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The Kingdom of Tonga Health System Review

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Contents

List of Figures

List of Tables

Preface

The Health Systems in Transition (HiT) profiles are country-based reports that provide a detailed description of a health system and of policy initiatives in progress or development. HiTs examine approaches to the organization, financing and delivery of health services and the role of the main actors in health systems; describe the institutional framework, process, content and implementation of health and health-care policies; and highlight challenges and areas that require more in-depth analysis. HiT profiles seek to provide information to support policy-makers and analysts in the development of health systems. They are building blocks that can be used:

- to learn in detail about different approaches to the organization, financing and delivery of health services and the role of the main actors in health systems;
- to describe the institutional framework, the process, content and implementation of health care reform programmes;
- to highlight challenges and areas that require more in-depth analysis;
- to provide a tool for the dissemination of information on health systems and the exchange of experiences of reform strategies between policy-makers and analysts in different countries; and
- to assist other researchers with more in-depth comparative health policy analysis.

Compiling the profiles poses a number of methodological problems. In many countries, there is relatively little information available on the health system and the impact of reforms. Due to the lack of a uniform data source, quantitative data on health services is based on a number of different sources, including the World Health Organization (WHO), national statistical offices, the Organization for Economic Co-operation and Development (OECD) health data, the International Monetary Fund (IMF), the World Bank, and any other sources considered useful by the authors. Data collection methods and definitions sometimes vary, but typically are consistent within each separate series.

The HiT profiles can be used to inform policy-makers about experiences in other countries that may be relevant to their own national situation. These profiles can also be used to inform comparative analyses of health systems. This series is an ongoing initiative and material is updated at regular intervals. In-between the complete renewals of a HiT, the APO has put in place a mechanism to update sections of the published HiTs, which are called the "Living HiTs" series. This approach of regularly updating a country's HiT ensures its continued relevance to the member countries of the region.

Comments and suggestions for the further development and improvement of the HiT series are most welcome and can be sent to apobservatory@wpro.who.int. HiT profiles and HiT summaries for Asia Pacific countries are available on the Observatory's website at http://www.wpro.who.int/asia_pacific_observatory/en/.

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The current series of HiT profiles has been prepared by the staff of the Asia Pacific Observatory on Health Systems and Policies. The Observatory is a partnership between country governments, donors and development partners. The Observatory team working on the HiT profiles is led by Dale Huntington.

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List of abbreviations

ADB	Asian Development Bank
AIDS	Acquired immune deficiency syndrome
AUD	Australian dollar
AusAID	Australian Agency for International Development (now DFAT)
BMI	body mass index
BSc	Bachelor of Science
CEO	Chief Executive Officer
CMO	Chief Medical Officer
CPMS	Central Pharmacy and Medical Stores
CVD	cardiovascular disease
DALY	disability-adjusted life years
DFAT	Australian Government Department of Foreign Affairs and Trade
DHS	Demographic and Health Survey
DOTS	directly observed treatment short course
ER	emergency room
EU	European Union
FNU	Fiji National University
GBD	Global Burden of Disease
GDP	gross domestic product
GFC	global financial crisis
GNI	gross national income
HIES	Household Income and Expenditure Survey
HIS	health information system
HIV	human immunodeficiency virus
HR	human resources
HSSP	Health Sector Support Project
IMR	infant mortality rate
IT	information technology

ITU	International Telecommunication Union
JICA	Japanese International Cooperation Agency
KAP	knowledge, attitudes and practices
KPI	key performance indicator
KRA	key result area
LMIC	low- and middle-income countries
MAF	MDG Acceleration Framework
MBBS	Bachelor of Medicine/Bachelor of Surgery
MCH	maternal and child health
MDG	Millennium Development Goals
MMR	maternal mortality ratio
MoFNP	Ministry of Finance and National Planning
MTBF	Medium Term Budget Framework
NCD	noncommunicable disease
NCU	national currency unit
NGO	nongovernmental organization
NHA	national health account
NZ	New Zealand
NZD	New Zealand dollar
NZAID	New Zealand Agency for International Development
NZMTS	New Zealand Medical Transfer Scheme
ODA	overseas development aid
O&G	Obstetrics and Gynaecology
OOP	out-of-pocket payment
OPD	Outpatient Department
PACTAM	Pacific Technical Assistance Mechanism
PFM	public and financial management
PHIN	Pacific Health Information Network
PICT	Pacific Island Countries and Territories
POLHN	Pacific Open Learning Health Net
PPHSN	Pacific Public Health Surveillance Network
PPP	purchasing power parity
PSC	Public Service Commission
PvtHE	private health expenditure
QSSN	Queen Salote School of Nursing
RHD	rheumatic heart disease

SDP	Strategic Development Plan
SPC	Secretariat of the Pacific Community
SSCSiP	Specialized Clinical Services in the Pacific
STEPS	STEPwise approach to risk factor surveillance
STI	sexually transmitted infection
SWAp	sector-wide approach
TB	tuberculosis
THE	total health expenditure
THIS	Tonga Hospital Information System
THPMP	Tonga Health Performance Management Programme
THSPMP	Tonga Health Sector Planning and Management Project
THSSP	Tonga Health Sector Support Program
TOP	Tongan pa'anga
TSDF	Tonga Strategic Development Framework
USD	United States dollar
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USP	University of the South Pacific
VHI	voluntary health insurance
WB	World Bank
WHO	World Health Organization
WHR	waist to hip ratio
WISN	workload indicator of staffing needs

Abstract

Tonga is a small Pacific state comprised of over 170 islands and islets scattered in a north-south direction over 800 km, of which around 36 are inhabited. In 2011 the national census enumerated the population as 103 252. In 2013, Tonga was classified as an upper-middle income country with a gross national income (GNI) per capita of US$ 4240, and health expenditure per capita has increased significantly from US$ 163 in 2000 to US$ 245 in 2011.

The Vision of the Ministry of Health is "to be the highest health-care provider in the Pacific as judged by international standards in 2020" and its mission is "to improve the health of the nation by providing quality care through promotion of good health, reducing morbidity, disability and premature (death) mortality". Health services are provided by a network of 34 maternal and child health clinics, 14 health centres, three district hospitals and the tertiary referral hospital, Vaiola Hospital, located in the capital city, Nuku'alofa. Tonga has workforce densities which are higher than other low- and middle-income countries (LMICs) in the Pacific but significantly below high-income neighbours, and suffers from "brain drain". The government is the main financer of the health system, providing close to half (47%) of financing in 2007/2008, supplemented by a large degree of donor and development partner funding (38%) and an average of 10% of total health expenditure coming from household out-of-pocket payments (OOPs).

Since the 1990s, Tonga has undergone many rounds of development partner-supported health reform and has an established National Health Accounts and health information system that are used to support planning, resource allocation and evaluation. Tonga has had one of the best overall levels of health within the Pacific as a result of a dramatic reduction in communicable diseases and maternal and child mortality since the 1950s. However, the emergence of lifestyle diseases, particularly diabetes and cardiovascular disease, poses a huge challenge to the health system and the overall health of the nation. The 2004 STEPS survey revealed that an alarming 99.9% of the adult population

are estimated to be at moderate to high risk of developing a non-communicable disease (NCD).

Tonga prioritized NCDs within the MDG acceleration framework; produced the *Tonga Commitment to Promote Healthy Lifestyles and Supportive Environment* in 2003 at the Pacific Ministers of Health Meeting; and was the first Pacific Island country to develop a comprehensive NCD strategy based on the WHO *Stepwise Framework for Action*. The original plan, the *National Strategy to Prevent and Control NCDs 2004–2009*, has now been replaced by a second plan covering 2010–2015.

Moving forward, Tonga faces the challenge of ensuring that quality primary health-care services can be maintained in remote areas. Also, in meeting the needs of the disease burden now dominated by NCDs and chronic conditions, the key priority for the health system is to re-orientate its focus on prevention and treatment of NCDs, and to continue to strengthen the health system within financial and human resource constraints. This requires increased efficiency and investigating alternate sources of financing. The *National Health Strategic Plan* (NHSP 2011–2015) prioritizes prevention and system effectiveness under the banner of "doing better" and the aim of current reforms is to strengthen the system to become "strong and affordable" building on the resilience of rural health services of the last two decades.

Executive summary

Tonga has had one of the best overall levels of health within the Pacific as a result of a dramatic reduction in communicable diseases and maternal and child mortality since the 1950s. Tonga is on target to achieve the Millennium Development Goals (MDG) around maternal and child mortality reflecting an effective primary health-care system, good public health infrastructure and comprehensive antenatal and postnatal care, immunization, water, sanitation and waste disposal programmes. The Ministry of Health reports that 100% of the population can access appropriate health-care services with a regular supply of essential drugs within a one-hour walk. In spite of these successes, however, the emergence of lifestyle diseases, particularly diabetes and cardiovascular disease, poses a huge challenge to the health system and the overall health of the nation. The 2004 STEPS survey revealed that an alarming 99.9% of the adult population are estimated to be at moderate to high risk of developing a noncommunicable disease (NCD). As of 2011, WHO estimates that NCDs account for 74% of all deaths in Tonga and are a leading cause of premature death and disability. Furthermore, research conducted in 2010 concluded that previous methods of estimating life expectancy for Tonga did not adequately cope with the high level of adult mortality and based on improved data, the estimated life expectancy was revised downward by five years for both males and females, to 65 years and 69 years, respectively (Hufanga et al., 2012). As 39% of Tongans are under the age of 15, primary prevention of obesity, inactivity and poor nutritional habits will be a key strategy for future population health. In response, in 2004 the Tongan Government, with high-level support from multiple ministries, was the first country in the Pacific to launch a National Strategy to Prevent and Control NCDs. However, despite many preventative strategies implemented over the past decade, NCD risk factors continue to rise. The real challenge now is for Tonga to adapt its strong primary health-care system to deal with the range of emerging issues, particularly the large financial burden associated with chronic and noncommunicable diseases.

The Ministry of Health is mandated to provide the administration and delivery of preventive and curative public health services in Tonga under

the Health Services Act. Health-care services are decentralized and managed geographically through four health districts which correspond to the main island groups. Six functional divisions are also responsible for service delivery and planning. Donor and development partners are also important in the governance and organization of the health system, providing capital investment funding, technical assistance and programmatic support. In conjunction with the Government of Tonga, they also fund teams of visiting overseas medical specialists and transfers of patients to overseas hospitals for advanced and complex care that is not available in Tonga. Apart from a relatively large cohort of unregulated and widely-utilized traditional healers, the private health sector is small, consisting of a limited number of private pharmacies and a few government health workers engaged in dual practice. As such there is no formalized regulation of these providers, nor is there regulation of private health services or insurers. Clinical staff are regulated by several key legislations and are registered and licenced by professional boards.

With donor support, particularly the Tonga Health Sector Planning and Management Project (THSPMP), the planning, budgeting and management capacity of the Ministry of Health has grown considerably. Health sector planning is aligned with the Government's Strategic Development Plan and Framework, and underpinned by the Ministry's Vision and Mission statements which are described in the Corporate Plan, created every three years. The Corporate Plan sets out six key result areas, targets and key performance indicators against which they are measured. The Ministry has also institutionalised several relatively sophisticated performance management systems which complement quarterly and annual reporting, namely the Balanced Scorecard and the Executive Performance Appraisal System.

One patient satisfaction survey has been undertaken at Vaiola Hospital in 2002 and the level of satisfaction is generally high. Complaints about cleanliness and comfort are likely to have been addressed since the upgrade and refurbishment of the hospital between 2002 and 2014. The Ministry of Health continues to prioritize the improvement of customer service and has made it a key result area in the latest Corporate Plan.

Since 2000, government expenditure on health as a proportion of total health expenditure has averaged above 80%, at an average 4% of GDP and with the health sector consistently receiving a relatively large portion (12%) of total government funding. In the last NHA (2007/2008) total

health expenditure was roughly TOP 40 million and health expenditure per capita has increased significantly from US$ 163 in 2000 to US$ 245 in 2011. The Government is the main financer of the health system, providing close to half (47%) of financing in 2007/2008, supplemented by a large degree of donor and development partner funding (38%) with only an average of 10% of total health expenditure coming from household out-of-pocket payments (OOPs), a relatively small figure compared to regional averages for the Asia Pacific region. Payments to traditional healers account for the majority of OOPs. User fees were introduced for some services in 2009 and raise approximately TOP 1 million per year. Although fee exemptions and a safety net are in place to protect the poor, there is a lack of research to show whether this has been effective in protecting the poor without decreasing service utilization. Voluntary health insurance currently only accounts for around 3% of total health expenditure and recent attempts to implement social health insurance for the 12% of the population employed in the formal sector failed to pass through Cabinet. With the double burden of disease and Tonga's commitment to provide universal health care, the Government must look at alternate financing mechanisms and increasing health system efficiency in particular through budgeting more for preventative health.

Health services are provided by a network of 34 maternal and child health clinics, 14 health centres, three district hospitals and the tertiary referral hospital, Vaiola Hospital, located in the capital city, Nuku'alofa. The four hospitals also provide primary health care to the populations of their respective island groups through outpatient and emergency departments; in fact, over 90% of health services are delivered from the hospitals. There have been several donor-funded infrastructure programmes over the past few years, the most notable of which was the multimillion dollar redevelopment and upgrade of Vaiola Hospital. The hospital has been designed and planned to meet the needs of the population now and into the future. Maintenance and upkeep of health facilities do, however, remain an ongoing challenge within constrained operational budgets. Purchasing new equipment and ensuring that the outer island facilities have adequate levels of basic, functional equipment is also challenging and often requires donor supplementation.

Tonga has workforce densities which are higher than other low and middle-income countries (LMIC) in the Pacific but significantly below high-income neighbours. Tonga does suffer from brain drain, and routinely experiences critical deficiencies, particularly for in-demand

medical specialists such as surgeons and anaesthetists. Key deficiencies have been filled with funding from the Australian Aid-funded Tonga Health Systems Support Program (THSSP). However, this is a costly option and a more sustainable method must be established. Local training of health workers is limited, with the Queen Salote School of Nursing providing the only accredited in-country health professional training, in basic and post-basic nursing. The Ministry of Health also provides training courses for some cadres of health professionals such as health officers and dental assistants, but the programmes are ad hoc and unaccredited. There is no medical education available in Tonga and most doctors enrol at Fiji National University or at other universities in Australia, New Zealand, or more recently, in Cuba. With close to a quarter of the workforce reaching retirement age in the next ten years, workforce succession planning is vital and innovative use of technologies such as video-conferencing (e-health) will be needed to overcome workforce shortages.

The Government currently provides the majority of the country's primary health care through the network of reproductive and child health clinics, health centres and hospitals. However, patients, particularly in rural and remote areas, often bypass the lower-level health services and go directly to a hospital, which can result in late presentation and reduced technical efficiency of the health system.

Ensuring that quality primary health-care services can be maintained in remote areas is a major challenge for Tonga. The range and scope of secondary and tertiary services also need to be expanded, in particular to treat and limit complications due to NCDs. For example, Tonga is not currently able to deliver complex surgical procedures such as specialized cardiac, paediatric and neurological surgery nor multimodal cancer therapies in a cost-effective and sustainable manner. Tonga relies on overseas transfers and the visits of specialist medical teams to provide these services, and this is likely to be the case for the foreseeable future. The health system is also very limited in the scope of available rehabilitation services and lacks adequate human resources, medical equipment and assistive devices to cater for the growing demand related to the rise in lifestyle diseases and chronic conditions. In general, the majority of rehabilitation, long-term care and care for those with disabilities is provided by family members although a small number of NGOs and faith-based organizations also provide limited services, predominantly on Tongatapu. Whilst Vaiola Hospital has a psychiatric unit, mental health care is also limited in scope on outer islands where it is

generally delivered by health staff with no formal mental health training. Tonga has a significant cohort of traditional healers who, although not recognized as a part of the formal health system, play an important role in providing health services, particularly in remote areas. Additionally, a small number of private practitioners also provide fee-based health services, mainly around Nuku'alofa. As the Ministry of Health endeavours to expand and improve the quality of primary and secondary health services, it is imperative that they engage and work with all health providers including those who operate outside of the formal public system.

Since the 1990s, Tonga has undergone many rounds of development partner-supported health reform. Programmes such as the World Bank's Health Sector Support Project, the Australian Aid-funded Tonga Health Sector Planning and Management Project and the more recent Health Systems Support Program, have helped to strengthen the Ministry of Health's capacity, particularly in planning, budgeting and financial management. These programmes have also been responsible for significant upgrading and development of key infrastructure. Donor funding has also led to major improvements and upgrades to the health information system and the use of data for decision-making, particularly the system of National Health Accounts (NHAs). As a result the Ministry of Health now has the basic governance and management infrastructure, together with the skills required, to lead further reform processes on its own. While the Government has been praised internationally for prioritizing NCDs within the MDG acceleration framework; a key priority now is for the health sector to reorientate itself to focus on prevention and treatment of NCDs. It must overcome identified weaknesses in the fight against NCDs, including insufficient organizational management and funding for NCDs, and the need for better NCD monitoring, evaluation and surveillance. The health sector must also increase efficiency and look for alternate means of financing so that it can continue to strengthen institutional capacity and provide the required physical and human resources to effectively minimize the NCD epidemic and complete the unfinished MDG agenda.

The health system currently provides a high degree of financial protection with out-of-pocket payments accounting for only 10% of total health expenditure and only 0.5% of average total annual household expenditure, a level which is significantly below the average 2–5% of other countries in the East Asia and Pacific region. There is, however,

some inequity in terms of access and financing which is due, in large part, to the difficulties of maintaining adequate health services in areas with low population density. For example, it was shown that households living in rural areas spend slightly less than half the amount that urban households spend directly on health and medical services each year (although this figure does not take into account the indirect expenses for health-seeking travel such as time off work and transport costs which should also be considered). Despite the Ministry of Health ascertaining that 100% of the population can access appropriate health-care services with a regular supply of essential drugs within a one-hour walk, quality and scope of services is an issue in rural areas. Furthermore, a key area that requires strengthening is the disaggregation of data by gender, age, race, and socioeconomic group as it is not currently possible to ascertain whether there is inequity in health outcomes amongst different population groups in Tonga.

In terms of providing universal health coverage, Tonga must ensure that the enforcement of user fees which were mandated in 2009 does not further jeopardise equity and that, alternately, non-enforcement of user fees does not reduce the efficiency of the system in terms of appropriate referrals. The scope, coverage and quality of services also need to be further defined and monitored in order to maximize both allocative and technical efficiencies of the health system – one of the few areas in which the health system may be able to increase fiscal space in the future. In terms of quality and health-care effectiveness, despite the significant improvements that the Ministry of Health has made in terms of accountability and transparency under the World Bank-funded Health Sector Support Project (HSSP) and other programmes, the creation and implementation of an integrated quality in health-care programme is recommended. Additionally, more budget should be funnelled towards preventative health services in the recognition that delivery of cost-effective primary and secondary prevention strategies for NCDs will improve efficiency in health care over the long term and lower expenditures associated with secondary and tertiary care.

1 Introduction

Chapter summary

Prior to the rise in noncommunicable diseases (NCDs), Tonga had one of the best overall levels of health in the Pacific, having achieved a dramatic reduction in communicable diseases and maternal and child mortality since the 1950s. Tonga is on target to achieve the MDG goals around maternal and child mortality, reflecting an effective primary health-care system, good public health infrastructure and comprehensive antenatal and postnatal care, immunization, water, sanitation and waste disposal programmes. The Ministry of Health reports that 100% of the population can access appropriate health-care services, with a regular supply of essential drugs within a one-hour walk.

In spite of these successes, the emergence of lifestyle diseases, particularly diabetes and cardiovascular disease, poses a huge challenge to the health system and the overall health of the nation. The 2004 STEPS survey estimated that an alarming 99.9% of the adult population are at moderate to high risk of developing a NCD. NCDs are now the leading cause of premature death and disability in Tonga (WHO, 2011). Due in large part to premature deaths from NCDs, and based on research showing that previous methods were likely to have overestimated life expectancy, the estimated life expectancy for both males and females was lowered by five years in 2011, to 65 years and 69 years, respectively (Hufanga et al., 2012). As 39% of Tongans are aged under 15, primary prevention of obesity, inactivity, and poor nutritional habits will be a key prevention strategy for a healthy future population of adults.

The Tongan Government has been at the forefront of mounting a comprehensive strategy to fight these conditions, with the highest levels of Government working together to launch the National Strategy to Prevent and Control NCDs in 2004, the first such commitment in the Pacific. The challenge now for Tonga is to adapt its primary health-care system, which has successfully delivered maternal and child health interventions, to deal with the range of emerging issues, and in particular

the large financial burden associated with chronic and noncommunicable disease.

1.1 Geography and sociodemography

The key source of information for this section is the most recent Census, conducted in 2011 (Statistics Department Tonga, 2013); unless otherwise stated, data is taken from this report.

Geography: The Kingdom of Tonga is located in the southern Pacific Ocean, approximately 900 km south of Samoa and approximately 700 km east-southeast of Fiji. Tonga is comprised of over 170 islands and islets scattered in a north-south direction over 800 km, of which around 36 are inhabited. There are five administrative divisions based on the major island groups, namely:

- Tongatapu, the main island where the capital, Nuku'alofa is situated
- Vava'u
- Ha'apai
- 'Eua
- the Ongo Niua group, referred to as the Niuas.

Population growth: Tonga had a population of 103 252 in the 2011 Census, having increased 1.2% since the 2006 Census at an annual growth rate of 0.2% (Statistics Department Tonga, 2013). In 2011 there were 18 033 households, a 3.4% rise on the 2006 figure. The population growth rate is relatively low, considering a crude birth rate of about 27 per 1000 population and the fact that child mortality rates are amongst the lowest in the Pacific (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014). The explanation is found in the high net emigration rate, which averaged 19.8% between 1986 and 1996 and has continued, with around 1.8% of the population emigrating every year between 1996 and 2006. Those aged between 15 and 24 years of age are the largest cohort to emigrate (Statistics Department Tonga, 2008). It is now estimated that as many Tongans live overseas as in Tonga, with large communities in New Zealand, the United States and Australia. Strong relationships between Tongan communities residing in Tonga and abroad contribute significantly to the Tongan economy through remittances and imports (UNDP, 2013).

Seventy-three per cent of Tonga's population live on the main island, Tongatapu, and roughly a third (35%) of the population live in greater

Nuku'alofa, Tonga's capital city. The population on Tongatapu has increased by 5.1% since 2006 as people increasingly move there for work and educational opportunities. Careful monitoring of internal and external migration is thus important in order to provide adequate health services to the population and understand health determinants in urban and rural settings. The remainder of the population is dispersed across the outer island groups, with Vava'u accommodating 15% of the population, Ha'apai 6%, Eua 5% and 1% in the Niuas (Statistics Department Tonga, 2013).

Population structure: Demographic transition has been relatively slow in Tonga, with the median age of the population in 2011 being 21 years of age and only 8% of the population currently aged 60 and over (Statistics Department Tonga, 2013). Out-migration coupled with high birth rates and relatively low infant mortality mean that almost one in four Tongans (39%) are aged less than 15, as shown in Figure 1.2. Just under half (49.7%) of the population is female; however, as females have a life expectancy which is five years greater than males, the proportion of the population which is female will increase in the future. The dependency ratio of 84 is high, meaning that 100 people of working age (15–59) are needed to support 84 dependents who do not or are not able to work, a figure which is elevated by the high out-migration of the working-age population.

Ethnicity: Tonga's population is very homogenous, with over 97% being Polynesian or part-Polynesian. The 2.5% of foreign nationality are mainly Chinese (843 individuals), European (569 individuals), Fijian (304 individuals), other Pacific Islander (236 individuals), other Asian (186 individuals), and Fijian Indian (133 individuals) (Statistics Department Tonga, 2013).

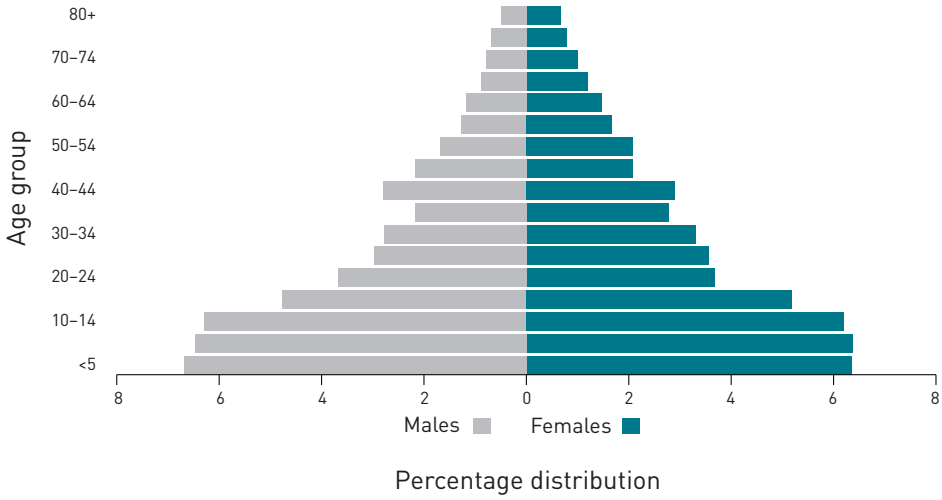
As shown in Table 1.1, the average household size is relatively large at 5.7 members. The fertility rate of 4.1 births per woman has declined significantly from around 7.4 in 1960. The birth rate of roughly 27 per 1000 has remained constant at a relatively high level since 2006. The crude death rate has increased from 5.0 per 1000 in 2006 to 6.4 in 2011, but this figure is still relatively low. Roughly a quarter (23.5%) of the population live in urban areas,[1] comprised of the villages of Kolofo'ou, Ma'ufanga and Kolomotu'a, which make up Nuku'alofa in Tongatapu. The population density in the aforementioned urban areas (2123 people/km^2) is around 17

1 The definition of rural/urban is however not particularly meaningful in a small country such as Tonga, with the main criterion used by the National Department of Statistics being that urban areas have a population of 5000 or more inhabitants.

times higher than that of rural areas (124 people/km^2), with the average population density across Tonga being 159 people/km^2. Again, the density varies greatly across the island groups, from only 18 people/km^2 in the Niuas to 290 people/km^2 on Tongatapu. As in other small island nations in the Pacific and elsewhere, general socioeconomic development and provision of health services to remote, low-density areas is a challenge for Tonga.

Language: Tongan is the official language, but English is taught in all primary schools, is the language of instruction in most secondary schools, and is increasingly being used as the official language. Government documents are often published in both languages. Literacy is high (98.2%) in both males and females, with few people (11%) literate in Tongan only and around 86% literate in both Tongan and English or other languages.

Figure 1.1 Population pyramid 2012



Source: Tonga Department of Statistics and Tonga Ministry of Health et al., 2014

Education: Education is provided free of charge and is compulsory between the ages of five and 14, with enrolment rates of at least 94% across all districts and for both genders. Around three quarters of Tongans have also attended secondary education, with a further 16.1% going on to attend tertiary education, although completion rates are low at 31.1% and 3.1%, respectively. Additionally, around one in ten Tongans

Table 1.1 Trends in population/demographic indicators, selected years

Indicator	2006	2007	2008	2009	2010	2011	2012*
Total population (thousands)	102.0	102.0	102.0	102.0	102.0	103.3	..
Population, female (%)	49.2	49.2	49.2	49.2	49.2	49.7	..
Population, male (%)	50.8	50.8	50.8	50.8	50.8	50.3	..
Population ages 0–14 (%)	38	38	38	38	38	39	..
Population ages 60+ (%)	6	6	6	6	6	8	..
Population growth (average annual % increase)	0.4[a]	0.4	0.4	0.4	0.4	0.2	..
Population density (people/km^2)	157	157	157	157	157	159	..
Age dependency ratio (population 0–14 & 65+: population 15–64 years)	86	86	86	86	86	84	..
Urban population (%)	23	23	23	23	23	23	..
Average household size	5.8	5.7	5.7	5.7	5.7	5.7	..
School enrolment rates (% of 6–14 year-olds)	97.9	97.9	97.9	97.9	97.9	94.4[b]	..
Total fertility rate (births/ woman) ∞	4.1[c]	3.7[c]	3.7[c]	3.7[c]	3.8[c]	3.7[d]	4.1*
Crude birth rate (per 1000) ∞	26.5[c]	26.5[c]	26.7[c]	25.4[c]	26.0[c]	26.8[d]	28.1*
Crude death rate (per 1000) ∞	5.0[c]	5.2[c]	5.1[c]	5.5[c]	5.3[c]	6.4[d]	..

Note: Data from the 2012 DHS is included where relevant to show the most recent data; however, due to sampling, it is not considered as accurate as the data for previous years, which comes from routine population-based health ministry data. For census data, the data points between 2007 and 2010 are interpolated and are not actually measured. a = 2006 figure is calculated between 1996 and 2006. b= 2011 figure is for children aged 5–14, whereas 2006 data is for children aged 6–14. ∞While these indicators are better reported as multi-year averages, they have been simplified for reference in this table – see Tables 1.3 and 1.6 and accompanying text for further information around stochastic variation in figures due to the small population size.

Source: Data primarily from the 2006 Census (Statistics Department Tonga, 2008) and 2011 Census (Statistics Department Tonga, 2013), or from the following sources as denoted: *2012 data from DHS (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014); c = data from Ministry of Health 2010 Annual Report (MoH, 2010b), d= data from Ministry of Health 2011/2012 Annual Report (MoH, 2013b).

have a Technical Vocational Education & Training (TVET) qualification. While educational attainment is quite similar between males and females, nearly 2.5 times as many urban residents have a tertiary, vocational or professional qualification compared to their rural counterparts (Statistics Department Tonga, 2013).

Religion: Religion has played a central role in the life and identity of Tongans since missionaries brought Christianity to Tonga in the 19th

century. Around 98% of Tongans subscribe to Christianity and attend church regularly, and Tonga's constitution mandates that Sundays are a day of worship on which trade, professional or commercial undertakings should not be undertaken. The churches also play an important role in providing health education and promotion and in some cases, providing basic health services.

Family structure: In Tonga, the family continues to play a central role in everyday life. Families are typically large, with extended relatives sharing living quarters, food, income and tasks such as child-rearing. The oldest members of the family and society are conferred a high level of respect and each household is headed by a male patriarch who makes decisions on behalf of the family members, a role which is passed down to his eldest son. The head of the extended family, the *kainga,* is usually the oldest male relative, but sometimes the rank of *fahu* is given to a woman who is the oldest family member. This extended family structure plays an important role in caring for sick and disabled family members.

Gender: In general, work is divided according to traditional gender roles, although women are increasingly also taking on subsistence farming for family food production. Men tend to be the decision-makers in the public, political and private spheres, as demonstrated by women's poor representation in politics, with only one female representative in the Legislative Assembly and none in the Judiciary. Although a woman may become Queen, the constitution forbids a woman from inheriting hereditary noble titles or becoming a chief. Furthermore, as established in the constitution (section 111), women in Tonga are unable to own land, and leasing is difficult – a significant deterrent to establishing a small business, for example. Legislation to protect women's rights in terms of employment, domestic violence and inheritance is also lacking (JICA, 2010).

1.2 Economic context

Tonga moved from a lower-middle income to an upper-middle income country in mid-2013 with a gross national income (GNI) per capita of US$ 4240 in 2012 (WB, 2013b). On the 2012 Human Development Index Tonga was ranked as having "medium human development", with a rank of 95 out of 195 countries, just above Samoa and Fiji (tied 96th position) and well above other Pacific countries such as Vanuatu (124th) and the Solomon Islands (143rd) (UNDP, 2013). Tonga had a gross domestic product (GDP) per capita of US$ 4494 in 2012, a doubling of the 2000

GDP of US$ 1926 per capita (WB, 2013b). Tonga does however remain dependant on external aid and remittances to offset a large trade deficit arising from heavy reliance on imported foodstuffs, fuels, chemicals, machinery and transport equipment (Central Intelligence Agency, 2013b). In 2011, Tonga received net overseas development assistance (ODA) of US$ 896 per capita, over one fifth of the GDP per capita, a steep increase from the US$ 250 per capita received in 2008 (WB, 2013b). Tonga's Strategic Development Framework (TSDF) defines key approaches to socioeconomic development, which include a focus on creating enabling environments for private sector growth and supporting the main productive sectors, namely tourism and agriculture, forestry and fisheries (MoFNP, 2011b). Up to 90% of Tongan households are estimated to receive remittances (Brown and Jimenez, 2007), with remittances averaging around 30% of GDP between 2000/2001 and 2007/2008 and being the leading source of revenue, at 42.5% of GDP in 2004 (Foliaki et al., 2008). Following the global economic crisis in 2008, remittances declined by 82 million Tongan pa'anga (TOP) and continued to fall, from TOP 280.4 million to TOP 194.2 million in the economic recovery process of 2011/2012. In 2012 remittances were estimated to account for 24% of GDP (WB, 2012b).

The economy recorded a strong average annual growth rate of 2.6% between 2008 and 2011, although this was largely due to reconstruction of the Nuku'alofa central business district, a large Chinese loan-funded construction project and other donor-funded aid projects such as the redevelopment of Vaiola Hospital. With the finalization of these projects, as anticipated, total growth slowed to 0.8% in 2011/2012 and to 0.2% in 2012/2013 (MoFNP, 2013).

The primary sector including subsistence farming as well as agricultural, forestry and fishery exports forms the backbone of Tonga's economy, consistently accounting for close to 20% of GDP. Main exports include squash, sandalwood, sea cucumbers, tuna and seaweed; however, exports weakened during the global financial crisis (GFC) and industries need to ensure that they introduce sustainable practices. The primary sector's growth is expected to slowly pick up, with projected growth estimated at 2.1% in 2012/2013 and 2.2% in 2013/2014 (MoFNP, 2012). Tourism is hoped to hold significant economic potential for Tonga as has been the case in Fiji and Samoa. In 2011, Tonga had 94 960 registered arrivals (roughly the same as the population size), mostly tourists or non-residing Tongans (Statistics Department Tonga, 2012). Aiming to

build tourism infrastructure, several development projects have been funded through a soft loan from China including development of roads and interisland communication as well as the construction of a wharf in Nuku'alofa to enable docking of major cruise ships (MoFNP, 2012).

Labour force and unemployment: There are limited opportunities for formal, salaried employment in Tonga and a large portion of the population is engaged in subsistence agriculture. While official unemployment figures are low (1.1% of the population, based on those who register with the Ministry of Labour Employment Service Unit), around one third of the population undertake unsalaried subsistence work. In the 2011 Census, just over half (52%) of the adult population reported that they had worked in the preceding week, of whom 71% had performed paid work and 29% performed unpaid subsistence work. Labour force participation rates are significantly higher for men (63%) than women (42%). Amongst those who had not worked in the week preceding the Census were 13 801 people with domestic duties, 9026 students, 3857 retirees and 838 people with disabilities (Statistics Department Tonga, 2013).

Distribution of wealth: The traditional highly stratified nature of Tongan society means that much of the country's wealth and large-scale enterprise is held by the nobles and royal family. Tonga is estimated to have a Gini coefficient of 0.42, where 0 is perfect equality and 1 absolute inequality (Asian Development Bank, 2004). Income inequality also exists between urban and rural areas as a result of lack of access to markets and other services in rural areas. Rural Tongans are three times as likely to be in the lowest wealth quintile and half as likely to be in the highest wealth quintile compared to urban inhabitants (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014). Shortages of rural land, worsening with rising sea levels and the effects of climate change, are mediating a large amount of internal migration to Tongatapu, resulting in high dependency ratios and an increase in substandard housing in informal squatter settlements around Nuku'alofa, often in low-lying flood-prone areas. Although remittances have a positive impact on poverty, there are estimates that in 2006 20% of Tongans lived in "poverty housing", defined as not meeting minimum requirements for "tenure security, affordability, adequacy, accessibility, proximity to services, availability of infrastructure, and cultural adequacy" (Habitat for Humanity, 2009).

Poverty: As a traditionally cashless society, networks of extended family, community and church act as a safety net to ensure that all individuals obtain their basic needs for food and shelter. Although they are weakening in the modern context, these networks are still relied upon, particularly by subsistence households. The Government thus uses the term "hardship" instead of "poverty" to describe those who are able to cover their basic needs but struggle to pay for items such as education, transport and health care. According to the Second MDGs report there is no extreme poverty (internationally defined as living on <US$ 1.25 per day) (MoFNP, 2010a). However, more than 3000 Tongans live in absolute/food poverty (locally defined as living on <TOP 24.12 per person per week). Absolute poverty rose from 2.8% in 2001 to 3.1% in 2009 (Statistics Department Tonga, 2010) and the number of people living in hardship (calculated against the National Basic Needs Poverty Line of TOP 49.73 per person per week) was also estimated to have increased from 16.2% in 2001 to almost a quarter (22.5%) of the population in 2009. The highest increase was seen in the outer islands following a decrease in remittances due to the GFC, where the proportion of the population below the poverty line rose from 11.8% in 2001 to 22.9% in 2009.

Table 1.2 Macroeconomic indicators, selected years

Indicator	1986	1996	2006	2010	2011	2012	2013
GDP (current US$, millions) (1)	..	..	296.0	..	..	449.4	..
GDP (TOP, millions)	..	..	..	..	753.1	..	..
GDP, PPP (US$, millions)	..	..	..	..	487.6	..	..
GDP per capita (current US$)	..	..	..	3544	4152	..	..
GDP per capita, PPP (US$)	..	..	4250	..	4666	4332	..
GDP average annual growth rate (%)	..	..	0.12	..	1.16	..	..
GDP per capita average annual growth rate (%)	..	..	..	..	0.72	..	..
Public debt (% of GDP)	..	..	..	..	39	45	45
General government final consumption expenditure (% of GDP)	..	..	20.88	18.88	..	..	..
Value added in industry (% of GDP)	-3	-16	-0.88	0.17	..	..	..
Value added in agriculture (% of GDP)	38	30	19.65	20.34	..	..	..
Value added in manufacturing (% of GDP)	5	4	9	7.52	..	..	..
Real interest rate (%)	-5	6	-5	..	1.93	..	..
Official exchange rate (LCU per US$, period average)	1.5	1.2	2.03	..	1.73	..	..

Sources: WB, 2013a, WB, 2014a. Note: LCU = Local currency unit

1.3 Political context

Historical context: For several centuries dating back to around 950 AD, and continuing to the modern day, Tonga has been ruled by a line of kings and territorial chiefs. Tonga became a unified nation in 1845 when King Siaosi (George) Tupou awarded noble titles associated with estates of land to special chiefs, bringing them under his power. These titles continue today and form the basis of social stratification into three classes: (i) the King and Royal Family; (ii) the 28 noble titleholders (holding one or more of the 33 noble titles); and (iii) the untitled commoners. The vertical class structure is however broken up by kinship relationships, so that for many Tongans traditional social status is measured by distance from hereditary chiefly lines. In 1875, King Tupou also established the first and longest-running constitution in the Pacific. The Constitution contains a declaration of the rights of the people, establishes the system of governance including the 33 noble titles, and provides laws for the ownership, succession and sale of land. Europeans first discovered the outer islands of Tonga in 1616, with Abel Tasman being the first white man to visit Tongatapu in 1643. Captain Cook arrived some years later in 1773, followed by a steady stream of English missionaries leading to the King's conversion to Christianity in 1826; from this time on the large majority of the population adopted the Wesleyan (Methodist) or Catholic faiths. Although Tonga was a British protectorate between 1900 and 1970, the fact that it had a constitution and a stable, established form of government meant that it is the only country in the Pacific that was never colonized.

Modern political context: The monarch, currently King Tupou VI, is the head of state and oversees the judiciary as well as the three areas of the executive: the Cabinet of Ministers appointed by the monarch; the Privy Council, which includes all members of the Cabinet sitting with the monarch; and the Legislative Assembly. Until recently, the monarch held absolute power and could appoint the prime minister and the parliament from within the noble titles, as well as the Cabinet for life terms. In 2010, constitutional reform occurred and some of the King's power was devolved to the Cabinet, who now answer to the Legislative Assembly. The first election under this new structure was held in November 2010, and Tonga's citizens are now able to elect a majority (17 out of a possible 30) of representatives, in addition to nine noble representatives elected by the 33 noble titleholders and up to four additional members appointed by the King on the Prime Minister's advice. Furthermore, the members of Cabinet and the Parliament now have the power to elect the Prime

Minister. As a result of this process, the first Minister for Health without a medical background was appointed in 2010. However, this Minister and an additional Minister for Health both resigned for political reasons in the 18 months following the election.

While there is no subnational government in Tonga, the larger island groups, Ha'apai and Vava'u, have elected governors who are members of the Privy Council and have delegated responsibilities in the overall administration and reporting of outer islands affairs. The Kingdom is divided into 23 administrative districts, each headed by a District Officer who is responsible for reporting to the Office of the Prime Minister. A Town Officer is elected by each village every three years to represent the Government and facilitate village meetings to discuss government regulations and associated matters.

Governance indicators: According to international governance indicators, Tonga is now situated around the global average in terms of its performance. This is a substantial improvement, from being considered one of the world's most corrupt countries, ranking 175th out of 179 countries on the 2007 Corruption Perception Index, to 95th out of the 182 countries in 2011 (Transparency International, 2013). There does, however, continue to be a high perceived level of corruption in Tonga, and with the existing political and demographic structure rooted in a strong sense of kinship, combined with the late democratic awakening, political corruption and nepotism are prominent issues.

Membership of international organizations that impact on health: Tonga is a member of many regional and global organizations including the United Nations (UN), the ADB, the Red Cross, the International Monetary Fund (IMF), WHO, the Food and Agriculture Organization (FAO), the Group of 77 (G77), the Commonwealth of Nations, the Pacific Islands Forum (PIF) and the Secretariat of the Pacific Community (SPC). Tonga is also an active participant in regional trade agreements including the Pacific Islands Countries Trade Agreement (PICTA), the Pacific Agreement on Closer Economic Relations (PACER) and the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA). Tonga joined the World Trade Organization (WTO) in 2005 in an agreement which saw it reduce its import tariffs to 15% on most goods and open its domestic markets to foreign investment. This has led to an increased reliance on imported foods, including high fat meats (particularly corned beef, mutton flaps, and chicken parts) as well as refined carbohydrates and pre-packaged,

high calorie snack foods and drinks. Consumption of these products and deviation from the traditional lifestyle and diet is having a deleterious impact on the health of citizens.

Major international treaties that impact on health: Tonga is a signatory to the 2000 Millennium Declaration and the Millennium Development Goals (MDGs) and has made strong progress. Tonga has also ratified the Convention on the Rights of the Child (CRC), the Convention on the Rights of Persons with Disabilities (CRPD) and the WHO Framework Convention on Tobacco Control. Tonga has not however signed the Convention on the Elimination of all forms of Discrimination against Women (CEDAW), citing as the main reason for not having done so that it would require significant changes to the Constitution to enable female succession to the throne, nobility and hereditary titles, and changes to land laws. Tonga does have a national-level task force on violence against women, and in September 2013 a Family Protection Bill was passed which aims to protect women and children against violence through criminalization of domestic violence and by allowing police intervention (UN Women, 2013).

1.4 Health status

Research conducted in 2010 by the Ministry of Health in conjunction with researchers from the University of Queensland highlighted deficiencies in Tonga's death reporting, leading to the conclusion that previous estimates of life expectancy were inaccurate. As a result, the estimated life expectancy was reduced by five years, to 65 years, for males, and by three years for females, to 69 years (Hufanga et al., 2012)[2]. As Tonga has a relatively low infant mortality rate (IMR), averaging 15 deaths per 1000 live births between 2006 and 2012, this decrease is predominantly driven by high adult mortality, most likely due to NCDs. For further discussion of adult, child and maternal mortality see *1.4.1 Mortality,* below. The health status of Tonga's citizens benefits from almost universal access

2 This research is currently being updated by the Ministry of Health. Whilst the DHS reports that the 2011 Census estimated life expectancy at birth had improved by 1.3 years for males and 0.3 years for females during 2006–2011, with the advantage in LE of females over males declining by 1.6 years, estimates of the level of mortality based on Ministry of Health data and data from the 2011 Census are actually somewhat different to the above figures. They instead suggest that infant mortality rates declined by two deaths per 1000 births between 2006 and 2011. Furthermore the DHS estimated the IMR to be 17 per 1000 live births in 2012. The divergences in these rates are in part due to the use of different methodologies (i.e. sampling in the DHS versus population-based routine Ministry of Health data). The key issue is that such indicators should really be done over multiple years with confidence intervals which denote the high level of uncertainty due to the small population size.

to primary health care, safe drinking water and adequate sanitation facilities. Tonga's fertility rate remains relatively high at around 3.7–4.1 births per woman, a figure which has remained constant for roughly 15 years, having declined from an estimated range of around 6.0 to 7.5 during the 1960s and 1970s (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014). For more information on maternal and reproductive health, see Table 1.5 on page 32 and associated text.

Table 1.3 Mortality and health indicators, selected years

INDICATOR	2006	2007	2008	2009	2010	2011	2012
Life expectancy at birth (Male) Life expectancy at birth (Female)	67.3[a] 73.0[a]	70[b] 72[b]	70[b] 72[b]	70[b] 72[b]	65[b] 69[b]	65[b] 69[b]	..
Mortality rate male (per 1000)[d] Mortality rate female (per 1000) [d]	181.2 116.1	180.5 113.6	178.5 111.9	176.6 110.2	174.6 108.5	172.6 106.8	170.6 105.1
Maternal mortality ratio (per 100 000 live births) ∞ ϕ	110.5[c]	36.5[b]	76.1[b]	114.4[b]	37.1[b]	0[b]	..
Infant mortality rate (per 1000)ϕ	10.7[c]	11.7[b]	16.4[b]	14.5[b]	21.5[b]	15.2[b]	17[e]
Total fertility rate	4.1[c]	3.7[b]	3.7[b]	3.7[b]	3.8[b]	3.7[b]	4.1[e]
Population with safe water supply (%)	97.5[c]	98.0[b]	99.0[b]	99.9[b]	99.0[b]	99.9[b]	..
Households with adequate sanitary facilities (%)	97.2[c]	99.6[b]	98.0[b]	99.7[b]	99.0[b]	99.5[b]	..
Population with access to appropriate health-care services with regular supply of essential drugs within a one-hour walk (%)	100[c]	100[b]	100[b]	100[b]	100[b]	100[b]	..

Note: ∞ the maternal mortality ratio has been incorrectly labelled as maternal mortality *rate* in the Ministry of Health annual reports; ϕ See Table 1.6, page 35 for absolute number of maternal and infant deaths. The Ministry of Health projects the same established data value on to the following years until a new figure is established; for example, the life expectancy was established in 2006 and then not again until 2010.

Sources: a = 2006 Census (Statistics Department Tonga, 2008), b = Ministry of Health annual report 2011/12 (MoH, 2013b), c = Ministry of Health annual report 2010 (MoH, 2010b), d = World Bank databank (WB, 2013b), e = DHS data (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014).

1.4.1 Mortality

It is prudent to first note that there remains uncertainty in and limitations to Tonga's mortality data. While all deaths occurring in health facilities are certified by a doctor, around one in every two deaths occur in the community and hence may not be medically certified. In such instances, the cause of death is often reported as "unknown" or "symptoms, signs

and abnormal findings not elsewhere classified"—classifications which do not produce trustworthy and informative mortality data. The fact that "symptoms, signs and abnormal findings not elsewhere classified" was the second leading cause of reported mortality in 2010 highlights the scale of the issue. In 2010, a system of medical record review was implemented as part of a research project (Carter et al., 2012a), and ongoing use of this methodology has helped to reduce the number of deaths allocated to unknown causes.[3] As a result, in 2011 "symptoms, signs and abnormal findings not elsewhere classified" accounted for less than 5% of certified deaths; but death due to unknown causes was the second leading cause of death, accounting for 22.5% of deaths (see Figure 1.3) (MoH, 2013b) and many of these represent deaths that occurred outside of hospitals. Mortality data is also biased by the nature of diseases, with patients with a chronic disease, such as an NCD, more likely to live long enough to reach the hospital than those with acute infections or deaths due to injuries/external causes, underlying causes of death which are thus likely to be underrepresented in Tonga's mortality data.

Based on an assessment and synthesis of local mortality data, Tongan adults were shown to experience an adult (15–59 years) mortality rate which was roughly three times higher than New Zealand and Australia, with an estimated mortality rate of 26.7% for Tongan males and 19.8% for Tongan females between 2005 and 2009 (Hufanga et al., 2012). This research, however, suggests that even reconciled mortality data are under-enumerated, and places estimates of adult mortality in an even higher range of 28.6% to 36.3% for males and 20.9% to 27.7% for females (Hufanga et al., 2012).

Tonga has undergone a profound epidemiological transition since the 1950s, when infectious diseases accounted for 32% of deaths and cardiovascular disease (CVD) accounted for less than 6% of deaths (WPRO, 2011). Today NCDs, namely cancers, CVD (also referred to as diseases of the circulatory system), respiratory disease, diabetes and other NCDs, account for almost three in every four (74%) deaths across all ages (WHO, 2011). Communicable diseases, maternal, perinatal and nutritional conditions account for around 22% of deaths, and injuries are

3 Carter et al. also noted discrepancies in the way deaths are certified, with cause of death data for previous years calculated on *immediate* cause of death and not the *underlying* cause of death; while their research accounted for this finding, it is unclear whether it was done in the Ministry of Health annual reports.

responsible for the remaining 4% of deaths. Crude incidence and death rates for all medically certified deaths are also shown for those aged 25 and above in Table 1.4 below. It should be noted that as these figures do not include the significant number of deaths which are not certified, mortality rates are likely to be underestimated and to show a high level of uncertainty when taken for a single year only, and thus should be viewed with caution.

Table 1.4 Crude incidence and death rates from NCDs in Tonga, 2008

Disease	Incidence rate *per 100 000, aged 25+*			Death rate *per 100 000, aged 25+*		
	Male	Female	Total	Male	Female	Total
Malignant neoplasms	216	247	232	174	148	161
Circulatory diseases	3300	2612	2948	442	224	331
Diabetes mellitus	3700	5600	4672	28	22	25
Respiratory diseases	..	..	..	122	148	135

Source: MoH, 2008

According to Ministry of Health Annual Reports, for more than a decade diseases of the circulatory system, "symptoms, signs and abnormal findings not elsewhere classified", neoplasm and diseases of the respiratory system have all consistently been in the top four leading causes of death. In 2011, the Ministry of Health recorded a total of 656 medically certified deaths from both inpatient and outpatient deaths. There were significantly more deaths amongst males certified[4] (n=400, 61%) than females (n=256, 39%). Diseases of the circulatory system were the leading cause of male death, while unknown cause of death was the leading cause of death in females. NCDs accounted for four of the top five causes of death (see Figure 1.3), as discussed below.

Diseases of the circulatory system: In 2010 and 2011, diseases of the circulatory system were the leading cause of death in Tonga. CVD is a major cause of premature mortality, with almost half (48%) of all deaths occurring in those aged under 64 (i.e. the working aged population) (WB, 2012a). This is especially the case for men, who account for 68% of the CVD deaths. The most common causes of cardiovascular mortality are acute myocardial infarction/cardiac arrest,[5] accounting for almost half of

4 This reflects the higher mortality rate in males, but also the preferential certification of male deaths given that males hold land and a death certificate is required for transfer of land titles.

5 This is also a possible reflection of poor certification (e.g. including "heart stopped") and therefore the distribution of CVD diseases within the category requires further attention.

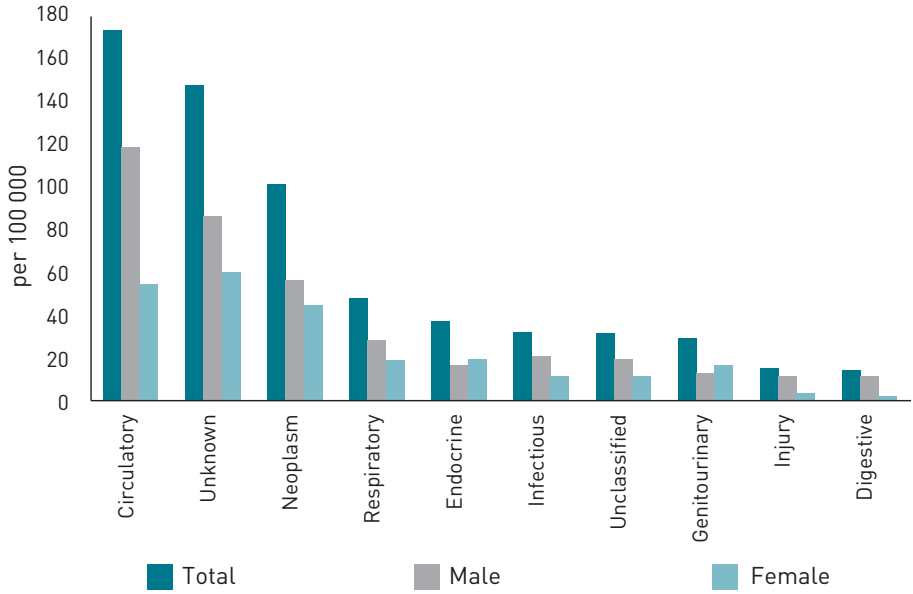
the deaths (48%), followed by heart failure (21%) and stroke (12%). Deaths due to CVD have almost doubled amongst males, from approximately 194–382 deaths per 100 000 males in 2001–2004 to approximately 423–644 deaths in 2005–2008. Females also witnessed substantial increases, from 108–227 deaths to 194–321 deaths per 100 000 females across the same time period (Carter et al., 2012a).

Neoplasms: Neoplasm was the third leading cause of mortality in 2011, accounting for over 15% of all deaths; however, deaths from cancer are thought to be underreported, especially deaths occurring outside of hospital. Since 2006, neoplasms have however consistently been in the top four leading causes of mortality, and the reported cancer mortality continues to increase over time due partly to late detection. The age-standardized cancer incidence in Tonga was estimated to be 151.4 per 100 000 person-years over the period 2000–2005 (Foliaki et al., 2011). This was considerably lower than rates for Pacific Islanders living in New Zealand. The researchers concluded that the low incidence in Tonga was due to environmental rather than genetic factors and that it is likely to rise with the adoption of Westernized lifestyles. The Ministry of Health reports that for the years 2000–2005 there were 759 cases of cancer (432 female, 327 male). The leading cancers among males were lung (14.4%), prostate (12.8%), liver (11.3%) and stomach (9.8%). Among females, the leading cancer sites were the breast (22.9%), uterus (12.0%), cervix (7.6%) and ovary (6.3%). In both males and females the primary site was unknown in over 8% of cases.

Diseases of the respiratory system: In 2011, there were 48 deaths (7.3% of all deaths) due to diseases of the respiratory system, with deaths more common in males (60% of all deaths). The leading causes were: chronic obstructive pulmonary disease, unspecified (seven cases, all of which were male); hypostatic pneumonia, unspecified (six deaths, three of which were male); bronchopneumonia, unspecified (five cases, two of which were male); and status asthmaticus (five deaths, three of which were male). This represented a significant reduction in deaths from pneumonia from 2010, when it was responsible for close to half (46%) of all deaths due to respiratory issues. Caution must however be taken not to over-interpret the data when using single year data, given the small population size (see for example the impact that a small change in the number of deaths has on IMR and MMR).

Endocrine, nutritional and metabolic diseases: Endocrine, nutritional and metabolic diseases were the fourth leading cause of mortality in 2011,

Figure 1.2 Top ten causes of certified inpatient and outpatient deaths by gender, 2011



Note: *Endocrine* includes endocrine, nutritional and metabolic diseases; *Infectious* includes certain infectious and parasitic diseases; *Unclassified* relates to "symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified"; *Injury* includes injury, poisoning and certain other consequences of external causes.

Source: MoH, 2013b.

with diabetes accounting for 89% of these deaths (MoH, 2013b). Deaths due to diabetes were slightly more common in females (n=20, 54%) than males (n=17, 46%). Research based on medical record review has, however, shown that diabetes is underrepresented, with 80% of deaths for which diabetes was selected as the underlying cause originally assigned to other causes, notably septicaemia and cardiovascular disease (Carter et al., 2012a). The research thus estimates mortality from diabetes for 2005–2008 at 94 to 222 deaths per 100 000 population for males and 98 to 190 for females (based on the range of plausible all-cause mortality estimates).

Maternal and child mortality

It is important to note that the maternal mortality ratio and, to a lesser extent, the infant mortality rate show wide variations over time due to small population size and a limited number of deaths. In effect, an MMR of around 40 per 100 000[6] equates to roughly one maternal death, and

6 For example, the scale of the denominator for MMR (per 100 000 births) is roughly equivalent to Tonga's population, of which women of reproductive age are only a small component.

as previously seen in Tables 1.3 and 1.5, great variations in the MMR (i.e. from 36 to 114) in effect account for less than three total deaths. Single year trends are thus not useful, and analysis of trends over time should ideally be done over longer periods of time using aggregated data. The infant mortality rate (measured per 1000 live births) requires at least three infant deaths to manifest a change, and the doubling of the IMR from 10.7 in 2006 to 21.5 in 2010 represents a 50% increase in deaths (from 29 deaths per year to 45), not a doubling (see Table 1.5 for absolute measures).

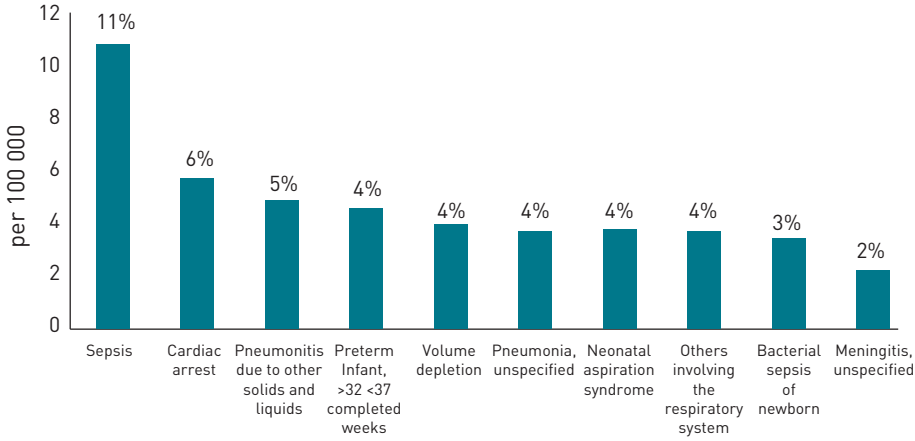
Child mortality

Tonga has averaged an under-five mortality rate of around 24 per 1000 between 2006 and 2012 (see Table 1.5), a rate which is far lower than seen elsewhere in the South Pacific. Thus, while Tonga is on track to meet MDG target 4A (reduce by two thirds the under-five mortality rate from the 1990 baseline of 27/1000) (MoFNP, 2010a), this target will be challenging for Tonga with an already low baseline and the aforementioned issues with accurate measurement of trends in a small population with a low absolute number of events. The main causes of death in children under five, babies in particular, are prematurity, sepsis, pneumonia, gastroenteritis and meningitis (Figure 1.4). Close to half of these deaths (45%) occur in the neonatal period, with the leading causes of neonatal mortality being preterm delivery (40%), congenital abnormalities (20%), infection (15%) and asphyxia (15%) (UNICEF, 2012). The MDG target for IMR is four deaths per 1000 (equating to an absolute number of nine infant deaths each year); however, for Tonga to reduce the IMR below 13 they would need to invest in complex intensive care for premature babies, at a prohibitive cost, and this is unlikely in the immediate future considering resourcing constraints (MoFNP, 2010a).

Maternal mortality

Tonga has averaged an MMR of around 62 per 100 000 live births between 2006 and 2012 and is on track to meet MDG target 5A (51 per 100 000). While there are, on average, less than two maternal deaths per year, the most common cause of maternal death is postpartum haemorrhage, and complications from obstructed labour, puerperal sepsis and antepartum haemorrhage are also common. Further interventions, such as addressing a shortage of midwives and obstetricians in a number of health facilities, and treatment and prevention of gestational diabetes and pregnancy-induced hypertension, will need to be addressed to further reduce preventable deaths (MoFNP, 2010a).

Figure 1.3 Main causes of death in children under five years (2000–2010)



Source: Percival and Stowers, 2011

1.4.2 Morbidity

It is also important to understand what diseases and conditions are leading to disability and a loss of healthy years of life. Estimates[7] of Tonga's health-adjusted life expectancy (HALE) (measuring the equivalent number of years of life expected to be lived in full health, free from disability), decreased by almost three years from 62.9 in 1999 to 60.1 years in 2010 (Institute for Health Metrics and Evaluation, 2013). Disability-adjusted life years (DALYs) quantify the years of life lost through premature mortality as well as the number of years lived with disability. In 2010 the top three causes of DALYs were diabetes mellitus, ischaemic heart disease, and lower respiratory infections.

Hospital admissions: Further information around the morbidities that were the leading causes of admission to hospitals in Tonga is provided in Figure 1.4. While NCDs account for the majority of deaths they are not among the most common causes of admission, which are overwhelmingly dominated by mothers and newborn babies with over 2750 admissions for pregnancy, childbirth and postnatal care in 2011. The second leading cause was "factors influencing health status and contact with health services" (ICD categories Z00-Z99, broadly encompassing many

7 It should be noted that this is modelled, not observed, data and thus while it is useful for indicating the scale of overall problems, caution must be taken in interpreting "trends" which may be largely driven by assumptions in the method, as described in the Global Burden of Disease (GBD) Study.

diagnoses that do not fall elsewhere) with over 2000 admissions.[8] These two causes of admission require a significant amount of the hospital's resources, and in combination are responsible for more admissions than all of the other causes of admission combined.

Diseases of the respiratory system such as influenza, unidentified viruses with respiratory manifestations, chronic obstructive pulmonary disease with acute exacerbation, asthma, pneumonia and acute bronchiolitis have consistently been the third leading cause of admission to hospitals. These diseases mostly affect children aged under five and adults aged 45 years and above, and the average length of stay is around four days (MoH, 2013b). In comparison, the average length of stay for NCD-related admissions was over four times longer, at 17 days for females and 18 days for males. Admissions for NCDs thus consume a large portion of the hospital's resources. Furthermore, as the average age of NCD patients is higher, at around 54 years, these patients tend to require additional support, creating more work for both health personnel and operational staff (MoH, 2010b).

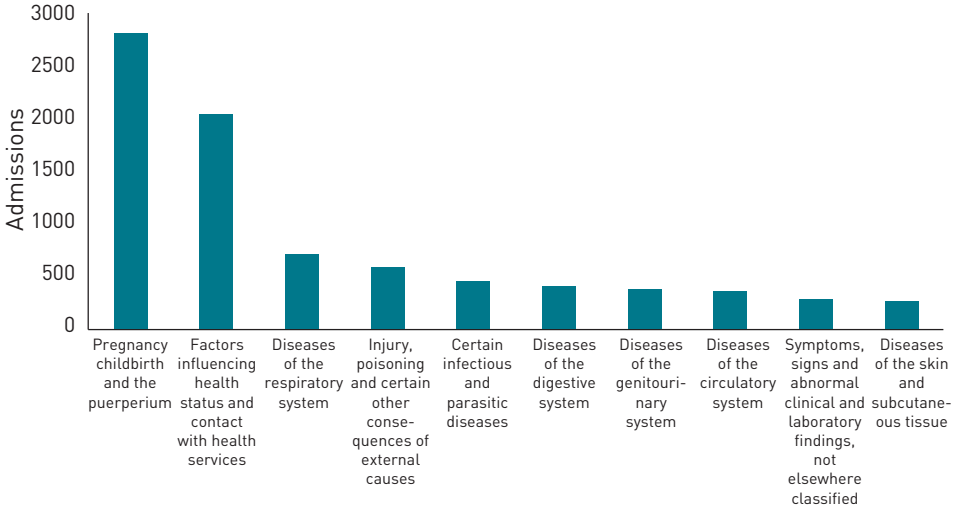
Injury and poisoning emerge as the fourth leading cause of admission, with the foremost diagnoses being head injuries and open scalp wounds and concussion, issues which are most common among males aged under 25. Viral infection with diarrhoea and gastroenteritis of presumed infectious origin are the most common conditions leading to admissions under the infectious and parasitic diseases category.

As previously mentioned, NCDs do not account for the majority of admissions. For example, although diseases of the circulatory system are the leading cause of death, they are only the eighth leading cause of admission. Similarly, the number of hospital admissions for neoplasms and for endocrine, metabolic and nutritional disorders do not feature in the top ten reasons for hospital admission. This partly reflects the fact that chronic conditions are much more survivable over the long term but also the fact that to a large degree, chronic disease management should be performed at the primary care and outpatient levels. The lack of capacity in the health system to undertake complex inpatient services such as cardiac surgery, chemotherapy, radiotherapy and renal dialysis may also contribute in some part to a limited number of admissions for these diseases/conditions.

8 Extensive use of these codes instead of attributing admissions to a particular disease/condition suggests likely issues with ICD coding capacity and an associated degree of uncertainty associated with coding results.

Admissions for mental and behavioural disorders appeared in the top ten causes of admission for the first time in 2010, thought to be due in part to improvements by the Medical Records Department in coding of these disorders (MoH, 2010b). They do not appear in the top ten leading causes of admission in 2011, but major depressive disorder was estimated by the GBD study to be one of the top five leading causes of years lived with disabilities (YLD) in Tonga, having increased the number of DALYs by 40% between 1990 and 2010 (Institute for Health Metrics and Evaluation, 2013).

Figure 1.4 Leading causes of admission to hospital, 2011



Source: MoH, 2013b

Patient contact at other health facilities: The seven health centres on Tongatapu had roughly 50 000 visits in 2012. Eighty-seven percent were acute in nature, and 7.2% were for chronic diseases (5.2% for diabetes and 2.9% for hypertension) (MoH, 2012a). Of the presentations for chronic disease, the majority of cases were due to diabetes (roughly 63% of visits), followed by hypertension (approximately 36%). Children aged under 15 years accounted for a similar proportion of the visits (41%) as did those in the productive age group (49%), and those aged over 65 accounted for around 10% of the visits (MoH, 2012a). These health centres also delivered several health programmes in 2012 including 74 immunizations, 279 home visits and 500 preventative health visits. Information from the other eight health centres on the outer islands is not reported centrally, going instead to the outer island hospitals, and is thus not available.

Maternal and child health: Table 1.5 describes key maternal, child and adolescent health indicators. The reproductive and child health clinics and outreach services from higher-level facilities provide a high level of immunization and antenatal coverage. In 2011 they provided over 30 000 immunizations covering 99.7% of the population; 2652 antenatal visits, covering 98.6% of mothers; over 8000 contraceptives; and performed interviews with 2353 mothers regarding their infant feeding practices (MoH, 2013b). The level of immunization coverage in Tonga is very high (99.8%) and surpasses many industrialized countries. Tonga is one of only a few countries to have legislation, the Vaccination Act, which makes immunization compulsory and makes those who do not vaccinate their children liable for a fine of TOP 20 or a period of imprisonment in default of payment (Kingdom of Tonga, 1988).

Table 1.5 Maternal, child and adolescent health indicators, selected years

Indicator	2006	2007	2008	2009	2010	Latest year available
Contraceptive prevalence rate (% married couples)	23.9[b]	27.7[b]	27.0[b]	29.8[b]	28.4[b]	20.3 (2012)*
Total fertility rate	4.1 [b]	3.7 [c]	3.7 [c]	3.7 [c]	3.8 [c]	4.1 (2012)*
Adolescent (ages 15–19) sexual and reproductive health						
Adolescent births as a percentage of all births	4.0 [a]	..	..	..	..	..
Adolescent birth rate (per 1000)	..	..	19.6[d]	..	..	..
Adolescent fertility rate per 1000	24 [a]	..	..	..	..	..
ANC and deliveries						
Antenatal coverage (at least 1 visit) (%)	99.0 [b]	98.7[b]	98.0 [b]	98.6 [b]	97.7 [b]	99.3 (2012)*
Antenatal coverage (at least 4 visits) (%)	..	..	85.6[d]	..	..	70.4 (2012)*
Pregnant women immunized with tetanus toxoid 2 (%)ϕ	97.2 [b]	97.6[b]	99.0[b]	97.8 [b]	97.9 [b]	41.1 (2012)*
Infants attended by trained personnel (%)	100 [b]	100 [b]	100 [b]	100 [b]	100 [b]	..
Deliveries conducted by trained personnel (%)	98.0 [b]	98.0 [b]	97.0 [b]	98.1 [b]	99.0 [b]	97.9 (2012)*
Maternal and child mortality						
Neonatal mortality rate (per 1000)	..	..	10.6[e]	..	..	8.0 (2012) *
Perinatal mortality rate (per 1000 live births)	13.1 [b]	13.0[b]	18.9[b]	13.5 [b]	12.4 [b]	8 (2012) *
Infant mortality rate (per 1000)	10.7[b]	11.7[b]	16.4[b]	14.5 [b]	21.5 [b]	17 (2012) *
Infant deaths (absolute number)	29 [b]	32 [b]	45 [b]	38 [b]	45 [b]	42 [c] (2011)
Under-five mortality rate (per 1000) Male Female	22[a] 26 [a] 18 [a]	..	26 [d]	..	..	23 (2012) * 15 (2012) * 21 (2012) *
Maternal mortality ratio (per 100 000 live births)	110.5[b]	36.5[b]	76.1[b]	114.4[b]	37.1 [b]	0 [c] (2011)
Number of maternal deaths [c]	3	1	2	3	1	0 (2011)

Table 1.5 Maternal, child and adolescent health indicators, selected years (Cont.)

Indicator	2006	2007	2008	2009	2010	Latest year available
STIs and HIV						
HIV cumulative incidence per 100 000[f]	18 (1984–2012)					
Condom use at last high risk sex (total)[g]	..	..	21.1	..	..	..
STIs – curable cases (number)[g]	88	192	..	..	..	..
Proportion of the population aged 15–24 years with a comprehensive correct knowledge of HIV/AIDS (total)[g]	..	..	36.4	..	..	..
Childhood indicators						
Immunization coverage (%)ϕ	99.1[b]	99.6[b]	99.5[b]	99.5[b]	99.6[b]	46.3 (2012)*
Exclusive breastfed at 4 months (%)	68.7[c]	67.5[c]	70.4[c]	69.6[c]	67.7[c]	71.8[c] (2011)
Exclusive breastfed at 6 months (%)	55.2[c]	54.3[c]	62.9[c]	54.8[c]	56.3[c]	22.4 (2012)*

Note: ϕ DHS and Ministry of Health methodologies of measurement may differ. While the DHS acknowledges the discrepancy with the Ministry of Health routine data, it does not always provide a full rationale for the differences. For immunization coverage, the DHS shows the percentage of children aged 12–23 months who are fully immunized against BCG, measles, and three doses each of polio and DPT. However, this relies on either sighting a vaccination card, which may not be fully updated, or relying on a mother's recall, which is shown to be inaccurate. For tetanus toxoid 2 the DHS measures the percentage of mothers aged 15–49 with a live birth in the five years preceding the survey receiving two or more tetanus toxoid injections during the pregnancy – again subject to recall bias. These issues are thought to account for the significantly lower rates of childhood immunization and tetanus toxoid immunization for pregnant women reported by the DHS. For exclusive breastfeeding the DHS measures the per cent distribution of youngest children under 3 years who are living with their mother by breastfeeding status according to age in months, and considers exclusive breastfeeding to mean receiving breast milk alone, and no other liquids (including water) in the 24-hour period prior to the survey. The Ministry of Health definition is presumed to include children who also receive water in addition to breast milk within the definition of exclusive breastfeeding.

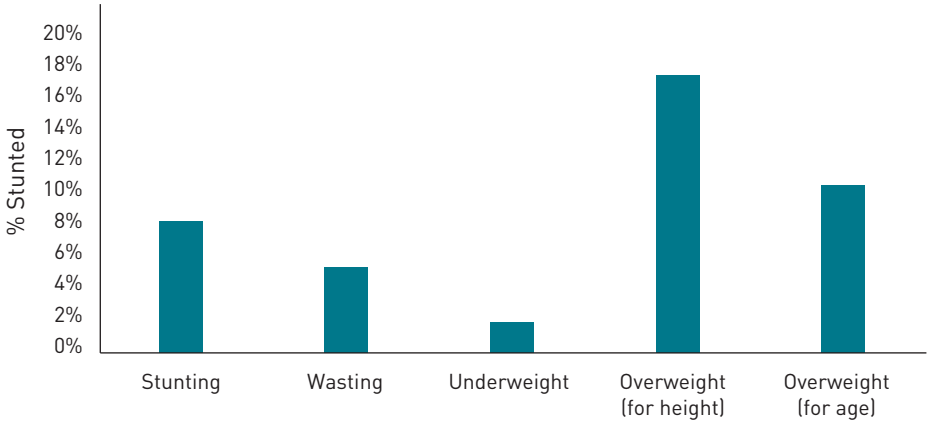
Sources: a = 2006 Census data (Statistics Department Tonga, 2008), b = 2010 Ministry of Health annual report (MoH, 2010b), c = 2011/2012 Ministry of Health annual report (MoH, 2013b), d = Ministry of Health data (of unknown source) reported in Second MDGs Report (MoFNP, 2010a), e = Ministry of Health 2008 annual report (MoH, 2008), f = (SPC, 2013), g = 2nd generation HIV surveillance report (MoH and SPC, 2008), * = 2012 DHS data (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014).

Tonga's first DHS[9] was conducted in 2012 with assistance from UNFPA and SPC (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014). The DHS was used to calculate unmet need for family planning,

9 While the DHS has proven useful in filling certain data gaps, methodological differences, namely sampling within the DHS, mean that in several instances the results may differ vastly from routinely collected health system data (as revealed in the differences between data points prior to the 2012 DHS data in Table 1.Table 1.Table 9.Table 1.5 above). The Ministry of Health prefers to use the routinely collected, population-based data for its ability to show trends over time.

estimating that 25% of married Tongan women have an unmet need for family planning, specifically for spacing (13%) and limiting (12%). The total demand for family planning is almost equal among women from urban and rural Tongatapu and the outer islands; however, interestingly, the unmet need for family planning is slightly higher among urban women (29%) as compared with rural women (25%) and is lowest among women in the outer islands (23%). Abortion is illegal in Tonga under Sections 103–105 of the Criminal Offences Act. It is reported though that exceptions are permitted in cases where it is necessary to save the life of the mother (UN, n.d.), and between 2006 and 2011 an average of 53 abortions were performed each year in Government-run health facilities (MoH, 2013b). Although only 4% of births were reported to be of low birth weight (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014), nutrition remains a concern for children. While the WHO and UNICEF recommend exclusive breastfeeding for the first six months of life to achieve optimal growth, development and health, only around 70% of Tongan infants are exclusively breastfed to four months, a rate which drops to around 57% at six months. The prevalence of underweight (2%) and stunting (8%) is minimal in Tongan children and is considered to be of low prevalence and public health concern according to WHO classifications, while the prevalence (5%) of wasting (low weight for age) is of medium public health concern (Figure 1.6 below). Clearly, the dominant concern in Tonga is the high prevalence of children under five classified as overweight for their age (>10%) or height (17%) and it is noteworthy that the prevalence of overweight and obese children increases with the wealth quintile of the household.

Figure 1.5 Nutritional status of children under five years of age, 2012



Source: Tonga Department of Statistics et al., 2014

Status of other noteworthy morbidities and preventable health conditions

STIs and HIV: Since 1987, 19 people have been diagnosed as HIV-positive in Tonga, with males accounting for over 60% of cases (MoH, 2009, 2013b). The key mode of transmission appears to be unprotected sexual intercourse amongst those aged 15 to 44 years. Since 1987, nine people living with HIV/AIDs (PLWHA) have died and several have moved overseas; of the two remaining in Tonga, one is on antiretroviral treatment (ART) according to their CD4 count. Tests for CD4 and viral load monitoring are sent overseas for analysis. Routine screening for STIs and HIV in antenatal clinics began in 2007.

In 2012, 538 patients tested positive for STIs at the Communicable Diseases Unit of Vaiola Hospital, representing a 7% increase since 2010 and a large increase (56%) since 2009. Chlamydia accounted for six out of every ten cases (59%), followed by "other STIs including those treated syndromically" (25%), gonorrhoea (12%) and chlamydia/gonorrhoea co-infection (4%) (MoH, 2013b). In 2012, as in 2010, females accounted for slightly more (55%) of the STI infections than males, although this was thought to be due to an increase in referrals from antenatal clinics. The data clearly show that STIs are more common amongst adolescents and young people, with 58% of the cases occurring in the 15–24 age group and 36% of infections in those aged 25–34. While males accounted for a higher proportion of the cases of gonorrhoea (95%), other STIs (83%) and chlamydia gonorrhoea co-infection (73%), women represented the majority (83%) of chlamydia infections, with the number of women aged 15–24 who were positive for chlamydia accounting for almost one in every three STI cases. Clearly, increased health education programmes targeting behaviour change amongst adolescents and young people are needed to reduce high-risk sexual behaviours. Although the number of people living with HIV/AIDS in Tonga is very low, high prevalence of STIs has been proven to facilitate the acquisition and transmission of HIV and the rise in STI cases must be addressed.

Other communicable diseases: Infectious diseases have largely been bought under control in Tonga. In terms of mosquito-borne diseases, the vector for malaria is not found in Tonga but a small number of cases are diagnosed each year in people returning from overseas. An outbreak of dengue fever was experienced in 2003, causing six deaths in children, and transmission continued into 2005 resulting in the further death of two adults. Out of the 30 clinically suspected cases of dengue fever in

2010, only six cases were confirmed using laboratory testing. Lymphatic filariasis has been all but eradicated following five rounds of mass drug administration, finishing in 2005, which had an estimated population coverage rate of >90% (WPRO, 2011).

There were 11 registered cases of tuberculosis (TB) in Tonga in 2012, all of which successfully underwent the directly observed treatment short course (DOTS) programme, with no relapses recorded, no treatment failures and no defaulters (MoH, 2013b). There were no suspected cases of multidrug-resistant TB. The Communicable Disease Unit of the Ministry of Health also undertook active contact tracing.

Although it should be possible to eliminate typhoid fever and leprosy in Tonga, there are still a small number of cases each year. In 2010 there was one confirmed case of typhoid, and six confirmed cases and one healthy carrier were identified in 2012. The Ministry of Health places great importance on finding and treating asymptomatic chronic typhoid carriers through contact tracing and stool sampling, and this limits the spread of typhoid. In 2012 there were three cases of multi-bacillary leprosy under the care of the Communicable Diseases Unit. There was one fatal case of meningococcal meningitis reported to the Communicable Diseases Unit in 2012. The Unit initiated contact tracing and 44 contacts from three different villages were offered prophylactic treatment. Tonga also undertakes hospital-based active surveillance (HBAS) of acute flaccid paralysis (AFP) for poliomyelitis, neonatal tetanus, and acute fever and rash as a part of the Pacific Public Health Surveillance Network (PPHSN).

Dental health status: It is reported that changes in lifestyle and eating habits have resulted in a dramatic increase in the number of dental caries (ʻAkaʻola et al., n.d.). The high burden of diabetes is also increasing the need for oral health services, as people with poorly controlled diabetes have a higher risk of tooth problems and gum disease. In 2010, the National Diabetes Centre saw 196 patients for dental referral (MoH, 2010b). A successful school-based oral health programme, the Mali Mali programme, has also been implemented since 1998 with funding from the Japanese International Cooperation Agency (JICA). This programme provides school students with tooth-brushing materials, fluoride mouth rinses, general education through various media outlets, and a fissure sealant and early intervention initiative at the Hospital Dental Clinic. Since 2000, a total of 15 600 children have been involved in the programme. Evaluation of 76 12-year-olds who had remained in the study from 2000 to 2007 showed that dental caries decreased by 70%, with the mean number

of diseased, missing and filled teeth (DMFT) falling from 4.10 in boys and 5.48 in girls to 1.48 and 2.10 respectively in 2007. Evaluation of the Fluoride Mouth Rinse programme also showed great success, with the DMFT in the fluoride group (0.87) being less than half of that of the control group (1.91) ('Aka'ola et al., n.d.).

1.4.3 Risk factors

This section focuses on key NCD risk factors. A time-trend analysis has been used, comparing data from the STEPS surveys conducted in September–November 2004 with that from the STEPS survey between September 2011 and August 2012 (Table 1.6). The results of the 2004

Table 1.6 Factors influencing health status for males and females, STEPS surveys 2004 and 2012

Risk factor	2004			2012		
	Male	Female	Total	Male	Female	Total
Behavioural risk factors						
Current smoker (%)	46.2	14.3	29.8	46.4	13.4	29.3
Lifetime abstainers (%)	76.1	94.7	85.7	58.1	86.5	72.8
Average daily consumption of < 5 servings of fruit and/or vegetables (%)	91.4	92.9	92.2	72.4	73.7	73.1
Low levels of physical activity (% with <600Metabolic Equivalent of Task-min/ week)	33.3	53.7	43.9	15.1	31.7	23.7
Physical measurements						
Mean body mass index (BMI) (kg/m^2)	31.7	34.9	33.3	31.3	34.8	33.1
Overweight (% with BMI ≥25)	89.2	94.9	92.1	87.3	94.0	90.7
Obese (% with BMI ≥30)	60.7	76.3	68.7	57.2	77.6	67.6
Overweight or obese (%)	89.2	94.9	92.1	87.3	94.0	90.7
Mean waist circumference (cm)	103.4	105.2	..	103.3	106.7	..
Mean waist to hip ratio (cm)	..	..	..	0.9	0.9	0.9
Raised blood pressure (%)	26.5	19.9	23.1	28.2	27.1	27.6
Biochemical markers						
Impaired fasting glycaemia (%)	20.0	13.8	17.1	23.9	23.8	23.8
Raised fasting blood glucose (%)	16.3	16.6	16.4	29.7	38.6	34.4
Raised total cholesterol (%)	66.1	34.2	49.7	49.3	48.2	48.8
Summary of risk factors						
0 risk factors (%)	0.0	0.2	0.1	1.6	0.3	1.3
1–2 risk factors (%)	39.5	39.0	39.2	42.4	39.5	41.6
3 or more risk factors (%)	60.5	60.8	60.7	56.0	60.2	57.1

Source: 2004 STEPS survey (MoH and WHO, 2012), 2011/2012 STEPS survey (MoH and WPRO, 2013)

survey were met with alarm in Tonga: almost all of the population (99.9%) aged between 25 and 64, and 100% of men, were at moderate to high risk of developing an NCD. Six in every ten adults (60.7%) were considered at high risk (having over three or more risk factors), with an additional four in every ten adults (39.2%) being at moderate risk (having one to two risk factors). Only one in every thousand adults had no risk factors for NCDs. The 2012 results offered a small improvement: 1.2% fewer people were classified as being at moderate to high risk. The risk factors for males improved more than for females, with a 4.5% reduction from the high risk category compared to 0.6% in females, and an increase in the number of people with no risk factors by 1.6% compared to only 0.1% in females. Key risk factors of concern will be discussed further below.

Obesity: The increase in obesity rates is a key risk factor contributing to the rise of NCDs in Tonga, and in 2012 Tonga was ranked as the third most overweight country in the world (Central Intelligence Agency, 2012). In the 2012 STEPS survey, 87.3% of men and 94% of women were classified as either overweight or obese. The incidence of obesity has risen markedly among women, with an average increase per woman of 21.1 kg (from 73.9 to 95 kg) between 1973 and 2004. The corresponding increase for males is 17.4 kg, increasing from 79.1 to 95.7 kg for the same period (WPRO, 2011). Obesity and overweight are also commonly occurring at younger ages; nearly one in four boys and one in five girls in Tonga are obese (WB, 2012a). Young women in particular tend to gain weight in adolescence and retain weight after pregnancy. Measurements of waist to hip ratio (WHR), which is a significant predictor of type 2 diabetes, coronary heart disease, and mortality, reveal that the mean WHR for women, 0.89, is above the safe level ($<$0.85) putting them at greater risk, while the WHR for males, 0.93, is within the acceptable range ($<$1.0).

Tobacco consumption: The number of cases of lung and tracheal cancer has rapidly increased over the last 30 years, and there are an increasing number of admissions for chronic obstructive pulmonary disease. The World Tobacco Atlas estimates that 8% of female deaths and 7% of male deaths in Tonga are due to tobacco (World Lung Foundation and American Cancer Society, 2011). In 2012 it was estimated that 29.3% of the population are current smokers; almost one in every two males (46.4%) and just over one in every ten females (13.4%). These levels are very similar to those calculated by the 2004 STEPS survey and reveal that tobacco control and prevention strategies may be ineffective.

Blood glucose and cholesterol levels: The percentage of the screened population with impaired fasting glycaemia rose by around 7% between 2004 and 2012, and the proportion of the population with raised fasting blood glucose more than doubled in the same time period (from 16.4% to 34.4%). Raised total cholesterol levels remained consistent, affecting almost half of the population.

Diabetes prevalence: The 2012 STEPS survey calculated the diabetes prevalence (34.4%) to be double the prevalence estimated in 2004 (16.4%), results which were also consistent with NCD screening studies (MoH, unpublished). Prevalence rates increase with age, peaking in those aged between 45 and 64 and affecting more than half of those aged 55–64. Women and girls carry a disproportional burden of diabetes compared to men, with prevalence rates of 38.6% versus 29.7% in males in the 2011/2012 STEPS survey and prevalence rates of 11.1% in girls aged under 25 compared to 6.7% of similarly aged boys in the 2012 screening study.

Tonga's NCD response

Tonga has been at the forefront of efforts to address the prevention and control of NCDs in the Pacific. The *Tonga Commitment to Promote Healthy Lifestyles and Supportive Environment* was produced in 2003 at the Pacific Ministers of Health Meeting (WPRO, 2003), and Tonga was the first Pacific island country to develop a comprehensive NCD strategy based on the WHO *Stepwise Framework for Action* (WHO, n.d.). The original plan, the *National Strategy to Prevent and Control NCDs 2004–2009* (MoH, 2004), has now been replaced by a second plan covering 2010–2015 (MoH, 2010a). Consultations for both plans involved participation from a wide cross-section of the community including senior representation from many government departments, NGOs and churches. Furthermore, the Tonga National NCD Committee (NCDC) was formed to play an advisory role to cabinet through the Minister of Health, and four subcommittees were established around the priority areas of healthy eating, alcohol harm reduction, tobacco control and physical activity. Several key achievements have been made, including:

- the strategic prioritization of NCDs by the whole Government in the *Tonga Strategic Development Framework 2011–2014* (MoFNP, 2011b), which has resulted in a bilateral agreement with the Australian Aid Program to make funds available to address NCDs;

- establishment of the Tonga Health Promotion Foundation (TongaHealth), which has resulted in better definition and distribution of funding sources for NCD activities; and
- establishment of the Health Promoting Church Partnership, which uses the churches' influential position to deliver healthy messages and interventions.

Tonga has also been praised by the international community for prioritizing NCDs within the MDGs, having set a target under MDG six to "have halted by 2015 and begun to reverse the incidence of TB and noncommunicable diseases" (The Prime Minister's Office, 2013). As such, indicators on death rates, incidence and/or prevalence of diabetes, CVD, hypertension, overweight and obesity are being routinely collected, although work still needs to be done to improve their reporting. Tonga has also produced an MDG Acceleration Framework titled *Reducing the Incidence of NCDs in Tonga* (Government of Tonga and United Nations, 2013). It sets a target of 100% coverage of prioritized interventions by the end of 2015. There is still considerable work required to reduce mortality from NCDs and to limit disability and ill-health due to NCDs.

2 Organization and governance

Chapter summary

The Ministry of Health is legislated to provide the administration and delivery of preventive and curative public health services in Tonga under the Health Services Act (1991). Health-care services are decentralized and managed geographically through four health districts which correspond to the main island groups. Six functional divisions are also responsible for service delivery and planning. Several donor and development partners are also important in the governance and organization of the health system, providing capital investment funding, technical assistance and programmatic support. In conjunction with the Government of Tonga, they also fund teams of visiting overseas medical specialists and transfers of patients to overseas hospitals for advanced and complex care that is not available in Tonga. The private health sector in Tonga is small, consisting mostly of traditional healers and government health workers who perform private practice as a side business. As such there is no formalized regulation of these providers, nor is there regulation of private health services or insurers. Clinical staff are regulated by several key pieces of legislation as well as registration and licencing by professional boards.

With donor support, particularly the Tonga Health Sector Planning and Management Project (THSPMP), the planning, budgeting and management capacity of the Ministry of Health has grown considerably. Health sector planning is aligned with the Government's Strategic Development Plan and Framework, and underpinned by the Ministry of Health's Vision and Mission statements which are described in the Corporate Plan, created every three years. The Corporate Plan sets out six key result areas, targets and key performance indicators against which they can be measured. Additionally, the Ministry of Health has institutionalized a number of performance management systems to assess performance in a relatively sophisticated manner. In addition to quarterly reporting and the annual reports from the Minster for Health, these include the Ministry of Health's Balanced Scorecard and the

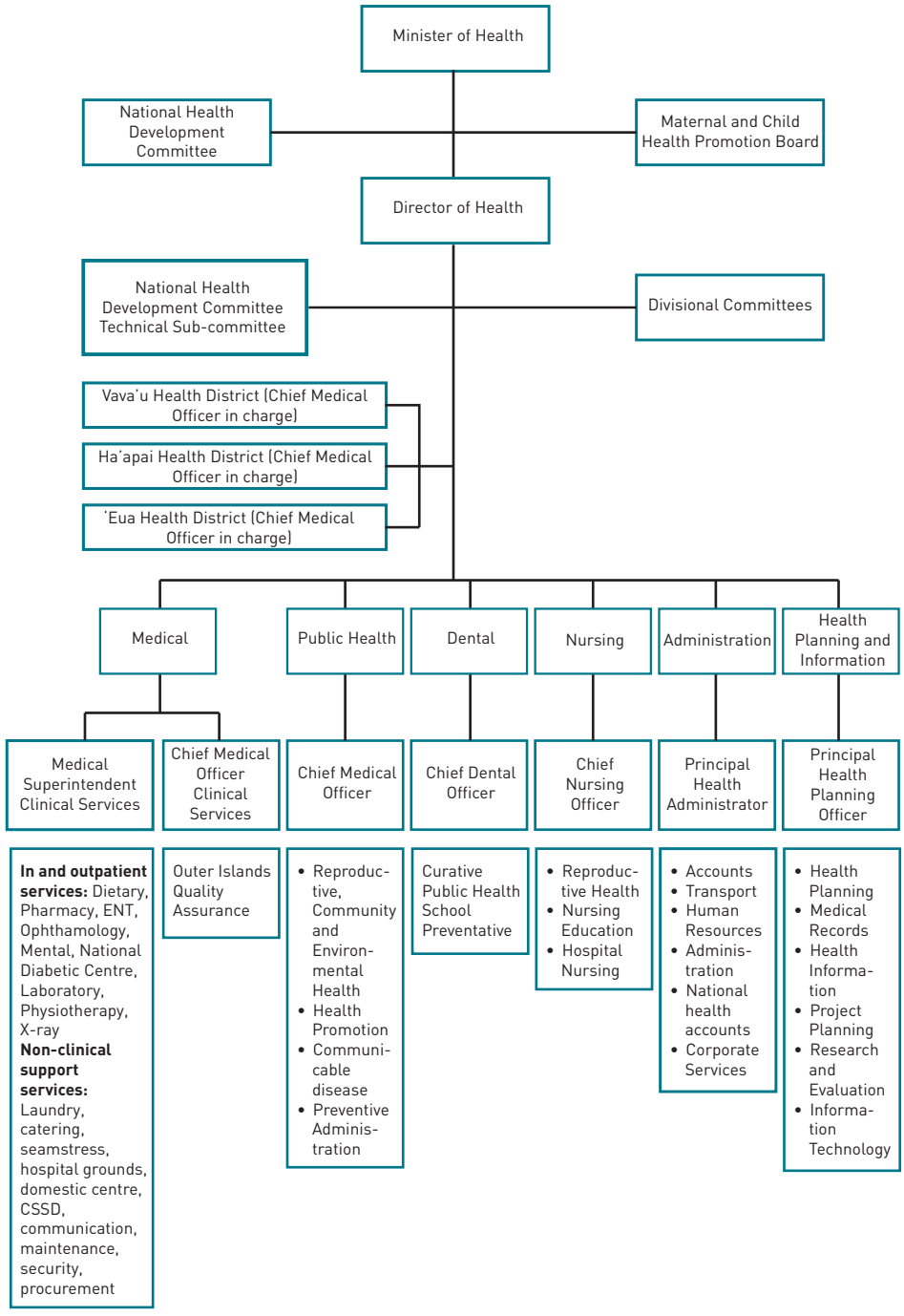
Executive Performance Appraisal System. Donor funding has also led to major improvements and upgrades to the health information system.

One patient satisfaction survey was undertaken at Vaiola Hospital in 2002 (discussed in section *2.9*).

2.1 Overview of the health system

The main legislation governing the health system is the *Health Services Act 1991* (Legislative Assembly of Tonga, 1991) (see *2.7 Regulation* for other pieces of key legislation). The Minister of Health, as the elected representative of the Government, has the overall responsibility to administer the Act; hence all actions performed under his direction are deemed to be done by the Government. The Act attributes to the Minister the following functions: (i) to preserve and protect the public health of Tonga; (ii) to establish and maintain a service, available to all, to promote the physical and mental health and well-being of the populace; and (iii) to provide and maintain comprehensive hospital and community health services with facilities for the investigation, diagnosis, treatment, rehabilitation from, and prevention of disease and ill-health. The Minister of Health may delegate duties and responsibilities to a medically qualified Director of Health and other officers within the Ministry of Health which is established under his/her direction and control. The Minister of Health is also responsible for establishing and chairing the National Health Development Committee (NHDC) which is the highest decision-making body within the Ministry and has the responsibility for endorsing plans and policies. The Director of Health acts as the Chief Executive Officer (CEO) of the health system and provides advice on health matters to the Minister. The Ministry of Health, led by the Director of Health, is responsible for the administration and delivery of preventive and curative public health services in Tonga. It is also responsible for providing policy advice to the Minister of Health; administration of health legislation; the collection, management and dissemination of health information; and negotiating, management and monitoring of funds allocated by government and donor agencies. In order to deliver services to the public, the Ministry of Health is divided into the following six functional divisions: Administration; Health Planning and Information; Public Health; Medical; Nursing; and Dental (Figure 2.1).

Figure 2.1 Overview of the Ministry of Health



Source: MoH, 2013a

A number of donor and development partners are also important players in Tonga's health system providing capital investment funding, technical assistance and programmatic support. The Governments of Australia and New Zealand also fund teams of visiting overseas medical specialists and the overseas patient referral scheme (see *5.2 Patient pathways*). Donors that are particularly active in the health sector include: the Asian Development Bank (ADB), the Australian Department of Foreign Affairs and Trade (DFAT), the European Union (EU), JICA, the New Zealand Agency for International Development (NZAID), China, the SPC, the World Bank, WHO, UNFPA and UNICEF.

The private sector is relatively small and consists predominantly of traditional healers, a limited number of dual-practicing government doctors and a small number of private pharmacies. As of January 2013, there were 16 private practitioners in operation, excluding traditional healers (who are not formally registered). The churches also operate a small number of health clinics, as do a limited number of NGOs. One notable NGO is the Tonga Family Health Association which provides MCH programmes as well as sexual health, family planning and pregnancy-related services.

Finally, other sectors such as the Ministries of Finance and National Planning, Internal Affairs, Justice, and Education and Training all play a role in the health sector, usually through involvement in multisectoral working groups or taskforces such as the National NCD Committee and the MDG Taskforce. Such collaboration will be described further in *2.6 Intersectorality.*

2.2 Historical background

Western medicine was introduced to Tonga around 1797 with the arrival of foreign missionaries and there are limited accounts of the use of medical services in the 18th and 19th centuries in Tonga. The first Act pertaining to health, the *Drugs and Poisons Act* was introduced in 1930 and extensive accounts of the Government-run health system exist from around this time. Prior to then illness was thought to be linked with supernatural powers and spirits and as a result, two systems of medicine co-exist today; *mahaki faka-Tonga* (traditional Tongan medicine) based on "sickness"; and *mahaki faka-Palangi* (western medicine), based on "disease". For diseases which are thought to have been introduced by foreigners, such as diabetes, Tongans tend to seek western medicine, while preferentially seeking treatment from a traditional healer, a *Kau Faito'o* for what are considered traditional Tongan illnesses (Parsons, 1985).

In the mid-1990s, concerns emerged that the quality of health services was being threatened by poor management, governance and planning within the Ministry of Health. This was partly the result of a series of changes at the ministerial level. The first National Minister of Health, Dr Sione Tapa, retired in 1997, after which the Royal Physician, Dr Tilitili Puloka was the acting Minister for a period of roughly two years. In 1999 a new Minister of Health was appointed and a new Director of Health commenced in 2001. A historic partnership aimed at institutional strengthening in the Ministry of Health was formed between the Government of Tonga and the Australian Government's aid agency in 1999 under the Tonga Health Performance Management Programme (THPMP). The programme began a process of reform in the health sector as will be discussed further in *Chapter 6 Principal Health-Care Reforms*.

2.3 Organization

Health-care services are decentralized and managed geographically through four health districts which correspond to the main island groups, namely: Tongatapu, Vava'u, Ha'apai and 'Eua. The Ministry of Health and the Tongatapu Health District are also responsible for services in the two Niuas. Each of the outer island districts is managed by the Chief/Senior Medical Officer who, as the district head, reports to the Director of Health and has responsibility for implementation of strategies in the Corporate Plan. Similarly, each of the six divisions of the Ministry of Health is also led by a divisional head including the Chief Medical, Dental and Nursing Officers, the Medical Superintendent, the Principal Health Administrator and the Principal Health Planning Officer. Each divisional head is responsible for implementing a range of services (Figure 2.1), reporting to the Director of Health. Of note, in late 2013 the Ministry lost three of its divisional heads including the Medical Superintendent, the Chief Nursing Officer and the Principal Health Planning Officer (through illness, retirement and one resignation) – a situation which is likely to impact on capacity in the near future.

The Administration Division and the Health Planning and Information Division play key operational and governance roles in the health system and are thus described in more detail below. Correspondingly, as the Public Health, Medical, Dental and Nursing divisions are responsible for delivering preventative and curative health services across Tonga, they will be described in *Chapter 5 Provision of Services.*

Administration Division: This division is responsible for providing efficient and effective support services to the Ministry and all health districts

through five sections: accounts, human resources, corporate services, transport services and national health accounts. The accounts section is responsible for managing the recurrent budget (payment of all salaries and distribution of funds to cost centres), budget development and monitoring. The corporate services section is responsible for establishing standard timeframes for processing administrative procedures, updating administrative protocols, and developing and maintaining an asset management register and procedures. The human resource (HR) section ensures that the Ministry is staffed with an appropriate number of trained personnel and is responsible for managing and producing the human resources management information system, creating and enforcing HR policies as well as training and inducting staff. The national health accounts section undertakes regular financial reporting according to the international National Health Account standards (Poullier et al., 2002) as discussed further in *3.1 Expenditure*. In addition, this section is tasked with revision of the schedule of user fees and their enforcement, and with assessing the feasibility of introducing social health insurance in Tonga. The transport section is responsible for ensuring the availability of transport services including ambulances, for efficient mobilization of health personal and distribution of medical supplies and equipment.

Health Planning and Information Division: This division is responsible for both health system and project planning as well as policy development. It also has the responsibility of ensuring that medical records and health information are available to patients and other stakeholders and that research and monitoring and evaluation activities are undertaken as required.

Provider organizations and professional groups: The Health Practitioners Registration Council within the Ministry of Health is responsible for regulating all health workers employed in the public system as well as private practitioners, with the notable exception of traditional healers. There are also three peak professional bodies: the Tonga Medical Association, the Tonga Dental Association and the Tongan Nurses Association.

New bodies/institutions that have been established in recent years in the health sector include the National Diabetes Centre and the Tonga Health Promotion Foundation (TongaHealth). The Australian Aid-funded National Centre for the Prevention and Control of Diabetes and Cardiovascular Disease and Healthy Lifestyle Promotion (now known as the National

Diabetes Centre) opened in 1993. TongaHealth was established as an autonomous body under the *Health Promotion Foundation Act 2007* (Kingdom of Tonga, 2007b). Its primary role is to promote healthy lifestyles for the people of Tonga and to establish the Tonga Health Promotion Fund for sourcing and distributing monies to community-run NCD programmes and activities. TongaHealth has recently launched an updated website: http://www.tongahealth.org/ which provides healthy recipes and tips, interactive tools and community listings of exercise and cooking programmes.

2.4 Decentralization and centralization

Government health-care services are decentralized in accordance with a longstanding commitment to primary health-care provision. It is estimated that 98% of Tonga's population seek care from the public health services (Statistics Department Tonga, 2013). Physical access to services is high for most of the population, with the exception of small populations living on isolated islands. There are four hospitals: the national referral hospital, Vaiola Hospital, located in Nuku'alofa and three district hospitals, Prince Wellington Ngu Hospital in Vava'u, Niu'ui Hospital in Ha'apai and Niu'eki Hospital in 'Eua. Bed occupancy rates are low, but have been increasing at Vaiola Hospital in conjunction with decreasing occupancy rates in the district hospitals (Tonga Ministry of Health, 2008). The hospitals are supported by a network of 14 health centres that provide both primary health care and preventive health services. Unfortunately there is a lack of information available about the frequency and quality of supervisory support given to health centres, although it is anecdotally reported that budget and time constraints lead to insufficient visits to health centres in the outer islands.

Tertiary services which are not available in Tonga are referred for offshore treatment (see *5.2 Patient Pathways)*. Specialized services are also provided through visiting teams of foreign doctors under the Royal Australasian College of Surgeons (RACS) Pacific Islands Programme (PIP) (see *5.4 Specialized ambulatory care/inpatient care*).

2.5 Planning

With donor support, particularly the Tonga Health Sector Planning and Management Project (THSPMP), the capacity of the Ministry of Health has grown considerably in recent years, particularly in policy, planning

and management. This reform will be discussed further in Chapter 6 with current planning mechanisms discussed in detail below.

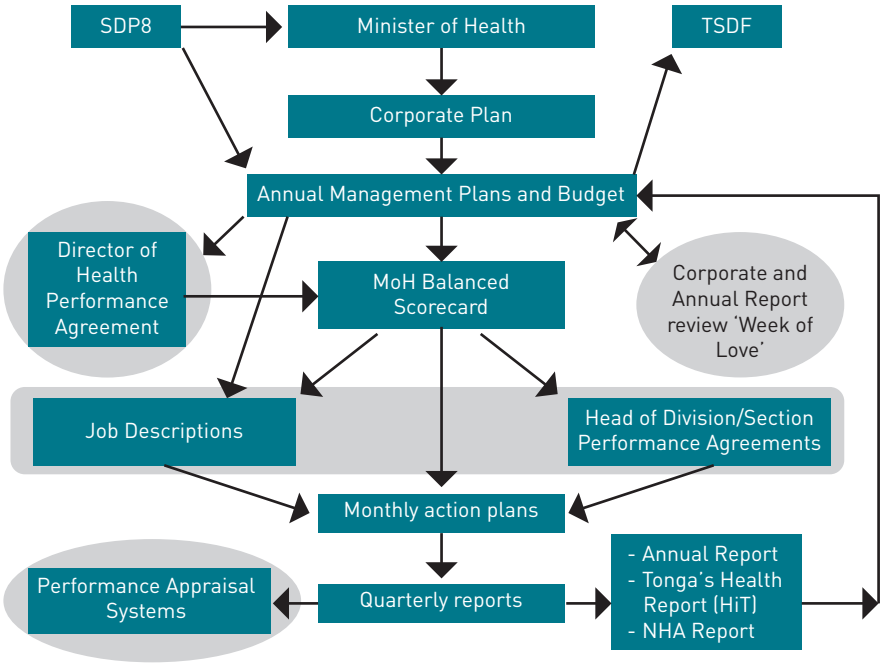
National plans and frameworks: Health sector planning in Tonga is aligned with the Government's Strategic Development Plan (SDP) (currently in its eighth version (SDP8) 2006/07 – 2008/09)[10] (Kingdom of Tonga, 2006). The SDP identifies a national vision, "to create a society in which all Tongans enjoy higher living standards and a better quality of life through good governance, equitable and environmentally sustainable private sector-led economic growth, improved education and health standards, and cultural development". It also sets out eight goals, of which goal six, "to improve health standards", and goal four, "to ensure equitable distribution of the benefits of growth", have strategies directly related to health. There are also many other strategies which have impact on the determinants of health or the legislative and administrative environment of the Ministry of Health, such as strategies to improve equity and reduce hardship, improve education standards, strengthen environmental sustainability and disaster risk reduction, and maintain social cohesion and cultural identity.

The other key national planning framework is the *Tonga Strategic Development Framework (TSDF) 2011–2014* (MoFNP, 2011b). The TSDF provides the guiding principles and strategic directions for the Government over a four-year term based on the detailed actions in sector and corporate plans and using annual management plans to guide budget allocations. Objective six of the TSDF is to achieve "improved health of the people, by promoting healthy lifestyle choices with particular focus on addressing noncommunicable diseases, and providing quality, effective and sustainable health services".

Health sector planning: Health sector planning in Tonga is aligned with the SDP and TSDF and underpinned by the Ministry of Health's Vision and Mission statements as detailed in the Corporate Plan; the current version of which is 2013/14–2015/16 (MoH, 2013a) (Figure 2.2). The Ministry's Vision is "to be the highest health-care provider in the Pacific as judged by international standards in 2020". The Mission is "to improve the health of the nation by providing quality care through promotion of good health, reducing morbidity, disability and premature (death) mortality".

10 A ninth SDP has not been developed and efforts instead focus on the TSDF.

Figure 2.2 Alignment of Ministry of Health planning with performance management systems and national plans



Note: Blue boxes represent Ministry of Health initiatives

Source: Hufanga, S 2013

The Corporate Plan sets out the strategic direction and objectives of the Ministry of Health in meeting the aforementioned Vision and Mission. Corporate planning is conducted every three years and in 2013 a new corporate planning process was introduced to link it more strategically to a three-year Medium Term Budget Framework (MTBF). The creation of the new plan involved careful planning and prioritization exercises, including SWOT analysis and consideration of assumptions and risks, to ensure that through implementation of newly-reformed systems and processes, the outputs identified in the Corporate Plan are achievable. As a result, the corporate planning process is now better linked to both the budget proposal process and staff development plans. The Corporate Plan reiterates the following core values developed in 1999 and still current: commitment to quality care; professionalism, integrity and accountability; care and compassion; commitment to staff training and development; and partnership in health. The Plan also details six outputs/key result areas (KRAs) and goals (Table 2.1) and further defines 44 strategies each associated with time-bound targets and a total of 93 key performance

indicators (KPIs). The Corporate Plan is implemented by assigning strategies to relevant personnel and in collaboration with partners and stakeholders. Strategies from the Corporate Plan are incorporated into *Annual Management Plans* for each division and section which establish line-item budgets and link to the budget and budget statement agreed to by the Ministry of Health and Treasury in association with development partners and other stakeholders. The head of each section then prepares monthly action plans to ensure that they stay on track in achieving the goals of the Annual Management Plans. The Corporate Plan is reviewed on an annual basis at the "Week of Love", an event which brings together senior ministry staff, managers from all health facilities (including the outer islands) and stakeholders from all over Tonga so that they can review progress of the corporate and annual plans, discuss challenges and barriers, and identify strategies for improvement. These strategies are fed into the budget for the following year, with progress reported upon the following year.

Table 2.1 Ministry of Health Outputs and Strategic Goals

1.	**Goal:** To reduce the morbidity due to NCDs by 2% and premature mortality by 10% and to maintain or reverse the current rate of communicable disease **Key Results Area:** To increase our capacity to respond efficiently through quality preventive health services in our collective battle against NCDs and communicable diseases (emerging diseases)
2.	**Goal:** We will deliver the range and quality of services to meet the basic health requirements **Key Results Area:** Improve the efficiency and effectiveness of curative health service delivery
3.	**Goal:** We will provide appropriate services to all the outer island districts and community health centres through effective resourcing. Specialized services will be provided through regular programmed visits **Key Results Area:** Provision of services in the outer island districts & community health centres
4.	**Goal:** We will build staff commitment and development by demonstrating to staff that they are valued **Key Results Area:** Improve the human resources so that the health system can deliver quality health-care services
5.	**Goal:** We will deliver our services in a professional and friendly manner **Key Results Area:** Improve customer service
6.	**Goal:** We will continue to improve the standard of existing facilities and ICT, construct new facilities and introduce new health information and research initiatives where needed **Key Results Area:** Improve infrastructure, information and research

Source: Hufanga 2013

Performance monitoring and evaluation: In addition to the 93 KPIs in the Corporate Plan, an additional 23 key national health indicators are also used for monitoring and evaluation. Furthermore, the Ministry of Health has institutionalized a number of performance management systems to assess performance in a relatively sophisticated manner. For example, in addition to quarterly reporting and the annual reports from the Minster for Health which are submitted to the Cabinet, these include the Ministry of Health's Balanced Scorecard and the Executive Performance Appraisal System. The balanced scorecard is the Ministry's primary performance data collection and analysis system (conducted quarterly) and reported on through its annual report process. It specifies a series of management and health indicators incorporating the KPIs and targets from the Corporate Plan for each of the KRAs. It allows organizational performance to be viewed across the six KRAs of the Corporate Plan, which when combined give a "balanced view" of the performance. It has been designed in a manner which meets the expectations of all stakeholders and also provides them with guidance about what needs to be done, the timelines for each activity and how it will be monitored and evaluated.

The Ministry of Health was the first Tongan ministry to introduce a performance appraisal management process for senior staff/managers, the Executive Performance Appraisal system which is based on and linked directly to the balanced scorecard system. This system ensures that managers are accountable for results via basing their performance contracts on achievement of the relevant divisional KPIs. The Director of Health, as the CEO of the Ministry of Health has a performance-based contract with the Public Service Commission.

Each division or section also reports on the relevant KPIs as developed from the Balanced Scorecard on a quarterly basis. This system ensures that actual performance is measured, monitored and reported at all levels of the Ministry and helps to identify and develop strategies to overcome any issues in a prompt manner. An annual report is then compiled from the information in the quarterly reports and presented to Cabinet and Parliament on their performance in line with their corporate and management plans. These reports focus on activities and outputs and also outline the goals of the health system and the specific roles and responsibilities for each programme in managing and providing health services. The annual report tends, however, to be quite descriptive in nature and has not traditionally analysed gaps and weaknesses. As such,

it has been proposed that the structure of this HIT template be used in the future for annual reporting so that a higher degree of analysis and critical thinking about the health system becomes institutionalized within the Ministry.

Within the Ministry of Health, the health planning section is responsible for coordinating, formulating and alignment of sectional and divisional plans in such a way as to achieve the Ministry's Vision and Mission. It also responsible for managing all development funds (donor funding) and other sections working under the Health Planning and Information Division. The project planning section is responsible for developing, implementing and monitoring of health projects in conjunction with programme managers and donor agencies.

The role of development partners in planning: In general, donor and development partner assistance should be aligned with the TSDF, the SDP and through the Corporate and Annual Management Plans of relevant agencies. According to a 2012 peer review of Tonga's national development planning, budgeting, public financial and aid management processes, the TSDF is "recognized and often quoted by Government officials, civil society, the private sector and development partners as the basis for agency planning and for coordinating their work with each other" (Pacific Islands Forum Secretariat, 2012). The review noted the progress being made in the health sector with plans bringing together domestic and aid resources, which include sector budget support behind a single Government-led policy. The review did not suggest any significant changes were required in terms of national planning, budgeting or aid management policy and practice.

The Aid Management Department of the Ministry of Finance and National Planning provides a mechanism for project planning and management including appraisal of and recommendation of priority projects. It also reports on progress in terms of results and undertakes monitoring and evaluation to determine aid effectiveness. In 2010, through the Australia-Tonga Partnership for Development, the Australian Aid Program funded a Donor Harmonization Technical Adviser, sitting within the Ministry of Finance and National Planning. This position was intended to assist Tonga to exercise effective leadership over its development policies, sector strategies, programme planning and implementation. Whilst this advisory position was reported to have played an important role in establishing systems around donor coordination, the position was scheduled to be

phased out in September 2012 once the Government had the capacity to take on the role itself (AusAID, 2010). Intersectoral planning between the various ministries and agencies and civil society within Tonga is discussed in *2.6 Intersectorality*.

Human resources planning: Public service management, roles and responsibilities are articulated in the *Public Service Act 2002* (and subsequently in the 2010 and 2012 revisions and regulations) (Kingdom of Tonga, 2002). The Public Service Commission (PSC) oversees human resource management functions and assists ministries by participating in recruitment processes, reviewing of ministerial proposals for promotions, new appointments, demotions and dismissals.

A Health Workforce Planning Partnership ran for several years between the Ministry of Health and the Health and the Health Workforce Branch of the Australian Department of Health and Ageing under the Policy Partnership Initiative. With the technical assistance provided through this partnership, the Ministry of Health used the WHO *Workload Indicators for Staffing Needs* (WISN) tool (WHO, 2010) which calculates health staffing requirements based on the work actually undertaken, to develop a health workforce planning process for nurses in Tonga. The WISN tool was chosen because it is simple to operate and can help anticipate the effect on workloads for: planned future services; transferring functions between existing categories of staff; allocating new functions to existing categories of staff; and creating new staff categories. However, after being used in the Nursing Division it was decided that WISN was not appropriate for assessing other staffing categories in Tonga due to the differences in roles and responsibilities, workloads and resources between Tonga and the WISN. The Ministry is investigating other suitable methodologies and requires considerable technical assistance and support from the Pacific Human Resource for Health Alliance. A staff profile was developed in 2013 and work is now being undertaken to identify staffing levels and training needs. Following these steps, a Human Resources Plan will be developed. Whilst an Excel spreadsheet is currently used to track the number of health workers, a more sophisticated computerized Human Resource Management Information System (HRMIS) is being devised (WHO and UNSW HRH Hub, 2014).

The Ministry of Health undertakes regular consultative meetings with the Ministry of Finance and National Planning and the PSC regarding staffing resources and financial planning. Annual consultations with development

partners including WHO, UNFPA, UNICEF, Australian Aid Program, NZAID, JICA, ADB and Taiwan, China are undertaken to coordinate support for priority areas of health sector development, specific health programmes and services, and HRH training and continuing education of health professionals. The *Human Resources for Health Action Framework for the Western Pacific Region (2011–2015)* developed by WHO is also of assistance for guidance on the issues that must be addressed by each Member State in the context of its own labour market (WHO, 2012).

Tonga has also been a part of the Australian Aid Program-funded Strengthening Specialized Clinical Services in the Pacific programme (SSCSiP), based at Fiji National University (FNU), which seeks to address challenges in the delivery of specialized care. Tonga is receiving support to plan for, access, host and evaluate specialized clinical services and to strengthening health worker skills, capacity and capability to meet clinical service needs.

Infrastructure/capital planning: The first *National Infrastructure Investment Plan* (NIIP) was endorsed in 2010 (D'Este et al., 2010). It forms the basis of the Government's public sector investment programme for the next decade and includes a monitoring and evaluation framework to measure progress towards the achievement of the vision. In regard to health, the Government and relevant agencies will maintain and expand access to safe water and sanitation for all communities by implementing the proposed priority water and sanitation projects outlined in the Plan.

2.6 Intersectorality

Intersectoral planning and implementation between government agencies and external partners occurs regularly in Tonga. The health sector is closely involved in multisectoral disaster risk management and preparedness including humanitarian assistance. It is a member of two national thematic committees for disaster management: the National Emergency Management Committee which produces preparedness plans and policies, and the National Emergency Recovery Committee which is focused on coordination of relief and recovery. Tonga experiences somewhat regular tropical cyclones and is vulnerable to earthquakes and the potential of tsunamis. In 2010, the Ministry of Health attended the *Inter-Agency Contingency Planning Workshop for Humanitarian Assistance in the Kingdom of Tonga*, run by the United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) in collaboration with the National Emergency Management Office of the Ministry of Works.

This workshop sought to explore and standardize the way in which the international humanitarian community supports the Tongan authorities in the event of a natural or man-made disaster. The key outcome of the workshop was the *Draft Inter-Agency Contingency Plan* (IACP) for Tonga (UN Office for the Coordination of Humanitarian Affairs, 2010).

Climate change and disaster management: A Ministry of Health representative was also involved in the creation of the *Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management* (JNAP-CCADRM), the aim of which is to reduce vulnerability and risk and to enhance resilience (Kingdom of Tonga, 2010b). The Ministry of Works, in collaboration with the Ministry of Environment and Climate Change, is responsible for mainstreaming disaster risk management through this Joint Plan and also for ensuring compliance with the *National Emergency Management Act* (Kingdom of Tonga, 2007a) and implementation of the *National Disaster Plan* (National Disaster Management Office, 2011). Following widespread destruction in Ha'apai due to cyclone Ian in early 2014, the Ministry of Health has also been actively involved in drafting and implementing a response plan. Ironically, outer-island health managers had requested but not received additional disaster planning training in late 2013.

Pandemic preparedness: The Ministry of Health is the lead organization and also works in close collaboration with other sectors in terms of planning responses to other types of hazards which affect human health, such as disease pandemics. As such, the *National Influenza Pandemic Preparedness and Response Plan* (Kupu, 2006) was developed in consultation with a multisectoral Epidemic/Pandemic Taskforce. The Taskforce included representation from several areas within the Ministry of Health (auxiliary services such as laboratory, health administrators/ planners in addition to public and clinical health staff) as well as other essential service providers (e.g. Immigration, Police, Defence, Justice, Education, the Red Cross, etc.), border control agencies (i.e. quarantine, aviation, port authorities), media and communication services and civil society organizations. The Plan provides national guidance for all stakeholders, and operationalizes strategic responses to the threat or occurrence of an influenza pandemic. The Ministry of Health is also an active participant within the PPHSN and routinely shares and receives information on infectious disease outbreaks through this network, as well as access to international reference laboratories.

Water, sanitation and hygiene: The Ministry of Health partners with other key stakeholders such as the Tonga Water Board, the Ministry of Environment and NGOs such as the Tonga Community Development Trust and the Red Cross to provide clean drinking water and sanitary facilities to the population.

The MDG Taskforce was established in 2003. It is chaired by the Secretary of Foreign Affairs, with membership comprising of the Directors of Ministries for Planning, Education, Health, and Environment, as well as the Secretary for Finance, the Head of the Women in Development Centre, the Secretary General, Langafonua ʻa Fafine Tonga, and the Government Statistician. Its mandate is to oversee the Government's intermediate and long-term national strategy for achieving and coordinating the reporting obligations of the MDGs.

The National NCD Committee, led by the Ministry of Health and chaired by the Director of Health, however, potentially brings together more stakeholders than any other group. It has representatives from all Government departments as well as representatives of sporting groups, churches, private business, communities, trade, NGOs and other civil society organizations. It is divided into four subcommittees which also have involvement of key sectors from a variety of backgrounds with a particular interest in healthy eating, physical activity, tobacco control and alcohol harm reduction. The Committee was instrumental in the creation of the *National Strategy to Prevent and Control NCDs (2010–2015)* (MoH, 2010a), the first NCD plan created by a Pacific Island Country or Territory. As part of the Government's commitment to reduce NCDs by encouraging good nutrition and healthy behaviours, legislation has been implemented placing fiscal measures such as excise taxes on unhealthy consumables. Several excise tax amendments have been passed to increase the duties on beer, wine, spirits and other alcoholic beverages as well as tobacco products (Kingdom of Tonga, 2010a, 2011). More recently, at the instigation of the Ministry of Health, new duty and excise tax rates were approved and gazetted by the Cabinet on 14 August 2013. The new rates increase the import duties on unhealthy foods such as carbonated drinks, certain fats and tobacco products and conversely, decrease duties on healthy foods such as vegetable oil and fish (Revenue Services, 2013). There have also been limitations imposed on the importation of tobacco and 2013 amendments to the control bill to expand smoke free zones, prohibit local tobacco cultivation and increase the size of health warnings on packaging.

2.7 Health information management

2.7.1 Information systems

In August 1999, under the Tonga Health project (also known as the Tonga Health Sector Planning and Management Project, THSPMP – described in detail in Chapter 6) a review of Ministry of Health data collection and reporting systems highlighted the following key areas for improvement: vital registration systems, the flow of hospital data and information, and the management of health information. In 2002/2003, the Ministry of Health committed to implementing several of the recommendations with support from the World Bank, funded under the Health Sector Support Project (HSSP). The project aimed to develop an information culture within the Ministry whereby policy and management decisions were based on data derived from internal information systems. There was also a focus on strengthening the operational efficiency and effectiveness of clinical services at Vaiola Hospital by improving medical records management and introducing a computerized hospital information system. Finally, it was hoped that by enhancing information flows among key stakeholders, the management and monitoring of patients with NCDs, especially diabetes, could be improved.

A health information system (HIS) steering committee and working group was established in 2003 to review the Ministry of Health's data collection forms and flows of information. The *Tonga Health Data Dictionary* was also introduced to ensure that comparable definitions of clinical and administrative procedures and terms were used throughout the health system. Of major importance was the upgrade of the data collection processes for health centres and the outer islands. A key improvement was the strengthening of civil registration and vital statistics via the introduction of new live birth and death reporting certificates, policies and procedures. As most births in Tonga take place in hospital, a certificate of live birth is given to the parents who must then register the birth with the Ministry of Justice. For births outside of hospital, midwives, traditional birth attendants and district lawyers are also required to report live births to the registrar. All deaths that occur in hospitals should be certified within 24 hours with collated mortality data coded according to the International Classification of Disease (ICD) version 10. Ministry of Health mortality data have an estimated completeness of at least 80%, although there remain issues with cause of death reporting (Carter et al., 2012b). The Ministry of Health and the Ministry of Justice have been working together to ensure consistency across the birth reporting and registration processes

and since 2009, deaths registered by the Ministry of Health have also been routinely reconciled against civil registry data. The Ministry is also a member of the interdepartmental civil registration and vital statistics (CRVS) committee. The other major aspect of HIS strengthening was the introduction of the Tonga Hospital Information System (THIS). This involved extensive staff consultation, external expert assistance and an assessment of available HIS products against a set of agreed criteria. The HIS Officer then undertook a study tour to further assess potential software and the IBA Health software was felt to be the best option for Tonga. This software encompasses both a web-based patient administration system (web-PAS) with modules for outpatients, inpatients, medical records, theatres, maternity, accident and emergency, billing, and results reporting; as well as a clinical information system (CIS). Thus it minimizes the cost and complexity of the system. It provides health-care workers at all of the hospitals, as well as outlying health centres, point-of-care access to vital patient information and has improved the Ministry of Health's capacity to collect, manage and use health information to effectively assist decision-making. Importantly, Tonga has made adequate provisions to support the system and ensure sustainability, an issue with which many LMICs struggle. Benefits that Tonga has witnessed from the upgrade of the health information system include:

- **Improved surveillance of communicable disease** through the linking of administrative data such as demographic details and clinical data such as laboratory results with live data detailing information about unusual occurrences of specific diseases. When the H1N1 outbreak occurred in 2009, this function enabled the Ministry of Health to detect the arrival of the virus and effectively contain its spread.
- **Improved capacity for operational research** on priority health areas due to training of several staff in data management and analysis with a focus on improving the reliability and accuracy of life expectancy and infant mortality indicators. This led to new estimates of the life expectancy, which, worryingly, placed life expectancy at 3–4 years below previous estimates (Hufanga et al., 2012).
- **Creation of comprehensive data sources and an e-library**, supported by the Australian Aid program, the Pacific Senior Health Officials Network (PSHON) and the Australian Department of Health and Ageing. All of the Ministry of Health annual reports dating back to 1956 and admission records dating back to 1925 are now available electronically via the Ministry of Health website and are a valuable resource for defining Tonga's epidemiological transition and the rise of NCDs.

- **Strong regional influence in HIS development**. Tonga's Health Information Manager contributed significantly to the Pacific Health Information Network (PHIN) as President from 2009–2013. During this time, PHIN formulated the *Regional Health Information Systems Strategic Plan 2012–2017* (Pacific Health Information Network, 2012) which is credited with creating widespread recognition of the importance of HIS and empowering stakeholders through a country-led partnership approach.
- **Strong local support for the importance of HIS.** Tonga has implemented two unique HIS initiatives from which other countries could also benefit. The first is an annual National Health Information Day with the objective of improving the culture of information through discussions around HIS challenges and developments and through strengthening working relationships between local and international stakeholders. The other initiative is the "Week of Love", an annual event hosted by the health information team (see *2.5* above for more detail).

Whilst significant progress has been made on the health information system, there is still some incomplete data. For example, information from the private sector is not routinely reported to the health information system and when it is obtained, is often of unknown quality. In fact, for the last decade most of the information on private health providers has been obtained through special surveys and interviews and many providers refrain from participating. It is strongly recommended that the Government enforce a system for the private sector to regularly report health information to the Ministry using a prescribed format and specifications.

2.7.2 Health technology assessment

No formal health technology assessment has been performed in Tonga, though WHO undertook global e-health (the use of ICT for health at a national level) monitoring in 2009 (WPRO, 2009). The report stated that although Tonga has a national eGovernment policy created in 2008, it has not been fully implemented. The Ministry of Health does not use electronic medical records and as such has not created a National eHealth policy. Tonga does, however, use an electronic patient administration system and clinical information system and has legislation to ensure privacy and confidentiality of personal information in medical records. The health sector also has a policy for ICT procurement.

In terms of funding for eHealth, there is both public, private and donor funding allocated to ICT equipment and software. However, pilot projects, skills training and ongoing support are only funded by donor/non-public funding in Tonga. There was no reported public-private partnership funding or scholarships for eHealth in Tonga.

In terms of education, eLearning is being used in training of health professionals and in teaching health sciences mainly through access to the Pacific Open Health Learning Network (POHLN). There is, however, no formal ICT education for health professionals and students in health sciences at tertiary level. There are currently no telemedicine or mHealth initiatives being conducted in Tonga although there could be potential for notification of births or deaths by mobile phone and for video-conferencing with outer island health facilities.

2.8 Regulation

In order to create legislation in Tonga, a bill (i.e. draft legislation) created by a ministry or other organization is submitted to the Legislative Assembly to be passed as an Act (Legislative Assembly of Tonga, n.d.). The bill is passed by the relevant member or Minister to the Standing Committee on Legislation and then to the House. A bill may will be read and debated up to three times and after the first reading, the Legislative Assembly must allow a period of at least two weeks for the members to scrutinize the bill and for the public to make submissions (except in cases where the Prime Minister certifies the bill as urgent). Several revisions may be required and re-debated over a period of many weeks, before the bill is either approved or rejected. A ministry is then responsible for implementation of each Act. The Ministry of Health administers a number of Acts (Table 2.2), as delegated by Parliament.

2.8.1 Regulation and governance of third party payers

As private, voluntary health insurance accounts for only roughly 2% of total health expenditure (see *3.5*), the number of insurers is very small and regulatory mechanisms have not yet been designed or implemented.

2.8.2 Regulation and governance of providers

As previously described, the vast majority of health services in Tonga are provided by the Government. The Ministry of Health is regulated by the *Health Services Act 1991* (Legislative Assembly of Tonga, 1991).

Table 2.2 Legislation relating to the Ministry of Health

Primary Legislation	Amendments and regulations
1930 Drugs and Poisons Act	2001 Drugs and Poisons (Amendment) Act
2001 Health Practitioners Review Act	2004 Health Practitioners (Amendment) Act
2007 Health Promotion Foundation Act	2010 Miscellaneous Amendments (Privy Council) Act
1991 Health Services Act	1956 Medical Services (Detained Patients) Regulations 1991 Medical Services Regulations 2000 Health Services (Fees and Charges) 2008 Health Services (Fees and Charges) Regulation 2010 Miscellaneous Amendments (Privy Council) Act
2001 Medical and Dental Practice Act	2004 Medical and Dental Practice (Amendment) Act
2001 Mental Health Act	2004 Mental Health (Amendment) Act 2010 Miscellaneous Amendments (Privy Council) Act
2001 Nurses Act	2004 Nurses (Amendment) Act
2001 Pharmacy Act	2004 Pharmacy (Amendment) Act 2010 Pharmacy Regulation
1992 Public Health Act	2008 Public Health Act (repealed the 1992 Public Health Act) 2009 Public Health (Amendment) Act
2001 Therapeutics Goods Act	2004 Therapeutics Goods (Amendment) Act 2011 Therapeutics Goods Regulations
2000 Tobacco Control Act	2004 Tobacco Control (Amendment) Act 2008 Tobacco Control (Amendment) Act

Source: developed for this HiT by the authors, based on Laws found on http://www.paclii.org/databases.html#TO

2.8.3 Registration and planning of human resources

The Tonga National Qualifications and Accreditation Board (TNQAB) is responsible for ensuring that qualifications in post-compulsory education and training undertaken in Tonga are valued as credible, both nationally and internationally. Currently, the Queen Salote School of Nursing (QSSN) offers the only accredited health professional training courses in Tonga and the Ministry of Health operates several non-accredited paramedical training programmes producing health officers, pharmaceutical, dental, radiological and medical laboratory technicians, public health workers and environmental health inspectors (see *4.2.3 Training of health workers).*

Health professionals are regulated by several Acts (Table 2.3) with each of the Acts establishing a professional registration board, i.e. the Medical and Dental Practice Board, the Nurses Board and the Pharmacy Board, with whom health practitioners must register prior to commencing practice. The Boards are also responsible for setting the code of practice and/or competency standards for each profession (Table 2.3). The Tonga Nurses Board recently published their first professional nursing standards in August 2012. The Boards are responsible for dealing with any matters of professional misconduct (conduct which demonstrates a lack of adequate knowledge, skill, judgment or care, or which contravenes the respective Act or directions made by the Board) and removal of the offender's name from the register, thus ending ability to legally practice.

Table 2.3 Professional registration, legislation, occupational standards and competencies

Legislation	Registration Board	Occupation	Professional competency
Medical and Dental Practice Act 2001	Medical and Dental Practice Board	Doctors	18 months internship for new graduates.
		Health officer/medical assistant	Code of practice set by Board
		Dentists and dental technicians/assistants	One year internship for new graduates
Nurses Act 2001	Nurses Board	Nurses and midwives	Professional Standards set by the Board
Pharmacy Act 2001	Pharmacy Board	Pharmacists and pharmacy technicians/assistants	Code of practice developed and quality control system in place
Public Health Act	None	Environmental health workers	Nil
		Public health workers	
None	None	Radiographers	Standardized based on qualification
		Community Health workers	Nil
		Traditional health workers	
		Health management workers	

Source: Human Resources for Health Hub, 2009

In order to gain registration as a health professional, applicants must hold the qualification prescribed by regulation and pay a prescribed fee.

Upon registration the Board grants the applicant a certificate of registration which must be renewed and an associated fee paid annually. If registration lapses for a period of five years the applicant may be required to pass an examination or such training as considered satisfactory by the Board. Temporary registrations for periods of up to three months may be granted to applicants who are registered in another jurisdiction. The *Health Practitioners Review Act 2001* (Kingdom of Tonga, 2001a) establishes the Health Practitioners Review Council as the body responsible for reviewing the decisions of the professional boards. There are also several active professional associations including: the Tonga Nurses Association, the Tonga Medical Association and the Tonga Dental Association. Although these organizations do not have a regulatory role, they serve to support and promote the delivery of high-quality health care and to strengthen professional practice through ongoing education and training.

2.8.4 Regulation and governance of pharmaceuticals

Regulation of pharmacies and pharmacists: The *Pharmacy Act 2001* establishes the Pharmacy Board as the registering body for Pharmacists and Assistant Pharmacists and is responsible for dealing with complaints and disciplinary proceedings. The Pharmacy Board also licenses premises which dispense pharmaceutical products as defined in the *Therapeutic Goods Act 2001* and ensures that they meet certain criteria such as being secure, well ventilated and having refrigeration and a safe or vault for secure storage of narcotic/psychotropic substances. A copy of the Pharmacy Act, the Therapeutic Goods Act and a recent edition of *Martindale, the Extra Pharmacopoeia* must be onsite and all prescription dispensed or compounded should be recorded. Officers authorized by the Minister of Health may at any time inspect licensed pharmacies and take appropriate action if the pharmacy does not comply with the conditions of the Act. The Act does not apply to wholesale dealers, however.

Regulation of pharmaceutical products: The *Therapeutic Goods Act 2001* establishes the National Drugs and Medical Supplies Committee which is responsible for regulating the import, quality and use of registered therapeutic goods. Each year the National Drugs and Medical Supplies Committee establishes a *Registered List of Medicinal Drugs* (MoH, 2013c, 2012b) which may be imported into the Kingdom. The Committee also determines in which classes each drug should be registered.

Before any new medicinal product is imported or offered for sale, the manufacturer or the licensed importer must make an application

to the Committee for inclusion of the drug in the registered list. The drug must meet certain criteria in terms of safety, efficacy, quality and appropriateness for use and be accompanied by a WHO *Certificate for a Pharmaceutical Product Moving in International Commerce* (WHO, 2013a). The Committee may request information on the composition, storage, indications, directions for use or labelling of the medicinal drug, advertising material relating to the medicinal drug, reports of adverse drug reactions or concerning treatment of over-dosage before registering the drug and may remove the drug from the registered list at any time. An application for an import licence shall only be made by a pharmacist, veterinary practitioner, wholesaler or retailer.

The National Drugs and Medical Supplies Committee also establishes a *List of Essential Drugs* (MoH, 2007b) which forms the basis for public sector drug procurement and procedures for the storage, distribution and administration of therapeutic goods. It also collates, reviews and suggests action on reports of adverse drug reactions which it receives from the Central Pharmacy and Medical Store. The Committee also has the responsibility of advising the National Health Development Committee on any matters relating to the National Drug Policy and any required modifications to the Therapeutic Goods Act. Donated medicinal drugs may only be imported into Tonga if they are in the *List of Essential Drugs*, are of good quality with a sufficient shelf-life and meet the specifications of the Central Pharmacy and Medical Store. The manufacturing of therapeutic goods is prohibited in Tonga except under licence and as of 2012 there were no licenced manufacturers in Tonga.

Regulation of supply of registered drugs: The sale of medicinal drugs is prohibited except under license. Non-pharmacy, retail outlets with a current retail license (i.e. trade stores) may sell medicinal drugs contained in Class 1 of the registered list. Tonga lacks the capacity to monitor and enforce the legislation, and it is reported that trade stores also sell unregistered products. Where drugs are dispensed by a pharmacy, a prescription stating the dose and usage is required and must be signed and dated by a registered medical practitioner, health officer or dentist. Health officers may write prescriptions for drugs included in Classes 1 and 2 and for drugs in Class 3 on the advice of a medical practitioner. Dentists can write prescriptions for drugs in Classes 1, 2 and 3 when the particular drug is for therapeutic use in the practice of dentistry. Medical practitioners may write prescriptions for Class 1, 2, 3 and 5 drugs, but only those predominantly practicing in a recognized specialty may write prescriptions for Class 4 drugs. No person may write a prescription for

the supply of narcotic drugs or psychotropic substances for his or her own use. Only veterinary practitioners may write prescriptions for medicinal drugs included in Class 6 of the registered list.

2.8.5 Regulation of medical devices and aids

Therapeutic devices are deemed to be therapeutic goods and are thus also regulated by the Therapeutic Goods Act as described above.

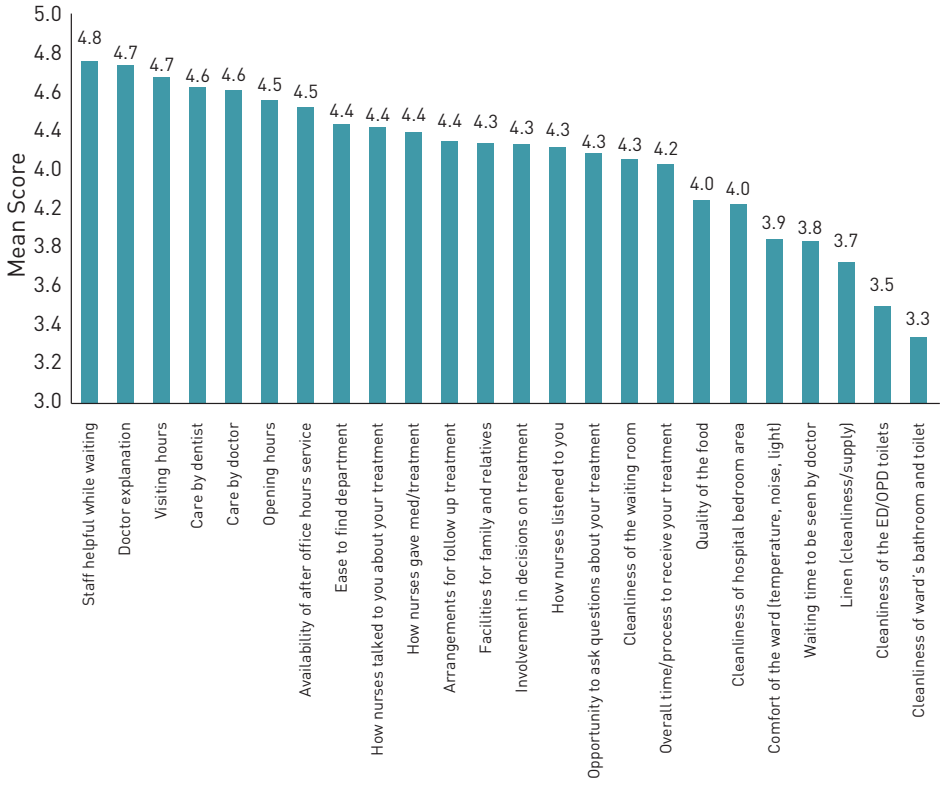
2.8.6 Regulation of capital investment

As a Kingdom, Tonga's capital investment is guided by the first *National Infrastructure Investment Plan 2010* (NIIP) to which the Ministry of Health contributed. The Plan outlines the Government's priorities and midterm plans for major initiatives in the economic infrastructure sector, mainly around energy, telecommunications, water, solid waste management, and transport. Although many of these areas impact on health, social infrastructure for the health, education and correctional services sectors is not included in this Plan, although it may be included in future updates. To date, capital investment in the health sector has really been regulated by the funding allocations from the MoFNP in conjunction with the Ministry of Health and donor partners, as was the case in the extensive upgrading and expansion of Vaiola Hospital.

2.9 Patient empowerment

In 2002, phase two of the THSPMP included a patient satisfaction survey at Vaiola Hospital designed to establish a baseline for use as a quality improvement tool (AusHealth International, 2002). Around 290 patients completed the questionnaire over a period of several weeks. The rating was a Likert scale with 1=very poor; 2=poor; 3=fair; 4=good; 5=very good; a response of four or below was deemed to be unsatisfactory. Staff helpfulness while waiting, care by doctors and dentists, explanations by doctors and visiting hours all rated very highly. On the other end of the scale the results for quality of food, cleanliness, comfort and waiting times to be seen by a doctor were considered unsatisfactory (Figure 2.3). It was recommended that a working party be established to review the findings of the survey and to repeat it annually. In response, the THSPMP delivered customer service training to middle and senior management staff within the Ministry of Health in 2004. Additionally recent infrastructure work at the hospital has addressed many of the cleanliness and comfort issues.

Figure 2.3 Results of the 2002 patient satisfaction survey



Source: AusHealth International, 2002

2.9.1 Patient information

In terms of patient information, the survey reported that a "lack of information concerning treatment and medication" was raised as a general concern across the hospital. In contrast however, "explanation by doctors" was rated with a high degree of satisfaction and discharge information on home care rated as satisfactory in all wards. Notably, discharge information from the Obstetrics and Gynaecology ward rated close to 100% satisfaction on this indicator. Patients in the Emergency/ Outpatient Department felt that they would like to have the triage process explained to them so that they could have realistic expectations about the waiting times. Further qualitative research to determine what type of information and in what formats patients wish to receive information would be useful.

Patients undergoing any procedures as inpatients or outpatients are required to sign a consent form. It is also standard operating procedure

that a doctor or nurse will provide an explanation to the patient about the procedure and treatment, however, written information is not commonly available.

2.9.2 Patient choice

The survey also showed that patients felt that improvements could be made in terms of involving informing them and involving them in decision-making around their health. For example, patients in the medical ward said that the communication between staff and patients needed improving, especially involving the patient in decisions regarding their treatment and explanation of their illness. Patients in the surgical ward also said they would like more opportunity to ask questions about their treatment, while those from the Physiotherapy Department said they would like their concerns to be listened to by staff.

2.9.3 Patient rights

A Patient Bill of Rights was established under an Australian Aid-funded programme, although a copy was not able to be sighted. In theory, a framed copy of the Bill should be visible to patients in each consulting room in Vaiola Hospital, although it is anecdotally reported that this is not consistently available. Tonga does have legislation to ensure privacy and confidentiality of personal information in medical records.

2.9.4 Complaints procedures (mediation, claims)

Tonga has a patient complaints mechanism that was developed to support quality improvements and risk management in the hospitals. As mandated by the Medical and Dental Practice Act 2001, any person may make a complaint in writing to the Registrar of the Medical and Dental Practice Board regarding the conduct of a medical practitioner, health officer, dentist or dental therapist. The Board will seek additional information as required from the complainant and will inform the health worker of the particulars of the complaint and give them an opportunity to respond. The Board may decide at any time that it will either: deal with the complaint at a meeting of the Board; conduct an inquiry into the complaint; or dismiss the complaint. The Board has the power to undertake an inquiry and summon witnesses under oath. If the Board finds the health practitioner guilty of misconduct, it has the power to implement a punishment, as they see fit, which may include temporary or permanent suspension of the health professional's licence to practice.

2.9.5 Public participation

There is a lay representative on the Health Practitioners Review Council who is appointed by the Minister of Health. Vaiola Hospital and each of the district hospitals have a Board of Visitors who are involved in planning and in particular in fundraising for the hospitals. Community consultation is also conducted around the introduction of new policies and plans.

2.9.6 Patients and cross-border health care

There is very limited cross-border health care in terms of non-Tongans utilizing the Tongan health system. Patients from other countries do not come to Tonga to seek health care, with only a small number of foreign tourists and expatriates utilizing the health system as necessary when in Tonga. Of interest, when the Minister of Health proposed a dialysis centre in Tonga, an American-residing Tongan expatriate suggested that he would return to Tonga and pay for dialysis if it was cheaper than in America, even if he had to pay more than Tongan residents. If Tonga does open the anticipated dialysis unit, this model could present an opportunity for Tonga to recoup some of the prohibitive costs that dialysis equipment and running costs would impose.

There are two categories of Tongans who seek overseas health care: those who are covered by the Overseas Medical Transfer Scheme (see *5.2 Patient Pathways*) and others who choose to and are capable of funding their own overseas travel and health-care expenses. For example, patients requiring dialysis for chronic kidney disease are ineligible for the Overseas Medical Transfer Scheme and must find their own means to fund such treatment in foreign countries where it is available. In some cases, people choose to permanently migrate overseas to receive life-prolonging treatment.

3 Financing

Chapter summary

Since the year 2000, government expenditure on health as a proportion of total health expenditure has averaged above 80%, at an average 4% of GDP. The health sector has consistently received a relatively large portion (12%) of total government funding. In 2007/2008 the total health expenditure was roughly TOP 40 million, or an average 5.6% of GDP, and health expenditure per capita has increased significantly from US$ 163 in 2000 to US$ 245 in 2011. The Government is the main financer of the health system, providing close to half (47%) of financing in 2007/2008, supplemented by a large degree of donor and development partner funding (38%).

Tonga provides a relatively high level of financial risk protection with, an average of 10% of total health expenditure coming from household out-of-pocket payments, a relatively small proportion compared to regional averages for the Asia Pacific region. This is partly due to the fact that the private sector is very small, with the exception of a large cohort of around 1000 traditional healers, who account for the majority of OOP payments. User fees which were introduced in 2009 now raise approximately TOP 1 million per year. However, there is not enough data to assess whether the fee exemptions and safety net mechanism are effectively protecting the intended populations or affecting health-care utilization. Voluntary health insurance currently only accounts for around 3% of total health expenditure and recent attempts to implement social health insurance for the 12% of the population employed in the formal sector were not approved by Cabinet. With the double burden of disease and Tonga's commitment to provide universal health care, it will be necessary for the Government to investigate alternate financing mechanisms for the health system.

3.1 Health expenditure

Although Tonga had conducted previous health-care expenditure studies, it first undertook a set of National Health Accounts (NHA) in collaboration with the World Bank in 2001/2002 which was subsequently

published in 2004. Tonga is one of only a few countries in the Pacific to have undertaken an NHA, and recognizing its importance as a policy tool, has now institutionalized its production within a team in the Ministry of Health. Tonga has subsequently published three NHAs and another two are reported to be in the pipeline.[11] The first NHA was also complemented by a National Household Expenditure Survey (NHES) and additional surveys with other providers including the private sector, traditional healers, NGOs and donors. Most of the data in this chapter are based on the NHA results. However, where more current data are available, other sources are used.

According to the latest available NHA, total health expenditure (THE) in 2007 was over TOP 40 million, representing a doubling from 2001/2002.

Table 3.1 Trends in health expenditure, selected years

Expenditure	2000	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total health expenditure in per capita PPP (NCU per US$)	163	201	196	270	235	291	280	207	226	245
Total health expenditure as % of GDP	5	5	5	7	6	7	6	5	5	5
Mean annual real growth rate in GDP*	..	1.0	-0.4	0.8	-3.2	..	-0.4	-1.2	..	..
Government expenditure on health as % of total health expenditure	70	83	83	87	87	85	85	79	81	84
Private expenditure on health (PvtHE) as % of total health expenditure	30	17	17	13	13	15	15	21	19	16
Government health spending as % of total government spending	13	18	14	17	18	23	24	12	13	16
Government health spending as % of GDP	3	4	4	6	5	6	5	4	4	4
Out-of-pocket payments as % of total health expenditure	23	11	11	8	8	10	10	14	13	11
Out-of-pocket payments as % of private health expenditure	77	63	63	62	62	68	68	68	68	68
voluntary health insurance as % of total health expenditure	3	3	3	2	2	3	3	4	3	3
voluntary health insurance as % of private health expenditure (1)	11	20	20	16	16	18	18	18	18	18

* Should be calculated as the mean of the annual growth rates in national currency units at 1995 GDP prices. (..) indicates no data available for that field. NCU = National currency unit

Sources: WHO, 2014; Somanathan and Hafez, 2009; MoFNP, 2011a, 2010b, 2009.

11 The 2003/04 NHA was published in 2006, the 2005/06 NHA was published in 2008 and the 2007/08 NHA was published in 2012. These reports are extensive undertakings as shown by the delay in publication. The Ministry of Health reports that NHAs for 2009/2010 and 2011/2012 are currently in production, but data are not yet publicly available.

The most recent data from WHO[12] show that the percentage of GDP spent on health in 2011 has remained at around 5% since 2000, although it has fluctuated during this time, peaking at rates of 6–7% between the years 2005–2008 (Table 3.1). Since 2000 the percentage of government spending on health has increased slightly (by 3%) to 16%, however, this is again a significant decline from the 24% recorded in 2008 prior to the GFC. Across the same period there has been a significant increase in the government expenditure on health as a percentage of total health expenditure, from 70% in 2000 to 84% in 2011 and an associated decline in the proportion of OOP payments.

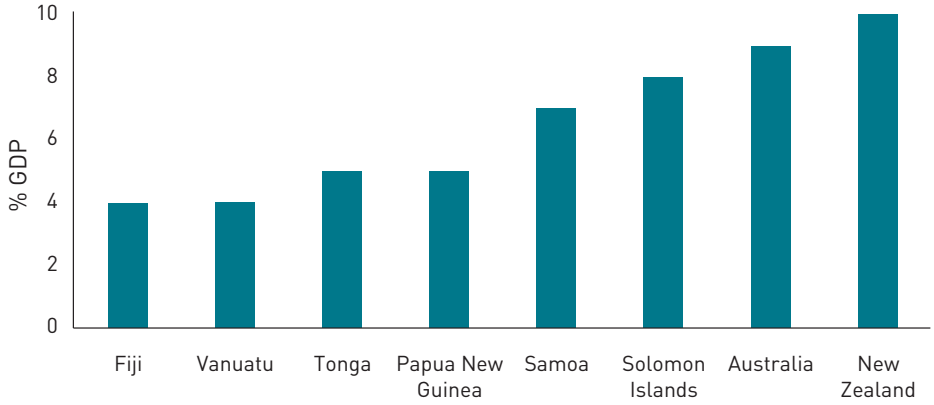
The fiscal context: The fiscal context refers to the ability of the Government to mobilize tax and other public revenues, and the need for these to be balanced with total spending. This of course impacts on health because the more money the Government has, the more it can effectively spend on health. According to a report assessing public health expenditure from a fiscal space perspective, there are good prospects for increases in Tonga's budget based on the macroeconomic conditions, i.e. projected GDP growth at 1.75% annually, a 15% consumption tax implemented in 2005 and recent tax collection improvements (Tandon and Cashin, 2010). However, as health has received a high average portion (12%) of the overall budget since 1994, one of the highest levels of government health spending in the East Asia and Pacific region, the likelihood of increased government budget for the health sector is small. External funding from grants and ODA is predicted to remain a major source of funding but is not anticipated to increase significantly and cannot be relied upon in the long term. Options for diversification of revenue sources are thus being explored in the form of social health insurance, although this will only address a small proportion of the population (12%) and earmarked taxes on tobacco and unhealthy food imports. The authors conclude that the real area where the health system can increase available revenue is through making efficiency gains within the sector and recommend that expenditure should be realigned to focus more heavily on public health and preventative measures in order to reduce costs from the mounting burden of chronic diseases and NCDs (Tandon and Cashin, 2010).

Health expenditure as share of GDP: Tonga's expenditure on health as a proportion of GDP (5%) was the same as Papua New Guinea in 2012 and

12 This data is based on projections and hence caution should be exercised when interpreting.

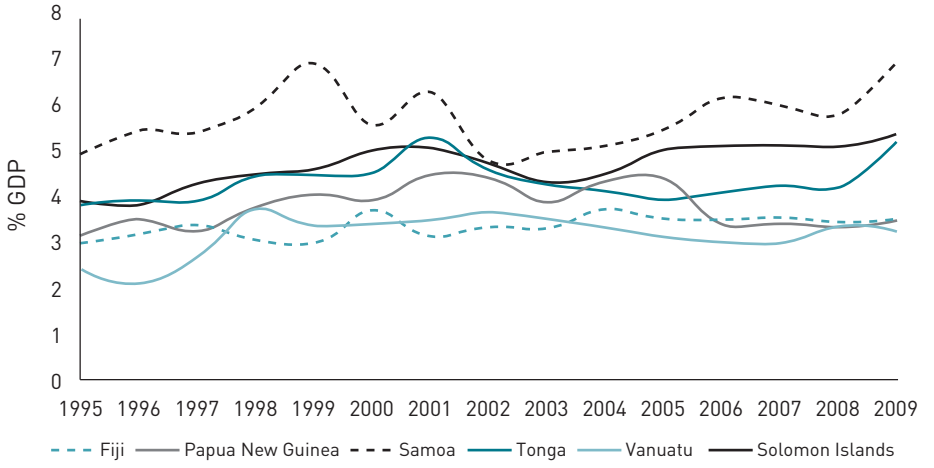
slightly above Fiji and Vanuatu. Samoa and the Solomon Islands spent slightly more on health than Tonga, and Australia and New Zealand spent close to double the amount in Tonga (Figure 3.1). A review of trends over time (Figure 3.2) reveal that Tonga's expenditure is placed in the mid to upper range compared to its peers. Over the period, Tonga's spending has consistently been at or above 4% of GDP, which is higher than that of Papua New Guinea, Fiji and Vanuatu, slightly below Samoa and similar to level in the Solomon Islands.

Figure 3.1 Total health expenditure as a share (%) of GDP in selected countries, 2012



Source: WHO, 2014

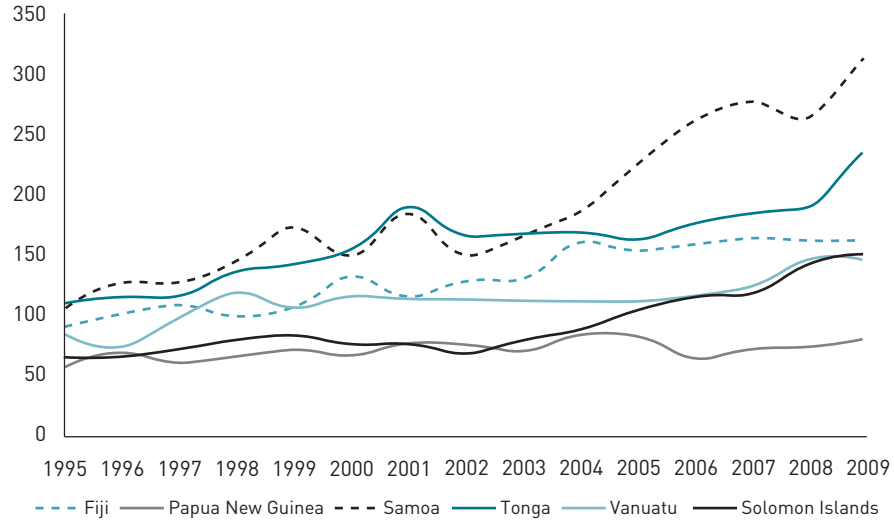
Figure 3.2 Health expenditure, per cent of GDP, Tonga and selected other countries, 1995–2009



Sources: WB, 2014b; WHO, 2014

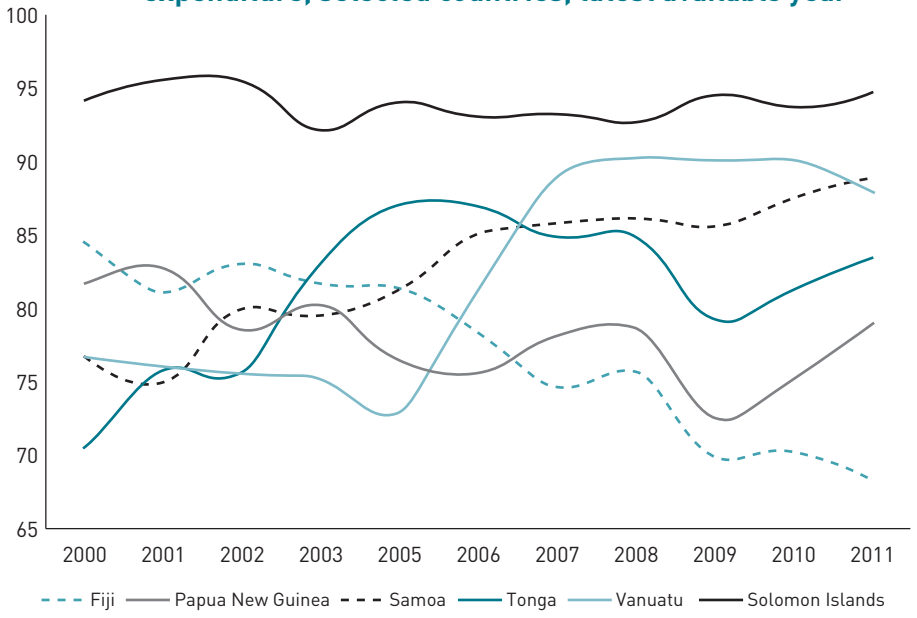
Spending per capita (Figure 3.3), however, shows that Tonga and Samoa have consistently spent the most over the past 15 years although the gap between countries has grown wider in this period. For example, whereas

Figure 3.3 Health expenditure in US$PPP per capita in selected countries



Sources: WB, 2014b; WHO, 2014

Figure 3.4 Government health expenditure as a per cent of total health expenditure, selected countries, latest available year



Source: WB, 2014b

in 1995 all six countries spent somewhere between US$ 69 and US$ 115 per person, in 2009, Tonga spent US$ 236 per capita compared to US$ 312 in Samoa, US$ 162 in Fiji, US$ 150 in the Solomon Islands and Vanuatu and US$ 81 in Papua New Guinea. Government expenditure is the main form of health spending, accounting for between 68–95% of total health expenditure in all six countries examined (Figure 3.4). Government spending has increased significantly since 2000 in Tonga, Samoa and Vanuatu, has remained constant in Samoa and has decreased in Fiji and Papua New Guinea.

Health expenditure by service programmes: Almost one in every four pa'anga (24% of THE) spent on health in Tonga goes towards capital works (Table 3.2). A disproportional amount is also spent on curative care, with inpatient care (both locally and overseas) accounting for 22.8% of THE, and pharmaceutical care for a further 9.7%. In contrast, only

Table 3.2 Public health expenditure on health by service programme (2005/2006)

Expenditure	% of total health expenditure
Capital formation of health-care providers	24.0
Inpatient curative care	15.7
Pharmaceuticals	9.7
General government administration of health	8.8
Research and development	8.3
Inpatient curative care (overseas)	7.1
Education and training of health personnel	6.0
Maternal and child health, FP and counselling	4.5
Traditional health care	2.8
Basic outpatient medical and diagnostic services	2.4
Outpatient dental care	2.4
Clinical laboratory	1.9
Prevention of NCDs	1.6
Health promotion & other public health services	1.5
Environmental health	1.2
Diagnostic imaging	0.7
Prevention of communicable diseases	0.7
Health administration & health insurance	0.4
Food, hygiene and drinking water control	0.2

Source: NHA Team et al., 2008

around 8.3% is spent on preventative health and health promotion: 1.6% for NCDs, 0.7% for communicable diseases, 1.5% for health promotion and other public health services and 4.5% for maternal and child health including family planning. General government administration including administration of health and health insurance accounts for 9.2%. Research and development received a sizeable 8.3% of the budget, and education and training of staff was allocated 6% of the budget.

Spending on NCDs: With the growing burden of NCDs in Tonga, the 2005/2006 NHA featured a chapter on NCDs for the first time. It revealed that in 2005/2006 the prevention and care of NCDs accounted for around 16% of total health expenditure, or almost 1% of GDP in 2005/2006, a figure which is higher than most neighbouring countries but relatively low when compared internationally to health outcomes with health expenditure on NCDs per capita. It also showed that the Ministry of Health was currently spending around 22% of its budget on curative care of NCDs, while devoting only 0.2% of its resources towards prevention of NCDs. Furthermore, expenditure on NCDs increases exponentially as higher levels of care are required; more than trebling as care progresses from health centres to the outpatient department of Vaiola Hospital; and increasing a further nine fold as inpatient care is required. These findings highlight that more budget should be shifted towards prevention in future corporate health plans.

Staff salaries consistently account for the majority of spending by service input (Table 3.3). This share has increased by 5% between 2003/2004 and 2008/2009 (the last reported year) and the upward trend is expected to continue due to reductions in budgeted operational spending; salaries are budgeted to consume over 72% of total Ministry of Health spending in 2010/2011. Increases in the expenditure on salaries are largely due to the recruitment of medical staff on short-term contracts to replace doctors that are on leave, with the proportion of "unestablished staff" increasing by 1% over the same time period. Despite reductions in the proposed budget to 60% by 2015/2016, it is likely that the high proportion of budget going to salaries will continue considering the shortages of medical doctors and other key staff positions as will be further discussed in Chapter 4.

In contrast, operational costs were 35% of Ministry of Health expenditure in 2008/2009, which in real terms (accounting for inflation) is close to a 30% reduction since 2006/2007. Drugs and medical supplies account for close to half (46%) of the operational budget, although this is projected to

Table 3.3 Ministry of Health recurrent expenditure by service input over time

Year	Expenditure per service input as a percentage of total health budget							
	Salaries	Operational costs*	Maintenance and operations	Drugs and medical supplies	Other operational costs	Goods and Services	Minor capital works	Travel and communications
2003/04	60	40	4	..	..	31	0	4
2004/05	56	44	4	..	..	28	9	4
2005/06	63	37	5	..	..	21	8	3
2006/07	59	41	5	..	..	21	14	3
2007/08	61	39	6	..	..	23	7	3
2008/09	65	35	5	14	16	27	1	3
2010/11 (budgeted)	72	28	7	15	6	..	..	..
2012/13 (proposed)	62	38	10	16	14	..	..	..
2015/16 (proposed)	60	40	10	18	12	..	..	..

Source: National Health Accounts 2008 - 2012.*"Operational costs" is inclusive of all of the columns to its right, although they may not add up to the total due to rounding (Ahio et al., 2010).

increase with the rising cost of transport from overseas and the weakness of the Tongan pa'anga against foreign currencies.

In 2008/2009, travel and communications also accounted for a smaller proportion of budget, down 1% on 2003/2004 figures to 3%, as did goods and services, down 4% to 27%. Maintenance and operations saw a 1% increase in funding to 5% of total health expenditure, though this has been insufficient to carry out essential maintenance, particularly of medical equipment, a significant proportion of which is not operational.

3.2 Sources of revenue and financial flows

There are three principal sources of finance for the health sector in Tonga: (i) the Government, through the Ministry of Finance and National Planning; (ii) foreign donors; and (iii) private sources, predominately household payments with a very small portion of private voluntary health insurance (VHI). Funding from these sources pass either directly or indirectly, via intermediate financing agents, to the providers of health-care services. In 2007/2008 the Government provided 47% of funding to the health system, complemented by donor funding (38%), household payments (10%), voluntary health insurance (3%) and NGOs (2%).

Table 3.4 Sources of revenue as a percentage of total expenditure on health

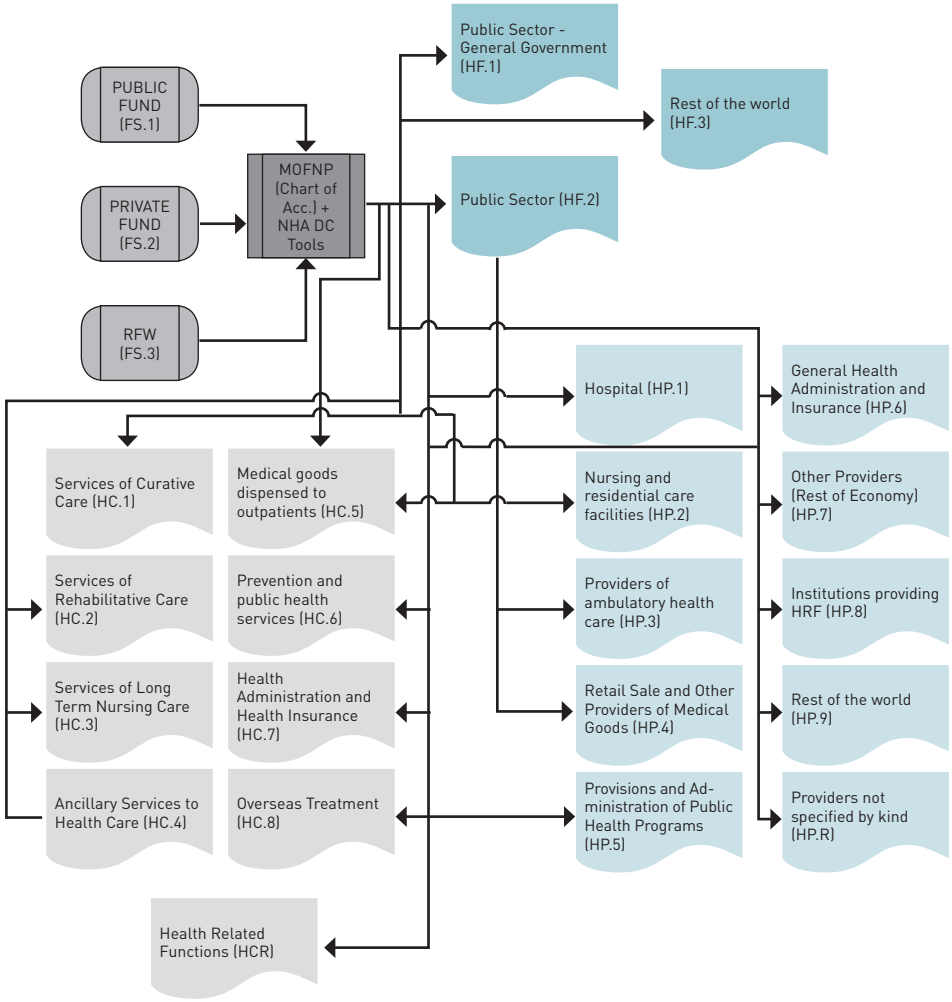
Sector	Source	Percentage of total health expenditure			
		2001/02	2003/04	2005/06	2007/08
Government	Ministry of Health	49.5	54.5	54.0	47.0
	Ministry of Defence	..	0.1	0.0	..
	Parliament	0.1	0.0	0.0	..
Donor	Donors and development partners	26.1	31.5	32.9	38.0
Private	Private insurance companies	2.6	0.4	2.1	3.0
	Household out-of-pocket	18.8	11.1	8.2	10.0
	NGOs	3.0	3.1	2.9	2.0
	Private firms	..	0.3	0.0	..

Source: NHA Team et al., 2004, 2006, 2008 and 2007/2008 NHA (unpublished)

The Ministry of Health contribution has decreased seven percentage points from around 54% between 2003 and 2006 (Table 3.4). Consequently, donor partners have increased funding for the health sector by 5% since 2005/2006, representing an approximate 12 percentage point increase in donor funding since 2001/2002, demonstrating the heavy reliance on donor support. Donor funding tends to be mainly for the operational costs of the health system, revealing that the Government does not have the ability to fund significant health capital/development costs out of its limited budget. OOP payments have also fallen significantly from 18.8% in 2001/2002. NGOs and private insurance companies have consistently provided only small amounts of revenue in the order of 2–3% of the total annual health expenditure.

In terms of financial flows (Figure 3.5), the Ministry of Health develops a budget in accordance with the guidelines and ceiling prepared by Treasury. This annual budget also takes into account recurrent multi-year funding for the health system from donor and development partners which is centrally processed through MoFNP. The proposed Ministry of Health budget is submitted to the MoFNP and must be approved by Parliament. When the Ministry of Health receives the annual budget they allocate funds to each of the health districts based on historic allocations as well as arising needs and constraints identified in the review of the Corporate Plan conducted in the previous Week of Love. There is, however, a lack of information around the efficiency of cash flows from the Ministry of Health down to the district and facility level, the capacity of health centres to utilize funds and accountability at the decentralized levels. Budget for functions such as human resources management

Figure 3.5 Financial flows



Source: NHA analysis 2008/2009. Note the codes within brackets refer to NHA classifications.

is retained centrally and health services receive line-item lump-sum budgets. Revenue that is generated by the health system in terms of user fees and out-of-pocket payments (averaging TOP 1 million per year) is returned to the MoFNP and is not earmarked for health system use.

3.3 Overview of the public financing system

3.3.1 Coverage

Breadth (who is covered): The Constitution entitles all citizens to free health care, while foreigners and non-citizens are expected to pay for health services. In 2008/2009 however, user fees for inpatient health

services were introduced via legislation although they have not been consistently enforced to date as discussed further in *3.4.1 Cost-sharing (user charges).*

Scope (what is covered) and depth (how much of the costs are covered): In terms of the scope of coverage, while the Health Services Act 1991 states that the Minister has the responsibility *"*to provide and maintain comprehensive hospital and community health services with facilities for the investigation, diagnosis, treatment, rehabilitation from, and prevention of disease and ill-health", the actual services which should be provided at each level of the system are not specified. In practice, health services are provided by a network of public providers consisting of four hospitals, supported by health centres and maternal and child health clinics, as will be further described in Chapter 4. The services provided at each type of facility and the provision of pharmaceutical therapy is, in theory, guided by the *Standard Treatment Guidelines and Essential Drugs List* (MoH, 2007b). In practice, however, the services and drugs provided at facilities are often limited by the level of staff, their capacity, and the availability of resources and many patients bypass local services for district hospitals or Vaiola Hospital in Nuku'alofa in order to access a wider range of better quality services.

Where highly specialized services are not available within Tonga, eligible patients may receive subsidized travel and have treatment or diagnostic services performed overseas, under the Overseas Treatment Scheme (the eligibility criteria and details of which are discussed further in *5.2 Patient pathways*). Teams of visiting overseas specialists, surgeons in particular, regularly visit Tonga to perform complex procedures which are not locally available, however this may require patients to wait for an extended period of time, and to travel to a district hospital or Vaiola Hospital for treatment. Services such as renal dialysis, some forms of cancer therapy (types of radiotherapy and chemotherapy, for example) and other complex diagnostic and curative treatments are not currently available in Tonga and may not be covered by the Overseas Treatment Scheme, limiting these treatments to those who are able to personally fund them or find alternate means of finance.

3.3.2 Collection

General government budget – source of Ministry of Health funds: At present, Tonga's National Health Service is financed primarily through general government revenue, predominantly through taxation.

The Ministry of Revenue and Customs is responsible for collecting a mix of taxes to fund the government budget; the main revenue generator being consumption tax, generating 44% of all tax income in 2007/2008, followed by import tax (29%), progressive income tax (19%) and excise and other taxes (8%) (MoFNP, 2011a). Whilst the Ministry of Health also generates around TOP 1 million each year through user fees, this is transferred to the MoFNP as a contribution to the total government budget. Similarly, although there have been several increases on the excise duties on tobacco, alcohol and unhealthy foods, this revenue goes to the MoFNP and is not earmarked for the health sector.

Taxes of contributions pooled by a separate entity – social health insurance: The National Health Accounts Section of the Ministry of Health recently investigated the feasibility of introducing a social health insurance scheme for the 12% of the population engaged in the formal sector. A preferred option was selected but was vetoed prior to being submitted to Cabinet as it was predicted that it could result in a reduction in employment and economic activity and thus was not feasible within the country's present capacity. Estimates of the preferred option indicated that a 5% increase in payroll taxes for both employers and employees would generate an additional TOP 5 million for the health sector, equating to an additional 19% in funding. The costs borne by the Revenue Services Department were estimated to be in the order of 5–6% of the collected revenue with employers bearing some additional costs. Somanathan and Hafez (2009), however, pointed out that the actual revenue generated and the amount made available to the health sector are likely to be much less than the estimated 19%, especially if administrative costs and potential evasion are taken into account. It was also felt that because such a small portion of the population is employed in the formal sector, it would be difficult to scale up social health insurance to include more of the population.

3.3.3 Pooling of funds

As the majority of health care is funded by the Government through general government revenue which is distributed directly to the Ministry of Health in budgetary allocations, there is effectively a high level of pooling in Tonga. The Ministry of Finance and National Planning operates a consolidated fund into which tax and other general revenues including the small contribution of health user fees are pooled. The Ministry of Health submits annual budget proposals to the MoFNP based on annual planning and has to compete with other ministries for resources from within the limited national budget. The size and content of the allocated

budget is usually based on historical trends of previous line item budgets. However, the budget for 2013/2014 has been recently passed, allocating TOP 31 million or 8.7% of the total budget to the Ministry of Health, a decrease from previous year's average of 12% (Fonua, 2013). There are some potential risks which may arise if Cabinet was to endorse the social health insurance scheme for those in the formal sector. For example, creation of separate pools of funds results in fragmentation of risks and limits the potential for cross-subsidization. This means that the employed, potentially younger groups in society belong to a risk pool covered by social insurance and the unemployed, poorer and more vulnerable groups in the population belong to different pools where they may have more shallow coverage, and therefore limited financial risk protection. In order to achieve significant risk pooling and financial protection a national social health insurance programme needs to have mandatory enrolment across what amounts to a large portion of the population.

Allocating resources to purchasers: Once the MoFNP has allocated a budget to the Ministry of Health, health facilities are paid on the basis of line-item budgets, with amendments made based on the review of the Corporate Plan in the Week of Love responding to identified needs and KRAs. Doctors and other health workers are paid salaries. However, neither of these methods uses incentives to improve performance and Tonga lacks the regulatory frameworks or monitoring and evaluation capacity that would enable them to hold providers accountable for performance. The current method of resource allocation and purchasing is not conducive to improving efficiency and better data is required to assess the levels of efficiency in service provision and resource allocation in Tonga.

3.3.4 Purchasing and purchaser–provider relations

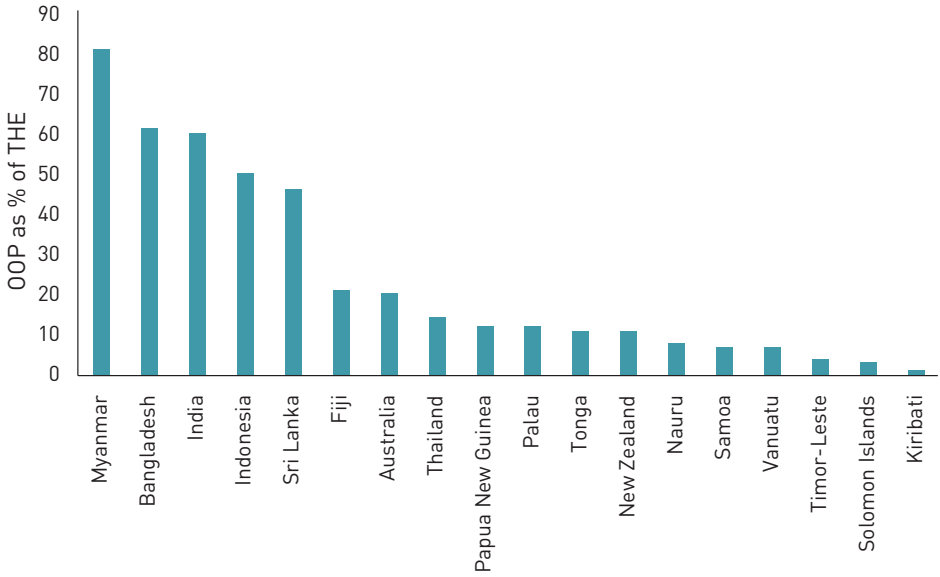
The relationship between purchasers (i.e. the Government), and providers (both health facilities and employees) is integrated and managed hierarchically. A small number of international specialists/experts are contracted to fill key roles or to provide technical assistance, supported through donor-funded programmes such as the THSSP. Sometimes this facility is used by the Ministry of Health to backfill staff on leave.

3.4 Out-of-pocket payments

OOP household payments as a proportion of total health expenditure have averaged around 10–11% since 2003, representing a significant decrease

from the 23% reported in 2000, reportedly because people are now more likely to obtain services from Vaiola Hospital than from private providers following an increase in the quality of services due to the hospital upgrade project. As shown in below, the OOPs in Tonga are significantly lower than in the East Asia region which average above 45%, reaching over 80% in Myanmar, and are in the mid to upper range compared to other PICTs (Figure 3.6). In 2005/2006 approximately TOP 3 million or 8% of total health expenditure was attributed to household OOPs (Table 3.5).

Figure 3.6 Regional comparison of OOPs as a percentage of total health expenditure, 2011



Source: WHO, 2014

Table 3.5 National OOP expenditure in 2005/2006

Provider	Amount	%
Traditional healers	908 764	30.5
Dispensing chemists	843 435	28.3
Physicians, clinics and health centres	511 625	17.2
General Government hospitals	337 528	11.3
Other health-related expenditures	180 264	6.1
Dentists	143 566	4.8
Medical and diagnostic laboratories	33 244	1.1
Public health programmes (provision and administration)	18 863	0.6
Total	**2 977 289**	**100**

Source: NHA Team et al., 2008

As will be discussed further in Chapter 4, apart from a cohort of around 1000 traditional healers, the private health workforce is very small in Tonga, accounting for approximately 10 to 12 individuals. Of this group, approximately six are pharmacists in addition to five medical specialists and one medical officer who engage in "dual practice" (i.e. working in both the public and private systems). Traditional healers account for the largest proportion, or almost one third (30.5%) of OOPs, which is not surprising given the size of their cohort and the fact that all payments to them are out of pocket as they are not integrated into the formal health system. Data from household surveys indicates that communities have a high level of trust in the traditional medicines and services provided by traditional healers although there is no actual description of what these services entail, information which would be useful for determining whether this has an impact on health seeking behaviour of the community. Traditional healers may also be paid in kind rather than in cash and are often the first point of call in areas without formal health services. The 2005/2006 NHA included a survey of 232 active traditional healers from the four main islands. In 2005/2006 traditional healers were estimated to have collectively processed around 19 000 visits at an estimated cost of TOP 908 764. The findings also revealed that on average TOP 7.3 was paid in cash per visit, or slightly more, at a figure of TOP 12.10 for an in-kind visit.[13] In terms of geographical distribution of expenditure on traditional healers, Tongatapu accounted for 60% of the expenditure, followed by Vava'u (34%), and 3% each in Ha'apai and 'Eua. There were similar trends in utilization with Tongatapu again accounting for the bulk (66%) of the visits, followed by Vava'u (23%), Ha'apai (6%) and 'Eua (5%). However, when comparing the utilization rates and spending, the cost of a visit to a traditional healer was shown to be higher in Vava'u than the other islands with the 23% of the visits which occurred in Vava'u accounting for 34% of the total expenditure.

Payments to dispensing chemists accounted for the second highest portion of OOPs (28.3%). The fact that there are six pharmacists employed in the private sector and only four in the Ministry of Health reveals that there is high demand for pharmaceutical goods outside of the formal health sector. OOP payments to physicians, clinics and health centres accounted for 17.2% of all OOPs although it is not clear whether this represents informal payments within the health system or to physicians

13 In-kind payments were converted to a monetary value using a price list from the Department of Statistics.

operating in private practice. This works out to an average fee of TOP 20 charged per consultation, with an addition TOP 20–30 spent on drug costs per visit. The 11.3% that was spent at general government hospitals may be accounted for by user fees and/or informal payments.

3.4.1 Cost-sharing (user charges)

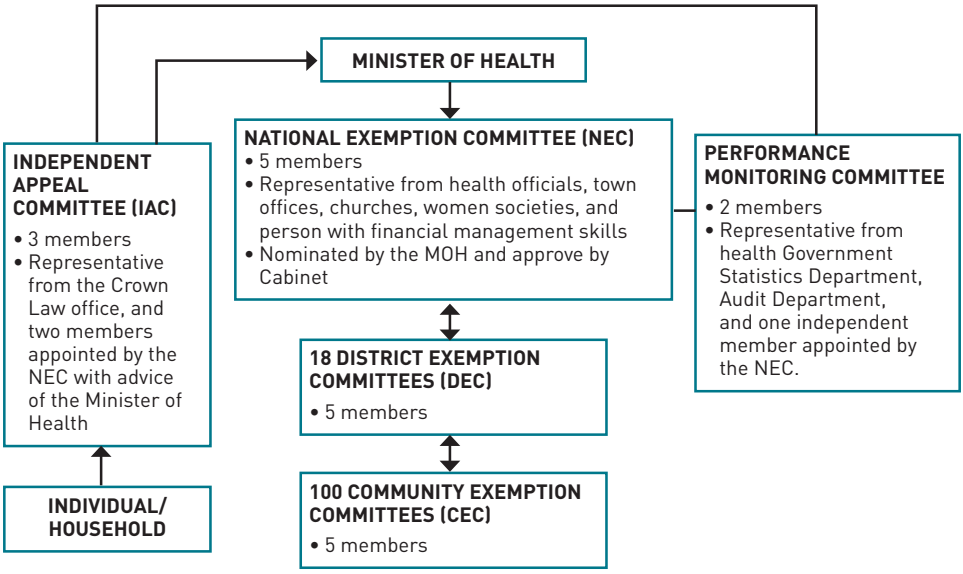
Whilst most health services in Tonga are provided free of charge, there have traditionally been some limited charges levied for certain inpatient services provided at Vaiola Hospital which were primarily targeted at foreigners and health services related to travel or emigration. However, in 2004, as part of Ministry of Health reforms supported by the World Bank, WHO and other international agencies, the feasibility of increasing and expanding user fees was investigated. Within the context of tight budgetary constraints and the rising cost of delivering health services, user fees were seen as a means of providing operational funds to maintain the quality of the upgraded Vaiola Hospital, purchase needed equipment and offset the shortfall created by the large wage increases of 2005. User fees were also seen as a way of focusing the health system on providing high quality and efficient services meeting citizen's needs. It was also hoped that the introduction of user fees would encourage private sector development by allowing private practitioners to use public facilities. Finally, user fees were seen as a stepping stone to the introduction of social health insurance in the longer term.

Within this context, the user fee policy was passed through Cabinet and introduced in January 2009. The policy includes a fivefold increase in admission fees and fees for domestic services (e.g. inpatient meals) for Tongan nationals however charges are capped at 21 days and there are several categories for fee exemption. These include patients aged under 14 and over 70, those in the infectious disease ward or isolated in the ward for infection control, and those admitted for psychiatric illness. There is also an established process for user fee exclusion for indigent individuals and households based on a series of poverty determinants including: access to land or sea, regular waged employment, receipt of remittances, assets including a house (with European-style walls and roof), a vehicle or boat, or more than five major animals. Other issues that may be considered include: the size of the household, legal problems, a record of substance abuse and a record of receiving support from either public or private social services. Screening of individuals is also determined on the following criteria: having a health problem/disability or notifiable communicable disease, and having more than one inpatient

stay and/or over 12 outpatient visits to a hospital in the last year. The information pertaining to individual eligibility is verified by the Ministry of Health, Vaiola Hospital and the Red Cross (for disability data) and patient medical records are clinically reviewed to ascertain whether the person is trying to follow the recommended treatment regimen.

Fee exemptions and the safety net are executed through exemption committees which have been formed at the community level (of which there are 100 across the Kingdom), as well as at the district and national levels (Figure 3.7). Screening is conducted by the community committee and a shortlist of eligible households is then forwarded to the district and national committees. Appeals may also be processed through an independent committee.

Figure 3.7 Overview of user fee exemption processes



Source: Hufanga S 2013

Since 2009, the yearly revenue raised from user fees has been TOP 1 million with 85% of this revenue being raised in Tongatapu (Table 3.6). However, it is reported that the implementation and enforcement of fees has not been consistent and has not happened at all in some places. This is partly because there has been considerable debate around the potentially negative effects of user fees in terms of causing catastrophic household payments as it is well known that user fees worsen access by the poor when appropriate waivers and exemptions fail to be implemented (Somanathan and Hafez, 2009).

Table 3.6 Revenue raised by user fees by region (TOP)

Location	Budget 08/09	Budget 09/10	Budget 10/11	Budget 11/12
Tongatapu	395 141	896 300	850 200	850 200
Vava'u	86 132	86 100	125 000	125 000
Ha'apai	14 960	9700	12 500	12 500
'Eua	7170	4350	6550	6550
NTT	2800	2450	5750	5750
NF	150	1100	..	..
Total	**506 353**	**1 000 000**	**1 000 000**	**1 000 000**

Note: NTT= Niuatoputapu, NF = NiuafoÐou, collectively referred to as the Niuas

Source: National Health Accounts 2008 - 2012

While there is not a pronounced difference in access to health services between different socioeconomic groups in Tonga, some inequality does exist. The introduction of user fees could worsen this effect if the fee exemption policy is not adequately enforced and continually reviewed for effectiveness (as discussed further in Chapter 7). If user fees fail to be enforced, it could result in crowding out those who are rightfully entitled to exemptions and hence lower their access and utilization of services. Whereas effective enforcement of user fees should improve efficiency in utilization of facilities by reducing bypassing of appropriate lower-level facilities for more expensive higher-level facilities. As all of the revenue generated goes directly to the MoFNP, formal evaluation of the cost of running and enforcing the scheme and the benefits to the Ministry of Health should also be undertaken. As Somanathan and Hafez (2009) point out, if user fees achieve only marginal increases in funding to the Ministry of Health, but at the same time significantly undermine risk pooling and financial protection for citizens, the costs of introducing user fees may outweigh their benefits.

3.4.2 Direct payments

All OOP payments in Tonga are direct payments – see *3.4 Out-of-pocket payments*.

3.4.3 Informal payments

As discussed above, traditional healers form the largest component of the informal health sector in Tonga, along with a very small number of doctors and pharmacists working in private practice. All payments to traditional healers are informal payments whether made in cash or in

kind. Survey results, however, showed that close to 86% of payments to traditional healers were in-kind payments, which although they equate to a cost of roughly 65% more than cash payments (an average of TOP 12.10 for in-kind visit, versus TOP 7.3 per cash visit), in-kind payments are likely to be more convenient for many subsistence Tongans who do not have easy access to cash.

The extent of informal payments in the formal health sector is unclear. However, as Somanathan and Hafez (2009) point out, with growing demand for health care and budgetary allocations in commensurate with the increased expenditures, health-care providers may increasingly resort to user fees and other formal and informal payments in order to close the resource gap. For instance, patients may be asked to buy drugs and supplies from private pharmacies because hospitals do not have adequate supplies.

3.5 Voluntary health insurance

3.5.1 Market role and size

Voluntary health insurance (VHI) only accounts for a very small portion of total health expenditure in Tonga. On average between 2001 and 2008, payments to private health insurance companies only accounted for 2% of total health expenditure (Table 3.4). The 2005/2006 NHA estimated that only five insurance companies provide health insurance in Tonga, but no detail was provided about these companies and what package of benefits they offer.

3.5.2 Public policy

There is currently no policy regulating private health insurance providers.

3.6 Other sources of financing (external support)

3.6.1 Parallel health systems

There are no parallel health systems in Tonga. Whilst some Ministries such as Defence have a budget for employee health, all services are delivered through the Ministry of Health.

3.6.2 External sources of funds

As previously discussed (Table 3.4), donor and development partner funding provides a large portion of revenue to the Tongan health system. Between 2001 and 2008, ODA provided, on average, around one third

(32%) of the annual health budgets, peaking at 38% of the 2007/2008 budget. In 2005/2006, TOP 10.6 million was received from donors with over half (55%) coming from the Health Sector Support Project funded through the International Development Association (IDA) of the World Bank. These funds went predominately towards the redevelopment and refurbishment of Vaiola Hospital and were higher than the average annual health expenditure of preceding years. In the same year, WHO provided around 12% of the ODA to health, and the European Union and DFAT (formerly AusAID) both provided around 9% of the funding. Other bilateral donors including NZAID and the JICA also provided 8% and 6% of the total health revenue, respectively. The Canada Fund, the Global Fund, UNFPA and others also provided small amounts of funding which accounted for 1% or less of the total donor funds. While the health system continues to rely on the goodwill and financial contributions from development partners, it is imperative that the Government prepare for possible reductions or withdrawal of donor funding.

Use of donor funds: Donor funds are often targeted towards a certain objective in line with their own interests and programmes. In 2005/2006, over half of donor funding to health was spent on capital works, 15% went to education and training, 11% on research and development, 8% on overseas treatment and 4% on pharmaceutical and other medical non-durables. Funding targeted to prevention was minimal, with only 3% spent on prevention of NCDs, 2% on MCH and family planning, and 1% spent on both prevention of communicable diseases and environmental health. The Australian Aid-funded THSSP, however, stipulates that the Ministry of Health should increase its budget for preventative health care to at least 10% of total health expenditure and discussions are currently being focussed on how the Ministry of Health defines expenses attributed to preventative health care.

3.6.3 Other sources of financing

There are some local and international NGOs that provide health services directly to households either as for-profit or not-for-profit organizations. In 2005/2006, there were 15 NGOs providing health-related services. The largest by far is the Tonga Family Health Association, followed by ʻAloua Maʻa Tonga, Vaiola Hospital Board of Visitors, Tonga Red Cross and a number of community-level and Church groups. In 2005/2006, 60% of NGO funds came from overseas, with the remaining 40% mobilized locally. Most funds were spent on MCH, NCD prevention and education and training of health personnel (Ahio et al., 2010).

3.7 Payment mechanisms

3.7.1 Paying for health services

As described above, all health services delivered by the Tongan Government are funded through general government revenue including ODA. Health services receive a yearly fixed-budget in the form of a prospective payment from the Government which is calculated on a line-item budget. The Ministry of Health budget preparation process is undertaken in a collaborative manner by a Budget Team consisting of staff from the accounts, HR and administration divisions plus members of the Executive. In recent years, the accounts section has been able to provide a monthly financial report through access to the Treasury's Sun System accounting software, which has assisted with budgeting and financial management. During the budget cycle, the accounts section has a heavy burden of fund transfers due to insufficient or inadequate funding for certain items e.g. overtime, utilities, and medical supplies. The Ministry of Health maintained an average variation of only 3% between budgetary allocation and actual expenditure between 2005/2006 and 2009/2010, placing its performance at the top of Tongan Ministries. The 7% variance recorded in 2009/2010 was due to MoFNP-mandated cuts in spending against a previously agreed budget, not underspending due to poor budget execution. It is clear that the Ministry of Health's financial management capacity has greatly improved as a result of the HSSP (Ahio et al., 2010).

3.7.2 Paying health workers

Health workers are paid a salary by the Ministry of Health, which may be supplemented by overtime payments. The *Situation Analysis of Specialist Services* conducted in 2010 documented the pay-scale for doctors employed by the Ministry (Fiji School of Medicine, 2011). Gross annual salaries for new medical graduates are in the order of TOP 29 000 to 39 000; Specialist Registrars earn from TOP 35 000 to 43 000; Senior Medical Officers earn from TOP 39 000 to 47 000 and Consultant Specialists earn between TOP 42 000 and 50 000. The only allowance is for overtime, for which all doctors are eligible. There is recognition that the salary structure is one of the lowest in the region. It is also very low compared to expatriate doctors who are funded by DFAT under the Pacific Technical Assistance Mechanism (PACTAM) programme to work in the Tongan Ministry of Health and receive a salary in the order of TOP 100 000 to 150 000 per annum with associated allowances.

From July 2005, roughly 2000 of the country's 5000 public servants went on strike, demanding pay increases in the order of 60% to 80%. The Government capitulated in September, granting the demanded increases and thus, although the total government recurrent spending on health has risen by TOP 9 million over six years, two thirds of this growth went to salaries. Since 2003, salary and wages have nearly doubled in absolute terms from TOP 7 million to TOP 13.5 million and have risen from 60% of total spending in to 65%. Spending on salaries is squeezing out operational spending and salary costs could rise in coming years unless some clear actions are taken (Ahio et al., 2010). A key issue is that positions are not established within the Ministry of Health and the number of health workers required through the year changes depending on the funds available. For example, posts automatically become void when a worker leaves and the position is only advertised if the line manager deems that there is a need to recruit a person to do a specific task and there is money in the budget. This means that it is difficult to project the number of health workers and salaries when an established number of positions is not defined (WHO and UNSW HRH Hub, 2014).

4 Physical and human resources

Chapter summary

Health services in Tonga are provided by a network of 34 maternal and child health clinics, 14 health centres, three district hospitals and the tertiary referral hospital, Vaiola Hospital, located in Nuku'alofa. The four hospitals also provide primary health care to the populations of their respective island groups through outpatient and emergency departments. There have been several donor-funded infrastructure programmes over the past few years, the most notable of which was the multimillion-dollar redevelopment and upgrade of Vaiola Hospital. The hospital has been designed and planned to meet the needs of the population now and into the future. Maintenance of health facilities and the provision of adequate levels of basic equipment does, however, remain an ongoing challenge, particularly in the outer islands, with the acquisition of medical equipment limited by funding constraints and often requiring donor supplementation.

In terms of human resources, although Tonga has higher workforce densities than other LMIC neighbours in the Pacific they suffer from brain drain of high demand specialists, such as surgeons and anaesthetists, to high-income countries. To date, the THSSP programme has helped to address critical staff deficiencies. However, this is not a sustainable method in the long term due to prohibitive cost. In-country training is limited, with the Queen Salote School of Nursing providing the only accredited health professional training, in both basic and post-basic nursing. The Ministry of Health also provides training courses for some cadres of health professionals, such as health officers and dental assistants, but the programmes are ad hoc and unaccredited. There is no medical education available in Tonga and most doctors enrol at Fiji National University or at other universities in Australia and New Zealand. With close to a quarter of the workforce reaching retirement age in the next ten years, workforce succession planning is vital and innovative use of technology such as video-conferencing will be needed to overcome workforce shortages.

4.1 Physical resources

4.1.1 Capital stock and investments

Tonga has four hospitals – the tertiary Vaiola Hospital in Nuku'alofa, with 191 beds, and three district hospitals: the Prince Wellington Ngu Hospital in Vava'u (61 beds), Niu'ui Hospital in Ha'apai (28 beds) and Niu'eki Hospital in 'Eua (16 beds). There is no hospital in the Niuas. The hospitals are supported by an additional 14 health centres and 34 MCH/reproductive health clinics which are located throughout the island groups (Table 4.1). There are also a very limited number of private medical clinics, mainly run by doctors from the public system operating in dual practice or by the churches or NGOs, the majority of which are based in Nuku'alofa. Traditional healers are widely dispersed throughout the islands.

Table 4.1 Distribution of health facilities by district

District	Number of health facilities		
	Hospital	Health Centre	MCH clinic
Tongatapu	1	7	19
Vava'u	1	2	5
Ha'apai	1	3	5
'Eua	1	0	3
Niuas	0	2	2
Total	**4**	**14**	**34**

Source: MoH, 2013b

Public health infrastructure in Tonga is relatively sound after the completion of four major health infrastructure projects in the last decade, mostly funded by donor and development partners. The largest health infrastructure project was the upgrading and refurbishment of Vaiola Hospital, initiated in 2002 under the financial support of the AusAID-funded Tonga's Health project and implemented in four stages, expected to be completed in 2014. Stage one, funded by the Japanese Government, included upgrades of the main examination ward, the obstetrics ward and the surgery ward. The World Bank HSSP funded stage two as well as improvements in health-care financing and the health information system. Phase three, again funded by the Japanese Government, commenced in 2010, replacing the main hospital building with a new hospital administration building accommodating the outpatient department, accident and emergency, the antenatal clinic, the central pharmacy, medical records, special clinics and hospital administration. Renovation of the existing laboratory building will accommodate diabetic and ophthalmology clinics and the physiotherapy unit. A new dental

department, School of Nursing building and extension to the mortuary are also planned. Utilities were also updated, and an Estate Management Policy, defining procedures for ongoing hospital maintenance, was created. This plan includes the implementation of a Health Care Waste Management Plan, National Health Accounts and the further development of the Hospital Information System. A maintenance fund, which receives an earmarked 7% of the Government's annual health budget, was also established as was a checklist of minimum infrastructure and equipment standards for health centres.

In 2012, with funding from the Chinese Government, two new "super health clinics" were built on the outskirts of Nuku'alofa at Mu'a and Vaini with the aim of decreasing the number of ambulatory patients who present at Vaiola Hospital. The intention was to staff these facilities with medical officers, although this has not happened due to a lack of appropriately trained staff (MoH, 2013b). AusAID has also upgraded five health centres on Tongatapu at Kolovai, Nukunuku, Houma, Kolonga and Fua'amotu since 2011. The Chinese Government has also funded an infrastructure extension and refurbishment at the Prince Wellington Ngu Hospital in Vava'u. The hospital now has a diabetes centre, and health centres and staff accommodation were upgraded by EU funding. Infrastructural development in Ha'apai, at the Uiha and Kauvai health centres, has been jointly funded by AusAID and the community, and the hospital in Ha'apai was repaired after damage from an earthquake in mid-2006. The Australian Aid Program also intends to buy a boat for the health centre in Ha'apai so that it may undertake outreach services. Following damage to Niu'ui Hospital in Ha'apai from Cyclone Ian in early 2014, the ADB has announced that it will fund the upgrade and relocation of the hospital to a safer location. In 'Eua, construction of the Children's Ward and Clinic at Niu'eiki Hospital was funded by the Government of Japan. A hospital is also being built in the Niuas under EU funding, which should commence in 2014.

Investment funding: As can be seen, a large proportion of investment funding for capital works and equipment is received through development partners and donors, with a smaller contribution from the Government of Tonga/Ministry of Health.

4.1.2 Infrastructure

The physical infrastructure, measured in terms of beds per 1000 capita, is fairly uniformly distributed across the islands with the exception of the

Niuas where there are no hospitals (Table 4.2). On average there are 2.9 hospital beds per 1000 people, a figure which is slightly higher than the average 2.6 beds per 1000 people across the East Asia and Pacific region. In Tonga, however, hospital beds are only filled roughly half of the time, and even less frequently in the outer islands, at 33%, 25% and 19% of the time in Vava', Ha'apai and 'Eua, respectively. The low occupancy rates suggest that hospitals are maintained to ensure access to services in low-density areas. Nationally, the average length of stay is 4.9 days; however the average length of stay for patients admitted with an NCD is estimated to be much longer, calculated at 9.2 days in 2003 (Doran, 2003) and having almost doubled to 17–18 days in 2010 (MoH, 2010b), a worrying trend.
Although Tongans have a relatively low rate of one outpatient consultation per year, the annual hospitalization rate of roughly 10% is relatively high, indicating that people are not utilizing primary health care properly.
The 2003 Tonga Household Survey revealed inequalities in health-care utilization, with the poorest quintile receiving on average 0.86 outpatient consultations per person per year, compared to 1.39 consultations in the richest quintile (Somanathan and Hafez, 2009) as further discussed in *7.3.2 Equity of access to health care*.

Table 4.2 Distribution of hospital beds and occupancies by Island Divisions, 2006

Divisions	Tot. pop.	% of pop.	# of beds	Beds per 1000	Occupancy rate (%)	Total admissions	ALOS	Outpatient consulta-tions
Tongatapu	72 045	70.6	199	2.76	60	8706	5	58 198
Vava'u	15 505	15.2	43	2.77	33	1036	5	23 500
Ha'apai	7570	7.4	22	2.91	25	370	5	12 568
Eua	5206	5.1	17	3.27	19	268	4	11 082
Niuas	1665	1.6	0	n/a	n/a	n/a	n/a	n/a
Total	**101 991**	**100**	**281**	**2.76**	**49**	**10 380**	**5**	**105 348**

*Source:*2006 Census and 2005/6 NHA

Table 4.3 Admission statistics to Vaiola Hospital, 2011

Ward/Department	Number of Beds	Admissions per year	Bed-days	Average length of stay	Bed occupancy rate
Obstetrics	34	4981	11 597	2	93%
Surgical Ward	40	1489	12 137	8	83%
Medical Ward	40	1379	5932	4	41%
Paediatric Ward	31	1368	6123	4	54%
Mental Health Unit	40	215	11 511	54	79%
Special Care Nursery	6	130	1726	13	79%

Source: Vaiola Hospital Records

The district hospitals have less specialization than Vaiola Hospital and as such tend to only have a general ward. Key operating statistics for the wards and departments of Vaiola Hospital are shown in Table 4.3.

Tonga has a hospital bed density per 1000 capita which is considerably higher than other Pacific Island countries and closer to that of New Zealand (Table 4.4). The average length of stay in Tonga is also comparable to both high-income and low to middle-income countries across the region, indicating that hospitals are operating at an average level of efficiency.

Table 4.4 Comparative operating indicators in Pacific countries, latest available year

Country	Hospital beds per 1000 capita	Average length of stay (days)	Hospital discharges per 1000 capita
Australia	3.9 (2009)	5.1 (2009)	155 (2009)
Fiji	2.1 (2011)	5.4 (2007)	88 (2010)
New Zealand	2.8 (2011)	5.5 (2010)	145 (2010)
Papua New Guinea	-	6.0 (2008)	37 (2008)
Samoa	1.0 (2005)	-	-
Solomon Islands	1.5 (2005)	-	75 (2006)
Tonga	2.9 (2014)*	5.0 (2006)	-
Vanuatu	1.7 (2008)	-	-

Source: OECD/World Health Organization, 2012, Central Intelligence Agency, 2013a; *derived value

4.1.3 Medical equipment

Tonga has a limited inventory of major pieces of medical equipment and acquisition relies on donation or funding from donors or development partners. For example, between 2012 and 2014, donors provided more than 54% of laboratory running costs and equipment purchases (Laboratory Services, 2013). Tonga does not currently have magnetic resonance imaging (MRI) machines, positron emission tomography (PET) machines or equipment to perform renal dialysis. In 2014 Tonga will receive its first computed tomography (CT) scan machine, which has been donated by the Government of China, and will also receive a machine for conducting mammography. X-ray and ultrasound services are only available at Vaiola Hospital and at Prince Wellington Ngu Hospital in Vava'u. Tonga also has several ultrasound echocardiography machines which are used in Vaiola Hospital and in portable form for the RHD screening programme.

While all hospitals have basic laboratory equipment which can conduct tests for haematology and blood transfusions, Vaiola Hospital Laboratory is to the only location to process histology and cytology samples from Vava'u. Recently (2013) the Australian Aid Program has provided a new biochemistry analyser to Vaiola Hospital, and the older machine was sent to Vava'u to support local processing of specimens. Vaiola Hospital Laboratory also processes the histology, cytology, biochemistry, microbiology and TB samples from Ha'apai and 'Eua. There is no laboratory capacity in the Niuas. Samples which require more complex testing are sent overseas for processing, and as a member of the PPHSN, Tonga has access to international reference laboratories. Likewise, samples must be sent overseas for testing in the instance that there is a shortage of reagents, which happens on a semi-regular basis.

It was reported that at one time operating theatres in Vaiola hospital were forced to close down when there was a patient in intensive care due to insufficient oximeters. In 2012, the Australian Society of Anaesthetists donated ten oximeters to Tonga's hospitals, which will hopefully ameliorate this issue. The Government of Japan also donated autoclaves and two endoscopes to the Ministry of Health in 2013.

Tonga has a national guideline for accepting donated medical items and equipment which stipulates that items must be less than five years of age, in good working condition, have all accessories and attachments and come with a one year supply of consumables. The Facility and Equipment Committee together with the Biomedical Engineering Unit of the Ministry of Health have also developed a list of approved medical devices for procurement or reimbursement and a national inventory for medical equipment.

While the medical equipment available at Vaiola Hospital is reported to be adequate, an analysis of specialized clinical services performed in Tonga in 2010 reported that there is a need for new equipment to enable doctors who have trained overseas to practice their skills and maintain clinical currency on return to Tonga (Fiji School of Medicine, 2011). Furthermore, at health centres and MCH clinics, especially in the outer islands, basic medical equipment is not always available. For example, clinics in remote areas may only receive new supplies once every six weeks with visiting ships. The maintenance and repair of medical equipment is also problematic in these areas, but this is an issue across the health system due to inadequate operational budget.

4.1.4 Information technology

The majority (82%) of Tongans are subscribed to either a fixed line telephone or mobile phone, with a six-fold increase in mobile phone coverage since around 2006 (ITU, 2012). Internet coverage is currently much lower however, with around 30% of Tongans using the internet, 15.5% of households owning a computer, and less than 2% of the population being internet subscribers. This situation is likely to change however as in late 2013 a high-speed, fibre-optic broadband cable was brought underwater from Fiji through the World Bank- and ADB-funded Pacific Regional Connectivity Project.

Current use of information and communication technology (ICT) in the health system: As discussed in *2.7.1 Information Systems*, Tonga's health information system has been upgraded in the past decade. However, internet has not been used extensively in the HIS due to unreliability. For example, medical professionals have tried to use the internet to seek the opinion of overseas colleagues, but with a slow and intermittent internet connection it can take days to send an image or message and hence it cannot be relied upon in emergency situations. However, the new broadband access is expected to facilitate improved communication and means that clinics in remote areas will be able to access medical records and work more closely with staff in Tongatapu and overseas. Video conferencing, whereby international specialists could provide real-time advice during operations, for example, is also thought to have significant potential.

The IT and health information departments of the Ministry of Health introduced an electronic patient data/clinical information registry for outpatient clinics in 2009. This system has proven to be very useful in facilitating access to and retrieval of information. The system also uses electronic monitoring and booking of clinic appointments, which has resulted in better coordination and streamlining of the clinics, and also electronic records for prescription and dispensing of pharmaceutical supplies. It should be noted, however, that an electronic system is not used exclusively, and paper records are created by some health workers who are not computer literate.

4.2 Human resources

4.2.1 Health workforce trends

Current stock of health workers: A total of 809 staff were employed within the Ministry of Health in January 2013 (Table 4.5), which, along with

the corresponding overall densities of health workers, has remained relatively stable since 2005. However, as previously noted, three of the senior management retired from their positions in 2013, which is likely to create some instability and inefficiency within the system while these key positions are filled.

Nurses and midwives: In 2013 the nursing profession (including registered nurses, midwives and student nurses) comprised half (50.4%) of the health workforce, having increased by 7% since 2005. There has however been a decrease in the number of midwives from 32 to 24 between 2005 and 2013. In contrast, there has been a large increase in the number of advance practice nurses over the past eight years (from two nurses in 2005 to 31 nurses in 2013), corresponding with the Queen Salote School of Nursing offering the first postgraduate training programme in intensive care in 2005 and expanding this to encompass training in midwifery, internal medicine, surgery and public health in 2006–2007. An advanced diploma of nursing in NCDs has also been developed in conjunction with the University of Sydney, and 20 nurses were selected to take part in the 30-week course. Following course completion, anticipated for December 2013, one nurse trained in prevention and treatment of NCDs will be installed in every health centre across Tonga.

Doctors and health officers: As of 2013 there were a total of 55 doctors, representing 6.8% of all Ministry of Health posts. There has been a six-fold increase in the number of doctors who have specialized since 2005 and there are currently 20 doctors with specialist training, of which one pathologist acts as the Director of Health. These medical specialists include five surgeons, three anaesthetists, three obstetricians and gynaecologists, two internists, two paediatricians, and one pathologist, psychiatrist, ophthalmologist and radiologist, respectively. The number of health officers has also decreased significantly, from 31 to 20 between 2005 and 2013. Health officers train for three years under the Ministry of Health and are usually posted in health centres along with the support of one to three nurses.

Allied health professionals, medical and laboratory technicians: There are a total of 39 dental health workers, the majority of whom (27) are dental technicians and assistants. Similarly, technicians and assistants (n=23) make up the majority of the pharmaceutical professionals, with only four registered pharmacists. In terms of other allied health professionals, there is only one physiotherapist in Tonga, and three nutritionists/

dietitians. The number of technicians operating medical imaging and therapeutic equipment decreased from 11 to seven between 2005 and 2013, and the number of laboratory technicians also decreased slightly from 29 to 25, due in part to overseas migration.

Table 4.5 Staff employed by the Ministry of Health, density per 1000 population, 2005 and January 2013

Occupation	2005		2013	
	N	Density	N	Density
Generalist medical practitioners	37	0.36	36	0.35
Specialist medical practitioners	3	0.03	19	0.18
Health officers	31	0.30	20	0.19
Advanced practice nurses	2	0.02	31	0.30
Graduate/registered/professional nurses	318	3.11	256	2.48
Student nurses			97	0.94
Midwives	32	0.31	24	0.23
Dentists	13	0.13	12	0.12
Dental technicians and assistants	27	0.26	27	0.26
Pharmacists	4	0.04	4	0.04
Pharmaceutical technicians/assistants	18	0.18	23	0.22
Medical imaging and therapeutic equipment technicians	11	0.11	7	0.07
Medical and pathology laboratory technicians	29	0.28	25	0.24
Physiotherapists	1	0.01	1	0.01
Nutritionists and dietitians	3	0.03	3	0.03
Biomedical engineers	0	0.00	1	0.01
Environmental health and hygiene professionals	24	0.23	26	0.25
Health professionals not elsewhere classified	16	0.15	17	0.16
Health service managers	4	0.04	3	0.03
Health management personnel not elsewhere classified	10	0.10	5	0.05
Medical records and health information technicians	11	0.11	14	0.14
Non-health professionals not elsewhere classified	16	0.16	15	0.15
Service and sales workers	20	0.2	32	0.31
Personal care workers in health services not elsewhere classified	6	0.06	13	0.13
Clerical support workers	13	0.13	41	0.40
Domestic and support services	161	1.57	56	0.54
Total	**810**	**7.92**	**809**	**7.85**

Source: WHO and UNSW HRH Hub, 2014

Non-clinical staff: Roughly one quarter of the Ministry of Health staff are employed in non-clinical roles, with approximately 180 personnel involved in management, health information and medical records, service and sales, and clerical and domestic support services. This figure has actually decreased by around 60 people since 2005 despite a more than 50% increase in the number of service and sales workers and a threefold increase in the number of clerical support workers. The number of domestic and support services has however been reduced significantly, from 161 workers to 56 workers in 2013, and this is likely to impact on maintenance and upkeep of facilities in the long term.

Critical deficiencies: Tonga faces difficulties in attracting and retaining staff in key disciplines, particularly those for which there is international demand. Critical staff deficiencies have been filled through PACTAM, with salary supplementation at an estimated yearly A$ 660 000 to support up to three key vacancies at any one time provided under THSSP funding (AusAID, 2009). Key positions which have been filled to date include surgeons and anaesthetists. This supplementation is viewed as necessary in the medium term while the Ministry of Health investigates mechanisms with which to address these staffing issues in a more sustainable manner.

Comparative health worker densities: As shown in Table 4.6, Tonga has a relatively high density of health workers compared to other LMIC neighbouring countries, but densities are roughly three to five times lower than high-income Pacific countries such as New Zealand and Australia.

Table 4.6 Health workers per 1000 population, Pacific countries, latest available year

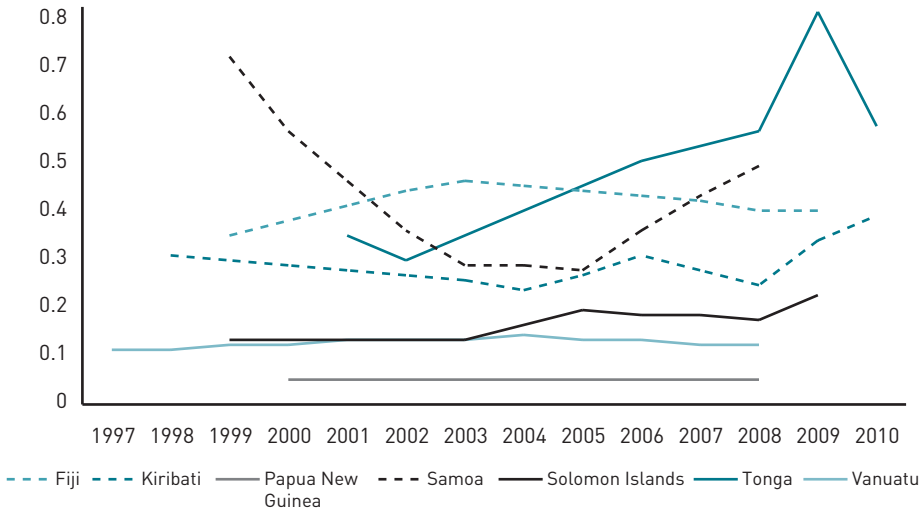
Country	Personnel per 1000 population (latest available year)				
	Physicians	Nurses and midwives	Physicians, nurses and midwives	Dentistry personnel	Pharmacy personnel
Australia	3.85 (2010)	9.59 (2009)	12.59 (2009)	0.69 (2009)	1.56 (2011)
Fiji	0.43 (2009)	2.24 (2009)	2.67 (2009)	0.2 (2009)	0.09 (2009)
Kiribati	0.38 (2010)	3.71 (2010)	4.09 (2010)	0.17 (2008)	0.21 (2008)
New Zealand	2.74 (2010)	10.87 (2007)	13.25 (2007)	0.46 (2007)	1.01 (2011)
Samoa	0.48 (2008)	1.85 (2008)	2.33 (2008)	0.34 (2008)	0.31 (2008)
Solomon Islands	0.22 (2009)	2.05 (2009)	2.27 (2009)	0.1 (2008)	0.1 (2008)
Tonga*	0.53 (2013)	3.01 (2013)	3.54 (2013)	0.38 (2013)	0.26 (2013)
Vanuatu	0.12 (2008)	1.7 (2008)	1.82 (2008)	0.01 (2008)	0.01 (2008)

Source: WHO, 2013b, *derived from WHO and UNSW HRH Hub, 2014

In total there are 3.54 health workers (doctors, nurses and midwives only) per 1000 population in Tonga – well above the WHO minimum recommended threshold of 2.3 health workers per 1000 (WHO, 2006) (Figures 4.1 to 4.5). This ratio of health workers to population is one of the highest in the Pacific Island region, excluding Australia and New Zealand (Table 4.6 and Figure 4.3), but simply meeting this threshold does not mean that Tonga has adequate health worker capacity. In fact, Tonga faces significant challenges in retaining an adequate health workforce and in taking ownership of its own health personnel training, particularly in post-basic and paramedical training – an issue which is further outlined in *4.2.3 Training of health workers*.

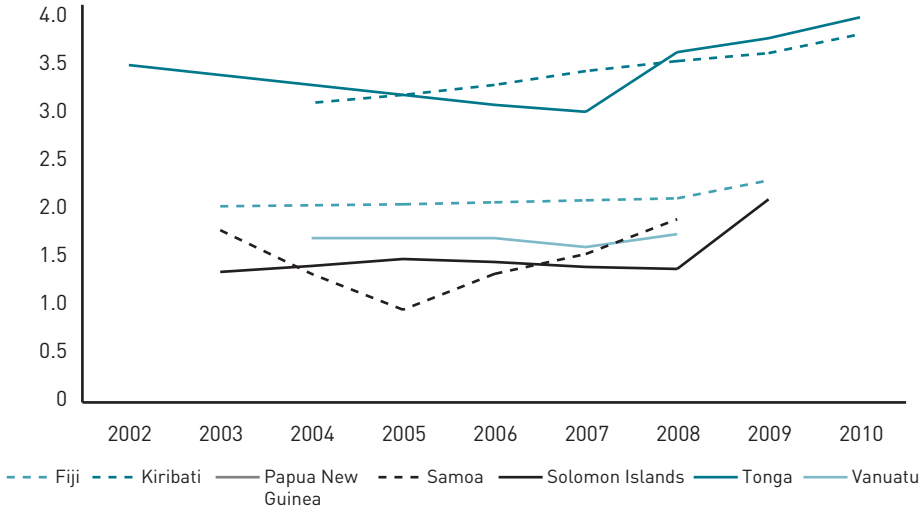
The density of doctors has almost doubled in Tonga since the early 2000s. Kiribati, the Solomon Islands and Vanuatu have also increased their ratio of doctors, although at a much slower rate and to a density of less than half that of Tonga (Figure 4.1). Fiji and Samoa have shown both increases and decreases over time, while the density in Papua New Guinea has remained consistently low. Although Tonga has the highest doctor to population ratio amongst LMICs in the Pacific, this is still around three to four times lower than in high-income countries; for example, the physician density in New Zealand is above 2.1 doctors per 1000 capita.

Figure 4.1 Trends in physicians per 1000 population in Tonga and selected Pacific countries



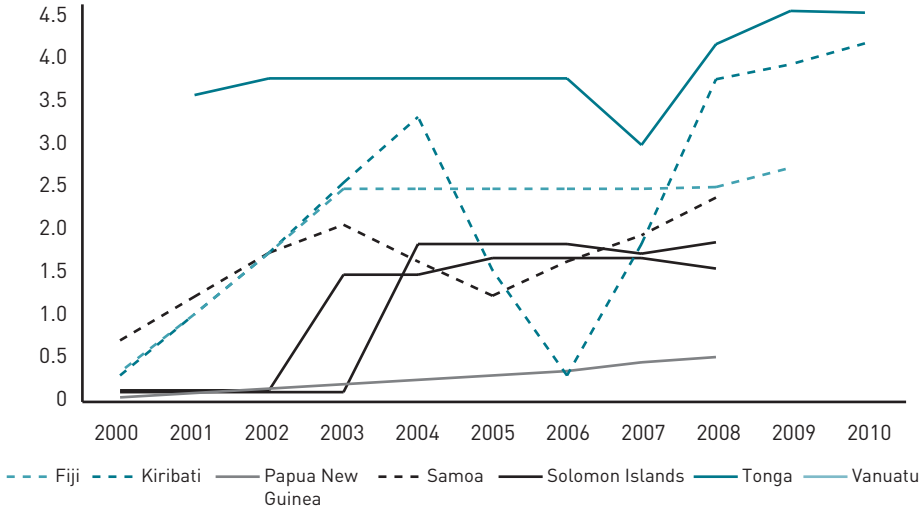
Source: WHO, 2013b

Figure 4.2 Trends in nurses and midwives per 1000 population, Tonga and selected Pacific countries



Source: WHO, 2013b

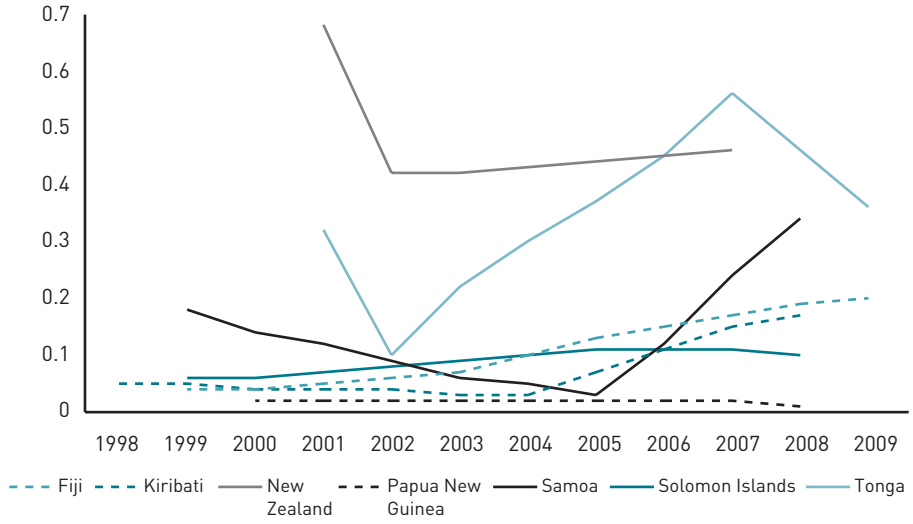
Figure 4.3 Trends in total number of physicians, nurses and midwives per 1000 population, Tonga and selected Pacific countries



Source: WHO, 2013b

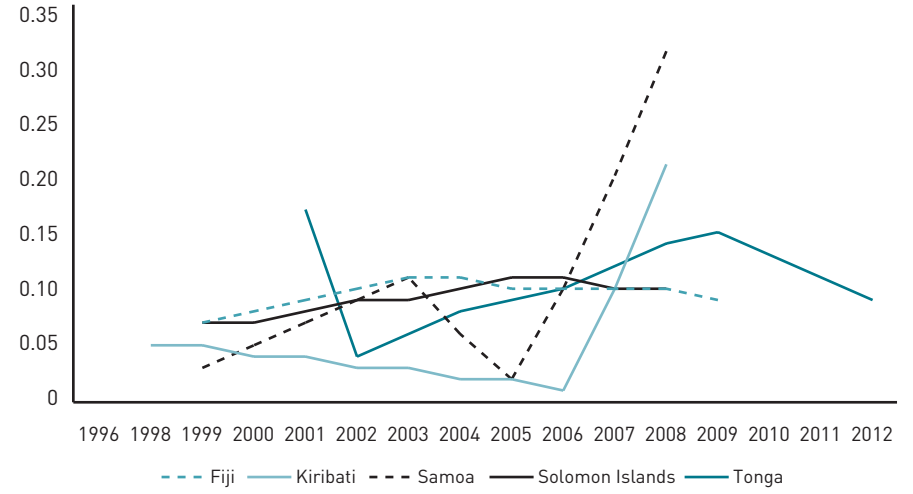
The ratio of nurses to population in Tonga has increased by around 0.7 since 2002 and along with Kiribati is one of the highest densities in Pacific LMICs, although still less than half of Australia with a density of 9.59 in 2009 and New Zealand with a density of 10.87 in 2007.

Figure 4.4 Trends in dental personnel per 1000 population, Tonga and selected Pacific countries



Source: WHO, 2013b

Figure 4.5 Trends in pharmacy personnel per 1000 population, Tonga and selected Pacific countries



Source: WHO, 2013b

In summary, there has been a slow increase in Tonga's health workforce over the last decade, and health workforce densities are among the highest of Pacific LMICs but greatly below high-income countries in the region (Figure 4.3). The density of dental health workers in Tonga has fluctuated over the last decade but is at a density similar to that of New Zealand (Figure 4.4) and Samoa, while the density of pharmacy workers

has remained fairly constant but is lower than other LMICs including Samoa and Kiribati (Figure 4.5).

Key features of the workforce

The health workforce is highly feminized. Almost 70% of all Ministry of Health employees are women. The nursing profession has the greatest proportion of females in the workforce, with all midwives and advance practice nurses being female. Almost half of all generalist medical practitioners are women, but a smaller proportion of women (31.6%) continue on to obtain a specialization, suggesting that there are boundaries preventing female doctors from upskilling. Despite this, most allied health positions are filled by women, including half of the managerial posts.

The health workforce is relatively young but significant cohorts of key staff will retire within 10 years. Over one third (38%) of the workforce is aged under 30, around half (48%) are aged between 30 and 54, and 13% are over 55. Although the compulsory retirement age within the public service is 60, there are 22 health workers above this age, six of whom are highly skilled specialist doctors, accounting for almost a third of their cadre. Looking further to the future, 23% of Ministry of Health employees will reach retirement age in the next ten years. Worryingly, these retirements account for at least half of the cohort of the following occupations: advance practice nurses (74%), health service managers (67%), domestic and support services staff (59%), and pharmacists (50%). It will also account for at least a third of the following cadres: midwives (46%), health management staff not elsewhere classified (40%), environmental health and hygiene professionals (39%), dentists (33%), and nutritionists/dietitians (33%). It is thus imperative that workforce succession planning is undertaken to cater for these predicted shortfalls.

The workforce is well-distributed geographically but staff with advanced skills are almost exclusively based on the main island. Overall, there are 7.85 Ministry of Health employees per 1000 population. Although there is a skew towards Tongatapu, the distribution of health workers is roughly comparative to the distribution of Tonga's population. For example, 80.1% of all health workers are based in Tongatapu where 73% of the total population resides, while Vava'u has just over 10% of the workforce to serve 15% of the population, Ha'apai has 5% of the workforce for 6% of the population and 'Eua has 3% of the workforce for 5% of the population. The Niuas are the exception, having 1.5% of the workforce catering to their 1%

of the population, resulting in the highest health worker density; however, this hides the fact that there are no doctors, midwives, dentists or other allied health workers on the Niuas. There is also a great disparity in the skill-mix between Tongatapu and the other islands, with the vast majority of the highly skilled workforce based at Vaiola Hospital. There are also no student nurses, health service managers, health management personnel or non-health technical and associate professionals outside of Tongatapu.

Across Tonga there are 5.7 nurses for each physician, with vast disparities across the islands, ranging from a ratio of 81.7 in Vava'u to 6.3 in Tongatapu. Nationally, there are 1873 people per doctor and 167 people for every nurse but again, these ratios vary widely from island to island. The only doctor in 'Eua serves 5011 people, whereas one doctor in Tongatapu serves an average of 1534 people. The ratio of nurses to the population ranges from 61 in Vava'u to 295 in 'Eua. Furthermore, as community nurses are currently trained to deliver either reproductive health services or NCD control services, there is a shortage of multiskilled nurses who can competently deal with a range of health issues. This means that at any health post, two nurses need to be employed, impacting on the efficiency and cost-effectiveness of service provision. Upskilling nurses to cover both health areas would not only allow for task-shifting but would also improve the skills base of the greater nursing workforce.

Very few staff are employed in the private sector and private provision of health services in Tonga remains limited. There only 16 individuals involved in private practice, six of whom are pharmacists – the cadre with the highest proportion (60%) of private practice. There are also roughly six doctors who are employed by the Ministry of Health and also undertake private consultations after hours. One quarter (n=5) of specialist medical practitioners also conduct private practice, which is seen as acceptable as it means their skills are not lost entirely from the public service. A much smaller proportion (3%) of general medical practitioners and registered nurses are engaged in dual practice. When health workers who are in dual practice (working for both the Ministry of Health and in private practice) are classified as private sector workers, the percentage of all health workers engaged in private practice is still only 2%.

4.2.2 Professional mobility of health workers

Unlike other Pacific Island Countries and Territories, Tonga is not reliant on foreign workers to fill positions. As of January 2013 there were only

two expatriate health workers (0.2% of Ministry of Health employees) in the public sector: one Fijian pathologist and one Australian biomedical engineer. Tonga does however face a "brain drain" due to emigration of Tongan-born/trained skilled health workers. A survey undertaken in 2006 revealed that there were 26 Tongan-born doctors working in Australia (n=14) and New Zealand (n=12) (Negin, 2008), a number which equates to approximately half of the doctors employed in Tonga in 2013. The situation is even more extreme for Tongan-born nurses and midwives, with more of them employed in Australia and New Zealand than in the domestic workforce. In 2006, 421 nurses were working in Australia (n=238) and New Zealand (n=183), a figure which is greater by 110 nurses than the current Tongan nursing workforce (excluding student nurses). In line with emigration patterns, there is also likely to be a significant number of Tongan health workers employed in the United States. In any case, Australia and New Zealand have considerably more than double the number of health workers per 1000 population compared to Tonga and PICTs, and have been active in recruiting Pacific Islanders to meet staffing shortfalls.

This issue is, however, not solely due to other countries poaching Tongan workers – there are also many incentives for workers to move abroad. A study showed that around a third of all health workers in Tonga, Samoa and Fiji aimed to migrate overseas when they entered the profession (Connell, 2009). Common reasons for migration were that their home country had poor income potential, long working hours, and inadequate supplies and equipment. In terms of remuneration, a study demonstrated the forceful pull of migration, with Tongan, Samoan and Fijian nurses working in Australia or New Zealand earning a mean income of A$ 1100 per month, almost three and a half times the A$ 318 for return migrants and five times the A$ 221 for non-migrants (Brown and Connell, 2004). Furthermore, although remittances from Pacific health workers substantially exceed the in-country training costs, they do not contribute to greater equity, new training or improved health-care provision as they go to private households and not back into the government system, and thus do not directly compensate for the loss of skills in the public sector. A further study showed that many nurses actually become deskilled when they migrate overseas, as they often end up working in different occupations, in part so that they can take care of family responsibilities (Fusitu'a, 2000). Thus, if these ex-nurses return to the workforce in Tonga or abroad they may need retraining, at additional cost to the system.

4.2.3 Training of health workers

The Queen Salote School of Nursing (QSSN) offers the only accredited training of health professionals in Tonga (accredited by the Tonga National Qualifications and Accreditation Board, [TNQAB], as discussed in *2.8.3 Registration and planning of human resources*). The Ministry of Health also operates several paramedical training programmes producing health officers, pharmaceutical, dental, radiological and medical laboratory technicians, public health workers and environmental health inspectors. However, these courses are not accredited with any agencies and enrolments are sporadic. All other health workers including doctors require training abroad, most commonly in Fiji, Australia or New Zealand, with more recent enrolments also in Cuba. Between 2008 and 2012, a yearly average of 66 health workers entered training and 45 graduated (Table 4.7).

Medical education

As previously described, Tonga does not have the in-country capacity to train doctors. The majority of Tongan medical students thus attend the Fiji School of Medicine at Fiji National University. For each year since 2008 there have been between 18 and 32 students, with an average of 24 students, enrolled in the six-year medical degree at FNU (Table 4.7). Additionally, there are another six students studying at the Latin America School of Medicine (ELAM) in Cuba, the first of whom will graduate in 2016 (WPRO, 2013a). In effect, this means that Tonga may have up to 37 foreign-trained medical graduates who may wish to return to Tonga in the next six years. As this figure represents the total number of general medical practitioners currently employed in the Ministry of Health, it is unlikely that the health system will be able to establish sufficient staff vacancies to absorb all of the returning graduates. There was a discussion of the risks that a large increase in the number of medical graduates could have on PICTs at the same Pacific Health Ministers meeting. These include: a surge in direct and indirect costs, the potential displacement of established cadres of health officers and advanced practice nurses, and the likelihood that countries will not be able to provide adequate supervision and mentoring for a medical workforce that is increasingly comprised of junior doctors. Work is being undertaken regionally to define the relevant competencies required by entry-level medical officers and to create regional, competency-based standards for internship programmes, but Tonga must carefully consider these issues in terms of human resource planning.

Table 4.7 Average number of entrants and graduates by cadre, 2008–2012

Health profession	Entrants		Graduates	
	Average number per year	Total number 2008–2012	Average number per year	Total number 2008–2012
Generalist physicians	8.2	FNU – 32, Cuba – 9, Total – 41	3.0	FNU – 14, NZ –1, Total – 15
Specialist physicians	2.6	FNU– 13	1.8	FNU – 9
Health Officers	n/a	n/a	1.2	MoH –6
Advanced practice nurses	0.4	FNU – 2	1.8	FNU –9
Graduate/registered/ professional nurses	34.6	QSSN – 170, FNU – 3, Total – 173	24.0	QSSN– 119, FNU – 1 Total – 120
Midwifery	3.0	QSSN – 15	3.0	QSSN – 15
Dentists	1.4	FNU – 7	1.4	FNU – 7
Dental technicians/ assistants	1.4	MoH – 6, FNU – 1 Total – 7	0.8	FNU – 4
Pharmacists	0.8	FNU – 4	n/a	n/a
Pharmacy technicians/ assistants	1.2	MoH – 6	1.2	MoH – 6
Medical imaging and therapeutic equipment technicians	1.2	FNU – 2, MoH – 4 Total – 6	1.0	FNU – 2, MoH– 3 Total – 5
Medical and pathology laboratory technicians	1.6	FNU – 4, MoH – 4 Total – 8	0.2	FNU – 1
Physiotherapists	0.4	FNU – 2	n/a	n/a
Dieticians and nutritionists	0.2	FNU – 1	0.2	FNU – 1
Environmental health & hygiene professionals	1.6	MoH – 6, FNU – 2 Total – 8	1.4	FNU – 1, MoH – 6 Total – 7
Health professionals not elsewhere classified	6.6	FNU – 31, NZ – 1 Brunei Darussalam – 1, Total – 33	3.0	FNU – 14,NZ –1 Total –– 15
Health service management	0.6	USP – 1, FNU – 3 Total – 4	0.6	USP – 2, FNU – 1 Total – 3
Total	**65.8**	**329**	**44.6**	**223**

Source: WHO and UNSW HRH Hub, 2014. USP = University of the South Pacific

Nursing education

Pre-service training. The Queen Salote School of Nursing (QSSN) was opened in 1947 and moved to its current site at Vaiola Hospital in 1971. Funding for the school comes out of the Ministry of Health annual budget, with graduates qualifying as registered nurses after completing a three-year Diploma in Nursing. Between 2008 and 2012, the school averaged 30 to 40 enrolments per year, with approximately 30 new graduates each year (Table 4.7 above). Acceptance into the school is extremely

competitive, ensuring high-quality students and a low number of dropouts due to failure. In 2012, there were 230 applicants and only 40 (17.4%) were accepted. The average retention rate for the school is approximately 85–90%, with those who leave the programme doing so to pursue other job opportunities or scholarships to study courses abroad. To be eligible applicants need to have completed, at minimum, a Pacific Senior Secondary Certificate with passes in mathematics, one science subject, as well as a grade of 4 or better in English and a total aggregate mark in their final year of 14 or under, across four subjects.

Enrolment is guided by the Student Admission and Registration Policy and the Quality Management Policy. As students are deemed to be Ministry of Health employees, annual recruitment is conducted early each year through the Public Service Commission. As such, students do not pay tuition, are paid a small salary by the Ministry of Health and are automatically absorbed into the workforce upon graduation. In previous years, a few places in the school were set aside for private (fee-paying) students; these students are not supported by the Government and must apply for vacant positions upon graduation.

The Tongan Nurses Board is required by law to develop practice standards and the curriculum for the QSSN. Curriculums are reviewed every few years, with the previous two reviews conducted by the Tongan Nurses Board in 2002 and 2008 with technical assistance from overseas consultants.

Post-basic training. QSSN operates certificate-level post-basic nursing training on an ad hoc basis, as determined by need. These programmes are one year in duration and have been developed in collaboration with the Auckland University of Technology. The first programme offered was in intensive care nursing in 2005, and this was expanded to encompass training in midwifery (2012) and internal medicine, surgery and public health in 2006–2007. An advanced diploma of nursing in NCDs, developed in conjunction with the University of Sydney, was also conducted in 2013. Twenty nurses were enrolled in this 30-week course, which was scheduled to be completed in December 2013. To be eligible for post-basic training, registered nurses are required to have at least three years of clinical experience. Each class accepts approximately 15–20 students and the pass rate has historically been 100%. Like the undergraduate nursing students, these students are given financial support, with the Ministry of Health continuing to pay their salaries and tuition fees provided by donor partners.

Allied health professional training

Tonga trains several cadres of paramedical health professionals in-country. Enrolment is not yearly and, again, is dependent on need. Acceptance into each of these training programmes requires a minimum pass in the Pacific Senior Secondary Certificate examinations. Desirable applicants are shortlisted and undergo an interview. All students become employees of the Ministry of Health upon entering study, tuition is free for students, and they are paid a small wage. Other training costs are supported by donors. Upon graduation, students are absorbed into the health workforce and given entry-level positions.

Health officers. Health officers are trained over three years, with courses delivered in blocks which are taught by one teacher. The previous two intakes were in 1999 and 2004; however, the last course was inefficient, having a high turnover of teaching staff, and this resulted in the course taking close to five years to complete. Of the ten students who enrolled in 2004, six graduated in 2008; three left of their own accord, and one was dismissed.

Dental technicians and assistants. Dental therapists train for three years in Vaiola Hospital. The last enrolment, of six students, was in 2010. Historically, retention and pass rates are high, with almost all enrolled students graduating. The next dental technician programme is scheduled to commence in 2018. Chairside assistant training has been on hold for the previous ten years due to a focus on the dental technician programme. The Ministry of Health will reopen the programme in 2014 and hopes to recruit six students to undertake the three-year training delivered at Vaiola Hospital.

Pharmaceutical technicians and assistants. The last training course for pharmaceutical technicians took place in 2010. Six students were selected from more than 20 applicants (30% acceptance rate). All six went on to graduate with a Pharmacy Certificate. Eight teachers taught the course.

Medical and pathology laboratory technicians. Laboratory technicians were previously trained for two years, but since the last enrolment of students in 2012, the programme has been extended to three years. There are currently four students enrolled, and there are attempts to recruit another four as there is a high attrition rate of laboratory technicians. The previous programme commenced in 2006 with four students. Currently

the course is delivered in seven blocks by one of four teachers. Admission to the course is very competitive – for example, in 2012, approximately 30 applicants were shortlisted for 20 interviews, from which only four students were enrolled in the course. Withdrawal rates during study are very low and failure to complete the course is rare, as students are given opportunities to repeat failed subjects. Attrition of laboratory health workers after qualification is high, however.

Radiology technicians. The last class of radiology technicians was enrolled in 2010 and graduated in 2012. The previous class before this was over a decade before, beginning in 1999. Three of the four enrolments completed the two-year programme, with one student dismissed. The programme is taught by two radiologists within the X-ray department at Vaiola Hospital.

Environmental health inspectors. The environmental health inspector training programme is two years in duration and was last delivered in 2008, with five enrolments, all of whom graduated. The previous class to this was in 1993, with all six enrolled students graduating. The programme is taught by seven staff, providing a high staff-to-student ratio. Competition to enter the programme is high: in 2008 there were 19 applications, with just over one in four (26.3%) being accepted. The acceptance rate was even lower in 1993, with only 17% of 35 applicants accepted.

Education capacity

As described above, the Ministry of Health manages pre-service education. The Ministry of Education, however, manages the production of secondary school graduates, and there are no formal links between the two ministries to ensure that enough high quality graduates capable of completing health profession training, either in Tonga or overseas, are being produced. Schools sometimes invite the QSSN to speak about nursing at career information days, but with competition to enter nurse training already fierce, the QSSN has little need to do any form of marketing.

Anecdotally speaking, there are reports that secondary school leavers are not graduating with an adequate level of English language skills to compete for overseas jobs in countries such as New Zealand and Australia. However, efforts to improve this situation should be made with caution, as they may further exacerbate Tonga's brain drain by making Tongans more eligible for overseas, English-speaking jobs.

Tonga has little capacity to boost training numbers, as it is heavily reliant on donors for financial support to cover teacher salaries, resources, and teaching materials. All medical, post-basic nursing and paramedical training (either completed in country or offshore) is supported by donors. While donor support is vital for Tonga in the training of adequate numbers of health workers, donors often have a predetermined number and type of placements that does not always correlate with Ministry of Health needs. Currently, the only training costs funded by the Ministry are pre-service nurse production at QSSN. The cost of training each nurse is approximately TOP 13 000, excluding their yearly salary of TOP 5187. While the Ministry of Health has expressed an intention to take more ownership of the training of their health workers and to increase funding for training and development, it does not currently have the financial capacity to do so. Donor support is currently received for training of the following cadres: laboratory technicians, medical imaging technicians, pharmaceutical technicians, environmental health inspectors, dental technicians, midwifery and post-basic nursing and health officers.

A relatively large number of scholarships are available for Tongans to study health-related disciplines. In 2013, there are a total of 56 students studying abroad on scholarships, including 37 students in a Bachelor of Medicine/Bachelor of Surgery (MBBS) programme; eight studying a Bachelor of Dental Surgery (BDS); five in the Bachelor of Pharmacy (BPharm); and three in a Bachelor of Science (Nursing). Additionally, there were two students completing Diplomas in Physiotherapy and one each in a Bachelor of Medical Laboratory Science and a Diploma in Dental Technology. All of these students on scholarships are studying at either the Fiji National University, James Cook University in Australia or at the Latin American School of Medicine in Cuba.

All scholarships are the responsibility of the Scholarships Unit of the Ministry of Education (MoE). When a health-related scholarship becomes available, applicants can be selected in two ways; either through a competitive application process where applicants are interviewed by the MoE (with the Director of Health on the review panel), or the Ministry of Health can advertise the scholarship through its staff and nominate a receiver.

Pacific Open Learning Health Net (POLHN)

POLHN was established in 2004 by WHO and ministries of health in the Pacific. The network provides improved access to continuing education

through distance and flexible learning and currently operates through 37 learning centres in 12 countries, including Tonga. Accredited courses are available through POLHN on behalf of Fiji National University (both a Diploma and Masters in Public Health and Health Services Management), the Pacific Paramedical Training Centre (Diploma in Laboratory Sciences) and the Penn Foster Career School in the United States (a Dental Assistant Programme piloted in American Samoa and the Marshall Islands). The needs of ancillary support staff, for example clerical and administrative workers, have also been addressed through POLHN by providing three levels of computer-literacy training. As internet connectivity and bandwidth are set to increase in Tonga, POLHN will represent an increasingly important resource for continuing professional development, providing health professionals with access to both online and "hybrid" courses which utilize both phone and video-conferencing facilities.

4.2.4 Doctors' career paths

The Strengthening Specialized Clinical Services in the Pacific (SSCSiP) programme described the clinical qualifications of doctors as part of an exercise mapping the capacity of the clinical workforce in PICTs (Table 4.8). Close to half (47.7%) of all Tongan doctors have completed a postgraduate (PG) qualification, a figure quite similar to the other Pacific countries, but substantially higher than that of Fiji. In Tonga, ten doctors had completed a postgraduate diploma, eight had completed a Masters and three had obtained a PhD/fellowship. Priority areas for advanced

Table 4.8 Highest clinical qualification of physicians in Tonga and other Pacific Island countries

Highest clinical qualification	Tonga	Fiji	Kiribati	Samoa	Solomon Islands	Vanuatu
MBBS	23	354	9	32	43	12
Postgraduate diploma	10	65	8	19	15	11
Masters	8	34	1	2	20	4
Fellowship/PhD	3	2	0	2	1	0
Number of local physicians with a clinical postgraduate qualification	21	101	9	23	36	15
Percentage of local physicians with a postgraduate qualification	47.7	28.5	50	41.8	45.6	55.6

Source: WPRO, 2013a

specialist training on which the Ministry of Health needs to focus in order to ensure sustainability are: paediatrics, medicine, surgery, anaesthetics, psychiatry and obstetrics and gynaecology. Due to the long lead time from undergraduate training to the completion of specialist training the system is vulnerable to shortages of specialists.

All medical specialists in Tonga are legally required to be a Fellow of the New Zealand, Australian or another recognized professional college.

Table 4.9 Doctors registered as specialists or undergoing specialty training in 2011

Current Ministry of Health position	Qualification	Age	Sex
Anaesthetist specialist	German Fellowship	60+	Male
Senior Medical Officer; Anaesthetics	Fellow of the Royal Australasian College of Anaesthetists (FRACA)	30+	Male
Physician Specialist	Master of Internal Medicine; cardiology specialization	40+	Male
Senior Medical Officer; Physician	Master of Internal Medicine; endocrinology specialization	30+	Female
Chief Surgeon specialist	Fellow of the Royal Australasian College of Surgeons (FRACS)	60+	Male
Senior Medical Officer; Surgery	Master in General Surgery	40+	Male
Paediatric Specialist	Master in General Paediatrics	60+	Male
Paediatric Specialist	Master in General Paediatrics	40+	Female
Senior Medical Officer; ENT Surgery	Ear, Nose and Throat (ENT) specialist	60+	Male
Medical Officer Special Grade; Obstetrics and Gynaecology (O&G)	Master in O&G	30+	Male
Senior Medical Officer	Diploma in Radiology	40+	Female
Senior Medical Officer; radiology	Diploma in Radiology	50+	Male
Senior Medical Officer; pathology	Diploma in Pathology	50+	Male
Medical Officer Special Grade	Diploma/Master of General Surgery	30+	Male
Medical Officer Special Grade	Dip in Emergency Medicine	40+	Female
Training Institution	**Qualification studied in 2011**	**Age**	**Sex**
Fiji School of Medicine	Master O&G	30+	Male
Fiji School of Medicine	Diploma of Surgery	30+	Female
Fiji School of Medicine	Diploma of Internal Medicine	30+	Female
Fiji School of Medicine	Master in Anaesthesia	30+	Female
University of Otago, New Zealand	Diploma/Master of Pathology	20+	Male
Melbourne Hospital, Australia	Fellow of Emergency Medicine (not bonded)	30+	Male
Fiji School of Medicine	Internal Medicine	30+	Female

Source: Fiji School of Medicine, 2011

They must have a Clinical Masters (five years' clinical training) with five years of work experience as a Senior Medical Officer, have post-Masters training and be supported by a recommendation from the Medical Superintendent, with final endorsement by the Ministry of Health Promotion Board. Of those medical officers who are already qualified as specialists, there only four were females; however, another four women are amongst the cohort of doctors (n=7) who are currently undertaking specialist training (lower half of table). Four of the current specialists are aged over 60 and thus face imminent retirement. As of 2011 there were also nine specialists either on long service leave or who had resigned, including two public health specialists, an obstetrician/gynaecologist, an anaesthetist, a radiologist, and two surgeons. In terms of ongoing professional development for doctors, the Ministry of Health actively supports clinicians to undertake advanced training, with two doctors having participated in one-year overseas attachments in 2011 and 2012, respectively (Table 4.9).

4.2.5 Other health workers' career paths

Nurses

In the SSCSiP mapping exercise, there were 33 Tongan nurses who had undergone specialist nursing training or attachments (Table 4.10). All specialist Tongan nurses are female. In addition, Tonga's first nurse graduated with a PhD in Nursing from the University of Sydney in 2013.

Table 4.10 Tongan nurses with postgraduate qualifications, 2010

Qualification	Number of Specialist Nurses
Diploma in Eye Care	3
Certificate in Intensive Care	13
BSc Nursing (New Zealand)	4
BSc Nursing (Fiji)	2
Diploma in Nursing (New Zealand)	1
BSc Nursing (Tonga)	3
Diploma in Nursing	3
Masters in Nursing	1
Attachment in paediatric oncology	2
Attachment in ear, nose and throat (ENT) nursing	1
Total	**33**

Source: Fiji School of Medicine, 2011

The nursing model in Tonga has historically been based around training very competent generalist nurses with a focus on additional midwifery and nursing practitioner training. As discussed in *4.2.3 Training of health workers*, from 2005 QSSN began to operate ad hoc, certificate-level post-basic nursing training of one year duration. To date, postgraduate programmes have been focused on intensive care nursing, midwifery and NCDs. It is reported that Tongan nurses are rotated more regularly between hospitals, health centres, and urban and rural clinics than nurses in other Pacific Island countries and that this has the advantage of preventing burnout, fostering skills development and sharing experiences (WHO and UNSW HRH Hub, 2014).

Allied health workers

The number of allied health workers who provide support for specialized services is growing slowly, although there are still several obvious shortages, especially in the areas of occupational therapists and speech therapists (Table 4.11). There are also shortages of biomedical engineers/technicians, anaesthetist technicians, and physiotherapists. With the growing NCD burden, it will be vital that Tonga manages to train and secure an adequate number of allied health professionals.

Table 4.11 Qualifications of allied health workers in 2011

Profession	Total with formal qualification	Total undergoing training in 2011	Total qualified staff over the age of 50
Physiotherapists	1	1	0
Radiographers	7	2	0
Pharmacists	4	1	1
Biomedical engineers/ technicians	1	1	1
Laboratory technicians	7 with BSc, 2 with MSc	2	4
Anaesthetist technicians	0	1	0
Occupational therapists	-	-	-
Speech therapists	-	-	-
Dietitians	2	0	0

Source: Fiji School of Medicine, 2011

5 Provision of services

Chapter summary

The Government currently provides the majority of the country's primary health care through the network of reproductive and child health clinics, health centres and hospitals. However patients, particularly in rural and remote areas, often bypass the lower-level health services and 90% of all health care is provided at hospitals. While reversing this trend would improve early diagnosis and treatment as well as the technical efficiency of the health system, it will continue to be a challenge for Tonga to provide quality primary health-care services in remote areas and with limited resources. The range and scope of secondary and tertiary services also needs to be expanded, in particular to treat and limit complications due to NCDs. For example, complex surgeries such as specialized cardiac, paediatric and neurological surgeries as well as multimodal cancer therapies cannot currently be delivered in a cost-effective and sustainable manner within Tonga's resources. As such, Tonga relies on overseas transfers and the visits of specialist medical teams to provide these levels of care, and this will be the case for the foreseeable future.

The health system is also very limited in the scope of available rehabilitation services and lacks adequate human resources, medical equipment and assistive devices to cater to the growing demand related to the rise in NCDs and an ageing population. The majority of rehabilitation, long-term care, and care for those with disabilities is provided by family members, although a small number of NGOs and faith-based organizations also provide limited services, predominantly on Tongatapu. While Vaiola Hospital has a psychiatric unit, mental health care is also limited in scope on outer islands, where it is generally delivered by health staff with no mental health training. Tonga has a significant cohort of traditional healers who, although not recognized as a part of the formal health system, play an important role in providing health services, particularly in remote areas. Additionally, a small number of private practitioners provide fee-based health services, mainly around Nuku'alofa. As the Ministry of Health endeavours to expand and improve the quality of primary and secondary health services, it is

imperative that they engage and work with all health providers including those who operate outside of the public system.

5.1 Public health

There are 34 reproductive and child health clinics providing a basic level of care, including essential public health interventions such as immunization, family planning and disease control as well as clinical services centred around providing primary health care including MCH care, as well as first aid and basic emergency care (Table 5.1). Health centres provide an intermediate level of care. In addition to the services provided by the reproductive and child health clinics, health centres provide basic mental health education and links to mental health services through collaboration with local NGOs. They also have the capacity to provide dental clinics and to treat minor surgical and medical emergencies which cannot be treated at clinic level. Health centres provide limited outreach activities to provinces.

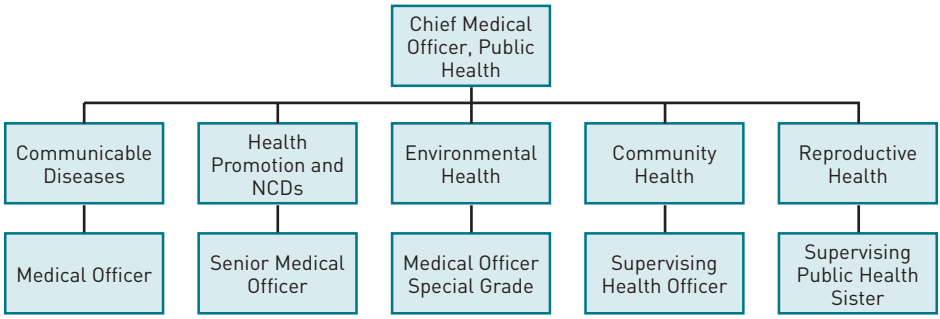
There are three community hospitals located in ʻEua, Vavaʻu and Haʻapai. These hospitals are able to provide a more advanced level of dental care (extractions, dentures and fillings) as well as manage and treat STIs, pregnancies and deliveries. They are also responsible for performing active surveillance of and screening for both communicable and noncommunicable diseases. These hospitals conduct risk reduction programmes for drugs, tobacco and alcohol as well as obesity prevention. While the community hospitals can perform medical and minor emergency surgeries, for most tertiary services or complex treatment scenarios patients are either referred to Vaiola Hospital or await a visit from either a Vaiola Hospital or overseas specialist medical team. The national referral hospital, Vaiola, is located in Nukuʻalofa. It is able to provide treatment and diagnosis for more complex conditions that require specialized medical staff and equipment. It has radiology, pathology and pharmaceutical services and houses the majority of the country's specialist physicians and allied health professionals. Vaiola Hospital also houses a 26-bed psychiatric ward which provides both inpatient and outpatient mental health care. It also provides secondary level general medical and surgical services and receives several teams of visiting specialists each year who provide services such as audiology, eye surgery, corrective orthopaedic surgery and treatment and management of rheumatic heart disease. Cases that are not treatable in Tonga may be sent abroad on the overseas patient referral scheme which is discussed further in the next section, *5.2 Patient Pathways*.

Public health services in Tonga operate under the Mission Statement:

> *To help all people in Tonga to achieve the highest attainable level of health, defined in WHO's Constitution as "a state of complete physical, mental and social well-being and not merely the absence of infirmity", by significantly reducing morbidity and mortality due to infectious diseases and improving the quality of life.*
>
> *Source*: MOH 2013a

There are five sections that fall under public health – Communicable Diseases, Health Promotion, Environmental Health, Community Health and Reproductive Health – each of which will be described below (Figure 5.1).

Figure 5.1 Overview of public health services in the Ministry of Health



Source: Government of Tonga 2011

The **Environmental Health section** is concerned with all aspects of the natural and built environment that may affect human health. It provides environmental health services for the community such as maintenance of water supply to villages, oversight and control of the hospital waste management system, and responding to natural disasters. It works in conjunction with the **Communicable Diseases section** to protect Tonga from the introduction and spread of infectious diseases. The Communicable Diseases section is responsible for undertaking surveillance activities and developing guidelines for prevention and control of outbreak-prone diseases such as dengue, typhoid and influenza-like illnesses. As such, all clinicians who know or suspect that a patient may have any of the conditions on the list of notifiable infectious diseases is obliged by law to notify the Director of Health through the Communicable Diseases section. They also develop treatment protocols, manage patients with suspected/confirmed sexually transmitted infections (STIs) and implement DOTS against TB. Tonga also routinely

shares and receives information on infectious disease outbreaks through the PPHSN.

Tonga has not had any major outbreaks of the common communicable diseases in recent years. Cases of typhoid fever, leprosy and meningococcal meningitis were however confirmed in both 2010 and 2012, and there were 24 clinically suspected cases of dengue fever, with a further six being pathologically confirmed, in 2010. In both 2010 and 2012 there were 11 registered cases of TB managed successfully under DOTS with no relapses, no cases of treatment failure and no defaulters. The reported number of STIs, in particular chlamydia and gonorrhoea, has been increasing in recent years as discussed in Chapter 1.

The **Community Health section** provides health care in the community, including outreach and education programmes in villages, schools, youth groups and homes, as well as in diabetes clinics and health centres. The Community Health team works in conjunction with the Health Promotion section to educate the public about sanitation and healthy lifestyles and to encourage the community to participate in community health development. In an attempt to reduce the number of patients referred to Vaiola Hospital, a dominant focus of the community health outreach work is on screening, treatment and control of NCDs, in particular diabetes.

Table 5.1 Overview of services provided by different levels of health facilities

Facility	Essential Services		Expanded Services
	Public health, prevention and outreach	Clinical (primary and secondary)	
Reproductive and child health clinics (34)	• Family planning and nutrition • HIV/AIDS and STI prevention • Sanitation and hygiene • Immunization (EPI) • Infection control • School health • Reproductive health • Rheumatic heart screening program	• Primary care • General practitioners services • First aid treatment for emergencies • Management of antenatal care, low risk birthing and postnatal care not requiring hospitalization • Maternal and child health and family planning	
Health centres (14)	*As for reproductive and child health clinics* • Mental health education and awareness	*As for reproductive and child health clinics* • Dental clinic • Medical and minor surgical emergencies	• Limited outreach activities to provinces • NGOs o Mental health services

Table 5.1 Overview of services provided by different levels of health facilities (Cont.)

Facility	Essential Services		Expanded Services
	Public health, prevention and outreach	Clinical (primary and secondary)	
Community hospitals (3) 87 beds (total)	*As for health centers* • Health surveillance • HIS/AIDS and STI prevention including screening, surveillance and education • Programs for the reduction of tobacco, alcohol consumption, substance abuse and obesity	*As for health centers* • Dental care (extraction, fillings and dentures) • Management of antenatal care, birthing and postnatal care • Management, treatment and care of STIs including HIV/AIDS • Medical and minor surgical emergencies • Outpatient consultations	• Visiting specialist teams o Limited outreach services
National referral hospital (1) 199 beds	*As for community hospitals*	*As for community hospitals* • General practice (primary care) • Emergency department • Operating theatre • Outpatient clinics • Secondary level general medical and surgical services • Treatment for chronic diseases including follow-up care • Laboratory • Radiology • Pharmaceuticals • Dietetics • Physiotherapy • Mental health o Psychiatric ward o Inpatient and outpatient care o 12 beds	• Visiting specialist teams o Hearing services o Eye surgery o Corrective orthopaedic surgery o Rheumatic heart diseases • Overseas referrals

Sources: Fiji School of Medicine, 2011, MoH, 2007a, Somanathan and Hafez, 2009, reproduced from WHO and MoH, 2012

The **Health Promotion and Non-Communicable Disease section** is responsible for identifying and providing intervention programmes for at-risk persons and groups. They work in partnership with community groups such as churches and NGOs and have established several key partnership projects including the Health Promoting Churches Project, the Health Promoting Schools Project and the Health Promoting Workplaces project. These projects have served as a conduit for risk factor assessment surveys including the mini-STEPS, the Global Youth

Tobacco Survey and the Global School Health Survey. The Health Promotion and NCD section works in close collaboration with the National NCD Committee and subcommittees.

The **Reproductive Health section** is responsible for providing women of childbearing age with reproductive health-care services including family planning, immunization services, antenatal and postnatal care. This section also monitors the health and development of infants and children under five through encouraging proper nutrition including breastfeeding, complete immunization and the effective care and management of childhood illnesses in the community.

National screening programmes

NCD risk factor screening. Screening for NCDs was initiated under the Australian Aid Program-funded Tonga Health Sector Support Program. The sample size of the pilot conducted in 2012 was almost three times as large as the STEPS survey, with the inclusion of 3000 participants aged between 13 and 88. In addition to the collection of demographic information, data on the following risk factors was also collected: family history, smoking and alcohol consumption, body mass index (BMI), waist circumference, blood pressure, fasting blood glucose and total blood cholesterol. Data on fruit and vegetable consumption and physical activity, however, were not recorded.

Rheumatic Heart Disease Programme. The prevalence of rheumatic heart disease (RHD) in the Pacific Islands is one of the highest in the world (Seckeler and Hoke, 2011). It was estimated that in Tonga at least 8% of adults were affected by RHD (ʻAkaʼola et al., n.d.). As RHD was usually not detected in Tongans until the disease had progressed to cardiac failure, it was costing the Government a significant amount of money to transfer patients overseas for lifesaving heart valve surgery. Calculations showed that for the cost of sending one child to New Zealand for surgery a national screening programme for children could be established. Furthermore, for the same cost, primary care facilities could be upgraded to systematically provide the preventative primary and secondary care services proven to keep children with RHD from developing heart damage, thus preserving their quality of life and avoiding the future need for more expensive valve surgery. As a result of these findings, from 2008 the Ministry of Health began a comprehensive screening programme whereby every primary school student was either auscultated or underwent an echocardiograph. By 2011 the programme had screened over 13 000 students, of which 676 (5.2%) were found to have RHD. These children

were then treated with antibiotics to prevent further infection with rheumatic fever and heart damage. The programme has shown dramatic results, with the incidence of RHD declining to the point that the visiting paediatric cardiac surgical team which was due to arrive in 2011 had to be postponed due to a lack of new cases (ʻAkaʻola et al., n.d.).

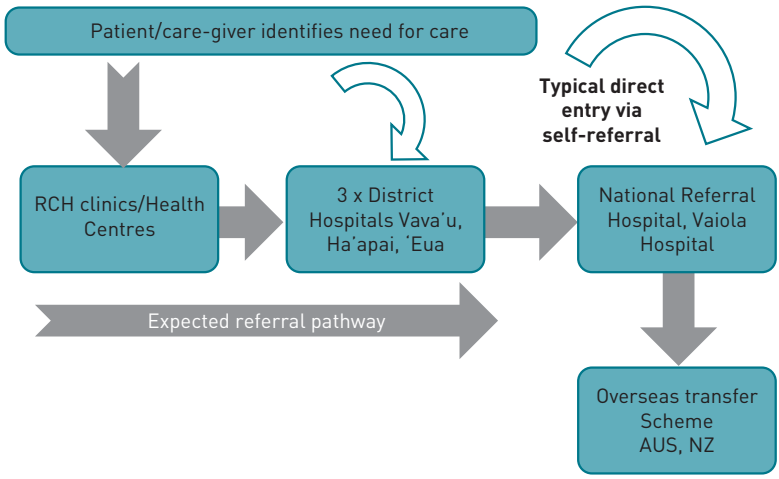
HIV/STI screening. Screening for HIV is routine for pregnant women attending antenatal clinics and is also mandatory for immigration visas, civil service job applications and blood donors. As of 2013, there were 11 centres providing voluntary counselling and confidential testing (VCCT), with another three pending accreditation.

Other screening programmes. Routine oral glucose tolerance test (OGTT) screening is conducted on pregnant mothers with high risk factors for diabetes. Pap-smear screening for cervical cancer is conducted in the gynaecology outpatient clinic. In 2014 Tonga will receive its first mammogram machine and thus breast cancer screening will become available at Vaiola Hospital. The National TB programme also conducted screening on roughly 100 prisoners in 2010.

5.2 Patient pathways

While it is intended that people are referred sequentially through the system via a reproductive and child health clinic or health centre to the district hospital and then to the national referral hospital, Vaiola Hospital (Figure 5.2), this does not always happen in practice. Patients often bypass

Figure 5.2 Patient referral pathways from the periphery



Source: developed by the authors

local facilities for either the district hospital or Vaiola Hospital. This was confirmed by the 2003 Tonga Household Survey, which showed that 89% of all health services were delivered by public hospitals and only 6% by health centres.[14] Furthermore, a large portion of those residing on Tongatapu go directly to the outpatient clinic at Vaiola Hospital. Patients may also be transported to Australia or New Zealand (and occasionally Fiji or the United States) via the Overseas Treatment Scheme described below.

Overseas Treatment Scheme

Limited by finances, clinical capacity and access to sophisticated diagnostic and therapeutic equipment, and considering Tonga's small and dispersed population, it is unrealistic and would not be efficient or clinically feasible for the health system to deliver a full range of secondary and tertiary services. Overseas referral for specific conditions with good clinical outcomes is thus the best option for Tonga and other small island nations, now and into the future. As such, the Overseas Treatment Scheme was established, managed by an Overseas Referral Committee within the Ministry of Health which assesses all applications for overseas assessment or treatment. The scheme aims to ensure equitable access to secondary and tertiary overseas treatment for all Tongans, based on need and clinical priority. Patients must first be assessed by a local clinician, who will seek the opinion of an appropriate overseas specialist and an estimate of the costs for diagnosis and/or treatment. The case is then forwarded to the Overseas Referral Committee, which must confirm that the medical condition is unable to be treated locally or within acceptable time frames by a planned visiting medical team. The case is then forwarded to the Director of Health, who consults with the Minister of Health with whom the final approval rests. If the case is approved, the Overseas Treatment Committee makes the logistical arrangements, including authorizing an overseas specialist to provide treatment within proscribed financial and clinical limits (Table 5.2). The referring clinician is responsible for maintaining contact with the foreign clinical team, reviewing the patient and developing a clinical follow-up plan upon their return to Tonga.

Overseas referrals are funded through either the Tongan Government Scheme or the New Zealand Medical Treatment Scheme (NZMTS). On average, the NZMTS funds 15 cases per year and the Tonga Government

14 Note the 2003 Tonga Household survey conducted by the National Statistics Office and World Bank was not published.

Table 5.2 Overseas referral institutions and the services provided

Country	Hospital/medical institution	Clinical services provided
New Zealand	Starship Hospital	Cardiac surgery, oncology and paediatric surgery
	Mercy Ascot Hospital	Cardiac surgery
	Christchurch Hospital	Oncology and paediatric surgery
Australia	Royal Children's Hospital	Cardiac surgery
	Westmead and Prince of Wales Hospital	Radiotherapy

Source: Fiji School of Medicine, 2011

funds 26. Cardiac surgery accounts for the most cases, at close to a quarter of all overseas transfers, followed by neurosurgery, orthopaedics and ophthalmology (Table 5.3). Combined oncology services (for paediatric, breast and gynaecological cancers) account for almost one in five referrals.

Table 5.3 Number of patients referred per specialty in 2009/2010

Specialty	Number of patients referred			
	Tongan Government Scheme (2010)	NZ Medical Treatment Scheme (2009/2010)	Total	% of all referrals
Cardiac surgery (partial funding for valves only)	6	4	10	24.4
Neurosurgery	1	6	7	17.2
Orthopaedics	2	4	6	14.6
Ophthalmology	3	2	5	12.2
Gynaecological cancer	3	0	3	7.3
Breast cancer	2	0	2	4.9
Paediatric oncology	1	1	2	4.9
Stroke	2	0	2	4.9
Renal	1	0	1	2.4
Paediatric surgery	1	0	1	2.4
Urology	1	0	1	2.4
Oral maxillofacial	0	1	1	2.4
Total	**23**	**18**	**41**	**100**

Source: Fiji School of Medicine, 2011

Cost of the scheme

In 2009/2010, the Government spent 3.4% of the total health budget (TOP 443 750) on overseas referrals. This represents a significant reduction in costs from the TOP 743 750 spent in 2008/2009, due to the implementation of the RHD screening programme as previously discussed and the subsequent clearing of cardiac surgery waiting lists.

Case study 1 – overseas medical treatment

In Tongatapu, a 32-year-old woman has had shortness of breath on exertion for several months. She takes local transport to Vaiola Hospital for around TOP 2. At the Outpatient Department (OPD), a nurse records her details and the patient is triaged as non-urgent and asked to retrieve her own medical record from the Medical Records Department. She then waits in the OPD waiting room for 1.5 hours, at which time she is taken into a cubicle where a nurse takes observations. The patient is then seen by a clinician and given a physical examination which reveals a heart murmur suggesting rheumatic heart disease. The patient is referred to see a medical specialist in the cardiac clinic of the Medical Ward later that week, where the woman is given an echocardiogram which reveals extensive mitral valve damage. It is decided that the woman needs valve replacement surgery, which is not available in Tonga. She will have to either apply for the overseas treatment scheme to be transferred to Australia or New Zealand, or wait for the visit of an overseas cardiac surgery team, roughly every four to six months. While in hospital in Tonga, patients must pay a daily fee for food and domestic services. In the interim she needs to attend Vaiola Hospital for monthly injections of benzathine penicillin as secondary prophylaxis and undergo three-monthly review by a cardiologist. After surgery she will undergo follow-up at specialized OPD clinics at Vaiola Hospital.

Case study 2 – diagnosis and treatment for diabetes in the outer islands

A 57-year-old man residing in the Niuas has a weeping ulcer on his lower leg which has been there for several weeks and suspects that he might have diabetes. He goes to the local health centre, where after waiting for one hour he is seen by a nurse who confirms that the man has diabetes via a glucometer. As the wound is not clean and needs debridement, the nurse decides to refer the patient to the nearest hospital, the Prince Wellington Ngu Hospital in Vava'u. The man has to wait for the weekly ferry, which arrives on Wednesday evenings and takes over 36 hours to arrive in Vava'u, at a cost of TOP 110 each way. The nurse calls ahead, tells the hospital when to expect him and provides a referral letter. On arrival, the man presents at the outpatient department and has to wait around half an hour. He is seen by a doctor who confirms diabetes and schedules surgery for his wound the next day. The man stays overnight with relatives and then presents to the hospital again the next day, where he is admitted and has his wound debrided under local anaesthetic. He stays overnight, is seen by the doctor again the next day, and is discharged with a prescription for painkillers and instructions for follow-up at his local health centre. He also sees a nurse at the hospital's outpatient diabetes clinic, and while he does not need medication, he receives counselling about diet and managing his risk factors. He returns to Niua Toputapu via boat and has follow-up visits with the nurse at his local health facility. Doctors from Vava'u also provide outreach visits to the Niuas once every six months, so he will be followed up then.

The budget for the NZMTS is negotiated annually; however, in previous years the allocation has been NZ$ 350 000, which was increased to NZ$ 500 000 in 2010/2011. The scheme is implemented by a contractor, Health Specialists Ltd., who also manage the same scheme in Fiji, Kiribati, Tuvalu and Vanuatu. Tonga is reputed however to have the most efficient and well-organized scheme (Fiji School of Medicine, 2011).

5.3 Primary/ambulatory care

Tonga is reasonably well provisioned with basic level clinical services. The geographical distribution of the reproductive and child health clinics and health centres means that most Tongans can access health services within a one-hour walk. In general, each reproductive and child health clinic is staffed by one to two nurses, while health centres are typically staffed by a health officer and one to three nurses to serve approximately 7200 people. The outpatient contact rate in Tonga is very low compared to other countries in the region (Table 5.4), with Tongans having on average one to two outpatient consultations per year. The annual hospitalization rate is however relatively high at about 10%, revealing that lower-level ambulatory care services are currently being bypassed in favour of hospitals. The use of user fees to discourage bypassing may not be operating as effectively as planned. This may also indicate a level of dissatisfaction with the quality and/or range of care available in the peripheral centres. There have been anecdotal reports that people refer to outer health centre doctors as "Panadol doctors" due to their lack of capacity to provide a wide range of diagnostic and therapeutic services.

Despite the provision of universal coverage, inequalities in health care use exist across socioeconomic groups. The THS 2003 showed that the poorest quintile reported 0.86 outpatient consultations per person per year, compared to 1.39 in the richest quintile, demonstrating that cost is a deterrent to health seeking amongst the poor in Tonga (Somanathan and Hafez, 2009).

Table 5.4 Outpatient contacts per person in the Western Pacific Region, latest available year

Country	Latest available year	Outpatient contacts per person
Tonga	1991	1.70
Solomon Islands	1993	3.40
Australia	2006	2.77
New Zealand	2001	4.40

Source: Index Mundi, 2013

A large proportion of primary care is provided at Vaiola Hospital through the Outpatient/Emergency Department. This is demonstrated by the finding that 90% of attendances at the Outpatient/Emergency Department in 2011 were not urgent. Efforts are being made to improve the triaging of patients so that only those who require admission are processed accordingly.

Vaiola Hospital provides multiple, regular outpatient clinics. The Medical Ward runs clinics in echocardiography, cardiac and INR; chest; hypertension; endoscopy/bronchoscopy; and general clinics, both at Vaiola Hospital and Mu'a/Kolovai health centres. There are, however, reports that these clinics are congested and not well organized (MoH, 2010b) and a proper clinical audit and review needs to be undertaken with the aim of decentralizing certain services, especially for stable patients who unnecessarily take up clinicians' time. These issues have been partially addressed through an AusAID-funded NCD/Community Care Project which started in 2011 and coincided with the opening of the Mu'a and Vaini clinics. Medical Officers from Vaiola Hospital provide outreach services at these clinics. The project is also looking to improve the clinical capability of health officers and is modelled on the diabetes community clinics which cater for patients with stabilized chronic disease.

Vaiola Hospital also provides around ten surgical outpatient clinics per month, with a total of 125 surgical clinics conducted in 2010 with an average of 15 patients per clinic. This was a 15% increase from 2009. The National Centre for Diabetes and Cardiovascular Diseases is responsible for delivering health services and outreach programmes to all patients suffering from diabetes and/or cardiovascular diseases. In 2010, there were over 6500 attendances at the clinic, or over 500 per month.

5.4 Specialized ambulatory care/inpatient care

In addition to the tertiary Vaiola Hospital, one divisional hospital and two community hospitals provide selective specialized and inpatient care; however, the scope of services they provide is restricted by a lack of equipment and appropriately-trained staff. In a recent review of hospital efficiency in Tonga, key stakeholders reported overcrowding in inpatient facilities, a lack of patient segregation and poor follow-up in the community (Mehan, 2013). These issues need to be addressed in terms of the quality of inpatient services and the continuum of care. The services provided by and limitations of the regional hospitals will be discussed below, followed by an extended discussion of the services provided at Vaiola Hospital which, as the national referral hospital, receives the largest case load.

In Vava'u, the Prince Wellington Ngu Hospital has 61 beds and is staffed by approximately eight nurses and three doctors, for a population of approximately 20 000 people. The hospital maintains emergency, medical, surgical, obstetric and paediatric wards as well as outpatient, diabetic, hypertension/cardiac and dental clinics. Although the hospital is not large, it has a medical laboratory that can run blood cultures, staffed by two fulltime technicians and one fulltime laboratory assistant. The hospital is only equipped to deal with uncomplicated cases and refers those requiring more comprehensive medical care to Vaiola Hospital on Tongatapu. Patients can travel to Tongatapu either by boat (20 hours, from TOP 88), or plane (one hour, TOP 295 one way).

Nui'ui Hospital in Pangai, on the island of Lifuka, services the Ha'apai group. It has 28 beds, and is staffed by two doctors to cover the population of 7369 people. There is an operating theatre at Niu'ui Hospital, but only emergency surgeries are performed (mainly caesarean sections and appendectomies) and most other cases are transferred to Vaiola Hospital. They do frequently perform minor procedures such as circumcisions. The outpatient/emergency clinic is very busy as people residing in Ha'apai tend to go there for primary care rather than to health centres. Limited investigations can be undertaken in the hospital including X-rays and blood tests. Travel to Tongatapu is possible by boat (11 hours, from TOP 68), or plane (50 minutes – 1 hour, TOP 214).

Niu'eki Hospital in 'Eua has 16 beds providing limited emergency and minor services. It is staffed by one doctor and roughly 12 nurses, servicing a population of 4902. It has a laboratory, pharmacy, and a special children's ward built with the support of the Japanese Government. Travel to Tongatapu takes only 10 minutes by plane (TOP 96) or 2.5 hours by ferry (TOP 25).

Travel to the Niuas is very time-consuming. There are no regular flights available, and travel by boat takes approximately 41 hours to Niuatoputapu and 60 hours to Niuafo'ou, at a cost starting from TOP 190 for a one-way economy class ticket.

The majority of specialized inpatient services are provided at Vaiola Hospital. Specifically, the Medical Ward is responsible for providing internal medicine and primary care for the nation, including consultation medicine (interdepartmental, interisland and overseas referrals). In 2011 there were a total of 1379 admissions to the medical ward with an average length of stay of four days. The Medical Ward had the lowest

bed occupancy rates of any ward in Vaiola Hospital, averaging only 41% occupancy; however, Ministry of Health reports state that this is the most appropriate level in terms of the nursing staff allocation. In 2010, the majority of admissions were sepsis-related, primarily with respiratory sepsis (i.e. pneumonia), followed by sepsis of unknown focus, gastrointestinal and genitourinary infections. Sepsis was followed closely by NCDs and NCD-related complications including unstable diabetes, hypertension, heart failure and stroke. Diabetes accounted for 60% of the sepsis cases. Chronic kidney disease related to diabetes is also on the increase, and Vaiola Hospital does not presently offer renal replacement therapy such as dialysis due to prohibitive cost. Emphasis is instead on primary and secondary prevention as a more cost-effective strategy in line with the National NCDs Strategy, although dialysis services are being further investigated.

Vaiola Hospital is limited in its diagnostic abilities due to limited laboratory capacity, including equipment. Oncology services are largely palliative, often with late presentation and advanced metastatic disease, and general exclusion of these patients in favour of overseas referral for further treatment.

Vaiola Hospital also has a busy Obstetrics and Gynaecology Ward, with pregnancy, childbirth and the puerperium being the leading cause of admission to the hospital, accounting for 4981 admissions in 2011. Despite an average length of stay of only two days, this ward has the highest bed occupancy rate, averaging 93% over the year.

The Paediatric Ward is responsible for providing health-care services for children aged under 15, including special care for premature and sick babies in the Special Care Nursery. In 2011 there were 1368 admissions to the Ward and 13 to the Nursery.

The Surgical Ward undertakes emergency surgery in conjunction with the Anaesthesia and Intensive Care Unit (ICU) Section. There were 1489 admissions in 2011. Emergency surgery (i.e. surgery performed to save a life or a limb or to prevent severe disability/complications) accounted for 46% of all major surgeries (435 cases) in 2010. Almost one in every two (46%) major emergency surgeries was for acute abdominal pain, including appendectomies and laparotomies due to peritonitis, intestinal obstruction or trauma. The second most common cause of emergency surgery was for orthopaedics and amputation in diabetic patients, which although not strictly "emergencies" are undertaken in a "semi-

emergency", non-elective manner. In 2010, 46 major amputations were conducted, 95% of whom were suffering from diabetic sepsis. Of all of the surgical admissions, 15% were for diabetic complications, an increase of 13% from 2009. Diabetic patients increase the nursing workload, as the patients spend a long time in the ward and require frequent wound dressings and often multiple surgical procedures. Furthermore, most of those who undergo an amputation for diabetic sepsis die within five years. Other major categories of surgical admission were trauma (27%) acute abdominal pain (21%), motor vehicle accidents (2%) and unspecified (35%). Minor surgeries, classified as any surgical operation below the scale of a hernia repair and done either under local or general anaesthesia, are usually performed by the registrar and interns.

5.4.1 Visiting surgical teams

Visits from overseas specialists are relied upon to provide surgical services not normally performed in Tonga. These visits enable patients who under normal circumstances would have required expensive transfers overseas to receive complicated procedures or evaluation in Tonga. Funding for the teams is provided through various donors, including AusAID (through the Royal Australasian College of Surgeons (RACS) Pacific Island Program), the New Zealand Medical Transfer Scheme (NZMTS), the Tonga Health Service Strengthening Project, the Ian Stratton Fund, and faith-based organizations (Table 5.5). The Ministry of Health is responsible for planning and scheduling the visiting clinical teams, most of whom go to Vaiola Hospital. In 2010, Tonga received 12 visiting teams.

Table 5.5 Visiting medical teams in 2010

Clinical Team	No. of visits in 2010	Source/origin of assistance	Comments
Ophthalmology	3	Royal Australasian College of Surgeons, Eye Team Private Funding, Mormon Church	Vaiola, Prince Ngu, Vava'u
Ear, Nose, Throat	1	Royal Australasian College of Surgeons	Vaiola
Urology	1	Royal Australasian College of Surgeons	Vaiola
Paediatric Surgery	2	New Zealand Medical Transfer Scheme	Vaiola
Paediatric Oncology	1	New Zealand Medical Transfer Scheme	Vaiola
Cardiology	3	Tonga Health Service Strengthening Project	Vaiola, Ha'apai
Talipes	1	Ian Stratton	Vaiola

Source: Fiji School of Medicine, 2011

5.4.2 Day care

Day care is described as the provision of medical services to patients who are formally admitted for diagnosis, treatment or other types of health care with the intention of discharging the patient the same day. There is currently no formal mechanism for the provision of such care in Tonga and it is not a common practice.

5.5 Emergency care

As previously described, only basic emergency care is available on the outer islands. When necessary and feasible, patients from the outer islands may be transferred via boat or plane to Vaiola Hospital Emergency/Outpatients Department (Box 5.1). Vaiola Hospital also has two ambulances for transfers. In 2010, ambulances undertook 96 pre-hospital emergency trips. Upon arrival at the Emergency/Outpatients Department , an abbreviated history and personal details are obtained and patients are triaged according to the Australian system which classifies urgency on a scale of 1 (immediate resuscitation required) to 5 (non-urgent). Patients with a triage score above 3 are not considered urgent, are asked to collect their chart from medical records, and should be consulted within one to two hours. Those with a triage score of 3 should be either transferred directly to the emergency room (ER) or to an observation bed within 30 minutes. Those patients with a triage score of 1 or 2 are taken immediately to ER, or, if arriving by the non-emergency entrance should be transferred there within 10 minutes. The Standard Treatment Guidelines provide directions for basic (including cardiopulmonary resuscitation) and advanced common presentations in the Accident and Emergency ward, including cardiac arrest and other life-threatening emergencies such as anaphylaxis, asthma, pulmonary oedema, acute myocardial infarction, poisoning, burns, coma, diabetic emergencies, dehydration, drowning and seizures. A review of hospital efficiency (Mehan, 2013) revealed that, based on data for April 2011, the majority of presentations at the Emergency Department are in triage category 5 (i.e. not urgent/true emergencies) and thus greater efficiency could be gained in this area, as will be discussed further in *7.5.2 Technical efficiency*.

In 2010, a total of 825 cases presented at the Vaiola Hospital emergency room. 71% of cases were admitted, 19% were sent home, 7% were dead on arrival and 2% died in ER. Males accounted for more than half (56.5%) of admissions. From all admissions through ER, 43% were sent to the

Medical Ward, 31% to the Surgical Ward, 22% to the Paediatric Ward, 2% to ICU, and 1% to the Obstetric Ward. There were 122 ER admissions due to trauma in 2010 (15% of all ER cases), with the majority (44%) of them due to motor vehicle accidents, followed by assault (19%), spinal/head injuries (14%), falls and wounds (both 13% respectively), other (6%), sports injuries (5%), electric shock (4%), and suicide (2%). Most (82%) trauma cases were admitted, and 5% died. Males made up 80% of the ER trauma cases (MoH, 2010b).

Box 5.1 Emergency care example of patient pathway

A 52-year-old man in ʻEua with an acute appendicitis would take the following steps:

- Be driven to the local health clinic, where he is assessed by a health extension officer or nurse who decides that he needs to be transferred to Vaiola Hospital for surgery.
- Based on the severity and acuteness of the condition he is transferred either by ferry (leaving four times per week), airplane (five flights per week) or private charter boat. The health centre will phone Vaiola Hospital to inform them of the patient's arrival so that an ambulance is available to meet him at the airport or port.
- On being transferred to Vaiola Hospital he will be admitted through the Emergency Room where a nurse does triage and estimates the urgency of the complaint. The waiting time depends on the level of urgency.
- In the Surgical Ward, a surgeon performs an appendectomy on the patient, and they are sent to the ward to recover. They are discharged in one to two days.
- Follow-up is done through the Outpatient Department one week following surgery. The patient may then return to ʻEua.

5.6 Pharmaceutical care

There are no manufacturers of pharmaceuticals in Tonga, and all procurement and distribution of imported pharmaceutical products is performed by the Central Pharmacy and Medical Supplies (CPMS) unit housed in the Vaiola Hospital Pharmacy. The CPMS is responsible for providing quality, safe, effective and affordable drugs and standard medical supplies to the entire nation. It is also responsible for ensuring the rational use of pharmaceuticals through creation of the *Revised Medicinal Drugs List* (MoH, 2012b, 2013c) for use in the public sector and by providing education and counselling to the community about

correct use of pharmaceuticals. The CPMS is divided into five units: the Administration Unit; the Manufacturing Unit (responsible for compounding preparations); the Regulatory/Training Unit; the Store and Distribution Unit; and the Dispensing Unit. In 2010, the total value of goods issued from CPMS was over TOP 2 million, including medical drugs and supplies. Procurement is undertaken via public tender and contracting.

Vaiola Hospital Pharmacy

Vaiola Hospital Pharmacy has both an inpatient and outpatient pharmacy staffed by roughly 10 personnel. The unit maintains ward stock levels and provides patients and health workers with drug information and counselling. In 2010, the inpatient pharmacy dispensed a total of 5505 items from 2495 prescriptions and slightly more (over 5000 items on more than 3000 prescriptions) in the outpatient department. The Vaiola Pharmacy also refills prescriptions for patients who have attended special outpatient clinics. In 2009, over 88 000 items were dispensed through roughly 30 000 prescriptions. In 2010, the total cost of medications issued through Vaiola Pharmacy was over TOP 1 million, of which outpatient prescriptions accounted for slightly more (52%) expense than inpatient costs (48%) (MoH, 2010b).

5.7 Rehabilitation/intermediate care

Home and family care remain a strong value in Tonga's culture, and as such, family members perform the bulk of rehabilitation and intermediate care. There are some community-based rehabilitation services provided by the churches, other faith-based organizations or local or international NGOs. Formal rehabilitative services provided by the Government are extremely limited, with the allied health workforce in Tonga consisting of only three nutritionists/dietitians and one physiotherapist. This means there is a distinct lack of resources for rehabilitation from conditions such as cerebral palsy, stroke or diabetic amputations, and as a result many Tongans are severely impaired by their disabilities and unable to function optimally. The National Centre for Diabetes and Cardiovascular Diseases has a growing number of patients who have mobility impairments or have undergone amputations. It has very limited resources; for example, it currently has only one wheelchair, and no walking frames or assistive devices to provide to patients. AusAID has recommended that the Ministry of Health consider funding additional rehabilitation physiotherapists and physiotherapy assistants to support centre-based outreach work,

potentially utilizing funding from the Critical Staffing Deficiencies Fund (AusAID Tonga, 2011). The National Centre does currently undertake some community outreach through quarterly home visits to patients who are immobile or have difficulty accessing either the Centre or a local health centre. Outreach clinics are also held at health centres and an annual visit is conducted to each of the outer island hospitals.

One local NGO, the Mango Tree, provides rehabilitation services to around 80 children and adults with severe impairments, including spinal cord injuries. They provide minor medical and rehabilitation care, assistance and emotional support as well as rehabilitative services/treatment, special education and early intervention programmes to disabled children in order to prevent secondary or permanent disability. Furthermore, a mobility aid and renovation service supports people with disabilities in living in their homes with optimal independence, comfort and mobility. The Mango Tree is supported by a Korean charity, and rehabilitation therapies are delivered by volunteer physiotherapists from New Zealand and Australia. The Japan Overseas Cooperation Volunteers Scheme also offers direct physiotherapy to persons with disabilities and trains local people in basic caregiving for people with disabilities.

5.8 Long-term care

There are limited formal options for long-term care in Tonga, with families usually assuming this role. The few organizations that do provide this type of care are church-based or funded by international NGOs and tend to be based in Nuku'alofa. For example, the Tongan Red Cross Society established the 'Alonga Centre for the handicapped in Pea, Tongatapu, which provides temporary to permanent accommodation for up to 25 individuals living with disabilities. The centre is planning to establish vocational training programmes, and currently runs the Hearing and Speech Impaired Unit where children receive special education such as sign language and braille lessons. The Mango Tree Centre for People with Disabilities, which opened in 2005, also provides a respite care programme for the disabled and their primary caregiver.

In August 2012 the MoFNP, with support from the ADB and the Japan Fund for Poverty Reduction, began the Tonga Social Service Pilot programme for the vulnerable elderly. Those who are aged 60 and over, have an official diagnosis and referral from a doctor, and are approved by the Social Service Selection Committee may receive case management services, social care home visits and targeted health promotion and

disease prevention visits from the Ministry of Health. The one-year pilot is being delivered on the island of Lifuka (Ha'apai) and in outer areas of Tongatapu.

5.9 Services for informal carers

Outside of the church/NGO-provided respite services described above, there are no programmes or entitlements for informal carers in Tonga.

5.10 Palliative care

The *Standard Treatment Guidelines and Essential Drugs List* (MoH, 2007b) follows WHO'S definition of palliative care, which focuses on improving the quality of life of patients and their families through the prevention of pain and suffering as well as physical, psychosocial and spiritual problems. The guideline describes how health workers must cooperate as a multi-disciplinary team including the clinician, nurse, other allied health workers, family members, community groups, volunteers and pastoral care staff and chaplains. Strategies to control pain and optimize the quality of life of terminal patients include regular administration of analgesics according to the WHO analgesic ladder, use of pharmacological and non-pharmacological therapies, a range of strategies to improve mood, morale, general health and resilience, and multifaceted interventions to overcome impairment to physical capability, relationships, normal activities of daily life and the sense of self.

5.11 Mental health care

The provision of mental health services is mandated by the Mental Health Act 1992 (Kingdom of Tonga, 2001c). This act establishes a Mental Health Advisory Committee and Tribunal and describes the procedures for involuntary institutionalization or a community treatment order for those who, "as a result of a mental illness, are likely to cause imminent harm to him/herself or others, or to suffer serious mental or physical deterioration". Patients processed under an involuntary treatment order are referred by a medical practitioner to the Tribunal, who may issue a warrant to forcibly bring a mental health patient to a facility, where they should be assessed by a psychiatrist within 24 hours. In accordance with the Act, patients should not be detained for more than 72 hours except when they present as a suicide risk, in which case they can remain for a further seven days; and they should not be admitted more than twice within 30 days. In reality, the average length of stay in the ward is 54 days.

Inpatient treatment may involve pharmacotherapy, psychotherapy and/or electroconvulsive therapy.

Tonga's main psychiatric unit is attached to Vaiola Hospital. It has 12 beds, although it frequently exceeds this number of patients. The unit also works to rehabilitate chronic psychiatric patients through outpatient review, continued psychosocial rehabilitation, home visits and "medication on wheels". While there is currently no halfway house for those transitioning from inpatient mental health care back to the community, the unit has an open door policy whereby patients can drop in to seek respite and care. The unit is staffed by a medical officer, a mental health welfare officer, nurses, psychiatric assistants and a social worker, and is headed by a psychiatrist who has been appointed as Tonga's national focal point for disability by the Prime Minister. The unit had a total of 869 admissions between 2005 and 2010, peaking at 194 admissions in 2010. The most common reasons for admission are schizophrenia, occurring in almost one in every two patients, followed by bipolar mood disorder in roughly 30% of patients. Close to 3% of admissions were for mental and behavioural disorder due to psychoactive substance use, with similar admission rates for mental retardation, dementia, schizoaffective disorder and acute and transient psychotic disorder. Staff from Vaiola Hospital also provide Government-funded community mental health services at the forensic mental health unit at Tolitoli Prison. Mental health care on the outer islands is provided by non-specialized health workers. NGOs also provide a range of services for mental health clients, often in close association with the hospital services. The Tonga National Disability Identification Survey estimated that there are approximately 1000 mental health-care seekers on Tongatapu and up to 300 on Vava'u and Ha'apai, where mental health services are less developed (Taylor et al., 2006). The survey made several mental health recommendations, including full implementation of the Mental Health Act, establishment of a transitional care facility to support people with mental health difficulties in a community setting, a greater range of allied health staff input at the Psychiatric Unit, and implementation of community awareness campaigns to reduce stigma. Tonga's first NGO for mental health, the Tonga Mental Health and Disabilities Association, has been established with the mandate of providing mental health promotion and primary prevention. Funding for psychiatric services is very low at only 1% of the Ministry of Health's total expenditure, and dramatically below WHO recommendations. There are no data to reveal how this small mental health budget is expended, but it is likely that most of it goes to treating patients in the Psychiatric Unit rather

than on primary care prevention. In line with other developing countries, it is also likely that a significant portion is spent on pharmacotherapy, rather than on psychosocial care. Addressing both of these trends could help improve outcomes and efficiencies of the health system.

WHO Regional Office for the Western Pacific reports that many Pacific Island countries have suicide rates which are higher than the global average (WPRO, 2013b). Suicidal behaviour among young people has become a major concern in the Pacific. In Tonga, the median age of suicide (22 years) is notably lower than in countries such as Australia (41 years). In Tonga, the cases are predominantly males (80%) and young adults aged between 16 and 32, with the common method being hanging (71%) (WPRO, 2007). In 2005, Lifeline established a suicide hotline managed by a Board, with representatives from the Free Wesleyan Church of Tonga, the Ministry of Health, the Police Department and NGOs working in mental health.

5.12 Dental care

The provision of dental health services is legislated under the Medical and Dental Practice Act 2001 (Kingdom of Tonga, 2001b). The Ministry of Health provides both curative and public health/preventative dental services through a workforce of roughly 40 staff under the leadership of the Chief Dental Officer. The Curative Dentistry section provides hospital-based oral health services including extractions, filling and casting and fitting of dentures. Basic dental care is also provided at the 14 health centres across the country. The Public Health Dentistry section provides preventative programmes, often delivered in community settings, to reduce the incidence of dental caries and other dental health problems – for example, the Malimali School Dental Health Project (see *1.4 Health Status*). In 2006, there were a total of 32 813 dental consultations in Tonga, 73% of which were at Vaiola Hospital, with just over 5000 at Prince Wellington Ngu Hospital, approximately 2000 at Niu'eiki hospital, and 1400 at Niu'ui Hospital. Although most dental services are free, with the exception of dental prostheses, roughly 5% of household OOPs were spent on dentists in 2005/2006 (NHA Team et al., 2008).

5.13 Complementary and alternative medicine

As discussed in *3.4*, traditional healers are widely consulted in Tonga, especially for diseases that are seen to be of Tongan origin. In 2005/2006 there were estimated to be around 1000 traditional healers in Tonga – a

very sizeable number considering that the Ministry of Health employs around 800 staff in total, of which roughly 600 are in clinical roles. Traditional healers are however not formally recognized as professional health providers, and there is a lack of integration and collaboration with the public health system. Traditional healers believe that disease and poor health are caused by a disturbance of relationships with gods, supernatural powers, society or the land. Healers are generally categorized by the four main areas they are able to treat: spiritual imbalances/possessions; injuries; metabolic and internal disorder; and those illnesses with no apparent causes. Healing is viewed as an energy or power which is divine and has been bestowed upon healers by the gods/spirits or passed down from generation to generation in families. Most traditional medicine treatments involve herbal tonics, liniments, potions, massage and prayer, although each healer has their own unique treatments and remedies. The National Health Accounts made a recommendation that traditional healers should be regulated and controlled through the creation of a professional association (NHA Team et al., 2008). WHO also recommends that traditional medicine should be integrated into the national health system in combination with a national policy and regulation for products, practices and providers (WPRO, 2002). These recommendations have not been progressed in Tonga to date.

5.14 Health services for specific populations

There is no formalized system for the provision of health services to specific populations, and any such care is provided on a limited scale through the standard health-care system.

6 Principal health-care reforms

Chapter summary

Since the 1990s, Tonga has undergone many rounds of development partner-led health reform. Programmes such as the World Bank Health Sector Support Project, the Australian Aid Program-funded Tonga Health Sector Planning and Management Project and the more recent Tonga Health Systems Support Program have helped to strengthen the Ministry of Health's capacity, particularly in planning, budgeting and financial management. These programmes have also been responsible for significant upgrading and development of key infrastructure. As a result the Ministry of Health now has the basic governance and management infrastructure, together with the skills required, to lead further reform processes on its own. This will involve the health sector reorienting itself to focus on prevention and treatment of NCDs. While the Government has been praised for prioritizing NCDs within the MDG acceleration framework, it must overcome identified weaknesses in the fight against NCDs, including insufficient organizational management and funding for NCDs, and the need for better NCD monitoring, evaluation and surveillance. The health sector must increase efficiency and continue to strengthen institutional capacity in order to provide the required physical and human resources to effectively slow the pace and impact of the NCD epidemic as well as finishing the MDG agenda.

6.1 Analysis of reforms

Despite the remarkable improvements in population health status witnessed in Tonga, core problems within the Ministry of Health's planning, management, and coordination capacity became evident during the 1990s. This has led to several programmes of reform, most of which were led or supported by donor and development partners (Box 6.1) and implemented within the context of national public service reforms focused on improving systems efficiency and transparency. Health sector reform has focused on strengthening planning and management across four key building blocks of the health system: financing, human resources, physical infrastructure and information. However, strengthening of the

other building blocks – service delivery and governance – has also been implicit in all programmes. A high degree of success has been achieved via these reforms due largely to consistent and strategic leadership and political support, a participatory approach and a facilitative role played by donors, in particular by the Australian Aid Program and the World Bank (Tu'itahi, 2008). Coordination of programming between development partners and synergies between implementation of activities has also helped to ensure the appropriateness of the design for Tonga's health sector.

Box 6.1 Major reforms and policy initiatives that have impacted on health care

Timeframe	Programme and funder
2009–2013*	**Tonga Health Systems Support Program (THSSP)** - AusAID A$ 7.5 million *No cost extension to 2015 recently approved
2003–2009	**Health Sector Support Project (HSSP)** - World Bank US$ 12 million
1999–2001	**Economic and Public Sector Reform Programme (SPSRP)** – Government of Tonga
1999–2007	**Tonga Health Sector Planning and Management Project (THSPMP)** - AusAID A$ 5.7 million

Source: developed by the authors for this HiT with Tonga Health Sector Planning and Management Project (THSPMP)

The Ministry of Health was suffering from a poor public image and unmotivated workforce due to a lack of transparency and ad-hoc, top-down planning, HR and financial management. A programme of institutional strengthening, the THSPMP, was thus initiated in 1999 with the formation of a partnership between the Governments of Tonga and Australia. The A$ 5.7 million project aimed to "significantly improve the Government's planning, management and delivery of health services, focussed across the core building blocks of information, workforce, finance, creation of a national health plan and a supportive environment" (Figure 6.1). Acknowledging that the Ministry of Health required substantial organizational change, an early step in the THSPMP was the establishment of a National Taskforce to lead the development of a shared vision for the Ministry. The visioning process was championed by the newly appointed Minister of Health and was undertaken in a consultative

and collaborative process which gained support from all levels of the Ministry. The result was a mission statement, a set of core values, and the ambitious goal "to be the healthiest nation in the Pacific rim as judged by international standards and determinants".

Based on this vision, the National Taskforce also created Tonga's first National Health Plan, *Tonga's Health 2000*. Computerized systems and processes for the planning and management of finances and human resources were also introduced in an attempt to raise the transparency, equitability and accountability of middle management in decision-making. Improvements in the financial system concentrated on strengthening budgeting and reporting whilst the HR component clarified position roles, responsibilities and lines of reporting. Multidisciplinary committees were also established to ensure wide representation within the decision-making process. For example, a training development committee was formed to oversee succession planning and the allocation of training opportunities.

Figure 6.1 Conceptual overview of the structure of the THSPMP

Source: Aka'ola, S et al., n.d.

The THSPMP was implemented in conjunction with a programme of national reform, the Economic and Public Sector Reform Programme which was approved in December 1999 and supported by the ADB, NZAID and Australian Aid Program. This programme focused on policy development to promote private sector leadership, strengthening of public sector management, improving the efficiency of the financial sector and service delivery, and improving social security. The Ministry of Health was in fact the pilot ministry for testing new systems for performance

management and accountability such as the balanced scorecard and the executive performance appraisal system. These new systems tied in well with the second phase of the THSPMP which concentrated on: (i) hospital management, public health management, pharmaceuticals and supplies inventory management; (ii) preparing a services plan for the sector; and (iii) developing a master plan for the upgrade and redevelopment of Vaiola Hospital (which eventually led to securing funding through the World Bank and the Government of Japan to undertake the construction packages as previously described in Chapter 4).

The third phase of the programme then went on to examine issues of data flow and logistics management in several areas of the hospital and health system, including reviews of patient registration, disease notification and vital registration as described in detail in *2.7.1 Information systems*. A major initiative focusing on health statistics and health information management was undertaken as part of the World Bank-funded HSSP which ran from 2003–2007. Coordinated and targeted support was also received from many other donors, in particular, WHO, SPC and the Japanese Government. The HSSP aimed to further improve the performance of the health sector across the following four key areas (WB, 2010):

- **Strengthening health-care financing** to support the review, development and implementation of policies which define the funding and overall allocation of resources to health services.
- **Improving health information management**, including three sub-components: (i) strengthening the information culture; (ii) developing and implementing a Hospital Information System at Vaiola Hospital; and (iii) information management for NCD prevention and control.
- **Improving the quality of Vaiola Hospital**. Improving the administrative, technical and functional efficiency of Vaiola Hospital by investing in infrastructure redevelopment and management strengthening. This component focused on three areas: redevelopment of Vaiola Hospital, improving hospital management and developing a health-care waste management system.
- **Project management and coordination and operation of the Project Management Unit (PMU).** Under the HSSP, Tonga's health information management capacity was greatly improved and as a result, Tonga is now a leader in the production of health statistics in the Pacific. A key output during the HSSP was the training to Masters level of the health statistics officer. Local capacity to complete national health

accounts was also established and the process has now become institutionalized. WHO also provided assistance for priority public health programmes and technical assistance in health legislation and waste management and were instrumental in the preparation of clinical guidelines for NCD prevention and control, along with several other donors including AusAID, WHO, and the SPC.

The THSPMP and HSSP have been widely credited for making significant improvements in the Ministry of Health's organizational capacity and culture (Tu'itahi, 2008; Soakai, 2006; 'Aka'ola et al., n.d.; AusAID, 2009). The Ministry of Health now has the ability to analyse expenditures and prepare more accurate budgets. The national referral hospital has been upgraded and the new health information system is one of the most developed in the region. The project completion evaluation of the HSSP concurred that the project achieved its development objectives with limited shortcomings. At the close of the HSSP it was too early to monitor the impact of the new user fees policy on the target of reducing the proportion of the Ministry of Health budget from general government revenue from 98% to 92% (WB, 2010). Since the implementation of the revised user fees, the revenue generated has almost doubled, but it goes directly to the MoFNP revenue pool, not to the Ministry of Health. Key factors which were identified as being fundamental to the success of both projects include: consistent and strategic leadership and political support, participatory approaches, a clear sense of the challenges, and the facilitative role played by donors, in particular by the Australian AID Program (Tu'itahi, 2008). A key learning from the THSPMP was that "prospects for developing or effectively utilizing domestic capacity are enhanced when capacity issues (individual, organizational, and institutional) are addressed systematically, and the approach to capacity development is rooted in host country vision and leadership" (Tu'itahi, 2008).

Building on the institutional capacity developed under the THSPMP, the Australian Aid Program launched the Tonga Health Systems Support Programme (THSSP) in 2009. This aims to support the Ministry of Health to fully implement the 2008/2009–2011/2012 Corporate Plan, in particular to meet the identified targets agreed in the Tonga-Australia Partnership for Development (signed in August 2009) with a focus on reducing the prevalence of NCD risk factors and increasing access to primary health care following a national standard. The THSSP will assist the Ministry of Health to manage a suite of health system improvement

projects which they have identified through their own planning processes and using their own systems of accountability. Funding will go towards assisting the Ministry to address components one (Preventive Health) and three (Community Services) of the Corporate Plan, and assist with the implementation of the national strategy to prevent and control NCDs. This will also involve funding, on a temporary basis, for critical staffing deficiencies while longer term solutions are developed and implemented. Furthermore, an untied flexible fund of A$ 250 000 per year is allocated for unplanned small scale and/or urgent work as well as continued funding of A$ 60 000 a year for the twinning programme with the St John of God Hospital, Ballarat.

Whilst the THSSP was intended to run from 2009–2013, following an interim progress report in April 2013, it is anticipated that the programme will be extended on a no-cost basis for a further two years. The THSSP is also the first phase of a ten-year period of support from Australia to the health sector. AusAID envisages that over time there will be a transition to sector budget support and, in parallel, a shift to a sector-wide focus which encompasses overall health sector priorities, and associated systems for planning and resource allocation, stating:

> *The experience gained under the approach of this design will enable the Ministry of Health to learn by doing and continuously improve its systems, processes and understanding… In time, with the experience gained under this funding, Tonga may choose to bring all donor funding together with its own financing, under a sector-wide approach (SWAp) … Australian support to the health sector in Tonga is based on a 10 year time frame, by the end of this period the desire from AusAID's perspective is to have a true SWAp" (AusAID, 2009).*

To date however, the Tongan Government has not sought to initiate a SWAp as it reportedly feels that it needs further experience operating planning, decision making and monitoring systems and strengthening its capacity for project implementation (AusAID, 2009).

6.2 Future developments

6.2.1 National reforms

Government reform in Tonga is aligned with the Tonga Strategic Development Framework (TSDF) (2011–2014). A major area of reform is the restructuring and reform of the public service through the adoption,

and gradual implementation, of the enhanced corporate planning and budgeting, within a Medium Term Budget Framework (MTBF). Delivering public services within tight financial constraints is an ongoing challenge for the Government with careful consideration needed to balance improvements in cost-effectiveness with the potentially negative impact on service delivery of reducing public sector employment. Ministries are thus in the midst of a major effort to effectively reorient the budget process and service delivery away from an input-based system, shifting the focus to the efficiency and cost-effectiveness of service delivery as the measure of public sector success. The aim is for the system to focus on customer service and be output-based. Over the coming years, government ministries will continue to embrace this shift, increasing their adaptation of programme-based budgeting and matching resources to services in order to better serve the Tongan people. This will be achieved through strengthening the corporate and annual management plan processes, and ensuring a stronger link between these plans and the annual budget. Both plans will include performance and service delivery targets and more specific indicators for monitoring of inputs, outputs, outcomes and impact. The plans will also be more closely monitored on an annual basis and will be used to inform resource allocations in periods of budget restraint (MoFNP, 2011a).

In line with the emphasis on service delivery, efforts are being made to streamline the government to focus on core services and remove functions that can be performed externally. As such, a number of ministries have been merged from the start of the 2012/2013 fiscal year in order to streamline central government functions such as corporate services and central procurement. The initiative was also expected to identify surplus staffing positions and facilitate redeployment. This has had limited success, however, since most excess staff are in administrative positions and most ministries suffer shortages of professional staff. In the 2013/2014 budget, funding for all vacant posts is pooled and managed by the Public Service Commission to ensure that the filling of essential posts is prioritized.

A new Public and Financial Management (PFM) Reform Roadmap covering 2013–2018 has recently been sent to Cabinet for endorsement. The vision for the Roadmap is: "Effective and efficient governance with a transparent and disciplined public financial management system that serves the interests of the Government of Tonga and its people". The IT network in the MoFNP will be improved and rolled out to line

ministries. The further integration between the three-year rolling MTBF and corporate plan will continue. Close cooperation between the core ministries will ensure smooth linking of job descriptions to corporate plans, an improved staff performance management system, and contracting of CEOs to help drive improved performance and delivery across all of government. This focus on evidence-based monitoring of performance and the creation of appropriate incentives for public servants is needed if the government is to make real progress to a more efficient, effective and affordable public service (MoFNP, 2013).

Whilst it is widely acknowledged that a stronger public service is better able to support the progressive achievement of the vision of a just and progressive society for all Tongans, significant challenges remain. The Kingdom's public debt levels need to be brought down; the public service wage bill is crowding out critical operations and maintenance spending and limiting the capacity to fund investments from local funds while cash reserves are declining; the civil service needs to be further rationalized; more private sector development is needed, and more jobs need to be created (MoFNP, 2013). It is also important that Tonga continue to address social challenges in an equitable manner so that the less fortunate and more vulnerable are not left behind.

6.2.2 Health sector reform

Within the context of overall government reform, the health sector has made significant improvements in institutional strengthening as discussed above. The Ministry of Health now has the basic governance and management infrastructure together with the skills required to lead further reform processes on its own. As a public service, it is subject to ongoing reform as described above and acknowledges that its reform agenda is by no means complete and that only through gains in efficiency will the Government be able to continue to provide and expand a range of quality health services to the population. A recent, independent review of public finance management in the health sector funded by the Australian AID Program concluded that the THSSP should continue to utilize the government systems in order to align policy and continue to strengthen systems (Pretorius, 2013). It was also recommended that the THSSP conduct the following:

- further support the Ministry of Health's planning and reporting framework and its links with the new MoFNP process;
- assist with the establishment of the Ministry's internal audit function;

- document internal procedures for financial management and procurement in the Ministry;
- consider placing procurement under health administration rather than under the medical superintendent;
- provide training to health finance staff and THSSP staff on Sun Systems;
- continue to follow the Ministry of Health's philosophy of including managers and clinicians in budgeting/planning processes and provide training as necessary; and
- undertake an annual independent audit of THSSP (at least critical services and the flexible fund) managed in conjunction with the Audit Office.

It was also suggested that the taskforce which will represent line ministries in the management of the PFM Road Map should include a health perspective and that financial management capacity should continue to be developed in both the MoFNP and Ministry of Health. Staffing levels must also be maintained to mitigate any financial risk (Pretorius, 2013).

The highest priority for the immediate future arises from the growing NCD epidemic. As described, the Australian Aid Program has provided funding to address the primary and secondary risk factors for NCDs, particularly diabetes and cardiovascular disease, from 2009–2013. The Tongan Government is also very serious about its commitment to fighting NCDs, reflected as a national priority in the National Strategic Development Framework (2011–2014), the Ministry of Health's Corporate Plan (2013/2014–2015/2016) and the 2nd National Strategy to Prevent and Control Non-Communicable Diseases (2010–2015). The NCD strategy has the goal of reducing NCD prevalence by 2% per year by 2015 through targeting interventions around the four key NCD risk factors and identified bottlenecks:

- weaknesses in organizational management for combating NCDs;
- deficiencies in monitoring, evaluation and surveillance; and
- insufficient funding.

The strategy offers quantified and measurable objectives, and the national targets are used to monitor progress under MDG 6 (halt or reverse the trend in NCDs by 2015). The plan articulates with the MDG Acceleration

Framework (MAF) for NCDs which was produced in June 2013. Priority interventions in the MAF include increasing local food supply and creating income-generating opportunities for women and vulnerable groups. A review of legislation and policies affecting food/tobacco/kava/alcohol and physical activities will be conducted and advocacy around healthy lifestyles will be initiated through settings including churches and workplaces. The plan also aims to identify and prioritize bottlenecks to effective implementation and then to select, implement and monitor feasible, multi-partner acceleration solutions. The MAF report and action will feed into the strategic plan, the corporate plan, and other work plans of relevant ministries, NGOs, development partners and other stakeholders (Government of Tonga and United Nations, 2013). The Prime Minister of Tonga presented the MAF for NCDs at the MDG Summit in New York in September 2013 where Tonga was praised for its high level of political commitment and momentum for action. The Prime Minister acknowledged that to make this initiative truly a national movement, it is important to continue to rally support at all levels – Government, the UN, civil society and development partners (The Prime Minister's Office, 2013).

The major challenge for Tonga now is the rising cost of health care associated with the burden of NCDs. With a high dependence on donor funding, debate around the enforcement of user fees and the high portion of Ministry of Health budget allocated to staff salaries, the health system faces major budgetary constraints. Allocations need to increasingly be focused on preventative health rather than curative care and the Ministry needs to improve the efficiency and effectiveness of its spending and programmes. The 2013/2014 Government budgetary allocation to the Ministry of Health is TOP 31 million, representing an increase of TOP 910 000 for new intakes of nurses and promotion of existing nurses as well as a TOP 370 000 contribution to recurrent funding and TOP 60 000 for medical supplies. There is a decrease of TOP 189 166 due to staff vacancies in the funding pool. A further increase of TOP 1.7 million is to be funded by AusAID under the THSSP (MoFNP, 2013).

Major new projects planned to start in 2013/2014 that are likely to have some impact on health include the Tonga Governance Strengthening Programme (Australian Aid Program, TOP 6.5M), Upgrading of the Customs and Revenue Management Systems (ADB/AusAID, TOP 3.0M), Tonga Education Support Programme 2 (NZAID/Australian Aid

Program, TOP 6.6M), Community Water Pumping (International Union for Conservation, TOP 1.2m), the Pacific Environment Community Fund (Pacific Island Forum Secretariat, TOP 7.3M) and the Global Climate Change Alliance Project (Secretariat of the Pacific Communities, TOP 1.0M), the anticipated extension of the Tonga Submarine Cable Projects to Vava'u and Ha'apai islands (World Bank, TOP 14.0M), and new aircraft (China, TOP 25.0M).

7 Assessment of the health system

Chapter summary

Tonga's primary health-care system has delivered levels of antenatal care, immunization, and hospital deliveries comparable to that of high-income countries. Combined with good access to improved water and sanitation, this has led to a significant reduction in the burden of infectious disease and maternal and child deaths in Tonga since the 1970s and the progress in reaching relevant MDG targets. However, improvements in health status are now being reversed by the rise of NCDs to levels which are described as an epidemic. The challenge for the health system now is to respond to this growing burden of NCDs through improving the quality and access to both preventative and curative health services, particularly for those who live on the outer islands. Tonga has undertaken some innovative responses to the "epidemic" including the reskilling of primary health-care nurses as NCD nurses, intersectoral action and legislative review, and advocacy resulting in high-level political commitment. However, a key area that requires strengthening is the disaggregation of routine health data by gender, age, race, and socioeconomic group to measure and monitor inequity in health outcomes amongst different population groups in Tonga. Obtaining this sort of information for NCDs will be particularly important in identifying key populations.

The health system currently provides a high degree of financial protection with OOPs accounting for only 10% of total health expenditure and only 0.5% of average total annual household expenditure, a level which is significantly below the average 2–5% of other countries in the East Asia and Pacific region. This is a positive outcome for the Tongan population. There is however, some inequity in terms of access and financing which is due, in large part, to the difficulties of maintaining adequate health services in areas with low population density. For example, it was shown that households living in rural areas spend slightly less than half the amount that urban households spend directly on health and medical services each year (although this figure does not take into account the

indirect expenses for health-seeking travel such as time off work and transport costs which should also be considered). Despite the Ministry of Health ascertaining that 100% of the population can access appropriate health-care services with a regular supply of essential drugs within a one-hour walk, the quality and scope of services is an issue in rural areas, exacerbated by the needs for services linked to NCD management, especially at secondary and tertiary prevention levels. This is a challenge that Tonga and many other PICTs will face and must be a priority in the post-MDG agenda.

In terms of providing universal health coverage, Tonga must ensure that the enforcement of user fees which were mandated in 2009 does not further jeopardize equity. The scope, coverage and quality of services also needs to be further defined and monitored in order to maximize both allocative and technical efficiencies of the health system – one of the few areas in which the health system may be able to increase fiscal space in the future. In terms of quality and health-care effectiveness, despite the significant improvements that the Ministry of Health has made in terms of accountability and transparency under the HSSP and other programmes, the creation and implementation of an integrated quality in health-care programme is recommended. Additionally, increased budget should be funnelled towards preventative health services in the recognition that delivery of cost-effective primary and secondary prevention strategies for NCDs will improve efficiency in health care over the long term and lower expenditures associated with secondary- and tertiary-level care. Although Tonga is performing better than most PICTs and Papua New Guinea on expenditure on health per capita, Samoa, which has similar health profiles and trends as Tonga, is spending around a third more per capita on health. It is important for Tonga's health planners to understand whether this increased expenditure represents the cost of better access to quality NCD services for all in Samoa, and so sets a benchmark for Tonga, or whether it is due to other factors. Reviewing the health human resource data, it is also noted that Samoa has fewer health personnel than Tonga, so it is possible that more of the health expenditures is on goods and services, rather than salaries, but again this should be reviewed by the Tongan health planners to provide some guidance in planning for the next decade.

7.1 Stated objectives of the health system

The Mission of the Ministry of Health as set out in the Corporate Plan is "to improve the health of the nation by providing quality care through

promotion of good health, reducing morbidity, disability and premature (death) mortality". This is set within the ambitious vision "to be the highest health-care provider in the Pacific as judged by international standards in 2020" (MoH, 2013a). Since the 1970s Tonga has made significant progress in its goal of improving health standards, particularly in relation to the prevention of infectious disease and the provision of universal access to primary health care. The challenge now is for the health system and the Government to combat the NCD epidemic. Whilst NCDs have been incorporated into several strategic plans including as a priority outcome area of the TSDF, in the Corporate Plan and the MDG acceleration framework for NCDs (as discussed in *6.2*), meeting the Ministry of Health's abovementioned Mission will be challenging within current resources.

7.2 Financial protection and equity in financing

7.2.1 Financial protection

As noted above, the Tongan health system currently provides a high degree of financial protection with very limited OOP payment. The Government provides the large majority of health services, with 89% of health services delivered at public hospitals and 6.2% at Government health centres. The 2009 HIES estimated that expenditure on health and medical services had the lowest monthly household expenditure out of all 12 consumption expenditure categories, at only TOP 7 per month. The HIES, however, revealed that monthly spending on health and medical services in urban areas (TOP 10) was twice that of residents in rural areas (TOP 5), which may be indicative of a level of inequity of access to services, or differences in willingness to pay. This was consistent with the proportion of consumable expenditure on health and medical services via island division which revealed the following differences: Tongatapu spent 0.5% of household consumption, 'Eua 0.4%, Vava'u 0.3%, Ha'apai 0.1% and 0.0% in Ongo Niua (where there is no hospital and limited but sufficient health workers for the population size). Hence, travel (commonly to Nuku'alofa) and the associated opportunity costs (time away from work and family duties) are also important and inequitably distributed costs that should be considered when investigating equity in financing. Other reasons that may account for higher OOP spending in Tongatapu are that such areas are likely to have greater access to Tonga's very limited private health services which are available almost exclusively in Tongatapu/Nuku'alofa, and are likely to cost significantly more than public services. Furthermore, people with chronic conditions or ongoing

complicated health issues may make the decision to permanently relocate to Tongatapu in order to facilitate better access to both private and public health services. This possible cause of internal migration should be investigated as it may have social, economic and other costs to the communities and the nation.

Inability to pay for health services has been reported as a reason for not seeking health care. In the most recent Census, 5% of the population reported having a health complaint in the previous two weeks, of whom 2% (n=80) said they did not seek health care. Among those who did not seek care, the most common reasons were that respondents did not consider themselves to be sick enough, could not afford treatment, said it was too far to travel, felt that service at the provider was of a poor standard or that they were too busy. Travel time and cost is also anecdotally reported as a reason why many Tongans consult local traditional healers as a first line of treatment (Statistics Department Tonga, 2013). Strategies to understand and address these possible barriers to universal health care must be addressed, especially as the need for NCD services is likely to continue to rise in the near term, until some strong primary prevention programmes are implemented and achieve the reversal of the present trend in these conditions.

As discussed in *3.4.1 Cost-sharing (user charges)*, the increase in user charges since 2009 could jeopardize financial risk protection if the fee exemption scheme is not properly implemented and assessed for effectiveness. For example, excluding patients from fee exemptions who are not ascertained to have been "constructively managing their condition and following the recommended treatment regime" may unfairly exclude those who are unable to do so for reasons outside of their control (e.g. inability to travel, lack of access to medications, etc.). Furthermore, the threshold of service use on which the eligibility is based (more than 12 outpatient visits to a hospital and/or two or more hospital admissions in the last year, or hospital stays of over 21 days) may be too high considering that less than 7% of those who reported a hospitalization in the 2003 Household Health Survey reported more than one hospitalization. Furthermore, only 6% of inpatients stay more than 14 days and only around 10% of people have 12 or more outpatient visits per year. It remains to be seen whether this scheme will adequately protect the 22.5% of the population who are estimated to live in "hardship" (see *1.2*). Although the Ministry of Health does state that it intends to review these cut-off points on a yearly basis in order to determine the

appropriate number of visits for the safety net inclusion, there is no evidence to show that this has been done to date. It is also anecdotally reported by the Ministry[15] that the village committees which have been delegated the responsibility of nominating local people for inclusion in the safety net, have not been finding anyone eligible and have an attitude that everyone should have to pay. This means that the safety net is not having the intended outcome of protecting those who are vulnerable to catastrophic health payments. The Ministry feels that the community committees need training and capacity building to make this system work properly. Furthermore, whilst there is information available about the amount of revenue that has been generated since the introduction of user fees, there are insufficient mechanisms in place to monitor the effect of user fees on the use of health services, or the effectiveness of the safety net in limiting catastrophic payments and this area warrants further research and evaluation, especially in light of the global movement towards universal health coverage, and Tonga needs to ensure adequate services to address the NCD epidemic.

Other issues pertaining to financial protection

The depth of financial protection in Tonga is challenged by limitations to the services and technologies that the health system can provide within its budgetary and human resource constraints. For example, the Ministry of Health has not introduced advanced services such as cancer treatment or renal dialysis. At present, roughly 200 Tongans are diagnosed with end-stage renal disease each year, a figure that is likely to increase with the high prevalence of diabetes. As discussed by Dr Siale Akau'ola, Director of Health, end-stage renal disease requires dialysis which is not available in Tonga due to the prohibitive cost. Hence, patients who are not eligible for the Overseas Medical Transfer Scheme or cannot self-fund overseas travel and treatment have few options for receiving these types of curative or life-prolonging treatments (ABC Radio Australia, 2012). A review of innovations to address these needs in LMICs would assist planning appropriate services for the country, and, importantly, increase resourcing for evidence-based primary prevention programmes for the Tongan setting to reduce the demand for such tertiary prevention services. The work started of reskilling nurses to support NCD prevention and primary care is an important step, and evaluating the outcomes of this innovation will be important to guide future health plans and resource allocation.

15 Personal communication, 26 March 2014.

Financial protection can also be restricted by the depth of coverage of secondary and tertiary services, especially for those in remote areas. As discussed, people who live in remote areas may need to expend considerable amounts of money to travel to a hospital in order to access required services, creating significant opportunity costs.

7.2.2 Equity in financing

The Government provides the majority of funding to the health system and in general, revenue collection in Tonga, especially income tax which targets those with higher levels of education and formal employment, is progressive. As discussed in *3.4.1 Cost-sharing (user charges)*, it is imperative that the Government ensure that health financing reform does not lead to inequitable health financing as seen in other countries of the East Asia and Pacific region, where user fees worsen access by the poor when appropriate fee exemptions are not implemented (Somanathan and Hafez, 2009). The Government must thus ensure that the fee exemption and safety net effectively protect vulnerable population groups. This will require careful monitoring and evaluation of the effects of the fees and exemption policies on the demand and utilization of health services, especially for poor and marginalized groups.

7.3 User experience and equity of access to health care

7.3.1 User experience

As previously discussed in *2.9 Patient empowerment*, a patient satisfaction survey was undertaken under the THSPMP in 2002, highlighting some concerns about quality of care and amenities, and waiting times. In response, customer service training was delivered to middle and senior management in 2004 and infrastructure work was completed at Vaiola Hospital. Following this redevelopment, qualitative information in the HSSP completion report describes an improvement in the quality of services at Vaiola Hospital and a corresponding increase in patient satisfaction and health outcomes. According to hospital managers, productivity also increased as a result of a more efficient physical design of the hospital enabling smoother patient flows and a better match between facility supply and demand. Doctors and nurses also acknowledged that patient waiting times decreased as a result of the hospital upgrade (World Bank, 2010). Continuing to monitor these variables is important as part of the equity and coverage agenda of the Government.

Improving customer service continues to be a priority for the Ministry of Health. It is the fifth KRA/output area in the Corporate Plan, supported by the following three strategies: (i) all managers and staff to attend the internal customer service training workshop; (ii) develop and implement customer satisfaction surveys in each division and district of the Ministry; and (iii) review customers' information needs and implement endorsed recommendations to improve communication. The target was to obtain baseline data by the end of 2013 and to see a 20% increase in customer satisfaction levels within one year. This was the same target that was in the previous Corporate Plan, yet and there is no data describing whether any progress was previously made. Similarly, previous plans have also described strategies and targets to reduce waiting times and increase patient satisfaction; however, there seems to be a paucity of follow up, or at least available data about any monitoring or evaluation of outcomes. For example, a reduction in waiting times in the Outpatient Department was a strategy within the previous Corporate Plan with targets of obtaining baseline data by March 2009, achieving current benchmark waiting times by December 2009 and increasing the use of community health centres clinics by 50% by July 2010. However, although the 2010 Annual Report stipulates the expected waiting times for different triage scores of patients in the outpatient and emergency departments, there is no discussion of the adherence to these times. There are few other references to customer satisfaction in the same report. It is reported that in 2013 the Ministry assigned staff to the issue of customer satisfaction with the mandate to develop an integrated customer satisfaction survey and to implement monitoring and evaluation based on the past survey and training which was carried out in the last decade.

7.3.2 Equity of access to health care

Geography: The main issue around equity of access to health services arises from the difficulty of providing adequate resources to Tonga's population spread across roughly 40 islands, and in particular, to those who inhabit remote areas which have low population density. While the Ministry of Health reports that 100% of the population can access appropriate health-care services with a regular supply of essential drugs within a one-hour walk, there are physical and fiscal limitations to what can be provided in such settings. This is a problem for many small island nations in the Pacific and globally, and a challenge for health planners. Sharing innovations on improving the scope of and access to quality primary health-care services, including NCD prevention and care, should

be encouraged within the PICTs and other island nations, and this is an important agenda for implementation research.

Infrastructure: In terms of infrastructure, the number of hospital beds per capita is distributed fairly uniformly across the country as shown in Chapter 4 (Table 4.1). However, although there are health centres in each of the Niuas, there are no hospitals and travel time to the hospital in Ha'apai is significant, meaning that access to hospital facilities is more limited in these islands (Ahio et al., 2010). In other relatively low-density areas, however, the Government maintains hospitals despite low bed occupancy rates so that inhabitants of these regions are able to access secondary health services. This balance between access and utilization is one experienced by many remote locations, including in Australia and Canada, where e-health, visiting specialist programmes and other programmes to cost-effectively provide quality services have been implemented. Tonga should review these experiences in planning for the next decade.

Medical and diagnostic equipment and drugs: Vaiola Hospital plays the lead role in delivery of health services for Tonga, catering for the 73% of the population that lives on Tongatapu, as well as acting as the national referral hospital for the outer island hospitals and health centres. As such, high-tech medical equipment and staff who are trained in its use and analysis are only available there. On a more rudimentary level however, basic medical supplies, diagnostic equipment and pharmaceutical products are not always available or in working condition in outer island health centres and hospitals. For example, at the time of their visit, the public expenditure review team found that the Prince Wellington Ngu Hospital in Vava'u lacked X-ray capacity and was out of stock of glucose testing strips which are essential for preventive activities (Ahio et al., 2010). These issues compromise the delivery of primary health care and disadvantage those on the outer islands in that they necessitate travel in order to access medical goods and services. The Ministry of Health reports that the situation has improved through the flexible fund and clinical critical deficiencies component of the THSSP. These initiatives aim to address required specialized services (anaesthesia, surgical, biomedical engineering, etc.) on Tongatapu and the remote islands through regular visits.

Skilled health workers: Whilst the density of trained health workers is distributed fairly evenly in regard to population (with a slightly bias

towards Tongatapu, as discussed in *4.2.1*), the skill-mix and capacity of health workers is much lower on the outer islands. For example, the Niuas, despite having the highest health worker density of all of Tonga's main island groups, does not have any doctors, midwives, dentists or other allied health workers. All specialist medical staff and the vast majority of the highly skilled workforce are based in Tongatapu (mainly in Vaiola Hospital), with outer islands having to rely on occasional visits from overseas and Tongatapu-based medical teams or travel to Nuku'alofa for treatment. These geographical inequities within the health system are unlikely to change anytime in the near future as it would prove to be prohibitively expensive, inefficient and unrealistic to deploy highly skilled workers to all of the islands. As it is, the Ministry of Health has made primary care strengthening a top priority to address this challenge. As discussed earlier, solutions such as mHealth and eHealth may provide opportunities to improve access to services in these remote areas.

Socioeconomic status: Despite the provision of universal coverage, inequalities in health-care use exist across socioeconomic groups. The THS 2003 showed that the poorest quintile reported 0.86 outpatient consultations per person per year, compared to 1.39 in the richest quintile. The poorest quintile was also less likely to seek care when ill.

Gender: In general reproductive and maternal care for women is of high quality, however, concentrated effort is needed to continue to lower the maternal mortality rate. There is no evidence that females have less access to health care, but the THSSP mid-programme review made specific recommendations that gender disaggregation should be actively encouraged in all national data collection and that the STEPs, knowledge, attitude and practices (KAP) and other demographic surveys should be carefully reviewed to determine if they identify any previously unrecognized gender biases. It is acknowledged that the concept of gender as a cross-cutting issue is relatively new in Tonga. The Australia-Tonga partnership for development has a specific focus on gender and sets targets for NCD reduction stating that within NCD programmes, attention to gender must be given in terms of examining the social influences that determine behavioural risk factors, health care seeking and health outcomes for men and women. For example, women have higher rates of obesity which is a major risk factor for NCDs and this is linked in part to social norms discouraging women from taking part in exercise.

7.4 Health outcomes, health service outcomes and quality of care

7.4.1 Population health

As discussed in Chapter 1, Tonga has a relatively good primary health-care system which has been responsible for significant improvements in health outcomes related to infectious disease, maternal, child and infant mortality. Tonga has already met MDG targets 4a (a two-third reduction in the under-five mortality rate) and 5a (a three quarter reduction in the maternal mortality ratio)(MoFNP, 2010a). Furthermore, if prevailing trends persist, there is sufficient progress and good national support to achieve targets 5b (universal access to reproductive health), 6a and 6b (by 2015 have halted and begun to reverse the spread of HIV/AIDS; and by 2015 ensure universal access to treatment for HIV/AIDS for all those who need it). In spite of this impressive progress, however, the overall level of population health is declining with NCDs now responsible for 75% of all deaths. Although there is good national support, the MDG target related to NCDs (target 6c - have halted by 2015 and begun to reverse the incidence of NCDs) is the only target (out of a total of 17) that will not be met by 2015 based on prevailing trends. Whilst effectively combatting NCDs requires intersectoral action and extensive collaboration outside of the health sector, many NCDs such as hypertension and cerebrovascular disease are amenable to medical care.

However, as Tonga struggles to deal effectively with the NCD burden, there is no data to show that the health system is managing to reduce the NCD-associated mortality and morbidity or to improve health outcomes for those at high risk.

Maternal mortality ratio. Although Tonga has met the MDG target for reducing the maternal mortality rate (recording an MMR of 37.1 per 1000 in 2010, which equates to roughly one death,[16] against the MDG target of 51 per 1000), post-partum haemorrhage, which is arguably the most preventable cause of maternal death, is the leading cause of maternal mortality. Further interventions are thus required to reduce preventable deaths, such as addressing shortages of trained basic and emergency obstetric care providers and necessary support services in a number of health facilities. Additionally, the health system must address the effect of NCDs on women in order to reduce a likely increase in maternal (and

16 AbouZahr 2010 discusses the problems with use of maternal mortality ratios in small populations.

neonatal) mortality and morbidity due to conditions such as diabetes and hypertension in pregnancy.

Infant mortality rate. The IMR has fallen dramatically since the 1940s when it was estimated to be 56 per 1000 live births to a relatively low and stable figure between 10 and 25 deaths per 1000 live births (based on the synthesis of credible published estimates of local data produced in an assessment of mortality trends in Tonga as previously discussed in *1.4 Health status*)(Hufanga et al., 2012). Whilst a great deal of the improvement in the infant and child mortality rates is attributable to the health system, particularly from comprehensive coverage of immunization, antenatal visits and skilled birth attendants, other social determinants of health have also played a role, such as improved access to water and sanitation and increased rates of female education.

Rheumatic heart disease. As discussed in *1.4*, in 2008, Tonga was estimated to have one of the highest incidence rates of RHD in the world, at an estimated 8% of the adult population. A routine screening programme implemented in 2008 has shown significant results, reducing the incidence to 2.7% in 2011. Early diagnosis means that in many cases, the disease can be successfully and cost-effectively treated by secondary prophylaxis, avoiding any future need for surgery. This locally-endemic infectious disease remains an important challenge for the country and needs to be monitored to ensure the sustaining of the downward trend in incidence.

Tuberculosis. Tonga has greatly diminished the prevalence of TB from 53.7 per 100 000 in 1990 to 34 per 100 000 in 2007 through effective implementation of the DOTS programme, which is run through four DOTS clinics (MoFNP, 2010a). Continuing to ensure that prevention and early detection and treatment are available for the population, and monitoring any impact of urbanization, internal migration and co-morbidities with NCDs such as diabetes upon the epidemiology are important considerations for the health system.

Cancer. Despite the Ministry of Health approving the establishment of a Cancer Registry in 2005, using CANREG-4 software, this system is not affiliated with the International Agency for Cancer Research and there is currently no information available on the five-year survival rates for any form of cancer. Whilst cancer is the third leading cause of death in Tonga, only a very small number of patients are admitted to hospital for cancer (there were 11 admissions to Vaiola Hospital for cancer in 2012).

This probably reflects the limited oncology services available in Tonga, presently consisting only of surgery. Patients requiring chemotherapy and/or radiotherapy need to apply to be sent overseas for treatment under the medical transfer scheme. Mammography services are not available in Tonga in spite of the fact that breast cancer is the leading cancer amongst women. The Ministry of Health has, however, launched a breast cancer awareness campaign which aims to encourage women to perform breast self-examination and to present for treatment if they find any changes. More programmes addressing known risk factors for common cancers in Tonga as primary prevention are critical to reducing the need and demand for secondary and tertiary services, which may not be available in Tonga. Additionally, ensuring equitable access to appropriate palliative care, including pain relief, will be an important adjunct for cancer services (especially at primary health-care level).

7.4.2 Health service outcomes and quality of care

Health service outcomes

Immunization. As previously discussed, Tonga has a very strong child immunization programme which delivers near-universal coverage through integration of the vaccination programme into all health centres, reproductive health clinics and outreach programmes. Tonga now has no neonatal tetanus or poliomyelitis, and the last confirmed case of measles was in 1998. Sustaining community and political commitment to immunization is a consideration for future planning, as it is common that as these vaccine-preventable diseases of childhood become rare, support for immunization declines and with it, coverage levels.

Although the recent DHS reported immunization rates which are significantly lower than those produced by routine Ministry of Health reports (see Table 1.5 and associated discussion), the DHS is the first survey to produce disaggregated data by socioeconomic characteristics. Regardless of methodological differences, this survey is useful for describing which groups of children are not being adequately protected by vaccinations. The results show some urban-rural differences in coverage of basic immunization as well as a relationship to the mother's highest level of education, as shown in Table 7.1. In summary, children in rural Tongatapu are around 13% less likely to have received all of the basic childhood immunizations as children living in urban Tongatapu or the outer islands, and children in rural areas were more likely to have received no vaccinations. Children of mothers with post-secondary

education were also more likely to be fully immunized (57%) than children of mothers who only had secondary-level education (43%). No clear relationship was, however, shown between rates of immunization and wealth quintile. A rural-urban difference was also observed in the proportion of children with fever receiving antibiotic drugs: while a total of 19% of children included in the survey received drugs, 33% of those in urban Tongatapu did so, compared to rates of 11% in rural Tongatapu and 15% in the outer islands. It appears that children living in rural Tongatapu are the most disadvantaged in terms of health service outcomes and priority should be given to targeting this group. As discussed previously, further disaggregation of routine health data to monitor coverage and equity is an important step for the routine health information system.

Table 7.1 Childhood immunization rates by socioeconomic characteristics, 2012

Background characteristic	Category	Children aged 12–23 months vaccinated (%)	
		All basic received*	No vaccines received
Region	Urban TT	52.6	5.6
	Rural TT	39.8	7.7
	Outer Islands	53.2	9.2
Mother's education	Secondary	43.3	8.5
	Post-secondary	57.0	4.7
Wealth quintile	Lowest	45.0	5.7
	Second	62.1	5.0
	Middle	36.3	8.3
	Fourth	39.4	9.5
	Highest	51.5	11.0

Note: TT = Tongatapu (the main island); * all basic vaccines include the BCG vaccine, three doses each of DPT vaccine and the polio vaccine, and a measles vaccination by age 12 months.
Source: (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014)

Antenatal care. As identified in the routine Ministry of Health reports, the DHS results showed that standardized antenatal care from a health professional is universally accessed in Tonga with characteristics including wealth, educational level, birth order and age not appearing to influence who accesses care. Some differences were however apparent in the type of health-care provider that different women access: women from the upper wealth quintiles and those with higher levels of education are more likely than women from lower wealth quintiles or with a lower level of education to be seen by a doctor. This finding may reflect that more educated/wealthy women are choosing to see private obstetricians.

Quality of care for chronic conditions. There is currently limited data from which to determine the avoidable hospital admission rates for chronic conditions such as asthma, chronic obstructive pulmonary disease, congestive heart failure and hypertension. However, the increase in hospital admissions related to inadequately controlled diabetes is reflected in the Ministry of Health Annual Reports. For example, in 2010 there were 159 admissions to the surgical ward for diabetic complications, representing 15% of all surgical admissions (MoH, 2010b). This figure is a substantial increase from 2009 when 2% of admissions (n=130) were for diabetic complications. In 2010, 44 patients underwent either below- or above-the-knee major amputations due to sepsis for diabetic complications, making it the second most common type of major surgery. In addition, there were 89 minor amputations due to diabetic complications. The length of stay for amputees is relatively long and it is clear that better primary and secondary prevention is essential to minimize diabetic complications and their impact on both the health system as well as patients' quality of life. Meeting the needs of people already or likely to be disabled by poorly controlled NCDs is a concern for health planners that needs further attention.

Quality of care for acute exacerbations of chronic conditions. There is also a paucity of data related to in-hospital mortality rates (deaths within 30 days of admission) for acute myocardial infarction, haemorrhagic stroke and ischaemic stroke. The Ministry of Health undertook an audit of surgical mortality in 2010 which revealed a total of 11 surgical deaths (defined as all deaths occurring in the surgical, paediatric or ICU wards of patients admitted under the surgical department, regardless of the cause of admission, the cause of death or whether surgery was performed) (MoH, 2010b). There were a further seven deaths in ICU, from a total of 21 admissions. The total of surgical, intra and post-operative deaths (including all hospital deaths occurring within 30 days of a surgical operation, whatever the cause of death) in 2010 represented a 23% reduction from 2009.

The operative mortality rate in 2010 was 1% (4 deaths/435 major operations), higher for emergency surgery (2.6%) which may reflect on the quality of the global surgical care and intensive care received, but also the severity of the cases. In 2010, the most common surgical deaths were related to patients with cancer (n=5), diabetes (n=4) and trauma (n=4). No deaths occurred with elective surgeries, indicating the safety of anaesthesia and the quality of preoperative care.

Overall quality of care. The Review of Public Expenditure on Health (AusAID, 2010) in Tonga stated that the Ministry of Health could improve health-care effectiveness and strengthen subsequent health outcomes through the development and monitoring of an integrated "Quality in Health Care" programme taking into account the following dimensions of quality care: safety; effectiveness; access; appropriateness; and consumer participation. Whilst the authors of this review acknowledge that Tonga has made significant progress through the development of the Corporate Plan and accompanying balanced scorecard, they recommend the adoption of a more systematic approach to quality of care such as the *Framework for Managing the Quality of Health Services in NSW*, and related indicators, which may be appropriate for Tonga (NSW Health, 2000). There is no evidence to suggest that the Ministry has made any progress on this recommendation.

7.4.3 Equity of outcomes

As discussed in *7.3.2*, some inequity exists around access to health care – predominantly arising from geographical barriers to health facilities and the associated difficulties with staffing and resourcing remote facilities. Lower socioeconomic groups also have on average fewer yearly visits to health facilities than those in higher socioeconomic groups, in part due to the cost of travel from remote regions. Data on health service outcomes disaggregated by socioeconomic characteristics tends to be lacking, however, although some information pertaining to maternal and child health has recently come to light through Tonga's first demographic and health survey (Tonga Department of Statistics and Tonga Ministry of Health et al., 2014). As shown in Table 7.1, whilst there were no differences between overall rural and urban rates of childhood mortality, significant differences existed when rural areas were disaggregated: rural Tongatapu has the highest rates for all childhood mortality indicators, while the lowest rates for all childhood mortality indicators are in the outer islands. The under-5 mortality rate in the outer islands (6 deaths per 1000 persons) is far lower than either rural Tongatapu (22 deaths per 1000), and urban Tongatapu (18 deaths per 1000). These rates may be a result of migration by high-risk families to rural Tongatapu, where services and employment are available but housing is less expensive than in urban Tongatapu.

As expected, childhood survival was correlated with socioeconomic status, with children growing up in households in the highest wealth quintile having lower neonatal, infant and under-5 mortality rates than

those in the lowest wealth quintiles. One unexpected finding was that children of more educated mothers had *higher* rates for all childhood mortality indicators (except child mortality) than mothers with secondary-level education only, although these differences were only small. In summary, child mortality rates are highest in the poorest households in rural Tongatapu, and there are higher rates amongst children of more educated mothers.

Table 7.2 Childhood mortality rates by socioeconomic characteristics, 2012

Background characteristic	Category	Mortality rates for the 10-year period preceding the survey					Children aged 12–23 months vaccinated (%)	
		Neonatal mortality	Post-neonatal mortality	Infant mortality	Child mortality	Under-5 mortality	All basic received	No vaccines received
Region	Urban TT	7	7	14	4	18	52.6	5.6
	Rural TT	8	9	7	5	22	39.8	7.7
	Outer Islands	4	2	6	0	6	53.2	9.2
Mother's education	Secondary	6	7	13	5	18	43.3	8.5
	Post-secondary	9	7	16	3	19	57.0	4.7
Wealth quintile	Lowest	12	8	20	2	22	45.0	5.7
	Second	4	3	7	7	14	62.1	5.0
	Middle	7	10	17	5	22	36.3	8.3
	Fourth	7	10	17	0	17	39.4	9.5
	Highest	2	2	4	7	11	51.5	11.0

Note: TT = Tongatapu

Source: Tonga Department of Statistics and Tonga Ministry of Health, et al., 2014

Unfortunately, similar disaggregated information is not available for maternal mortality. The second MDG Report does state that inequality in maternal health and mortality rates is not evident in Tonga because all pregnant women, even on the remote outer islands, have access to skilled birth attendants (MoFNP, 2010a). The quality of care at health facilities is however dependent on functions such as a reliable supply of essential drugs and medical equipment as well as adequate numbers of skilled health workers – functions which are not altogether equitably distributed, especially in remote areas as described in the *Review of Public Expenditure on Health* (Ahio et al., 2010). There is no data to show whether there is

any correlation between the quality of care at certain levels of health facility and health outcomes. However, this information is particularly pertinent to the provision of effective primary and secondary care for NCDs. Acknowledging that the relationship between quality of care, service delivery and health outcomes is complex and that socioeconomic and environmental factors also impact on health, the Ministry of Health has expressed an interest in including information about the social determinants of health in its future annual reports.

7.5 Health system efficiency

7.5.1 Allocative efficiency

Allocative efficiency indicates the extent to which limited funds are directed towards purchasing an appropriate mix of health services. This means that in Tonga, allocation of the national health budget should be aimed at achieving the overall goal of "improving the health standards", or, as described in the Mission of the Ministry of Health's Corporate Plan, "to support and improve the health of the nation by providing quality, effective and sustainable health services and being accountable for the health outcomes". In order to achieve this, the Ministry must determine the number of key inputs such as staff, buildings and supplies needed to provide the optimal mix of primary, secondary and tertiary care services to address the conditions which contribute the largest disease burden – NCDs. The allocation for public and preventive health has been relatively constant over recent years at around 8% of the total health expenditure. There are criticisms by some in the public arena that too much money is being spent on inpatient curative care (29%), although the rationale behind why this is thought to be too much is not provided. Communication and travel which are required to provide public health and preventative services, especially on the outer islands in the Kingdom, were also only allocated 1% of the budget and in general, operational funds have been insufficient to carry out community-based preventive programmes.

Ensuring the delivery of cost-effective primary and secondary prevention strategies for NCDs is likely to improve efficiency in health care in the long run and lower expenditures associated with secondary or tertiary level care (Somanathan and Hafez, 2009). Furthermore, the bulk of NCD spending (60%) has been on pharmaceuticals with roughly 11% of the NCD budget going to curative care and 12% for preventative services (NHA Team et al., 2008). These expenditures should be based on evidence-based practice which shows, for example, that the following

interventions are actually cost-saving: glycaemic control in people with HbA1c>9%; blood pressure control in people with BP>160/95mmHG; and foot care in people with high risk of ulcers (World Bank, 2006). The Ministry of Health should thus prioritize these interventions and ensure that they are widely available at the local level.

The current method of budget allocation relies almost exclusively on input-based budgeting, meaning that health facilities are paid on the basis of line-item budgets and doctors are paid salaries – a system which provides few incentives to improve efficiency or quality of provision. Although indirect provision of health services through purchasing linked to performance would improve allocative efficiency, Tonga lacks the regulatory, administrative and evaluative capacity to manage such a system (Somanathan and Hafez, 2009).

The 2010 Public Expenditure Review recommended that allocative efficiency could be improved marginally by applying stricter criteria to the overseas medical referral programme. If the criteria were changed so that only patients with a good prognosis and aged under fifty were eligible, this would reduce the budgetary allocation by 50% to TOP 300 000 a year.

Whilst there is a spending bias towards Vaiola Hospital, Nuku'alofa and Tongatapu, this does not necessarily denote allocative inefficiency as over 70% of the country lives on Tongatapu and Vaiola operates as the national referral hospital. Improved geographic targeting using resource allocation formulas that reduce spending gaps across regions may however be useful, as may changing the allocation of spending across levels of care. The Government has made efforts to align health spending with identified health needs and strategic plans and is being supported through the Australia-Tonga Partnership for Development to increase the budget for preventive health care to 10% of the total public health operational budget by 2015. The Government will then need to focus on securing the maximum level of outputs in relation to the given inputs, i.e. improve technical efficiency.

7.5.2 Technical efficiency

Given that Tonga has one of the highest total and government levels of spending per capita on health in the East Asia and Pacific region and that increased fiscal space for health is unlikely, Tonga will need to make gains in technical efficiency in order to continue to deliver and

improve universal health coverage. The high dependence on development assistance to support the health budget also needs to be reviewed when considering the sustainability of programmes. Again, improving technical efficiency may assist in this quest for sustainability. It has been identified that efficiency gains could be made through the following.

- ***Invest more in primary and secondary prevention, especially in rural and remote areas.*** Strengthening and improving the quality of primary and secondary prevention, and primary health care in Tonga will increase both allocative and technical efficiency. Through early diagnosis and treatment, hospital admissions can in many cases be averted, delayed or shortened. As previously discussed, Tonga has a very high hospital admission rate but a relatively low outpatient contact rate due to the fact that lower-level health facilities are often bypassed in favour of hospitals. Improving the quality of primary care services, ensuring the appropriate implementation of the user fees system which can address some bypassing, and delivering services in a standardized manner (as described below) has been shown to positively influence health seeking behaviour in Tonga and other settings.
- ***Develop and implement a common national standard for primary health care.*** To maximize efficiency and quality, all health facilities in Tonga should follow a common guideline for best practice and cost-effective preventative, and curative primary health care. Through the Australia-Tonga Partnership for Development, the Australian Government has committed to assist the Government of Tonga to create these standards and to ensure that by 2015 all community-level facilities conform to these standards and that all communities receive standardized, high quality PHC (Government of Tonga and Government of Australia, 2009).
- ***Enforce referral mechanisms.*** Whilst improving the quality of services at the lower levels of care is likely to improve attendance rates, referral patterns can also be enforced through user fees and other forms of gatekeeping. Enforcement of the user fee policy may increase efficiency and free up valuable time of health workers through proper triage and case management. To achieve efficiency gains and to do so without undermining equity, greater investment to improve accessibility and quality of health service delivery is needed at these lower levels of the health system.
- ***Maximize the efficiency of curative inpatient care.*** Low bed occupancy rates, especially at the district hospitals, stem from the fact that the

hospitals were built to deal primarily with infectious diseases, and hence had a high number of beds and isolation wards. As infectious disease outbreaks are now comparatively rare in Tonga and most NCDs are managed outside of hospital inpatient settings, there should be ongoing review of the appropriateness of maintaining the current level and distribution of beds. The mix of inpatient, outpatient and community services must be optimized to deal with the current disease burden attributed largely to NCDs. The length of stay for key diseases and staff ratios should also be reviewed. Key efficiency indicators that can be measured in a systematic way should be identified (Ahio et al., 2010).

- ***Limit the amount of budget spent on salaries.*** The Review of Public Expenditure on Health recommends that medical salary costs be controlled to 60% of the total health budget so that essential operational health services can continue to be provided and improved (Ahio et al., 2010). Suggested options for controlling costs include reducing the use of planned overtime, using experienced nurses instead of doctors to deliver specific services, and outsourcing activities such as meal preparation, laundry services and maintenance work.
- ***Ensure that the possible introduction of social insurance and user fees does not undermine efficiency.*** The cost for collection and administration of user fees and health insurance for the formal sector must not outweigh the revenue received or deter people from accessing the health system. This will require careful monitoring of trends in patient attendance and significant administration of the new revenue-generating processes.
- ***Ensure that adequate maintenance is conducted on buildings and equipment*** to support improvements in the quality of care and medical efficiency and to reduce capital costs in the long term.

7.6 Transparency and accountability

7.6.1 Transparency

In terms of transparency in policy formation, Tonga has been praised and promoted as a case-study (WHO, 2005) for its intersectoral policy development of the National Strategy to Prevent and Control Noncommunicable Diseases (MoH, 2004). The development of this policy involved extensive stakeholder consultations with government departments, churches, NGOs, development agencies and international collaborators throughout all stages of the process including drafting,

reviewing and redrafting the policy until endorsement was achieved. A key factor to the success of the policy was the principle that the process of consultation was as important as the content in generating support and ownership. This model should be standard for other health policy developed in Tonga.

7.6.2 Transparency amongst donors

Within the Pacific in general, there have been calls for greater transparency amongst donor and development partners in terms of how they allocate and prioritize areas for funding. Countries are also calling for predictability in ongoing, multi-year support. Many of the PICTs have experience in SWApS and other donor coordination mechanisms and lessons learnt from their experiences would be useful to access.

7.6.3 Procurement

All ministries, departments and agencies of the Government of Tonga are required to undertake procurement in accordance with the Public Procurement Regulations (MoFNP, 2010c). The Government has a central Procurement Division and each approved ministry has an internal procurement unit which requests purchases through an Annual Procurement Plan. In most cases, and dependant on certain pre-established thresholds, all goods and services should be obtained through a public tendering process, using a Request for Quotation which is generally sent to a minimum of three suppliers. The final selection of a supplier must demonstrate value for money, or the lowest evaluated price decision and is subject to authorization by various delegates (e.g. CEO, Head of Department, Procurement Division) depending on the size of the purchase. In order to ensure a complete audit trail, all documentation in the procurement process must be filed and key information is entered into several databases (MoFNP, 2010c).

Pharmaceutical and medical supply procurement. The Procurement/ Registration Unit of the Ministry of Health's Central Pharmacy and Medical Supplies is responsible for managing the procurement of drugs and medical supplies from overseas. Each year they put out a Request for Quotation for the majority of the items required and other small items are procured directly from suppliers. Procurement is based on the approved Essential Drug List and Standard Supply List.

Capital works and equipment procurement. Under the Public Finance Management Act (Treasury Instructions) 2010 all ministries are required to maintain a Fixed Asset Register. The Treasury instructions require that all property, plant or equipment with a value in excess of TOP 500 be recorded in the Fixed Asset Register. The Ministry of Health maintains a Fixed Assets Register to keep track of the details of each asset, ensuring control and preventing misappropriation of programme assets. Treasury also instructs each Ministry to carry out an annual stock take of its physical assets as a management tool to ensure all physical assets are accounted for.

7.6.4 Accountability

Within the various ministries in the Tongan Government, the Ministry of Health is viewed as an exemplar in its capacity for planning and monitoring and evaluation of its work (Commonwealth Secretariat, 2011). Under more than ten years of donor support, particularly from the Australian Aid Program and the World Bank (see Box 6.1), the Ministry of Health has been a frontrunner in implementing innovative performance management and accountability systems. Examples of their accountability mechanisms include the Balanced Scorecard and the Executive Performance Appraisal System. The Balanced Scorecard measures actual performance in relation to the expected strategic outputs/outcomes. This is directly linked to the Executive Performance Appraisal system, including the performance of the Director of Health. These mechanisms are supported by a reporting system which ensures that the actual performance is measured, monitored and reported at all levels on a monthly and quarterly basis to ensure that targets are met. The use of Corporate Plans and Annual Health Reports also ensures a high level of accountability and transparency in reporting on the achievement of strategic goals and targets at the highest level.

Financial accountability. The Ministry of Health also displays a high degree of accountability in terms of financial reporting. Since 2001/2002 the Ministry has undertaken the system of National Health Accounts. Although the timeliness of these reports (three have been published to date, with the 2007/2008 final publication still pending), they have been very useful as an accountability and policy tool. The Accounts Section of the Ministry of Health also provides monthly expenditure reports to the Executive meetings, which allows line managers to manage their budget more effectively. In the Review of Public Expenditure on Health,

the Ministry's budget execution was rated "A" (budget execution of more than 90%), with an average variance of only 2% between the budgeted and actual spending across the years 2005 to 2009. This performance was well above the overall C grade given for all Ministries in Tonga and is attributed to the vast improvements in financial management made by the Ministry of Health under the Health Sector Strengthening Project (Ahio et al., 2010).

8 Conclusions

The Ministry of Health aims to provide universal health coverage, defined as affordable, accessible, high quality health care with protection from financial risk, to all citizens. Having achieved high levels of access to basic health care, low out-of-pocket payments and a relatively high level of equity in access and financing, the health system has been successful in achieving this goal, particularly in relation to communicable diseases and maternal and child health. To this end, the health system has served the country well, delivering good health outcomes compared with other low-middle income countries in terms of its fiscal context.

However, with Tonga's disease burden now dominated by NCDs and chronic conditions, the key priority for the health system is to re-orientate itself to focus on prevention and treatment of NCDs. Increasing the budget funnelled towards preventative health services and working to deliver cost-effective primary and secondary prevention strategies for NCDs will improve efficiency in health care over the long term and lower expenditures associated with secondary- and tertiary-level care. Organizational management needs to be strengthened and systematic and transparent processes established to ensure effective resourcing and provision of services in areas such as: improving NCD monitoring, evaluation and surveillance; the way in which specialities are filled through the Australian Aid Program's critical deficiencies fund; documentation of appropriate service provision in health centres; and further role delineation for health workers in regard to NCD treatment and management, in particular for the new cadre of NCD nurses.

The health sector must increase efficiency and look for alternate means of financing so that it can continue to strengthen institutional capacity and provide the required physical and human resources to effectively minimize the NCD epidemic and complete the unfinished MDG agenda. One of the few areas in which the health system may be able to increase fiscal space in the future is through maximizing both allocative and technical efficiency. In order to do this the scope, coverage and quality of services need to be further defined and monitored. A basic package

of services which should be provided by primary care facilities, district hospitals and Vaiola Hospital must be defined. This should then be complemented with further research and evaluation to determine which additional services provide the best value for money and the areas of greatest need where cost-effective interventions exist but are not currently being provided in Tonga (e.g. cancer, mental health, disability, contraception). In terms of quality and health-care effectiveness, despite the significant improvements that the Ministry of Health has made in terms of accountability and transparency under the HSSP and other programmes, the creation and implementation of an integrated quality in health-care programme is recommended.

9 Appendices

9.1 References

ABC Radio Australia. 2012. Tonga holds consultation to deal with dialysis problem (http://www.radioaustralia.net.au/pacific/radio/onairhighlights/tonga-holds-consultation-to-deal-with-dialysis-problem).

Ahio TA, Foliaki DS, et al. 2010. Review of Public Expenditure on Health, Kingdom of Tonga, Final Report September 2010. Government of Tonga and the Australian Agency for International Development.

AbouZahr, C. 2010. *Making sense of maternal mortality* Working Paper no 11. November Brisbane: Health Information System Knowledge Hub (http://www.uq.edu.au/hishub/wp11, accessed 20 November 2014).

'Aka'ola S, Evans L, et al. n.d. Health Sector Reform in Tonga, Improving Management in the Ministry of Health.

Asian Development Bank. 2004. Priorities of the People: Hardship in Tonga.

AusAID. 2009. Tonga Health Systems - Australian Support Framework Design, August 2009. Canberra: Australian Agency for International Development.

AusAID. 2010. Tonga Country Program Report, Pacific review of adviser positions funded by the Australian Aid Program.

AusAID, Tonga. 2011. Tonga Health Systems Support Program, Six month review July 25 - August 8, 2011. AusAID.

AusHealth International. 2002. Patient Satisfaction Survey - Vaiola Hospital - Final Report. Tonga Health Sector Planning & Management Project - Phase II. In fulfillment of Milestone, Document Detailing the Finding of a Patient Satisfaction Survey for Vaiola Hospital.

Brown RPC & Connell J. 2004. The migration of doctors and nurses from South Pacific Island Nations. Social Science & Medicine. 58**,** 2193–2210.

Brown RPC & Jimenez E. 2007. Estimating the Net Effects of Migration and Remittances on Poverty and Inequality, a Comparison of Fiji and Tonga.Wider Research Paper 2007/23 April (http://www.wider.unu.edu/publications/working-papers/research-papers/2007/en_GB/rp2007-23/, accessed 7th April 2015).

Carter KL, Hufanga S, et al. 2012a. Causes of death in Tonga: quality of certification and implications for statistics. Population Health Metrics 10:4.

Carter LK, Rao C, et al. 2012b. Mortality and cause-of-death reporting and analysis systems in seven Pacific Island countries. BMC Public Health. 12:436.

Central Intelligence Agency. 2012. News and Information: A Spotlight on World Obesity Rates (https://www.cia.gov/news-information/featured-story-archive/2012-featured-story-archive/obesity-according-to-the-world-factbook.html, accessed 21 November 2013).

Central Intelligence Agency. 2013a. The World Factbook, Field Listing: Hospital Bed Density (https://www.cia.gov/library/publications/the-world-factbook/fields/2227.html, accessed 21 November 2013).

Central Intelligence Agency. 2013b. The World Factbook: Tonga (https://www.cia.gov/library/publications/the-world-factbook/geos/tn.html, accessed 21 November 2013).

Commonwealth Secretariat. 2011. Donor-Government Aid Programme Partnership: case study, Tonga. Partnership for Development between Government of Australia and the Government of Tonga. Commonwealth Aid Effectiveness Workshop on Domestic and Mutual Accountability. London: Marlborough House.

Connell J. 2009. Bittersweet home? The return migration of health workers in Polynesia. In: Conway D and Potter R, editors. Return migration of the next generations: twenty-first century transnational mobility. Ashgate: Aldershot.

Davidson J. 2009. Mapping human resources for health: Profiles from 15 Pacific-Island countries. Human Resources for Health Knowledge Hub. Sydney, Australia: University of NSW.

D'este G, MacGeorge R & Lomu M. 2010. Tonga National Infrastructure Investment Plan, October 2010. Pacific Region Infrastructure Facility.

Doran C. 2003. Economic impact assessment of non-communicable diseases on hospital resources in Tonga, Vanuatu and Kiribati. In: AusAID, SPC, editors. Pacific Action for Health Project Pacific.

Fiji School of Medicine. 2011. Situational Analysis of Specialised Clinical Services in Kingdom of Tonga - 2010. Strengthening Specialised Clinical Services Program. Suva, Fiji: College of Medicine, Nursing and Health Sciences.

Foliaki S, Best D, et al. 2011. Cancer Incidence In Four Pacific Countries: Tonga, Fiji Islands, Cook Islands and Niue. Pacific Health Dialog. 17(1):21–32.

Foliaki S, Jeffreys M & Pearce N. 2008. Tonga's Health 2006. Wellington: Centre for Public Health Research.

Fonua P. 2013. Tonga Parliament Unanimously Passes Record Budget. Matangi Tonga Magazine.

Fusitu'a P. 2000. My Island Homes: Tonga, Migration and Identity [dissertation]. University of Sydney.

Government of Tonga & Government of Australia. 2009. Schedule to the Partnership for Development between the Government of Tonga and the Government of Australia. Implementation Strategy Priority Outcome 2: Improved Health.

Government of Tonga 2011 Report of the Minister for Health for the year 2010 Nuku-alofa: Government of Tonga

Government of Tonga & United Nations. 2013. Tonga MDG Acceleration Framework, Reducing the Incidence of Non-Communicable Diseases in Tonga. United Nations System in the Pacific Islands.

Habitat for Humanity. 2009. Poverty housing in the developing nations of the Pacific Islands: An analysis of housing for poor and low-income

households in Cook Islands, Fiji, Kiribati, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Vanuatu.

Hufanga, S. 2013. Tonga HIT Update Presentation provided at Stakeholder Meeting on Tonga HIT 28 May 2013. Nuku'alofa.

Hufanga S, Carter KL, et al. 2012. Mortality trends in Tonga: an assessment based on a synthesis of local data. Population Health Metrics. 10.

Human Resources for Health Hub. 2009. Mapping Human Resources for Health Profile from 15 Pacific Island Countries : Report tp Pacific Human Resource for Health Alliance April 2009 (http://www.sphch.med.unsw.edu.au/SPHCMWeb.mnsf/page/HRHHub , accessed 7 April 2015).

Index Mundi. 2013. Outpatient visits per capita (http://www.indexmundi.com/facts/indicators/SH.VST.OUTP/compare?country=hk#country=au:fj:hk:nz:ws:sb:to:vu, accessed 8 September 2013).

Institute for Health Metrics and Evaluation. 2013. GBD Profile: Tonga. Seattle.

ITU. 2012. Tonga Profile (Latest data available: 2012).

JICA. 2010. Country Gender Profile: The Kingdom of Tonga. Japan International Cooperation Agency.

Kingdom of Tonga. 1988. Vaccination Act, 1988 Revised Edition. In: Government of Tonga, editor. Act 12 of 1909, 13 of 1988. Nuku'alofa.

Kingdom of Tonga. 2001a. Health Practitioners Review Act 2001: No. 7 of 2001. Nuku'alofa.

Kingdom of Tonga. 2001b. Medical and Dental Practice Act 2001. Nuku'alofa.

Kingdom of Tonga. 2001c. Mental Health Act. Nuku'alofa.

Kingdom of Tonga. 2002. The Public Service Act. No. 34 of 2002. Nuku'alofa.

Kingdom of Tonga. 2006. Kingdom of Tonga Strategic Development Plan 8 2006/07–2008/09. Looking to the future, building on the past. Nuku'alofa.

Kingdom of Tonga. 2007a. Emergency Management Act 2007. Act No. 14 of 2007. Nuku'alofa.

Kingdom of Tonga. 2007b. Health Promotion Foundation Act 2007. In: Government of Tonga, editor. Act No. 2 of 2007. Nuku'alofa.

Kingdom of Tonga. 2010a. Excise Tax (Amendment) Order 2010. Order 1. Nuku'alofa.

Kingdom of Tonga. 2010b. Joint National Action Plan on Climate Change Adaptation and Disaster Risk Management 2010–2015. Nuku'alofa: Ministry of Environment and Climate Change, National Emergency Management Office.

Kingdom of Tonga. 2011. Excise Tax (Amendment) (No.2) Order 2011. Order 1. Nuku'alofa.

Kupu S. 2006. National Influenza Pandemic Preparedness and Response Plan. Nuku'alofa.

Laboratory Services. 2013. Standardized Ministry of Health Annual Report. Ministry of Health. Nuku'alofa

Legislative Assembly of Tonga. 1991. Health Services Act. Nuku'alofa: Government of Tonga. Nuku'alofa.

Legislative Assembly of Tonga. n.d. Rules of Procedure of the Legislative Assembly of Tonga. Nuku'alofa.

Mehan T. 2013. Hospital Efficiency Review (Tonga). Canberra: Health Resource Facility for Australia's Aid Program.

MoFNP. 2009. Budget Statement for Year Ending 30th June 2010. Nuku'alofa.

MoFNP. 2010a. 2nd National Millennium Development Goals Report, Tonga: Status and Progress between 1990–2010. Nuku'alofa.

MoFNP. 2010b. Budget Statement for Year Ending 30th June 2011. Budget Paper No 1: Review of the Tongan Economy & Outlook 2010/11. Nuku'alofa.

MoFNP. 2010c. Procurement Publications: Steps in a Procurement Process. Nuku'alofa.

MoFNP. 2011a. Budget Statement 2011/2012. Nuku'alofa.

MoFNP. 2011b. Tonga Strategic Development Framework (TSDF) 2011–2014. Nuku'alofa.

MoFNP. 2012. Budget Statement, 2012/2013. Nuku'alofa.

MoFNP. 2013. Budget Statement 2013/2014, Continuing to Create Opportunities by Building on Inclusive Sustainable Growth. Nuku'alofa.

MoH. 2004. National Strategy to Prevent and Control NCDs (2004–2009). Nuku'alofa.

MoH. 2007a. Report of the Minister for Health for the year 2006. Nuku'alofa.

MoH. 2007b. Standard Treatment Guidelines and Essential Drugs List. Nuku'alofa.

MoH. 2008. Report of the Minister of Health for the year 2008. Nuku'alofa.

MoH. 2009. National Strategic Plan for HIV & STIs: 2009–2013. Nuku'alofa.

MoH. 2010a. Hala Fononga, Ki Ha Tonga Mo'ui Lelei. Path to Good Health. Tonga National Strategy to Prevent and Control Non Communicable Diseases (2010–2015). Nuku'alofa.

MoH. 2010b. Report of the Minister of Health for the year 2010. Nuku'alofa.

MoH. 2012a. Health Centre Quarterly Report. Nuku'alofa.

MoH. 2012b. Tongan Registered List of Medicinal Drugs May 2012. Nuku'alofa.

MoH. 2013a. Corporate Plan 2013/14–2015/16. Nuku'alofa.

MoH. 2013b. Report of the Minister for Health for the financial year 2011/2012.

MoH. 2013c. Tongan Registered List of Medicinal Drugs July 2013 Supplementary List. Nuku'alofa.

MoH & SPC. 2008. Second Generation HIV Surveillance in Antenatal Clinic Attendees and Youth, Tonga, 2008.

MoH & WHO. 2012. STEPS chronic disease risk factor surveillance (2004), Tonga. Suva, Fiji.

MoH & WPRO. 2013. WHO STEPS Chronic Disease Risk Factor Surveillance Data Book for Tonga 2011. Ministry of Health and the WHO Western Pacific Regional Office.

National Disaster Management Office. 2011. National Disaster Management Plan and Emergency Procedures. Nuku'alofa: Ministry of Works.

Negin J. 2008. Australia and New Zealand's contribution to Pacific Island health worker brain drain. Australian and New Zealand Journal of Public Health. 32**,** 507–511.

NHA Team, NHA Steering Committee & Azzam O. 2004. Tonga National Health Accounts 2001/2002. Nuku'alofa: Ministry of Health.

NHA Team, NHA Steering Committee & Azzam O. 2006. The Tonga National Health Accounts FY 2003/2004. Nuku'alofa: Ministry of Health.

NHA Team, NHA Steering Committee & Azzam O. 2008. The Tonga National Health Accounts FY 2005/2006. Nuku'alofa: Ministry of Health.

NSW Health. 2000. Framework Managing the Quality of Health Service in New South Wales.

OECD/World Health Organization. 2012. Health at a Glance: Asia/Pacific 2012. OECD Publishing.

Pacific Health Information Network. 2012. Regional Health Information Systems Strategic Plan 2012–2017.

Pacific Islands Forum Secretariat. 2012. Kingdom of Tonga Forum Compact Peer Review Report. Suva, Fiji.

Parsons C. 1985. Healing Practices in the South Pacific. Honolulu: University of Hawaii.

Percival T & Stowers L. 2011. Functional Health Information for Child Health in the Pacific. The Pacific Child Health Indicator Project for Samoa and Tonga.

Poullier J-P, Hernandez P & Kawabata K. 2002. National Health Accounts: concepts, data sources and methodology. Geneva: WHO.

Pretorius C. 2013. Tonga: Assessment of the Public Finance Management System in the Health Sector. Draft Final Report. Adam Smith International.

Prime Minister's Office. 2013. Tonga demonstrated leadership in Pacific initiatives to achieve MDGs.

Revenue Services. 2013. New Duty and Excise Tax Rates to Encourage Healthy Living Nuku'alofa (http://www.revenue.gov.to/Article.aspx?UsePopup=&Mode=1&ID=769, accessed 20 December 2013).

Seckeler MD & Hoke TR. 2011. The worldwide epidemiology of acute rheumatic fever and rheumatic heart disease. Clinical Epidemiology. 3, 67–84.

Soakai S. 2006. The experience of health sector reform in Tonga. Papua New Guinea Medical Journal. Sep-Dec, 104–107.

Somanathan A & Hafez R. 2009. Financing Options for the Health Sector in Tonga. Washington D.C.: World Bank.

SPC. 2013. HIV surveillance in Pacific Island countries and territories: 2012 report. Noumea: Secretaritat of the Pacific Community, Surveillance and Operational Research Team; Research, Evidence and Information Programme; Public Health Division.

Statistics Department Tonga. 2008. Tonga 2006 Census of Population and Housing. Nuku'alofa: Government of Tonga.

Statistics Department Tonga. 2010. Household Income and Expenditure Survey 2009. Series No. SDT. 46–02. Nuku'alofa: Government of Tonga.

Statistics Department Tonga. 2012. Statistical Bulletin on International Arrivals, Departures and Migration 2011. Nuku'alofa: Government of Tonga.

Statistics Department Tonga. 2013. Tonga 2011 Census of Population and Housing Volume 1: Basic Tables and Administrative Report. Nuku'alofa: Government of Tonga.

Tandon A & Cashin C. 2010. Assessing Public Expenditure on Health From a Fiscal Space Perspective. Health, Nutrition and Population (HNP) Discussion Paper. Washington (DC): World Bank.

Taylor D, Tonga Red Cross Society, Daction & ʻOfa Tui ʻAmanaki Centre. 2006. The Tonga National Disability Identification Survey 2006. Nuku'alofa.

Tonga Department of Statistics and Tonga Ministry of Health, SPC & UNFPA. 2014. Tonga Demographic and Health Survey, 2012: Final Report.

Tongan Laws. In: Pacific Islands Legal Information Institute/PacLII Databases [website]. (http://www.paclii.org/databases.html#TO, accessed 7 April 2015).

Transparency International. 2013. Corruption and Anti-Corruption in Tonga (http://www.transparency.org/country#TON_DataResearch, accessed January 2014).

Tu'itahi K. 2008. A new vision for the health sector in Tonga: change and capacity development strategies. Mandaluyong City: Asian Development Bank.

UN. n.d. Tonga Abortion Policy. Population Policy Data Bank. Department of Economic and Social Affairs.

UN Office for the Coordination Of Humanitarian Affairs. 2010. Inter-Agency Continency Planning Workshop for Humanitarian Assistance in the Kingdom of Tonga, Nuku'alofa, Tonga, 13–16 September 2010.

UN Women. 2013. Law for women's protection passes with unanimous support in Tonga (http://www.unwomen.org/en/news/stories/2013/9/family-protection-bill-tonga, accessed 20 December 2013).

UNDP. 2013. Human Development Report 2013, The Rise of the South: Human Progress in a Diverse World [Online]. New York: United Nations Development Programme.

UNICEF. 2012. Country Profile, Tonga: Maternal, Newborn & Child Survival. UNICEF Statistics and Monitoring Section/Policy and Practice.

WB. 2010. Implementation completion and results report (IDA-3814) on a credit in the amount of SDR 8.0 million (US$10.94 million equivalent) to the Kingdom of Tonga for a Health Sector Support Project. Washington (DC).

WB. 2012a. The Economic Costs of Non-Communicable Diseases in the Pacific Islands. A Rapid Stocktake of the situation in Samoa, Tonga and Vanuatu. Washington (DC).

WB. 2012b. World Development Indicators 2012. Washington (DC).

WB. 2013a. Trading Economics: Tonga World Bank Data (http://www.tradingeconomics.com/tonga/indicators-wb, accessed 21 November 2013).

WB. 2013b. World Development Indicators Databank, Tonga.

WB. 2014a. Data (http://data.worldbank.org/?display=graph).

WB. 2014b. World DataBank. Washington (DC) (http://databank.worldbank.org/data/home.aspx, accessed 12 July 2013).

WHO. 2005. Part Four - Taking action: essential steps for success; Success factors. Spotlight: Tonga. In: WHO Chronic Diseases and Health Promotion Division, editor. Preventing chronic diseases: a vital investment. WHO global report. Geneva.

WHO. 2006. The World Health Report 2006: Working together for health. Geneva.

WHO. 2010. Workload Indicators of Staffing Need (WISN) User's manual. Geneva.

WHO. 2011. Tonga NCD Country Profile, 2011.

WHO. 2012. Human Resources for health: Action framework for the Western Pacific Region (2011–2015). Geneva.

WHO. 2013a. Certification scheme on the quality of pharmaceutical products moving in international commerce. Geneva [Online, accessed 20 December 2013].

WHO. 2013b. Global Health Observatory Data Repository (http://apps.who.int/gho/data/node.main.A1444?lang=en, accessed 21 November 2013).

WHO. 2014. Global Health Expenditure Database. World Health Organization.

WHO. n.d. Stepwise Framework for Action (http://www.who.int/gard/publications/Stepwise%20framework.pdf, accessed 21 November 2013).

WHO & MOH. 2012. Health Service Delivery Profile, Kingdom of Tonga 2012.

WHO & UNSW HRH HUB. 2014. Human resources for health country profiles: Tonga. World Health Organization Western Pacific Regional Office, University of NSW Human Resources for Health Knowledge Hub.

World Atlas. 2013. Worldatlas - explore your world...Tonga (http://www.worldatlas.com/webimage/countrys/oceania/to.htm, accessed 21 June 2013).

World Bank. 2006. Disease Control Priorities in Developing Countries. Washington (DC).

World Bank. 2010. Tonga - Health Sector Support Project. Implementation Completion and Results Report. Washington (DC).

World Lung Foundation & American Cancer Society. 2011 (http://www.tobaccoatlas.org/harm/deaths, accessed 20 November 2013).

WPRO. 2002. Regional Strategy for Traditional Medicine in the Western Pacific. Manila.

WPRO. 2003. Tonga Commitment to Promote Healthy Lifestyles and Supportive Environment. Manila.

WPRO. 2007. Meeting Report: Meeting on Suicide Prevention in the Western Pacific Region Manila, Philippines 15–19 August 2005. Manila .

WPRO. 2009. Tonga eHealth Profile 2009. Manila.

WPRO. 2011. Country Health Information Profile: Tonga. Geneva: WHO Western Pacific Regional Office.

WPRO. 2013a. Tenth Pacific Health Ministers Meeting, Health Workforce Development in the Pacific (Apia, Samoa 2–4 July 2013). Manila.

WPRO. 2013b. Tenth Pacific Health Ministers Meeting, Towards Healthy Islands: Pacific Mental Health Response. Manila.

9.2 Useful web sites

Ministry of Health: http://www.health.gov.to/homepage

Ministry of Finance and National Planning: http://www.finance.gov.to/

Tonga Department of Statistics: http://www.spc.int/prism/tonga/

World Health Organization Tonga Country Page: http://www.who.int/countries/ton/en/

WHO Western Pacific Regional Office, Tonga Country Page: http://www.wpro.who.int/countries/ton/en/

World Bank Data: Tonga: http://data.worldbank.org/country/tonga

Australian Department of Foreign Affairs and Trade (DFAT), including information from the former Australian Agency of International Development (AusAID): http://aid.dfat.gov.au/countries/pacific/tonga/Pages/home.aspx

New Zealand Aid Programme, Tonga: http://www.aid.govt.nz/where-we-work/pacific/tonga

9.3 HiT methodology and production process

HiT reports are produced by country experts in collaboration with an external editor and the Secretariat of the Asia Pacific Observatory based in the WHO Regional Office for the Western Pacific in Manila, Philippines. Reports are based on a template developed by the European Observatory on Health Systems and Policies that, revised periodically, provides detailed guidelines and specific questions, definitions, suggestions for data sources and examples needed to compile reviews. While the template offers a comprehensive set of questions, it is intended to be used in a flexible way to allow authors and editors to adapt it to their particular national context. The template has been adapted for use in the Asia Pacific region and is available online at http://www.wpro.who.int/asia_pacific_observatory/hits/template/en.

Authors draw on multiple data sources for the compilation of HiT reports, ranging from national statistics, national and regional policy documents to published literature. Data are drawn from information collected by national statistical bureaux and health ministries. Furthermore, international data sources may be incorporated, such as the World Development Indicators of the World Bank.

In addition to the information and data provided by country experts, WHO supplies quantitative data in the form of a set of standard comparative figures for each country, drawing on the Western Pacific Country Health Information Profiles (CHIPs) and the WHO Statistical Information System (WHOSIS). HiT report authors are encouraged to discuss the data in the text in detail, including the standard figures prepared by the Observatory staff, especially if there are concerns about discrepancies between the data available from different sources.

The quality of HiT reports is of real importance since they inform policy-making and meta-analysis. Reports are subject to wide consultation throughout the writing and editing process, which involves multiple iterations. They are then subject to the following.

- A rigorous review process consisting of three stages. Initially, the text of the HiT report is checked, reviewed and approved by the Asia Pacific Observatory Secretariat. It is then sent for review to at least three independent experts, and their comments and amendments are incorporated into the text, and modifications are made accordingly. The text is then submitted to the relevant ministry of health, or appropriate authority, and policy-makers within those bodies to check for factual errors.
- There are further efforts to ensure quality while the report is finalized that focus on copy-editing and proofreading.
- HiTs are disseminated (hard copies, electronic publication, translations and launches). The editor supports the authors throughout the production process and, in close consultation with the authors, ensures that all stages of the process are taken forward as effectively as possible.

9.4 About the authors

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The Asia Pacific Observatory on Health Systems and Policies (the APO) is a collaborative partnership of interested governments, international agencies, foundations, and researchers that promotes evidence-informed health systems policy regionally and in all countries in the Asia Pacific region. The APO collaboratively identifies priority health system issues across the Asia Pacific region; develops and synthesizes relevant research to support and inform countries' evidence-based policy development; and builds country and regional health systems research and evidence-informed policy capacity.

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