NATIONAL STRATEGIC PLAN

Tuberculosis Control Programme

2016-2020

Ministry of Health

REPUBLIC OF VANUATU

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Foreword

The National Tuberculosis Programme (NTP) was originally initiated under the Department of Preventative Medicine of the Condominium Health Services. In 1984, the NTP was adopted and implemented as a National priority of the Ministry of Health (MOH), when the government of Vanuatu endorsed the World Health Organisation (WHO) social goal on "Health for all by 2000" to be achieved through the basic principles underlying the Primary Health Care (PHC) concept.

Tuberculosis (TB) continues to cause an immense burden of suffering and death around the world and continues to be an important healthcare issue in Vanuatu. There have been compounding efforts from successive TB coordinators, with assistance of different partners to reduce the burden of TB in Vanuatu.

In March 1999, the DOTS Strategy was endorsed and introduced by the MOH in an aim to curb the incidence of TB in Vanuatu. The DOTS programme was progressively expanded and covered the entire population by 2003. Since that time there has also been intensified TB case finding, improved treatment outcomes, strengthening of reporting and recording systems and capacity building within the TB program with ongoing training of health care workers.

The Vanuatu TB program is based on a programmatic approach, combining well defined management systems with fully integrated service delivery and a multi-sectorial approach with both national and international partnership.

With programmatic management of TB and the DOTS strategy, TB should be both preventable and curable. We call on the continued collaborative efforts from our partner agencies and NGO's to work together for the fight against TB. Similarly we call on the participation of other stakeholders including individuals and families to join the battle against TB.

Minister of Health
Honourable Jerome Ludvaune

Acknowledgements

The Ministry of Health wishes to acknowledge the efforts and contribution of all the health professionals who were instrumental to the development of this National TB Program Strategic plan and who provided valuable comments. We wish to acknowledge specifically the technical and financial support provided by WHO in this development.

Thank you all for your commitment.

Director of Public Health
Len Tarivonda

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Abbreviations

ACF	Active Case Finding
ACSM	Advocacy, communication, social mobilization
CBO	Community-based organization
CRP	Comprehensive Reform Program
CSO	Civil society organization
CSS	Community systems strengthening
DOTS	Directly Observed Treatment Shortcourse
DR	Drug Resistant
DST	Drug Sensitivity Test
FAST	**F**inding TB cases **A**ctively, **S**eparating safely, and **T**reating effectively
FBO	Faith-based organization
FDC	Fixed dose combination
FSM	Federated States of Micronesia
GFATM	Global Fund for AIDS, Tuberculosis and Malaria
HSS	Health Systems Strengthening
IATA	International Air Transport Association
JANS	Joint Assessment of the National Health Strategies and Plans
M&E	Monitoring and Evaluation
MC	Microscopy Centre
MDG	Millennium Development Goals
MDR-TB	Multi-Drug Resistant Tuberculosis
NPH	Northern Provincial Hospital
NSP	National Strategic Plan
NTBSC	National Tuberculosis Steering Committee
PAA	Priority Action Agenda
PATLAB	Pacific TB Laboratory Initiative
PICs	Pacific Island Countries
PIRMCCM	Pacific Islands Regional Multi-Country Coordinating Mechanism
QC	Quality Control
QMRL	Queensland Mycobacterial Reference Laboratory
SDG	Sustainable development goals
SOP	Standard Operating Procedures
SPC	Secretariat of the Pacific Community
SWOT	Strengths, weaknesses, opportunities and threats
SMART	Specific, measurable, attainable, relevant and time-bound
UNDP	United Nations Development Program
VCH	Vila Central Hospital
VDHS	Vanuatu Demographic Health Survey
VEPAC	Vanuatu Education Policy Advocacy Coalition
VNSO	Vanuatu National Statistics Office
VUV	Vanuatu Vatu

Executive Summary

Global END TB strategy

The vision for the post-2015 global tuberculosis strategy is "a world free of tuberculosis", also expressed as "zero deaths, disease and suffering due to tuberculosis". The goal is to end the global tuberculosis epidemic.

Strategies for TB control in the Pacific:

The Pacific TB Strategy launched in 2000[1] facilitated the implementation of successive Global Fund multi-country proposals since 2002.

The Mid-term Regional TB Strategic Plan for 11 Pacific Island Countries (2015-2019)[2] commissioned by WHO is aligned with the post-2015 Global strategy and is built on the achievements made by the previous strategic plan and the Regional Strategy to Stop TB in the Western Pacific (2011-2015).

Strategies for TB control in Vanuatu:

The National Tuberculosis Program (NTP) was established in Vanuatu in the early 1980s. The DOTS strategy was introduced in 1999, initially in two main referral hospitals, Vila Central Hospital (VCH) and Northern Provincial Hospital (NPH) and gradually expanded to cover the entire country by 2003.

The Technical Guidelines and Policies for TB Control in Vanuatu which was launched in 1999 and updated in 2003, was further revised in 2011. It contains the general policy for tuberculosis control in Vanuatu and is intended to be a reference to guide health care workers in the diagnosis, treatment and prevention of tuberculosis in Vanuatu.

In 2006, on the recommendation of the Ministry of Health, a National DOTS Steering Committee was established; however, it became inactive within a short period. In the same year, the National Strategic Plan for TB (2006-2010) was developed which was a brief 10 page document which was neither modified nor updated later.

In August 2010, the Government of Vanuatu and the Ministry of Health (MoH) embarked on the Health Sector Strategy (2010-2016) with a clear objective: to improve the health of all people living in Vanuatu. The Health Sector Strategy (HSS) was built on the MOH policies for organizational re-structuring, human resource development and management, and capacity building at all levels[3].

The development of the National Strategic Plan (NSP) for TB has been guided by the methodology and format recommended by the WHO Tool Kit for NSP development[4]. The NSP for TB prevention, cure and control is a key instrument for not only managing the TB programme in the country but also, for defining the priorities and strategic interventions to achieve the goals and objectives consistent with the regional and nation health policies and plans. It is in line with the collective global movement towards ending TB and the health-related Sustainable Development Goals (SDGs) beyond 2015.

Country profile

The Republic of Vanuatu, with a population of 284,358[5], situated in the South Pacific Ocean, is an archipelago comprising of 83 islands with 2,528 kilometres of coastline and a total surface area of 12,189 square kilometres. Being within the "Ring of Fire", more than 80% of its landmass and 76% of its

population are vulnerable to natural hazards such as volcanic eruptions, cyclones, earthquakes, droughts, tsunamis, storm surge, flooding and landslides.

Approximately, 80% of the population is living in rural areas. Providing health services to remote communities is costly and logistically challenging in this context. There are two urban centres, the capital, Port Vila, with a population of 44 039 (2009) and Luganville with 13 156 people. The increasing migration from rural to urban sectors is of significant concern as overcrowding in urban settlements leads to the clustering of risk factors for the spread of diseases including TB.

Political commitment for health is reflected in the Health Sector Strategy (2010-2016) which categorically states that "improving the health of the nation is at the heart of government policies". The government uses domestic funds for the procurement of anti-TB drugs, laboratory equipment and supplies and providing meals for TB patients hospitalized during the intensive phase of the DOTS.

Vanuatu is classified by World Bank as a lower middle income country for the current 2016 fiscal year[6]. The Gross Domestic Product (GDP) per capita in Vanuatu was last recorded at 2891.22 US dollars in 2014, when adjusted by purchasing power parity (PPP). The economy is largely based on agriculture, with approximately 80% of the population engaged in subsistence farming or farming cash crops.
The Vanuatu Demographic and Health Survey (VDHS) 2013 findings indicate that the wealth status of the population is clearly differentiated geographically, between urban and rural areas. Over half (57%) of the urban population is in the highest wealth quintile, compared with only 3% of the rural population.

The MoH organizational structure is divided into three directorates, namely, Corporate (covering mainly human resources and finance), Curative (covering hospital services) and Public Health (covering community health services). These three directorates are coordinated by the Director General of Health.

In each province, health services are provided through a provincial hospital and peripheral health facilities managed by a Provincial Health Manager. Each province is further divided into zones, and health facilities are distributed among these zones[7].
Access to health services can be very difficult due to geographical dispersion of the population and it is estimated that 20% of the population do not have access to health-care services. A large proportion of people need to travel by boat, canoe or truck to reach the nearest aid post and in some cases, travel can take up to two days[8].

Vanuatu faces a 'double burden of disease' with communicable diseases not completely under control and an increasing incidence of Non-Communicable Diseases (NCDs). While the prevalence of malaria has remarkably declined over the last ten years, tuberculosis prevalence remained relatively stable, while sexually transmitted infections prevalence has somewhat increased over the same period[9].

In April 2012, it was estimated that there were 1261 health workers in the public sector, including 443 doctors, nurses and midwives. This is equal to 1.77 health workers per 1000 population, below the WHO recommended 2.3 health workers per 1000 population needed to support the achievement of the Millennium Development Goals (MDGs).

The health system is supported mostly by general taxes and supplemented by user fees and donor funds. Mobilization of resources for the health sector is facilitated by a well-functioning health partners group including a joint partners working group. It is instrumental for increasing aid effectiveness by aligning donor inputs to government priorities and for harmonizing donor processes in supporting service delivery.

The majority of health expenditure is funded by government (63%) with some support from external donors (37% in 2012).

The Health Sector Strategy (2010-2016) has a clear objective: to improve the health of all people living in Vanuatu and has identified the reduction of maternal and infant mortality rates as priorities for the next few years. It emphasizes integrating efforts in reducing specific causes of mortality and morbidity into a continually improving primary health care service, supported by adequate curative services, and by improving systems to ensure the availability of drugs and supplies where and when they are needed.

Since 2007 the country has benefited from GFATM funding for TB control under the multi-country Western Pacific Grant for 11 Pacific Island Countries. UNDP is the current Principal Recipient (PR). The country has a functional national country coordinating mechanism (CCM) that meets regularly and is composed of several government and non-government organizations and also community-based organizations. However, it does not contribute much towards implementation of TB activities.

TB burden

Tuberculosis (TB) remains a major global health problem and ranks with the human immune-deficiency virus (HIV) as a leading cause of death worldwide. In 2014, there were an estimated 9.6 million new TB cases: 5.4 million among men, 3.2 million among women and 1.0 million among children. There were also 1.5 million TB deaths (1.1 million among HIV-negative people and 0.4 million among HIV-positive people), of which approximately 890,000 were men, 480,000 were women and 140,000 were children.

Generally speaking, the burden of TB in Pacific Island Countries (PICs) is relatively small; almost half of all TB cases (49%) were in Micronesia, while 43% were in Melanesia and 8% in Polynesia. However, in some of the PICs, e.g. Kiribati, Marshall Islands, the Federated States of Micronesia (FSM) and Solomon Islands, the TB case-notification rate is even higher than the average notification rate of 75 per 100 000 population in the Western Pacific Region.

Based on the TB incidence, the Mid-term Regional TB Strategic Plan 2015-2019 for 11 Pacific Island Countries has grouped them into 3 categories: (a) high TB incidence countries (FSM, Kiribati, Marshall Islands, Tuvalu); (b) moderate TB incidence countries (Nauru, Niue, Palau, Vanuatu) and (c) low TB incidence countries (Cook Islands, Samoa, and Tonga).

In 2014, in Vanuatu, the prevalence, incidence and mortality rates of TB were 90, 63, and 7.9 per 100,000 population, respectively. The TB case detection rate was 69% and the treatment success rate was 85%. 13% of the total (112 cases) was represented by children less than 15 years[10].

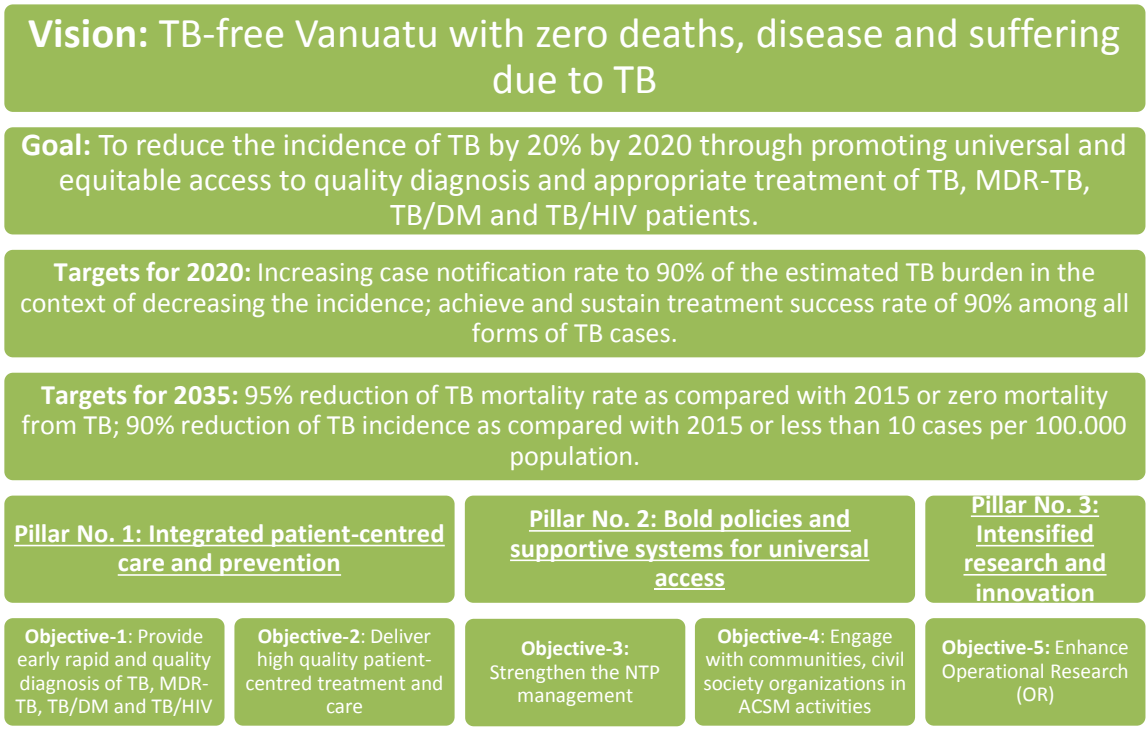
From 2009-2011, the case detection rate (CDR) for new sputum smear positive TB cases ranged from 47-67%, an average of 50% of cases detected, which was however below the WHO recommended target of 70%. In 2014, the TB case detection rate for all cases was 69%. There are important variations in CDR among provinces. Four provinces, Tafea, Shefa and Torba/Sanma have a CDR in 2015 over 80% while 2 provinces Malampa and Penama have a CDR 0f 32% and 24% respectively.

There is a wide geographical variation in the detection and reporting of TB cases from the provinces. As noticed above for the CDR, 2 provinces have a much lower notification rate than the national both in 2014 and 2015, namely Malampa and Penama. For the other 4 provinces, Torba/Sanma increase

significantly the notification rate between 2014 and 2015 to reach the national rate in 2015. Shefa and Tafea provinces were consistently in 2014 and 2015 above the national notification rate

Vision and goal of the National Strategic Plan (NSP):

The **vision** of the NSP is to have a ´*TB-free Vanuatu with zero deaths, disease and suffering due to TB*´ and the **goal** is '*to reduce the incidence of TB by 20% by 2020 through promoting universal and equitable access to quality diagnosis and appropriate treatment of TB, MDR-TB, TB/DM and TB/HIV patients*'.



Objective 1. Provide early rapid and quality diagnosis of TB, MDR-TB, TB/DM and TB/HIV with patient support having specific focus on targeted active case finding (ACF) in key affected populations to increase TB case notification to 90% of the estimated TB burden in the country.

> **Strategic intervention 1.1.** Strengthen the TB diagnostic services including capacity building, infrastructure, procurement, quality assurance and supervision
>
> **Strategic intervention 1.2.** Support targeted Active Case Finding (ACF) activities in key affected populations to increase TB case notification to 90% of the estimated TB burden in the country

Objective-2: Deliver high quality patient-centred treatment and care to achieve and sustain treatment success rate of >90% among all forms of TB cases

> **Strategic intervention 2.1.** Strengthen the technical management of TB services to deliver high quality patient-centred treatment and support
>
> **Strategic intervention 2.2.** Ensure effective and efficient integration of TB services with the general health care delivery system at all levels to achieve treatment success rate of >90%

Objective 3. Strengthen the NTP management to develop bold policies and to improve the financial capacity to allocate additional resources for monitoring and evaluation, including supervision to the most peripheral levels, and the introduction of web-based Health Information and Management System (HIMS).

Strategic interventions 3.1. Strengthen the NTP management at national and provincial levels.

Strategic intervention 3.2. The NTP will transition from paper-based reporting to computerized reporting for nation-wide consistency among all health programs and compliance with development partners.

Strategic intervention 3.3. Develop bold policies to change the management protocol of TB patients from hospitalized DOTS to ambulatory DOTS.

Objective 4. Engage with communities, civil society organizations in ACSM activities to: (1) reduce stigma, (2) pilot Community-DOTS for remote communities and disadvantaged people in selected areas and (3) build Public-Private Partnerships (PPP)

Strategic intervention 4.1. Develop ACSM policy and linkages with Civil Society Organisations (CSOs), Faith Based Organisations (FBOs), Community-Based Organisations (CBOs), such as National Council of Chiefs, Churches, Women's and Youth.

Strategic intervention 4.2. Implement ACSM interventions and engage CSOs, FBOs and CBOs in TB interventions at community level.

Objective 5. Enhance Operational Research (OR) to optimize National Strategic Plan implementation and adopt use of innovations (new diagnostics, drugs).

Strategic intervention 5.1. Strengthen the capacity of the NTP officers, nurses and other staff on operational research (OR)

Strategic intervention 5.2. Conduct OR relevant to the NTP in Vanuatu

In addition to the Operational plan, M&E, Technical Assistance (TA), budget and procurement plans are summarized in the relevant section.

1. Background of the Vanuatu National TB Strategic Plan (2016-2020)

1.1 Global END TB strategy

The vision for the post-2015 global tuberculosis strategy is "a world free of tuberculosis", also expressed as "zero deaths, disease and suffering due to tuberculosis". The goal is to end the global tuberculosis epidemic.
Under this strategy, new, ambitious yet feasible global targets are proposed for 2035. These include achieving a 95% decline in deaths due to tuberculosis compared with 2015, and reaching an equivalent 90% reduction in tuberculosis incidence rate from a projected 110 cases/100 000 in 2015 to 10 cases/100 000 or less by 2035 (Ref. The END TB strategy. WHO.2014).

VISION	A world free of tuberculosis – zero deaths, disease and suffering due to tuberculosis
GOAL	End the global tuberculosis epidemic
MILESTONES FOR 2025	75% reduction in tuberculosis deaths (compared with 2015) 50% reduction in tuberculosis incidence rate (less than 55 tuberculosis cases per 100 000 population) – No affected families facing catastrophic costs due to tuberculosis
TARGETS FOR 2035	95% reduction in tuberculosis deaths (compared with 2015) 90% reduction in tuberculosis incidence rate (less than 10 tuberculosis cases per 100 000 population) – No affected families facing catastrophic costs due to tuberculosis
PRINCIPLES 1. Government stewardship and accountability, with monitoring and evaluation 2. Strong coalition with civil society organizations and communities 3. Protection and promotion of human rights, ethics and equity 4. Adaptation of the strategy and targets at country level, with global collaboration	
PILLARS AND COMPONENTS	
1. INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION A. Early diagnosis of tuberculosis including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups B. Treatment of all people with tuberculosis including drug-resistant tuberculosis, and patient support C. Collaborative tuberculosis/HIV activities, and management of comorbidities D. Preventive treatment of persons at high risk, and vaccination against tuberculosis	
2. BOLD POLICIES AND SUPPORTIVE SYSTEMS A. Political commitment with adequate resources for tuberculosis care and prevention B. Engagement of communities, civil society organizations, and public and private care providers C. Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control D. Social protection, poverty alleviation and actions on other determinants of tuberculosis	
3. INTENSIFIED RESEARCH AND INNOVATION A. Discovery, development and rapid uptake of new tools, interventions and strategies B. Research to optimize implementation and impact, and promote innovations	

1.2 Strategies for TB control in the Pacific

The Pacific TB Strategy launched in 2000[11] facilitated the implementation of successive Global Fund multi-country proposals since 2002 with the Secretariat of the Pacific Community (SPC) initially as the Principal Recipient (PR). Currently, UNDP is the PR for the Global Fund multi-country grant (2015-2017).

The Mid-term Regional TB Strategic Plan for 11 Pacific Island Countries (2015-2019) is aligned with the post-2015 Global strategy and is built on the achievements made by the previous strategic plan and the Regional Strategy to Stop TB in the Western Pacific (2011-2015). The main strategic changes are a stronger focus on diagnosis and treatment for high risk groups and hard to reach populations, on innovative diagnostic tools and algorithms for TB, on TB prevention and the adjustment of costing estimates to the projected decrease in external funding with prioritization of cost-effective interventions.

The 11 Pacific Island Countries which are fully committed to the vision and goal of the WHO End TB Strategy, are grouped into 3 categories:

- High TB incidence countries: FSM (200), Kiribati (356), Marshall Islands (536), Tuvalu (228);
- Moderate TB incidence countries: Nauru (33), Niue (40), Palau (24), Vanuatu (67); and
- Low TB incidence countries: The Cook Islands (6), Samoa (10), and Tonga (16).

1.3 Strategies for TB control in Vanuatu:

The National Tuberculosis Program (NTP) was established in Vanuatu in the early 1980s. The DOTS strategy was introduced in 1999, initially in two main referral hospitals, Vila Central Hospital (VCH) and Northern Provincial Hospital (NPH) and gradually expanded to cover the entire country by 2003.

The Technical Guidelines and Policies for TB Control in Vanuatu which was launched in 1999 and updated in 2003, was further revised in 2011. It contains the general policy for tuberculosis control in Vanuatu and is intended to be a reference to guide health care workers in the diagnosis, treatment and prevention of tuberculosis in Vanuatu. This revision incorporates the recent changes recommended in the 2009 Tuberculosis Coalition for Technical Assistance International Standards for Tuberculosis Care (ISTC) and the 2010 World Health Organization TB treatment guidelines[12].

In 2006, on the recommendation of the Ministry of Health, a National DOTS Steering Committee was established. A National Strategic Plan (NSP) for TB (2006-2010), developed in 2006, was a brief 10 page document which was neither modified nor updated.

The Ministry of Health and partners are currently engaged in developing a new five-year Health Sector Strategy (HSS) for the period 2016-2020 to continue the efforts and resources invested in the HSS 2011-2016. The NSP, a key instrument for the NTP, would also define the priorities and strategic interventions to achieve the goals and objectives consistent with regional and national health policies and plans.

The NSP for TB prevention, cure and control is a key instrument for not only managing the TB programme in the country but also, for defining the priorities and strategic interventions to achieve the goals and objectives consistent with the regional and national health policies and plans. In addition, it should dovetail into the collective global movement towards ending TB and the health-related Sustainable Development Goals (SDGs) beyond 2015.

It is in harmony with the WHO End TB Strategy that has the **vision** of *a world free of tuberculosis – zero deaths, disease and suffering due to tuberculosis* and the **goal** to *end the global tuberculosis epidemic*, including ambitious milestones and targets.

The National Strategic Plan contributes to making TB visible in the national health agenda to advocate for substantial resources from the government. The Global Fund multi-country grant (2015-2017) is ending in 2017. A sound and robust NSP will encourage donors to further support the Vanuatu National TB Programme.

1.4 Development process of the NSP for TB

The initial step of the NSP development was a review mission, including field visits to DOTS centres, conducted in coordination between the MoH and WHO in early 2015. The findings and recommendations from this mission have been used to inform the development of the revised NSP.

The development of the Vanuatu NSP for TB, has been guided by the methodology and format recommended by WHO[13]. A Task Force was formed to enlist support and ensure active participation in the 3-day Multi-Stakeholder Workshop organized to consider and incorporate the views and needs of all concerned in the process to develop a sound and robust NSP. It comprised of key NTP and MoH staff from national and provincial levels; focal points from other national programmes, representative from the consortium of civil society organizations and development partners including WHO and UNDP which is the PR for the current Global Fund multi-country grant.

The workshop provided a transparent platform for conducting a SWOT analysis which was a fundamental step to do the programmatic gap analysis and based on that, to identify the goals, objectives, strategic interventions and activities for the NSP.

A 5-member writing team was also identified which included the National TB Coordinator, the National TB M&E Officer and WHO focal points for TB based in Port Vila, Vanuatu and Suva, Fiji and the consultant provided by WHO.

2. Country Profile

2.1 Geo-demographic background

The Republic of Vanuatu, with a population of 284,358[14], situated in the South Pacific Ocean, is an archipelago comprising of 83 islands with 2,528 kilometres of coastline and a total surface area of 12,189 square kilometres. Being within the “Ring of Fire”, more than 80% of its landmass and 76% of its population are vulnerable to natural hazards such as volcanic eruptions, cyclones, earthquakes, droughts, tsunamis, storm surge, flooding and landslides.

Since the population is geographically dispersed, the rhythm of life in Vanuatu is intricately yet intrinsically intertwined with its physical environment being exposed to a wide range of hydro-meteorological hazards with a varying degree of damage to the health infrastructure and people’s health (Post Cyclone Pam, NTP Rapid Assessment Report, 2015).

Figure 1. Map of Vanuatu

About 98.5% of the population is of Melanesian descent, the rest being a mix of Europeans, Asians and other Pacific Islanders. Vanuatu's population is currently growing at a rate of 2.4% per year. 40% of Vanuatu's population is less than 15 years old, while about 47% is aged 15–49, and 13% is aged 50 and over. The median age of the population is 22 years. Life expectancy at birth for males is 71 years and for females is 74 years (WHO, 2013).

Approximately, 80% of the population is living in rural areas. Providing health services to remote communities is costly and logistically challenging in this context. While the average household size is 4.7 people, 7% of rural households have more than 7 members, an important risk factor for TB transmission. There are two urban centres, the capital, Port Vila, with a population of 44 039 (2009) and Luganville with 13 156 people (Vanuatu National Statistics Office, 2010). While the mean urban household size is 5.2 people, 11% of urban households have more than nine members[15]. The increasing migration from rural to urban sectors is of significant concern as overcrowding in urban settlements leads to the clustering of risk factors for the spread of diseases including TB.

2.2 Political and administrative structure

Vanuatu has been an independent republic since 1980 and is a member of the Commonwealth of Nations. Vanuatu has a unicameral Parliament made up of 52 members who are elected every four years through an election process and the government is headed by a Prime Minister. The President elected for a five-year term, has little administrative power and performs a largely ceremonial role.

The constitution provides for a certain amount of decentralization, intended to promote regional autonomy and local participation. The national Council of Chiefs is elected by the district councils of chiefs and advises the government on culture and language matters. In 1994, the 11 local councils were replaced

by six provincial governments. Administratively, the country is divided into six provinces – Malampa, Penama, Sanma, Shefa, Tafea and Torba.

Political commitment for health is reflected in the Health Sector Strategy (2010-2016) which categorically states that "improving the health of the nation is at the heart of government policies". The government uses domestic funds for the procurement of anti-TB drugs, laboratory equipment and supplies and providing meals for TB patients hospitalized during the intensive phase of the DOTS. The National DOTS Steering Committee was set up in 2006 but it became inactive due to the lack of Ministry of Health commitment and participation of members, including development partners.

2.3 Socio-economic profile

In Vanuatu, there is evidence of a strong social fabric as the communities and families are grounded in the deeply rooted *kastom* system, which instils a sense of ethnic identity including robust family and community support. *Kastom* also encompasses customary laws which are well established and as a legal system has undergone many changes due to colonization[16]. Approximately 10% of the population practice *Kastom* beliefs while 83% are Christians. The main religious denominations are Presbyterian (28%), Anglican (15%), Seventh Day Adventist (12%) and Catholic (12%). Chiefs, churches, women's groups, etc. are seen as strong pillars of the community; hence collaborative mechanisms to promote health could be built on these existing community structures.

Although ethnically and linguistically diverse, with over 105 local dialects spoken in Vanuatu, *Bislama* (pidgin) is the lingua franca, while English and French are also official languages. The literacy rates in Vanuatu are 94.8% for males aged 15-24 years and 94.4% for girls of the same age group (UNICEF, 2013). The Vanuatu Education Sector Strategy 2007-2016 focuses on better educational outcomes through long-term strategies and the implementation of annual initiatives to achieve the short-term results.

Vanuatu is classified by World Bank as a lower middle income country for the current 2016 fiscal year[17]. The Gross Domestic Product (GDP) per capita in Vanuatu was last recorded at 2891.22 US dollars in 2014, when adjusted by purchasing power parity (PPP). The economy is largely based on agriculture, with approximately 80% of the population engaged in subsistence farming or farming cash crops. The GDP growth of 2.3% in 2014 was mainly driven by services, followed by agriculture and industry. Natural hazards and climate change impacts have the potential to wipe out hard-won development gains and to set back progress made at community, province and national levels particularly to improve people's lives.

The total unemployment rate is 4.6%; males-5.2%, females-5.2% (source: WB). About 63% of currently married women and nearly 98% of currently married men aged 15–49 years were employed at some time in the year prior to the VDHS-2013.

The Vanuatu Demographic and Health Survey (VDHS) 2013 findings indicate that the wealth status of the population is clearly differentiated geographically, between urban and rural areas. Over half (57%) of the urban population is in the highest wealth quintile, compared with only 3% of the rural population. On the other hand, 30% of the rural population is in the lowest wealth quintile but none from the urban population is in that quintile.

On the Gender-related Development Index (GDI) for 2014, Vanuatu ranked 131 out of 187, (above Kiribati, Solomon Islands and PNG but below the rest of the Pacific nations (UNDP, 2014). On the Human Development Index (HDI), ranking of Vanuatu at the global level is: 135 / 188 (UNDP, 2015).

Foreign aid contributes greatly to the economy of Vanuatu. Since 1980, Australia, France, New Zealand and the United Kingdom have been the largest donors as these countries have strong social and cultural ties to the country. Due to low level of external migration, the remittances from abroad are not significant as compared to neighboring countries.

2.4 Health system

The Ministry of Health formulates national health policies, coordinates the development and planning of public health sectors, and regulates health standards. It is responsible for the provision of curative and preventive health services through a four-tier system comprising of referral hospitals, health centres, dispensaries and community supported aid posts[18]. In addition, there are municipal clinics in Port Vila (5) and in Luganville (3) run by Urban Councils on a semi-private basis. The support services for hospitals and primary health care programmes include pharmaceutical, blood-transfusion and laboratory services.

The MoH organizational structure is divided into three directorates, namely, Corporate (covering mainly human resources and finance), Curative (covering hospital services) and Public Health (covering community health services). These three directorates are coordinated by the Director General of Health.

In each province, health services are provided through a provincial hospital and peripheral health facilities managed by a Provincial Health Manager. Each province is further divided into zones, and health facilities are distributed among these zones[19]. There are 37 health centres (HCs), which provide outpatient and inpatient services, health promotion and preventive health services, such as immunization. Each HC is staffed by a nurse practitioner (who is also the manager), a midwife and a general nurse. The HCs are the referral centres for dispensaries (referred to as Primary Health Care Centres) and aid posts. There are 96 active dispensaries. All the islands have at least one dispensary, which is usually staffed by a general nurse. Aid posts have been established in most villages and are funded by the community, while the Ministry of Health provides basic medicines and training for the staff. There are about 195 aid posts in the country, each staffed by a village health worker[20].

Table 1. List of public health facilities in Vanuatu

Health Facilities	Malampa	Penama	Sanma	Shefa	Tafea	Torba	Total
Referral Hospitals	0	0	1	1	0	0	2
Provincial Hospitals	1	1	0	0	1	1	4
Health Centres	9	6	9	6	4	3	37
Dispensaries	13	21	25	18	14	5	96
Aid Posts	38	33	30	42	32	20	195
Total	**61**	**61**	**65**	**67**	**51**	**29**	**334**

The five public hospitals in the country have a total of 390 beds, the health centres having fewer beds. Most tertiary health care services are not available in Vanuatu and patients requiring such treatment are usually referred to Australia or New Zealand, the cost being borne by the government and respective donor countries.

Access to health services can be very difficult due to geographical dispersion of the population and it is estimated that 20% of the population do not have access to health-care services. A large proportion of people need to travel by boat, canoe or truck to reach the nearest aid post and in some cases, travel can take up to two days[21].

2.5 Health situation and trends

Vanuatu faces a 'double burden of disease' with communicable diseases not completely under control and an increasing incidence of Non-Communicable Diseases (NCDs). While the prevalence of malaria has remarkably declined over the last ten years, tuberculosis prevalence remained relatively stable, while sexually transmitted infections prevalence has somewhat increased over the same period[22]. It is worth noting that confirmed mortality due to malaria has been reduced to zero since 2012.

According the WHO data in 2013, the maternal mortality ratio was 86/100,000 live births showing a vast improvement from the 1990 baseline which was 170/100,000 live births; the under-five mortality rate in 2013 was 17/1000 live births compared to the 1990 baseline of 33/1000 live births.

The 2013 VDHS data showed that 2% of women and 7% of men aged 15–49 are active tobacco users and that women and men are more likely to use cigarettes than other forms of tobacco: about 6% of women and 55% of men aged 15–49 use cigarettes. In urban areas, 10% of men and 3% of women use tobacco compared to 6% of men and 2% of women in rural areas.

The table below highlights the 10 leading causes of mortality in Vanuatu in 2015. Almost half of deaths are caused by NCD: Cardio vascular, neoplasm, diabetes, renal failure and liver disease.

Table 2. Top 10 causes of death, 2015

1. Circulatory Disease (including ischaemic heart disease, hypertensive disease, pulmonary heart disease and cerebrovascular disease) [1]	22%
2. Ill-defined causes [3]	17%
3. Neoplasms [2]	12%
4. Perinatal disorders (primarily early neonatal but some stillbirths likely included) [8]	10%
5. Respiratory Disease (Acute and Chronic) [6]	8%
6. Endocrine, metabolic, nutritional (Primarily Diabetes) [5]	8%
7. Infection (including Diarrhoea, TB, Viral Hepatitis and Malaria) [4]	7%
8. External causes and injuries (including accidents, assault, self-harm and poisoning) [10]	4%
9. Genito-urinary diseases (primarily Renal Failure) [7]	3%
10. Digestive Diseases (primarily Liver Disease)[11]	3%

The quality of diagnosis is often hampered by inadequate laboratory facilities for investigation and is mainly based on clinical judgment. The mortality pattern over the years shows a clearly increasing trend towards non-communicable diseases becoming the leading cause of mortality in the country.

Women and men display almost the same level of awareness of TB: 85% of women and 88% of men aged 15–49 have heard of TB. About 15% of women and 9% of men aged 15–49 who have heard of TB would want a family member's TB status kept a secret, as TB is still considered a stigma (VDHS 2013).

2.6 Health Work Force

In April 2012, it was estimated that there were 1261 health workers in the public sector, including 443 doctors, nurses and midwives. This is equal to 1.77 health workers per 1000 population, below the WHO recommended 2.3 health workers per 1000 population needed to support the achievement of the Millennium Development Goals (MDGs). Nursing personnel made up the largest cadre of the health workforce at 31.4%, which includes 56 advanced practice nurses and 62 midwives. There are more specialists than generalists in Vanuatu; of the 46 medical practitioners, 29 are specialists. The proportion of paramedical health workers, totaling 162 (12.8%) is small.

Women comprise almost half the health workforce due to the largely female nursing cadre. However, there are fewer women in highly skilled positions, e.g. only 38% of general practitioners; 27% of specialist practitioners; 38% in health management posts are female. Shortages of health workers occur across all cadres, but are critical in the nursing workforce. Staff turnover is mostly due to the ageing of the workforce rather than resignations or migration[23].

2.7 Health Financing

The health system is supported mostly by general taxes and supplemented by user fees and donor funds. Mobilization of resources for the health sector is facilitated by a well-functioning health partners group including a joint partners working group. It is instrumental for increasing aid effectiveness by aligning donor inputs to government priorities and for harmonizing donor processes in supporting service delivery.

Total health expenditure in 2010 totaled US$ 36 167 504 (5.3% of GDP), or US$ 157.34 per capita (World Bank, 2012). The allocation to health was 18% of government expenditure, and 5% of GDP, which is in the median range of countries in the Western Pacific Region. The majority of health expenditure is funded by government (63%) with some support from external donors (37% in 2012). The percentage of government resources allocated to health has been gradually increasing since 1995 but the proportionate benefit from recent growth in GDP has been greater to other sectors[24].
Private insurance plays a minor role in health financing, accounting for 3% of total health expenditure in 2007; three authorized private insurance companies operate in Vanuatu, mainly for expatriate residents.

The dispersion of the small population means there is a high unit cost of providing basic primary health care (ADB, 2009). The total health expenditure in 2010 was US$ 36 167 504 (5.3% of GDP), or US$ 157.34 per capita (World Bank, 2012). Average expenditure per notified TB patient is nearly US$ 2,000 (source: www.who.int/tb/data, March 2016). Integration of the NTP management and services into the general health care delivery system may ensure sustainability especially if support from external resources either diminishes or is discontinued.

2.8 Overall Health Strategy and Objectives:

The Health Sector Strategy (2010-2016) has a clear objective: to improve the health of all people living in Vanuatu and has identified the reduction of maternal and infant mortality rates as priorities for the next few years. It emphasizes integrating efforts in reducing specific causes of mortality and morbidity into a continually improving primary health care service, supported by adequate curative services, and by improving systems to ensure the availability of drugs and supplies where and when they are needed. This health sector strategy builds on MOH policies for organizational re-structuring, human resource development and management, and capacity building at all levels.

Broad Objectives of the Health Sector Strategy (2010-2016):

- Improve the health status of the population
- Ensure equitable access to health services at all levels of services
- Improve the quality of services delivered at all levels
- Promote good management and the effective and efficient use of resources

Key Health Sector Strategy Indicators to measure progress:

Table 3. Health indicators related to improved health status

Output/outcome	Indicator	Baseline (year)	Target (2016)
Reduce child mortality (MDG 4)	Under-five mortality rate	30/1000 (MICs, 2007)	25/1000
	Infant mortality rate	25 (MICs, 2007)	20/1000
Improve maternal health (MDG 5)	Maternal mortality rate	68 /100,000	50/100,000
	Ratio of maternal deaths to pop. by prov	11/100,000	9/100,000
	Proportion of deliveries attended by SBA	74%	90%

Table 4. Health services indicators related to equitable access and quality

Output/outcome	Indicator	Baseline (year)	Target (2016)
Access to services	Health Centre and home visits per capita of population covered	NA	1.5
	No. of referrals from primary care to hospitals	600	300
	Number of inpatient admissions	24,000	15,000
Key health professionals	Doctors / 1000 population	1/30,000	1/15,000
	Nurses / 1000 population	1/600	1/200
	Allied workers / 1000 population	1/60,000	1/7,500
	Public health officers/ 1000 pop.	1/30,000	1/20,000
Access to safe water (MDG 7)	Proportion of people with access to safe water	85%	90%
Access to improved sanitation (MDG 7)	Proportion of people with access to improved sanitation facilities	64%	80%

The sector-wide approach (SWAp) allows the MoH to work jointly with interested donors to agree annual plans and funding allocations to achieve Vanuatu's health objectives; it aims to ensure transparent

accountability to partners through a single performance and reporting mechanism thus minimizing disruptive and time consuming multiple dealings with partners.

2.9 Private Health Sector:

There is a small private sector that contributes to health care largely in the two towns. Support from NGOs and community-based services supplement government services but they are limited. There is one private international clinic in Port Vila, offering primary and secondary care with capacity for medical evacuation and medical emergency. In addition, there are 16 other private health facilities eg. clinics, pharmacies and centres for dental, physiotherapy and counseling. Mostly run by expatriates, these facilities serve high-income clients. There is also a private air ambulance service that provides helicopter transport for medical emergencies in the outer islands, and support for non-critical overseas medical evacuations[25].

Traditional healers and traditional birth attendants are part of the informal private health sector. Local communities accept traditional medicine because of accessibility and affordability. The Priority Action Agenda for health includes strategies to encourage use of modern medicine and provide capacity building for traditional healers and traditional birth attendants to discourage harmful practices[26].

2.10 Partnerships

The Government and the Ministry of Health work very closely with partners. WHO is the main partner for technical assistance, while the other development partners are: the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA), the Japan International Cooperation Agency (JICA), the Australian Department of Foreign Affairs and Trade (DFAT), the New Zealand Ministry of Foreign Affairs and Trade (MFAT) and the Asian Development Bank (ADB). The Secretariat of the Pacific Community (SPC) and the Pacific Island Forum also assist the country in health sector development programmes. Australia contributes the largest financial support for health in Vanuatu.

A robust development partners group works to coordinate and harmonize donor assistance. The UN organizations jointly support health and development through the national MDG agenda and the UN Development Assistance Framework (UNDAF). Recently, three UN agencies – WHO, UNICEF and UNFPA – have collaborated to support joint programming to improve reproductive health, maternal and child health outcomes, in line with the Paris Declaration for aid effectiveness. The multi-partnership malaria control programme to eliminate malaria[27] is a good model of cooperation.

The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) has supported the health sector since 2002 (Round-2). Since 2007 the country has benefited from GFATM funding for TB control under the multi-country Western Pacific Grant for 11 Pacific Island Countries. UNDP is the current Principal Recipient (PR). Up to 2015, the country had a functional national country coordinating mechanism (called VCCM) that met regularly and was composed of several government and non-government organizations and also Community-Based Organizations (CBOs). There are plans to reactivate the VCCM in 2016. However, while those CBOs are effective in providing feedback and oversight, they do not contribute to the implementation of TB control activities[28].

3. Epidemiology and TB burden analysis

3.1 Global TB situation

Tuberculosis (TB) remains a major global health problem and ranks with the human immune-deficiency virus (HIV) as a leading cause of death worldwide. In 2014, there were an estimated 9.6 million new TB cases: 5.4 million among men, 3.2 million among women and 1.0 million among children. There were also 1.5 million TB deaths (1.1 million among HIV-negative people and 0.4 million among HIV-positive people), of which approximately 890,000 were men, 480,000 were women and 140,000 were children.

Globally, the MDG target of halving the prevalence rate compared with 1990 was achieved in 9 high-burden countries; TB prevalence in 2015 was 42% lower than in 1990. The target of halving the TB mortality rate by 2015 compared with 1990 was met in 11 high-burden countries; TB mortality has fallen 47% since 1990. The target to halt and reverse TB incidence has been achieved in 16 of the 22 high-burden countries that collectively account for 80% of TB cases; TB incidence has fallen by an average of 1.5% per year since 2000 and is now 18% lower than the level of 2000. Globally, the treatment success rate for people newly diagnosed with TB was 86% in 2013, a level that has been sustained since 2005. In all, effective diagnosis and treatment of TB saved an estimated 43 million lives between 2000 and 2014[29].

3.2 Burden of TB in Pacific Island Countries and Territories

Generally speaking, the burden of TB in Pacific Island Countries and Territories (PICTs) is relatively small compare to other countries in the Western Pacific Region; almost half of all TB cases (49%) were in Micronesia, while 43% were in Melanesia and 8% in Polynesia. However, in some of the PICTs, e.g. Kiribati, Marshall Islands, the Federated States of Micronesia and Solomon Islands, the TB case-notification rate is even higher than the average notification rate of 108 per 100 000 population in 2014 in the Western Pacific Region.

Based on the TB incidence, the Mid-term Regional TB Strategic Plan 2015-2019 for 11 Pacific Island Countries has grouped them into 3 categories: (a) high TB incidence countries (FSM, Kiribati, Marshall Islands, Tuvalu); (b) moderate TB incidence countries (Nauru, Niue, Palau, Vanuatu) and (c) low TB incidence countries (Cook Islands, Samoa, and Tonga) (See table 5).

In the PICTs, where diabetes type 2 is prevalent and TB risk factors such as poverty, malnutrition and tobacco smoking coexist, it is likely that high TB rates in the older population is a result of reactivation of old TB infection caused by reduced immunity in this age group.

Globally, the TB death rate dropped 47% between 1990 and 2015. In the context of PICTs, the estimated TB mortality rates are declining in the three sub regions by an annual average of 5.4% in Melanesia, 4.3% in Micronesia and 5.8% in Polynesia.

The 11 PICs were on track to reach: (a) the MDGs target of reversing TB incidence by 2015, (b) the Stop TB Partnership target of halving the 2000 mortality rate by 2015 and (c) the Stop TB Partnership Global Plan targets on improving case detection to at least 70% and treatment success to at least 90%, by 2015. They will likely not reach the Stop TB Partnership target of halving the 2000 prevalence rate by 2015[30].

Table 5. TB burden in Pacific Islands countries (sorted by decreasing incidence)

Countries	Population	Incidence rate (per 100 000pop)	Incidence (number)	Prevalence rate (per 100 000 pop)	Prevalence (number)	Mortality rate (excl. HIV+TB) (per 100 000 pop)	Mortality (number)
Kiribati	110470	497	550	749	830	49	54
Marshall Islands	52898	335	180	466	250	38	20
Micronesia (Federated States of)	104044	195	200	250	260	16	17
Tuvalu	9893	190	19	238	24	14	1
Solomon Islands	572171	86	490	133	760	13	76
Nauru	10176	73	8	94	10	6	1
Fiji	886450	67	590	110	970	5	41
Vanuatu	**258883**	**63**	**160**	**90**	**230**	**8**	**20**
Palau	21097	42	9	45	10	1	0
Samoa	191845	19	37	31	60	3	7
Tonga	105586	14	15	21	22	2	2
Cook Islands	20725	12	3	18	4	2	0
Niue	1610	0	0	14	0	0	0

3.3 TB situation in Vanuatu

The impact of TB control interventions is measured by the trend and level in TB incidence, prevalence and mortality and through achievement of MDG and Stop TB Partnership goal and targets.

3.3.1 TB Burden

There is an overall decreasing trend of the TB burden in Vanuatu. Incidence rate has decreased from 110/100 000 pop in 2000 to 63/100 000 pop in 2014. Similarly, the prevalence rate has decreased from 167/100 000 pop to 90/100 000 pop over the same period. (Figures 2, 3). The mortality rate has been declining as well; from 17/100,000 pop in 1995 to 7.9/100,000 pop in 2014 (Figure 4).

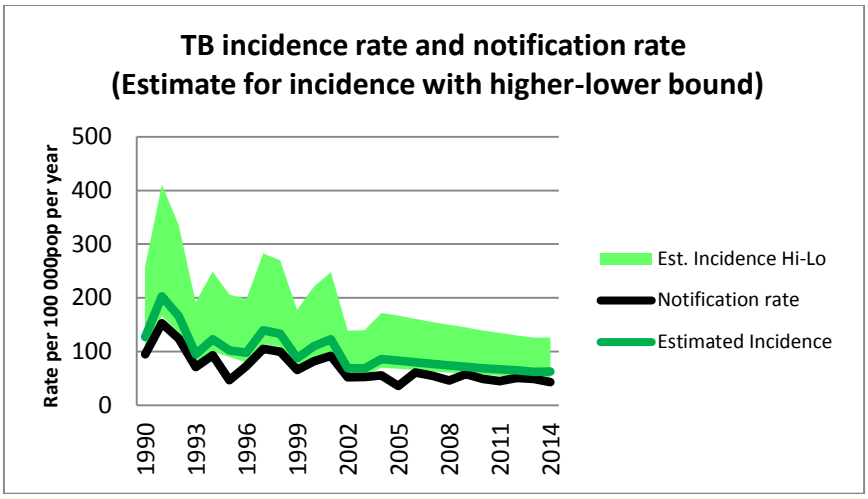


Figure 2. Incidence rate (per 100 000pop/year)

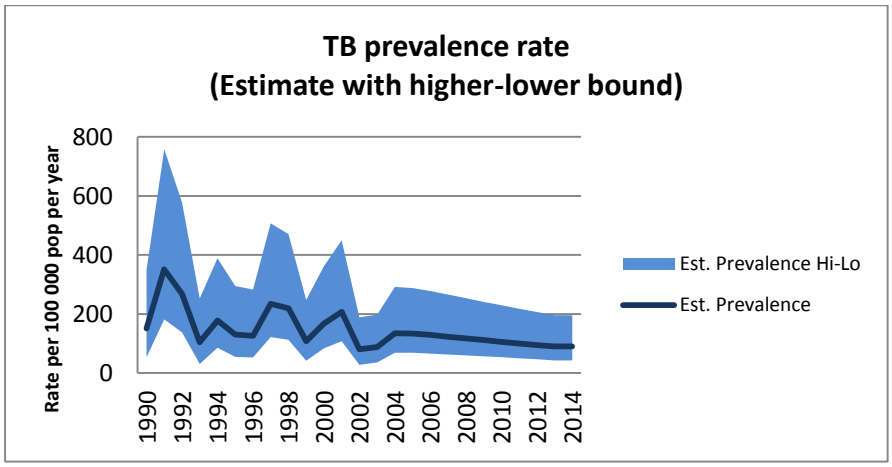


Figure 3. Prevalence rate (per 100 000pop)

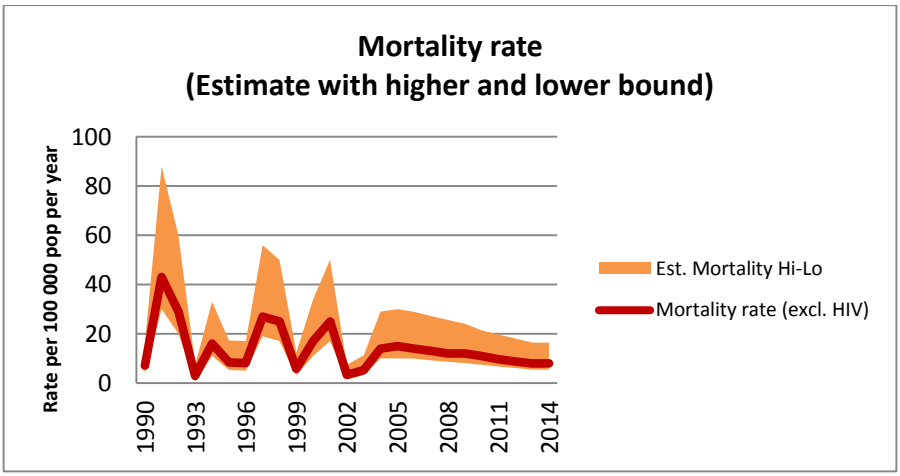


Figure 4. Annual TB Mortality rate (per 100 000pop) excluding HIV+TB

3.3.2 TB case notification and case detection rate

The trend of TB case notification rate has decreased over time. In 2000, TB case notification rate was 82/100,000 population for all forms of TB and the case detection rate for new smear positive cases (now defined as new pulmonary bacteriologically confirmed TB cases) was 32%. In 2005 and 2008, there were significant drops in notification rates for different reasons: in 2005, due to sub-optimal reporting caused by the sudden resignation of a key staff and in 2008, due to end of Global Fund round-2[31]. In 2014, the TB case notification rate was 43/100,000 population.

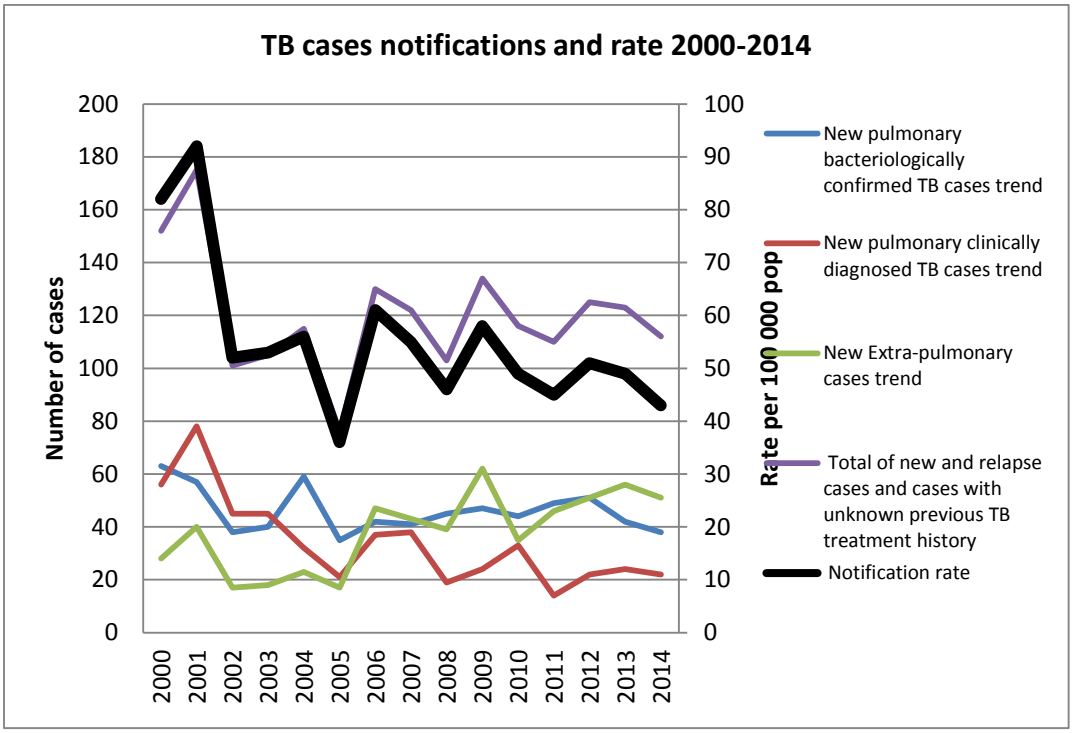


Figure 5. TB notification rate

Evaluation of the NTP data between 2000 and 2014, showed that the notification of new smear positive cases has decreased from 41% in 2000 to 34% in 2014. New smear negative TB cases decreased from 37% in 2000 to 20% in 2014 while new extra-pulmonary TB cases increased from 18% in 2000 to 46% of the total cases in 2014 (Figure 6 and table 6).

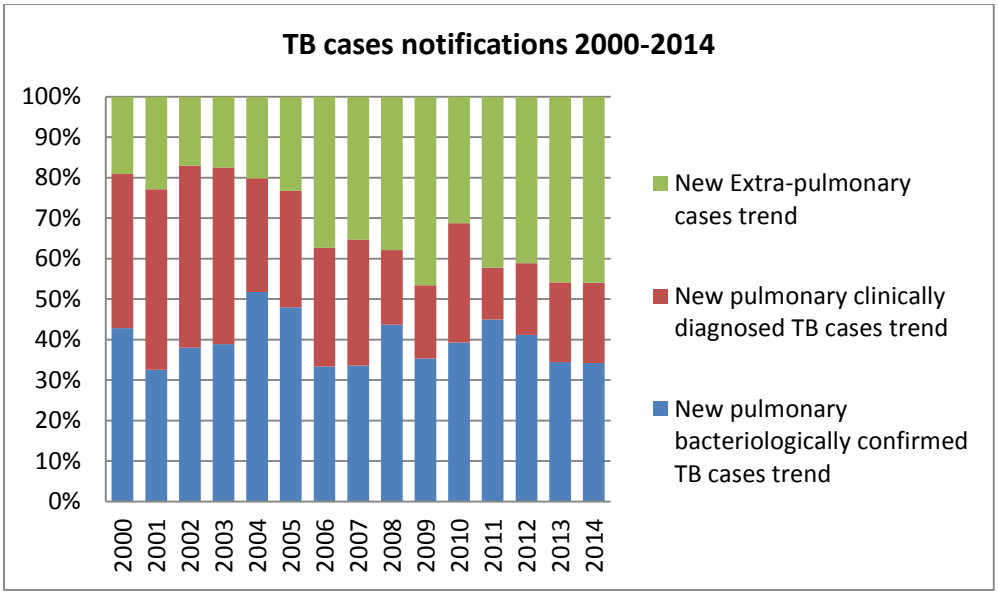


Figure 6. TB cases notifications and relative distribution

Table 6. TB cases notifications relative distribution

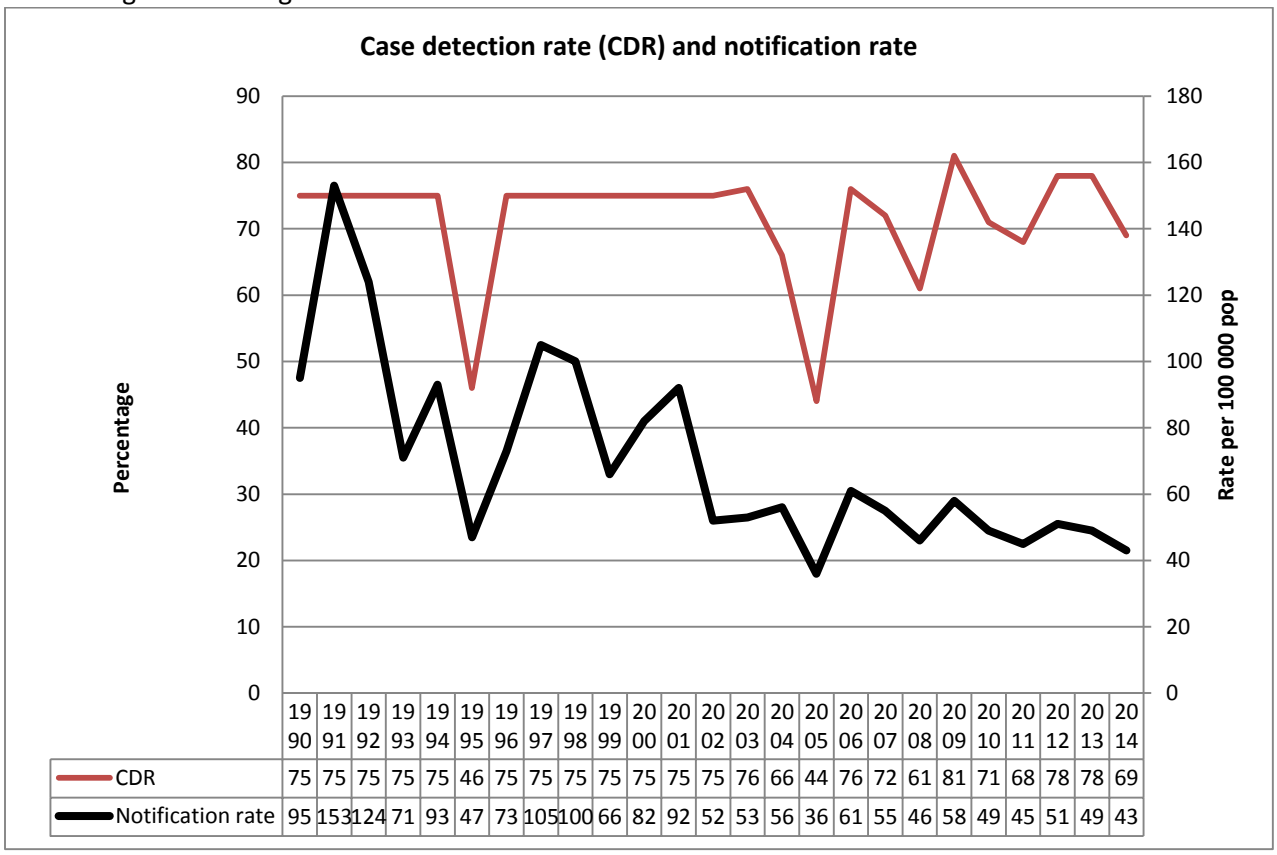
	New pulmonary bacteriologically confirmed TB cases (perc of total)	New pulmonary clinically diagnosed TB cases (perc of total)	New Extra-pulmonary cases (perc of total)
2000	41%	37%	18%
2005	46%	28%	22%
2010	38%	28%	30%
2014	34%	20%	46%

In 2014, among the 112 TB cases notified (new and relapse), there were 38 pulmonary, bacteriologically confirmed; 22 pulmonary clinically diagnosed and 51 extra-pulmonary TB cases. 13% of the total (112 cases) was represented by children less than 15 years[32]. The rate of TB among children below 5, an indicator for recent transmission, was not included in national TB surveillance until 2007 (Table 7).

Table 7. Notification of new TB cases in Vanuatu 2000-2005-2010-2014

	New pulmonary bacteriologically confirmed TB cases trend	New pulmonary clinically diagnosed TB cases trend	New Extra-pulmonary cases trend	Total of new and relapse cases and cases with unknown previous TB treatment history
2000	63	56	28	152
2005	35	21	17	76
2010	44	33	35	116
2014	38	22	51	112

From 2009-2011, the case detection rate (CDR) for new sputum smear positive TB cases ranged from 47-67%, an average of 50% of cases detected, which was however below the WHO recommended target of 70%. In 2014, the TB case detection rate for all cases was 69%. Figure 7 shows the variation of the CDR in relation with the variations of the notification rate which decrease was due in 2005 and 2008 either to staff changes or funding issues as mentioned above.



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CDR	75	75	75	75	75	46	75	75	75	75	75	75	75	76	66	44	76	72	61	81	71	68	78	78	69
Notification rate	95	153	124	71	93	47	73	105	100	66	82	92	52	53	56	36	61	55	46	58	49	45	51	49	43

Figure 7. CDR and case notification rate

Reasons for low case detection include an over estimation of TB incidence (although efforts are made not to do this) or under notification of TB cases (which can be due to under diagnosis or under reporting). There are important variations in CDR among provinces. Four provinces, Tafea, Shefa and Torba/Sanma have a CDR in 2015 over 80% while 2 provinces Malampa and Penama have a CDR 0f 32% and 24% respectively (Figure 8).

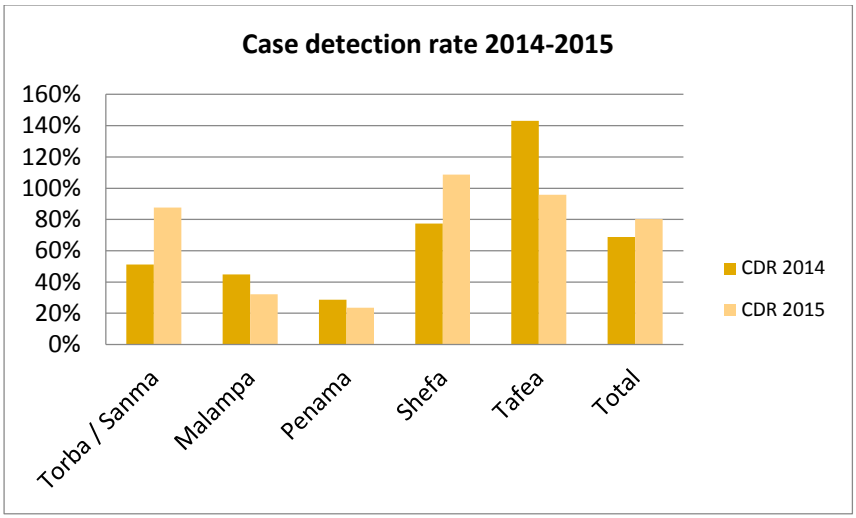


Figure 8. CDR by province 2014-2015

The proportion of TB suspects screened using two or three sputum samples is high at 89%, indicating that TB suspects are submitting the required number of specimens[33]. In addition, 8% of TB suspects test positive on sputum smear microscopy and this is close to the target of 10%.

3.3.3 Treatment outcomes

Although the treatment success rate has remained over 85% and for the last five years has been between 85-90%, there was no significant reduction in the TB notification rate over the last decade which implies limited impact of TB control on the reduction of TB incidence in Vanuatu.

In Vanuatu, a retrospective cohort study (2007-2011) to determine the TB case burden, the pattern of disease and treatment outcomes in children, adults and older adults registered with the NTP, concluded that children and older adults constitute 45% of the TB burden. It also noted that differences in disease patterns and poorer treatment outcomes in older adults have implications for policy and practice[34].

Due to limited diagnostic resources in Vanuatu, it is possible that older patients have a higher prevalence of chronic lung disease with various aetiologies that are potentially misdiagnosed as smear-negative PTB based on negative sputum smears and abnormal CXR.

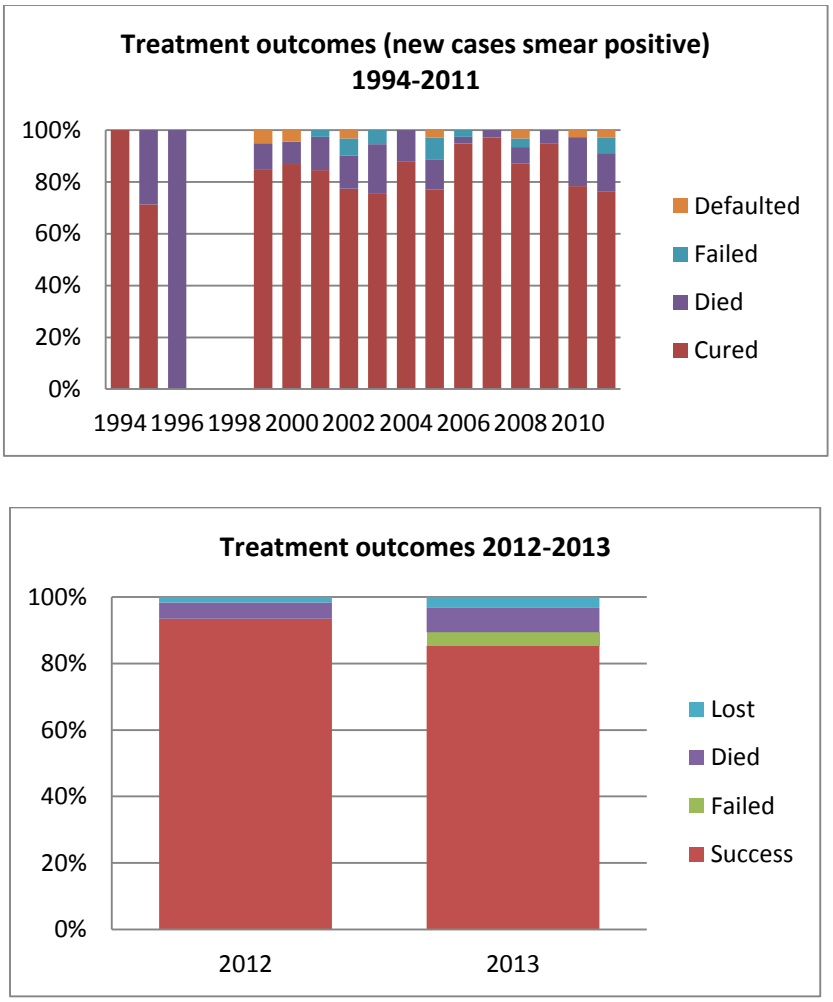
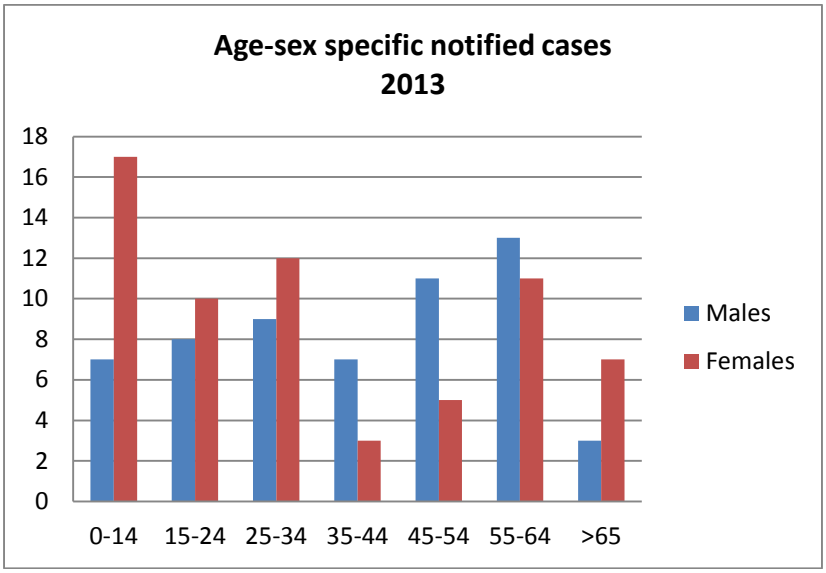


Figure 9. Treatment outcomes 2004-2012

3.3.4 Age-sex distribution of TB cases

The age-sex distribution shows that in 2013, notified TB cases were higher among females than males, particularly among the age groups of 0-14, 15-24 and 25-34 years as well as 65 years and above. However this trend was not confirmed in 2014 where there were more male TB cases notified than females except in the 35-44 years age group (Figure 9). It is also noted that TB is affecting mostly the working class. Overall, TB affects all age group with annual variations for age-sex specific cases.



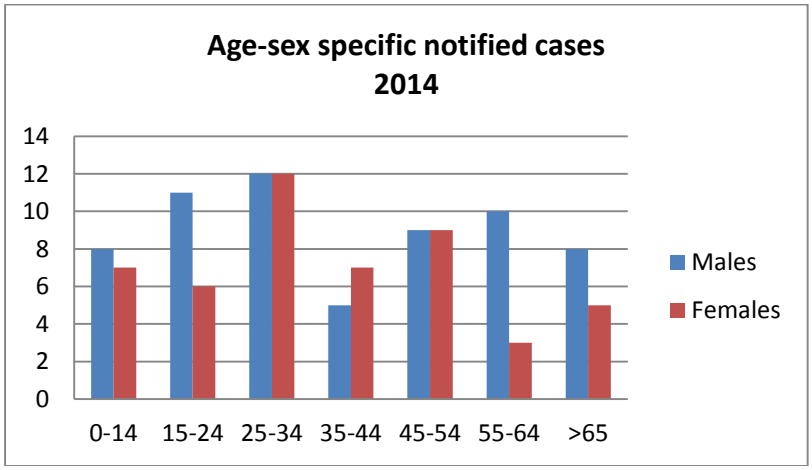


Figure 10. Age-sex specific notification rate

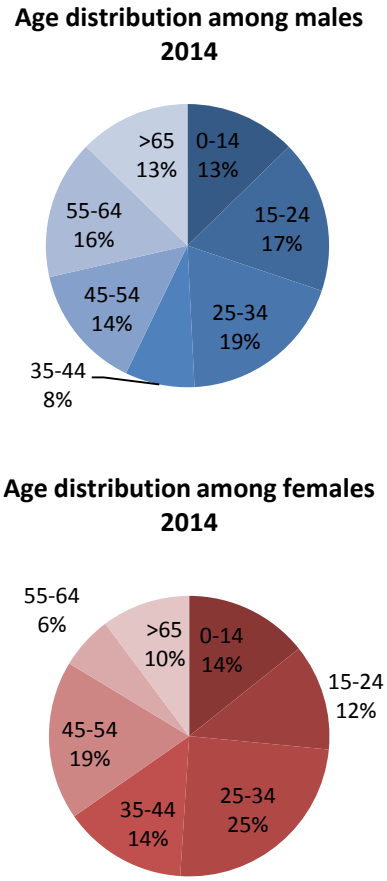


Figure 11. Age distribution among males and females

3.3.5 Geographical distribution

There is a wide geographical variation in the detection and reporting of TB cases from the provinces as shown in Figure 12. As noticed above for the CDR, 2 provinces have a much lower notification rate than the national both in 2014 and 2015, namely Malampa and Penama. For the other 4 provinces, Torba/Sanma increase significantly the notification rate between 2014 and 2015 to reach the national rate in 2015. Shefa and Tafea provinces were consistently in 2014 and 2015 above the national notification rate (Figure 12).

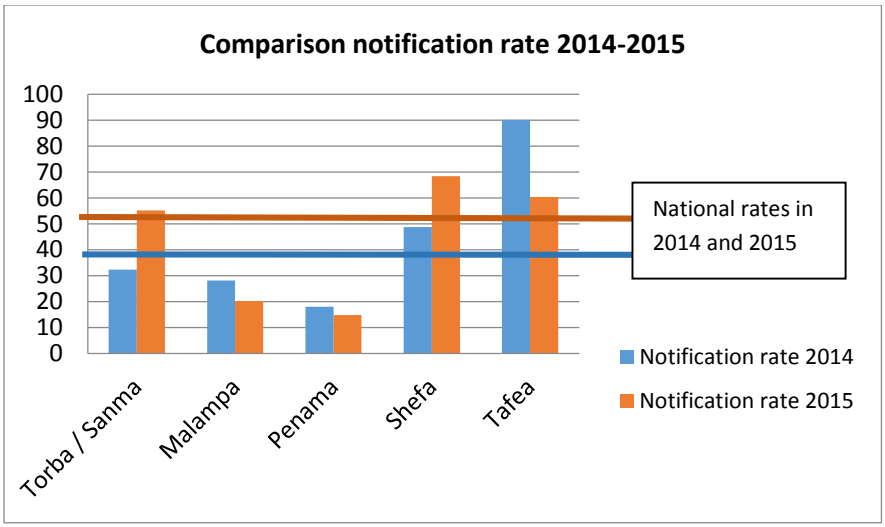


Figure 12. Notification rate by province. 2014-2015

While equity is one of the core values of the Ministry of Health, population dispersion and the geography of Vanuatu pose significant challenges to equitable delivery of services. On the other hand, majority of the TB patients interviewed in a study[35] did not attribute TB to a bacterial cause, so consulting a traditional healer for health care, including while seeking a diagnosis for TB symptoms, was common and may have delayed diagnosis.
The unique geographical features of most islands, the widely dispersed and hard to reach populations, the high transaction costs of providing health services and limited financial resources, are factors that make the implementation of TB services a very big challenge. Therefore, it is likely that an unknown number of TB patients remain undiagnosed in some of the provinces.

Further analysis of new TB cases notified in 2015 by province, allows identifying provinces where case detection should be improved. When comparing new TB cases notified with the estimated number of new cases expected based on incidence, Penama and Malampa provinces are showing a gap in notified new cases compare to what would be expected (Figure 13). Furthermore, although Malampa and Penama represent respectively 15% and 12% of the total population (Figure 15), each reported respectively 6% and 4% of the total new TB cases notified in 2016 (Figure 15).

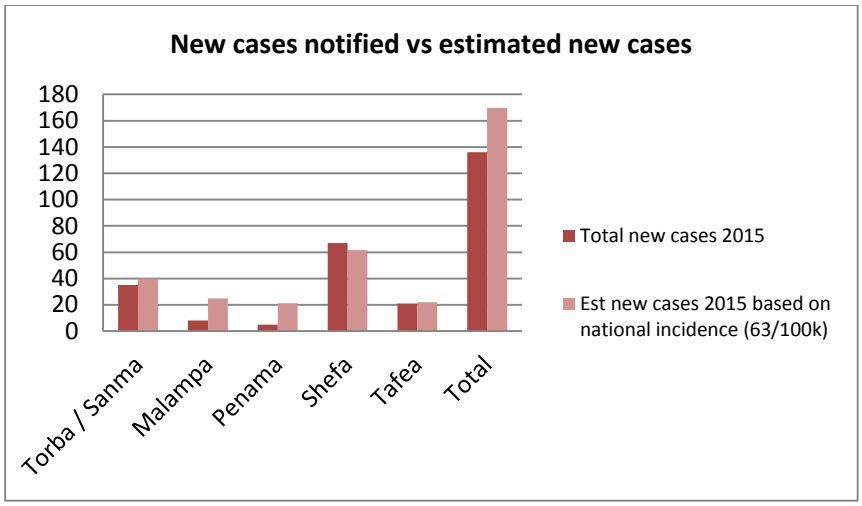


Figure 13. New cases notified vs estimated new cases in 2015

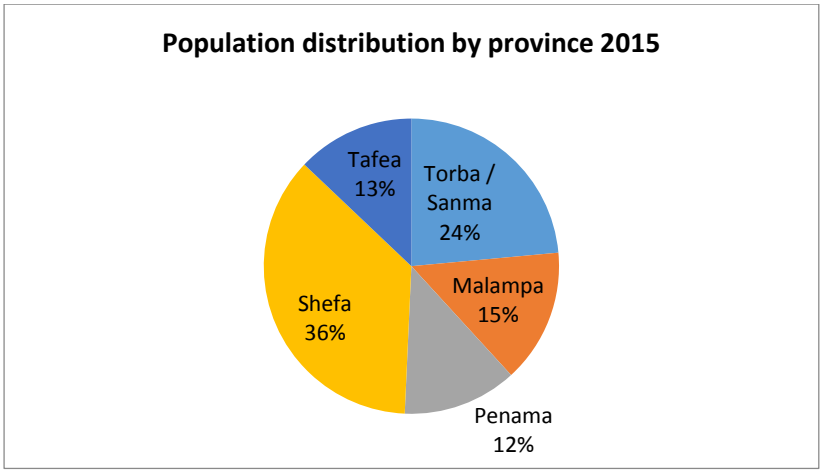


Figure 14. Population distribution by province. 2015

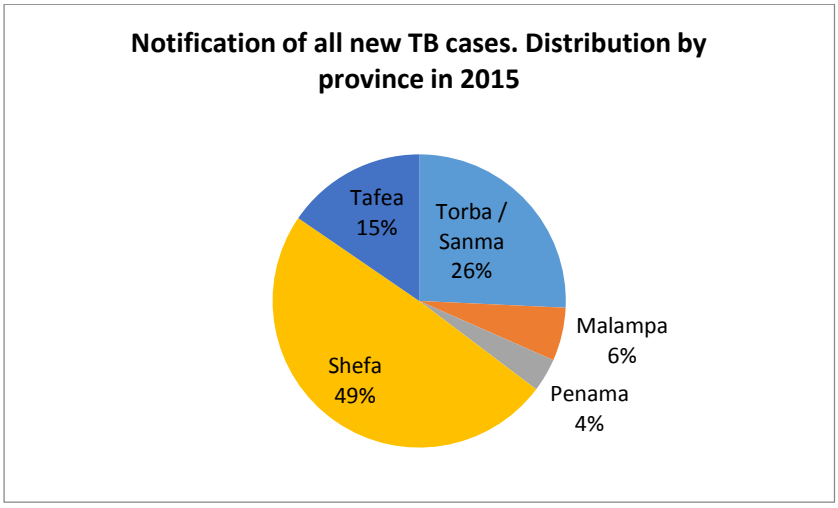


Figure 15. New TB cases 2015. Distribution by province

3.4 HIV/AIDS situation

Vanuatu officially reported its first HIV-positive case on 25 September 2002. HIV screening rates are low and voluntary screening through antenatal and TB programmes has resulted in about 2% of the population screened a year: a very low proportion but general awareness is increasing through on-going advocacy for screening and testing[36].

In Vanuatu, the National AIDS Committee (NAC), a multi-sectoral body, was appointed by the Minister of Health to oversee the whole HIV and STI programs in terms of planning, implementation, Monitoring and Evaluation of the national response for effective prevention, treatment including care and support.

The results from the Second Generation Surveillance prompted the government to implement a multi-sectoral frame work and strategic plan (2008-2012)[37] for both government departments and civil society organizations to address HIV and Sexually Transmitted Infections (STIs) in the country for 5 years.

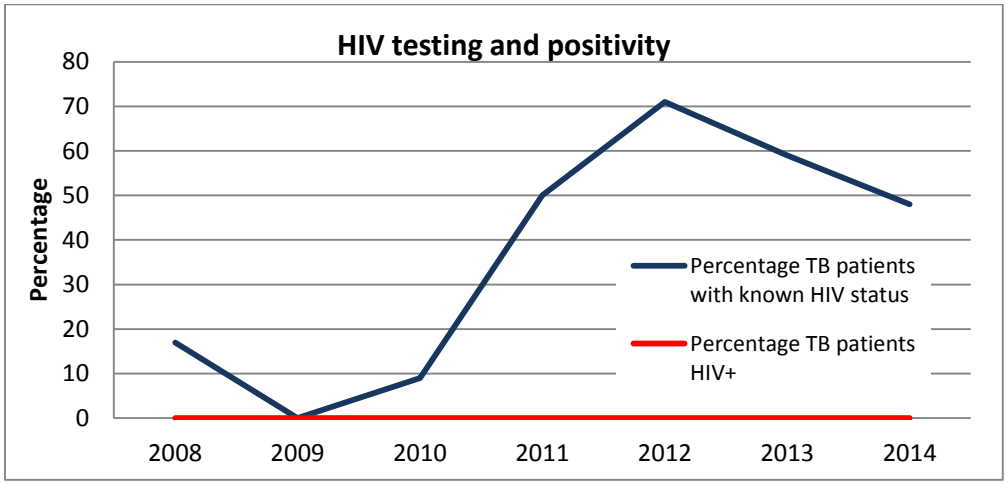


Figure 16. HIV testing and positivity

Prior to 2007, the low rate of HIV testing in TB patients was due the fact that only in 2008 during the 4th Stop TB meeting in Brisbane, the revised TB/HIV Framework was endorsed by PICT National TB Programmes. Since 2010, routine HIV testing of all patients diagnosed with Pulmonary TB and Extra-Pulmonary TB (EPTB) who are above 18 years of age, has been carried out; so far TB-HIV co-infection has not been recorded in Vanuatu (Figure-10).

3.5 Drug-resistant TB

Multidrug-resistant tuberculosis (MDR-TB) is posing a substantial threat to TB control in the Pacific. During the period 2005–2007, a total of 14 multi-drug resistant-TB (MDR-TB) cases were reported in the Pacific: 4 in Republic of Marshall Islands (RMI), 1 each in Samoa and Kiribati, 2 each in Northern Mariana Islands and Guam, and 4 in Federation State of Micronesia (FSM). In addition, 4 TB cases were reported with resistance to Rifampicin alone: 1 each in Vanuatu, FSM, RMI and Solomon Islands. Strains of Mycobacterium tuberculosis resistant to RIF alone can be due to the misuse of RIF in single-drug TB therapy or in the treatment of non-TB conditions.

Since rates of MDR-TB were low in the PICTs up to 2007, formal drug resistance surveillance had not been implemented widely in the region. WHO estimates that in PNG about 900 MDR-TB cases occur every year[38].
In Vanuatu, sputum specimens from TB cases suspected of having drug resistance are usually sent to the Queensland Mycobacterium Reference Laboratory in Brisbane, Queensland, (Australia) for culture and drug susceptibility testing (DST).

Delayed sputum smear conversion has been identified as a risk factor for TB treatment failure and drug-resistant TB. In Vanuatu, a comprehensive study on the profile of TB patients with delayed sputum smear conversion published in 2014, concluded that delayed sputum conversion was relatively uncommon and was not associated with adverse outcomes or drug resistance. The study further recommended that regional differences require further investigation to better understand local factors that may compromise patient management[39].

4. Organization of the National TB Programme

4.1 Background

The National Tuberculosis Programme (NTP) in Vanuatu was originally initiated under the Department of Preventative Medicine of the Condominium Health Services. The government of Vanuatu displayed strong political commitment to achieve the WHO goal 'Health for All by the year 2000' and endorsed the necessary policies and strategies to enable existing health services to be reoriented to a health system based on primary health care. In 1984, the NTP was adopted and implemented as a national priority of the Ministry of Health (MoH).

In 1999, the directly observed treatment short course (DOTS) was introduced, initially in two main referral hospitals, Vila Central Hospital (VCH) and Northern Provincial Hospital (NPH). It was gradually expanded and covered the entire country by 2003. The program also has a strong focus on intensified case finding, improved treatment outcomes, strengthening of reporting and recording systems and capacity building with on-going training of health care workers.

4.2 Organizational Structure of the NTP

National level: Leadership and managerial responsibility of the NTP is entrusted to the National TB Coordinator, under the Director of Public Health in the Ministry of Health, who is also responsible for leprosy. The responsibilities of the National TB Coordinator include: defining the National TB strategy; planning and evaluation of the NTP activities, including preparation of budgets and action plans; ensuring that a high priority is given to the NTP by allocation of adequate financial, human and material resources and coordination with TB laboratories and overseas reference laboratory.
In addition, he is responsible for ensuring a continuous supply of anti-TB drugs, laboratory reagents, equipment, etc; supervision and capacity building of health workers and evaluation of TB quarterly reports and treatment outcomes. He is supported by the National M&E Officer and the National TB Laboratory Officer. The post of Assistant TB/Leprosy Coordinator is currently vacant.

Provincial level: There are 6 Provincial TB/Leprosy Officers whose responsibilities include: ensuring that the diagnosis of pulmonary TB for most patients is based on smear microscopy; ensuring that directly observed treatment (DOT) routinely occurs for all TB patients in both the intensive and continuation phase of treatment; ensuring that contact tracing occurs in a timely fashion for all newly diagnosed sputum smear positive cases of TB; maintaining the Provincial TB register and submitting timely quarterly reports; supervision and training of health workers at both the DOTS centres and at the community level.

Community level: The NTP has decentralized TB treatment to 5 Health Centers which have been designated as Sub-DOTS centres. Primary health services and TB services are integrated at the community level. The health personnel who are in charge at this level may be nurses or nurse practitioners who maintain regular communication with the Provincial TB officers. The responsibilities of the health care workers at the community level include: identification and referral of TB symptomatics to the DOTS Centres for assessment and diagnosis; delivery of DOTS to TB patients and maintenance of records. Currently, there are no community-based DOTS for remote villages and hard-to-reach populations in the interior of islands.

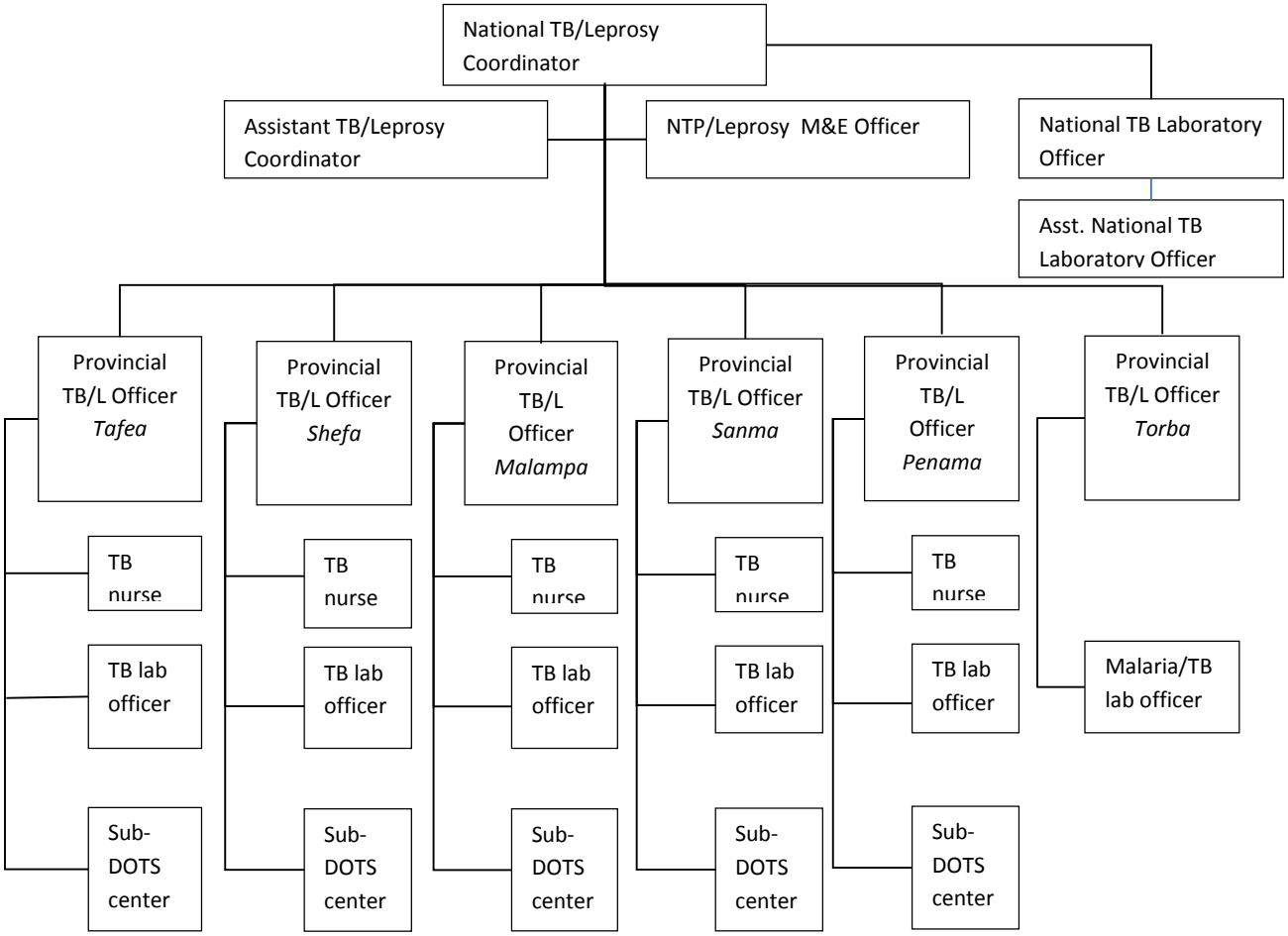


Figure 17. Organisational structure of the NTP as of 2016

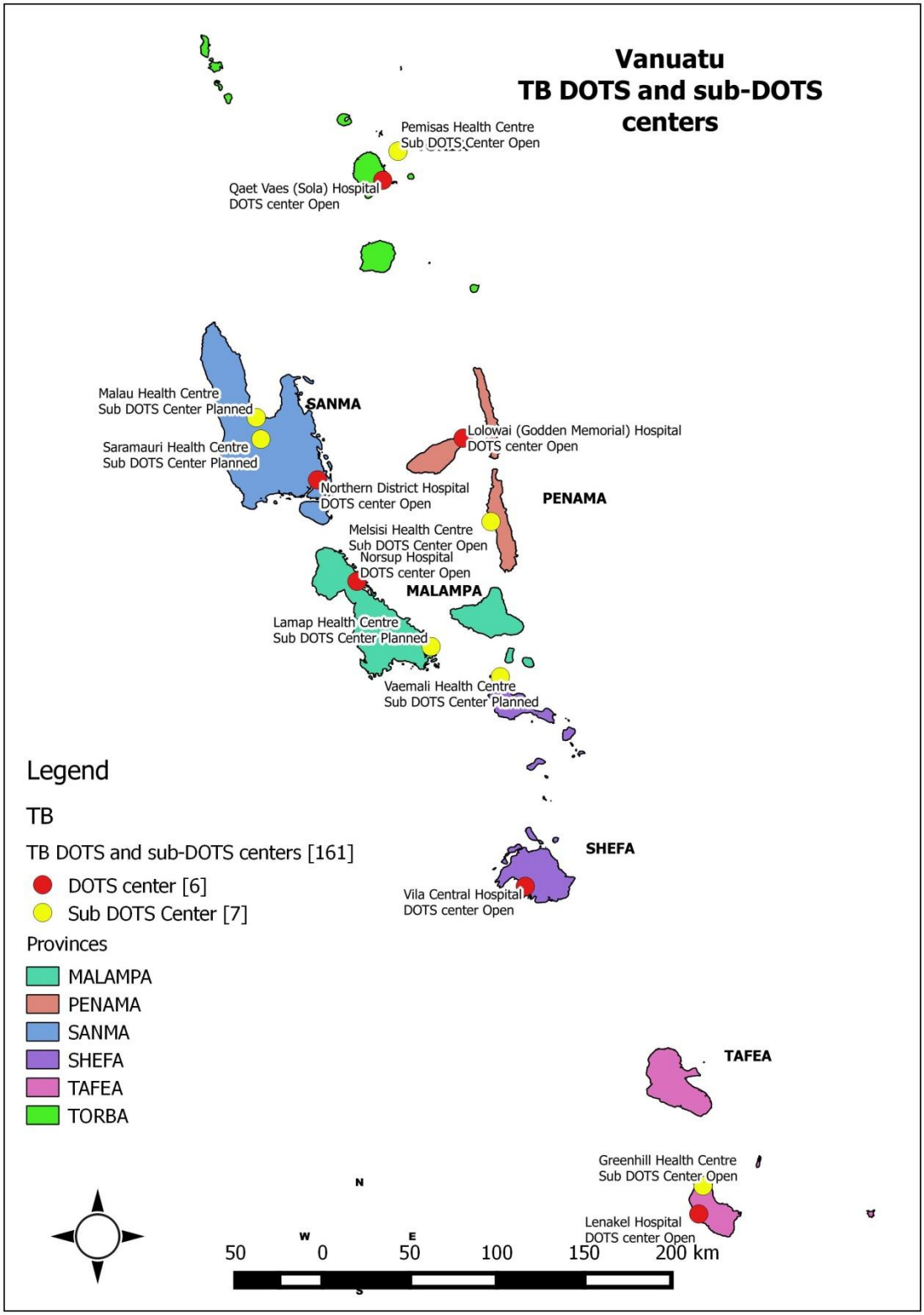


Figure 18. Map of Vanuatu. Location of DOTS and sub-DOTS centers

4.3 Impact of regional and national TB initiatives and strategies implemented to date:

Regional initiatives (WHO and SPC):

In recognition of the tuberculosis problem and the challenges in the Pacific Islands Countries, WHO has established a long series of initiatives - in collaboration with the Secretariat of the Pacific Community (SPC) and other partners - from the Pacific Regional Tuberculosis Project in 1998 to the STOP TB meetings that take place every other year and the investment in capacity building. The general objectives of the NTPs of the PICTs were aligned to the Strategic Plan for TB Control in the Western Pacific 2011-2015 with an aim to achieve the 2015 Millennium Development goals for TB.

In 2004, the Pacific TB Laboratory Initiative (PATLAB) was established following the Second Stop TB Meeting as a collaborative partnership between PICTs, Pacific TB Reference Laboratories (PTRLs) and is co-ordinated by the Stop TB Unit, WHO/WPRO, on behalf of SPC and CDC. The primary objectives of PATLAB are: (i) to improve the quality of sputum microscopy by application of external quality assessment, and (ii) to expand surveillance for TB drug resistance.
The key element in fulfilling the PATLAB objectives is the Pacific TB reference laboratory network of five laboratories based in Adelaide, Brisbane, Wellington, Auckland and Honolulu[40].

In collaboration with governments of Member States of PICTs, WHO South Pacific is coordinating development and implementation of National Stop TB Plans to improve their capacity to extend DOTS nationwide and to ensure the continuous supply of high quality anti-TB drugs; coordinating training and advocacy meetings; establishing surveillance of TB, including laboratory based surveillance for multi-drug resistant TB and HIV/TB co-infections, and coordinating work with international agencies such as CDC, SPC and other partners, and sharing information on the progress of DOTS implementation and activities[41].

The Mid-term Regional TB Strategic Plan 2015-2019 for 11 Pacific Island Countries (Cook Islands, Kiribati, Marshall Islands, Federated States of Micronesia, Nauru, Niue, Palau, Samoa, Tonga, Tuvalu, and Vanuatu) was developed during a one year regional dialogue conducted by the Pacific Islands Regional Multi-country Coordinating Mechanism (PIRMCCM) with support of country CCMs and National Stakeholders' Committees, Western Pacific Regional Office of WHO and SPC. It provided the basis for alignment and harmonization of domestic and external funding commitments, including the New Funding Model (NFM) of the Global Fund[42].

4.4 National guidelines, policies and actions:

The National Tuberculosis Programme (NTP) was originally initiated under the Department of Preventative Medicine of the Condominium Health Services. In 1984, the NTP was adopted and implemented as a national priority of the Ministry of Health (MOH), when the government of Vanuatu endorsed the World Health Organisation (WHO) social goal on "Health for all by 2000" to be achieved through the basic principles underlying the Primary Health Care (PHC) concept.

In 1999, the Technical Guidelines and Policies for Tuberculosis Control in Vanuatu was launched and then updated in 2003. It contains the general policy for TB control in Vanuatu and is intended to be a reference to guide health care workers in the diagnosis, treatment and prevention of TB in Vanuatu. The revision in 2011 incorporated the recommendations in the International Standards for Tuberculosis Care (ISTC) and the 2010 WHO TB Treatment Guidelines.

In March 1999, the DOTS Strategy was endorsed and introduced by the MOH in order to control the spread of TB in Vanuatu. By 2003, the DOTS programme was progressively scaled up to provide nation-wide coverage of the entire population to achieve the WHO goal of 100% coverage by 2005. In 2006, on the recommendation of the Ministry of Health, a National DOTS Steering Committee was established. In the same year, the National Strategic Plan for TB (2006-2010) was developed.

The development of the National Strategic Plan (NSP) for TB has been guided by the methodology and the format recommended by the WHO Tool Kit for NSP development. The NSP for TB prevention, cure and control is a key instrument for not only managing the TB programme in the country but also, for defining the priorities and strategic interventions to achieve the goals and objectives consistent with the regional and nation health policies and plans. In addition, it is in line with the collective global movement towards ending TB and the health-related Sustainable Development Goals (SDGs) beyond 2015.

4.4.1 Main activities of the NTP

TB Laboratory services: Diagnosis of pulmonary TB for most patients is based on sputum smear microscopy. TB microscopy centres are located in the 6 provinces (Malampa, Penama, Sanma, Shefa, Tafea and Torba) within the DOTS and sub-DOTS Centres. There are 9 laboratory technicians trained in TB sputum smear microscopy. In addition, in the 2 main DOTS centres other tests including a baseline blood count, creatinine, alanine amino-transferase (ALT), hepatitis B surface antigen, and HIV serology, are done in all patients who are to be treated for TB disease or latent TB infection. Depending on the patient's risk factors for hepatotoxicity, regular monitoring of either ALT or liver function tests may be required for patients on treatment for TB.

In March 2016, the Xpert MTB/RIF assay which is a new test that is revolutionizing TB control by contributing to the rapid diagnosis of TB disease and drug resistance, has been introduced in Vanuatu and is placed at the Vila Central Hospital in Port Vila under a trained laboratory Officer.

The Queensland Mycobacterium Reference Laboratory (QMRL) in Brisbane, Queensland, Australia) provides technical support including data collection and analysis, blinded slide rechecking, culture and drug susceptibility testing (DST). Regularly, once every two years, an expert from QMRL, Brisbane provides refresher training on smear examination and adherence to External Quality Assessment (EQA) to the national TB Laboratory technician and to the provincial lab technicians.

TB treatment services: Currently, all TB patients are hospitalized at one of the 5 provincial DOTS Centres for administration of daily DOT during the initial 2 months treatment. Treatment during the continuation phase is currently administered by health centres, dispensaries or through a village aid post. If the TB patient lives far from a health facility, then a 'treatment partner' is identified to supervise the treatment. The treatment partner is responsible for collecting a month's supply of medication from the nearest health facility and for ensuring that the patient completes treatment for TB.

Drug Management: In Vanuatu, anti-TB drugs are procured by the government through IDA Foundation and distributed through the Central Medical Store in Port Vila to the Provincial Pharmacies every 2 months. The anti-TB drugs are produced by WHO-approved suppliers and are fixed-dose-combination (FDC) tablets that contain rifampicin, isoniazid, pyrazinamide and ethambutol for the intensive phase and rifampicin and isoniazid combination tablets for the continuation phase for adults. However, paediatric formulations to treat TB in children are not available and cause problems for care givers resulting in erratic doses being given.

M&E system including supervision: Standardized recording and reporting system has been established in all DOTS centres and TB laboratories. However, the country has yet to adopt the new WHO case definitions and related new register and forms. The M&E officer is responsible for supervisory visits along with the national TB laboratory officer to every DOTS centre on at least a quarterly basis, or sooner should there be an urgent need. Guidance and technical advice is provided to health workers so that they can improve their performance in detecting, referring and managing TB patients; also, feedback is provided on the previous report and data that were submitted to the NTP office.

Each supervisory visit includes an assessment of the following five key programme components:

- Validation of data by comparing TB treatment cards, the TB register and the laboratory register
- Assessment of laboratory services
- Review of the stock of TB drugs and other supplies
- Observation of health workers
- Discussion with TB patients under the care of the health worker at the DOTS center

Training: Regular training sessions are conducted for health care workers at the DOTS centres and those within the community setting. Separate training of the TB laboratory technicians in sputum smear microscopy is conducted. Since TB control efforts are coordinated with other health units within the primary health care domain, there is a need for training the health staff outside of DOTS centres engaged in management and supervision in specific NTP activities.

Community mobilization: Community leaders have been engaged by the NTP to raise awareness about TB, identify and refer suspect TB cases, and mobilize communities during World TB Day and other events.

Infection control (IC): It is sub-optimal in most of the facilities and laboratories visited due to lack of norms, standard operating procedures (SOP) and tools (air extractors, fans, UV lamps and respirators). Especially in the light of Vanuatu moderate burden of TB, prevention efforts should be encouraged including prevention of TB through TB infection control in health facilities. Currently the health care workers are not routinely periodically screened for TB[43].

Partnerships: The main partners of the NTP are: (a) WHO, providing technical assistance, (b) the Global Fund and UNDP as the Principal Recipient, (c) the Pacific Paramedical Training Center and the Ministry of Foreign Affairs and Trade (MFAT) from New Zealand supporting capacity-building for TB laboratories, (d) the Secretary of the Pacific Community (SPC).

4.4.2 Programmatic gap analysis

The programmatic gap analysis is the result of both a TB program assessment conducted in 2015 and of a consultative process conducted during a 3-day multi-stakeholders workshop organized by the NTP in 2016. The workshop provided a transparent platform for in-depth discussion and analysis by participants who were key NTP and MoH staff from national and provincial levels, focal points from other national programmes, representative from the consortium of civil society organizations and development partners including WHO and UNDP (PR for the Global Fund multi-country grant). The paragraphs below summarise the main programmatic and strategic gaps identified following a SWOT analysis of the program.

Health System:

The National Health Strategic Plan for next 5 years is in the process of development and there is high commitment from the Government to ensure that the National Health Strategic Plan is aligned with the Sustainable Development Goals. In addition, the government is supporting the procurement of anti-TB drugs, laboratory equipment and materials, providing meals for hospitalized TB patients in intensive phase and for payment of salaries of NTP staff.
However, insufficient government funding is the cause for some vacant positions in NTP. There is a need to allocate government funds to fill critical posts which are vacant at the national and provincial levels of the National TB Programme.

Integration of multiple public health programs at provincial level is hampered by multiple factors: (i) lack of clear policy direction, (ii) lack of support from management, (iii) lack of knowledge and (iv) capacity of provincial health staff to work across programs.
The National TB Steering Committee, through the Public Health Steering Committee, should be revived to play an advocacy role in strengthening the managerial and financial capacity of the NTP.
Infection control (IC) measures are not strictly implemented in hospital wards and OPD. Standard Operating Procedures for infection control (IC) measures in hospital TB wards need to be developed, as part of general IC measures being developed.
It is worth noting that various risks, outside of the health sector may affect the program in the future:

- Natural disasters can affect delivery of health services including damage to health facilities and displacement of TB patients and emphasize the need for disaster preparedness.
- Political instability in country may impact health priorities including TB
- Potential risk of diminished funding from external donors may affect sustainability of the program

NTP diagnostic services:
The National TB laboratory at Vila Central Hospital (VCH) is well established and trained TB microscopists are posted at all provincial levels. The addition of GeneXpert at VCH since March 2016 is an asset for the diagnostic services. However, GeneXpert and portable Xray unit should be available in other provinces to ensure nation-wide coverage of TB diagnosis services.
There is good collaboration with the Queensland Mycobacterial Reference Laboratory (QMRL) in Brisbane for external Quality Control (QC), culture & drug sensitivity testing (DST). But IATA certification for packaging/sending of infectious samples has not been renewed (expired in 2010). Refresher training should be planned every two years to ensure compliance with international regulations.
Transportation of samples from provinces is very difficult and involves high cost. There is a need for renovation of the laboratories in DOTS and sub-DOTS centres, some of them having been affected by Cyclone Pam.

NTP management:
The TB policy and strategy is in place, has been reviewed and revised regularly and has supported the structure of the NTP. Current NTP staffs have good knowledge and experience in TB case management as they have been in the position for many years.
Monitoring and Evaluation of the NTP is severely affected at provincial levels since there are no funds allocated for supervision from province to community levels. In addition, the managerial capacity to organize M&E and supervision is also limited, leading to delay in the submission of quarterly M&E reports to the central level of the NTP and absence of timely feedback from the central level to provinces

Patient treatment and care:

The implementation of Directly Observed Treatment (DOT) during the continuation phase of the treatment is facing challenges in some parts of the country which has the potential risk of creating drug resistance; during the intensive phase, all TB patients are hospitalized for DOT which is not part of current recommendations of the Global TB strategy.
There is a need for ongoing capacity building of health workers providing TB care at Sub-DOTS centres and for community volunteers to provide DOTS in both the intensive and continuation phases. The capacity to diagnose TB in children is low; training should be provided to improve the knowledge, skills and capacity of the health staff to diagnose TB in children.

Drug management:
No anti-TB paediatric formulations are currently available leading to erratic dosages being given to children. Action should be taken to include paediatric formulation of anti-TB drugs with the procurement of anti-TB drugs by the government through IDA (e.g. four fixed-dose combination (4FDC) for adults).

Collaboration with other health programmes:
TB-HIV collaboration is good, however HIV screening among TB patients is still low at 42%. More efforts are needed to address stigmatization due to TB and HIV including the need to strengthen family or community support. There is limited collaboration between TB and other health programs such as NCD (eg. Diabetes) in the provinces due to the absence of NCD focal points.

Advocacy, communication social mobilization (ACSM):
There is limited engagement between community & civil society engagement for ACSM activities. There is no established working relationship with national non-governmental organizations (NGOs) and civil society organizations (CSOs) in the heath sector although there is a consortium of CSOs available in the country for collaboration and partnership in health.

Private Public Partnership (PPP)
There is no formal working relationship with private health sector at the implementation level to support Private-Public-Partnership and their engagement with the NTP although efforts have been made at the national level.

Operational Research:
No investment has been done for capacity building of health staff at provincial levels in operational research and opportunities are limited for their involvement. Therefore, there is a lack of research capacity and opportunities at provincial levels.

5. Strategic Plan

5.1 Overall strategy:

The National Strategic Plan (NSP) for TB prevention, cure and control is a key instrument for not only managing the TB programme in the country but also, for defining the priorities and strategic interventions to achieve the goals and objectives consistent with the regional and national health policies and plans. It reflects the collective global movement towards ending the TB and the health-related Sustainable Development Goals (SDGs) beyond 2015. It is in harmony with the WHO End TB Strategy that has the **vision**: *a world free of tuberculosis – zero deaths, disease and suffering due to TB* and the **goal**: *end the global tuberculosis epidemic*, including ambitious milestones and targets.

The development of Vanuatu NSP for TB, in response to the request from the NTP and the MoH, has been guided by the methodology recommended by WHO. A 5-member writing team to draft the NSP was identified which included the National TB Coordinator, the National TB M&E Officer and WHO focal points for TB based in Port Vila and Suva, Fiji and the consultant provided by WHO. A Task Force was formed to include key NTP and MoH staff from national and provincial levels; focal points from other national programmes, representative from the consortium of CSOs and development partners including WHO and UNDP being the PR for the GFATM multi-country grant.

The NTP/MoH and development partners organized a 3-day Multi-Stakeholder Workshop (WS) in Port Vila to consider and incorporate the views and needs of all concerned through a SWOT analysis, followed by a programmatic gap analysis, to ensure that the process would lead to the development of a sound and robust National TB Strategic Plan.
The Task Force unanimously decided on the following vision, goal, objectives, strategic interventions and the main activities that would effectively address the priorities of the NTP and would be achievable time-bound targets.

Vision: TB-free Vanuatu with zero deaths, disease and suffering due to TB

Goal: To reduce the incidence of TB by 20% by 2020 through promoting universal and equitable access to quality diagnosis and appropriate treatment of TB, MDR-TB, TB/DM and TB/HIV patients.

Targets for 2020: Increasing case notification rate to 90% of the estimated TB burden in the context of decreasing the incidence; achieve and sustain treatment success rate of 90% among all forms of TB cases.

Targets for 2035: 95% reduction of TB mortality rate as compared with 2015 or zero mortality from TB; 90% reduction of TB incidence as compared with 2015 or less than 10 cases per 100.000 population.

Pillar No. 1: Integrated patient-centred care and prevention		Pillar No. 2: Bold policies and supportive systems for universal access		Pillar No. 3: Intensified research and innovation
Objective-1: Provide early rapid and quality diagnosis of TB, MDR-TB, TB/DM and TB/HIV	**Objective-2**: Deliver high quality patient-centred treatment and care	**Objective-3:** Strengthen the NTP management	**Objective-4**: Engage with communities, civil society organizations in ACSM activities	**Objective-5:** Enhance Operational Research (OR)

5.2 Operational Plan

The Operational Plan is an important component of the NSP and would focus as a priority, on the strategic interventions and the main activities to be implemented. It is fully consistent with the core plan, budget plan, monitoring and evaluation plan and technical assistance plan.

The activity and sub-activities have been identified in the operational plan under the strategic interventions and objectives to which they are linked. The operational plan shows how the main activities will be implemented in a precise manner. It provides for each of the activities substantial information to make their implementation successful (See Annex for details). The operational specifies detailed information, by quarter, on the activities and sub-activities that need to be implemented for the first year of the period covered by the NSP. The implementation of the activities for the remaining years of the NSP would be detailed subsequently.

The operational plan is presented below by objectives and strategic interventions:

Objective 1. Provide early rapid and quality diagnosis of TB, MDR-TB, TB/DM and TB/HIV with patient support having specific focus on targeted active case finding (ACF) in key affected populations to increase TB case notification to 90% of the estimated TB burden in the country.

Strategic intervention 1.1. Strengthen the TB diagnostic services including capacity building, infrastructure, procurement, quality assurance and supervision

The national TB lab manual will be developed and the SOP drafted in 2016 updated. This will allow conducting training of TB lab staff based on these reference documents. Regular refresher training will be conducted every 2 years.

An assessment of existing DOTS and sub-DOTS centers will be conducted in the first two years, addressing HR, infrastructure and equipment capacity. The renovation of Sub-DOTS Centers damaged by cyclone PAM will be conducted based on the assessment and in coordination with the MOH Assets Unit. The establishment of 14 new Sub-DOTS centers in selected areas will be conducted in 6 provinces in order to cover the main inhabited islands. Attention will be given to ensure that there is sufficient HR capacity and equipment before establishing those new centers. Mobile digital X-rays machines will be procured to improve diagnosis services, especially at the periphery of the health system.

In order to further strengthen diagnosis services, 2 GeneXpert machines and essential lab materials will be procured, for Sanma and Tafea provinces. Associated capacity-building will be conducted for lab technicians.

The participation in the PATLAB Regional network will be maintain for ongoing maintenance of Safety Cabinet and microscopes, External Quality Assurance, Infection Control standards and surveillance of TB drug-resistance with supra-national reference laboratory in Brisbane (QMRL).

Monitoring and evaluation of lab activities and outcomes will be conducted regularly through supervision from the national level to DOTS and sub-DOTS centers.

Participation in international events on TB will be supported to ensure continuous and updated building of capacity for diagnosis at national level.

Strategic intervention 1.2. Support targeted Active Case Finding (ACF) activities in key affected populations to increase TB case notification to 90% of the estimated TB burden in the country

In order to increase TB case notification to 90% of the estimated TB burden in the country, targeted active case finding will be conducted in high risk groups and communities. Training of health workers will be conducted on systematic screening of PLHIV, of patients with *diabetes mellitus* (DM), of health workers, especially frontline TB caregivers.

Enhanced case finding will be conducted among contacts of TB patients (contact tracing). Mobile teams will conduct active screening in communities and ensure transportation of sputum and/or patients to the closest DOTS or sub-DOTS center for testing. This intervention will be conducted in parallel with community awareness and engagement activities (Objective 4).

Collaborative mechanisms with relevant programs (HIV, NCD) will be developed as well as innovative strategies using ICT tools and products to detect and track new TB cases among specific groups and in the general population.

Particular attention will be given to failures with first line regimen, retreatment cases and symptomatic contact persons of MDR-TB index cases as they should be considered presumptive MDR-TB cases.

The introduction of the FAST strategy (**F**ind cases **A**ctively by cough surveillance and rapid molecular sputum testing, **S**eparate safely, and **T**reat effectively based on rapid drug susceptibility testing (DST).) will be explored in Referral Hospitals and Health Centers. This approach is based on the assumption that most transmission occurs, not from known TB patients on effective treatment, but from persons with unsuspected TB or unsuspected drug resistance. This strategy will be embedded into a broader Infection Control approach in hospital and TB wards settings.

Objective-2: Deliver high quality patient-centred treatment and care to achieve and sustain treatment success rate of >90% among all forms of TB cases

Strategic intervention 2.1. Strengthen the technical management of TB services to deliver high quality patient-centred treatment and support

The Technical Guidelines and Policies will be reviewed and updated to include new strategies and approaches. This will be followed by training of TB staff, doctors and private medical practitioners on the revised Technical Guidelines including ACF. Regular refresher training will be conducted every two years.

The NTP will ensure that user-friendly TB Patient Kits for adults and children are available in the future, in view of the expected increase of TB patients due to ACF strategies including contact tracing.

Assessment of the impact of the training and patient satisfaction surveys will be conducted during supervisions on a regular basis to ensure that treatment and support are provided appropriately for patients and according to guidelines.

The management structure of the NTP will be strengthened by addressing gaps in human resources, essential office equipment and supplies at all levels (See Objective 3).

Strategic intervention 2.2. Ensure effective and efficient integration of TB services with the general health care delivery system at all levels to achieve treatment success rate of >90%

In order, to achieve a treatment success rate of more than 90%, sensitization of other government health staff at all levels will be conducted on the importance of DOTS and community DOTS to increase adherence and compliance to treatment protocols.

With the introduction of FDC drugs, selected TB patients who have access to a Health Centre or Dispensary may be discharged from TB hospital wards when they are medically stable and receive DOT supervised by the Health Centre or Dispensary Nurse and then at community level. Treatment outcomes at Sub-DOTS centres, Aid Posts and Community DOTS projects will be assessed to analyze the extent of integration within the general health care delivery system.

Collaborative mechanisms with relevant programs (HIV, NCD) will be developed as well as innovative strategies using ICT tools and products to detect, track and treat new TB cases among specific groups and in the general population.

Infection prevention and control capacity-building and activities will be conducted in line with existing general guidelines and mechanisms in hospitals and TB wards and labs

Objective 3. Strengthen the NTP management to develop bold policies and to improve the financial capacity to allocate additional resources for monitoring and evaluation, including supervision to the most peripheral levels, and the introduction of web-based Health Information and Management System (HIMS).

Strategic interventions 3.1. Strengthen the NTP management at national and provincial levels.

The function and the activities of the National TB Steering Committee will be integrated within the existing Public Steering Committee. Specific sessions on TB will be scheduled to ensure coordination and integration with other stakeholders. New and bold policies will be discussed and validated through the Steering Committee, including on community DOTS.

Annual Review Meetings will be conducted at national level with TB staff from provinces (officers, nurses, lab). It will allow to review and discuss program implementation, achievements, results, lessons learned and to adjust annual business plans accordingly. Similar meetings will be conducted at provincial level involving health centers and dispensary nurses.

Supervision from national to provincial level will be conducted two times a year for each province. Supervision from provincial level to sub-DOTS center will be conducted on a quarterly basis. These supervision visits will cover overall program management, mentoring and coaching on technical matters, recording and reporting, drug supply and management, laboratory. In order to support these activities, 4WD vehicles will be purchased. Remaining health facilities and staff will be supervised as part of the Integrated Supervisory Visits of the MoH.

To further strengthen the management capacity of the NTP at national and provincial level, office and IT equipment will be procured to ensure full functionality of NTP activities. New sub-DOTS centers will each be staffed with a laboratory technician.

Strategic intervention 3.2. The NTP will transition from paper-based reporting to computerized reporting for nation-wide consistency among all health programs and compliance with development partners.

NTP will organize meetings with key MoH staff and other national programmes to explore ways and means for launching a web-based HIMS and gradually switch over from paper-based reporting to computerized reporting in a phased manner.

NTP will establish a web-based HIMS (using DHIS2 platform already in use for the routine Health Information System of the MOH) and switch over from paper-based reporting to computerized one as soon as possible, including use of smartphone for ACF (case mapping, tracking). Technical assistance will be sought to support this transition.

Strategic intervention 3.3. Develop bold policies to change the management protocol of TB patients from hospitalized DOTS to ambulatory DOTS.

Through a consultative process with main stakeholders in country and with the support of international technical assistance, a policy for community DOTS and a strategy for transitioning from hospitalised DOTS to community/ambulatory DOTS will be developed. Community DOTS will be piloted in selected areas in 2017, evaluated in 2018/2019 and scaled-up and adjusted as needed based on the evaluation findings.

Guidelines for community DOTS will be developed considering the difficulties to access health services in remote areas. Training of frontline health workers will be conducted based on these guidelines, and a standardized training package for non-health workers (eg. community volunteers or cured TB patients) on Community-DOTS & HE will be developed.

Objective 4. Engage with communities, civil society organizations in ACSM activities to: (1) reduce stigma, (2) pilot Community-DOTS for remote communities and disadvantaged people in selected areas and (3) build Public-Private Partnerships (PPP)

Strategic intervention 4.1. Develop ACSM policy and linkages with Civil Society Organisations (CSOs), Faith Based Organisations (FBOs), Community-Based Organisations (CBOs), such as National Council of Chiefs, Churches, Women's and Youth.

An initial policy development workshop will be conducted and facilitated by international technical assistance, involving both national and international CSOs, FBOs and CBOs to ensure broad consultation. The ACSM policy and strategy will be printed and disseminated at national and provincial levels to main stakeholders through one day advocacy meetings. The policy will be disseminated as well during training for health workers and regular meetings at national and provincial level.

Strategic intervention 4.2. Implement ACSM interventions and engage CSOs, FBOs and CBOs in TB interventions at community level.

Health workers in health centres and dispensaries and Village Health Workers in aid posts will be responsible to raise awareness about TB among consulting patients as well as at community level, through one-on-one or group health education sessions.

Awareness campaigns will be conducted during World TB day and any other social events at national and sub-national levels.

FBOs, CBOs and CSOs will be engaged for ACSM activities in ACF and Community-DOTS (C-DOTS) interventions, especially in remote areas and for hard-to-reach populations.

Objective 5. Enhance Operational Research (OR) to optimize National Strategic Plan implementation and adopt use of innovations (new diagnostics, drugs).

Strategic intervention 5.1. Strengthen the capacity of the NTP officers, nurses and other staff on operational research (OR)

Exposure to international TB conference for national level TB officers and distance learning on OR methodologies, for example through the Pacific Open Health Learning Net POHLN, will be supported. Resources will be mobilized for operational research activities including networking with universities and academic institutions for collaboration and technical and financial support. Possibilities to in include TB officers in regional OR training will be explored (SPC-UNION training course).

In order to develop the capacity of provincial TB officers, in country training will be provided to provincial TB officers by senior trained officers to conduct and/or assist the design, implementation and analysis of OR projects.

Strategic intervention 5.2. Conduct OR relevant to the NTP in Vanuatu

The following OR topics have been identified to orientate and refine the national strategy in the coming years:

A follow-up study on the impact of collaboration with traditional healers and CBO related to early detection of TB and screening among high risk groups will be conducted and will inform the community-DOTS and ACF interventions.

A study to estimate the cost benefits annually due to the change over from hospitalized DOTS to ambulatory/community-DOTS will be conducted with external technical assistance. This study will inform the way forward for the community DOTS strategy.

An OR study on geographical distribution of TB cases will be conducted and linked to the ACF strategy by mapping TB cases in the provinces and exploring potential hotspots or clustering of cases. The impact of ACF on case notification will be evaluated.

5.3 Monitoring and Evaluation (M&E) Plan

The M&E Plan consists of essential managerial functions; role and responsibility of supervisors, timelines and frequency of supervision.
The M&E plan is needed in order:

- To monitor the progress made in the implementation of planned activities and delivery of services (usually this is a continuous process)
- To evaluate the progress made to achieve the intended objectives and targets (usually this is periodical process)

Monitoring, supervision and evaluation of programme activities is regularly conducted through onsite visits, review meetings, workshops and trainings on guidelines and data management for TB.

Standardized recording and reporting system has been established in all DOTS centres and TB laboratories. However, the country has yet to adopt the new WHO case definitions and related new register and forms. Guidance and technical advice is provided to health workers so that they can improve their performance in detecting, referring and managing TB patients; also, feedback is provided on the previous report and data that were submitted to the NTP office.

5.3.1 Indicators

The tables below present the Impact and Outcome indicators with related annual target from 2016 to 2020. The Process indicators table can be found in the Annex.

Table 8. Impact and outcome indicators

Impact Indicator		Baseline			Targets				
		Value	Year	Source	2016	2017	2018	2019	2020
1	TB Incidence Rate (per 100,000 population)	63	2015	WHO Global TB Report 2015	61	59	56	53	50
2	TB Mortality Rate (per 100,000 population)	6.4	2015	WHO Global TB Report 2015	6	5.5	5	4.5	4
3	Catastrophic cost to the patient family	NA	2015	WHO Global TB Report 2015	0	0	0	0	0

Outcome Indicator		Baseline			Targets				
		Value	Year	Source	2016	2017	2018	2019	2020
1	Case Notification rate of all forms of TB – Bacteriologically confirmed & clinically diagnosed New and Relapse cases (per 100,000population)	136	2015	R&R TB system, yearly management report	110	123	128	129	131
2	Case notification rate per 100,000 population-bacteriologically-confirmed TB, new and relapse	81	2015	R&R TB system, yearly management report	66	74	77	77	79
3	Treatment success rate - bacteriologically confirmed TB cases	87	2015	R&R TB system, yearly management report	85	90	90	90	90
4	Treatment success rate of MDR-TB: Percentage of bacteriologically confirmed drug resistant TB cases (RR-TB and/or MDR-TB) successfully treated	NA	2015	R&R TB system, yearly management report	-	90	90	90	90

5.3.2 Recording and reporting

Standardized recording and reporting system has been established in all DOTS centres and TB laboratories. However, the country has yet to adopt the new WHO case definitions and related new register and forms. Guidance and technical advice is provided to health workers so that they can improve their performance in detecting, referring and managing TB patients; also, feedback is provided on the previous report and data that were submitted to the NTP office.

5.3.3 Supervisory visits

5.3.3..1 Key components of the supervision: Each supervisory visit includes an assessment of the following five key programme components:

- Validation of data by comparing TB treatment cards, the TB register and the laboratory register
- Assessment of laboratory services
- Review of the stock of TB drugs and other supplies
- Observation of health workers
- Discussion with TB patients under the care of the NTP

5.3.3..2 Roles and responsibilities at each level

- **National TB Coordinator**
  - Organize and lead annual program review meetings
  - Oversee supervision, M&E activities
  - Provide quarterly and annual report to the program, stakeholders on the program activities
  - ➢ Timeline and frequency: Visit all Provinces for programme review in 1 year

- **National M&E Officer**
  - Conduct quarter M&E activities in the field
  - Conduct data quality assurance in the field
  - Provide support to the field teams on Recording & Reporting methods
  - ➢ Timeline and frequency: Visit all Provinces/divisions every 6 months

- **Provincial TB Coordinators**
  - Management and coordination of TB services in the province.
  - Coordinate with the DOT centres in the periphery for treatment services.
  - Collection and aggregation of data on a monthly and or quarterly basis
  - Carry on analysis of data to ensure data quality and completeness
  - Carry regular supervision of TB activities and make report to the M&E team leader
  - ➢ Timeline and frequency: Complete compilation of monthly data by the end of 1st week of the following month and quarterly data by the end of 2 weeks following the quarter; visit all DOT centres every month and visit all bacteriologically confirmed TB patients

- **TB Nurse/General Nurse**
  - Identify presumptive cases, support in diagnosis by referral, sputum collection and transport
  - Monitor TB patients' treatment including ambulatory DOTS through CSO/ village volunteers
  - ➢ Timeline and frequency: Visit all DOTs providers every month, visit all TB patients at home and counsel family members; identify children below 5 years, start and monitor IPT.
- **National / Provincial Laboratory Officers**
  - Conduct regular supervision of TB laboratory activities,

- Perform quality assurance on Lab and
- Send report to the head of the M&E Team

➢ Timeline and frequency: Visit all TB Microscopy centres every quarter

- **TB Technical Working Group (TWG)**
  - Provide oversight, guidance and technical support to the NTP for execution of their duties.
  - Assess and recommend improvement to the TB prevention, care and control plan
  - Suggest ideas to address weaknesses that have been identified
  - Provide advice on indicators, reports.

  ➢ Timeline and frequency: TWG meets once in 6 months and sub-groups meet as per the need

5.3.3..3 Tools for Supervision:

Checklists mainly cover the following aspects:

- Diagnostic aspects: Review of resources; review of forms, registers, records and reports; observation of the microscopist during (a) the sputum-collection procedure; (b) preparing smears for examination; (c) examining smears under the microscope; and exit-interviews of at least 2 patients undergoing sputum microscopy.

- Treatment aspects: Review of TB Register; review of Treatment Cards; interview at least 3 new smear positive patients on every field-visit day; interview and observe at least one DOT-provider; review organization of direct observation of treatment; inspect the drug storage area.

- Summary of observations: which would include the following details- key observations and recommendations; name of the person responsible to take action and actions taken (*which should be completed on subsequent visit*).

5.4 Technical Assistance (TA) Plan

The technical assistance plan provides detailed information on the technical assistance (TA) required for the strategic interventions and activities, as identified in the operational plan. The TA plan is consistent with the other four components of the NSP, using the same established numbering system. Therefore, it is established for the first two years of the NSP with an estimate of the costing; the TA needs for remaining period may be identified as far as possible. Technical assistance can be provided by international as well as national experts. Technical Assistance for training activities are not described here (refer to the TA Plan in the Annex).

- **International Technical Assistance** is required from development partners for following activities:

  - To develop the national TB laboratory manual (including updating the SOP; developing the SOP and algorithms to optimize the use of the GeneXpert; maintenance of Safety Cabinet & microscopes)
    - Requirement: An international TB consultant with experience on developing laboratory manuals and SOPs
    - Duration: 1 person for 2 weeks. *to complete in Year-1*
    - Location: Port Vila.
    -
  - To review and update the Technical Guidelines and Policies for TB control
    - Requirement: An international TB consultant with experience in developing guidelines
    - Duration: 1 person for 2 weeks. *to complete the assignment in Year-1*
    - Location: Port Vila.

  - To conduct a National TB Programme Review in 2017/2018 (including pilot C-DOTS)
    - Requirement: A team of experienced international TB consultants
    - Duration: 2 persons for 3 weeks. to complete the review in Year-2
    - Location: Port Vila and other provinces.

  - To develop Guidelines for Community DOTS (Activity: 4.2.1.)
    - Requirement: An international TB expert
    - Duration: 1 person for 2 weeks. *to complete the assignment in Year-1*
    - Location: Port Vila and selected provinces
    -
- **National Technical Assistance** (from national TB program):
  - To conduct operational research (OR) on traditional healers (Activity: 5.3.2.)
    - Requirement: A national health consultant with experience in operational research
    - Duration: *to complete the assignment in Year-3 (quarter-1/2) of the project cycle*
    - Location: Port Vila and selected provinces

  - To conduct operational research on mapping and clustering (Activity: 5.3.3.)
    - Requirement: A national health consultant with experience in operational research
    - Duration: *to complete the assignment in Year-3 (quarter-1/2) of the project cycle*
    - Location: Port Vila and selected provinces

5.5 Budget Plan

The budget plan is a fundamental component of the NSP. It is designed to strengthen national TB planning and budgeting at country level and to link targets in the Global Plan to Stop TB and country targets to the required investments.

The budget presented below has been prepared with the WHO End TB planning and budgeting tool. The settings of this tool are such that certain activities are budgeted under a different objective (i.e. supervision activities are budgeted under Objective 3 although supervisions are mainly related to Objectives 1 and 2 in a programmatic perspective). For details, refer to budget in the attachment.

In 2015, an estimated cost of VUV 14,197,300 was budgeted for implementing national TB and Leprosy program activities. Eighty eight per cent (88%) of this amount was donor funded; GFATM was the key donor for TB program activities and the funds were coordinated by the Secretariat of the Pacific Community (SPC). The program however did not get the funds as expected and was unable to implement all the activities as outlined in the plan for 2015[44].

In Table 9, the summary budget is shown according to the objectives of the NSP. The comprehensive budget in Excel format is in a separate document. The higher budgets in 2017 and 2019 are related to planned procurement (digital X-ray machines, vehicles) and renovation of infrastructure.

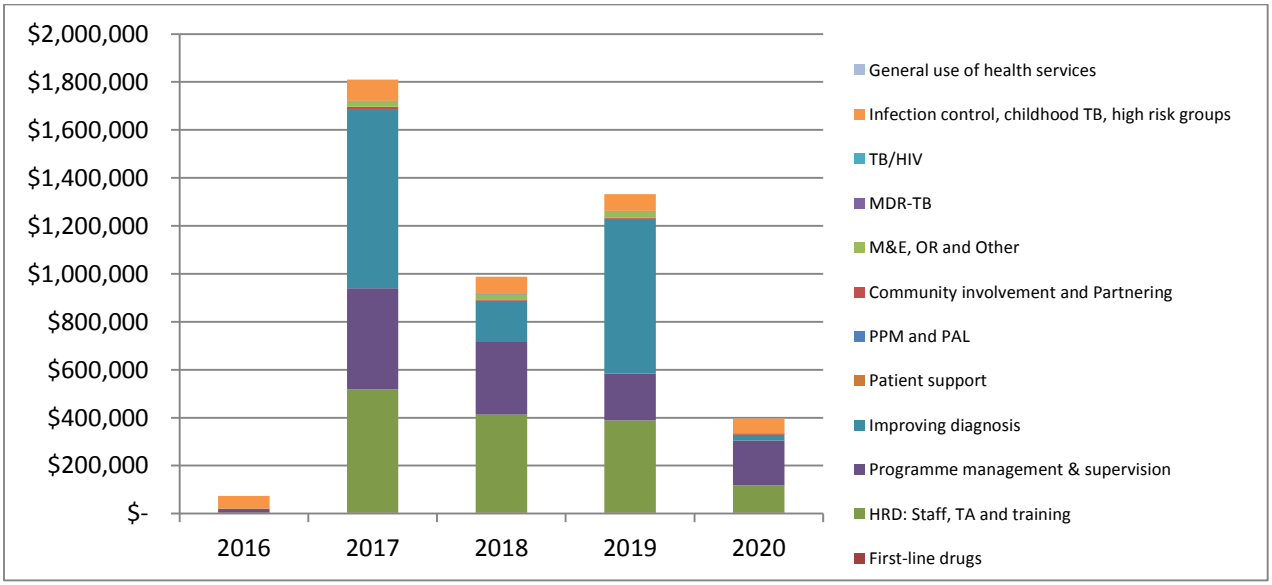
Table 9. Summary budget by objectives

Objectives	2016	2017	2018	2019	2020	Total
Objective-1: Provide early rapid and quality diagnosis of TB, MDR-TB, TB/DM and TB/HIV	$ 54,300	$ 835,752	$ 243,701	$ 715,387	$ 86,804	$ 1,935,944
Objective-2: Deliver high quality patient-centred treatment and care	$ 4,693	$ 4,787	$ 4,882	$ 4,977	$ 5,072	$ 24,410
Objective-3: Strengthen the NTP management to develop bold policies	$ 15,240	$ 940,000	$ 711,710	$ 584,650	$ 300,031	$ 2,551,632
Objective-4: Engagement with communities, civil society organizations in ACSM activities	$ -	$ 9,100	$ 4,900	$ 4,900	$ 4,900	$ 23,800
Objective-5: Enhance Operational Research (OR) to optimize National Strategic Plan implementation and adopt use of innovations	$ -	$ 20,000	$ 22,000	$ 22,000	$ -	$ 64,000
Total	**$ 74,233**	**$ 1,809,639**	**$ 987,193**	**$ 1,331,914**	**$ 396,807**	**$ 4,599,786**

In table 10, the budget is shown by intervention and reflect the needs of the NTP with its top 3 budget interventions: Improving diagnosis, Human Resources Development (staff, TA and training) and Programme management and supervision.

Table 10. Budget by interventions

Intervention	2016	2017	2018	2019	2020	Total
First-line drugs	$ 4,306	$ 4,398	$ 4,491	$ 4,585	$ 4,679	**$ 22,459**
HRD: Staff, TA and training	$ -	$ 513,540	$ 407,600	$ 383,540	$ 112,600	**$ 1,417,280**
Programme management & supervision	$ 15,240	$ 421,260	$ 303,910	$ 195,910	$ 187,231	**$ 1,123,552**
Improving diagnosis	$ -	$ 747,642	$ 171,591	$ 645,777	$ 24,694	**$ 1,589,704**
Patient support	$ -	$ -	$ -	$ -	$ -	**$ -**
PPM and PAL	$ -	$ -	$ -	$ -	$ -	**$ -**
Community involvement and Partnering	$ -	$ 9,100	$ 4,900	$ 4,900	$ 4,900	**$ 23,800**
M&E, OR and Other	$ -	$ 25,200	$ 22,200	$ 27,200	$ 200	**$ 74,800**
MDR-TB	$ 137	$ 134	$ 131	$ 128	$ 126	**$ 656**
TB/HIV	$ 387	$ 389	$ 390	$ 392	$ 393	**$ 1,951**
Infection control, childhood TB, high risk groups	$ 54,300	$ 88,110	$ 72,110	$ 69,610	$ 62,110	**$ 346,240**
General use of health services	$ -	$ -	$ -	$ -	$ -	**$ -**
Total costs	**$ 74,370**	**$ 1,809,773**	**$ 987,324**	**$ 1,332,043**	**$ 396,932**	**$ 4,600,441**



The domestic funding, mainly from the government, supports the human resources for health, procurement of anti-TB drugs, essential equipment and other supplies including laboratory supplies, maintenance of health facilities and other health-related services. In addition, the government budget supports the costs related to hospitalization of TB patients, including the mandatory admission of TB patients during the intensive phase of treatment to ensure supervised direct observation of treatment (DOT).
Additional funding from development partners, the Global Fund will be required to fully implement the NSP 2016-2020, particularly for investment in infrastructure and equipment.

5.6 Procurement Plan

The Ministry of Health is responsible for the procurement of drugs, hospital equipment and other health and non-health products from the government funds.

External funding through development partners and the Global Fund is required to fill the funding gap for procurement of essential equipment and other supplies.

Summary of specific procurement needs:

Objective 1:

- GenXpert machines x1 for Tafea province
- Renovation and establishment of infrastructures in cyclone Pam affected areas (budgeted under Obj. 3)
- Digital X-ray machines: x2 in 2017 and x2 in 2019
- IT equipment (laptops and printers for Lab Officers)

Objectives 2 and 3:

- Vehicles (4WD) for provincial TB programs.
- Office supplies and equipment for national and provincial offices.

6. Emergency Plan

National policies and plans for disaster preparedness

Situated within the "Ring of Fire", more than 80% of the landmass and 76% of the population of Vanuatu are vulnerable to two or more hazards including volcanic eruptions, cyclones, earthquakes, droughts, tsunamis, storm surge, flooding and landslides. In 2000, the Government of Vanuatu declared the first Disaster Act which outlines the role and responsibility of the government in the event of a disaster. This was followed by the National Health Disaster Management Plan established by the Ministry of Health in 2003.

Vanuatu has been ranked as the country most at risk to the effects of disasters based on an assessment of exposure to disasters, susceptibility to their impact and capacity to cope through response and recovery strategies[45]. It has also been identified as the nation most in need of technical assistance and resources to respond to disasters.

The National Health Plan for Climate Change Adaptation and Disaster Risk Management (2016-2020)[46] was drafted by WHO in December 2015 in support of the MoH's commitment to disaster risk management for health. The Disaster Risk Management for Health Committee (DRMHC) has been set up to provide guidance to health sector stakeholders both government and non-government organizations, to plan and implement disaster risk management activities.

Emergency preparedness plan of the NTP

It is recommended that the NTP should take the leadership and the responsibility for developing strategic TB plans, guidelines and emergency preparedness measures. TB services should be integrated into the acute and chronic phases of the plan for complex emergencies through a set of interventions.

However, as the government has developed an extensive national health plan for disaster risk management for each of the critical phases (prevention, preparedness, response and recovery), the NTP should designate a focal point for emergencies who will guarantee NTP participation in the emergency preparedness meetings, involvement of stakeholders around specific issues, e.g. tracing of patients, as well as ensuring that TB is included in emergency preparedness guidelines and emergency plans.

The NTP's emergency preparedness plan would be incorporated within the country's health sector disaster risk management plan which would give priority to the identification of displaced TB patients whose treatment has been interrupted; secondly, it would ensure that steps are taken to re-establish TB treatment for these patients as quickly as possible. It is essential that TB drug supply and management and monitoring systems be integrated into the health sector response to the emergency.

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