australia funded Aus$5.7 million for the Tonga Health Sector Planning and Management Project (THSPMP). Following the success of this project, AusAID decided to embark on a new program of support. With this, in 2009, AusAID has contracted a design team to develop a new framework. This resulted in the Tonga Health Systems Support Program (THSSP) which officially commenced in March 2010. While Australian support to the health sector in Tonga is based on a 10year timeframe, the subsidiary arrangement for THSSP covers the first four years (2009-2013) which provides Aus$7.5 million.

The Program Manager is the Principal Health Planning Officer in MOH. There are also two staffs that are employed for NCD community outreach (medical doctor) and NCD behavior change (nurse).

Table 5-40 shows the cash on NCDs by THSSP in the past three years (in kind was none).

Table 5-40 Cash on NCDs by THSSP (2008/09-2010/11)

Unit: T$

Item	2009/10	2010/11	2011/12
Administration	478,710	-	-
Technical Assistance	398,925	-	-
Community Health	797,850	-	-
Diabetes	159,570	-	-
Flexible Funding	797,850	-	320,000
AusAID Direct Expenditure	79,785	-	-
Critical Deficiencies	-	787,227	723,200
Twinning Program with St. John Hospital	-	92,615	76,800
Legislative Fiscal Measures	-	75,945	71,680
Behavior Change/Health Promotion	-	405,654	422,400
NCD Primary Care	-	564,951	819,200
Diabetic Centre Outreach	-	96,320	407,296
Program Management	-	274,140	346,880
Total	**2,710,690**	**2,296,852**	**3,187,456**

Source: MOH

According to the interview with the program manager, AusAID noticed that good health indicators or performance on MCH are attributed to RHN's efforts in MCH clinics at the community level. As mentioned above, health officers who are working in health centers at the community level provide diagnosis and treatment of NCDs but not care. The diabetic centre has the responsibility for NCD care at the community. However the centre has not been able to provide sufficient services so far due to the shortage of staff. In response to this, the MOH started deploying NCD nurses in health centers to provide NCD care at the community level.

The work plan of THSSP outlined four key strategies, namely:

- Strategy One: Legislative and Fiscal Measures
- Strategy Two: Behavior Change Communication (Health Promotion)

- Strategy Three: NCD Primary/Community Care
- Strategy Four: Diabetes Centre and Diabetes Outreach

The primary goals of the program are long-term, and the following goals are included;

- Halting/reducing the prevalence of risk factors for NCDs,
- Improving community health service, and
- Increasing the budget used for preventive health.

Progress of the project to date is as follows;

- Three health centers were upgraded.
- Five health centers received medical equipment upgrades.
- Five nurses specializing in NCDs have been recruited and have commenced working in communities in February 2012.

The Australia and Tonga Partnership for Development Health Sector 2012-2013 which was endorsed in October 2012 described that NCD nursing division was established and NCD nursing curriculum development was approved by the Tonga National Qualifications and Accreditation Board (TNQAB) in the fiscal year of 2012-2013. They assume that NCD tutor and NCD supervising sister are recruited, and NCD nurses are recruited for all health centers with a view to improve health services across Tonga and reduce NCD risk factors, and related illness accordingly.

(4) Others

1) NZAP

NZAP provides NZ$ 500,000 for fund of overseas patient referral annually.

2) China AID

The Chinese government constructed the diabetic centre in Vava'u and a building for CT. Also, they constructed several health centers and equipped with medical devices such as ECGs and Defibrillators.

3) World Bank

The WB has implemented the community diabetes care and management project in 2009.

4) EU

The EU donated Accucheck Glucometer for diabetes in 2007.

5) World Diabetes Foundation

This foundation supported the glucose testing strips and training in 2011.

6) Israel Parliament

The parliament provided glucometers and strips for patient use in 2011.

5.9 Findings

(1) NCDs Burden Impact

As derived from statistical data, around 30% to 40 % of deaths in a 25-64 age group are attributing to NCDs, NCDs accounted for 19.6% of hospital costs, and around 53% of governmental fund for overseas patient referral in 2009 were NCD cases, medical drugs and supplies for NCDs accounted for 25% of its total cost etc., NCD burden has already had a large impact on the limited health budget and society in Tonga.

(2) Coordination among Development Partners

The GOT stated that preventive health measures are more cost-effective than curative services in the National Strategic Planning Framework (NSPF) 2010-2014. In accordance with this strategy, National Strategy to Prevent and Control NCDs 2010-2015 (Tonga's PATH) only focused on primary prevention accordingly. While AusAID made a contract with MOH for THSSP in the previous year of Tonga's PATH formulation. THSSP covered not only primary prevention but also tertiary prevention. However, it is very difficult to achieve the goal of Tonga's PATH, (to reduce death rate from NCD by 2% per year over and above the existing trends by 2015) by primary prevention alone so implementation of other preventions i.e. secondary and tertiary are necessary, if possible.

Also, many development partners have been working for NCDs, i.e. four NCD subcommittees, Tonga Health, WHO, Aus AID, China AID, relevant ministries (education, agriculture etc.) and so forth. However there has been no coordination among them.

(3) Health System Functioning

In the analysis of HSS six blocks, governance/leadership, health finance and health information system seems to function well comparatively because MOH has prepared essential legislations and guidelines for NCD, i.e., establishment of the first National NCD Strategy and health promotion foundation in the Pacific, implementation of best buys interventions, allocation of budget to NCD relevant sections, and showing of accurate NCD mortality data.

As for the rest, health service, health workforce, and medicine/technology have remained at the low and middle income level due to budget constraint.

(4) Continuum of Care

Activities for NCDs preventions (primordial to tertiary) have intervened in all three places and whole life stages.

(5) Medical Equipment

Medical equipment supply for NCD is less important because THSSP and China AID have provided equipment to hospital and health centers.

(6) Disparity in the Health Promotion between Tongatapu and Outer-islands

Almost all health promotion activities were implemented by the environmental health, health promotion unit and community health. Recipients of the grant scheme program are concentrated in Tongatapu. Even though only 28%

of the total population reside and sporadically scattered in outer islands (‘Eua, Ha’apai, Vava’u, Niuatoputapu and Nuiafo’ou), this is a critical challenge to be addressed.

(7) Coverage of the High and Moderate Risk Population

The STEPS Survey 2004 revealed that 60.7% of the surveyed population was at high risk of NCDs and 39.2% was at moderate one. High risk means persons with 3-5 risk factors while moderate means persons with 1-2 risk factors. This rate has been applied to the latest population for person aged 25-64. High and moderate risk population was estimated at 23,858, and 15,407, respectively. Beneficiaries of Inter-Ministry Department Sports in 2007 were about 1,694 persons (as per the number of execution×2 teams×the number per team i.e. six persons/team for touch rugby and volleyball, five persons/team for basketball) and beneficiaries of the physical activity by grant scheme in 2009/10 and 2010/11 were 1,189 and 131, respectively. As for healthy eating by grant scheme, the number of beneficiaries in 2009/10 and 2010/11 was 571 and 661, respectively but in the known range. Those numbers are far from the targets like thehigh and moderate population.

(8) Coverage of the Primary and Secondary Schools

Students in primary and secondary schools are crucial targets for health promotion. Various surveys showed poor health results for children i.e., 27.1% of students currently smoke cigarettes, 70.5% had ever drunk alcohol (other than a few sips) at ages below 14 years, 59.6% were overweight, 21.9% were obese and so forth. A considerable number of students may already be at a high or moderate health risk. According to an obtained information, “No Smoking” signs were placed as well as tobacco and alcohol free zones were displayed at secondary schools in Tongatapu only. HPU implements four programs for secondary school annually, whereas, two colleges and one technical school received a grant from Tonga Health. The number of both primary and secondary schools is 51 in Tongatapu, 6 in ‘Eua, 19 in Ha’apai, 31 in Vava’u and 5 in Niuas. And as for the secondary schools, the number of both government and private schools is 13 in Tongatapu, 2 in ‘Eua, 4 in Ha’apai, 6 in Vava’u and 2 in Niuas. Health promotion activities have not reached these targets sufficiently.

(9) Capacity Building of the Community

The grant scheme program provides based on proposal submitted by the community, however most of them do not fulfill the requirement. Health promotion is the process of enabling people to increase control over, and to improve, their health. NCD prevention is almost the same as a life style control. Inevitably, it requires the continuances of eating healthy foods, physical activity and cessations of tobacco and alcohol use. The support for capacity building is necessary to improve the quality of proposal and keep up activities in the community.

(10) Women’s Development Group

Women prepare meals in a Tongan traditional way. Activities for home vegetable gardening and cooking demonstration to women are more cost effective because the benefit expands up to their family members.

(11) Gender Differences

Studies showed that genders differences in term of lifestyle disease such as high prevalence of tobacco use, alcohol drinking and high mortality of CVD are common in male adults, while high mortality of cancer and diabetes, high

prevalence of obesity are common in female adults. It is more important to put gender perspective in NCDs measures.

(12) RHN Involvement in Women's Cancer

Regular Pap smear can help prevent up to 90% of the most common type of cervical cancer. This screening needs simple equipment i.e., speculum, glass slide, spatula and fixative, these are not expensive. Performing breast self examination can save a women's life from breast cancer. It is desirable to introduce Pap smear and beast palpation (both self check and examination by RH nurse) in MCH clinic.

5.10 Recommendations

In terms of cost-effectiveness, expansion and dissemination of health promotion towards the community level are given priority and urgent action. However, this does not mean that secondary and tertiary preventions are not necessary in Tonga.

The team leader of Healthy Pacific Lifestyle Section in the SPC Headquarter gives high appraisal to JOCV activities and has requested a dispatch of JOCV in all 22 Pacific countries to create a network for NCDs prevention and control. Tonga Health needs human resources such as a National Coordinator for various development partners and person for monitoring and evaluation of the grant scheme program.

The Australia and Tonga Partnership goes forward as scheduled activities like NCDs section establishment, NCDs section NCDs supervising sister appointment and NCD nurse recruitment for all health centers will be completed in 2013. If these will materialize, experiences of the current NB-IST project could be applicable.

Tongan people like to eat food. The school food policy listed Japanese food "Sushi" (sushi roll) as one of the healthy foods compared with eating-out and foods from the school canteen have contained high levels of sugar and/or fat with little nutritional so far. Sushi would be a healthy food due to low fat and vegetable filling. Sushi ingredients are available in Tonga (i.e. sea weed, wasabi, soy source, etc.) and sushi is also available at Korean restaurants but is expensive. In Japan, kitchen cars were used for the expansion of bread-centered diet after the war. Therefore, it seems probable that sushi and other healthy food will be available to all through cooking demonstration.

Chapter 6 Situational Analysis in Kiribati

6.1 NCDs Situation

Table 6-1 lists the leading causes of mortality in Kiribati in 2011. NCDs such as cardiovascular diseases (CVDs), cerebrovascular diseases, and diabetes occupy 20.8% of country's total deaths. Nutritional deficiency ranked ninth, indicating that Kiribati faces a double-edged health problem related to diet and nutrition, i.e., overnutrition in adults and undernutrition in children.

Table 6-1 Leading Causes of Mortality (All Ages, 2011)

Rank	Causes	Number of Deaths	% of Deaths
1	Digestive diseases	42	8.7
2	Cardiovascular diseases	41	8.5
3	Cerebrovascular diseases	33	6.9
4	Respiratory infections	30	6.2
5	Diabetes mellitus	26	5.4
6	Diarrhoeal diseases	17	3.5
7	Infectious and parasitic diseases	17	3.5
8	Endocrine diseases	16	3.3
9	Nutritional deficiency	14	2.9
Total		494	-

Source: 2011 Annual Report, Ministry of Health and Medical Services Kiribati (MHMS), 2012

The relative contribution of underlying causes of mortality varied with age (Table 6-2). For young adults aged 15-24 years old, the main cause of death differs between males (external causes) and females (neoplasm). Diseases of the circulatory system, in which CVDs are a major component in Kiribati, cause more deaths as people age.

Table 6-2 Leading Causes of Mortality by Age Group (2011)

Age Groups	Male		Female	
	Causes	% of Deaths	Causes	% of Deaths
15-24	External causes of morbidity and mortality	43.8	Neoplasm	33.3
25-44	Diseases of the circulatory system	21.3	Digestive diseases	30.0
45-63	Diseases of the circulatory system	40.0	Diseases of the circulatory system	20.0
64-84	Diseases of the circulatory system	21.2	Diseases of the circulatory system	26.0

Source: 2011 Annual Report, Ministry of Health and Medical Services Kiribati (MHMS), 2012

Table 6-3 shows the number of confirmed deaths caused by major NCDs in Tungaru Central Hospital (TCH), which is the national top referral hospital in Kiribati.

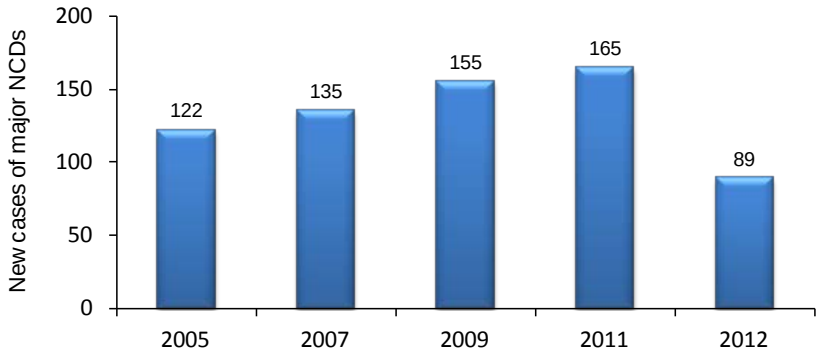
Table 6-3 Number of Confirmed Deaths Caused by Major NCDs in TCH (2005-2012)

	2005	2007	2009	2011	2012*
Cardiovascular diseases	3	-	11	9	4
Heart diseases	2	-	1	-	1
Cerebrovascular diseases	1	-	2	3	2
Diabetes	5	4	5	14	2
Cancer	4	5	12	7	6
Total	12	9	28	30	12

* Data for 2012 includes only the number of deaths until July.

Source: Health Information Unit, MHMS

The data indicates that the number of deaths due to CVDs, diabetes and cancers have been increasing from 2005 to July 2012 in which monthly data was available. In accordance with the increasing number of deaths, the new cases of these diseases increased to 165 in 2011 (Figure 6-1).

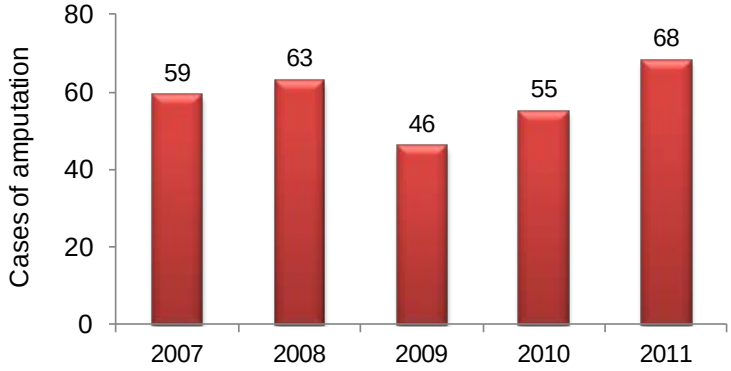


Note: Data for 2012 includes the number of patients until July.
Source: Health Information Unit, MHMS

Figure 6-1 Number of New NCD Cases in TCH (2005-2012)

6.2 Burden of NCDs

The results of STEPS survey 2004-2006[49] showed that 28.1% of adults aged 15-64 have diabetes. According to the data from the Diabetic Clinic, the number of amputations related to diabetes steadily increased to 68 cases in 2011 (Figure 6-2). Among surgical cases in TCH, 39-45% was due to diabetic foot sepsis in 2010-2011 (Table 6-4). The Kiribati National Disability Survey 2004 found 3,840 people with 4,358 disabilities[50]. Physical disabilities accounted for 32% of all disability patients, 40% among those were caused by amputation. According to the World Bank (2004), the annual value lost by whole disability was Aus$76 million.



Source: Diabetic Clinic, Tungaru Central Hospital

Figure 6-2 Number of Amputations in Kiribati (2007-2011)

Table 6-4 Number of Surgical Cases and Amputations in TCH (2010-2011)

Years	General surgical case	Diabetic foot sepsis	Amputation
2010	340	131 (39%)	49
2011	420	187 (45%)	61

Source: Itaaka K.T. (2012) review of diabetic foot sepsis – Tungaru Central Hospital; Year 2010-2011

[49] The outline is described in Section 6.3.
[50] Some people identified as having more than one disability.

As it will be described in Section 6.5.2, patients in need of tertiary medical care are referred overseas in Kiribati. Because cancers and CVDs are major cases for the referrals, the budget for the overseas referrals could be another burden for the government. The annual budget for overseas referral was Aus$400,000 in 2011 and 2012, which represent 3% of the total budget of the Ministry of Health and Medical Services (MHMS).

6.3 Major Surveys on NCD Risk Factors

The NCD STEPS survey which was conducted from May 2004 to September 2006 in South Tarawa and in four outer islands of Butaritari, Makin, Onotoa, and Beru, provided the first snapshot of the NCD status and risk factors among I-Kiribati[51]. The Mini-STEPS survey has been conducted every six months in South Tarawa since 2010. It specifically focuses on people of particular communities, workplaces, and schools. The results of the STEPS survey in 2004-2006 and the Mini-STEPS survey in October 2010 are shown in Table 6-5.

Table 6-5 Results of STEPS and Mini-STEPS Survey (age 15-64)

Year	2004-2006	2010		
Targets	**Community**	**Community**	**Workplace**	**Schools**
Number surveyed	1,755	1,810	463	885
Behavioral Risk Factors				
Current tobacco smoking (%)	61.3	43.6	31.5	19.2
Current alcohol consumption (%)	25.5	21.0	26.3	38.9
Low level of physical inactivity (%)	50.1	39.7	67.6	38.0
Less than five combined servings per day (%)	99.3	97.1	98.9	96.5
Metabolic Risk Factors				
Overweight (%)	81.5	75.0	81.2	34.8
Obesity (%)*	50.6	41.5	60.2	26.4
Raised blood pressure (%)	17.3	46.1	38.7	3.8 (SBP)** 15.5 (DBP)***
Raised Blood glucose (%)	28.1	42.1	35.2	14.7
Raised Cholesterol (%)	27.7	-	-	-

Note: *The percentage of obesity in the overweight population.
**SBP; systolic blood pressure
*** DBP; diastolic blood pressure

Source: Kiribati NCD Risk Factors STEPS REPORT, MHMS and WHO, 2009
NCD Report 2010-2011, MHMS , 2012

As for behavioral risk factor, the percentage of current smokers was particularly high at 31.5-61.3%. Among current smokers, 59.0% smoked daily in the 2004-2006 survey. The smoking rate in school students was 19.2% in 2010. The results of the surveys also showed that 38.0-67.6% of people reported a low level of physical activity; that is, they engaged in physical activity for less than 600 metabolic equivalent (MET) minutes per week. In addition, the results indicated that average consumption of fruits and vegetables among I-Kiribati was well below recommended levels. The prevalence of people consuming less than five combined servings of fruits and vegetables per day was 96.5-99.3%.

Among metabolic risk factors, the overall prevalence of overweight (BMI $\geq$ 25 kg/m^2) was 75.0-81.5% and among those, obesity (BMI $\geq$ 30 kg/m^2) was 41.5-60.2%. The survey found that 17.3-46.1% of respondents had hypertension[52]. The surveys also found that the overall prevalence of diabetes[53] was 28.1-35.2%.

[51] I-Kiribati is the demonym for native people of Kiribati.
[52] Hypertension is defined as SBP $\geq$140 mmHg and/or DBP $\geq$90 mmHg or on medication for high blood pressure.
[53] Diabetes is defined as raised fasting glucose level $\geq$6.1 mmol/L or on medication for raised blood glucose.

The surveyed population of the STEPS Report 2009 was classified into three NCD categories. The analysis showed that only 0.1% of the population of I-Kiribati have zero risk factors for NCDs, 25.4% are at moderate risk (1-2 risk factors), and 74.6% are at high risk (3-5 risk factors) (Table 6-6). By the age of 25-44 years old, the majority of the population (72.7%) has 3-5 combined risk factors.

Table 6-6 Population with Combined Risk Factors in the STEPS survey 2004-2006 (%)

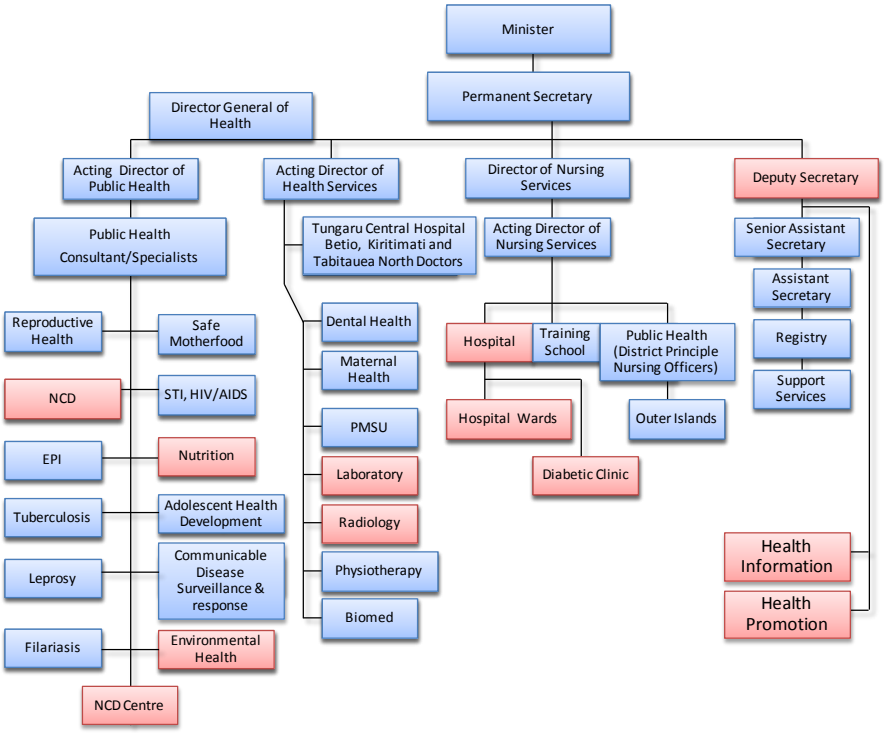
NCD risk categories	% of population
Zero risk factors	0.1
Moderate (1-2 risk factors)	25.4
High (3-5 risk factors)	74.6

Source: Kiribati NCD Risk Factors STEPS REPORT, MHMS and WHO, 2009

6.4 Organizational Arrangement for NCD Prevention and Control

6.4.1 The MHMS

Figure 6-3 represents the organizational structure of the Kiribati MHMS. There are 12 active programmes within the Public Health Department. The Health Information unit and Health Promotion unit provide administrative supports to all departments.



Note: The units concerning NCD prevention and control are indicated in red.

Source : The Survey Team based on Kiribati Country Health Information, WHO, 2012

Figure 6-3 Organization of the MHMS

The NCD unit is primarily responsible for research and planning to prevent NCDs in the Public Health Department of MHMS. The NCD Centre was established by SPC in 2010 under MHMS. It is also responsible for handling NCD programmes. The NCD unit mainly focuses on primary prevention of NCDs, whereas the major role of the NCD Centre is to survey NCD risk factors, conduct the Mini-STEPS survey, and analyze and utilize the data for future planning. The Health Promotion unit plays a role in conducting awareness rising activities for tobacco,

alcohol as well as physical activities through information, education, and communication materials and mass media. The Nutrition unit is responsible for the activities for improving the diet in communities and schools.

As each unit has a small number of staff, human resources for NCD programmes are occasionally insufficient. There are only one staff in the NCD unit, two including an assistant in the Nutrition unit, and two including an assistant in the NCD Centre.

6.4.2 The NCD Committee

The NCD Committee was established in 2010 to coordinate NCD programmes. In addition to the heads of the relevant units mentioned above, health information officers, a nurse from the Diabetic Clinic, the Deputy Secretary of MHMS, and two staffs from the World Health Organization (WHO) participate in the committee to conduct NCD activities.

Officers of the Ministry of Education (MOE) are included in the committee for programmes and sports promotion events at schools. For improving diet, officers of the Ministry of Environment, Lands and Agriculture Development (MELAD) are invited to the committee to adopt multisectoral approaches for NCDs.

6.4.3 Roles and Responsibilities

Units in the Public Health Department are mainly responsible for primary prevention of NCDs (Table 6-7). The NCD Centre is also involved in the secondary prevention of NCDs through screening of potential NCD patients with the Mini-STEPS survey. The Diabetic Clinic, hospital doctors, and hospital wards are included in the secondary and tertiary NCD prevention scheme.

Table 6-7 Roles and Responsibilities for NCD Programmes

Roles	Organization
Primary prevention	NCD unit, Health Promotion unit, Nutrition unit, Environmental Health unit, Health Information unit
Primary and secondary prevention	NCD Centre
Secondary and tertiary prevention	Diabetic Clinic, hospital doctors, hospital wards, Rehabilitation unit

Source: MHMS and Tungaru Central Hospital

6.5 Analysis used Health System Strengthening (HSS) Six Blocks for NCDs

6.5.1 Governance and Leadership

(1) National Development Plan

The Kiribati Development Plan (KDP) 2012-2015 is a strategy to reduce poverty and achieve sustainable growth in six key priority areas which are: i) human resource development, ii) economic growth and poverty reduction, iii) health, iv) environment, v) governance, and vi) infrastructure. KDP 2012-2015 recognizes that maternal and child mortality, burden of communicable and noncommunicable diseases and gaps in health service delivery are key issues in the health sector.

MHMS is in the process of developing its sector plan to achieve the key expected national outputs in KDP 2012-2015 (Table 6-8).

Table 6-8 Key Expected Outputs in Health in KDP 2012-2015

1	Reduced population growth
2	Reduced maternal morbidity and mortality
3	Reduced child morbidity and mortality
4	Reduced burden and incidence of communicable diseases (tuberculosis, leprosy, lymphatic filariasis, STIs and HIV/AIDS)
5	**Reduced burden and incidence of other diseases (NCDs)**
6	Improve health services delivery

Source: Kiribati Development plan 2012-2015, Government of Kiribati, 2012

(2) Health Sector Development Plan

The strategic objectives set out in the draft of the Kiribati National Health Strategic Plan 2012-2015 are shown in Table 6-9. The strategic plan outlines six key objectives, one of which (Objective 4) aims to reduce the prevalence of risk factors and morbidity, disability, and mortality due to NCDs.

Table 6-9 Strategic Objectives of the Kiribati National Health Strategic Plan 2012-2015

1	Increase access to and use of high quality, comprehensive family planning services, particularly for vulnerable populations including women whose health and wellbeing will be at risk if they become pregnant.
2	Improve maternal, newborn and child health.
3	Prevent the introduction and spread of communicable diseases, strengthen existing control programmes and ensure Kiribati is prepared for any future outbreaks.
4	**Strengthen initiatives to reduce the prevalence of risk factors for NCDs, and consequently reduce morbidity, disability and mortality from NCDs.**
5	Address gaps in health service delivery and strengthen the pillars of the health system.
6	Improve access to high quality and appropriate health care services for victims of gender based violence, and services that specifically address the needs of youth.

Source: National Health Strategic Plan 2012-2015 (Draft), MHMS

The strategic actions to attain this objective include strengthening of work plans; identifying the needs of high risk groups for tobacco, alcohol, healthy eating, physical activity, diabetes; and improvement of health services for cancer, hypertension, heart disease, and chronic lung disease through diagnosis and early intervention (Table 6-10).

Table 6-10 Strategic Actions and Indicative Activities of Objective 4 in the Kiribati National Health Strategic Plan 2012-2015

4.1	Review, update and implement NCD work plan.
4.2	Strengthen initiatives around tobacco control and alcohol misuse.
4.3	Strengthen initiatives around healthy eating.
4.4	Strengthen initiatives around physical activity.
4.5	Strengthen initiatives around prevention and management of diabetes.
4.6	Promote prevention, early diagnosis and early intervention in relation to cancer, hypertension, heart disease and chronic lung disease.
4.7	Improve mental health services.

Source: National Health Strategic Plan 2012-2015, Final Draft, MHMS

The indicators for tobacco, obesity, and diabetes targets are set at 20% reductions from baseline (Table 6-11).

Table 6-11 Indicators and Target in the Kiribati National Health Strategic Plan 2012-2015

Health Indicator	Target	Baseline
Tobacco smoking prevalence (among population 25-64 years)	Males=59% Females=36%	Males: 74% (2006)* Females: 45% (2006)*
Obesity rate (among population 20+ years)	Males=34% Females=47%	Males: 42% (2006)* Females 59% (2006)*
Number of new cases of diabetes	674	842 (2010)**

Source: National Health Strategic Plan 2012-2015, Final Draft, MHMS
* Kiribati NCD Risk Factors STEPS REPORT, MHMS and WHO, 2009
** Kiribati Health Databank 2011, WHO, 2011

(3) National NCD Strategic Plan

The Kiribati government developed the first national NCD plan called the NCD Strategic Plan 2008-2011 in 2007 to reduce the prevalence of NCDs in Kiribati. The NCD Strategic Plan 2013-2015, a continuation of the last strategic plan, was formulated in 2012. The strategic objective of the plan is to reduce the NCD risk factors by 20% in three years. To achieve this goal, the plan focuses on five major components shown in Table 6-12.

Table 6-12 Five Major Components of the NCD Strategic Plan 2013-2015

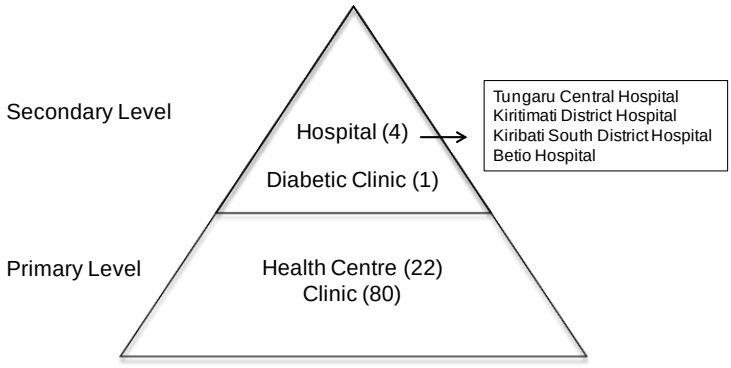
1. Strengthen development and management of the comprehensive multi-sectoral national NCD strategies
2. Support National Implementation of NCD prevention and control activities
3. Strengthen national health system and capacity to prevent and control NCDs
4. Support national development of funding mechanism for the NCD programme
5. Strengthen national NCD monitoring and surveillance system

Source: Kiribati National NCD Strategic Plan 2013-2015, Government of Kiribati, 2012

6.5.2 Health Service Delivery

(1) Overview

Figure 6-4 shows the referral system. TCH in South Tarawa[54] provides comprehensive secondary curative services as a national referral (Figure 6-5). Three district hospitals provide secondary services. These hospitals are found in Kiritimati Island (Kiritimati District Hospital)[55], North Tabiteuea (Kiribati South District Hospital)[56] and Betio (Betio Hospital)[57]. These four hospitals are the only facilities with medical doctors.



Note: ( ) indicates number of facilities.

Source: Tue Survey Team based on WHO (2012) WHO MIND Mental Health in Development

Figure 6-4 Referral System in Kiribati

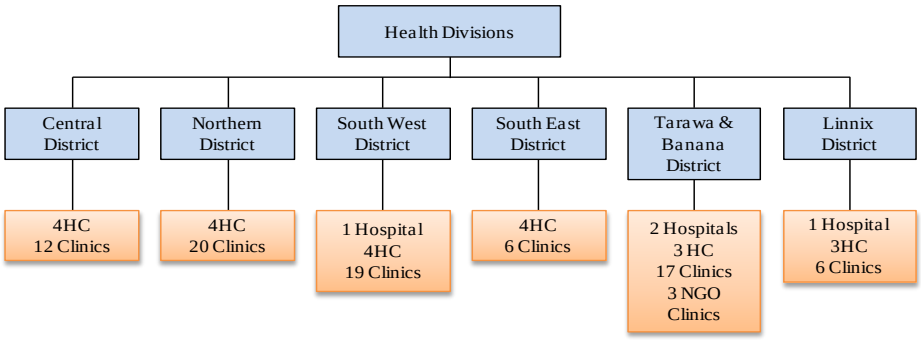
[54] The hospitals are located in the islands of large population: according to the Kiribati 2010 Census, 48.3% (South Tawara), 5.6% (Kiritimati) and 3.6% (North Tabiteuea) of the total population of 103,466 reside on the islands.
[55] Kiritimati District Hospital provides basic surgical, medical and maternity services.
[56] Kiribati South District Hospital serves the Southern islands or district of the Gilbert Islands.
[57] Betio Hospital is smaller than the other two and provides basic medical services in South Tarawa.

Tungaru Central Hospital (TCH) and MHMS

Patients at a waiting area of TCH

Figure 6-5 MHMS and TCH

Health centers and clinics provide primary services. Health centers are headed by a medical assistant (MA) who is a registered nurse with post-graduate training. Six District Principal Nursing Officers, based in Tarawa, are responsible for the support and supervision of the overall health services in each district (Figure 6-6).



Source: Health Information Unit, MHMS

Figure 6-6 Health Districts and Facilities in Kiribati

The number and specialization of the doctors in the four hospitals are shown in Table 6-13. There are doctors of medicines and surgery at TCH and Kiritimati Hospital who are engaged in the diagnosis and treatment of NCDs. In addition to these doctors, one nurse who specializes in diabetes is employed in the Diabetic Clinic at TCH. Diabetes Clinic provides services such as diagnosis, consultation, foot care, and treatment of diabetes.

Table 6-13 Numbers of Medical Doctors According to the Specialties in the Hospitals

	TCH	Kiritimati District Hospital	Kiribati South District Hospital	Betio Hospital
Medicine	2	1	-	-
Pediatrics	2	-	-	-
Surgery	1	1	-	-
Obstetrics and gynecology	2	-	-	-
Anesthesia	2	-	-	-
Opthalmology	1	-	-	-
Psychiatry	-	-	-	-
General	2	1	1	1
Contracted	4	-	-	-
Total	16	3	1	1

Source: WHO MIND Mental Health in Development, WHO, 2012

(2) Diagnosis and Treatment of NCDs

Body weight, blood pressure and blood glucose has been able to be measured in all facilities since 2011. Therefore, diagnosis of diabetes is possible even in primary facilities of remote islands. As for diagnoses for CVDs, respiratory diseases, and cancers highly depend on the medical examination by doctors in the hospitals.

Medicines for treating diabetes and hypertension are available at primary facilities. However, only a limited number of treatments are available for CVDs, respiratory diseases, and cancers. For treating cancer, simple surgical operations, a number of chemical treatments[58] and pharmacotherapy are possible at TCH. Operations such as balloon dilatation for CVDs are not available. Only supportive treatment such as anticoagulant and anti-platelet therapy is available. Dialysis is also not available.

(3) Overseas Referral

Patients in need of tertiary cares are referred overseas if they fulfill the criteria set out by MHMS. Every year, more than 50 cases are referred overseas. Common cases include; i) cancers[59], ii) orthopedic cases[60], and iii) pediatric abnormalities. Annual budget for overseas referral was Aus$400,000 in 2011 and 2012, which represent 3% of the total budget of MHMS.

An overseas referral is considered when the doctor presents the case to the Technical Advisory Committee of MHMS. The committee comprises of at least five doctors, and the cases are discussed within MHMS. However, cases that are listed in Table 6-14 are excluded. Referral patients have been sent to New Zealand, Fiji, Taiwan, and India in recent years with financial support from government funds.

Table 6-14 Criteria for Overseas Referral in Kiribati

Excluding Criteria	
1	Cancers which are terminal or not curable Except: more than a 95% survival, early cervical entraepitherial cancer
2	Chronic renal failure that require dialysis
3	Acute or chronic hepatitis
4	Liver failure
5	If the treatment cost exceeds Aus$100,000 (equivalent to US$105,000[61])
6	Patients who are not going to benefit from the referral where the service is not available in Kiribati.
7	Age should not be the excluding factor
Including Criteria	
1	Patient should be an I-Kiribati residing in Kiribati
2	The service is not available in Kiribati

Source: Referral and Caretaker Policy, MHMS, 2011

6.5.3 Health Workforce

As shown in Table 6-15, the number of health workforce except nurse is less than one per 1,000 populations. Kiribati has an ageing health workforce and relies on retired staffs who are re-employed on contract basis to fill the nursing and medical vacancies.

[58] Chemical treatments include a treatment using anticancer drugs.
[59] early-stage cervical cancers, lymphoma, and curable leukemia
[60] Hip fractures, femoral fractures, osteoarthritic hips, and Pott's disease
[61] Kiribati Dollar is the currency of Kiribati. It is not an independent currency but is pegged at 1:1 ratio to the Aus$. Aus$1 = US$1.035 (http://www.oanda.com/lang/ja/currency/converter/) (accessed 19 Oct 2012)

Pre-service training for registered nurses is provided in-country through a three year course in the Basic Nursing School in MHMS. Annual intake of the school is approximately 25. To meet future requirement, MHMS plans to increase the annual enrollment up to 30 until 2015. The Post Basic School provides post-graduate programmes for Midwifery, Public Health and MAs for registered nurses with working experiences.

Because there are no medical schools in Kiribati, doctors are usually trained at the Fiji National University and more recently in Cuba. Once they graduate, Kiribati doctors continue their professional development through short courses and workshops provided by MHMS.

Table 6-15 Health Workforce (2010)

	Total		Male		Female	
	Number	Per 1,000 Population	Number	Per 1,000 Population	Number	Per 1,000 Population
Doctors	41	0.40	19	0.18	22	0.21
Dentists	4	0.04	0	0	4	0.04
Pharmacists	4	0.04	1	0.01	3	0.03
Nurses	330	3.19	39	0.38	291	2.81
Midwives	74	0.72	6	0.06	68	0.66
Total	**118**	**-**	**34**	**-**	**41**	**-**

Source： Kiribati Health Databank 2011, WHO, 2012

The number of NCD-related workforce in the four hospitals is summarized in Table 6-16. The numbers of radiographers, sonographers and medical technologists for diagnosis, physiotherapists and orthotists for rehabilitation, as well as pharmacists and dieticians for supportive treatment are not sufficient even in TCH.

Table 6-16 Number of Workforce for NCDs in the Four Hospitals (2012)

	TCH	Kiritimati Hospital	Kiribati Southern District Hospital	Betio Hospital
Medical Doctor	16	3	1	1
Nurse	160	21	21	19
Midwife	78	4	3	1
Radiographer	4	1	0	0
Sonographer	0	0	0	0
Pharmacist	3	0	0	0
Medical Technologist	2	0	0	0
Dietitian	1	0	0	0
Physiotherapist	3	0	0	0
Orthotist	1	0	0	0

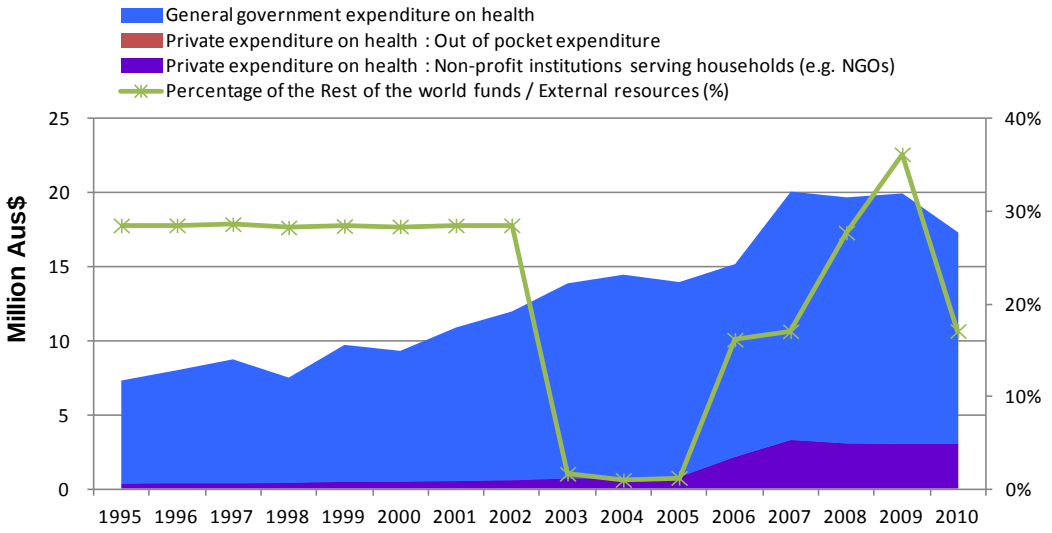
Source: Establishment Register 2012, Government of Kiribati

Nurses play important roles for NCD prevention and control in the primary facilities. After the MAs participate in workshops and short training programmes on NCDs in South Tarawa, they are to train their staff nurses. MA supervises up to eight primary facilities in their responsible districts.

6.5.4 Health Financing

In Kiribati, services are provided free of charge. Total health expenditure has been increasing in the past years with an average annual growth rate of 8.6% from 2000 to 2010. Total health expenditure in 2010 was Aus$17.3 million (US$17.9 million) and 9.3% of GDP. In 2010, government expenditure on health was 12.1% of the total. Of the

total health expenditure, 82.3% of the budget comes from government funds, while 17.1% comes from private funds. Out-of-pocket payments in private expenditures for health are low at 0.1% in 2010 (Figure 6-7).

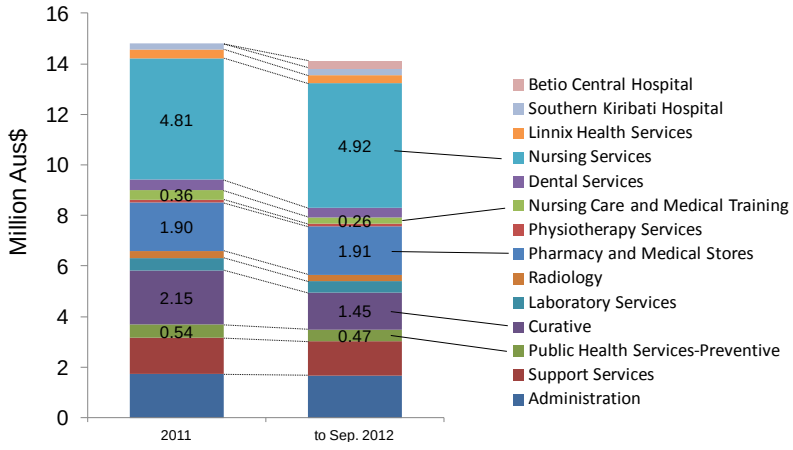


Year	1995		2000		2005		2010	
General government expenditure on health	6.97	(95.0%)	8.83	(94.6%)	13.15	(94.1%)	14.26	(82.3%)
Private expenditure on health	0.37		0.50		0.83		3.06	
Non-profit institutions serving households (e.g. NGOs)	0.36		0.50		0.81		3.04	
Out of pocket expenditure	0.01	(0.09%)	0.01	(0.09%)	0.02	(0.13%)	0.02	(0.11%)
Total expenditure on health	7.34		9.33		13.98		17.32	
Rest of the world funds/External resources*	2.09	(28.5%)	2.65	(28.4%)	0.17	(1.2%)	2.96	(17.1%)

Note: Numbers in the parentheses are percentage to the total expenditure on health (Only the major components are calculated.)
* Rest of the world funds/External resources are based on the data of OECD/DAC, and included in the total health expenditure on health.
Source: The Survey Team based on WHO Global Health Expenditure Database, accessed October 2012

Figure 6-7 Budget Allocation for Health in Kiribati (1995-2010)

The majority of the government's expenditure on health is more allocated towards curative care than preventive care. As shown in Figure 6-8, nursing services, curative service, and pharmacy and medical stores account for a large part of the total expenditure: 32.5%, 14.5% and 12.8%, respectively, and 59.8% of the total expenditure of MHMS in 2011.



Note: Data for 2012 include expenditure until September.
The expenditure allocated to NCD-related item is indicated by numbers. Nursing Services, Pharmacy and Medical Store and Curative account for large portion of the total expenditure.
Source: Government Kiribati- Management Information Report 2011, 2012

Figure 6-8 Health Expenditure of MHMS (2011, 2012)

There is no specific budget allocation for NCDs under the recurrent MHMS budget. Only a small portion of the budget is included under public health, and the rest is covered by funding from development partners. According to the estimation of WHO Kiribati, less than 5% of the overall health budget was spent on NCDs in 2011.

6.5.5 Medicines and Technology

(1) Medicines

The Kiribati Essential Drug List includes most of the essential medicines indicated by WHO (Table 6-17). Among the medicines on the list, medicines for diabetes (glibenclamide, metformin, and insulin) and hypertension (Captopril, Enalapril and hydrochlorthiazide) were found to be used in primary facilities. However, medicines used for treatment of cancers and other CVDs are limited, and are only available in the hospitals.

Table 6-17 Comparison of Recommended Medicines, Official Policy, and Availability

Drug	WHO Essential Medicines 2011	Kiribati Essential Drug List 2012	
			Prescription Requirements*
Anti-hypertensive medicines			
Amlodipine	✔	✔	3
Atenolol		✔	2b
Bisoprolol	✔		-
Captopril		✔	3
Enalapril	✔	✔	2b
Hydralazine	✔	✔	3
Hydrochlorthiazide	✔	✔	2a
Metaraminol		✔	3
Methyldopa	✔	✔	2b
Nifedipine		✔	3
Sodium nitroprusside	✔	✔	
Verapamil		✔	3
Lipid Lowering agents			
Simvastatin	✔	✔	3
Anti-diabetic agents			
Glibenclamide	✔	✔	2a
glucagon	✔		-
Insulin soluble (Actrapid)	✔	✔	3
Insulin premixed (Mixtard)	✔	✔	3
Insulin Isophane (Protaphane)		✔	3
Metformin	✔	✔	2a

*Level of restriction in Kiribati: 2a, Medicines available at clinic level, to be utilized by registered nurses.
2b, Medicines available at health centre level, to be utilized by MAs.
3, Medicines to be available on prescription only, dispensed by pharmacist or pharmacy assistant.

Source: WHO model list of essential medicines、WHO, 2011.
Kiribati Essential Drugs List, Department of Pharmacy, 2009

The Pharmacy Department updated the procurement policy and procedures in 2009 to expedite orders and receipts for essential medical supplies. Because there is no pharmaceutical supplier in Kiribati, all medicines are imported from overseas such as Fiji, Australia, and the Netherlands[62].

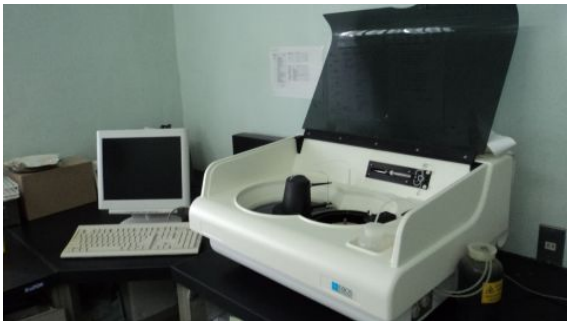
[62] Stock management is supported by the EU.

Medicines are ordered and distributed bi-monthly by the Distribution unit of the Pharmacy Department. Orders, receipts, storages, stock controls and distribution processes are done along the guidelines[63].

(2) Technology

The laboratory at TCH provides essential and basic diagnoses which include examination for HIV/AIDS, dengue fever, hepatitis B, lymphatic filariasis and water quality. Diagnosis of tuberculosis is made in the Tuberculosis/DOTS unit. Regarding NCDs, it is possible to measure cardiac enzymes, cholesterol, low density lipoprotein, urea, creatinine, and triglycerides with equipment introduced in 2010 (Figure 6-9, left). Medical equipment is maintained by an engineer from New Zealand because of the lack of qualified biomedical engineers in Kiribati.

Other diagnostic tests such as HbA1c need to be sent to Fiji or New Zealand. Histological analysis of cancer tissues requires to be sent to Australia which normally takes 3 to 4 months. Electrocardiogram (ECG) and X-rays are available in the Radiology unit of TCH. However, equipment that are generally used for diagnosing CVDs and cancers, such as magnetic resonance imaging (MRI), ultrasonography, and computed tomography (CT) are not currently available in Kiribati.



Equipment for Biochemical Analysis at Laboratory Unit TCH

Equipments for Cytological Analysis at Laboratory Unit TCH

Figure 6-9 Equipment for Diagnosis of NCDs at Laboratory of TCH

In contrast, measurement of height, body weight, blood pressure, and blood glucose are possible even in primary facilities (Figure 6-10). In addition, MHMS plans to provide portable equipment for assessing cholesterol levels at all primary facilities until 2013-2014 with assistance on the PEN from WHO.

Equipment for Measurement of Blood Pressure

Equipment for Glucose Measurement

Equipment for Cholesterol Measurement

Figure 6-10 Equipments Used for NCDs Diagnosis at Primary Facilities

[63] Guidelines for Management of Drugs at the Outer Island Health Centers and Dispensaries.

6.5.6 Health Information System

The Health Information Unit is responsible for the collection and compilation of health information. In 2012, MHMS presented the first annual report over 10 years with the assistance of expertise from the University of Queensland.

The Monthly Consolidated Statistical Report (MS-1) is the only data collection form in the health sector. It is directly collected from all facilities. The current MS-1 form was updated in 2008 which consists of 13 items (Table 6-18). The on-time submission rate of MS-1 in 2012 was 85-90%.

The MS-1 report contains chronic diseases data, which includes data regarding hypertension, diabetes, and mental illness. Information on CVDs, cancer, respiratory diseases, and other diseases are reported in the morbidity reporting. Detailed information on NCDs is provided by MS-1 from hospitals in which medical doctors are present. However, because of the limitations of diagnosis, reports from primary facilities frequently include insufficient information on NCDs.

Table 6-18 Items Monthly Reported by Monthly Consolidated Statistical Report (MS-1)

1	Clinical services	6	Referrals to Tungaru Central Hospital	11	Chronic diseases
2	Home visit	7	Births	12	Outbreak reporting
3	Impatient services	8	Maternal deaths	13	Morbidity reporting
4	Immunizations	9	Deaths		
5	Family planning	10	Malnutrition		

Source: Ministry of Health and Medical Services Kiribati (2008) Monthly Consolidated Statistical Report (MS-1)

6.6 Analysis used Continuum of Care (CoC) for NCDs

6.6.1 Primordial Prevention

The place and life stage intervention in primordial prevention of NCDs are shown in Figure 6-11. In Kiribati, agencies for the implementation of primordial prevention are MHMS, Ministry of Finance and Economic Development (MOFED), and Police and Prison.

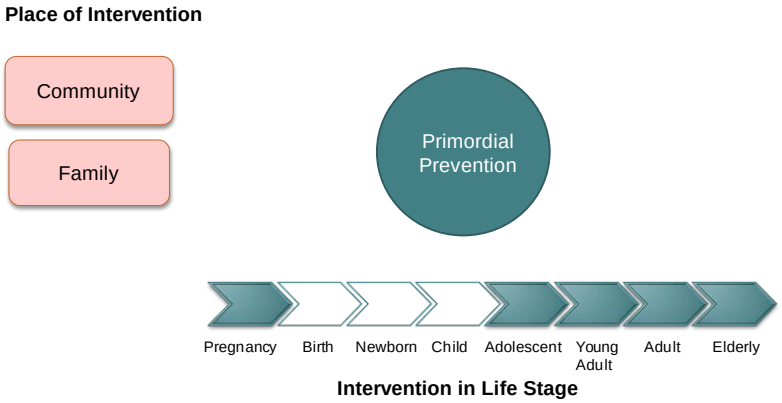


Figure 6-11 Place and Life Stage Interventions in Primordial Prevention of NCDs

The government places considerable importance to its international commitments to health, and is a signatory to the Framework Convention on Tobacco Control (FCTC) and other international regulations. The Kiribati Tobacco

Control Bill 2013 has been drafted and discussed in the Parliament. It includes: i) prohibition on advertising tobacco products, ii) restrictions on the sale of smoking products, and iii) prohibition of smoking in certain public places.

An increase in the excise tax on imported tobacco, which is currently 25%[64], is not included in the Act. The government plans to establish sustainable funding for the NCD programme by channeling excise tax from tobacco products and unhealthy foods in the near future.

The Kiribati Food Safety Act 2006 does not stipulate restriction on importing salty and oily food. Therefore, the government has drafted the renewed Food Safety Act and National Nutrition Policy to regulate the standards on imported food.

6.6.2 Primary Prevention

Because of the lack of funds and human resources, current activities for primary prevention and awareness on tobacco, alcohol, diet, and physical activity are often conducted in collaboration with relevant MHMS units. Figure 6-12 shows the place and life stage interventions in primary prevention of NCDs.

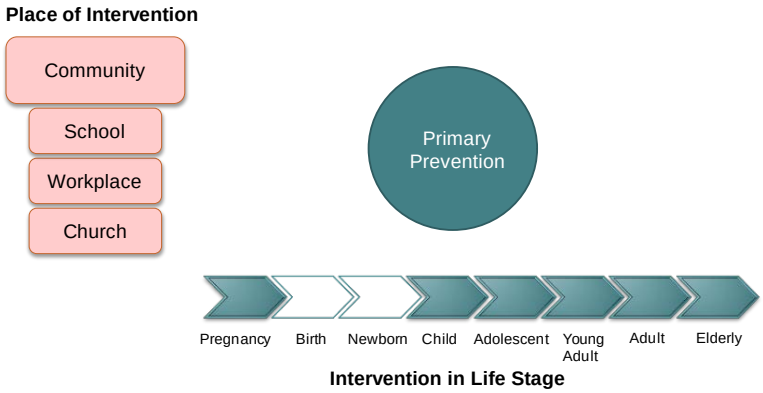


Figure 6-12 Place and Life Stage Interventions in Primary Prevention of NCDs

The contents and responsible conductors of the primary prevention are summarized in Table 6-19. As part of the annual programme for NCDs, members of the NCD Committee are cooperatively included in the primary prevention campaign. For example, preventive campaigns like the World Tobacco Day, the Nutrition Week, the World Food Day and the Cancer Week were held in communities and schools[65] in 2012 (Table 6-19 and Figure 6-13). MHMS broadcasts a radio programme once per week, where basic knowledge of NCDs and their risk factors are explained regularly to the general public. During the World Tobacco Day in June 2012, the islet of Nuotaea was declared as the first non-smoking area in Kiribati.

[64] Before 2010, excise tax for imported tobacco was 60%.
[65] Awareness for tobacco, alcohol, balanced diet and physical activity was carried out through a drama show, presentation, question and answers.

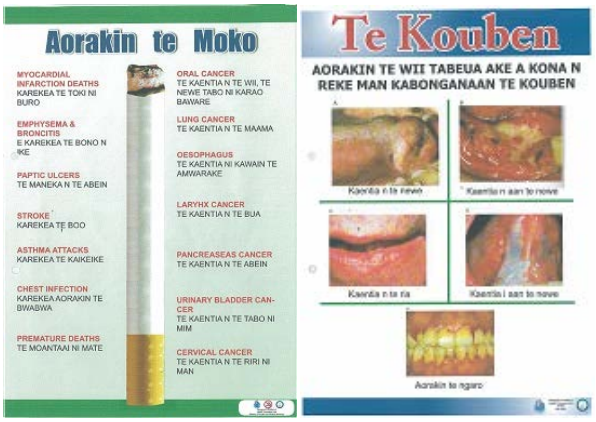
Table 6-19 Primary Prevention of NCDs and Its Conductors

Activities	Implementers
Annual awareness campaign ・ World Tobacco Day, Nutrition Week, World Food Day, Cancer Week	MHMS (NCD Committee)
Preventive programmes of NCDs ・ tobacco, alcohol, physical activity, healthy diet	MHMS (NCD Committee)
Awareness during Mini-STEPS survey	MHMS (NCD Committee) NCD Centre
Radio programme and advertisements on news papers	MHMS
Improvement of diet ・ Recommendation of home gardening ・ Distribution of gardening tools (PEN) ・ Cooking classes	Nutrition unit, WHO, MELAD, TTM WHO
Promotion of physical activities ・ Holding sports events ・ Distribution of sports gears (PEN)	Health promotion unit, MOE MISA WHO

Source: NCD Report 2010-2011, MHMS and NCD Centre, 2012 and interviews with MHMS

Promotion of Physical Activity

Leaflet Used for Primary Prevention of NCDs. Healthy diet (left), Physical Activity (middle), and Diabetes (right)



Posters for Health Promotion on Tobacco

Cooking Class for Green Vegetables

Figure 6-13 Physical Activity, Awareness Rising Materials and Promotion of Balanced Diet for Primary Prevention of NCDs

Other than the annual programmes, members of the NCD Committee have been focusing on primary prevention in communities, workplaces and schools. During screenings of NCD patients in the Mini-STEPS survey conducted every 6 months, the health staff visits communities, workplaces, and schools to promote awareness on smoking, alcohol, healthy diet, and physical activity.

For the improvement of diet, MHMS promotes home gardening to communities in collaboration with Taiwan Technical Mission (TTM) and the MELAD. Cooking classes, cooking competitions and cooking demonstrations are held on a regular basis.

To promote physical activities, MHMS promotes sports events in collaboration with the MOE and Ministry of Internal and Social Affairs (MISA). Because of the limitation in sports grounds, volleyball is one of the most popular games promoted by the NCD programme. One of the main sports event was the Primary School Soccer Competition which was held in 2011.

6.6.3 Secondary Prevention

Figure 6-14 shows the place and life stage interventions in secondary prevention of NCDs. The Mini-STEPS survey has been conducted in South Tarawa since 2010.

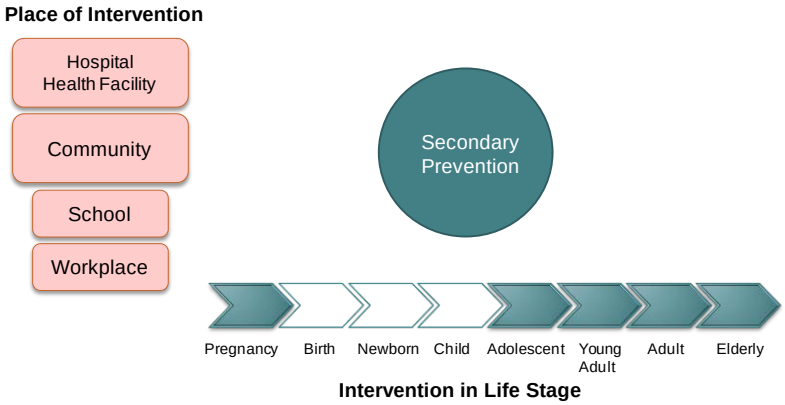
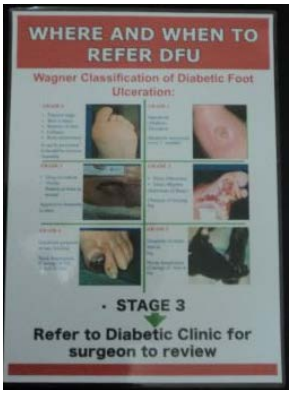


Figure 6-14 Place and Life Stage Interventions in Secondary Prevention of NCDs

In addition to the surveillance of risk factors, the survey screen potential patients with NCDs (Figure 6-15). The Mini-STEPS survey currently focuses on a particular population of 61 communities, 46 workplaces, and 24 schools in South Tarawa. The survey also monitors the NCD situation in the target population. Because of the shortage of staff (only one coordinator and one assistant in the NCD Centre), the survey is carried out by the community volunteers.

Mini-STEPS Survey in South Tarawa



Material Used for Diagnosis of Diabetes at Diabetes Clinic TCH

Figure 6-15 Mini-STEPS Survey and Diabetes Clinic for Screening Potential NCDs Patients

MHMS emphasized the importance of secondary prevention of diabetes in the NCD Strategic Plan 2008-2011, and the Diabetic Clinic was established in 2009. Other than treatment and consultation, the Diabetic Clinic also screens patients with diabetes. The only nurse in the clinic examines potential patients with diabetes as outpatients and visits people in the community.

6.6.4 Tertiary Prevention

Figure 6-16 shows the place and life stage interventions in tertiary prevention of NCDs. Foot care and counseling are available in the Diabetic Clinic for patients with diabetes. If the clinical nurse is unable to treat the patient, they are referred to the doctors at TCH and hospital ward.

In the Rehabilitation unit at TCH, two physiotherapists are assigned. Care and rehabilitation for physically handicapped patients and general physiotherapy are available in the unit. However, the building burned down due to electrical fault in October 2012, and the service is currently not available.

Human resources and procedures for treatment and rehabilitation of other CVDs and cancer patientsare very limited as described in Section 6.5.3 and 6.5.6, respectively.

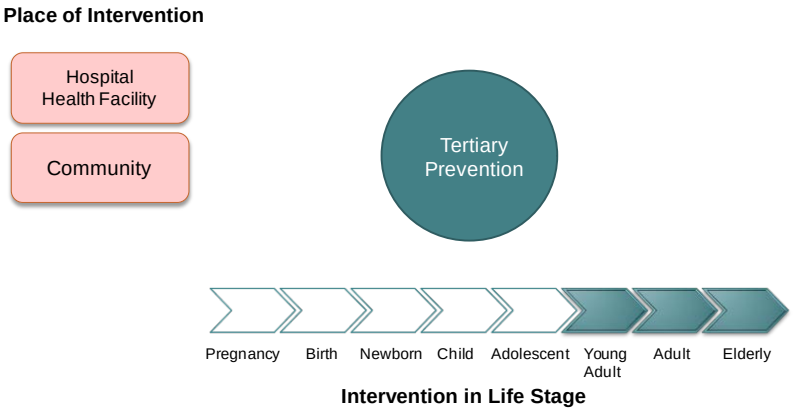


Figure 6-16 Tertiary Prevention of NCDs in Kiribati

6.7 Multisector Approach

Because the issues of NCDs need multiple aspect of interventions, MHMS has been adopted several multi-sector approaches for NCDs (Table 6-20).

Table 6-20 Multi-Sector Approaches of MHMS for NCDs

Cooperator	Activities
MOE	- Promotion of physical activity in school classes - Education on nutrition and balanced diet in school - Sports events in schools (e.g. Primary Schools Soccer Competition 2011)
MOFED	- Drafting the National Nutrition Policy 2013, Food Safety Act, and excise tax on tobacco and foods
MELAD, TTM	- Promotion of home gardening and technical guidance - Cooking classes - Distribution of gardening tools
MISA, MOE	- Promotion of physical activities - Improvement of public sports environment and ground
Government Offices	- Active participation in Mini-STEPS surveys - Participation in sports events in the workplace

Source: MHMS, MOE, MOFED, MELAD, TTM

In particular, the promotion of physical activities in schools and the improvement of diet pattern (Figure 6-17) need cooperation strategies across sectors. For this reason, the relevant officers from MOE and MELAD are frequently invited to the NCD Committee. In addition, formulation of acts for tobacco and food regulation needs partnership with other ministries.

Appearance of Local Market

Technical Guidance for Home Gardening.

Technical Guidance for Composing Fertile Soil for Gardening

Sales of Nurseries of Vegetables at the City Market

Figure 6-17 Cooperation with MELAD for the Promotion of Home Gardening

6.8 Development Partners on NCDs

Opportunities for pro-active coordination and policy dialogue have been limited in the Kiribati health sector. There are currently no mechanisms for more comprehensive health coordination, such as regular development partner meetings to improve harmonization, or regular meetings between key development partners and MHMS.

Major development partners in the health sector are summarized in Table 6-21 below.

Table 6-21 Development Partners in Health Sector

Development Partners' Strategy and/or Main Activities			
Multilateral Institutions and the UN System		**Bilateral**	
WHO	Nurse Training, NCD Programmes, HIV care and treatment, Essential health technologies and medicines, Tobacco control, Mental health, Health management, Environmental health, Nursing services, Curative and medical services	AusAID	Maternal, newborn and child health, NCD programmes, Nurse training
UNICEF	Basic Health and nutrition awareness, EPI, IMCI, Sanitation	NZAP	Teacher Training, Vocational Training, Overseas scholarship
UNDP	HIV policy development	Taiwan, China	Construction of hospital and clinics, Medical equipment, Overseas referral
UNFPA	Obstetric care and adolescent health, Reproductive health	EU	Rural Health infrastructure
SPC	NCD programme, Family health, Tuberculosis, HIV treatment	Cuba	Provision of doctors and medical scholarship to Cuba
		Japan	Infectious disease control, EPI

Source : Country Cooperation Strategy Kiribati 2010-2014, Asian Development Bank, 2010
2012 Budget, Kiribati Government
MHMS, TCH

Contribution of the following development partners are currently included in the NCD programmes.

(1) SPC

SPC supports the 2-1-22 NCD Programme in the Pacific Island countries including Kiribati. The programme began in 2007 but reached Kiribati in 2010. The NCD Centre was established in 2010 with a major contribution from SPC. Two staff members, the NCD Coordinator and an assistant, are fully paid by the SPC. The annual budget for the 2011-2012 NCD programme was Aus$150,000. SPC will extend the 2-1-22 NCD Programme until June 2013 without additional funds.

(2) WHO

WHO supports the 2-1-22 NCD Programme in a joint effort with SPC. WHO has a country liaison office in MHMS that works under the oversight and support of the WHO Representative Office for the South Pacific in Fiji. WHO provides regular technical assistance for NCDs such as policy making, preventive activities, introduction of PEN, drug delivery and treatment. WHO has been assisting in the formulation of the Tobacco Control Bill and Food Safety Act. WHO promotes PEN, and plans to distribute equipment for assessing cholesterol, and statins used to lower cholesterol levels to all facilities in Kiribati until 2013-2014. PEN also aims to provide sports gears (volley balls, nets, and air pumps) and gardening tools to all health facilities. The annual budget for the NCD programme in 2011 and 2012 was Aus$128,400.

(3) AusAID

AusAID financially supports the 2-1-22 NCD Programme. Health is not included as a priority area in the Australia-Kiribati Partnership for Development, but it remains as a standing agenda item. Since 2006, AusAID has supported the Kiriabti-Australia Nursing Initiative, a programme to help candidates obtain an Australian nursing degree. To enable locally trained health professionals to improve the quality of health care, AusAID is also funding the upgrade of the Kiribati School of Nursing and is constructing a maternity ward at Betio Hospital.

AusAID plans to promote sports starting 2013. In accordance with the plan, a memorandum of understanding between MHMS and the sport division of the MISA was signed, and a country proposal for Australian sports funding was submitted in October 2012.

(4) NZAP

NZAP supports family planning as well as water supply and sanitation in health centers and clinics. NZAP is also supporting the re-development of the curriculum at the Kiribati School of Nursing in partnership with AusAID and WHO. NZAP assists overseas referrals from Kiribati with a budget of NZ$200,000 per year. NZAP also financially supports the 2-1-22 NCD Programme.

(5) Taiwan

Taiwan supported the construction of the Southern District Hospital and supplied medical equipments and transportation for the hospital. Since 2009, budget for overseas referrals has been supported by the Taiwanese government with a budget of Aus$200,000 per year.

It was determined that Taiwan will support primary prevention of NCDs only in 2013 with a budget of Aus$40,000.

(6) Japan

Based on the cooperation plan agreed in the 5th Pacific Islands Leaders Meeting (PALM5[66]), the Japanese government supports EPI, improvement of health services, and eradication of lymphatic filariasis in Kiribati (Table 6-22).

Table 6-22 Japanese Cooperation in Health Sector

Modality	Cooperation Period	Title
Technical Cooperation Project	2011-2014	System improvement of expanded programme on immunization in the Pacific region (Fiji)
Special Medical Equipment	2012-2013	Special medical equipment against infectious diseases (filariasis)

Source: Country Data Book – Kiribati, Ministry of Foreign Affairs Japan, 2010
Website of Ministry of Foreign Affairs Japan, accessed December 2012
JICA Knowledge Site, accessed December 2012

[66] The Fifth Pacific Islands Leaders Meeting. With the major leadership of Japan, the meeting of leaders of the Pacific Island Countries has been held every three years since 1997. Along with the strengthening of the relationships between the countries, the meeting aims for the establishment of the stability and prosperity of the region. It has been held six times so far.

6.9 Findings

Kiribati is one of the most remote and geographically scattered countries in the world. It has a total land area of 810 km^2 with elevation of less than one to four meters above sea level in most of its territories. The Kiribati economy is volatile and extremely vulnerable to external financial influences. Most resources including food, water, and fuel must to be imported.

There has been a steady improvement in health indicators over the last decade, but people in Kiribati still have serious problems related to NCDs. The NCD problems generally include both health and external factors. However, in Kiriabti, contributions of external factors are significantly high, affecting the situation, cares and interventions of NCDs. The key findings of the current data collection survey are summarized as follows:

- Majority of population in Kiribati is at high risk of NCDs, i.e., 72.7% is at high risk (with 3-5 risk factors) and 25.4% for moderate risk (with 1-2 risk factors). In spite of the intensive efforts to reduce NCDs and its risk factors, recent data suggest that the prevalence of NCDs is increasing.

- Current approaches for primary prevention of NCDs may have limited effectiveness for changing the life-style of the I-Kiribati population. This partly originates from limitations in domestic food supply and lands for physical activities.

  For example, a balanced diet requires purchasing or growing of vegetables. In addition to the country having a coral soil land which is unsuitable for cultivating green vegetables, people cannot easily take a balanced diet because of the very high commercial prices of imported food. Furthermore, 48.3% of the total population is now living in the capital island, South Tarawa, providing insufficient spaces for physical activities.

- MHMS faces a number of challenges related to the quality and quantity of the workforce for health in general. In addition, its employees are mostly old aged. In particular, the workforce for NCDs, such as doctors, physiotherapists, dietitians, and public health officers, are considerably limited. Therefore, the availability of secondary and tertiary prevention of NCDs is restricted.

- Essential diagnoses and treatments, especially for CVDs and cancers are actually not provided in Kiribati. The number of patients for NCDs and burden of the diseases could be underestimated.

- Funding is one of the major obstacles for NCD programmes. The continuity and progress highly depend on the availability of funds for NCDs.

6.10 Recommendations

(1) Multi-stakeholder and Multi-sector Approach in Primary Prevention

As the resources for primary prevention are limited, all stakeholders should be in one umbrella especially in the primary prevention.

In particular, periodic risk factor surveys, health education and service delivery at the community level is essential to change people's behavior through the collection and analysis of updated information regarding relevant situations and raise the awareness of the people. For that, Mini-STEP survey should be supported. Also, community

health volunteers need to be empowered with updated knowledge on NCD risk factors and skills for behavior change communication. In addition, collaboration among stakeholders in communities, schools and workplaces are to be strengthened through regular meetings and cooperation in relevant activities.

As for the multi-sector approaches, strengthening of leadership of MHMS and cooperation among concerned ministries are necessary. Especially, to improve diet patterns, collaboration with MELAD and the Ministry of Fisheries and Marine Resources (MOFMR) are important for increasing food supply in terms of variation, quality and quantity. The establishment of market center will be necessary for efficiently providing seedlings, fruit and vegetables at lower prices in high population areas of Bairiki and Betio. Promotion of sales with emphasis on the risk factor for NCDs needs to be included in the primary prevention.

(2) Human Resources

The improvement of quality and quantity of human resources could be another key in NCD prevention and control. To maximize the effectiveness of the limited means of diagnosis and treatment, it is important to strengthen human resource development for NCDs especially in hospitals. Support for trainings of relevant personnel such as nurses, physiotherapists, medical engineers and dieticians are necessary.

Involvement in the PEN will enhance the knowledge of nurses to prevent and diagnose NCDs by themselves. Assistance in the introduction of PEN into primary facilities shall contribute to the essential diagnosis and primary prevention of NCDs in all clinics in Kiribati.

(3) Policy Formulation and Establishment of the Sustainable Funding

For reducing the smoking rate and changing the diet pattern, changes in the policy level is important. For sustainable funding of the NCD programme in the future, channeling funds from excise tax on tobacco and unhealthy food needs to be supported. Organizing high-level advocacy groups will be required.

Chapter 7 Conclusion

Through the situation analysis of the three target countries in Chapters 4, 5 and 6, situation of NCD prevention and control in each country is summarized and analyzed, then suggestions for future JICA's support for NCD prevention and control are made in this chapter.

7.1 Current Status and Issues of NCD Prevention and Control in the Target Countries

As shown in Table 7-1, NCD related death is 70% to 80% of total death in three countries. In Fiji and Kiribati, MDGs related health issues are still concerned. Despite various measures since Healthy Island Initiative in 1995, mortality and morbidity have been getting worse, and people with risk factors have been increasing.

NCD specific implementation agencies have been established in three countries. The Tonga Health established in 2007 is the first health promotion foundation in the Pacific Region. NCD committee in Tonga and Kiribati involves cross-sectoral stakeholders to promote multi-sector approach. In Fiji, although the national NCD taskforce was formulated in 1991, it is not functioning regularly.

Table 7-1 Summary of Three Countries

	Fiji	Tonga	Kiribati
Population	860,623	104,058	99,546
Health status			
NCD related death in total death	79% - Under nutrition is still concerned especially in the poor.	69% - MCH indicators have been improving.	74% - Under-five mortality and tuberculosis are still concerned.
Key structure of NCD prevention and control	- The National Wellness Center of MOH	- The National NCD Committee - Medical and Public Health Divisions of MOH - The Tonga Health	- The NCD Committee - NCD Unit and NCD Center of MHMS

Source: The Survey Team based on the results of the Survey

7.1.1 HSS Analysis

Table 7-2 summarizes the results of HSS analysis.

Relevant legislations and guidelines have been or are being prepared. Implementing organizations of NCD prevention and control have been established and playing important roles in each country. In Tonga, the Tonga Health has shared experiences with other similar setting countries such as Kiribati. However, coordination capacity needs to be strengthened as NCD related activities require multi-sectoral collaboration and more assistance might be provided in the future.

Fiji and Tonga provide primary to tertiary services while up to secondary service in Kiribati. The governments provide advanced diagnosis and treatment which are not available in the countries by receiving specialized medical services from foreign countries or supporting for overseas referral. Regarding the quality of the services, inadequate awareness on NCDs of health workers might be one of the reasons why the measures are not much effective. Although they are trained and carry out relevant activities as planned or instructed, such insufficient awareness might make them put more priority to more familiar activities such as MCH. Awareness of the users is also

concerned as many people still do not understand NCD is a life-long disease and the complications could be serious. Many patients come to health facilities at very late stage or stop taking medication without any advice from the doctors.

Table 7-2 Summary of HSS Analysis

HSS Blocks		Fiji	Tonga	Kiribati
1	**Governance and leadership**	- Rather centralized - Health service delivery seems to be decentralized to divisions.	- Strong leadership of MOH - Needs for national coordinator for NCDs	- NCD center relies on external funding support
	NCD strategic plan	"NCD Prevention and Control National Strategic Plan 2010-2014" "MOH NCDs Prevention and Control Strategic Plan 2010-2014" - Holistic approach (3M)	"Tonga's PATH 2010-2015" - Clear focus on primary prevention	"National NCD Strategic Plan 2013-2015" - Focus on primary prevention
2	**Health service delivery**	Diabetes hub in three major cities - Behavior of patients is concerned.	Diabetes centers in each island	NCD center Diabetic clinic
	Primary	Nursing stations and health centers - NCD is to be streamlined into all activities.	Health centers	Clinics and health centers
	Secondary	Sub-divisional hospitals	Hospitals in each island	TCH
	Tertiary	Divisional hospitals	Viola Hospital	Not available
	Overseas	India, Australia, New Zealand - MOH provide financial support mainly for treatment	Australia, New Zealand - GOT and the New Zealand Government provide financial support	India, New Zealand, Taiwan, Fiji - The recipient governments provide financial support
3	**Human resources for health (HRH)**	- Nurses play major role from primary to tertiary prevention. - Community rehabilitation assistants need to be enhanced. - Specialized doctors in NCDs are not enough.	- Physicians for NCDs are nine. - Health officers play major role at primary level. - NCD Nurses will be placed at all health centers. - Reproductive health nurses may contribute primary prevention.	- Nurses play major role at primary level. - HRH for NCDs are generally not enough. Retired nurses are still involved.
4	**Health finance**	- Most of health services at public facilities are free. - NCD related budget was 0.9% of total MOH budget in 2011.	- Most of health services are free for Tongan citizen. - NCD related budget is 7 to 10% of total MOH budget.	- Health services are free. - No specific NCD budget. WHO estimated it was 5% of total MHMS budget.
5	**Medicine and medical technology**	- All medicines are imported. Procurement system is under revision. - Demand forecasting system needs to be developed. - Compliance (medicine) needs to be improved. - Advanced technology has been introducing.	- All medicines are imported. - Cost for NCD related medicine was 26% of total medicine and medical supply cost. - CT will be available from 2013.	- All medicines are imported. - HbA1c test is not available. - No maintenance technician for NCD related machines.
6	**Health information**	- PHIS and PATIS include NCD related data. - No NCD focused routine system. - Delay in reporting is concerned. - Quality of data	- NCD related data is collected by Health Information Unit.	- MS-1 includes NCD related data. But the data quality from primary level is not sufficient.

Source: The Survey Team based on the results of the Survey

Human resources are concerned in both quality and quantity despite retention strategy and various trainings. Such insufficient human resource is one of the critical backgrounds of delay of in both the implementation of activities and progress of accomplishments. Regarding curriculum for future NCD work forces, NCD nursing curriculum is under development in Tonga, while the curriculum modification at tertiary education institution has not been progressed in Fiji.

Regarding finance, it seemed that necessary budgets are allocated in Fiji and Tonga. However, the financial sources mostly depend on the external support and the disbursement needs to be improved.

Medicines and medical technology are under development. In Fiji, advanced technology has been introduced to provide advanced diagnosis and treatment within the country. Some are intended to promote medical tourism, like dialysis centers. In terms of the referrals from other countries to Fiji, it seemed that quite a few patients came to Fiji from limited number of countries. Most of the Pacific countries send their patients to Australia, New Zealand or India.

Health information needs to be improved and strengthened to provide evidences for monitoring and evaluation as well as decision making that are relevant to NCDs. In Fiji and Tonga, immunization coverage is reported for monitoring of EPI monthly basis. Progress of NCD screening could be monitor with similar system. In Fiji, monthly report of NCD new cases could be used for demand forecasting system for drug supply.

7.1.2 CoC Analysis

Table 7-3 summarizes the results of CoC analysis.

In Tonga and Kiribati, it was clearly stated that the focus is on the primary prevention to improve NCD situation with limited resources. In Fiji, most of the health workforces have been involved in the primary and secondary preventions, especially in screening recently. At the same time, the Government of Fiji has committed to introduce advanced medical technologies for tertiary prevention.

Considering the resources and possible beneficiaries in each country, the current strategy seems to be quite appropriate. However, there are certain numbers of patients who need treatment and/or rehabilitation. Research on health economics at the country level could support future decision making of the government on how far they should be equipped and how they weigh their priorities.

Regarding time of CoC, intervention for children and adolescents should be enhanced while nutrition education has been provided in maternal and child health activities and awareness raising and screening have been mainly focus on adult population. In Tonga, primary prevention needs to be more promoted while in Fiji, it seemed to be still initial stage of integration of NCD prevention into school health.

Multisector approach is being applied in the primary prevention such as promotion of physical activity in school, as well as healthy diet through cooking classes and vegetable garden. In Tonga, the Tonga Health provide grant to MOE and MOA. In Kiribati, MHMS collaborate with MOE, MELAD and other concerned ministries. In Fiji, although relevant agencies have been working on the necessary measurements, these seem not to be well linked each other.

Table 7-3 Summary of CoC Analysis

	Fiji	Tonga	Kiribati
Primordial prevention	- Tobacco control from 1998 - Tax increase on tobacco and alcohol - Tariff reduction on specific imported vegetables	- Tobacco control from 2000 - Tax increase on tobacco and alcohol - Import prohibition on specified three items is under consideration.	- Relevant legislations (tobacco and foods) are under preparation. But tax increase on tobacco is not included.
Responsibility	The government	Ministry of Police and Ministry of Revenue	MHMS, MOFED and Police and Prison
Place of intervention	- Community - Family	- Community - Family	- Community - Family
Primary prevention	- Awareness raising is to be streamlined into all activities at primary level.	- Sports events - Mass media - Small grant (Tonga Health) - Coverage in schools and outer islands is still low.	- Mass media - Home garden - Cooking class - Sports events - Mainly in South Tarawa.
Main Responsibility	National Wellness Center, National Nutrition Center	HPU, Tonga Health	NCD Committee, MHMS (NCD Unit, NCD Center, etc)
Place of intervention	- Nursing station and health center - Community - School - Family	- Workplace - School - Church - Community - Family	- Workplace - School - Community
Secondary prevention	- Screening (BMI, blood sugar and blood pressure) for >25 - Screening is also one of opportunities of awareness raising.	- Screening (blood sugar and blood pressure) - Mini-STEPS Survey - Screening is also one of opportunities of awareness raising.	- Mini-STEPS Survey - Diabetes screening at the diabetic clinic - Screening is also one of opportunities of awareness raising.
Main Responsibility	National Wellness Center Divisional Health Office	Community Health Unit, Environmental Health Unit and Diabetes Center	MHMS (NCD Unit, NCD Center, etc)
Place of intervention	- Workplace - Community	- Health facilities - Community	- Diabetic center - Workplace - School - Community
Tertiary prevention	- Counseling - SNAP intervention - Treatment - Foot care - Rehabilitation - Home-based care	- Counseling - Treatment - Foot care	- Counseling - Treatment - Foot care - Rehabilitation (currently not available)
Main Responsibility	National Wellness Center	MOH	MHMS
Place of intervention	- Hospitals for treatment and rehabilitation - Primary health facilities, community and family for SNAP intervention, follow-up and hone-based care	- Diabetic Centers - Health Centers - Hospitals - Community	- Diabetic Clinic - TCH

Source: The Survey Team based on the results of the Survey

Regarding accomplishments of these activities such as coverage of awareness raising and screening, objective information was not available in the Survey, as routine monitoring system of the programs or activities are not well established. As mentioned in Section 3.1.3 (1), these measures tended to be concentrated at the national level and urban areas. Therefore, even awareness raising might not cover all people in rural or remote communities. Such

tendency is pointed in the field survey in Tonga and Kiribati. Also in Eastern Division in Fiji where consists of small islands, the relevant activities might not reach to all community.

7.2 Development Partners on NCDs

Table 7-4 summarizes major development partners' support relevant to NCD prevention and control. As mentioned in Chapter 3, the major support for NCDs in the Pacific Region is the 2-1-22 program. It is mainly focus on the capacity development at the national level.

In terms of HSS, AusAID provides holistic support for health system in Fiji and Tonga. In Fiji, NCDs are streamlined into all program activities and the main focus is diabetes screening and care. In Tonga, the main focus of the program is NCDs and the program will support to expand quantity and quality of human resources such as NCD nurses. In Kiribati, Taiwan will provide financial support for NCD Center in 2013 after completion of SPC's support at the end of 2012. Although many stakeholders recognize that regular monitoring and evaluation system is important, there are no specific assistance on NCDs monitoring and evaluation.

In terms of CoC, the development assistance tends to be concentrated to the primary prevention and community level.

Table 7-4 Development Partners relevant to NCDs

		Fiji	Tonga	Kiribati
HSS	Governance and leadership	- SPC and WHO: 2-1-22 - WHO: Best Buys		
		- AusAID: FHSSP	- AusAID: THSSP	
	Health service delivery	- AusAID: FHSSP (mainly, primary health care and diabetic hub)	- AusAID: THSSP - NZAP: overseas referral	- NZAP, Taiwan: overseas referral - SPC: NCD Center - Taiwan: NCD Center (2013)
	Human resources for health	- WHO: POLHN, trainings		
		- AusAID: FHSSP (trainings)	- AusAID: THSSP (NCD nurses, community outreach doctor, trainings, NCD nursing curriculum)	- SPC: NCD center staff - AusAID: nursing education
	Health finance	- AusAID - WHO (Best Buys)	- AusAID - SPC (Tonga Health, etc.)	- AusAID - SPC
	Medicine and medical technology	- WHO: PEN		
		-	- WHO: PEN - China: equipments	- WHO: PEN - Taiwan: equipments
	Health information	- Global Fund	-	-
CoC	Primordial prevention	- WHO: Best Buys		
	Primary prevention	- SPC and WHO: 2-1-22		
		- WHO: STEPS Survey 2011 - AusAID: FHSSP	- WHO: sports and home gardening promotion, - AusAID: THSSP	- AusAID: sports promotion from 2013
	Secondary prevention	- AusAID: FHSSP (NCD Kit, screening)	- WHO: Mini-STEPS Survey	- WHO: Mini-STEPS Survey
	Tertiary prevention	- AusAID: FHSSP (foot care)	- AusAID: THSSP (community outreach)	n.a.

Note: "-" = Notable information was not collected in the Survey. It might not mean that there is no support.
Source: The Survey Team based on the results of the Survey

7.3 Recommendations for Future JICA's Support on NCDs in the Pacific Region

Through the above analyses, possibility of future support is considered as shown in Table 7-5 and 7-6. In terms of HSS, human resource development and health information seem to have opportunity for future assistance. Regarding CoC, community level assistance for the primary prevention could help increasing effectiveness of the existing activities or expanding the coverage. The tertiary prevention at community level such as peer educator of diabetes patients might help to prevent serious complication and disability. It also might be linked with the primary prevention.

Table 7-5 Possibility of Future Support: HSS

Targets	Possibility	Comments
Governance and leadership	Some	- Necessary strategies, legislations and implementation structures have already been established. - Program management cycle such as PDCA cycle, especially monitoring and evaluation need to be strengthened. - Coordinating capacity could be supported to strengthen to enhance multisector approach. However, it is necessary to closely coordinate and cooperate with existing stakeholders. - Research to have evidences to held policy/ decision making might be assisted.
Health service delivery	A little	- Service delivery structures are generally functioning. - Behavior change of service providers and users (at community level) could be assisted. However, it might take long period to have outcome.
Human resources for health	High	- AusAID supports in terms of quality and quantity. - Transferring Japan's experience could be effective and good opportunity of behavior change. - Supervision and NB-IST system strengthened JICA's existing project could be utilized. - Assistance for modification of relevant curriculum (medicine, nursing and allied health) of Fiji National University could be helpful not only for Fiji but also the Pacific Region. It requires close coordination among MOH, MOE and FNU. - Future strategy on NCDs and human resource development plan need to be carefully considered.
Health finance	No	- AusAID, SPC and WHO have been providing the assistance.
Medicine and medical technology	A little	- Establishment of demand forecasting system might be assisted to improve efficiency of drug supply. It needs to like with health information system. - Research activity to have evidence for decision making on investment for medical technology could be supported.
Health information	Some	- Establishment of regular feedback system at operational to management level could be assisted. It might be useful for monitoring and evaluation.

Source: The Survey Team

Table 7-6 Possibility of Future Support: CoC

Targets	Possibility		Comments
	Community/ Primary health facilities	Hospitals	
Primordial prevention	Difficult		- Stakeholders are not only ministries of health but also various agencies. - It related to legislation system of the country.
Primary prevention	High	n.a.	- Much assistance has been concentrated. - Various tools and materials have been developed. - Intervention for children and adolescents might be assisted. Collaboration with education sector is necessary. - Collaboration with agriculture and food sector might be effective to promote vegetable consumption especially in Kiribati. - Outreach to remote islands could have needs, but it required huge transportation cost and the target population is small. - Long-term grass route activities might be effective.
Secondary prevention	A little	Difficult	- Much assistance has been provided to screening. - Following up to start treatment needs to be strengthened to increase effectiveness of the screening.
Tertiary prevention	Some	Difficult	- Rehabilitation and patient education (ex. peer educator) in the community could be effective. - Assistance for treatment needs careful consideration with cost effectiveness and feasibility.

Source: The Survey Team

Based on the above, the following possibilities could be suggested.

(1) Trainings in Japan

The existing group training or country focused training are to be modified to include various activities relevant to the primary prevention in Japan not only public sector but also private sector and activities at various level such as:

- Collaboration in awareness raising among municipal government, school and community in awareness raising through health education in school;
- Measurements which could be undertaken in private sector such as food producers, food importers retailers, meal service providers, etc.;
- Cooking class in health centers;
- Diabetes class in hospitals;
- Follow-up system of workplace screening; and so forth.

To prepare the curriculum, information on the measurements in Japan needs to be collected and analyzed. At the same time, applicability for the target countries should be carefully considered.

(2) Trainings or Experience Sharing among the Pacific Countries

Although NCD situation and environment of implementation of countermeasures vary among the countries, it could be useful to share some experiences or know how among or between countries which have similar concern, limitation or condition.

Kiribati has learned from Tonga about health promotion foundation. As those countries have similar size of population, experience sharing in Tonga could be effective for Kiribati counterparts. As nurses in Fiji and Kiribati

have rather similar function in NCD prevention and control, Fiji could transfer their experiences to Kiribati in terms of nursing services.

It might be also possible to dispatch JOCVs as a focal point of each country for the regional program. They could help NCD focal points to share experiences within and beyond the country and introduce concepts and tools relevant to the program.

(3) Community Support

To enhance awareness raising and patient education in community, peer educator system for diabetes patients which is under trial in Central Division in Fiji could be supported. When the model was developed, it could be applied to other areas in Fiji or other countries. JOCVs could be dispatched to collaborate with stakeholders in the community, health personnel, and development partners to support the trial and sustainability of the activity after the extensive phase. As it takes quite long period to have outcome of such community intervention, the dispatch should be continuous for long term.

(4) Multisector Approach

To reduce NCD burden in future, it is important to involve children and adolescence to the primary prevention, because they might be future patients without effective measures. Schools could be one of the best places of intervention for these groups. Actually, the respective ministries of health in the target countries and development partners have been coordinating and collaborating with the respective ministries of education. In Fiji, school health activity is already a part of routine MOH's work. Therefore, it might be possible to support to introduce NCD prevention to school health in Fiji. As for other countries, some experiences in Fiji and/or Japan could be referred.

In Kiribati, it could be considered to develop or introduce innovative vegetable production or found the way to intake necessary vitamins from available foods with cheaper cost for improvement of diet.

(5) Monitoring and Evaluation System

Common monitoring and evaluation framework on NCD among the countries in the Region could contribute to improve regional collaboration and implementation of the regional program like 2-1-22. To strengthen monitoring and evaluation system of NCD programs, health information management system of each country should be reviewed carefully because necessary data should be easily taken from the regular health information management system. Especially in Fiji, it will be complicated work as various forms are actually used at operational level.

(6) Research Activity

Research to have evidences of cost effectiveness of interventions for NCD could be useful for decision making of investment for infrastructure and human resource development for NCD prevention and control. Also, research on innovative vegetable production could help some countries like Kiribati.

(7) Regional Program/ Project

It could be difficult for NCD prevention and control to apply a common package similar to EPI or to simply expand a particular model to surrounding countries because NCD epidemics and progress of interventions vary. In addition, as most of NCDs are strongly related to life style which has been affected by culture, custom, sense of values,

socioeconomic situation and so forth, various interventions are required not only in health sector but also in education, food and agriculture, legislation and so forth. Also collaboration between public and private sectors could be necessary to guide people to change their risk behaviors. Therefore, situations of such sectors might also affect on the design of interventions.

In the Project for Strengthening of "Need-Based In-Service Training (NB-IST)" for Community Health Nurses supported by JICA in Fiji, Tonga and Vanuatu, the NB-IST modes developed in Fiji could not be applied as it was applied to other two countries because the situations of nursing workforce, human resource development, and other environments and settings varied. Particularly, the Fiji Model is difficult to be applied as the volume of coverage (population) and nursing workforce are quite different. Therefore, Tonga's experiences have been more referred in Vanuatu because the settings are rather similar than Fiji.

It might be possible to share good practices among the countries. However, this will depend on each country to decide whether they will apply these best practices and how it will be implemented. In this regards, the technical advice or cooperation might be effective to link the countries in order to provide broader point of view.

It might be efficient to establish or strengthen a regional monitoring framework at the regional level. It should be done in close corporation with SPC and WHO.

Annexes

Annex 1: Work Schedule of the Survey

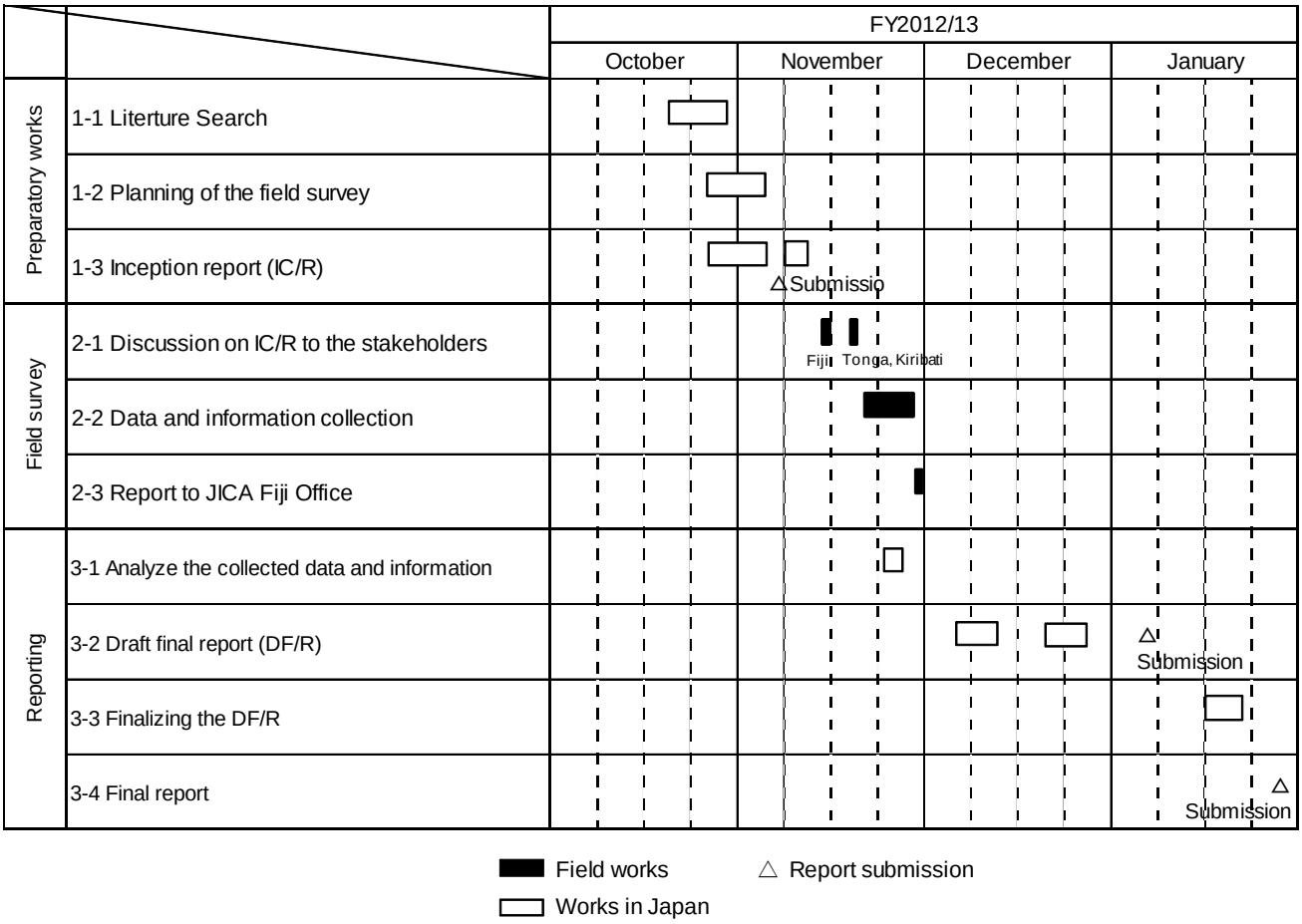
Annex 2: Members and Schedule of the Survey Team

Annex 3: Itinerary and Major Interviewees of the Field Survey

Annex 4: Major Health Indicators of the Target Countries

Annex 5: Reference Materials

Annex 1: Work Schedule of the Survey



Annex 2: Members and Schedule of the Survey Team

	Responsibility	Name	Company	FY2012/13				Person-month	
				10	11	12	1	Total	
								Field	Japan
Field	Team Leader/ Health Policy	Keiko Nagai	KRI International Corp.		Fiji			0.17	
	Deputy Team Leader/ Preventive Health 1/ NCD Control 2	Keiko Kobayashi	KRI International Corp.		Tonga and New Caledonia			0.60	
	NCD Control 1/ Preventive Heatlh 2	Takashi Inoue	KRI International Corp.		Fiji and			0.60	
								1.37	
Japan	Team Leader/ Health Policy	Keiko Nagai	KRI International Corp.						0.30
	Deputy Team Leader/ Preventive Health 1/ NCD Control 2	Keiko Kobayashi	KRI International Corp.						0.47
	NCD Control 1/ Preventive Heatlh 2	Takashi Inoue	KRI International Corp.						0.37
									1.14
	Reports (△=Submission)				△ IC/R		△ DF/R △ F/R		
	Total							1.37	1.14
								2.51	

Regend ■ Field Work
□ Work in Japan

Annex 3: Itinerary and Major Interviewees of the Field Survey

1. Itinerary of the Field Survey

<table>
<tr><th rowspan="2">Date</th><th rowspan="2">Day</th><th colspan="3">Itinerary</th></tr>
<tr><th>K. Nagai</th><th>K. Kobayashi</th><th>T. Inoue</th></tr>
<tr><td>04-Nov-12</td><td>Sun</td><td rowspan="4"></td><td colspan="2">Leave Japan</td></tr>
<tr><td>05-Nov-12</td><td>Mon</td><td>Arrive at Suva
Meeting with Dr. Viliami, SPC</td><td>Arrive at Nadi</td></tr>
<tr><td>06-Nov-12</td><td>Tue</td><td>Meeting with Dr. Viliami, SPC
Courtesy call JICA Fiji</td><td>Nadi to Tarawa</td></tr>
<tr><td>07-Nov-12</td><td>Wed</td><td>Suva to Nadi</td><td rowspan="8">Data collection in Kiribati</td></tr>
<tr><td>08-Nov-12</td><td>Thu</td><td>Nadi to Nuku’alofa</td></tr>
<tr><td>09-Nov-12</td><td>Fri</td><td rowspan="8">Data collection in Tonga</td></tr>
<tr><td>10-Nov-12</td><td>Sat</td></tr>
<tr><td>11-Nov-12</td><td>Sun</td></tr>
<tr><td>12-Nov-12</td><td>Mon</td><td>(Tonga to Suva)</td></tr>
<tr><td>13-Nov-12</td><td>Tue</td><td rowspan="6">Data Collection in Fiji
(3 days in total)</td></tr>
<tr><td>14-Nov-12</td><td>Wed</td></tr>
<tr><td>15-Nov-12</td><td>Thu</td></tr>
<tr><td>16-Nov-12</td><td>Fri</td></tr>
<tr><td>17-Nov-12</td><td>Sat</td></tr>
<tr><td>18-Nov-12</td><td>Sun</td></tr>
<tr><td>19-Nov-12</td><td>Mon</td><td>Nuku’alofa to Suva</td><td>Tarawa to Nadi</td></tr>
<tr><td>20-Nov-12</td><td>Tue</td><td>Report to JICA Fiji</td><td colspan="2">Report to JICA Fiji
Suva to Nadi</td></tr>
<tr><td>21-Nov-12</td><td>Wed</td><td rowspan="9">Data Collection in Fiji
(2 days in total)</td><td colspan="2">Leave for Japan</td></tr>
<tr><td>22-Nov-12</td><td>Thu</td></tr>
<tr><td>23-Nov-12</td><td>Fri</td></tr>
<tr><td>24-Nov-12</td><td>Sat</td></tr>
<tr><td>25-Nov-12</td><td>Sun</td></tr>
<tr><td>26-Nov-12</td><td>Mon</td></tr>
<tr><td>27-Nov-12</td><td>Tue</td></tr>
<tr><td>28-Nov-12</td><td>Wed</td></tr>
<tr><td>29-Nov-12</td><td>Thu</td><td>Suva to Nadi</td></tr>
<tr><td>30-Nov-12</td><td>Fri</td><td>Leave for Fiji</td></tr>
</table>

2. List of Major Interviewees in Fiji

Organization	Unit	Name	Position
Ministry of Health (MOH)	National Health Promotion Centre (National Wellness Centre)	Dr. Pita Vuniqunu	National Advisor for Public Health
		Dr. Isimeli Tukana	National NCD Advisor
		Mr. V. Bolaqada	Administrative Officer
	Health Information Unit	Mr. Shivne Naidu	Director, Health Information Systems
	Health Policy and Planning Unit	Mr. Rasish Singh	Director, Health Planning and Policy
	Health Information Unit	Dr. Sheetal Singh	Epidemiologist
	Financial Unit	Ms. Nina	Principal Accountant
Northern Division Health Office		Dr. Pablo	Divisional Medical Officer
Labasa Health Centre		Ms. Matelita Kadin	Zone Nurse
Labasa Hospital		Dr. Mikaele Mua	Medical Consultant
Central Division		Dr. Samuela Korovou Sr. Penina Druavesi NCD screening team at Westpac Bank	Divisional Medical Officer Divisional Health Sister SOPD Nurses, Dietitian
Diabetic Centre (Diabetes Hub)		Dr. Jima Kaiawadoko	Medical Officer
College of Medicine, Nursing and Health Science, Fiji National University (FNU-CMNHS)	Research Unit	Ms. Sharon Biribo Ms. Ngade	Acting Director Research Pacific Research Centre for Prevention of Obesity and NCD
Tamavua Hospital		Dr. Tukana Ms. A. Miyaguchi	Medical Officer JOCV
Colonial War Memorial (CWM) Hospital		Ms. Kelerayani Vakatora, Dr. Jamesa Tudravu, MS	Customer Relation Officer Medical Superintendent
AusAID	FHSSP	Dr. Margaret Cornelius	Technical Facilitator, Diabetes
Secretariat of the Pacific Community (SPC)	Health Advancement Unit	Dr. Josaia Samuela	Manager
JICA Fiji Office		Ms. Salojini Lal	Project Formulation Officer
Fiji Pharmaceutical and Biomedical Supplies Center		Mr. Apolosi	Chief Pharmacist

3. List of Major Interviewees in Tonga

Organization	Division/Section	Position	Name
Ministry of Health (MOH)		Director of Health	Dr. Siale ‘Akau’ola
	Public Health Dep.	Head of Reproductive Health Nurse	Sr. Afu Tei
		Head of Community Health	Dr. Cathy Latu
		Nurse Practitioner	Ms. Fusi Kaho
		Head of Health Promotion Unit	Mr. Eva Mafi
		Head of Environmental Health	Mr. MIu Fakakovi
	Administration	Principal Health Administrator	Mr. Tu’akoi ‘Ahio
	Health & Planning Information	Principal Health Planning Officer	Mr. Viliami Ika
	Health Information	Senior Health Informatics Officer	Mr. Sione Hufanga
	Medical Store	Principal Pharmacist	Ms. Melemanaite Mahe
MOH/ Vaiola Hospital	Medical Ward	Acting Medical Superintendent	Dr. Sione Latu
	Overseas Referral Committee	Secretary	Dr. Ana ‘Akau’ola
	Radiology	Radiologist	Dr. Ana ‘Akau’ola
	Psychiatric Unit	Psychiatrist	Dr. Mapa Puloka
	Pharmacy	Pharmacist	Ms. Kinia Levaitai ‘Asaeli
	Laboratory	Medical Scientist	Mr. Semisi Lenati
	Physiotherapy	Physiotherapist	Mr. John Poulivaati
	Diabetes Clinic	NCDs Supervisor	Sr. Seilini Soakai
	Accident and Emergency and OPD	Nursing Sister In-Charge	Sr. Heleine Lolita Kupu
Ministry of Finance and National Planning (MOFNP)		Principal Economist	Mr. Winston Halapua
		Assistant Economist	Ms. Palu Falepapalangi
Ministry of Revenue (MOR)		Deputy CEO	Ms. ‘Akanesi Taufa
Ministry of Police (MOP)		Assistant Chief Inspector	Mr. Kelekolio ‘Amato
Ministry of Education (MOE)		Deputy Director for Schools	Mr. Pone Taunisila
Ministry of Fisheries (MOF)		Fisheries Officer	Ms. Lesinili Loto’ahea
Ministry of Agriculture (MOA)	Agricultural Extension and Women Division	Head	Ms. Losaline Maasi
Tonga Department of Statistics (TDoS)		Statistician	Mr. Winston Fainga’anuku
Tonga Health Promotion Foundation (Tonga Health)		CEO	Ms. Iemaima Lisa Havea
		Project Coodinator	Ms. Siesi Hala’apiapi-Papani
Tonga Medical Association (TMA)		THSSP	Dr. Toakase Fakakovikaetau
SPC Headquarter	Healthy Pacific Lifestyle Section	Team Leader	Dr. Viliami Puloka
SPC Suva Regional Office	Health Advancement Unit	Manager	Dr. Josaia Samuela
WHO	Tonga Country Office	Administrative Assistant	Ms. Kalatina Palu
ADB/WB Joint Focal Office		Operations Assistant	Ms. Elizabeth Ika
AusAID		Program Manager	Ms. Barbara Tu’ipulotu
New Zealand Aid Programme (NZAP)			Ms. Meletonga Fakahua
Tonga Red Cross Society		Program Manager	Ms. Evaipomana Tuuholoaki

4. List of Major Interviewees in Kiribati

Organization	Section	Position	Name
Ministry of Health and Medical Services (MHMS)		Acting Deputy Secretary of MHMS	Mr. Tekoaua Tawaroa
	NCD	NCD Coordinator	Mr. Koorio Tetabea
	Health Information	Senior Health Information Officer	Mr. Teanibuaka Tabunga
	Health Promotion	Head of Health Promotion Unit	Ms. Marutaake Karawaiti
		Health Promotion Officer (Tobacco)	Mr. Enoka Arabua
	Nutrition	Head of Nutrition Unit	Ms. Eretii Timeon
	Health Information	Senior Health Information Officer	Mr. Teanibuaka Tabunga
	Administration: Account	Senior Accountant	Ms. Riema Mareko
	NCD Unit	NCD Coordinator MHMS	Mr. Koorio Tetabea
	Human Resources Planning	Assistant Secretary	Ms. Benny Teuea
	Outer Island Health Management Center	District Principle Nursing Officer	Mr. Beia Tabwaia
		Director of Hospital Services	Dr. Bwabwa Oten
NCD Center		NCD Coordinator	Dr. Airam Metai
Tungaru Central Hospital (TCH)	Pharmacy Store	Director of Pharmacy	Ms. Joana Taakau
	Nursing Services	Acting Principle Nursing Officer	Ms. Tabiria Kmautoa
		Principle Nursing Officer	Ms. Tireta Bobo
		Principle Nursing Officer	Ms. Teolaiti Tetoa
	Nursing School	Acting Principal	Ms. Tareti Ioane
		Acting Deputy Principal	Ms. Sapina Benitera
	Laboratory	Acting Director of Laboratory Services	Ms. Rosemary Tekoana
	Nursing Services	Director of Nursing Services	Ms. Mamao Robate
	Diabetic Clinic	Diabetic Nurse	Ms. Miiri
Biriki Clinic		Medical Assistant	Ms. Bema Ioabo
Ministry of Finance and Economic Development (MOFED)	National Statistics Office	Acting Republic Statistician	Ms. Aritita Tekaieti
Ministry of Environment, Lands and Agricultural Development (MOELAD)		Secretary	Mr. Manikaoti Timeon
Ministry of Education (MOE)	Basic Education	Senior Education Officer	Mr. Teba Taawetia
WHO		WHO Liaison Officer	Dr. Andre Ernst Reiffer
New Zealand High Commission		High Commissioner	Mr. Mike Walsh
WHO		WHO Officer	Mr. Kireata Ruteru
AusAID		Program Manager	Ms. Kakiateiti Erikate
Taiwan Technical Mission		Leader	Mr. Willis Wu

Annex 4: Major Health Indicators of the Target Countries

Annex 4: Major Health Indicators (Republic of Fiji)

Republic of Fiji				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
0 General Information	0.1 Demography	0.1.01	Population, total		WDI	728,390	811,718	868,406	2011	1,974,218,593	(2011)	East Asia & Pacific (developing only)
		0.1.02	Population growth (annual %)		WDI	0.55	0.59	0.90	2011	0.67	(2011)	East Asia & Pacific (developing only)
		0.1.03	Life expectancy at birth, total (years)		WDI	65.6	67.6	69.3	2011	72.2	(2010)	East Asia & Pacific (developing only)
		0.1.04	Birth rate, crude (per 1,000 people)		WDI	28.9	24.8	21.2	2011	14.2	(2010)	East Asia & Pacific (developing only)
		0.1.05	Death rate, crude (per 1,000 people)		WDI	6.3	6.1	6.8	2011	7.0	(2010)	East Asia & Pacific (developing only)
		0.1.06	Urban population (% of total)		WDI	41.6	47.9	52.2	2011	48.6	(2011)	East Asia & Pacific (developing only)
	0.2 Economic・Development Condition	0.2.01	GNI per capita, Atlas method (current US$)		WDI	1,790	2,230	3,680	2011	4,243	(2011)	East Asia & Pacific (developing only)
		0.2.02	GNI growth (annual %)		WDI	-	-	-	-	8.7	(2011)	East Asia & Pacific (developing only)
		0.2.03	Total enrollment, primary (% net)	2.1	WDI	-	94.7	99.1	2009	94.4	(2007)	East Asia & Pacific (developing only)
		0.2.04	Ratio of female to male primary enrollment (%)	3.1	WDI	-	98.2	98.5	2009	101.7	(2010)	East Asia & Pacific (developing only)
		0.2.05	Literacy rate, adult total (% of people ages 15 and above)		WDI	-	-	-	-	93.8	(2010)	East Asia & Pacific (developing only)
		0.2.06	Human Development Index		HDR	0.71	0.76	0.69	2011	0.67	(2011)	East Asia and the Pacific
		0.2.07	Human Development Index (rank)		HDR	65 / 160	72 / 173	100 / 187	2011	-	-	-
		0.2.08	Poverty gap at $1.25 a day (PPP) (%)		WDI	-	-	1.1	2009	3.4	(2008)	East Asia & Pacific (developing only)
	0.3 Water and Sanitation	0.3.01	Improved water source (% of population with access)	7.8	HNP Stats	84	93	98	2010	89.9	(2010)	East Asia & Pacific (developing only)
		0.3.02	Improved sanitation facilities (% of population with access)	7.9	HNP Stats	61	75	83	2010	65.5	(2010)	East Asia & Pacific (developing only)
1 Health Status of People	1.1 Mortality and Morbidity	1.1.01	Age-standardized mortality rate by cause (per 100,000 population) - Communicable		GHO	-	-	166	2008	74	(2008)	Western Pacific
		1.1.02	Age-standardized mortality rate by cause (per 100,000 population) - Noncommunicable		GHO	-	-	752	2008	534	(2008)	Western Pacific
		1.1.03	Age-standardized mortality rate by cause (per 100,000 population) - Injuries		GHO	-	-	35	2008	64	(2008)	Western Pacific
		1.1.04	Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)		HNP Stats	-	-	18.3	2008	13.4	(2008)	East Asia & Pacific (developing only)
		1.1.05	Cause of death, by non-communicable diseases (% of total)		HNP Stats	-	-	76.5	2008	76.3	(2008)	East Asia & Pacific (developing only)
		1.1.06	Cause of death, by injury (% of total)		HNP Stats	-	-	5.2	2008	10.3	(2008)	East Asia & Pacific (developing only)
		1.1.07	Distribution of years of life lost by broader causes (%) - Communicable		GHO	-	-	23	2008	19	(2008)	Western Pacific
		1.1.08	Distribution of years of life lost by broader causes (%) - Noncommunicable		GHO	-	-	67	2008	63	(2008)	Western Pacific
		1.1.09	Distribution of years of life lost by broader causes (%) - Injuries		GHO	-	-	10	2008	18	(2008)	Western Pacific
	1.2 Maternal and Child Health	1.2.01	Maternal mortality ratio (modeled estimate, per 100,000 live births)	5.1	MDGs	32	31	26	2010	83.1	(2010)	East Asia & Pacific (developing only)
		1.2.02	Adolescent fertility rate (births per 1,000 women ages 15-19)	5.4	MDGs	-	43.2	43.8	2010	18.8	(2010)	East Asia & Pacific (developing only)
		1.2.03	Mortality rate, under-5 (per 1,000)	4.1	MDGs	29.6	22.3	16.4	2011	20.7	(2011)	East Asia & Pacific (developing only)
		1.2.04	Mortality rate, infant (per 1,000 live births)	4.2	MDGs	24.7	19.0	14.1	2011	17.0	(2011)	East Asia & Pacific (developing only)
		1.2.05	Low-birthweight babies (% of births)		HNP Stats	-	-	-	-	6.4	(2010)	East Asia & Pacific (developing only)
		1.2.06	Fertility rate, total (birth per woman)		HNP Stats	3.4	3.1	2.6	2011	1.8	(2010)	East Asia & Pacific (developing only)
	1.3 Infectious Diseases	1.3.01	a) Prevalence of HIV, male (% ages 15-24)	6.1	MDGs	-	-	0.1	2009	-	-	-
			b) Prevalence of HIV, female (% ages 15-24)	6.1	MDGs	-	-	0.1	2009	-	-	-
		1.3.02	Notified cases of malaria per 100,000 population	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.03	a) Malaria death rate per 100,000 population, all ages	6.6	MDGs Database	-	-	-	-	43	(2010)	Oceania
			b) Malaria death rate per 100,000 population, ages 0-4	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.04	Tuberculosis prevalence rate per 100,000 population (mid-point)	6.9	MDGs Database	63.0	39.0	40.0	2010	231	(2010)	Oceania
		1.3.05	Incidence of tuberculosis (per 100,000 people)	6.9	MDGs	43	28	27	2010	123	(2010)	East Asia & Pacific (developing only)
		1.3.06	Tuberculosis death rate (per 100,000 people)	6.9	MDGs	5.3	3.2	3.6	2010	12.0	(2010)	East Asia & Pacific (developing only)
		1.3.07	Prevalence of HIV, total (% of population ages 15-49)		HNP Stats	0.1	0.1	0.1	2009	0.2	(2009)	East Asia & Pacific (developing only)
		1.3.08	AIDS estimated deaths (UNAIDS estimates)		HNP Stats	100	100	100	2009	-	-	-
		1.3.09	HIV incidence rate, 15-49 years old, percentage (mid-point)		MDGs Database	-	-	-	-	0.03	(2010)	South-Eastern Asia (including Oceania)
		1.3.10	Paritial Prioritization Score by the Global Fund (HIV)		GF	-	-	3	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (Malaria)		GF	-	-	3	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (TB)		GF	-	-	4	2012	-	-	-
	1.4 Nutrition	1.4.01	Prevalence of wasting (% of children under 5)		HNP Stats	-	-	-	-	3.6	(2011)	East Asia & Pacific (developing only)
2 Service Delivery	2.1 Maternal and Child Health	2.1.01	Births attended by skilled health personnel, percentage	5.2	MDGs Database	-	99.0	99.0	2002	-	-	-
		2.1.02	Birth by caesarian section		GHO	-	7.1	7.1	2000	24.4	(2011)	Western Pacific
		2.1.03	Contraceptive prevalence (% of women ages 15-49)	5.3	MDGs	-	44.0	43.1	2007	77.7	(2010)	East Asia & Pacific (developing only)
		2.1.04	Pregnant women receiving prenatal care (%)	5.5	HNP Stats	-	-	100	2008	91.9	(2010)	East Asia & Pacific (developing only)
		2.1.05	Pregnant women receiving prenatal care of at least four visits (% of pregnant women)	5.5	HNP Stats	-	-	-	-	-	-	-
		2.1.06	Unmet need for family planning, total, percentage	5.6	MDGs Database	-	-	-	-	-	-	-
		2.1.07	1-year-old children immunized against: Measles	4.3	Childinfo	84	81	94	2011	95	(2010)	East Asia and the Pacific
		2.1.08	1-year-old children immunized against: Tuberculosis		Childinfo	99	96	99	2011	97	(2010)	East Asia and the Pacific
		2.1.09	a) 1-year-old children immunized against: DPT (percentage of infants who received their first dose of diphtheria, pertussis and tetanus vaccine)		Childinfo	98	97	99	2011	96	(2010)	East Asia and the Pacific
			b) 1-year-old children immunized against: DPT (percentage of infants who received three doses of diphtheria, pertussis and tetanus vaccine)		Childinfo	97	90	99	2011	94	(2010)	East Asia and the Pacific
		2.1.10	1-year-old children immunized against: Polio		Childinfo	-	91	99	2011	96	(2010)	East Asia and the Pacific
		2.1.11	Percentage of infants who received three doses of hepatitis B vaccine		Childinfo	-	98	99	2011	94	(2010)	East Asia and the Pacific

Annex 4: Major Health Indicators (Republic of Fiji)

Republic of Fiji				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
	2.2 Infectious Diseases	2.2.01	Condom use with non regular partner, % adults (15-49), male	6.2	MDGs	-	-	-	-	-	-	-
		2.2.02	Condom use with non regular partner, % adults (15-49), female	6.2	MDGs	-	-	-	-	-	-	-
		2.2.03	Men 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.04	Women 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.05	Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years	6.4	MDGs Database	-	-	-	-	-	-	-
		2.2.06	Use of insecticide-treated bed nets (% of under-5 population)	6.7	HNP Stats	-	-	-	-	-	-	-
		2.2.07	Children under 5 with fever being treated with anti-malarial drugs, percentage	6.8	MDGs Database	-	-	-	-	-	-	-
		2.2.08	Tuberculosis treatment success rate under DOTS, percentage	6.10	MDGs Database	-	85.0	94.0	2009	76.0	(2009)	Oceania
		2.2.09	Antiretroviral therapy coverage (% of people with advanced HIV infection)	6.5	MDGs	-	-	30.0	2009	47.5	(2010)	East Asia & Pacific (developing only)
		2.2.10	People aged 15 years and over who received HIV testing and counselling, estimated number per 1,000 adult population		GHOr	-	-	37.1	2010	-	-	-
		2.2.11	Testing and counselling facilities, estimated number per 100,000 adult population		GHOr	-	-	5.6	2010	-	-	-
		2.2.12	Pregnant women tested for HIV, estimated coverage (%)		GHOr	-	-	83	2010	-	-	-
		2.2.13	Percentage of HIV-infected pregnant women who received antiretroviral drugs to reduce the risk for mother-to-child transmission (Mid point)	6.5	MDGs Database	-	-	-	-	-	-	-
		2.2.14	Tuberculosis case detection rate (all forms)		HNP Stats	72	64	82	2010	76	(2010)	East Asia & Pacific (developing only)
		2.2.15	Tuberculosis treatment success rate (% of registered cases)	6.10	MDGs	-	85	94	2009	92	(2009)	East Asia & Pacific (developing only)
	2.3 Nutrition	2.3.01	Vitamin A supplementation coverage rate (% of children ages 6-59 months)		HNP Stats	-	-	-	-	-	-	-
		2.3.02	Consumption of iodized salt (% of households)		HNP Stats	-	-	-	-	86.0	(2010)	East Asia & Pacific (developing only)
3 Health System	3.1 Human Resources	3.1.01	Physicians (per 1,000 people)		HNP Stats	-	-	0.43	2010	1.17	(2010)	East Asia & Pacific (developing only)
		3.1.02	Midwives (per 1,000 people)		HNP Stats	-	-	-	-	0.04	(2002)	East Asia & Pacific (developing only)
		3.1.03	Nurses (per 1,000 people)		HNP Stats	-	-	-	-	1.03	(2001)	East Asia & Pacific (developing only)
		3.1.04	Dentistry personnel density (per 10,000 population)		GHO	-	-	1.96	2009	1	(2007)	Western Pacific
		3.1.05	Density of pharmaceutical personnel (per 10,000 population)		GHO	-	-	0.87	2009	4.0	(2007)	Western Pacific
	3.2 Health Financing	3.2.01	Health expenditure, total (% of GDP)		HNP Stats	-	4.0	4.9	2010	4.8	(2010)	East Asia & Pacific (developing only)
		3.2.02	Health expenditure, public (% of total health expenditure)		HNP Stats	-	79.8	70.1	2010	53.4	(2010)	East Asia & Pacific (developing only)
		3.2.03	Health expenditure, private (%) of total health expenditure)		HNP Stats	-	20.2	29.9	2010	46.6	(2010)	East Asia & Pacific (developing only)
		3.2.04	Out-of-pocket health expenditure (% of private expenditure on health)		HNP Stats	-	62.9	65.8	2010	66.9	(2010)	East Asia & Pacific (developing only)
		3.2.05	Health expenditure, public (% of government expenditure)		HNP Stats	-	10.3	9.4	2010	9.3	(2004)	East Asia & Pacific (developing only)
		3.2.06	External resources for health (% of total expenditure on health)		HNP Stats	-	7.1	8.7	2010	0.4	(2010)	East Asia & Pacific (developing only)
		3.2.07	Social security expenditure on health as a percentage of general government expenditure on health		GHO	-	-	-	-	68.6	(2009)	Western Pacific
		3.2.08	a) Health expenditure per capita (current US$)		HNP Stats	-	84.6	154.3	2010	182.8	(2010)	East Asia & Pacific (developing only)
			b) Per capita total expenditure on health (PPP int. $)		GHO	-	133	198	2010	614	(2009)	Western Pacific
		3.2.09	Per capita government expenditure on health at average exchange rate (US$)		GHO	-	67	108	2010	361	(2009)	Western Pacific
	3.3 Facilities, Equipments and Supplies	3.3.01	a) Median availability of selected generic medicines (%) - Public		GHO	-	-	-	-	-	-	-
			b) Median availability of selected generic medicines (%) - Private		GHO	-	-	75.0	2004	-	-	-
		3.3.02	a) Median consumer price ratio of selected generic medicines - Public		GHO	-	-	-	-	-	-	-
			b) Median consumer price ratio of selected generic medicines - Private		GHO	-	-	2.7	2004	-	-	-
		3.3.03	Hospital beds (per 1,000 population)		HNP Stats	-	-	2.1	2009	3.9	(2009)	East Asia & Pacific (developing only)

WDI: World Development Indicators & Global Development Finance (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
HDR: Human Development Reports (http://hdr.undp.org/) (Accessed 28/11/2012)
HNP Stats: Health Nutrition and Population Statistics (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
GF: Global Fund eligibility list for 2012 funding channels, the Global Fund to Fight AIDS, Tuberculosis and Malaria (http://www.theglobalfund.org/en/application/applying/ecfp/) (Accessed 28/11/2012)
GHO: Global Health Observatory Country Statistics (http://www.who.int/gho/countries/en/) (Accessed 28/11/2012)
GHOr: Global Health Observatory Repository (http://apps.who.int/ghodata/) (Accessed 28/11/2012)
MDGs: Millennium Development Goals (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
MDG database: Millennium Development Goals Indicators (http://mdgs.un.org/unsd/mdg/) (Accessed 28/11/2012). Regional data is available on The Millennium Development Goals Report Statistical Annex 2012 (United Nations).
Childinfo: Childinfo UNICEF (http://www.childinfo.org/) (Accessed 28/11/2012)

Annex 4: Major Health Indicators (Kingdom of Tonga)

Kingdom of Tonga				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
0 General Information	0.1 Demography	0.1.01	Population, total		WDI	95,150	97,935	104,509	2011	1,974,218,593	(2011)	East Asia & Pacific (developing only)
		0.1.02	Population growth (annual %)		WDI	0.2	0.5	0.4	2011	0.7	(2011)	East Asia & Pacific (developing only)
		0.1.03	Life expectancy at birth, total (years)		WDI	69.6	70.8	72.3	2011	72.2	(2010)	East Asia & Pacific (developing only)
		0.1.04	Birth rate, crude (per 1,000 people)		WDI	31.1	28.3	26.6	2011	14.2	(2010)	East Asia & Pacific (developing only)
		0.1.05	Death rate, crude (per 1,000 people)		WDI	6.0	6.3	6.1	2011	7.0	(2010)	East Asia & Pacific (developing only)
		0.1.06	Urban population (% of total)		WDI	22.7	23.0	23.5	2011	48.6	(2011)	East Asia & Pacific (developing only)
	0.2 Economic・Development Condition	0.2.01	GNI per capita, Atlas method (current US$)		WDI	1,220	2,030	3,580	2011	4,243	(2011)	East Asia & Pacific (developing only)
		0.2.02	GNI growth (annual %)		WDI	-	-	-	-	8.7	(2011)	East Asia & Pacific (developing only)
		0.2.03	Total enrollment, primary (% net)	2.1	WDI	92.3	-	98.9	2006	94.4	(2007)	East Asia & Pacific (developing only)
		0.2.04	Ratio of female to male primary enrollment (%)	3.1	WDI	99.4	94.5	96.3	2007	101.7	(2010)	East Asia & Pacific (developing only)
		0.2.05	Literacy rate, adult total (% of people ages 15 and above)		WDI	-	-	99.0	2006	93.8	(2010)	East Asia & Pacific (developing only)
		0.2.06	Human Development Index		HDR	-	-	0.70	2011	0.67	(2011)	East Asia and the Pacific
		0.2.07	Human Development Index (rank)		HDR	-	-	90 / 187	-	-	-	-
		0.2.08	Poverty gap at $1.25 a day (PPP) (%)		WDI	-	-	-	-	3.4	(2008)	East Asia & Pacific (developing only)
	0.3 Water and Sanitation	0.3.01	Improved water source (% of population with access)	7.8	HNP Stats	100	100	100	2010	89.9	(2010)	East Asia & Pacific (developing only)
		0.3.02	Improved sanitation facilities (% of population with access)	7.9	HNP Stats	96.0	96.0	96.0	2010	65.5	(2010)	East Asia & Pacific (developing only)
1 Health Status of People	1.1 Mortality and Morbidity	1.1.01	Age-standardized mortality rate by cause (per 100,000 population) - Communicable		GHO	-	-	173	2008	74	(2008)	Western Pacific
		1.1.02	Age-standardized mortality rate by cause (per 100,000 population) - Noncommunicable		GHO	-	-	670	2008	534	(2008)	Western Pacific
		1.1.03	Age-standardized mortality rate by cause (per 100,000 population) - Injuries		GHO	-	-	29	2008	64	(2008)	Western Pacific
		1.1.04	Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)		HNP Stats	-	-	22.2	2008	13.4	(2008)	East Asia & Pacific (developing only)
		1.1.05	Cause of death, by non-communicable diseases (% of total)		HNP Stats	-	-	73.7	2008	76.3	(2008)	East Asia & Pacific (developing only)
		1.1.06	Cause of death, by injury (% of total)		HNP Stats	-	-	4.1	2008	10.3	(2008)	East Asia & Pacific (developing only)
		1.1.07	Distribution of years of life lost by broader causes (%) - Communicable		GHO	-	-	30	2008	19	(2008)	Western Pacific
		1.1.08	Distribution of years of life lost by broader causes (%) - Noncommunicable		GHO	-	-	61	2008	63	(2008)	Western Pacific
		1.1.09	Distribution of years of life lost by broader causes (%) - Injuries		GHO	-	-	8	2008	18	(2008)	Western Pacific
	1.2 Maternal and Child Health	1.2.01	Maternal mortality ratio (modeled estimate, per 100,000 live births)	5.1	MDGs	67	87	110	2010	83.1	(2010)	East Asia & Pacific (developing only)
		1.2.02	Adolescent fertility rate (births per 1,000 women ages 15-19)	5.4	MDGs	-	21.8	19.7	2010	18.8	(2010)	East Asia & Pacific (developing only)
		1.2.03	Mortality rate, under-5 (per 1,000)	4.1	MDGs	24.5	19.6	15.4	2011	20.7	(2011)	East Asia & Pacific (developing only)
		1.2.04	Mortality rate, infant (per 1,000 live births)	4.2	MDGs	20.7	16.8	13.2	2011	17.0	(2011)	East Asia & Pacific (developing only)
		1.2.05	Low-birthweight babies (% of births)		HNP Stats	-	-	3.0	2002	6.4	(2010)	East Asia & Pacific (developing only)
		1.2.06	Fertility rate, total (birth per woman)		HNP Stats	4.6	4.3	3.9	2011	1.8	(2010)	East Asia & Pacific (developing only)
	1.3 Infectious Diseases	1.3.01	a) Prevalence of HIV, male (% ages 15-24)	6.1	MDGs	-	-	-	-	-	-	-
			b) Prevalence of HIV, female (% ages 15-24)	6.1	MDGs	-	-	-	-	-	-	-
		1.3.02	Notified cases of malaria per 100,000 population	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.03	a) Malaria death rate per 100,000 population, all ages	6.6	MDGs Database	-	-	-	-	43	(2010)	Oceania
			b) Malaria death rate per 100,000 population, ages 0-4	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.04	Tuberculosis prevalence rate per 100,000 population (mid-point)	6.9	MDGs Database	63.0	42.0	29.0	2010	231	(2010)	Oceania
		1.3.05	Incidence of tuberculosis (per 100,000 people)	6.9	MDGs	38	28	17	2010	123	(2010)	East Asia & Pacific (developing only)
		1.3.06	Tuberculosis death rate (per 100,000 people)	6.9	MDGs	6.1	3.7	2.9	2010	12.0	(2010)	East Asia & Pacific (developing only)
		1.3.07	Prevalence of HIV, total (% of population ages 15-49)		HNP Stats	-	-	-	-	0.2	(2009)	East Asia & Pacific (developing only)
		1.3.08	AIDS estimated deaths (UNAIDS estimates)		HNP Stats	-	-	-	-	-	-	-
		1.3.09	HIV incidence rate, 15-49 years old, percentage (mid-point)		MDGs Database	-	-	-	-	0.03	(2010)	South-Eastern Asia (including Oceania)
		1.3.10	Paritial Prioritization Score by the Global Fund (HIV)		GF	-	-	3	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (Malaria)		GF	-	-	3	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (TB)		GF	-	-	3	2012	-	-	-
	1.4 Nutrition	1.4.01	Prevalence of wasting (% of children under 5)		HNP Stats	-	-	-	-	3.6	(2011)	East Asia & Pacific (developing only)
2 Service Delivery	2.1 Maternal and Child Health	2.1.01	Births attended by skilled health personnel, percentage	5.2	MDGs Database	-	95.3	98.0	2002	-	-	-
		2.1.02	Birth by caesarian section		GHO	-	-	-	-	24.4	(2011)	Western Pacific
		2.1.03	Contraceptive prevalence (% of women ages 15-49)	5.3	MDGs	-	33.0	23.9	2006	77.7	(2010)	East Asia & Pacific (developing only)
		2.1.04	Pregnant women receiving prenatal care (%)	5.5	HNP Stats	-	-	99.0	2008	91.9	(2010)	East Asia & Pacific (developing only)
		2.1.05	Pregnant women receiving prenatal care of at least four visits (% of pregnant women)	5.5	HNP Stats	-	-	-	-	-	-	-
		2.1.06	Unmet need for family planning, total, percentage	5.6	MDGs Database	-	-	-	-	-	-	-
		2.1.07	1-year-old children immunized against: Measles	4.3	Childinfo	86	95	99	2011	95	(2010)	East Asia and the Pacific
		2.1.08	1-year-old children immunized against: Tuberculosis		Childinfo	99	99	99	2011	97	(2010)	East Asia and the Pacific
		2.1.09	a) 1-year-old children immunized against: DPT (percentage of infants who received their first dose of diphtheria, pertussis and tetanus vaccine)		Childinfo	97	99	99	2011	96	(2010)	East Asia and the Pacific
			b) 1-year-old children immunized against: DPT (percentage of infants who received three doses of diphtheria, pertussis and tetanus vaccine)		Childinfo	94	95	99	2011	94	(2010)	East Asia and the Pacific
		2.1.10	1-year-old children immunized against: Polio		Childinfo	93	95	99	2011	96	(2010)	East Asia and the Pacific

Annex 4: Major Health Indicators (Kingdom of Tonga)

Kingdom of Tonga				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
		2.1.11	Percentage of infants who received three doses of hepatitis B vaccine		Childinfo	94	97	99	2011	94	(2010)	East Asia and the Pacific
	2.2 Infectious Diseases	2.2.01	Condom use with non regular partner, % adults (15-49), male	6.2	MDGs	-	-	-	-	-	-	-
		2.2.02	Condom use with non regular partner, % adults (15-49), female	6.2	MDGs	-	-	-	-	-	-	-
		2.2.03	Men 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.04	Women 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.05	Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years	6.4	MDGs Database	-	-	-	-	-	-	-
		2.2.06	Use of insecticide-treated bed nets (% of under-5 population)	6.7	HNP Stats	-	-	-	-	-	-	-
		2.2.07	Children under 5 with fever being treated with anti-malarial drugs, percentage	6.8	MDGs Database	-	-	-	-	-	-	-
		2.2.08	Tuberculosis treatment success rate under DOTS, percentage	6.10	MDGs Database	-	93.0	83.0	2009	76.0	(2009)	Oceania
		2.2.09	Antiretroviral therapy coverage (% of people with advanced HIV infection)	6.5	MDGs	-	-	-	-	47.5	(2010)	East Asia & Pacific (developing only)
		2.2.10	People aged 15 years and over who received HIV testing and counselling, estimated number per 1,000 adult population		GHOr	-	-	128.1	2010	-	-	-
		2.2.11	Testing and counselling facilities, estimated number per 100,000 adult population		GHOr	-	-	20	2010	-	-	-
		2.2.12	Pregnant women tested for HIV, estimated coverage (%)		GHOr	-	-	0	2010	-	-	-
		2.2.13	Percentage of HIV-infected pregnant women who received antiretroviral drugs to reduce the risk for mother-to-child transmission (Mid point)	6.5	MDGs Database	-	-	-	-	-	-	-
		2.2.14	Tuberculosis case detection rate (all forms)		HNP Stats	64	88	63	2010	76	(2010)	East Asia & Pacific (developing only)
		2.2.15	Tuberculosis treatment success rate (% of registered cases)	6.10	MDGs	-	93	83	2009	92	(2009)	East Asia & Pacific (developing only)
	2.3 Nutrition	2.3.01	Vitamin A supplementation coverage rate (% of children ages 6-59 months)		HNP Stats	-	-	-	-	-	-	-
		2.3.02	Consumption of iodized salt (% of households)		HNP Stats	-	-	-	-	86.0	(2010)	East Asia & Pacific (developing only)
3 Health System	3.1 Human Resources	3.1.01	Physicians (per 1,000 people)		HNP Stats	-	0.50	0.56	2010	1.17	(2010)	East Asia & Pacific (developing only)
		3.1.02	Midwives (per 1,000 people)		HNP Stats	-	-	0.19	2002	0.04	(2002)	East Asia & Pacific (developing only)
		3.1.03	Nurses (per 1,000 people)		HNP Stats	-	-	3.16	2001	1.03	(2001)	East Asia & Pacific (developing only)
		3.1.04	Dentistry personnel density (per 10,000 population)		GHO	-	-	3.59	2009	1.0	(2007)	Western Pacific
		3.1.05	Density of pharmaceutical personnel (per 10,000 population)		GHO	-	-	1.46	2009	4.0	(2007)	Western Pacific
	3.2 Health Financing	3.2.01	Health expenditure, total (% of GDP)		HNP Stats	-	5.6	5.1	2010	4.8	(2010)	East Asia & Pacific (developing only)
		3.2.02	Health expenditure, public (% of total health expenditure)		HNP Stats	-	71.9	81.5	2010	53.4	(2010)	East Asia & Pacific (developing only)
		3.2.03	Health expenditure, private (%) of total health expenditure)		HNP Stats	-	28.1	18.5	2010	46.6	(2010)	East Asia & Pacific (developing only)
		3.2.04	Out-of-pocket health expenditure (% of private expenditure on health)		HNP Stats	-	83.0	67.8	2010	66.9	(2010)	East Asia & Pacific (developing only)
		3.2.05	Health expenditure, public (% of government expenditure)		HNP Stats	-	15.2	12.9	2010	9.3	(2004)	East Asia & Pacific (developing only)
		3.2.06	External resources for health (% of total expenditure on health)		HNP Stats	-	26.3	17.4	2010	0.4	(2010)	East Asia & Pacific (developing only)
		3.2.07	Social security expenditure on health as a percentage of general government expenditure on health		GHO	-	-	-	-	68.6	(2009)	Western Pacific
		3.2.08	a) Health expenditure per capita (current US$)		HNP Stats	-	87.7	171.8	2010	182.8	(2010)	East Asia & Pacific (developing only)
			b) Per capita total expenditure on health (PPP int. $)		GHO	-	162	229	2010	614	(2009)	Western Pacific
		3.2.09	Per capita government expenditure on health at average exchange rate (US$)		GHO	-	65	140	2010	361	(2009)	Western Pacific
	3.3 Facilities, Equipments and Supplies	3.3.01	a) Median availability of selected generic medicines (%) - Public		GHO	-	-	-	-	-	-	-
			b) Median availability of selected generic medicines (%) - Private		GHO	-	-	-	-	-	-	-
		3.3.02	a) Median consumer price ratio of selected generic medicines - Public		GHO	-	-	-	-	-	-	-
			b) Median consumer price ratio of selected generic medicines - Private		GHO	-	-	-	-	-	-	-
		3.3.03	Hospital beds (per 1,000 population)		HNP Stats	-	-	2.6	2010	3.9	(2009)	East Asia & Pacific (developing only)

WDI: World Development Indicators & Global Development Finance (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
HDR: Human Development Reports (http://hdr.undp.org/) (Accessed 28/11/2012)
HNP Stats: Health Nutrition and Population Statistics (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
GF: Global Fund eligibility list for 2012 funding channels, the Global Fund to Fight AIDS, Tuberculosis and Malaria (http://www.theglobalfund.org/en/application/applying/ecfp/) (Accessed 28/11/2012)
GHO: Global Health Observatory Country Statistics (http://www.who.int/gho/countries/en/) (Accessed 28/11/2012)
GHOr: Global Health Observatory Repository (http://apps.who.int/ghodata/) (Accessed 28/11/2012)
MDGs: Millennium Development Goals (http://databank.worldbank.org/ddp/home.do) (Accessed 28/11/2012)
MDG database: Millennium Development Goals Indicators (http://mdgs.un.org/unsd/mdg/) (Accessed 28/11/2012). Regional data is available on The Millennium Development Goals Report Statistical Annex 2012 (United Nations).
Childinfo: Childinfo UNICEF (http://www.childinfo.org/) (Accessed 28/11/2012)

Annex 4: Major Health Indicators (Republic of Kiribati)

Republic of Kiribati				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
0 General Information	0.1 Demography	0.1.01	Population, total		WDI	71,845	84,010	101,093	2011	1,974,218,593	(2011)	East Asia & Pacific (developing only)
		0.1.02	Population growth (annual %)		WDI	1.4	1.8	1.5	2011	0.7	(2011)	East Asia & Pacific (developing only)
		0.1.03	Life expectancy at birth, total (years)		WDI	-	59.5	60.9	2005	72.2	(2010)	East Asia & Pacific (developing only)
		0.1.04	Birth rate, crude (per 1,000 people)		WDI	-	-	26.6	2005	14.2	(2010)	East Asia & Pacific (developing only)
		0.1.05	Death rate, crude (per 1,000 people)		WDI	-	-	8.7	2005	7.0	(2010)	East Asia & Pacific (developing only)
		0.1.06	Urban population (% of total)		WDI	35.0	43.0	43.9	2011	48.6	(2011)	East Asia & Pacific (developing only)
	0.2 Economic・Development Condition	0.2.01	GNI per capita, Atlas method (current US$)		WDI	730	1,380	2,110	2011	4,243	(2011)	East Asia & Pacific (developing only)
		0.2.02	GNI growth (annual %)		WDI	-	-	-	-	8.7	(2011)	East Asia & Pacific (developing only)
		0.2.03	Total enrollment, primary (% net)	2.1	WDI	-	99.7	99.4	2002	94.4	(2007)	East Asia & Pacific (developing only)
		0.2.04	Ratio of female to male primary enrollment (%)	3.1	WDI	101.5	97.3	103.7	2009	101.7	(2010)	East Asia & Pacific (developing only)
		0.2.05	Literacy rate, adult total (% of people ages 15 and above)		WDI	-	-	-	-	93.8	(2010)	East Asia & Pacific (developing only)
		0.2.06	Human Development Index		HDR	-	-	0.62	2011	0.67	(2011)	East Asia and the Pacific
		0.2.07	Human Development Index (rank)		HDR	-	-	122 / 187	2011	-	-	-
		0.2.08	Poverty gap at $1.25 a day (PPP) (%)		WDI	-	-	-	-	3.4	(2008)	East Asia & Pacific (developing only)
	0.3 Water and Sanitation	0.3.01	Improved water source (% of population with access)	7.8	HNP Stats	48	62	63	2006	89.9	(2010)	East Asia & Pacific (developing only)
		0.3.02	Improved sanitation facilities (% of population with access)	7.9	HNP Stats	26	33	34	2006	65.5	(2010)	East Asia & Pacific (developing only)
1 Health Status of People	1.1 Mortality and Morbidity	1.1.01	Age-standardized mortality rate by cause (per 100,000 population) - Communicable		GHO	-	-	263	2008	74	(2008)	Western Pacific
		1.1.02	Age-standardized mortality rate by cause (per 100,000 population) - Noncommunicable		GHO	-	-	703	2008	534	(2008)	Western Pacific
		1.1.03	Age-standardized mortality rate by cause (per 100,000 population) - Injuries		GHO	-	-	23	2008	64	(2008)	Western Pacific
		1.1.04	Cause of death, by communicable diseases and maternal, prenatal and nutrition conditions (% of total)		HNP Stats	-	-	28.5	2008	13.4	(2008)	East Asia & Pacific (developing only)
		1.1.05	Cause of death, by non-communicable diseases (% of total)		HNP Stats	-	-	68.6	2008	76.3	(2008)	East Asia & Pacific (developing only)
		1.1.06	Cause of death, by injury (% of total)		HNP Stats	-	-	2.9	2008	10.3	(2008)	East Asia & Pacific (developing only)
		1.1.07	Distribution of years of life lost by broader causes (%) - Communicable		GHO	-	-	36	2008	19	(2008)	Western Pacific
		1.1.08	Distribution of years of life lost by broader causes (%) - Noncommunicable		GHO	-	-	60	2008	63	(2008)	Western Pacific
		1.1.09	Distribution of years of life lost by broader causes (%) - Injuries		GHO	-	-	4	2008	18	(2008)	Western Pacific
	1.2 Maternal and Child Health	1.2.01	Maternal mortality ratio (modeled estimate, per 100,000 live births)	5.1	MDGs	-	-	-	-	83.1	(2010)	East Asia & Pacific (developing only)
		1.2.02	Adolescent fertility rate (births per 1,000 women ages 15-19)	5.4	MDGs	-	-	-	-	18.8	(2010)	East Asia & Pacific (developing only)
		1.2.03	Mortality rate, under-5 (per 1,000)	4.1	MDGs	87.6	65.3	47.4	2011	20.7	(2011)	East Asia & Pacific (developing only)
		1.2.04	Mortality rate, infant (per 1,000 live births)	4.2	MDGs	64.1	49.8	37.7	2011	17.0	(2011)	East Asia & Pacific (developing only)
		1.2.05	Low-birthweight babies (% of births)		HNP Stats	-	-	-	-	6.4	(2010)	East Asia & Pacific (developing only)
		1.2.06	Fertility rate, total (birth per woman)		HNP Stats	-	-	3.4	2005	1.8	(2010)	East Asia & Pacific (developing only)
	1.3 Infectious Diseases	1.3.01	a) Prevalence of HIV, male (% ages 15-24)	6.1	MDGs	-	-	-	-	-	-	-
			b) Prevalence of HIV, female (% ages 15-24)	6.1	MDGs	-	-	-	-	-	-	-
		1.3.02	Notified cases of malaria per 100,000 population	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.03	a) Malaria death rate per 100,000 population, all ages	6.6	MDGs Database	-	-	-	-	43	(2010)	Oceania
			b) Malaria death rate per 100,000 population, ages 0-4	6.6	MDGs Database	-	-	-	-	-	-	-
		1.3.04	Tuberculosis prevalence rate per 100,000 population (mid-point)	6.9	MDGs Database	138.0	541.0	550.0	2010	231	(2010)	Oceania
		1.3.05	Incidence of tuberculosis (per 100,000 people)	6.9	MDGs	116	372	370	2010	123	(2010)	East Asia & Pacific (developing only)
		1.3.06	Tuberculosis death rate (per 100,000 people)	6.9	MDGs	8.5	46	47	2010	12	(2010)	East Asia & Pacific (developing only)
		1.3.07	Prevalence of HIV, total (% of population ages 15-49)		HNP Stats	-	-	-	-	0.2	(2009)	East Asia & Pacific (developing only)
		1.3.08	AIDS estimated deaths (UNAIDS estimates)		HNP Stats	-	-	-	-	-	-	-
		1.3.09	HIV incidence rate, 15-49 years old, percentage (mid-point)		MDGs Database	-	-	-	-	0.03	(2010)	South-Eastern Asia (including Oceania)
		1.3.10	Paritial Prioritization Score by the Global Fund (HIV)		GF	-	-	4	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (Malaria)		GF	-	-	4	2012	-	-	-
			Paritial Prioritization Score by the Global Fund (TB)		GF	-	-	9	2012	-	-	-
	1.4 Nutrition	1.4.01	Prevalence of wasting (% of children under 5)		HNP Stats	-	-	-	-	3.6	(2011)	East Asia & Pacific (developing only)
2 Service Delivery	2.1 Maternal and Child Health	2.1.01	Births attended by skilled health personnel, percentage	5.2	MDGs Database	-	-	63.0	2004	-	-	-
		2.1.02	Birth by caesarian section		GHO	-	-	-	-	24.4	(2011)	Western Pacific
		2.1.03	Contraceptive prevalence (% of women ages 15-49)	5.3	MDGs	-	36.1	21.5	2004	77.7	(2010)	East Asia & Pacific (developing only)
		2.1.04	Pregnant women receiving prenatal care (%)	5.5	HNP Stats	-	-	100	2008	91.9	(2010)	East Asia & Pacific (developing only)
		2.1.05	Pregnant women receiving prenatal care of at least four visits (% of pregnant women)	5.5	HNP Stats	-	-	-	-	-	-	-
		2.1.06	Unmet need for family planning, total, percentage	5.6	MDGs Database	-	-	-	-	-	-	-
		2.1.07	1-year-old children immunized against: Measles	4.3	Childinfo	75	80	90	2011	95	(2010)	East Asia and the Pacific
		2.1.08	1-year-old children immunized against: Tuberculosis		Childinfo	93	80	86	2011	97	(2010)	East Asia and the Pacific
		2.1.09	a) 1-year-old children immunized against: DPT (percentage of infants who received their first dose of diphtheria, pertussis and tetanus vaccine)		Childinfo	98	95	99	2011	96	(2010)	East Asia and the Pacific
			b) 1-year-old children immunized against: DPT (percentage of infants who received three doses of diphtheria, pertussis and tetanus vaccine)		Childinfo	97	90	99	2011	94	(2010)	East Asia and the Pacific
		2.1.10	1-year-old children immunized against: Polio		Childinfo	97	90	95	2011	96	(2010)	East Asia and the Pacific

Annex 4: Major Health Indicators (Republic of Kiribati)

Republic of Kiribati				MDGs	Sources	1990	2000	Latest	Latest year	Latest in Region	(Latest year)	Region
		2.1.11	Percentage of infants who received three doses of hepatitis B vaccine		Childinfo	73	90	95	2011	94	(2010)	East Asia and the Pacific
	2.2 Infectious Diseases	2.2.01	Condom use with non regular partner, % adults (15-49), male	6.2	MDGs	-	-	-	-	-	-	-
		2.2.02	Condom use with non regular partner, % adults (15-49), female	6.2	MDGs	-	-	-	-	-	-	-
		2.2.03	Men 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.04	Women 15-24 years old with comprehensive correct knowledge of HIV/AIDS, percentage	6.3	MDGs Database	-	-	-	-	-	-	-
		2.2.05	Ratio of school attendance of orphans to school attendance of non-orphans aged 10-14 years	6.4	MDGs Database	-	-	-	-	-	-	-
		2.2.06	Use of insecticide-treated bed nets (% of under-5 population)	6.7	HNP Stats	-	-	-	-	-	-	-
		2.2.07	Children under 5 with fever being treated with anti-malarial drugs, percentage	6.8	MDGs Database	-	-	-	-	-	-	-
		2.2.08	Tuberculosis treatment success rate under DOTS, percentage	6.10	MDGs Database	-	91.0	97.0	2009	76.0	(2009)	Oceania
		2.2.09	Antiretroviral therapy coverage (% of people with advanced HIV infection)	6.5	MDGs	-	-	-	-	47.5	(2010)	East Asia & Pacific (developing only)
		2.2.10	People aged 15 years and over who received HIV testing and counselling, estimated number per 1,000 adult population		GHOr	-	-	33.1	2010	-	-	-
		2.2.11	Testing and counselling facilities, estimated number per 100,000 adult population		GHOr	-	-	23.2	2010	-	-	-
		2.2.12	Pregnant women tested for HIV, estimated coverage (%)		GHOr	-	-	84	2010	-	-	-
		2.2.13	Percentage of HIV-infected pregnant women who received antiretroviral drugs to reduce the risk for mother-to-child transmission (Mid point)	6.5	MDGs Database	-	-	-	-	-	-	-
		2.2.14	Tuberculosis case detection rate (all forms)		HNP Stats	81	81	78	2010	76	(2010)	East Asia & Pacific (developing only)
		2.2.15	Tuberculosis treatment success rate (% of registered cases)	6.10	MDGs	-	91	97	2009	92	(2009)	East Asia & Pacific (developing only)
	2.3 Nutrition	2.3.01	Vitamin A supplementation coverage rate (% of children ages 6-59 months)		HNP Stats	-	-	62	2005	-	-	-
		2.3.02	Consumption of iodized salt (% of households)		HNP Stats	-	-	-	-	86.0	(2010)	East Asia & Pacific (developing only)
3 Health System	3.1 Human Resources	3.1.01	Physicians (per 1,000 people)		HNP Stats	0.19	-	0.38	2010	1.17	(2010)	East Asia & Pacific (developing only)
		3.1.02	Midwives (per 1,000 people)		HNP Stats	-	-	-	-	0.04	(2002)	East Asia & Pacific (developing only)
		3.1.03	Nurses (per 1,000 people)		HNP Stats	-	-	-	-	1.03	(2001)	East Asia & Pacific (developing only)
		3.1.04	Dentistry personnel density (per 10,000 population)		GHO	-	-	1.71	2008	1.0	(2007)	Western Pacific
		3.1.05	Density of pharmaceutical personnel (per 10,000 population)		GHO	-	-	2.1	2008	4.0	(2007)	Western Pacific
	3.2 Health Financing	3.2.01	Health expenditure, total (% of GDP)		HNP Stats	-	8.0	11.2	2010	4.8	(2010)	East Asia & Pacific (developing only)
		3.2.02	Health expenditure, public (% of total health expenditure)		HNP Stats	-	94.1	82.3	2010	53.4	(2010)	East Asia & Pacific (developing only)
		3.2.03	Health expenditure, private (%) of total health expenditure)		HNP Stats	-	5.9	17.7	2010	46.6	(2010)	East Asia & Pacific (developing only)
		3.2.04	Out-of-pocket health expenditure (% of private expenditure on health)		HNP Stats	-	2.4	0.6	2010	66.9	(2010)	East Asia & Pacific (developing only)
		3.2.05	Health expenditure, public (% of government expenditure)		HNP Stats	-	13.7	12.1	2010	9.3	(2004)	East Asia & Pacific (developing only)
		3.2.06	External resources for health (% of total expenditure on health)		HNP Stats	-	28.3	17.1	2010	0.4	(2010)	East Asia & Pacific (developing only)
		3.2.07	Social security expenditure on health as a percentage of general government expenditure on health		GHO	-	-	-	-	68.6	(2009)	Western Pacific
		3.2.08	a) Health expenditure per capita (current US$)		HNP Stats	-	64.9	159.6	2010	182.8	(2010)	East Asia & Pacific (developing only)
			b) Per capita total expenditure on health (PPP int. $)		GHO	-	166	258	2010	614	(2009)	Western Pacific
		3.2.09	Per capita government expenditure on health at average exchange rate (US$)		GHO	-	61	131	2010	361	(2009)	Western Pacific
	3.3 Facilities, Equipments and Supplies	3.3.01	a) Median availability of selected generic medicines (%) - Public		GHO	-	-	-	-	-	-	-
			b) Median availability of selected generic medicines (%) - Private		GHO	-	-	-	-	-	-	-
		3.3.02	a) Median consumer price ratio of selected generic medicines - Public		GHO	-	-	-	-	-	-	-
			b) Median consumer price ratio of selected generic medicines - Private		GHO	-	-	-	-	-	-	-
		3.3.03	Hospital beds (per 1,000 population)		HNP Stats	4.3	-	1.4	2010	3.9	(2009)	East Asia & Pacific (developing only)

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