National Health Plan 2021 - 2030

Volume 2A Situation Analysis (2011-2020)

Government of Papua New Guinea

JUNE 2021

BUILDING THE HEALTH OF OUR PEOPLE
LEAVING NO-ONE BEHIND IS EVERYBODY'S BUSINESS

Contents

FOREWORD

The National Department of Health (NDoH) is the steward of the PNG health system and is responsible for planning, setting standards, reporting on health service delivery, and monitoring and evaluation of performance against set targets. It is critical that Papua New Guinea's health sector has timely and accurate data to monitor its performance in the provinces, districts and communities. The information generated provides valuable guidance so that policy and program implementation can be continually improved to achieve better services and health outcomes.

This document contains data and information that formed the basis of the Position Paper and underpins the strategies of the NHP 2021-2030 outlined in Volume 1a. It is divided into two parts namely – National Health Plan Situational Analysis 2011-2020 (Volume 2a) and Provincial and District Profiles, 2019 (Volume 2b). The goal of this document is to provide stakeholders including Provincial Health Authorities (PHAs), relevant government agencies and partners detailed information on the current status of health and disease including structural and operational elements of the health system at national (Vol 2a) and subnational levels (Vol 2b).

There are a number of positives of the Health Program since the NHP 2011-2020 was commissioned, but there are still many challenges to overcome. It is observed that children are better nourished and more likely to survive the threatening environment of their early years and the community is living longer. Conversely, it is evident that many districts are struggling to meet national targets and provide minimum service to its people. There is great disparity between district performances reflecting the differences in geography, facility availability, staffing and funding that affects overall performance of provinces and their populations. I appeal to everyone including our Regional and Open Members of Parliament to focus on these health indicators and provide support to the PHAs in their respective provinces to improve their provincial performance. It will also empower District Development Authorities (DDAs) make evidence based decisions for targeted interventions in their health care systems. This information will be the everyday tool for management and production as we implement the National Health Plan 2021-2030.

I must emphasize that the Health Sector can only address 30% of the health problems, while 70% remains outside of the sector (leadership, infrastructure and law & order are not within the health domain). The National Health Plan 2021 – 2030 emphasizes "Leaving No One Behind is Everybody's Business" as the theme to address the poor health coverage in provinces and districts. I urge leaders at all levels, stakeholders and development partners to take positive approaches and innovation as allies with Health to improve the Health Coverage for their people in their respective districts and provinces.

I appeal to all to take serious note of the current national health and disease status as shown by your respective provincial and district health profiles as a basis and challenge to make overall improvement in health coverage in our country within the resources available to us to secure the future of every Papua New Guinean in line with our NHP 2021-2030 priorities.

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Honorable Mr. Jelta Wong, MP
Minister of Health & HIV/AIDS

ACKNOWLEDGEMENTS

The National Health Plan Situational Analysis 2011-2020 and Provincial and District Health Profiles 2019 form the basis for the Position Paper that underpins the strategies of the National Health Plan 2021-2030.

The Situational Analysis was informed by a number of brief papers developed by "Thematic Working Groups" across programmatic and systematic elements of the health sector. The Provincial and District profiles were compiled by staff of the Performance Monitoring and Research, and Information Communication Technology (ICT) Branches at the National Department of Health (NDoH), guided by technical experts.

As Secretary for Health, I commend all those who have been involved in producing this document. It is the result of collaboration between the National Department of Health (NDoH), Provincial Health Authorities (PHAs), districts, health facilities, stakeholders and technical experts in Monitoring and Evaluation.

Firstly, I must acknowledge the tireless efforts of health facility staff who routinely submit their monthly activity reports through the National Health Information System (eNHIS). Provincial Health Information Officers (PHIOs) are also acknowledged for compiling these data and submitting them to National Department of Health.

I also recognize the efforts of the Performance Monitoring & Research and Information Communication Technology (ICT) Branches at NDoH who consolidated this information and made it available for us to use as basis for the National Health Plan (NHP) 2021-2030. Special thanks to the consultants who assisted the department staff to put this document together.

I encourage all to use the information in this document as the basis to improve on our health coverage as we embark on implementing the NHP.

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Dr. Osborne Liko
Secretary for Health

INTRODUCTION

This document provides the current status of health and disease in Papua New Guinea (PNG) both at the national level and with detailed analysis at provincial and district level. This information in this document was used to formulate a position paper that underpins the strategies of the NHP 2021-2030.

The document is divided into two volumes. Volume 2a provides several snap shots including the profile of health and disease, experience of implementation of the current and prior health plans and an analysis of the structural and operational elements of the health system. In addition, a position paper based on the information in the SA and a summary of key findings from the PNG Demographic and Health Survey (DHS) 2016-2018 are attached to Volume 2a. Volume 2b provides a snap shot of the health sector in 2019 based on 2018 data. It gives a detailed analysis of provincial and district profiles on key performance indicators. Projections for key Provincial and District Populations (2020-2030) are included in Volume 2b.

Volume 2a is presented as follows:

Chapter 1: Foundations. A brief identification of the context of health in PNG. This chapter includes an outline of the population, showing growth rates and a brief introduction to inequitable situation of health status by geography and some population groups. The high-level policy context is provided.

Chapter 2: Assessment against the objectives of the National Health Plan 2011 – 2020. The findings of the midterm review of the National Health Plan are presented, and further update of progress against the Key Result Areas of the Plan. The revised priorities following the mid-term review are provided, with performance against these priorities listed within an appendix to this chapter. A number of technical working groups have prepared a series of reports, the detail of which is included as another appendix.

Chapter 3: Epidemiological profile 2019. The chapter provides a series of "snapshots" of the current situation of health. These are presented in three sections: an overview of morbidity and mortality; consideration of specific life stages; specific diseases of interest. Each of these are presented in a short format (about 2 pages) providing a concise synopsis as to why this is an issue of concern.

Chapter 4: Health systems profile. Critical to the achievement of health outcomes and servicing community needs is to ensure that the 'building blocks' of the health system are in place. A short description is provided for Governance and Leadership; resources (staff, supply and financing); facilities and clinical governance; support services (ICT) and development (research).

Attachments. Attached to these analyses are **(a) "Position Paper**", the function of which is to set out the directions of the National Health Plan 2021 – 2030, and serve as the basis of consultations; (b) **summary of the 2016 -18 Demographic and Health Surveillance.**

Volume 2b is set out as follows

National Overview – Provides a national overview of health systems and performance indicators in line with the core performance indicators of the NHP 2011-2020

Provincial and District Profiles – The provincial and district profiles are presented in regions starting with provinces and districts in the **Southern Region** (Western, Gulf, Central, NCD, Milne Bay and Oro provinces and their districts), followed by provinces and districts in the **Momase Region** (Morobe, Madang, East Sepik, West Sepik), the **Highlands Region** (Enga, Hela, Southern Highlands, western

Highlands, Jiwaka, Chimbu and Eastern Highlands) and the **New Guinea Islands Region** (Manus, New Ireland, East New Britain, West New Britain, Autonomous Region of Bougainville).

Attachment

Provincial and District Populations Projects for 2020 – 2030, including populations disaggregated for males and females, under 1-year olds, under 5-year-olds and for ages 1 to 4 years.

Papua New Guinea National Health Plan

Situational Analysis, 2019

SECTION 1: FOUNDATIONS

1. Introduction

Key points:

- This Situational Analysis (SA) describes the current state of health and health systems in Papua New Guinea, and the experience of implements of the National Health Plan 2011 – 2020. it will hence inform the Position Paper that underpins the strategies of the National Health Plan 2021 – 2030;
- The SA is limited by incomplete availability and variable quality of information, with further revision expected.

Purpose

The National Health Plan is the underpinning strategy that provides the direction of the health sector in meeting the aspirations of the broader Government of Papua New Guinea to build a healthy and prosperous community.

This document serves to provide the basis upon which decisions on strategy and policy can be made. There are two aspect to this basis:

- Understanding to the best extent possible, what is the current state of health and what are the priorities that the country should expect to address; and
- An awareness of the interventions that are founded upon evidence and experience that will enable achievement of these priorities.

Hence, this analysis examines the achievements and challenges of the National Health Plan 2011 – 2020, drawing the lessons learned. Going forward, the analysis will provide baseline data for the future monitoring of the National Health Plan 2021 – 2030.

The most immediate purpose of this draft is to inform the development of a "Position Paper", the discussion piece that will be the stimulus for consultation to develop the National Health Plan 2021 – 2030.

2. Methods and limitations

Process

The Situational Analysis (SA) has been developed through a desk activity in mid-2019. It has been informed through a number of brief papers developed by "Thematic Working Groups" across programmatic and systematic elements of the health sector. These are annexed to this report. They are of variable quality and completeness. The SA has not replicated the findings of these in full, but rather drawn on the themes and conclusions, and at times specific data or statements of fact and observation.

Data have been sourced where it is available in a quantifiable form. These sources have included accessible databases within the health sector and published and unpublished reports. A key limitation of this report is that there are many gaps in data availability, with many technical programs and corporate centres unable to provide current or quality-reviewed data.

There has been brief national level consultation, chiefly to gain understanding of the stakeholder needs of the SA. The SA has been developed from a national perspective, cognisant, however, that the future health sector is firmly focussed upon a sub-national strategic focus. Where possible, findings are considered through the lens of the province and district. The consultation phase will deepen this perspective within the SA. Along with further information forthcoming from other stakeholders,

finalisation of the SA will follow the consultation phase of the National Health Plan 2021 – 2030. The first draft of the National Health Plan 2021 – 2030 (NHP) is scheduled at this same time. Similarly, other stakeholders will wish to build the basis of the information presented herein.

The analysis and conclusions drawn are built upon evidence wherever possible. However, given the concern about completeness and quality of the information gathered in a number of programs where evidence is not available, hypotheses are put forward with accompanying rationale. These should be considered as a stimulus for discussion, an enabler of policy debate.

Inclusions

The scene is set with an overview of population and identification of population groups and geographical localities that appear disadvantaged in meeting the hopes of the National Policy. A list of stakeholders is presented and explored as to how these contribute to the health of the nation, and what might be gained from an understanding of the role of each and the relationships that may be developed. The underpinning policy platforms are presented.

A presentation and analysis of the National Health Plan 2011 – 2020 is presented, drawing out the strengths and weaknesses of the Plan and lessons learned that will be applied in future PNG health sector planning. A profile of health and the state of systems in PNG that enable health and service delivery is given.

3. Stakeholders

Health is a fundamental right of all persons. Efforts to maximise health and prevent ill-health is exercised by everyone, or by those that have responsibility for them. The health sector endeavours to meet this responsibility in a manner that is humane, characterised by the best efforts and the best knowledge to support health. The complex web of people, the places they live, the needs they have, and the capacity to respond with the right skills, goods and services involves many. A detailed analysis of these players has not been undertaken as part of this description of the current situation. The sphere of stakeholders includes the community, the social institutions of society, the Government and its service agencies, both of the health sector and of other sectors and its central agencies, the academic sector that shares knowledge and explores intervention, and the agents of support – development partners, non-government organisations and industry.

The different stakeholders will view the position of the health sector and its strategy with different perspectives, seeing it framed through a different light. The attached appendix shapes a model on how this may be considered at a broad level, in understanding the influence and the differentials of power and contribution that each stakeholder may have. Internally, whether in a specific service or in a specific program, the relationships that we have will work in a way to take us toward a shared end. Appreciating these relationships enables a positive environment to deliver the health care that the community deserves.

Figure 1.1 Stakeholder matrix

HIGH POWER	SATISFY	MANAGE
	Opinion formers: keep them aware of what is happening and review your analysis of their position regularly *for example:* NAC, central agencies, professional bodies and societies, other govt/SOEs DDA, Members of Parliament	Key stakeholders who should be fully engaged through communication and consultation *for example:* NDOH, PHA, public hospitals, health industrial unions, WHO, DPs, health regulatory bodies; Christian Health Services, Catholic health services, other faith based agencies
LOW POWER	MONITOR	INFORM
	Contributors: two way dialogue will enable shaping of the service and approach *for example:* PNGIMR, private health service practitioners, extractive and agricultural industries, education institutions, NGOs	The beneficiaries: an understanding of need guides development and implementation *for example:* General public (consumers)
	LOW IMPACT	HIGH IMPACT

4. Population and Equity considerations

Key points

- Current population in PNG is estimated at 9.1 Million people. By 2030, there will be 11.3 – 12.4 million people;
- Early childhood mortality in PNG continues to steadily decrease, and life expectancy increase. These improvements are not even, with wide disparity depending on where one lives;
- The opportunities for health are not uniform across the country, with a spectrum of 17 years difference in life expectancy across provinces. Rural populations continue to have poorer health status than their urban peers, although growing concern around urban settlement populations exists;
- These differences in health status are impacted by access to education and health services, and by household income;
- Disability is likely to affect over a million people in PNG; People living with disability, and their families, experience poorer levels of health, lower levels of education, greater levels of dependency and are more impoverished.
- Gender continues to play a hand in the experience of health, where women disproportionately bear the burden of family and sexual violence, sexually transmitted infection, nutritional concerns and anaemia, and barriers to health service access This leads to poor reproductive health outcomes.

Population estimates and growth rates are premised upon the revisions of the 2011 National Census data agreed between Department of National Planning and Monitoring and National Department of Health (September 2018)[1], where the 2011 population was revised based upon growth rates from the

[1] Where growth rates in PNG have traditionally been calculated by taking the difference between two counts and average the growth over each year (inter-censal average growth rate), this alternative has taken the vital statistical data (births, deaths and migration) available through the censuses and surveys to determine an alternative growth rate. Adjusted Growth Rate = CBR – CDR +/- NMR.

2000 Census, and utilising the birth, death and migration rates of the 2000 and 2011 censuses and the 2006 DHS. These same growth rates have been applied to project through to 2020. In 2020, it is estimated that there are 9,106,354 persons living in Papua New Guinea. If the same population growth (nationally = 2.63%) is to continue, by 2030, there will be 11.81 million people. Figure 1.2 models a higher growth (3.13%) of 12.39 million people and lower growth (2.13%) scenario of 11.25 million people[2].

Figure 1.2: Population projections

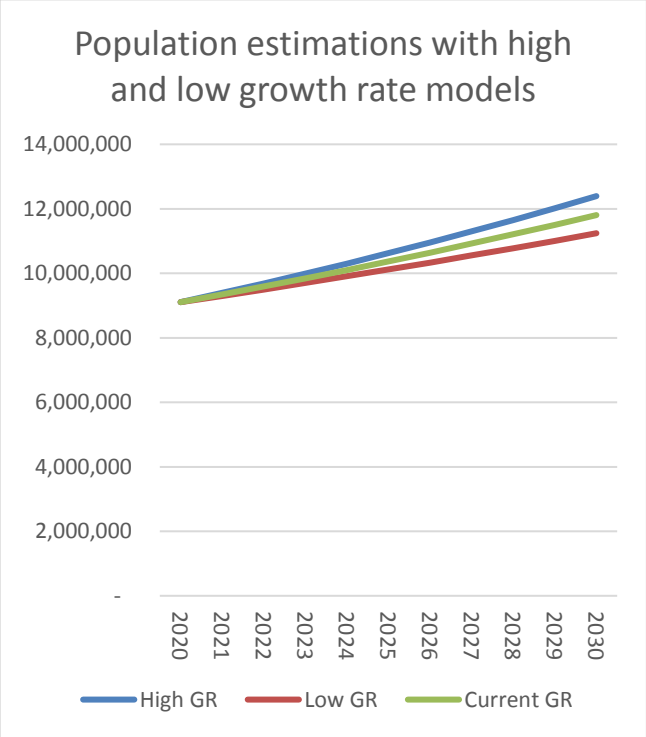
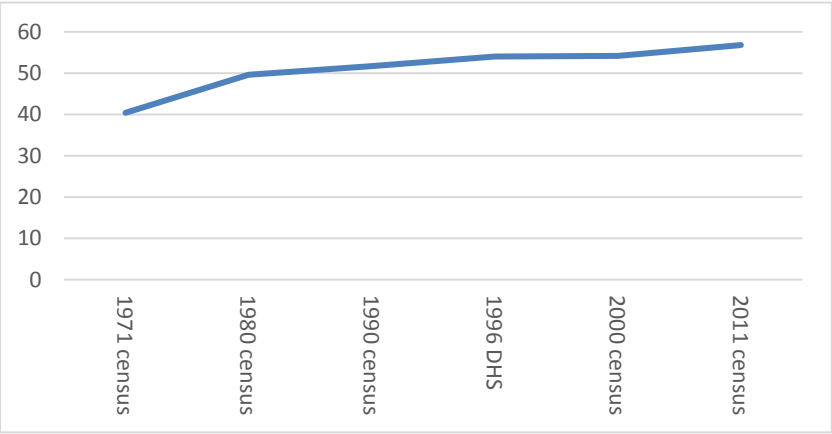


Figure 1.4: Demographic projections

Assumes continued 2.63% Growth Rate	2020	2030
Total	9,106,354	11,805,593
Expected births	313,191	406,025
Under 1 year	298,575	387,076
Under 5 years	1,250,584	1,621,273
Adolescents 12 – 24 yrs	2,276,589	2,951.398
Women of reproductive age (15 – 49)	2,234,045	2,896,244

Figure 1.3: Life Expectancy (at Birth) PNG 1971 - 2011



Overall, mortality indices in PNG have improved, with steady and sustained increases in life expectancy and decreases in infant and child mortality. As outlined below, however, these improvements still leave some populations behind.

[2] The full set of revised population data is available from PMRB

Figure 1.5: Infant and Under 5 yrs. Mortality Rate PNG 1971 - 2016

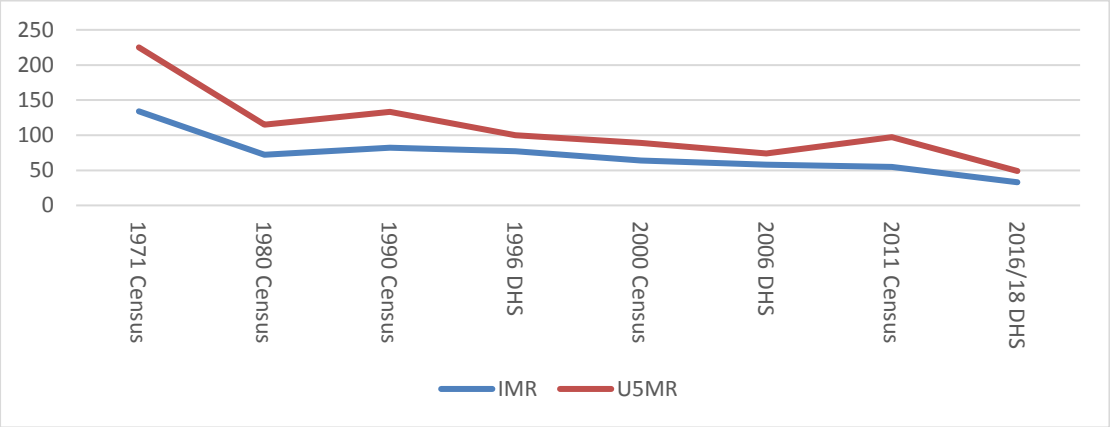
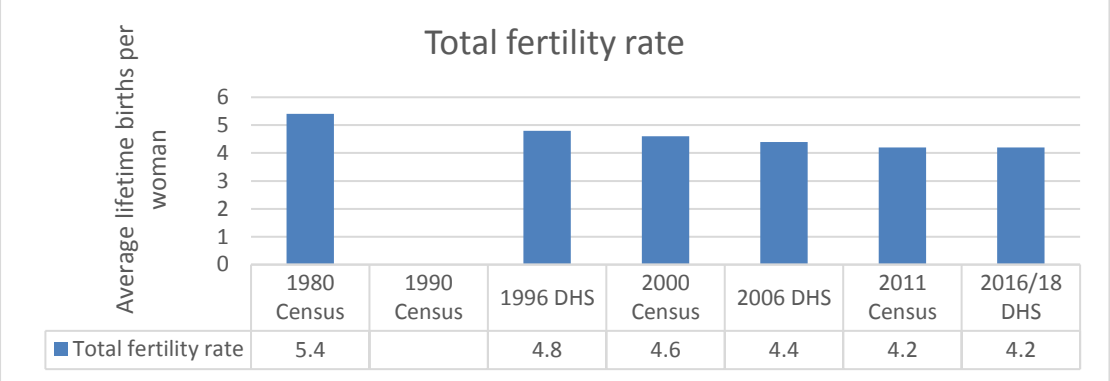


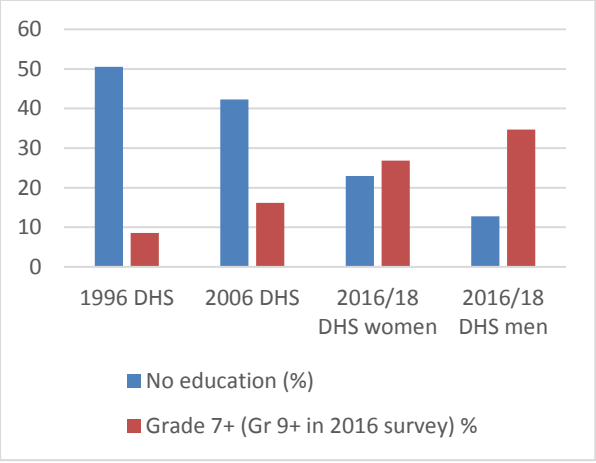
Figure 1.6: Total Fertility Rate



5. Equity

The notion of equity is firmly bedded in the PNG vision that all people have opportunity for a healthy life. While accepting that circumstances (for example, rural isolation, disability) are not the same for all, the principle of equity is that these circumstances are recognised, and effort made to provide equal opportunity.

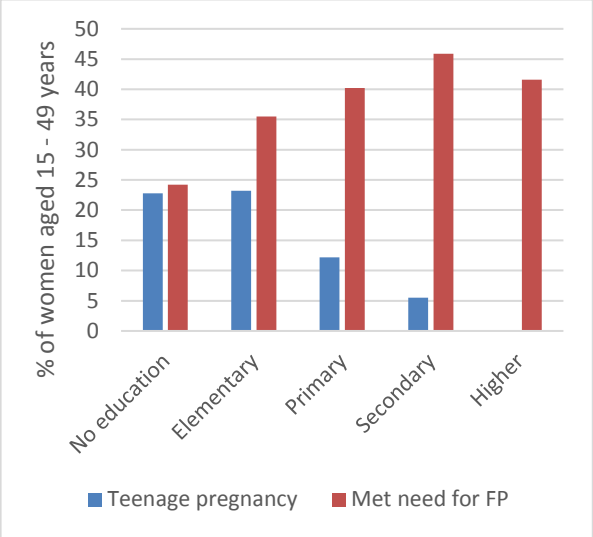
Figure 1.7 Education level 1996 - 2016/18



Why do these disparities exist in remote districts and urban settlements? For the most part, health is determined by matters other than accessibility to health services. Moreover, quality of housing, clean water, wealth and the level of education play an important role.

(a) *Education*: the level of education attained leads to more health-seeking behaviour and better health outcomes

Figure 1.8: Level of education & access FP



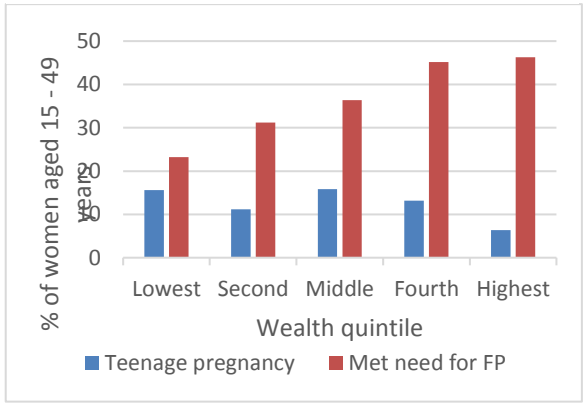
The 2016-18 Demographic and Health Survey provides a very strong correlation between health seeking behaviour and wealth. There is consistent observation across most key indicators in the report of a linear relationship with positive health seeking behaviour and level of education. The example of teenage pregnancy and accessing family planning demonstrate this. The 2016-18 DHS showed that under-5 mortality decreases from 68 deaths per 1,000 births among children whose mothers have no education, to 29 deaths per 1,000 births among children whose mothers have higher education. With improving levels of education improvements in health outcomes are expected.

(b) *Wealth*: households leads to more health-seeking behaviour and better health outcomes

Like education, the DHS demonstrates a clear relationship with a household's financial security. Like education, the more wealth a household has, the more they seek medical support (Figure 1.8).

(c) with greater wealth seek higher levels of medical care. Level of education attained

Figure 1.9: Level of wealth and fertility



The World Bank Facility Survey concludes that access to health facilities is skewed by income and wealth status. The higher the wealth score, the more likely that households will use higher level facilities. The percentage of treatment seekers who are "poor" was 73 percent at level 3 facilities, whereas it was 10% at the level 7 facility.[3]

6. Equity stratifiers:

The following section considers equity from the following perspectives:

Figure 1.10: Types of Stratifiers

Circumstance	Stratification	Circumstance	Stratification
Place of residence	Urban/Rural	Wealth	Incomes band
Region	Province/District	Social/physical	Disability
Education	Levels of education	Gender	Female/Male

[3] World Bank Group: Service Delivery by health facilities in Papua New Guinea, p 80

Region of residence

The census data show marked differences in the opportunities of life across the country. For example, at birth, the life expectancy for someone born in West Sepik Province is 50 years. In the National Capital District, it is 67 years. For every thousand children born in West Sepik, one in every seven children will die before the age of 5 years. In NCD, it is one in twenty five children. Overall, infant mortality in the Highlands (67 deaths for every 1000 live births) and Momase regions (70) is very much greater than the regions of Southern (42) and Islands (49). The granularity of the census data does not drill down to district level, where these disparities may become more apparent.

Figure 1.11 Vital Statistics, 2011 National Census

	Vital statistics						
	Population Growth rate	Crude birth rate	Crude Death rate	Infant Mortality Rate	Under 5 Mortality rates	Total Fertility Rate	Life exp at birth
	Annual increase in population (per hundred)	Births per 1000 population	Deaths per 1000 population	Deaths in infants (< 1yr) per 1000 live births	Deaths in children (< 5yr) per 1000 live births	Average number of children born to each woman during lifetime	Years
PNG	**2.63**	**36**	**9.6**	**54**	**97**	**4.23**	**56.8**
Southern Region	**2.69**	**35**	**8.3**	**42**	**77**	**4.32**	**59.5**
Western	3.20	41	9.2	48	87	5.15	57.7
Gulf	2.72	41	12.2	75	132	5.15	51.1
Central	2.57	34	8.2	33	63	4.51	62.1
NCD	2.69	31	4.4	21	39	3.23	67.4
Milne Bay	2.34	34	10.7	50	92	4.42	56.8
Northern	2.72	39	9.2	43	77	5.06	59.3
Highlands Region	**2.37**	**35**	**9.6**	**67**	**114**	**3.74**	**55.4**
Southern Highlands	2.80	37	9.4	72	119	3.82	54.6
Hela	1.70	35	10.1	72	119	3.82	54.6
Enga	2.27	34	10.5	81	137	3.56	52.5
Western Highlands	2.61	34	9.1	57	97	3.65	58.0
Jiwaka	2.93	36	8.5	57	97	3.65	58.0
Chimbu	1.70	30	9.7	64	110	3.31	56.1
Eastern Highlands	2.36	33	9.5	63	103	3.74	57.1
MOMASE Region	**2.83**	**38**	**11.2**	**70**	**122**	**4.8**	**53.7**
Morobe	2.54	35	10.7	69	118	4.25	54.1
Madang	3.25	41	10.3	67	116	5.16	54.4
East Sepik	2.99	40	11.3	67	115	4.98	54.6
West Sepik	2.50	40	13.5	89	150	5.16	50.0
Islands region	**2.80**	**35**	**9.1**	**49**	**87**	**4.43**	**58.7**
Manus	1.99	28	8.8	42	75	3.92	60.7
New Ireland	2.77	34	8.9	49	86	4.6	58.8
East New Britain	2.51	34	9.4	51	90	4.26	58.1
West New Britain	3.03	38	9.2	52	90	4.77	58.1
ARoB	3.08	35	8.6	44	79	4.34	59.9

Rural/Urban:

Rurality is associated with poorer health status. The 2016 -18 DHS demonstrates higher early childhood mortality rates in rural populations. Expectation duration of life from birth is 6.2 years longer for urban born children.

Figure 1.12: Mortality and rural-urban residence

	Under 5 Mortality Rate								Life Expectancy at Birth			
	1971 Census	1980 Census	1990 Census	1996 DHS	2000 Census	2006 DHS	2011 Census	2016-18 DHS	1980 Census	1990 Census	2000 Census	2011 Census
PNG	225	115	133	100	89	74	97	49	49.6	51.7	54.2	56.8
Rural	NA	126	145	112	95	79	103	49	48.7	50.5	53	56
Urban	NA	70	79	46	35	42	56	41	55	57.5	59.6	62.2

Anecdotes and observation suggest that urban settlement populations are growing in a number of centres. Concern has been expressed that this is placing a higher burden on provincial hospitals and that their needs may not be met. This analysis does not detail or quantify this need. Settlement communities may not have the same access to clean water and live in more crowded housing. Wealth indices are similarly expected to be low, establishing a picture of an 'urban poor', with expected health and mortality indices compromised.

Access to clean water

Safe water supplies, hygienic sanitation and good water management are fundamental to good health. It was estimated in 2013 that water and sanitation concerns contributed to more than 6000 deaths[4]. The difficulties of access to clean water within PNG reflects similarly to the other equity stratifiers. The disparity between rural and urban access is significant, with 89% of the urban population having access to improved water sources compared to 33% in rural areas[5]. Less than half of households have access to an improved source of drinking water[6].

Gender

Inequality in the health status of women remains a concern and is experienced at many levels. Daily life for the woman in PNG carries the opportunity costs of bearing children, food production and daily chores. These responsibilities encompass accessing health care for children, as well as meeting their own needs in reproductive health. The decline in outreach services and the widespread closure of aid posts has impact on the woman's capacity to meet these needs.

As outlined above, levels of education correlates closely with health and access of health care. The DHS found that 23% of women have no education (13% of men), while 27% of women have at least some secondary education or high (35% of men).

Fertility is closely aligned maternal morbidity and mortality. By international standards, PNG's fertility rate remains high at 4.2 births for each woman. The access of antenatal care remains less than required (76% coverage for first visit), and there is an ongoing deficit in demand for family planning, where 41%

[4] Cited in the National Water, sanitation and Hygiene Policy 2015 - 2020
[5] Joint Monitoring Program data 2013 estimates
[6] GoPNG Demographic and Health Survey, 2016-18

of this demand is not met. Support by a skilled health worker during delivery is accessed by only 56%. These vulnerabilities prevail not only in fertility. Among adults, women suffer more than men from anaemia (36 percent vs. 26 percent) and chronic energy deficiency (5.3 percent vs. 2.9 percent)[7].

In 2009, nearly two thirds of persons detected HIV infections were in females, possible reflecting the greater number of women being tested than men. Sexually Transmitted Infections (STI) are common throughout the country, and are often chronic, since women's fear of their husband's reaction makes them reluctant to notify their husband of the need for simultaneous treatment to avoid continual re-infection. Overall, 69 percent of the 71,025 STI cases recorded in 2009 were among women. The recent DHS shows that, overall, 59% of women aged 15 – 49 have experienced physical or sexual violence. The practice of seeking help from support organisations is not common.

The National Sexual and Reproductive Health Policy is to remove barriers to the effective provision and use of sexual and reproductive health services. The policy aims to use gender-responsive programming and includes strategies to limit Female Sexual Violence and other practices harmful to women and children and increase the involvement of men in sexual and reproductive health issues. The National Family Planning Policy seeks to promote family planning options to stabilize population growth, enable couples and individuals to achieve reproductive goals, and minimize illness and disability related to reproduction. The National HIV and AIDS Strategy 2011-2015 contains recommendations for the integration of services for the prevention of parent to child transmission (PPTCT) of HIV and services for gender-based violence to be fully integrated with sexual and reproductive health services. The National Policy for Women and Gender Equality 2011-2015 lists health as its second strategic priority after reducing FSV. Regarding health, the emphasis is on advocating for affordable and accessible rural health services, training traditional midwives, and community education in nutrition, hygiene and reproductive health. The health sector introduced a Gender policy in 2015.

Disability

Defining disability

Disability is a complex phenomenon, reflecting the interaction between features of a person's body and features of the society in which he or she lives. Consideration of disability is framed in three ways[8]:

- impairments (e.g. a problem in body function or structure),
- activity limitations (difficulty encountered by an individual in executing a task or action),
- Participation restrictions (a problem experienced by an individual in involvement in life situations).

People with disability are more likely to live in impoverished situations, and frequently socially excluded. Overcoming the difficulties faced by people with disabilities requires interventions to remove environmental and social barriers. There are, however, health needs beyond those of the wider community. These might arise directly to deal with a primary health problem, or to address secondary conditions (such as pressure sores or urinary tract infections). People living with disability have greater unmet health needs. For example, a recent survey of people with serious mental disorders, showed

[7] Dundon, A. 2004. Tea and Tinned Fish: Christianity, Consumption and the Nation in Papua New Guinea. Oceania. 75 (2). pp. 73-88.; Hide, R.L., B. J. Allen and R.M. Bourke. 1992. Agriculture and Nutrition in Papua New Guinea: Some Issues. Institute of National Affairs Discussion Paper. No. 54. Port Moresby. pp. 1-36.

[8] World Health Organisation definition

that between 76% and 85% in developing countries, received no treatment in the year prior to the study'[9].

The magnitude of disability in PNG:

There are no specific data captured within the PNG health system on disability. WHO estimates globally that approximately 15% of the population is affected by disability of some kind. This estimation equates to around 1.3 – 1.4 million people in PNG. The rise of diabetes and cerebro-vascular disease in the population will contribute to higher demand, with visual impairment, amputation and frailty associated renal or cerebrovascular disease. Resurgent polio, the incidence of injury, the prevalence of mental ill-health each take their toll on the individual and their families and communities who support them. A 2018 study[10] on visual impairment in people over 50 years of age in PNG estimates 40,746 persons to be blind (5.6% of population), and a further 21,519 severely visually impaired (2.9%) and 79,463 moderately visually impaired (10.9%). The majority of these suffer from cataracts (88.6%) – a treatable condition.

Impact of disability

Persons with disability experience poorer levels of health than the general population, with greater vulnerability to preventable secondary conditions, co-morbidities, and age-related conditions, as well as a higher risk of being exposed to violence. There are unmet needs for rehabilitation services resulting in reduced quality of life. Lower educational achievements, with children being less likely to start school (10% - 60% globally) and less likely to complete education. On average, the employment rate for persons with disability, at 44% (globally), is over half that for persons without disability (75%)[11]. The inactivity rate is about 2.5 times higher among persons without disability (49% and 20%, respectively). A lack of community living, and inadequate services leave people with disabilities isolated and dependent on others. The care for a person with disability has impact on that family's ability to tend to gardens and provide more generally.

Higher rates of poverty

People with disabilities thus experience higher rates of poverty than non-disabled people. A 2016 study[12] in Cambodia found that having disabled members increases the income required for a household to achieve the same standard of living as an otherwise similar household by 17%. Persons with disabilities and households with a disabled member experience higher rates of deprivations – including food insecurity, poor housing, lack of access to safe water and sanitation, and inadequate access to health care – and fewer assets than persons and households without a disability.

Policy response:

There is a current PNG Disability Policy (2015-25). It states that the nature and complexities of disabilities, persons with disabilities require specialised medical treatment and care. The Policy directs that health services be strengthened and where necessary established to address and manage the complex classes of disabilities ranging from habilitation to rehabilitation services.' (page 22). Advocates

[9] World Health Organisation, World Report on Disability, 2011
[10] Lee L et al. *Br J Ophthalmology* 2018; 0: 1-5
[11] World Health Organisation, World Report on Disability, 2011
[12] Palmer M, Williams J, McPake B, *The cost of disability in a low-income country*. Nossal Institute for Global Health, The University of Melbourne, 2016

for those living with disability comment that health workers are generally disrespectful and dismissive when it comes to people with disabilities, with few having the knowledge and skills to work successfully with people with disabilities. Most health facilities are not accessible to people with mobility difficulties.

The GoPNG is signatory to the Convention on the Rights of Persons with Disabilities. There is some very limited progress. Newer facilities are being constructed to enable better accessibility. Initiatives to address disability may include, for example, capturing information on need, canvassing treatable causes of blindness, training signers at district level to support those who are deaf, introduction of a prosthetic program.

7. Overarching policy considerations

Vision 2050

The hierarchy of PNG's broad policy agenda conforms with the wider vision to fulfil on the constitutional aspirations – defined in the Vision 2050. The vision is underpinned by seven strategic focus areas:

- Human Capital Development, gender, youth and people empowerment. [Health is identified as one of the core components of this focus area]
- Wealth creation
- Institutional development and service delivery
- Security and international relations
- Environmental sustainability and climate change
- Spiritual, cultural and community development; and
- Strategic planning, integration and control.

Vision 2050 is executed through the PNG Development Strategic Plan (DSP) 2010–2030. Health is one of the vital elements in the development strategies given the aim to "*achieve an efficient health system which can deliver an internationally acceptable standard of health services*". The DSP in turn is implemented through defined objectives of 5-year Medium Term Development Plans (MTDP). Health is again emphasised as a priority to achieve "quality health services accessible and efficient" over the next five years.

The health sector National Health Plan is governed by the planning framework of the Medium-Term Development Plan (MTDP). The key objectives of the MTDP III (2018 – 2022) are:

(i) Increase the internal revenue on a sustainable basis to secure sufficient resources from domestic tax collections, non-tax revenues and export earnings;
(ii) Increase training, capacity and employment opportunities for PNG citizens;
(iii) Increase PNG ownership and benefits in the formal business sector;
(iv) Improve quality of service delivery in rural districts across the country;
(v) Create a safe and competitive environment to attract foreign and domestic investments;
(vi) Support provinces and districts to generate sustainable internal revenue;
(vii) Manage population growth at a sustainable level and promote family planning; and
(viii) Improve evidence-based planning process.

The National Health Plan (NHP) provides the roadmap for the strategies of the sector. The National Health Plan 2011 – 2020 has the goal of strengthening primary health care for all, and improved service

delivery for the rural majority and urban disadvantaged, reflecting the focus on a "back to basics" approach.

There are numerous policies that provide direction to the development and implementation of activity to meet the National Health Plan. These policies are updated as required, determined by the environment, need and evidence. The NHP is both implemented within and supported by a Legislative Framework, determined by Parliament. Examples of key relevant Legislation include the Organic Law (1997), the National Health Administration Act (year), the Provincials Health Authorities Act (2007).

As a nation, PNG has defined its agenda through commitment to national and international programs. The Alotau Accord II identified heath as a key priority. It noted the policy of universal health care (UHC) through the provision of free basic health care and subsidised health care. Specific deliverables within the Alotau Accord II were agreed:

- Rehabilitate all provincial hospitals
- Expansion of Community Health Posts, redevelopment of district hospitals to address maternal and infant mortality. More focus on TB, HIV/AIDS and cancer in women.
- Translate the high level of investment in health infrastructure, health workers and medical supplies into improved health outcomes and health indicators;
- Institute an appropriate system to monitor the impact of investments on health indicators
- Complete the Demographic and Health Survey to ensure up-to-date reporting on PNG's progress on the UN Sustainable Development Goals.

There are other important overarching policy commitments. These include:

Sustainable Development Goals (SDG).

The SDGs build upon, and extend, the MDGs in order to tackle the "unfinished business" of the MDG era. The SDGs recognize that eradicating poverty and inequality, creating inclusive economic growth and preserving the planet are inextricably linked, not only to each other, but also to population health. The SDGs aim to be universal, integrated and interrelated in nature.

One of the 17 goals is specific to health and is framed in deliberately broad terms that are relevant to all countries and all populations: "Ensure healthy lives and promote well-being for all at all ages". The health goal is associated with 13 targets, including four means of implementation targets labelled 3.a to 3. d.[13]

Figure 1.13: Health targets for SDG 3

3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births.

3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births.

3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases.

[13] Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals. World Health Organization 2015

3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol.

3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents.

3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.

3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Means of Implementation Targets:

3.a Strengthen the implementation of the WHO Framework Convention on Tobacco Control in all countries, as appropriate.

3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all.

3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States.

3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.

8. Universal Health Coverage

Universal health coverage (UHC) is defined as ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective. UHC comprises two components – health service coverage on the one hand and financial protection coverage on the other. There is a strong relationship between the achievement of the SDGs and UHC. The target on UHC underpins all other targets and provides an opportunity to refocus efforts on a more sustainable approach through system-wide reform, based on the principles of efficiency and health service integration and people-centred care. The SDGs also fundamentally call for intersectoral action, acknowledging that attainment of health goals is dependent not only on actions within the health sector, but also on economic, social, cultural and environmental factors. Without UHC as the underpinning approach, there is a risk that pursuing the individual targets separately will lead to more

fragmentation and confusion in countries. UHC, rather than being one target among many therefore needs to be seen as having an integrating role, underpinning a more sustainable approach to the achievement of the other health targets and creating a balance among them.[14]

[14] Ibid, pp 41 - 49

Papua New Guinea National Health Plan

Situational Analysis, 2019

SECTION 2: IMPLEMENTATION AND ACHIEVEMENT

ANALYSIS OF NATIONAL HEALTH PLAN 2011 – 2020

Key points:

1. At highest level, **there is an improvement in health**, evidenced by longer life expectancy, lower early childhood mortality and improved nutrition. Across provinces and districts, however, there is **uneven health status**, with the most remote and impoverished districts remaining poor health status.
2. Program development and health services are functioning in a time of change, where governance and administration is being devolved to Provinces and Districts. **New models of service** (for example, Community Health Posts) are evolving in rural communities. Information systems, in shifting to electronic format, provide the prospect of a more accurate and timely basis for decision making in the health sector.
3. The sector is constrained by diminishing resources. **Health expenditure is lower, staffing ratios decreased, and fewer aid posts open.** Despite structural reform within Medical Supply that promises change, ongoing stockouts of essential medications occur. These constraints have a direct effect of the sector capacity to meet need, with less outreach and lower utilisation of services.
4. **Child health** has had mixed progress. With minimal outreach, there has been an ongoing decline in immunisation coverage. Malaria is resurgent, and TB prevalence is rising. HIV, acquired through vertical transmission, is frequently late to be recognised, with resultant poor outcomes. The management of childhood illness, however, improves, with diligent adherence to clinical protocols.
5. **Maternal health** similarly has faltered with low antenatal coverage, poor quality delivery suites, and a lack of supervised deliveries. Family planning programs show improved coverage, yet a third of women still express an unmet need.
6. There is evidence of **rising incidence of non-communicable disease, however, this has not been a focus of the current planning period. Communicable disease persists to cause concern.** There prevalence of malaria has rebounded to levels of a decade ago; TB prevalence has increased, and resistance to treatments emerged; HIV prevalence grows slightly; the ability to attain comprehensive reach of treatment of these infections is below target. Other diseases, including cancer, injury, mental ill-health and a range of tropical diseases have not been prioritised, yet remain of concern.

Summary Assessment of the National Health Plan 2011 – 2020

September 2019

1. There are a number of positive elements of the Health Program since the current National Health Plan was commissioned. Some of these are of a reform nature, and others the result of diligent and insightful work within specific programs. It is observed that at the highest level of indicators, children are better nourished and more likely to survive the threatening environment of their early years. More generally, the community is living longer, although significant variations in life expectancy exist, depending upon where one lives and the resources and educational opportunities at their disposal.
2. Such achievements are all the more noteworthy given the institutional constraints experienced by the sector. Most notably, the health expenditure has greatly diminished; in real terms, expenditure in 2019 is less than half that of 2011, whether this is viewed on a per capita basis, as a proportion of GDP or as a percentage of the total GoPNG expenditure. As a result, services and programs have been reduced, bearing direct burden upon the community.
3. While funding to the sector has a large bearing on the ability of the health sector to deliver on its vision, there are other 'building blocks' that contribute to this environment of challenge.

i. The current workforce is insufficient in number to meet need. Workforce- population ratios have reduced globally from 1.27/1,000 population in 2011 to 0.97/1,000 in 2018. Staff ceilings are not being met, with an overall 27% vacancy rate. These include priority programs (for example, pharmacy/assistant positions have 46% vacancy). There has been some effort to enhance skilled workforce numbers (for example, training 750 midwives); this is too little. Significant investment is needed such that the tertiary education sector will have the capacity to produce the required numbers needed.

ii. The physical stock of health facilities has an infrastructure that is failing, with 30 – 60 % of Level 3&4 facilities in need of significant remediation. There has been investment in the development of new rural facilities (32 to date, with further now planned), current transitioning of district health centres to district hospitals, and some limited enhancement to several provincial hospitals. The quality of services is further compromised by concerns of staff skills, and gaps in supply.

iii. Medical supply continues to be punctuated by interruptions to the stock levels of essential medications. There has been appropriate structural reform within the supply system that augurs well for improvement here. However, a fundamental weakness that persists at facility level in providing sound consumption data will continue to undermine the system with subsequent further stockouts to be expected. Increased staffing to support basic stock management at facility level is needed.

iv. Information systems, including management and service/program databases, lack integration, are perceived to be compromised in quality and do not serve need in an integrated manner. Vital events registrations systems have not progressed. Communication systems and technologies are not being used to best effect to support information transfer.

4. An important reform agenda that was central to the current plan has been the establishment of Provincial Health Authorities in all provinces. It is not clear that there is a readiness for this from the national program perspective, with uncertainty expressed on the future roles by several national program managers. This clarity is essential, to avoid a fragmentation of the delivery of evidence-based and cohesive approaches to national health priorities. Such leadership is also required in guiding the narrative on Development Partner contribution to the sector.
5. The Key Result Areas focussed on outcomes show a mixed picture in performance. These program areas are subject to the wider weaknesses mentioned above - funding shortfalls, inadequate staffing and supervisory support, faltering outreach, and inconsistent supply. It is observed that there remains a relative isolation of programs from each other.
    i. The Child Health program has shown that well considered interventions prevent illness and deaths. An introduction of new vaccines, an essential package of care approaches for the newborn, technological commitment in treatment settings (for example oxygen concentrators), and clearly stated management protocols have improved hospital management of the sick child. Improvements in nutrition are observed. Challenges, however, remain, with decreasing immunisation coverage, lesser outreach to provide primary care and prevention activities in remote communities and significant burden of infectious diseases (for example, TB, congenital syphilis, HIV, diarrhoeal disease).
    ii. Maternity services and women's health situation and needs are clearly enunciated in the Ministerial Taskforce review (2019). The analysis re-affirms that even with considered investment, poor quality and limited reach of antenatal care, and unsafe delivery environments persist, threatening the lives of women and their newborn. There is evidence that new methods of family planning may address unmet need, hence decreasing fertility and increasing birth

spacing. The skills of health workers and the quality of health facilities may contribute adversely to the program's objectives, noting that half of the known maternal deaths occur within health facilities.

iii. The Communicable Disease program has invested heavily in the three diseases of TB, HIV and Malaria, possibly to the disadvantage other infections, including respiratory tract infections, diarrhoeal disease and the "Neglected Tropical Diseases". There is little data available to validate their importance.

- Malaria is resurgent. Where the prevalence study of 2014, conducted at the end of an intensive phase of support, showed that control could be achieved with emphasis on prevention and capacity for diagnosis and early treatment, the subsequent study 3 years later showed the gains to be lost. While it may be difficult to attribute, this resurgence coincided with a sharp decrease in funds, stockouts of RDT and first line treatments, and limited cut-through with prevention activity. Research is urgently needed to understand current epidemiology, and so guide future programming to learn the lessons of recent program support.
- Through this planning period, the magnitude of tuberculosis in PNG has been realised, with high prevalence and drug resistance. Case notification rates have plateaued, yet treatment completion has proven stubborn, reaching around 70% only. Like malaria, should inputs be decreased, further escalation of this disease is likely.
- HIV has infected 0.83% of the population, each requiring lifelong medication available through the health system. The regular surveys and analyses provide an understanding of the program's needs; however, there are weaknesses recognised. For example, vertical transmission continues at unacceptable levels; high risk groups are infected at rates 10 times that of the general population. STIs are modelled at very high prevalence.

iv. Disease surveillance and public health preparedness for outbreaks and natural or other disasters have had limited investment during the planning period. The staff of the units demonstrate an understanding of need, yet a lack of development renders ongoing national vulnerability to significant infectious disease concerns.

6. Health Promotion and Water and Sanitation programs appear to have made little headway during the planning period. Ostensibly, this has been stated as a funding issue. The quiescence of both programs, both at the primary prevention level, will result in levels of ill-health with consequent human and economic consequences. PNG is already on a trajectory of non-communicable and chronic complex disease that it is ill-prepared for.
7. It is four years since the mid-term review team made its recommendations, namely a) a sharper focus on implementation, b) workforce enhancement, c) investment in programs at District level, d) cross program/district learning and e) a service level focus. Notwithstanding some important gains, the fruits of these recommendations are difficult to find. The inequities of certain populations to access good health care and enjoy good health still exist. The Health System is frequently caricaturised as "weak" and a "failing system". The development of the next National Health Plan should and can address its weaknesses (notably supply, supervision, information systems, outreach and referral systems), but more than that, it needs to consider the following:

i. package its service efforts in a manner that understands the complexity of the interface between the community and those services;

ii. place patients and their communities as the centre of its care models, through integrated approaches to prevention and care;
iii. respond to the magnitude of a dual disease burden, with the work of infectious disease still paramount, and the rising tide of non-communicable diseases already having reached the shore;
iv. rejuvenate a focus on primary prevention through intersectoral approaches, the use of policy levers and community/social mobilisation for health, while finding a suitable balance in its funding commitments between primary prevention, primary and tertiary level care;
v. provide cohesive national governance in the transition to a district/provincial led health system.

8. The magnitude of this task cannot be understated. There are three necessary commodities that underpin effort. These are (a) advocacy within the Central Agencies and Parliament for adequate and timely budget; (b) workforce enhancement, requiring the commitment of the higher education sector to create training places, and the health sector to engage the graduates; and (c) remediation and development of failing infrastructure that supports the rural majority yet maintains a strong central core at both province and central level. These efforts are conceived and driven through strong and supported leadership.

This chapter provides a brief analysis of Key Result Areas of the NHP 2011 – 2020. A review of the National Health Plan was undertaken mid-term (2015). A summary of the review findings along with its recommendations are presented. The National Department of Health responded to this by establishing priorities that would be focus of the subsequent period of the NHP. These are presented. Thereafter, the analysis of the Key Result Areas is provided.

Midterm review summary: findings and recommendations

A review of the 2011 – 2020 National Health Plan was undertaken in 2015. A further review of implementation has not been undertaken. The following provides a brief appraisal of observation rather than further in-depth review as the 2011 – 2020 NHP nears the completion of its period.

Summary of findings of the mid-term review:

- Overall, performance is described as 'sluggish', with fluctuating performance seen across key indicators. This was chiefly attributed to a failure in acknowledging the centrality of building the health workforce and financial resources inadequately focussed upon the areas of greatest need. Health system performance was variable across the nation, with some districts showing very positive improvements, yet many others not;
- Despite **equity** emphasised as a key feature of the Plan, there was growing inequity, with the higher performing provinces further improving, and those provinces with lowest performance further falling behind. The review found that those districts that were nearest to provincial centres were able to do best, with the more remote districts remaining with most concern. The review further noted that "urban poor" were not defined, and hence not evident as a focus of implementation.
- The National Department of Health and the National/Provincial hospitals has been where most capital development is invested, and where greatest growth in activity is seen;
- At **national level**, there has been solid progress on policy development. At the time of the review, however, these were observed to have little impact on service activity/implementation. It was observed that the linkages between NDoH and Provinces remained weak. At national level, there had been a successful decrease in reliance on external advisers.
- At **provincial and district level**, overall, there had been little progress towards servicing the needs of priority populations, although there was generally a greater interest in rural services. There were a number of 'bright spots' amongst district programs, and these were seen in both PHA and non-PHA provinces. The key features of success in a province was where there was a proactive working relationship between leaders (clinical and managerial), churches, provinces, districts and hospitals, where each of these players appreciated a common vision and worked together for this. Relationship is as important as a good policy environment. The PHA provides a sound framework for these relationships.

  The counterpoint at province level was a persistence of poor performance in a number of provinces. The contributing factors to these were assessed to be blockages in the flow of funds, weak leadership and where political and health decision making is made in isolation.
- The **National Health Standards Policy** was described as a welcome and useful mechanism in outlining clearly the role and expectation of each level of service. Yet it needs a prioritisation process applied (for example, which facilities need to be developed sooner).
- **Program performance** was also mixed. Malaria benefited greatly from additional funds and achieved outcomes. However, others, for example, EPI and TB programs had not performed to expectation.

The lack of overall prioritisation was again seen at facility level. For example, 70% of hospitals had upgraded X-ray machines, yet at rural facility level, only 70% had a working refrigerator.

- **Workforce** was acknowledged as an omission of the NHP. An Enhancement Plan had been developed to redress this (see progress on this below).
- **Expenditure**: There had been considerable increased funding to the health sector, reflected in raised per capita expenditure (from K83 in 2011, to K127 in 2015).

Overall, the plan was accepted and appreciated as a sound policy document, particularly at national level, yet did not carry the same awareness or as a role of compass in the district level. The lack of prioritisation of approaches, and the inability of detailing the 'how' of the plan had weakened its effectiveness. The plan provided an insightful approach to Universal Health Coverage, encompassing a focus on quality, efficiency, equity, accountability, sustainability and resilience.

The mid-term review made five broad recommendations:

(i) A need to focus on implementation, suggesting the creation of a short list of priorities, with 6 monthly reports on the progress of these priorities;
(ii) Workforce enhancement;
(iii) Improve purchasing and accountability, where Local Members and District Development Authorities allocate funds to program initiatives at district level;
(iv) Facilitate learning across and within districts and provinces;
(v) Adapt the National Health Plan to be more suited to implement at district level, so that frontline workers can easily identify how they might best meet community need.

Resetting the Priorities

In the latter part of the planning cycle (2016 – 2019), there have been a number of the initiatives and reforms of the NHP that have progressed. These include the further roll-out of the PHA to all provinces and development of Health Service Plans, strengthening of the National Health Information Systems (moving to electronic format), a number of additional national policy initiatives, and construction of Community Health Posts. Several of these are considered in some detail below. In response to the first of the above recommendations, the National Department of Health established a set of priorities, with targets aligned to the Sustainable Development Goals. These 'reset' priorities and targets were pitched at all levels of health services, and hence included both strategic outcomes and operational targets.

These Priorities encompass:

Figure 2.1: Priorities set to SDG

Priority	Health systems level:	No of targets	
		Outcome	Operational
1	Effective leadership, governance and partnership	1	14
2	Workforce planning, development and management	2	10
3	Medical supply reforms	1	14
4	Functional health infrastructure and equipment	1	9
5	Provincial Health Authority reform	1	6
6	Health Financing	1	8
7	Health performance monitoring, reporting and research	3	10
	Total Targets	**10**	**71**
Priority	Program level:		
1	Health promotion	3	10

2	Water, sanitation and climate change	4	8
3	Tuberculosis	2	3
4	Maternal Health	3	9
5	Child Health	6	7
6	Malaria	2	3
7	HIV/AIDS	2	4
	Total Targets	**22**	**44**

The reset priorities were clustered under the Key Result Areas, detailing the strategies and performance indicators. These were listed in order of priority. This new set of priorities includes 32 outcome targets and 115 operational targets. The intent of the revised set of priorities was to realise some focussed targets addressing the concern that the NHP was too broad in its ambition. The volume and scope of these is unlikely to address this concern. The current analysis found a very low level of awareness of these priorities, symptomatic that they have not been factored strongly in providing direction to the sector. A desktop analysis of performance against these indicators is provided as appendix. The "targets" are described as outcome and operational, yet there is inconsistency across the priority areas in the way they are framed, and frequently stated as activities, with poor capacity to be measured.

Key Result Areas NHP 2011 - 2020/Strategic Priorities 2016 – 2020: brief summary of progress

KRA 2/3: Leadership, governance and partnership:

The transition to the Provincial Health Authorities is now well progressed with expectation that this will be fully accomplished within the year. In support of this development, service plans have been drafted, and leadership and managerial training programs, although there is not a strong understanding of the role of the National Department of Health and the manner in which it will exercise its leadership in the new era. The SEM has representation on each of the PHA Boards. It is important that this voice is used to best effect to ensure the interface between national and provincial authorities is well understood and executed to best effect.

The National Health Service Standards is respected as a pivotal document to guide roles and capacity at each level of the health system. Its application appears to be predominantly at Hospital, rather than influencing rural health services. There has been an extensive investment in policy development across a wide range of programs and systems. The effectiveness of health policies and plans is greatly enhanced if developed in collaboration with other sectors, taking into account the broader socioeconomic, environmental and cultural contexts within which the health sector functions[15].

The support of Development Partners (DP) in achieving the policy and service objectives has been essential. This continues in both financial and technical spheres. It is observed that there is an appropriate engagement with PHA as well as NDoH; however, NDoH have observed, the direct engagement is not always notified, restraining the capacity of NDoH to provide full documentation of DP expenditure in the sector. Just a small proportion of DP funds are now channelled into the HSIP Trust Account. It remains that DP support will yield greatest benefit when in harmony with the unifying agenda of the National Health Plan.

[15] Ibid

Outreach services, a primary point of access for up to 60% of the population, continue to decline in frequency. There is no evident strategy to deal with this. Supportive supervision has been demonstrated to enhance service reach and capacity, yet this similarly remains insufficient in scope and quality.

KRA 3: Health Financing

Key Points

- There is an overall decline in GoPNG expenditure on health, well below international averages;
- DP expenditure is declining; The majority of DP expenditure is outside of HSIP Trust Account;
- Year to year GoPNG and DP expenditure shows significant fluctuation.

Figure 2.2: Graph showing Health Government Expenditure 2011-2018 (PGK)

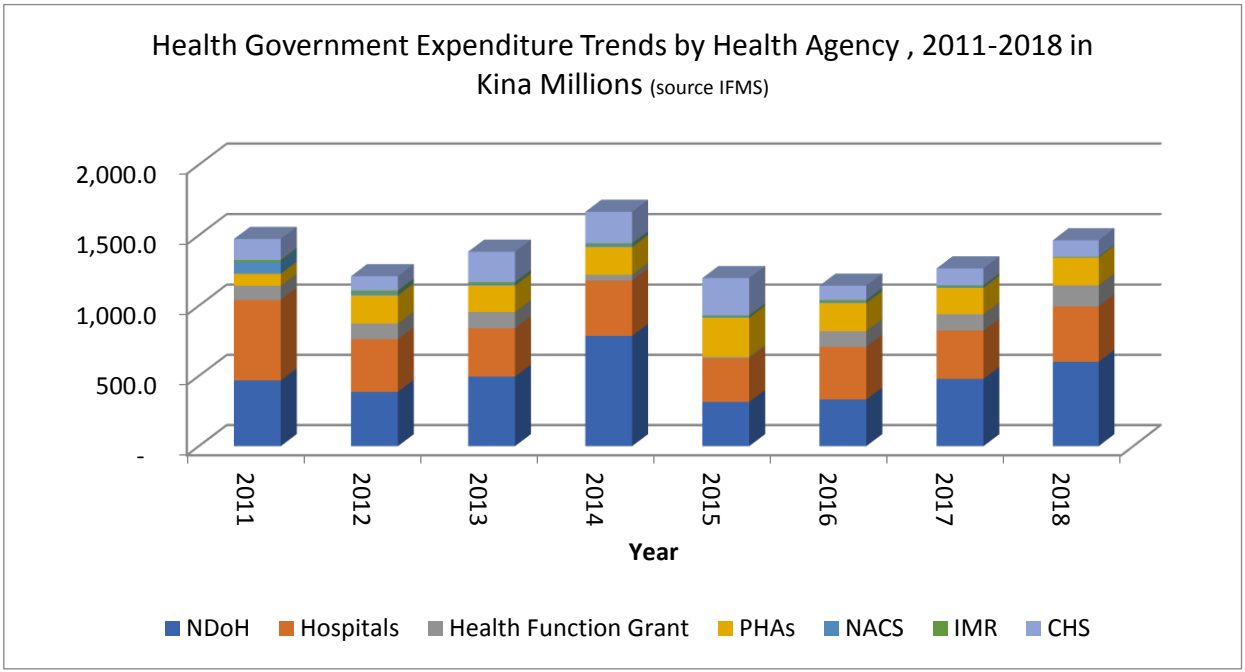


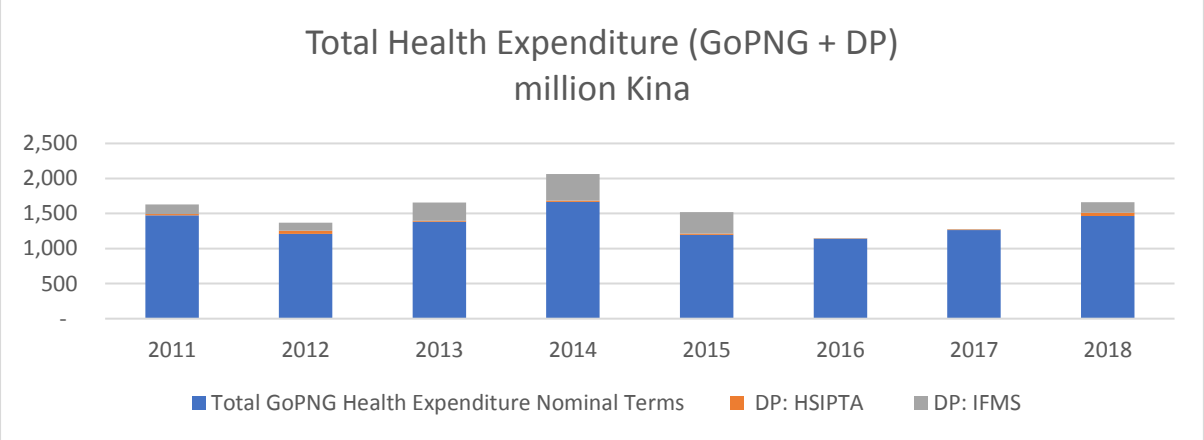
Figure 2.3: Table showing Total GoPNG Health Expenditure and development Partners

Table 2.1 Total GoPNG Health Expenditure and Development Partners 2011 – 2018 in million PGK (source IFMS)

	2011	2012	2013	2014	2015	2016	2017	2018
NDoH	468.4	386.9	495.4	785.2	315	332.4	478.9	600.9
Hospitals	572.9	374.4	344	393.7	310.1	374.4	344	393.7
Health Function Grant	99.8	112.6	116.8	40.4	10.3	112.5	116.8	149.9
PHAs	85.7	199.9	187.9	197.2	279	199.9	187.9	197.2
NACS	83.6	15.9	11.3	13.9	7.7	8.8	7.4	1.1
IMR	14.4	18.2	12.7	12.2	9	12.3	9.3	4.2
CHS	149	101.8	215.3	223.5	265.2	101.8	120.9	117.1
Total Health Expenditure Nominal Terms	1,474	1,209.70	1,383.40	1,666.10	1,196.30	1,142.10	1,265.20	1,464.10
Total Health Real Terms	881	619	708	800	547	497	525	578
Per Capita Health Nominal Terms	205.78	164.44	183.11	214.72	150.12	139.55	150.53	169.61
Per Capita Health Real Terms	122.99	84.14	93.71	103.10	68.64	60.73	62.46	66.96
% Annual Change Health Expenditure	0	-18%	14%	20%	-28%	-5%	11%	16%
Health as a % of GDP Nominal Terms	5.1	4	4	4	2	2	2	2
Health as a % of GDP Real Terms	7.2	4.6	4.9	5.2	2.9	2.6	2.6	2.8
Health as a % of GoPNG Expenditure Nominal Terms	16%	12%	11%	11%	8%	7%	8%	9%
Health as % of GoPNG Expenditure Real Terms	22%	15%	13%	13%	10%	9%	10%	10%
Development Partner funds to health sector								
HSIPTA	19.01	46.50	12.08	17.44	17.02	5.04	7.03	44.99
IFMS	138.9	113.4	260.7	378.7	307.3	3.0	1.0	150.5
Total DP funding	**158.0**	**159.9**	**272.8**	**396.1**	**324.3**	**8.0**	**1.0**	**195.5**
Percent DP expenditure of total GoPNG Health Expenditure	10.7%	13.2%	19.7%	23.8%	27.1%	0.7%	0.6%	13.4%

Total Government Health Expenditure in 2018 is in the order of 1.4 Billion Kina. Health expenditure trends 2011-2018 is erratic year to year, and not consistent or static, both at the agency level, as well as at the aggregate level.

Figure 2.4: Graph showing Total Health Expenditure



Development Partner contributions during this period have been inconsistent year on year. Total (GoPNG + DP) expenditure (per capita) has declined from K228/person (in 2011) to 192/person (in 2018 – a 16% fall. Development Partner expenditure in health has been variable, and on the whole, decreasing. In 1997, DP supported government health expenditure to the tune of 30%. In 2018, this was 13% (including a large portion focussed on Polio response).

In 2015, Domestic Private health expenditure amounted to 6%[16]. Over the course of the past 8 years, there has been less vigilance in utilising the Trust Fund (HSIP) by DPs. The establishment of PHAs is likely to see a greater commitment by DPs direct, bringing difficulty in coordination of total health expenditure.

The health sector portion of the GoPNG expenditure has reduced from 22% to 10%, now representing just 2% of GDP. Part of the difficulty with expenditure is delay in release of funds, whereby expenditure cannot be achieved with shortened time frames.

A domestic economic recession affected PNG in 2015. The economy is slowly recovering from this. Treasury economists have projected that the domestic economy will not improve until 2021. Nonetheless, the proposition of health sector share has decreased substantially. It is also proffered that delays in funds transfers occur late, resulting in an inability to expend. There are important reforms occuring. The sector has commenced moving toward facility based budgeting (FBB), with training and roll out about to commence in New Ireland, Morobe, and Eastern Highlands PHAs, as soon as funding for this activity is made available. Training and roll out to the rest of the PHAs will also follow suit, pending availability of funding.

It is observed that there has been little expenditure of DSIP funds for rural infrastructure.

The adoption of a social health insurance scheme is yet to be implemented in PNG. The reasons for this are stated as (a) the government does not have the fiscal capacity to implement it; (b) it has a high administrative cost, and (c) PNG does not have the expertise to manage the scheme.

[16] World Health Organisation, Health Systems in transition Vol 9 Number 1, 2019 p84

Figure 2.5: Percentage for Health of GDP

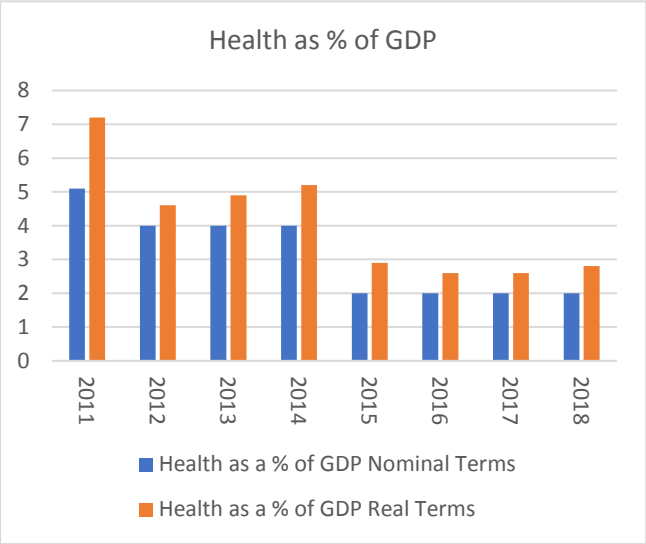


Figure 2.7: Percentage for Health via GoPNG

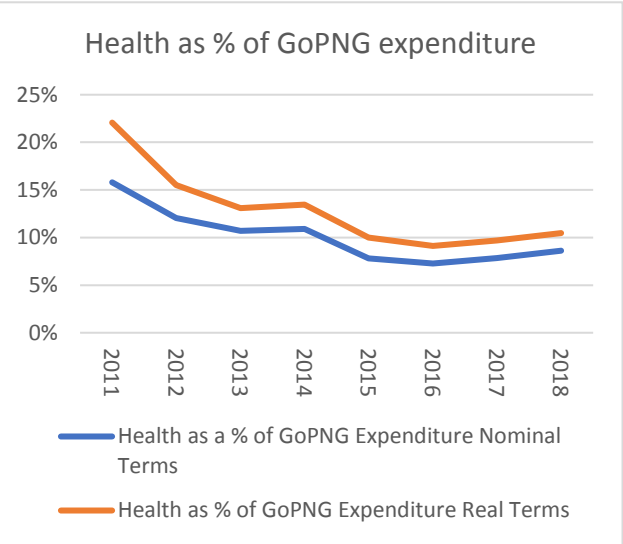


Figure 2.6: Kina/capita expenditure thru IFMS

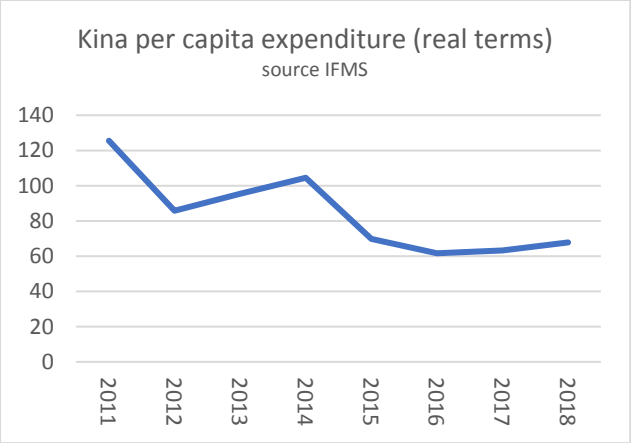
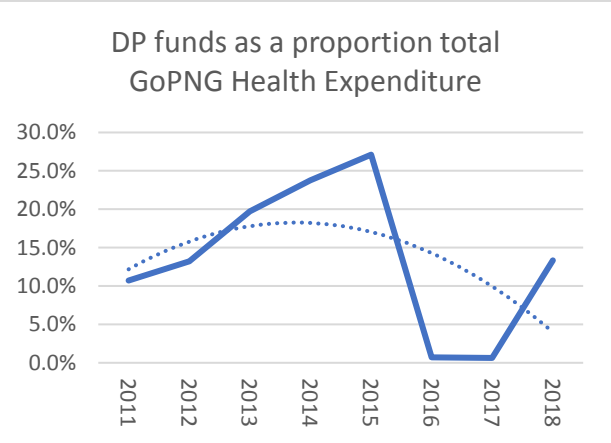


Figure 2.8: DP funds to GoPNG Health Expenditure



KRA 3: Workforce

Key points:

- The current health workforce numbers (population ratios) are well below requirement, and have steadily declined;
- Of the allocated GoPNG staff positions in health sector, 27% are vacant. These vacancies exist in priority areas; Approval to recruit lies outside of health sector, with DPM;
- The Higher Education sector does not have the capacity to provide for health sector requirement;
- Information systems within HR do not provide detail of whether skilled personnel (for example, midwives) are placed in facilities of need.
- There is evidence of poor supervisory skills, and low levels of supervisory support
- There have been pockets of skills development; however, there is little infrastructure or planning to address wide-scale in-service training.

The Human Resources for Health Strategic Plan has recent been drafted, identifying the core weaknesses of (a) lack of inter-sectoral coordination in implementing Human Resource (HR) policies, plans and programs; (b)

weak HR Information System to support other HR systems, and (c) Inadequate funding to rationalise basic HR standards.

Health Workforce information: The Human Resource Information System has been developed, and in part implemented. However, it is not fully operational, with constraints at IT level (concerns on data security). Detailed information on skills of staff at facilities is not available.

Population/workforce ratios: There has been progress toward the objectives of the HR Enhancement Plan, proposing 5000 graduates over a three-year period. The plan under-estimated the very limited capacity of the higher education sector to scale up pre-service training. Consequently, the per capita workforce ratios have further deteriorated, at levels incapable of delivering the health sector's objectives. There has been a steady decline in health worker population ratios over the past 30 years, especially so in nurses and CHWs. The Enhancement Plan (2011) report cited 1.27 health professionals (Doctors, HEOs, Nurses, CHWs) for every thousand population. The 2018 Headcount shows (in govt and church facilities) that that figure is now 0.97/1,000.

Pre-service training: There is an inability of training sector to keep up with demand. If improvement in Health worker/population ratios are considered in accordance with the PNG Development Plan 2010 – 2030, modelling shows that there is a requirement to graduate 7000 – 9000 health workers each year. In 2018, there were 42 doctors, 59 HEOs, 386 nurses and 172 CHWs graduated (total: 659; in 2017: 967)[17]. There is evidence that a number of these graduate are not absorbed into existing vacancies.

Figure 2.9: Health Workforce Vacancy by Cadre

Existing health workforce by category and by vacancy (GoPNG)[18]

Categories of Health workers	Staff on Ceiling	Staff on Strength	Vacancies/ Gaps	%unfilled positions
Medical Doctors	885	526	359	40.56
HEO	399	238	161	40.35
Pharmacist/Pharmacy technicians, Pharmacy Assistant	148	79	69	46.62
Dental	247	137	110	44.53
Nursing	3974	2762	1212	30.50
Community Health Worker	4058	3101	957	23.58
Allied health Professional	518	343	175	33.78
Health Technical/Paraprofessional	334	216	118	35.33
Health support Staff	2847	2087	760	26.69
Health Administrative	1715	1270	445	25.95
Management	195	137	58	30
Unattached	927	927	0	0
TOTAL	**16,247**	**11,823**	**4,424**	**27.23**

Staff vacancies: within Government-run health facilities and administrative units in 2018, there is a staff ceiling allocation of 16,247 positions. There is a 27% staff vacancy in these positions. It is stated that NDoH is limited in what it can do to address this, as Department of Personnel Management (DPM) determines recruitment ceilings and timing. Church Health Services and NGOs have much higher percentages of filled positions. These make up about a fifth of total health sector employees.

[17] National Human Resources for Health Strategic Plan 2021 – 2030 Draft, July 2019 version
[18] Source: HR Branch staff

Aligning skills with need: It is not clear how the HR activity and National Health Service Standards align. It is observed that nearly a quarter of all established positions are unfilled, with very high-level vacancies in priority programs (c.f. medical supply). Nor does there appear an active approach to strengthen staff allocation to areas where health indicators suggest most need.

Inservice training: Health worker skills have been highlighted as a concern in several reports. For example, the DHS (2016-18) survey showed that only 5% of children presenting with diarrhoea were provided with recommended treatments. The Ministerial Maternity Taskforce (2019) provides numerous examples of improper or inadequate treatment that contributed to maternal deaths. The Taskforce found that health workers of 30 years standing had never received upskilling on midwifery. There is limited information to quantify the level of in-service training. A program to establish training units in each province was conducted from 2013 – 2016 (Reproductive Health Training Units); this was not sustained after withdrawal of donor support. A program that placed 450 CHWs in provincial centres for a 6 month upskill was reported as successful (validation criteria have not been seen).

Supervision skills were highlighted as a concern in the report of the Health Facilities Survey[19]. It reports that only a very small number of facilities were supervised in the previous year. The same report provides evidence of compromised quality of supervision. In the 6 years from 2013 – 2018, there were 360 health workers trained in supervision. Notably, these were nearly all CHW and Nursing Officers. There were only 6 HEOs and no medical officers.

KRA 3: Medical Supply

Key Points:

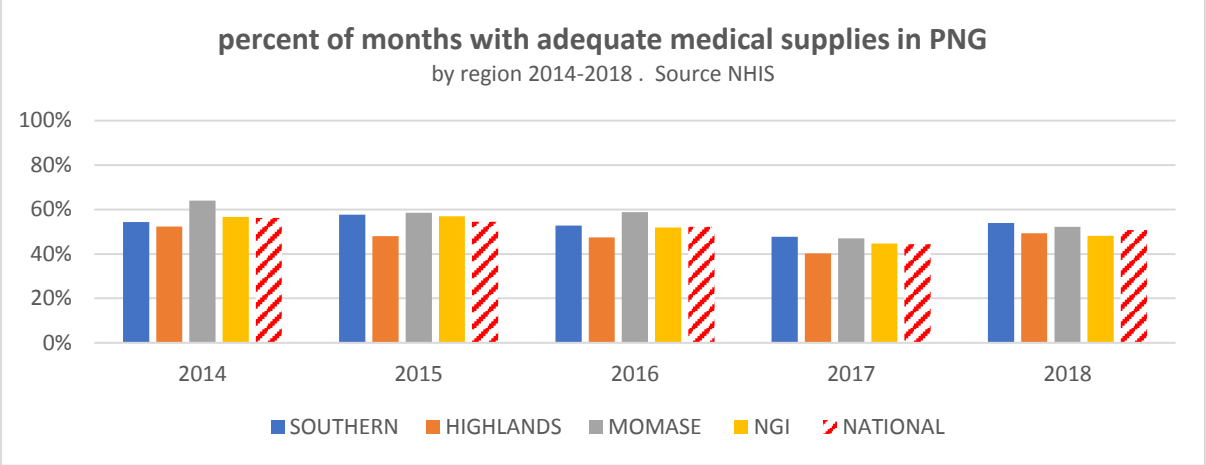
- Recommendations from previous reviews have been implemented, including establishment of a Standards section and commissioning of the National Medicines Quality Control Laboratory. The infrastructure of Area Medical Stores and provincial Transit Stores progresses, and the information system (mSupply) is now installed. These steps bode well in addressing the difficulties of medical supply;
- Weaknesses remain at facility level where poor capacity for management of pharmaceutical supply contributes to both high levels of wastage and stock-outs of essential medicines;
- Nearly half of the Pharmacist/Assistant positions are vacant.

The primary objective of this program is stated to re-establish an effective demand driven medical supply system. Good progress has been made on a number of fronts, including the improvement in distribution (enhancing Area Medical Stores, construction of Provincial Transit Stores (15 to date) and out-sourcing delivery), there has been separation of the Supply and Standards roles at the national level through the creation of a new Directorate. In support of a focus on quality, the National Medicines Quality Control Laboratory was established in 2018.

The capacity for *stock control* has been enhanced through the implementation of mSuppply, at this stage, at 15 hospitals, 5 Area Medical Store and NDoH levels only. While this is an important milestone, the observation is made that it is "just a tool" dependent upon the quality of data entered into the system.

[19] World Bank Group. Service Delivery by Health Facilities in Papua New Guinea, 2017

Figure 2.10: Percentage of months with Medical supplies in PNG 2014-2018



These enhancements provide promise; however, significant problems with medical supply persist. Stock-outs of essential medications persist, evidenced through the NHIS, and validated through two recent surveys. The Health Facilities survey[20] traced the availability of 45 medications in facilities. The drug availability index[21] was 49.1 (level 3&4 Gov. HF), 54.3 (Level 3&4 church HF), and 59.9 (level 5 & 6). A 2013 assessment[22] found 64% of facilities had the required WHO tracer medication, which is stated to be comparable with other countries. To counter these deficiencies, there remains a "push" system in place. It is the observation of senior management that consumption data is not forthcoming, and until that is the case, drug needs cannot be understood, leading to estimation of need which in turn lead to stock-outs. Speculation continues that medication 'leak' from supply chain to be sold in market settings. This results in Hospitals diverting funds from clinical service areas to prop up medical supply continuity.

The presence of pharmacy-trained staff has been demonstrated to enhance stock control performance. However, there are currently 46% vacancies of pharmacy/assistants on HRH strength.

KRA 3: Health Infrastructure

Key Points:

- Thirty to sixty percent of Level 3 and level 4 facilities are in need of major repairs;
- Aid Post closures continue, with currently 54% of all Aid Posts now closed;
- Outpatient service utilisation and outreach activity steadily decline
- Indicators of service quality, including staff knowledge and skills, and availability of supply show underperformance.

Infrastructure: A significant proportion (30% - 60%) of existing health level 3 and level 4 facilities are in need of major repairs. At the very least, adequate toilets, safe building infrastructure and stable water and electricity supply is required for all health facilities.

[20] World Bank Group. Service Delivery by Health Facilities in Papua New Guinea, 2017
[21] Drug availability defined as continuous availability of each of 45 drugs for the past 30 days without any stockouts.
[22] Burnett Report

Figure 2.11: Table showing Infrastructure Indexes for health facilities surveyed[23]

	Condition of toilet	Not many repairs needed	Condition other structural	Condition overall
Level 3 – 4 Public	38.6	38.6	66.0	51.3
Level 3 – 4 Church	57.6	46.4	73.7	62.0
Level 5 – 6	75.6	65.6	89.7	79.5
Level 7	100	100	100	100

Accessibility of health services is declining. Aid post (Level 1 facility) closures have continued, with current estimates that 54% of Aid Posts are closed. There have been 32 new Level 2 facilities (Community Health Posts) constructed, or in the process thereof (23 have been commissioned, 4 more completed awaiting commissioning, with another 5 under construction). An evaluation of these facilities is yet to be undertaken.

Utilisation of services continues to steadily decline, with a further 5% decrease over the past 5 years until 2018. Outreach services also decline with a fall of 9% from 2014 through to 2018. The reasons for these declines have not been examined in this Situation Analysis. However, commentary around the issue suggest that decreased available funding is a frequent cause. The Health Facility Survey reported that Lack of funding as the main reason that facilities were not able to conduct the planned number of outreach activities (76%).

Figure 2.12: Outpatient visits per person

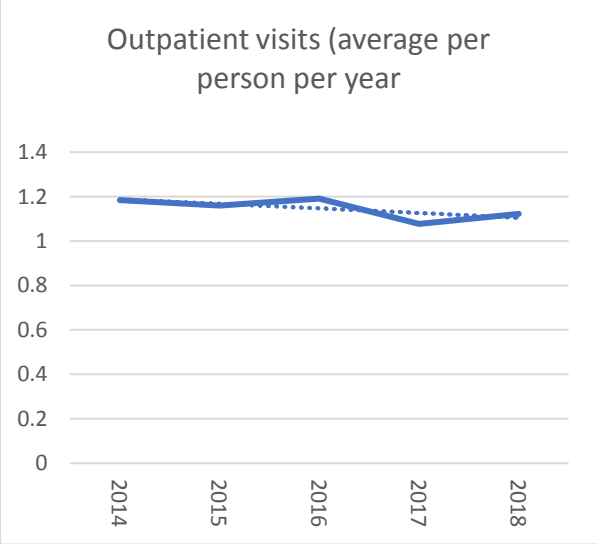
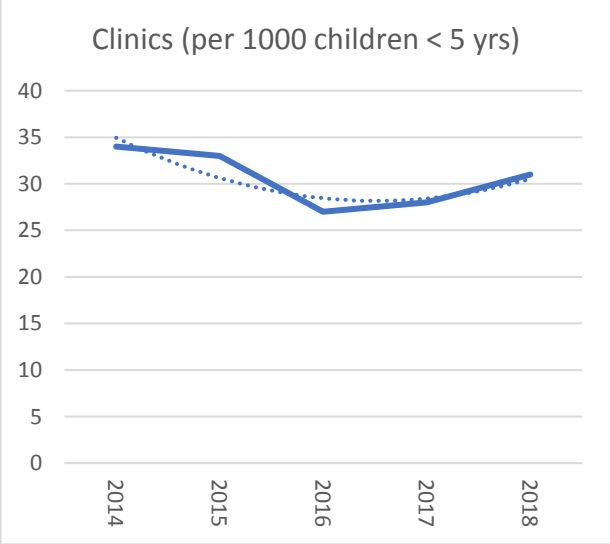


Figure 2.13: Under 5yrs for Clinics per 1000 children



Service quality, monitored by availability of supply and health worker knowledge, is inadequate; the Health Facility survey showed that rural facilities fell short of basic equipment and supply requirements for Antenatal Care and for delivery and neonatal equipment. The maternal taskforce identified important deficiencies in support for delivery: 82% had functional delivery bed in each delivery area, 88% supplies for cutting cord; 58% supply of oxygen. Only 54% of facilities had oxytocin available. These findings have been consistent with NHIS data and other survey data. Staff are an important contributor to the quality of care. The availability of

[23] World Bank Group. Service Delivery by Health Facilities in Papua New Guinea, 2017

skilled and knowledgeable staff is expected by the community. About 25 percent of nurse and CHW positions unfilled at Level 3 and 4 facilities). Supervision is sparsely conducted, with evidence of poor quality. There are examples, however, of the positive benefit of supervision.

The IMR Malaria indicator survey (2016/17) explored reasons for community not accessing the local health facility. There were 118 respondents who gave reasons for not visiting health facility for treatment. The most common reason was distance from the facility and availability and cost of transport. Other reasons included lack of medical supplies in facility; the physical quality of the facilities, the quality of care; and that the facility was closed.

Health facility and outreach services are the main carriage of clinical and public health efforts of the health sector to meet community need. There is a need to identify and resolve impediments to the provision of health care services at level 3 and level 4 facilities.

KRA 3: Performance Monitoring and Research

Key Points:

- Current capacity for Information warehousing within NDoH is inadequate for need;
- There are numerous databases across health and management systems. While these are well conceived and have capacity to serve the sector's needs, they are fragmented, with insufficient focus on quality and management;
- Information systems and communication technology are not realising their full potential.

Research is described as one of the seven drivers of the health system. The focal centre of research is the NDoH, hosting the Medical Research Advisory Committee (MRAC). This committee coordinates and vets applications for research throughout the country. Since 2013, The MRAC has met on a quarterly basis, receiving 494 research submissions, and approving 223. The Institute of Medical Research (IMR) is publicly funded and conducts biomedical and public health research in support of priority programs.

Reporting of real time data, tracking the implementation of key projects and programs, having sufficient reliable information for health planning, vital to proper management decision- making, need for improved reliable, sustainable and integrated health-based system, and improved use of ICT technologies and strengthening the NHIS (NDoH, 2016). The backbone of the health information system is the National Health Information System (NHIS), which is currently transitioning to electronic reporting format. There are a number of other management and information systems necessary for performance monitoring. These include Human Resources, payroll, finance management, supply, surveillance, hospital management. There has been no considered review of how these systems and the yielded data may be integrated for performance analysis.

The technology to support information and communication systems is built upon a server at the National Department of Health, managed by departmental staff. The ICT team report that the NDoH network security and ICT infrastructure for hosting of web-based and cloud-based databases is inadequate. The consequences have impact across all aspect of the daily functions of the health system, from departmental email systems, to stand alone databases, to an inability to support the Human Resource Information System.

Regular analysis of sector performance continues with quarterly reviews and annual reports. There are no data to report on the frequency and regularity of the quarterly review. The Annual Sector review (Sector Performance Annual Review) is produced by the PMRB. In recent years, this is published in the latter part of the year. The relationship of this report to annual activity planning is not known.

KRA 7: Health Promotion

Key points:

- There is limited evidence to analyse the performance of the Health Promotion programs. What evidence does exist suggests a focus on behavioural change with very limited success;
- Funding reductions to the Health Promotion sector has severely curtailed its ability to undertake core activities.
- Health Promotion is embedded as a key strategy across many programs.

The situational analysis has not received data on activity or outcomes from the Health Promotion Branch. The staff of the Branch remonstrate that decreased funds to the Branch have resulted in an inability to conduct core activity. Accordingly, there are no data to show progress toward the strategies of the NHP, nor the priorities.

Evidence of behaviour change in program reports is similarly scant. For example, utilisation of bed nets by children has not appreciably changed during the past decade (2016/18 = 52%). Only 8% received information in last three months [8.0 % rural, 8.2% urban (Islands 12.2%, Southern 5.6%)], with nearly half of these communications from health workers[24].

The revised NHP priorities (2016- 2020) provide emphasis upon Non-Communicable Disease (NCD). The primary and secondary prevention efforts needed here must embrace not only behavioural change, but encompass policy levers, environment change and social mobilisation. As discussed below, an ongoing failure to strengthen capacity in order to address these approaches will have important human and economic consequences.

KRA 7: Water, Sanitation and Climate Change.

Key Points:

- The role that the National Department of Health has in Water and Sanitation programs is limited; there is now a National Water Authority that carries responsibility. This shift in responsibility is not appreciated by program staff; the sector responsibility is to ensure water and sanitation services within health facilities, and to advocate at the National Authority that health needs are served. A National Policy is now present.
- The supply of protected water sources to rural communities is available to only a third of households; Eighteen percent of rural households have no toilet.
- The Health sector has not undertaken any significant water or sanitation projects since 2013.
- A draft strategy to address the health impacts of climate change has been prepared.

The highest level measures of water and sanitation are the capacity of the community to access clean and safe water (piped, covered well/spring, protected rainwater tank), preferably to their homes, and to dispose of faeces in a manner that will not create an environment of infection or contamination (through use of flush toilet, covered pit toilet). Comparison data is gained through the DHS (2006) and the IMR malaria indicator survey (2016/17). The sample size of the former is much larger than the Malaria Indicator Survey[25]

[24] IMR Malaria Indicator Survey, 2016/17

[25] DHS 2006 sampled 9017 HH (1807 urban, 7210 rural). The IMR survey sampled 2743 HH (250 urban, 2493 rural)

The sanitation capacity of Households in rural areas has not improved in the last 10 years, where 18% still defecate in the open setting, and 77% use an open pit or over-sea facility.

Figure 2.14: Table showing Household sanitation facilities

	Sanitation facility (%HH)										
	Flush toilet			Pit		pit latrine with slab		open pit latrine/over river, sea	none		
	2016-18 DHS	2006 DHS	2016-17 IMR	2016-18 DHS	2006 DHS	2016-18 DHS	2016-17 IMR	2016-17 IMR	2016-18 DHS	2006 DHS	2016-17 IMR
Urban	44	47	49	29.7	43	12.9	6.5	43.7	7	4.8	0.9
Rural	6.4	1.8	3.8	54.8	77	14.6	4.7	74.5	18	18	18.2
PNG	10.0	7	8.2	52.4	73	14.4	4.8	71.4	17	16	16.5

For access to clean and safe water supply, 66% of rural population continue to depend upon unprotected sources (2006 = 67%). Ten percent of urban populations depend upon unprotected water sources, an increase from 7% in 2006. While the recent urban sample size is too small to be conclusive, this negative change might represent the increase in poorly regulated urban settlements.

Figure 2.15: Table showing Household sources of water

	Source of water (%HH)							
	Piped to HH or locality (protected water source)			Water tank or protected well	Surface water: Spring/ river (unprotected water source)			open well
	2016 – 18 DHS	2006 DHS	2016-17 IMR	2016-17 IMR	2016 – 18 DHS	2006 DHS	2016-17 IMR	2016-17 IMR
Urban	83.2	70	53.6	35.2	16.5	7.1	7.4	2.8
Rural	41.5	9.9	11.6	23.5	58.1	67	58.3	7.4
PNG	45.5	16	23.4	24.7	54.2	60	53.3	5.8

A National Water, Sanitation and Hygiene Policy has been developed and published by Department of National Planning and Monitoring (2015). The National Department of Health states its role to oversee water and sanitation projects in the Provinces. However, there have been no activities to enhance household or village water supply during the past 7 years.

A draft strategy to address the health impacts of climate change has been developed in 2019. Formal adoption of this strategy is pending.

KRA 5: Maternal Health

Key points:

- PNG remains with a high fertility rate; 41% of women have an unmet need for family planning;
- The majority of maternal deaths result from post-partum haemorrhage or sepsis.
- Participation in antenatal care provides opportunity for health interventions, and increases the likelihood of a woman choosing to deliver in a supervised setting; participation in antenatal programs is steadily declining (NHIS reports 52%, DHS 76%);

- Supervised delivery rates continue to decline, with less than half of women choosing to deliver in a health facility. A number of health facilities still lack supplies and skills to provide safe delivery environment.
- There are inadequate staff with skills and knowledge to support all birthing facilities. The training of midwives and upskilling of CHWs has been an important contribution to this deficit. Very much more is required to address skills shortfall.

A recent ministerial taskforce has undertaken a thorough analysis of factors that contribute to adverse maternal and neonatal outcomes.

The DHS 2016 – 18 reports Maternal Mortality Rate (direct sisterhood method) at 171/100,000 births. The causes of maternal mortality remain predominantly a result of postpartum haemorrhage (PPH) and sepsis. There are a number of avoidable factors that contribute to these deaths. These include high parity, high prevalence of anaemia, and an unsafe delivery environment. Recent fertility estimates remain unchanged at 4.2 births/woman. However, currently uptake of family planning is likely to have some impact on fertility rate. NHIS data show a sharp rise in CYP in some provinces, very likely to be a result of distribution of Long Acting reversible Contraceptives (LARC) in a number of centres. The recent DHS, however, demonstrates that there is a still a high level (41%) of unmet need for contraception.

Figure 2.16: Family Planning (CYP) 2014-2018

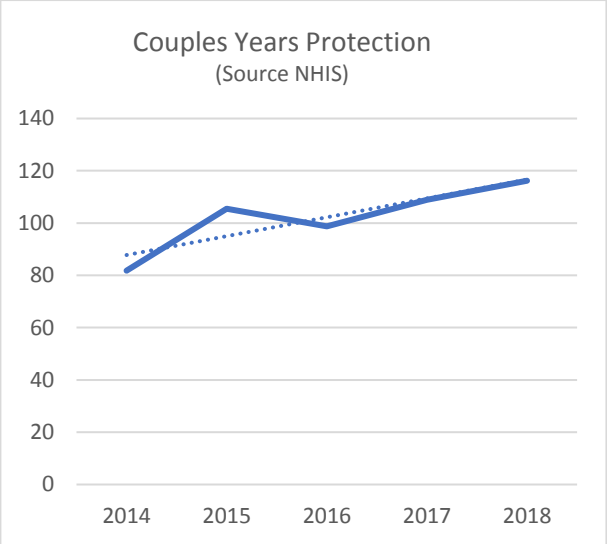
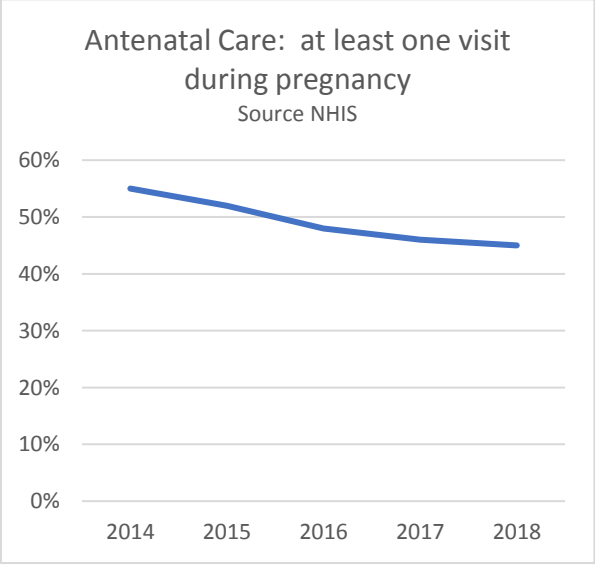


Figure 2.17: Antenatal Care 2014-2018



Women who do not participate in antenatal care are less likely not to deliver in a health facility. Fifty seven percent of women who deliver outside of a health facility compared with 17% who delivered in a health facility had no antenatal care (ANC) contacts[26]. There continues to be a decline in participation of ANC. The NHIS reports 52% of pregnant women attended for at least one visit. The DHS 2016/18 identified coverage higher than that shown in NHIS. In 2016/18, 76 % attended for at least one visit (84% in DHS 2006, 80% in 1996). While the figures are different, the trend is similarly showing less participation.

There is a correlation between home/community-based delivery and maternal death[27]. NHIS show that 37% of women delivered in facility in 2018; the DHS (2016/18) showed 55% (85% urban) facility births. (DHS in 2006: 54%; 1996: 53%). The NHIS shows lower rates, with a slight downward trend.

[26] Maternal taskforce, 2019 draft report
[27] Mola and Kirby paper, 2013

Quality of care within facilities raises concern. Fifty percent of maternal deaths occurred in health facilities, mostly level 3 and 4. Analysis of the centres shows shortages of critical medication and equipment and inadequate staff with poor skills and knowledge on delivery and neonatal care. The recommended threshold for skilled birth attendants (doctors, nurses and midwives) to provide adequate coverage is 23/10,000 live births. Currently the ratio at national level is 5/10,000 live births (Western 1.7 – Madang 15.9). A program to provide immediate redress of this concern was instituted through DFAT funding, resulting in 751 graduates of a midwife training program. Of these graduates, 41% are working in provincial hospitals and 32% working in district facilities. In 2016, a CHW upskilling program was put into place 6-month full time placement in provincial centres. In the three years since this program was commenced, over 200 CHWs (in 10 provinces) have been trained. However, despite this contribution, there remains a serious deficiency in trained birth attendants across all provinces. Pre-service training programs require review and development, and existing staff to be upskilled.

There are concerns on the quality of birthing facilities. Supply and equipment shortages prevail. Infrastructure problems continue, with 74% requiring major repairs; 44% had functional toilets in delivery areas and only 8% with functional hand hygiene stations. Eighty percent of delivery rooms are connected to water supply, although 62% had shortages during the last year.

There has been strong and considered development in relevant policy.

KRA 4: Child Health

- There is overall improvement in child health, with declining early childhood mortality and improvements in nutrition observed.
- The management of sick children in hospital is showing improved outcomes.
- Immunisation coverage continues to decline, with resultant outbreaks of preventable disease. Outreach clinics from health centres are less frequently undertaken.

(detail is provided in the Thematic Working Group report, appendix 2)

At the highest level of outcome data, there is improvement. Mortality rates of early childhood are declining steadily. The data from recent DHS (2016/18) is still incomplete in its analysis. It provides slightly lower rates than those captured through earlier surveys. It reports neonatal mortality 20/1000 live births, infant mortality 33/1000 livebirths and Under-5 mortality 49/1000 live births. About two thirds of early childhood mortality occurs in the first year of life.

Figure 2.18: Mortality Rate PNG; Infant & <5yrs 1971-2016

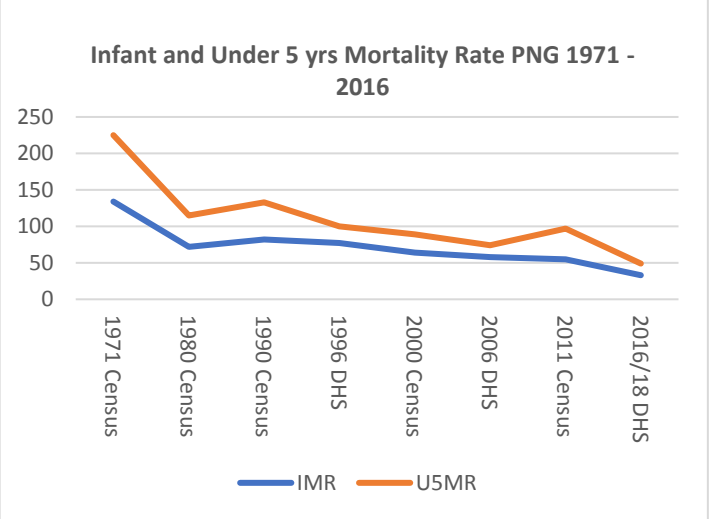
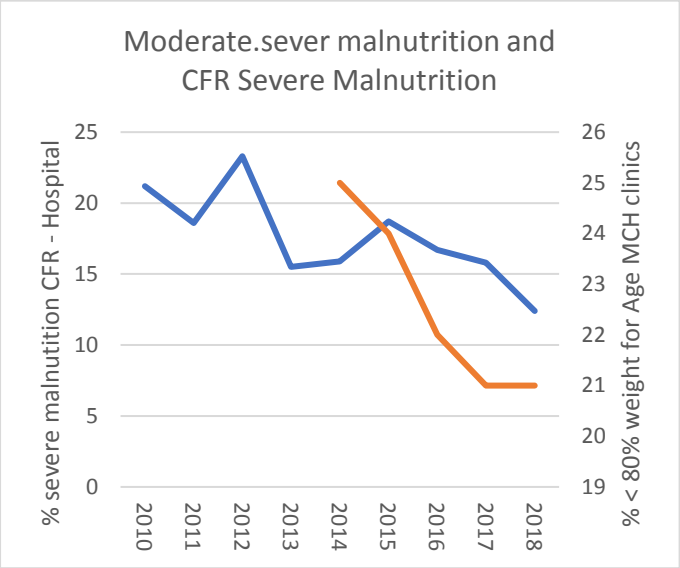


Figure 2.19: Graph showing Malnutrition 2010-2018



Levels of malnutrition are declining, and of those admitted to provincial hospitals with severe malnutrition, there is improved outcomes from management.

Hospital Management for childhood disease has improved performance on several indices. During the period 2009 – 2018, for patients admitted to Hospital, case fatality rates (all causes) have declined from 7.31 deaths per 100 admissions to 6.71[28]. Pneumonia case fatality rates from hospital admissions are reported as 3.5% in 2018. This has declined from a rate that has been at 4% - 5% for the decade prior. The hospitals morbidity and mortality report (2018) shows CFR for severe pneumonia to be 9.62% in 2018, down from the 10-year average of 11.16%. Pneumonia CFR at health centres (through NHIS) is not available at the time of writing. Case management within the hospital sector has improved, with declining CFR across a number of diseases. These improvements have been achieved through a number of measures, including:

- The introduction of the vaccines against Haemophilus influenzae and Streptococcus pneumoniae will contribute to prevention of pneumonia and meningitis. The low coverage of these vaccines suggests that greater impact can be achieved.
- Management of pneumonia is improved with better clinical care (achieved through training), provision of oxygen (oxygen concentrators) and pulse oximetry, and availability of antibiotics.
- Health seeking behaviour has improved marginally. The DHS 2016/18 reports that (for infections in the previous two weeks) ARI, 63% sought treatment; for fever 50% sought treatment; for diarrhoea 38% sought treatment.
- Following correct treatment regimens: for example, the DHS 2016/18 reports that for those who presented with diarrhoea, 30% were given ORS (2006 = 14%), and 7% given zinc supplements (5% given both).

Vaccine preventable disease outbreaks remain a risk, typified by the measles outbreak in 2013 and the emergence of polio in 2018. The low vaccine coverage underlines this risk. Example coverage from NHIS shows continued decrease.

Figure 2.20: Table showing Immunization coverage from NHIS

Immunisation Coverage (NHIS data)					
NHIS	2014	2015	2016	2017	2018
measles 9 – 11-month dose coverage	55%	40%	34%	32%	32%
Pentavalent 3rd dose	48%	46%	41%	38%	39%

Vaccine coverage is aggravated by inability to access fixed or outreach services and unavailability of vaccines (no data on vaccine availability). It is stated that 60% of MCH services are accessed through outreach. Outreach activity has declined a further 10% over the past 5 years.

[28] Child morbidity and mortality annual report, 2018

KRA 6: Malaria

Key points:

- Malaria prevalence was greatly reduced with intensification of the intensified malaria program (bed-net coverage, point of care testing and combination therapy); this has not been sustained, with prevalence in 2017 (7.1%) higher than that of 2011 (5.1%);
- The decline coincided with a gap in supply of test kits and medication. These stock-outs followed a sharp decline in funding to the program.
- Bed net utilisation is steady over the planning period with target group usage at 59% (children) and 63% (pregnant women).

The *current prevalence*[29] is 7.1% of people living below 1600m altitude (above 1600 m altitude 0.9% infected), rising from less than 1% in 2013/14). (2010/11 survey 5.1%; 2013/14 survey <1 %; 2016/17 survey 7.1%). Currently, 8.8% of children (less than 5 years) are infected. By region, overall, any species: Southern 4.2%; Highlands 0.7%; Momase 10.6%; Islands 2.8%. P falciparum most dominant parasite. Malaria associated morbidity**:** Anaemia is present in 62.5% all HH members, 3.5% severe anaemia. Splenomegaly (enlarged spleen) in children aged 2 – 9 years was found in 1.5%. (note WSP 17.8%).

The *prevention* of malaria is targeted on separation of the mosquito from the person. As the vector is night-feeding, bed nets (impregnated with insecticide) (ITN) has been the key strategy. Two recent surveys (IMR Malaria Indicator Survey 2016/17 and the DHS 2016/18) have examined current usage. Overall usage of ITN is 46% (urban) – 51% (rural), the Household ownership in the order of 70% - 80%. Target populations utilisation (under 5 years – 60%, pregnant – 63%) nearing the target of 65%. Net ownership has increased slightly (50% rural, 62% urban) since 2006. Similar findings in both DHS and IMR studies over time.

Figure 2.21: Table showing Percentage of Households with at least 1 ITN

Percentage of households with at least one ITN									
region	% HH with at least one ITN Target 70%		Average number of ITNs per HH		% Children under 5 years who slept under ITN last night Target 65%		% pregnant women who slept under ITN last night Target 65%		% HH population who slept under a LLIN last night Target 60%
	DHS	IMR	DHS	IMR	DHS	IMR	DHS	IMR	IMR
rural	71.7	80.0		2.4		59.6		63.4	51.8
Urban	68.3	83.7		3.1		57.8		9.8	45.8
Southern	84.4	89.0	2.6	2.8	59.3	71.3	61.5	67.9	59.5
Highlands	48.4	60.5	1.1	1.4	32.2	34.0	23.6	38.4	26.0
Momase	84.3	90.1	2.6	3.3	71.2	72.0	79.8	83.2	70.2
Islands	83.2	87.7	2.3	2.8	54.8	52.5	55.9	41.7	38.5

HH saturation with nets has not yet been achieved, with indifference found to be the main reason for non-use. Only 8% received information in last three months [8.0 % rural, 8.2% urban (Islands 12.2%, Southern 5.6%)], with nearly half of these communications from health workers.

Intermittent preventive Treatment (IPTp) of malaria in pregnancy is another important strategy of mitigation. Two doses of preventive treatment in pregnancy provides some level of protection against malaria. The IMR

[29] IMR Malaria Indicator Prevalence Survey 2016/17

(2016/17) survey demonstrates that urban women (64%, rural 48% receiving at least one dose), and women with greater wealth resources are more likely to receive treatment. Islands region has the highest coverage (Southern 55.7%; Highlands 44.3%; Momase 45.1%; Islands 66.8%).

Treatment: The IMR study (2016/17) found 44.5% of children with fever sought treatment (urban 84%, rural 42%), mostly at the health centre. The percentage of fever cases brought to a health facility has remained almost constant (below 50%) since 2009. Target is 65%. A diagnostic test (finger/heel prick) was done on 24.8% of all children who experienced fever. While testing rate has steadily increased, still only half of all cases who attend a health facility are tested. Proportion of treatment positive cases receiving first line treatment has further increased (71.7% children who took any antimalarial took ACT) yet remains below 100%.

In summary, a marked decrease in malaria incidence was achieved until about 2014/15, and there has been a subsequent resurgence of cases since then. Prevention measures are largely unchanged – with use of ITN at similar levels through the past decade, noting communication strategies having very limited reach. There is improvement in testing and treating. This does not explain the resurgence. Program staff have related two factors: (a) steady decrease in program funding since 2013; (b) there was a period of 6 month (around 2015/16) where there were widespread stockouts of diagnostic and treatment supply. It is assumed that this provided a window for higher levels of parasitaemia which have since been sustained. There is also speculation that the biting habits of the mosquito may have adapted.

Malaria remains a significant public health concern.

KRA 6: Tuberculosis

Key points:

- The 2016 prevalence study reveals 15%of population screened are TB smear positive.
- Case notification rates are 340/100,000 population (total 27,000 – 28,000 cases), of whom 42% are extra pulmonary TB; 3.4% of all new cases are drug resistant;
- Treatment completion rates remain at about 69%;
- Testing for HIV in TB patients has improved (56%), and most of those positive now receive ART (81%).

The most recent TB *prevalence* study was in 2016, where 0.4% of population were screened. About 15% of those screened were smear positive. Percentages vary across regions. Southern (0.78% screened, 15.8% positive); Highlands (0.22% screened, 7.6% positive), Islands (0.34% screened, 17.9% positive), Momase (0.44% screened, 17.9% positive).

Case Notification Rate of all forms was 340/100,000 (n = 27,569) in 2018. Extra pulmonary TB (42%), pulmonary TB without sputum (27%), confirmed pulmonary (25.9%); all TB confirmed (15.6%). The early rise in this prevalence may indicate a greater level of surveillance or increasing prevalence. Testing TB patients for HIV has generally improved from 15% in 2011 to 56 % in 2018. Over the last few years, of those patients with TB tested for HIV, 7% tested positive. ART coverage for TB-HIV co-infection has risen from 55% in 2010 to 81% in 2018.

Current estimates are that 3.4% of new cases are Drug Resistant (MDR/XDR), and 26% of retreatment cases have MDR/XDR-TB (428 cases in 2018). Nearly half of these cases are in NCD (=204) and a fifth in Western Province (=80).

Figure 2.22: Graph showing Case Notification Rate for TB Drug Sensitivity

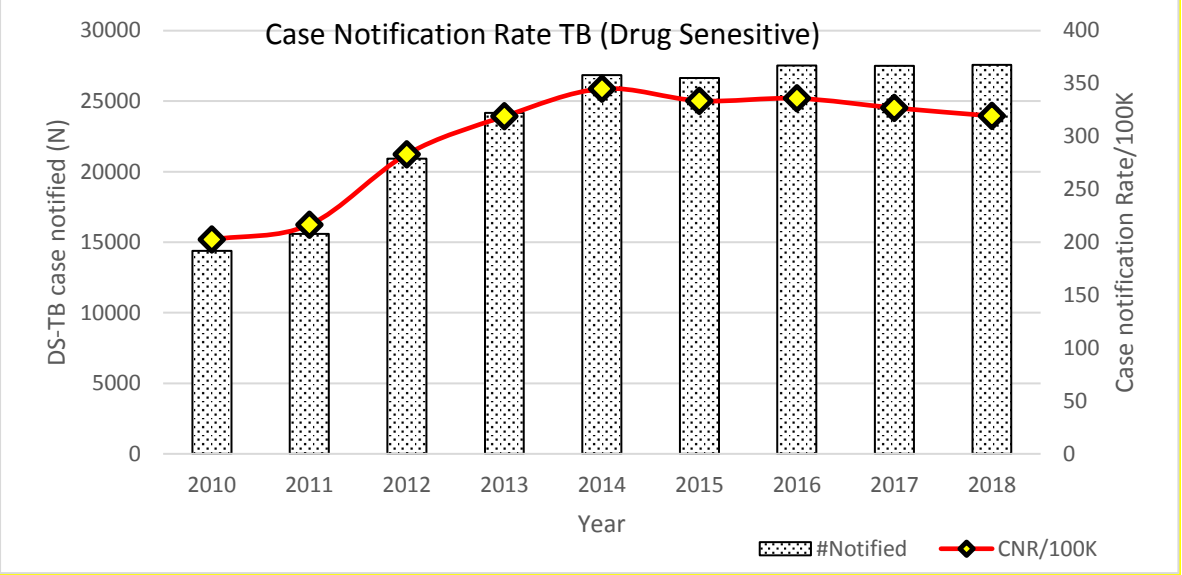


Figure 2.23: Table for TB Blister

TB Blister packs availability	
Level 3 and 4 Public	56%
Level 3 and 4 Church	66%
Level 5 and 6	92%
Level 7	100%

Treatment outcomes remain static at about 69% (2017 cohort). Treatment success for MDR- TB is 75%, and 63% for XDR-TB (2016 treatment cohort).

Supply of treatment: Shortages are observed at Level 3 and 4 facilities

KRA 6: HIV/Sexually Transmitted Infections

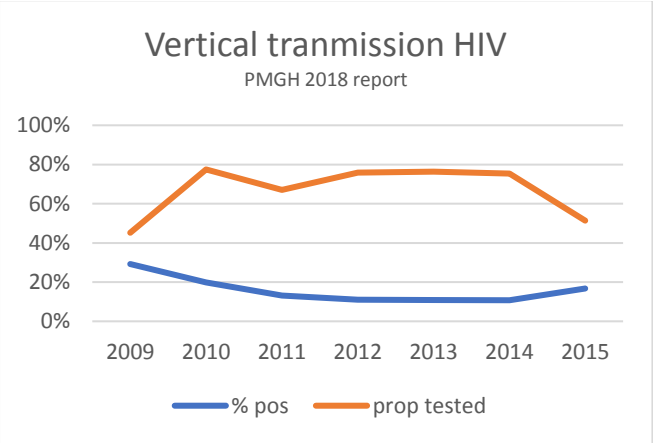
Key points:

- HIV currently infects 0.83% of population; in 2018, there were 3300 new cases of HIV (1856 female); Target groups (female sex workers 12 – 20%, men who have sex with men 7 – 8%) have higher prevalence;
- The majority of pregnant women are tested for HIV (92%), of whom 2.06% are positive. However, 19% of HIV positive pregnancy mothers gave birth to HIV positive infants;
- ART coverage is 62%; Only 56% of those who commence treatment remain on treatment at 12 months after commencing;
- Sexually Transmitted Infections appear to be at very high prevalence levels.

The prevalence of HIV in PNG (number of persons living with HIV) in 2018 is estimated at 47,413 persons (0.83% of population). This has increased from 31450 (0.71% of population) in 2010. The incidence of HIV in PNG (number of new cases diagnosed during the year) in 2018 is 3,300 new infections (40 cases for every 100,000 population) (females 45/100,000; males 35/100,000). This has increased from 2260 new cases in 2010. AIDS-related deaths have modestly decreased from 753 deaths in 2010 to 454 deaths in 2018. (*source 2019 spectrum estimates).*

In 2018, 92% of pregnant women were tested for HIV (2016 = 82% tested). HIV positivity at Antenatal testing in 2018 was 2.06% (2016 – 2.18%). Vertical transmission (Mother to child) has remained steady in recent years. In 2015 (data incomplete) there were 19% of mothers with positive HIV serology gave birth to HIV positive babies at PMGH. HIV testing in pregnancy at PMGH ranges from 50% – 78%. The persistent levels of mother to child transmission is of concern, contributed to by low levels of ANC. ART therapy in pregnancies where HIV has been identified is 68% in 2018.

Figure 2.24: HIV vertical Transmission for PMGH 2009-2015



Treatment coverage overall has improved with 62% (n= 29,420) ART coverage in 2018 (2010 was 25% ART coverage). In 2017, only 56% of people commencing ART were still on treatment after 12 months (2014 = 41.5%).

Prevention activity: there is limited knowledge of prevention strategies (52% women, 58% men) know that using condoms is protective against HIV, 68%/74% know limiting to one uninfected sexual partner is protective. Women and men in urban areas are more likely to be knowledgeable about HIV prevention than their counterparts in rural areas. Knowledge generally increases with age and educational attainment. (DHS 2016/18)

Key populations (for example, Female Sex Workers [FSM], Transgender [TG] and Men who have Sex with Men [MSM]) are prioritised as the most likely repository of HIV and hence potential avenues of dissemination. These are a primary target of prevention activity. It is noted that outreach workers are not reaching key populations: for example, 31- 51% of FSWs and 26 – 35% of TG/MSM have never had an outreach worker talk to them about HIV. Condom use (with casual partner) at last vaginal sex (32- 44% FSW) and last anal sex (7 – 37% FSW, 30 – 42% for TG/MSM).

High levels of STIs seen in these key populations: 52 – 61% FSW and 34 – 47% TG/MSM had at least one STI[30]

[30] Integrated bio-behavioural survey 2018

Figure 2.25: Table showing Prevalence of HIV, Hepatitis B and STI in PNG

Population	HIV prevalence	Syphilis prevalence	Gonorrhoea prevalence	Chlamydia prevalence	Hepatitis B prevalence
FSW†	11.9 - 19.6%	3.0 – 7.2%	15.4 – 21.5%[U]	29.7 – 32.5%[U]	9.3 – 10.8%
			15.1 – 22.6%[A]	31.8 – 32.1%[A]	
MSM/TG†	7.1 - 8.5%	4.0 – 8.3%	3.6 – 7.5%[U]	12.3 – 14.5%[U]	11.6 – 13.8%
			4.6 – 7.1%[A]	6.5 – 9.6%[A]	
Adults 15 – 49 years	0.9%*	4.6%*	13%*	19%*	6.6%‡

FSW = female sex workers; MSM = men who have sex with men; TG = transgender [U] Urogenital; [A] Anorectal
** Source: 2018 Spectrum estimates; †Source: 2018 IBBS report,*
‡ Source: Razavi-Shearer et al, Global prevalence, treatment, and prevention of hepatitis B virus infection in 2016: a modelling study. The lancet Gastroenterology & hepatology. 2018 Jun 1; 3(6):383-403.

The levels of syphilis in the community remain of concern, with 4.6% of pregnant women testing positive, resulting in 2 cases of congenital syphilis for every 100 births.

KRA 8: Preparedness for Disease outbreaks

Key Points:

- Surveillance and response capacity have been enhanced by the training of 90 field epidemiologists
- Since 2012, there have been 69 events investigated by the surveillance team;
- National disaster response is limited by the lack of Emergency Medical teams and mental health teams.
- The National Reference Laboratory for public health concerns is the limits of its capacity, with recognised need for expansion of role, scope and greater provincial presence.

Surveillance and response: from 2012 – May 2019, there were a total of 69 outbreaks/urgent events, with nearly 15% of these occurring in Morobe Province. Twenty four percent of these were confirmed in laboratory. Seventeen percent of reports were for diarrhoeal disease. Detailed assessment of the capacity and rigour of response has not been undertaken. The team, however, indicated that surveillance remains weak with respect to coverage, timeliness, completeness and quality of information reported. Capacity has been enhanced through the training of nearly 90 Field epidemiologists, most of whom are placed in provinces and districts. There were 3 Rapid Response Teams (provincial level) established in 2018.

Disaster response capacity: The Surveillance Team note that the surveillance unit is the default centre for response to disaster events, for which they are poorly equipped for. They report that there is no formal emergency medical response team, nor mental health team, leading to weak capacity for appropriate response in urgent situations.

Public Health Laboratory: The Central Public Health Laboratory plays a pivotal role in an environment of significant public health challenges. Longitudinal tracking of workload is not available. However, its current roles encompass:

1. Laboratory diagnosis of Public Health diseases such as, Tuberculosis, Human Immunodeficiency Virus (HIV), Vaccine Preventable diseases (VPD) including Measles and Rubella, and also provides Serological diagnosis of Syphilis, Typhoid, Dengue, Cryptococcal Meningitis and Chikungunya. This support is mainly provided for the patients at PMGH, whilst Measles and Rubella testing is provided for the entire country.

2. Surveillance on the above Public Health diseases in collaboration with the Surveillance unit of National Department of Health (NDOH), especially involving the Vaccine Preventable diseases described above, including outbreaks.
3. External Quality Assurance programs in TB, HIV, and malaria, and also participating in selected International QA programs.
4. Conducting training of technical staff in techniques and quality diagnosis in TB, HIV and malaria.
5. Validation of new diagnostic kits.
6. Supervisory roles by way of Provincial supervisory visits.
7. Research involving validating newer diagnostic techniques and assays.

The roles are mainly conducted in a centralised manner, although the limited public health roles being undertaken in provincial laboratories (for example, TB testing, Rapid Diagnostic Kits) is supported by CPHL. Observation was made that there is limited attention given to transfer of specimens back to the central laboratory, with inadequate attention given to timeliness and stability of temperature environment.

Papua New Guinea National Health Plan

Situational Analysis, 2019

SECTION 3: EPIDEMIOLOGICAL PROFILE 2019

Disease burden in Papua New Guinea 2020

This section of the report identifies what diseases are contributing to the overall burden of ill health in Papua New Guinea. It provides a snapshot of the significant disease issues – experienced by population groups, and also presented in profiling current prevalence, incidence and the need for prioritisation. It is organised in the following way:

1. A profile of morbidity and mortality: what are the diseases that cause most death and illness;
2. Illness at life stages:
    - Childhood
    - Adolescence
    - Woman and their reproductive health
    - People living with disability
3. Epidemiological profiles
    - Non-communicable Diseases
    - HIV
    - Sexually Transmitted Infections
    - Malaria
    - Tuberculosis
    - Neglected tropical diseases
    - Cancer
    - Injury
    - Mental health – NO DATA

There is limited availability of regular and accurate information to enable an overall and confident assessment of the disease burden in Papua New Guinea, notwithstanding a number of health information systems. The assessment of burden is gained from

- the National Health Information system,
- the Hospital Discharge Information System,
- periodic surveys, including the national census, national demographic and health surveys, program surveys (for example, malaria indicator survey),
- Other selective approaches, including verbal autopsies, and specific research activities,
- Mathematical modelling based upon past assessment and regional profiles.

There is both merit and difficulty in each to these approaches. The following appraisal draws on a consolidation of these approaches.

The overall picture: Mortality and Morbidity

Summary points:

- There is overall improvement in life expectancy and early childhood mortality observed over decades
- The provinces with higher levels of infant and childhood mortality, lower life expectancy, and higher adult mortality rates are all provinces of the Highlands (except Eastern Highlands and Jiwaka), all provinces of Momase, and Gulf Province in the Southern Region. These provinces are also most disadvantaged on socio-economic indicators (education, poverty, health access).
- Non-Communicable Diseases are the chief cause of death (40%), with a shift toward diabetes, ischaemic heart disease and stroke. Infections, however, remain an important contribution to death (21%), and death from injury also accounting for nearly a fifth of all deaths (19%).
- Facility presentations show no distinct change, with respiratory conditions, skin conditions, malaria and diarrhoeal diseases the most common cause for presentation to a facility. For admission to a facility (other than obstetric reasons), respiratory, infections and injury being the most common reasons.

Mortality

Estimating mortality

Reliable data on the levels and causes of mortality are cornerstones for building a solid evidence base for health policy, planning, monitoring and evaluation. Civil registration Systems (recording and registration of all births and deaths) provide the most definitive approach to understanding the births and deaths in the nation. However, this is currently not in place in Papua New Guinea, although in some districts, "village recorders" keep these data. The National Health Information System (NHIS) and the Discharge (Hospital) Information System do not provide the complete picture, as only about a quarter of deaths occur in health facilities. Periodically, surveys are undertaken that enable an estimation of mortality rates. For example, the National Censuses and the Demographic and Health Surveys ask of deaths in households over a given period of time, providing an indirect approach to quantify deaths. This has been applied in PNG since 1966 and provides a reasonably consistent approach. However, methodological concerns (for example, the 2011 census demonstrates implausibly low mortality estimates) warrant corroboration of data over multiple surveys. Early childhood mortality, adult mortality and life expectancy estimates presented here are based upon projections derived from periodic surveys. Maternal mortality has similarly proved to be difficult to estimate, with different methods (for example, surveys, mathematical modelling) yielding widely variable results. The recent DHS estimates are pending.

Cause of death:

Given the limitations outlined above with incomplete death reporting, an alternative approach to determine cause of death has been tried in PNG. Verbal Autopsy (VA) provides a public health tool for obtaining a reasonable direct estimation of the cause structure of mortality at a community or population level, although it may not be an accurate method for attributing causes of death at the individual level. It is based on an interview with next of kin or other caregivers using a standardized questionnaire that elicits information on signs, symptoms, medical history and circumstances preceding death. The cause of death, or the sequence of

causes that led to death, are assigned based on the data collected by a questionnaire and any other available information[31].

Quantifying overall mortality

Early childhood mortality

Infant mortality and under five-year mortality rates have declined over the past four decades. The rates in urban areas are lower than rural areas, and there remain several provinces where these mortality rates are persistently high. Especially so in the Highlands provinces, Momase region and Gulf Province. The mortality rates reported in the DHS 2016-18 are generally lower than those reported in the census. Both are provided here:

Figure 3.1: Graph showing Early Childhood mortality by region

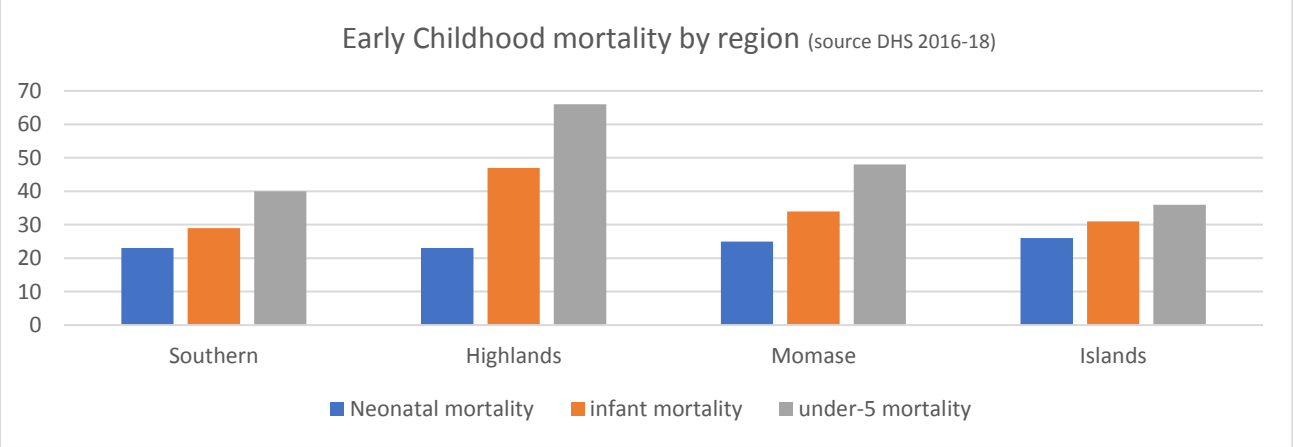


Figure 3.2: Graph showing 2 sources of IMR

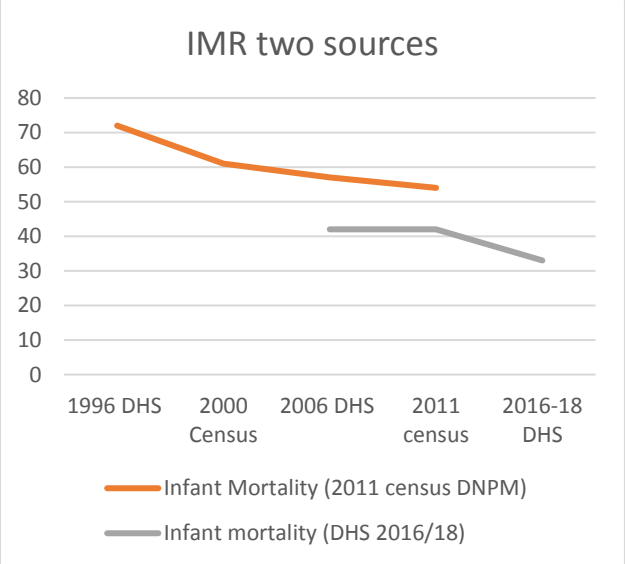
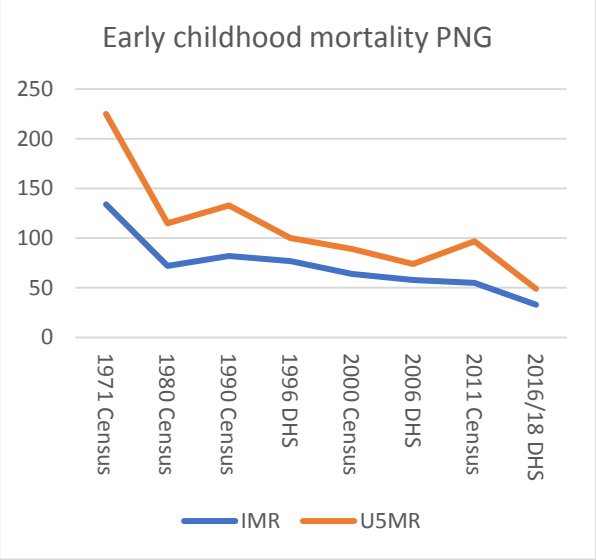


Figure 3.3: Graph showing Early Childhood Mortality



[31] Verbal autopsy standards: The 2012 WHO verbal autopsy instrument Release Candidate 1

Figure 3.4: Table showing IMR & Under 5 years Mortality Rate

		Total	Male	Female		Total	Male	Female		Total	Male	Female		Total	Male	Female
	Southern Reg.	42	43	41	Highlands Reg.	68	70	65	MOMASE Reg.	71	72	70	Islands Reg.	49	51	47
Infant Mortality Rate 2011 Census	Western	48	49	47	SHP	72	77	66	Morobe	69	69	69	Manus	42	41	43
	Gulf	75	76	74	Hela	72	77	66	Madang	68	66	69	New Ireland	48	50	47
	Central	34	35	33	Enga	82	81	82	East Sepik	67	69	65	EN Britain	51	54	48
	NCD	21	22	20	WHP	57	59	55	West Sepik	89	89	89	WNB	51	52	50
	Milne Bay	51	53	49	Jiwaka	57	59	55					ARB	45	48	41
	Northern	43	44	41	Chimbu	65	64	65								
					EHP	61	66	55								
	Southern Reg.	77	79	74	Highland Reg.	114	117	111	MOMASE Reg.	122	124	119	Islands Reg.	87	92	81
Under 5 Mortality Rate 2011 Census	Western	87	89	84	SHP	119	128	112	Morobe	118	119	117	Manus	75	75	74
	Gulf	132	135	129	Hela	119	128	112	Madang	116	114	117	New Ireland	86	90	81
	Central	63	65	60	Enga	137	135	138	East Sepik	115	119	111	EN Britain	90	97	82
	NCD	39	41	37	Western H.	97	100	94	West Sepik	150	151	149	WN Britain	90	93	86
	Milne Bay	92	96	87	Jiwaka	97	100	94					ARB	79	87	71
	Northern	77	80	74	Chimbu	110	108	111								
					Eastern H.	103	111	94								

Life expectancy

Life expectancy at birth and at 25 years of age has increased. (2011 Census data modelling)

Figure 3.5: Table showing Key Mortality Indices

Key Mortality Indices	All sectors combined			Rural Sector			Urban Sector		
	P	M	F	P	M	F	P	M	F
IMR (‰)	55	55	54	59	60	57	30	31	28
U5MR (‰)	97	98	95	103	105	100	56	58	54
e_0 (yrs.)	56.8	56.3	57.3	56.0	55.6	56.5	62.2	62.4	62.1
e_{25} (yrs.)	40.5	40.1	40.9	40.2	40.0	40.5	42.8	43.1	42.5

Key Mortality Indices	Southern Region			Highlands Region			MOMASE Region			Islands Region		
	P	M	F	P	M	F	P	M	F	P	M	F
IMR (‰)	42	43	41	68	70	65	71	72	70	49	51	47
U5MR (‰)	76	78	73	114	117	110	122	124	120	87	92	81
e_0 (yrs.)	59.5	58.6	60.4	55.4	55.2	55.7	53.7	53.1	54.3	58.7	56.8	60.6
e_{25} (yrs.)	41.6	41.0	42.3	40.5	40.5	40.5	39.3	38.9	39.7	41.6	40.2	43.1

Figure 3.6 Maps showing Adult mortality by gender and province[32]

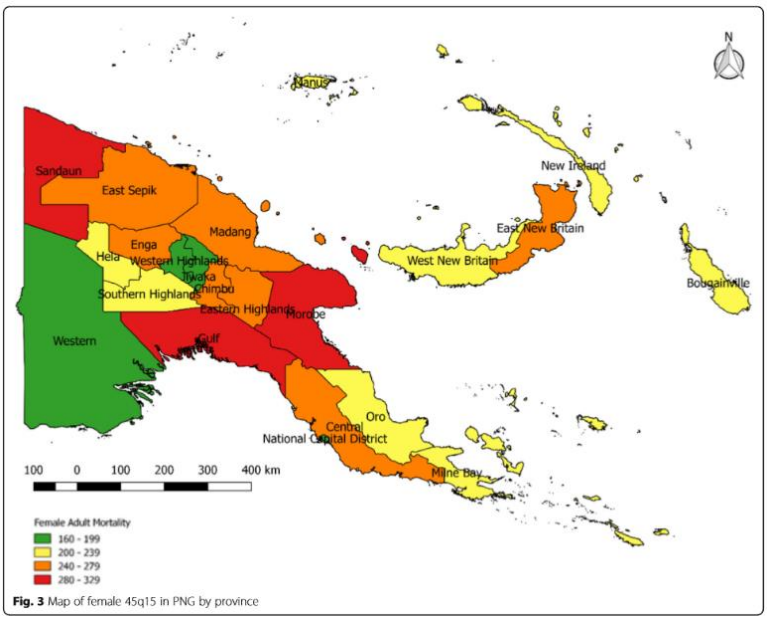


Fig. 3 Map of female 45q15 in PNG by province

The provincial adult mortality estimates for 2011 show substantial variation, ranging from 197 per 1000 in Simbu to 356 in Sandaun for males and 171 in National Capital District to 326 in Gulf for females. Provinces with the highest Adult mortality are found in the Highlands region (Enga and, for males only, Southern Highlands/Hela), Momase region (Sandaun, East Sepik, Morobe and Madang) and Gulf in the Southern region.

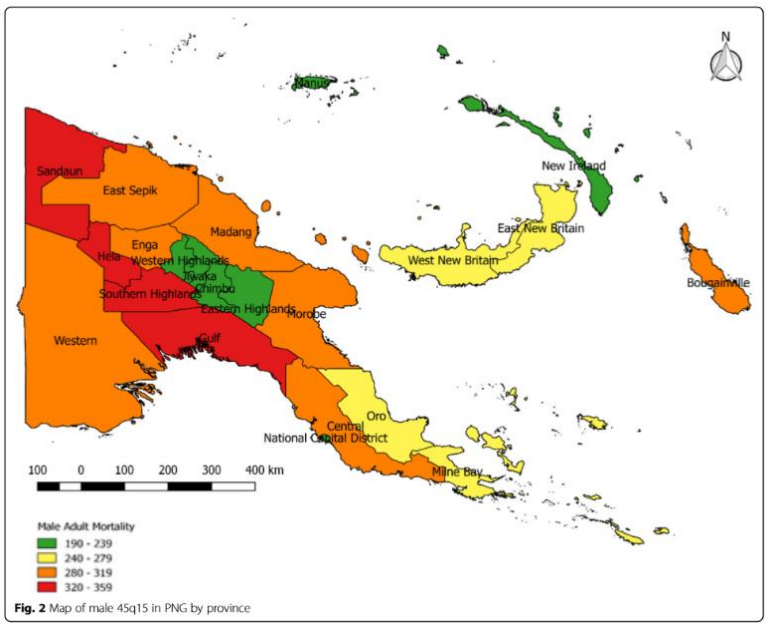


Fig. 2 Map of male 45q15 in PNG by province

These provinces contain some of the most remote communities with very limited access to health services and low socio-economic status; this is reflected by Sandaun, Enga, Southern Highlands/Hela and Gulf having the lowest Composite Index scores (see below).

The lowest adult mortality is found in the National Capital District, the island provinces of Manus and New Ireland and the Highlands provinces of Western Highlands/Jiwaka and, for males only, Eastern Highlands. These findings are consistent with the relatively high Composite Index for these provinces, (that is more developed provinces with relatively good levels of education and access to services, as well as their low levels of child mortality).

These estimates rank male adult mortality in PNG as 142nd out of 195 countries in the Global Burden of Disease and rank female adult mortality as 154th.

[32] Kitur U, Adair T, Lopez A. *Estimating Adult Mortality in Papua New Guinea, 2011*, Population Health Metrics (2019) 17:4

Figure 3.7; Graphs showing Adult mortality by socio-economic opportunity

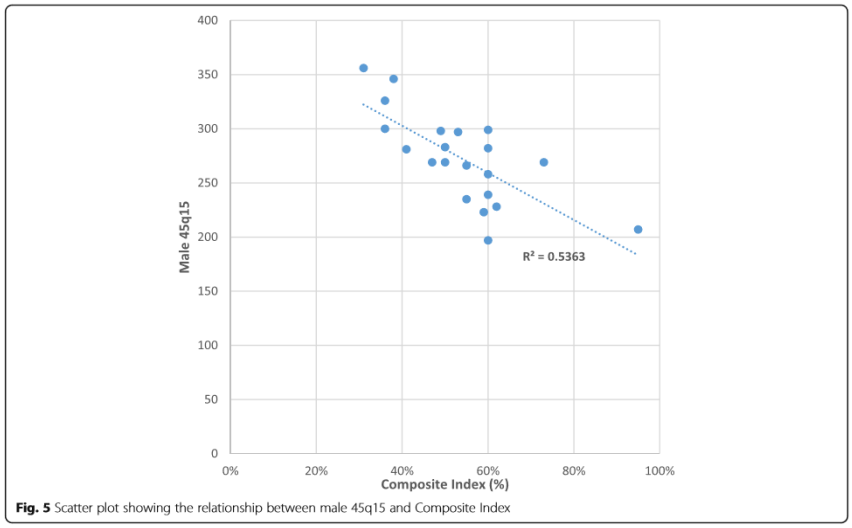


Fig. 5 Scatter plot showing the relationship between male 45q15 and Composite Index

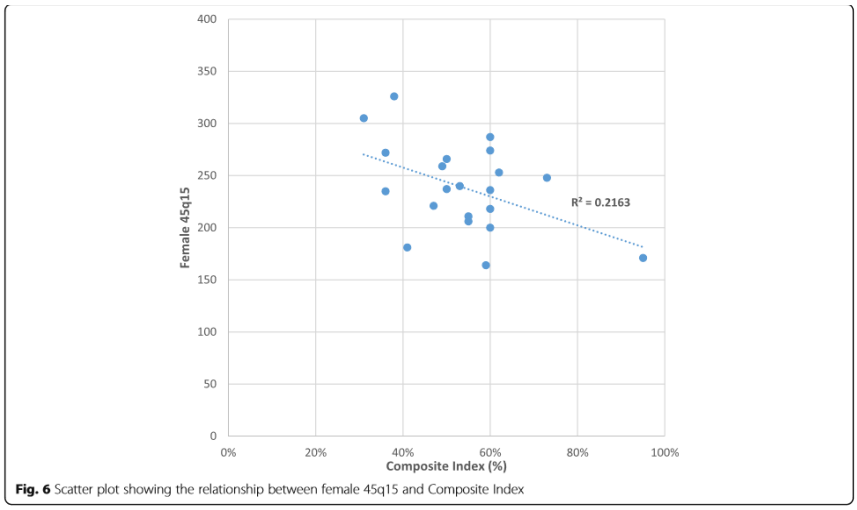


Fig. 6 Scatter plot showing the relationship between female 45q15 and Composite Index

The Kitur study uses a *Composite Index* calculated as the arithmetic mean of education, economic and health access indicators. The education indicator measures the net admission rate (percentage of children aged 6 years who were admitted to elementary prep school) and female literacy rate; the economic indicator is an average of poverty levels as assessed by the World Bank based on basic food and non-food expenditure and the proportion of people engaged in paid work activities from the 2011 census; the health access index was computed based on information about the number of health workers per population and the immunisation rates from the 2010-2011 Sector Performance Annual Review.

The scatter plots show a linear relationship between a higher Composite Index (more advantaged) and lower adult mortality.

Similarly, the 2016 -18 DHS also demonstrated a strong relationship between social development (levels of wealth available to household, and levels of education) and health seeking behaviour.

It can be concluded from this analysis that:

- There is overall improvement in life expectancy and early childhood mortality.
- Several provinces (Sandaun, Gulf, Southern Highlands, Hela, Morobe) have higher levels of infant and childhood mortality, lower life expectancy, and higher adult mortality rates. These provinces are most disadvantaged on socio-economic indicators (education, poverty, health access).
- There is a linear relationship showing the higher the level of wealth, education and access, the lower the levels of mortality.

Cause of Death

A recent study[33] (2010 – 2014) undertook mortality surveillance (1094 deaths) in four small populations across PNG: West Hiri in Central Province, Asaro Valley in Eastern Highlands Province, Hides in Hela Province and Karkar

[3333] Gouda et al, The epidemiological transition in Papua New Guinea: new evidence from verbal autopsy studies. International Journal of Epidemiology, 2019, 1–12

Island in Madang Province. Verbal autopsies (VAs) were conducted on all deaths identified. Causes of death were classified into five broad disease categories: endemic NCDs; emerging NCDs; endemic infections; emerging infections; and injuries (see below). Results were compared with previous PNG VA studies (using different VA methods) and spanning the years 1970 to 2001.

Figure 3.8: Table showing Analysis of Adolescents & Adults deaths by Verbal Autopsies

Analysis of adolescent and adult deaths by VA		
Disease category	**1970–2001**	**2009–2014**
Endemic infections	33.9%	9.5%
Emerging infections	2.7%	11.9%
All infections	**36.6%**	**21.3%**
Endemic NCDs	40.1%	25.6%
Emerging NCDs	0.5%	14.7%
All NCDs	**40.6%**	**40.3%**
Injuries	8.8%	19.1%
Undetermined	15.6%	19.2%
Totals	**100.0%**	**100.0%**

prominence as a cause of death, while endemic infections with lesser contributions. These transitions toward NCD have been anticipated with previous modelling, although infectious diseases continue to contribute to mortality more so than anticipated.

Morbidity

Like the difficulty of understanding the cause of deaths, similar difficulties arise in the assessment of illness. The National Health Information System and Discharge Hospital information Systems provide an insight into the conditions that community members present to health facilities (as outpatient), and their discharge diagnosis if admitted.

The leading reasons for presentation to health facilities in 2018 (NHIS) are upper and lower respiratory tract concerns, malaria, skin

The results show that Non-Communicable Diseases (NCD) account for most deaths. However, infectious diseases still contribute to much mortality. Injuries accounted for 19.1% of deaths. The study showed an important shift in cause of mortality with the earlier comparison data. Diabetes, Ischaemic Heart Disease, lung cancer and stroke have become more prominent. Infectious diseases remain a concern, although not as significant contributor to previously, with TB, HIV and Cervical Cancer (HPV) rising in

Figure 3.9: Table showing endemic/emerging infections & NCDs

Key: inclusions of diseases endemic/emerging infections and non-communicable diseases

Endemic NCDs
- Chronic respiratory diseases (COPD/asthma) [J40-J46]
- Cirrhosis [K70-76]
- Renal failure [N17-N19]
- Breast cancer [C50]
- Colorectal cancer [C18-21]
- Oesophageal cancer [C15]
- Leukaemia/lymphoma [C81-C85; C91-C96]
- Prostate cancer [C61]
- Stomach cancer [C16]
- Other cancers
- Other cardiovascular diseases
- Other digestive diseases
- Other NCDs

Emerging NCDs
- Diabetes [E10-E14]
- Ischaemic heart diseases [I20-I25]
- Lung cancer [C34]
- Stroke [I60-I69]

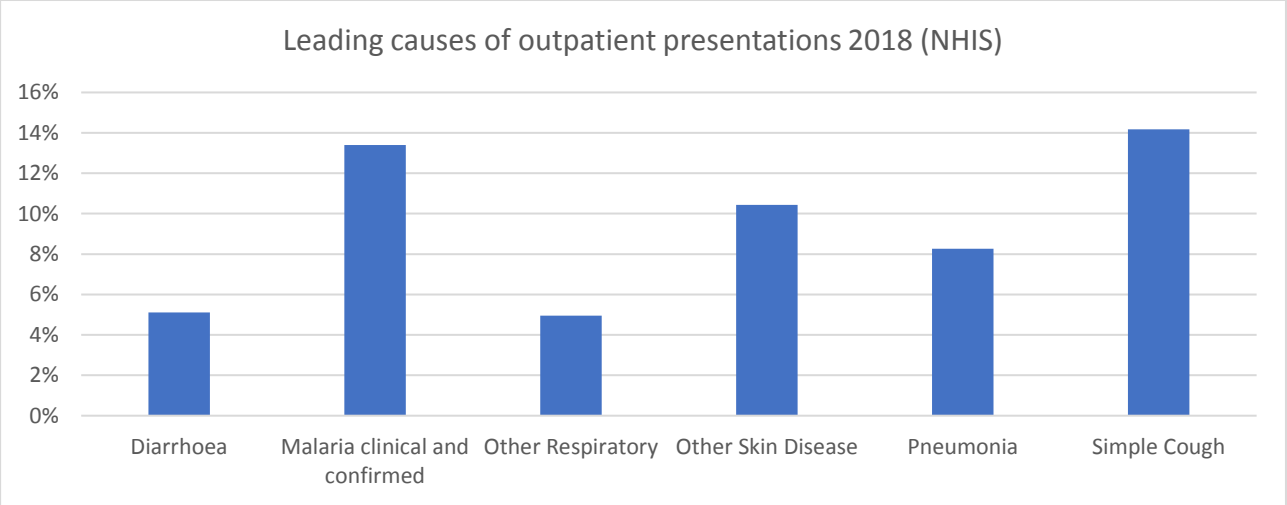
Injuries
- Bite of Venomous Animal [X20-29]
- Drowning [W65-W74]
- Falls [W00-W19] Fires [X00-X19]
- Homicide [X85-Y09]
- Poisonings [X40-49]
- Road traffic [V01-V89]
- Suicide [X60-X84]
- Other injuries

Endemic infectious diseases and conditions of poverty
- Diarrhoea/dysentery [A00-A09]
- Malaria [B50-B54]
- Maternal [O00-O99]
- Pneumonia [J10-J22, J85]
- Measles [B05]
- Malnutrition [E46]
- Haemorrhagic fever [A92-99]
- Other defined causes of child deaths
- Other infectious diseases
- Meningitis [G00-G03, A39, A87]
- Sepsis [A40-A41]
- Encephalitis [G04; A83-A86]
- Preterm delivery [P05-P07]
- Birth asphyxia [P20-P22]
- Meningitis/sepsis [P36, A39]
- Congenital malformation [Q00-Q99]

Emerging infections
- AIDS [B20-B24]
- Cervical cancer [C53]
- TB (A15-19)

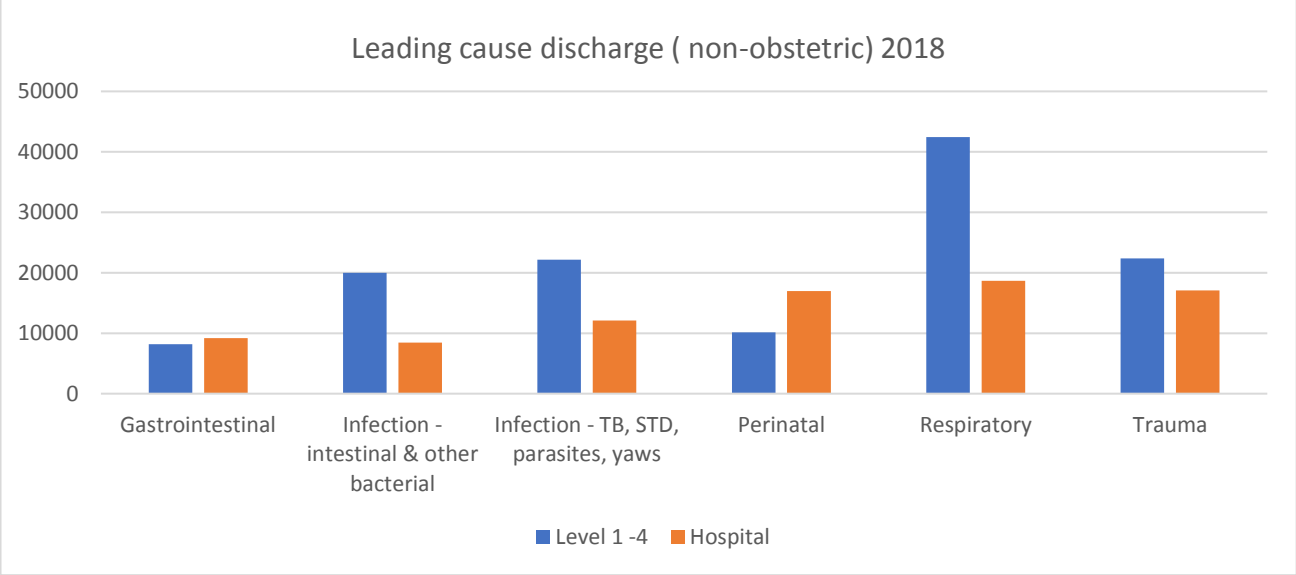
disorders and diarrhoeal disease. There has been very little change in these proportions over the previous 5 years.

Figure 3.10: Graph showing leading causes of outpatients in 2018



An analysis of Hospital Discharge database (DHIS) (2016 – 2018, approximately 1,300,000 records [estimated to be about 50% of all discharges][34]) show respiratory conditions, infections and trauma as the leading causes for admissions, outside of obstetric conditions.

Figure 3.11: Graph showing leading causes for discharges not including obstetrics



Conclusion

There is an overall decrease in early childhood mortality across PNG, and an improvement in life expectancy. However, there remain important differences in mortality status across provinces. There is a correlation of higher mortality with lower socio-economic status, frequently reflected by remoteness.

There have been observed changes of cause of death over a 50 year period. Fewer deaths occur now from 'endemic infections' (for example, diarrhoeal disease, pneumonia, malaria) and conditions associated with

[34] There are significant gaps is these records, notably from PMGH and Angau Memorial Hospital

poverty (for example, malnutrition), although 'emerging infections' (for example, HIV, TB, cervical cancer) are of concern. Overall, non-communicable diseases maintain their status as the largest contributor to death in PNG, however, the profile of these have dramatically changed toward the diabetes, ischaemic heart disease and stroke as pre-eminent causes of death. Injuries now account for a fifth of all deaths. The transition toward emerging NCD is being realised and is expected to bear a profound burden of ill-health in the community as further urbanisation and penetration of energy-dense foods replace traditional diets and negative environment influences (for example, tobacco smoking, sedentary lifestyle) exist. The expectation, however, that infections as a cause of death would diminish has not been realised, with new concerns (for example, HIV, drug-resistant TB, HPV) and conditions of risk-prone environments that lead to vector-borne infection, and diseases arising from poor sanitation still prevalent. Recent analysis reveals death from injury is more prominent than previously appreciated.

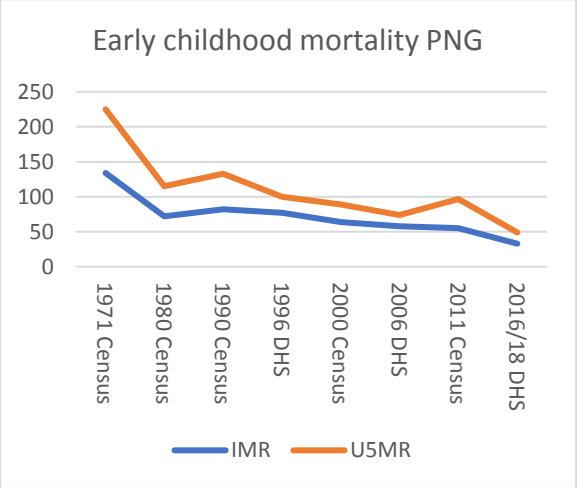
Health profile at different life stages

- Childhood
- Adolescence
- Reproductive years and women's health
- Living with Disability

Children and newborns

Early childhood is the most vulnerable period of life, with relatively high levels of mortality and potential lifelong debility if serious illness is encountered.

Figure 3.12: Mortality for Early Child Hood



Health Status

Mortality

There have been overall declines in early childhood mortality over a sustained period of time. The current PNG early childhood mortality rates (DHS 2016-18) are: Neonatal mortality rate 20/1000 live births; Infant Mortality Rate = 33/1000 live births; Under-5 Mortality Rate = 49/1000 live births.

SDG targets 3.2: By 2030, to reduce Neonatal mortality to 12/1000 live births or lower, and Under-5 mortality to 25/1000 live births or lower. So there is still a way to go.

Nutrition

Childhood nutrition lays the foundation for health. The estimated cost of child undernutrition significantly exceeds PNG's projected health sector and education sector budgets for 2017 ($USD 385 million and $USD 366 million respectively) (UNICEF).

In 2018, a fifth of children who attend MCH clinics were underweight. Stunting is a significant concern with nearly half of PNG children affected by stunting.

Figure 3.13: Children <80% WFA Attending clinics

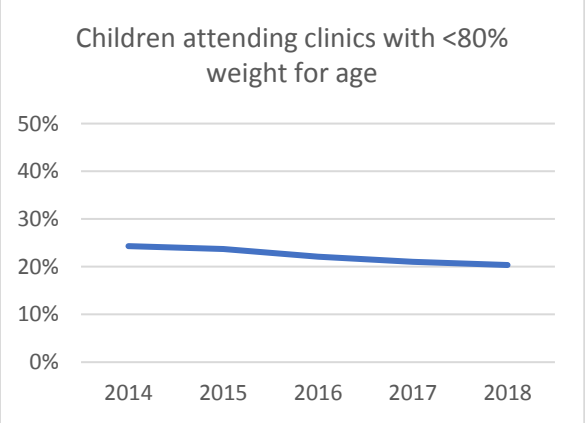
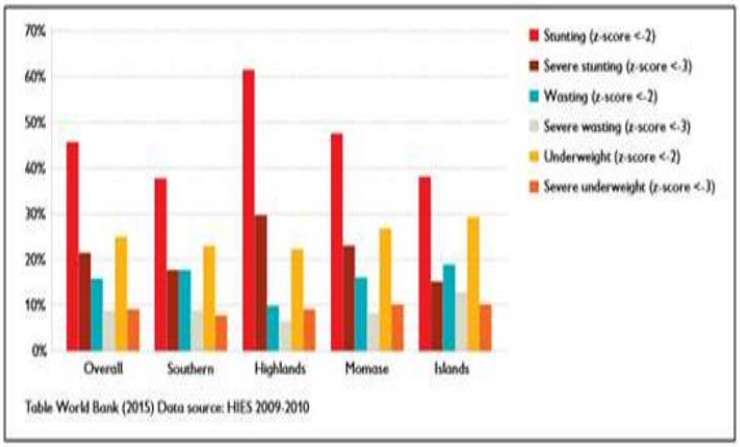


Figure 3.14: Graph showing malnutrition



About 10% of all paediatric hospital admissions are children who are severely

malnourished. In 2018, about 12.4% of these children died during that admission (improved from 15 – 20% in previous years).

Breastfeeding: the DHS 2016-18 showed that 62% of children under 6 months are exclusively breastfed.

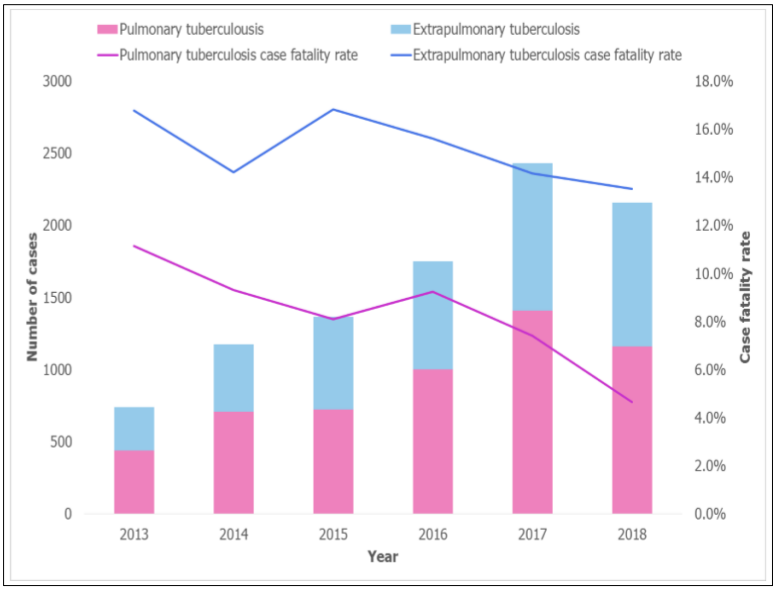
Illness

Hospital morbidity: Neonates (0 – 28 days of life) account for just over a third of all childhood deaths. This is mostly due to neonatal sepsis, birth asphyxia, and very low birth weight.

Pneumonia is the most common reason for admission to hospital (21%); other leading causes of admissions to hospitals include diarrhoea (11%), tuberculosis (9%), malaria (4%) and meningitis (3%).

Malaria remains a significant problem in PNG. In the 2016-17 Malaria survey, 9.5% of children under 5 years (<1600 m altitude) were infected with malaria parasites, and rates of insecticide resistance have increased since 2015.

Figure 3.15: Graph showing Case Fatality Rate



Tuberculosis has grown as a concern in children, with increasing case numbers and the emergence of multi-drug resistant TB. However, improvements in management have led to decreased case fatality rates since 2013.

HIV and syphilis: Mother to child transmission rates of HIV at the PMGH clinic are in the order of 25%, and 17% in Mt Hagen. With an effective Prevention of Maternal to Child Transmission (PMTCT) the rate should be <10%, and most countries achieve 5%. It is within the capacity of the health sector to address this concern. A solid focus on reaching mothers, providing treatment where needed and diligent assessment of the at risk child will address this concern. Currently, HIV is a cause of 8% of post-neonatal children deaths in hospital. It is estimated that more than 2% of neonates are born with positive syphilis serology.

Improving quality of care

At primary care level, the Standard Treatment Manual of Childhood Illness has helped health workers manage sick children for decades, the STM is now in its 10th edition. Since 2011 a program of teaching health workers how to improve hospital care for children (for health workers from provincial and rural hospitals and district health centres) has been successful. This coupled with improvements in basic needs of health centres: solar power, oxygen, and better supervision, has reduced referrals and pneumonia mortality rates in many rural clinics. Still, there are insufficient paediatric nurses in all

provinces, and this will only be addressed by establishing more post-basic courses to train nurses in paediatric and neonatal illness.

Prevention programs: keeping children healthy

Figure 3.16: Picture of a child getting vaccinated

Much of PNG's capacity to meet the needs of children and their mothers is dependent upon a functional outreach clinic program. Less than a third of the planned outreach activities are undertaken, resulting in decreased antenatal coverage, and low immunisation coverage. In the DHS 2016-18, only 35% of children had received all basic vaccinations. Coverage of the third dose of pentavalent vaccine was only 42%; measles vaccine: one dose 59%, and two doses 40%. Nutrition monitoring similarly is not achieved in the absence of outreach clinics.

Protection from malaria: The DHS 2016-18 found that just 60% of children under five slept under a bed net.

Preventing HIV: about a third of mothers who are HIV positive do not receive appropriate anti-viral therapy.

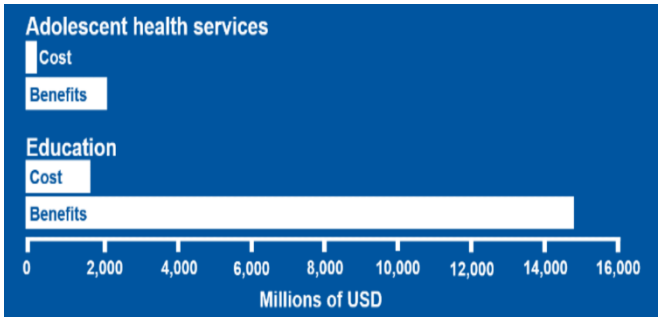
Challenges and opportunities

- Enhancing outreach and improving immunisation coverage
- Prevention of HIV transmission and other sexually transmitted infections in pregnancy
- Improving quality of care for unwell children and neonates
- Improving the care of children with tuberculosis and other common chronic health conditions
- Establishing a post-graduate paediatric and child health nursing course in each region
- Suitable models of continuing professional development and support for health care workers

Adolescence

Who are adolescents?

Figure 3.17: Graph Showing Adolescent Health services



- While there are various definitions of the age bracket that defines adolescence, this paper refers to the 10 – 19-year age group. This is a period of transition from childhood to adulthood, where important physical, physiological, mental and social changes occur in the individual. This time shapes their future health and bears upon the community in important ways. In Papua New Guinea, half of the total population are children and a large number of them are adolescents. The adolescent (10-19 years) population makes up 22.65% of the total population.

WHO estimate that nearly two-thirds of premature deaths and one-third of the total disease burden in adults are associated with conditions or behaviours initiated during adolescence. Matters of sexual and reproductive health, nutrition, mental health and school health programming require thoughtful planning to address their public health and clinical needs. Healthy adolescents and young people make an important contribute to national productivity.

The situation

Sexual and Reproductive health:

- Adolescent birth rate is measured at 68 per thousand 1000 women 15 – 19 years (DHS 2016 -18), with a decreasing trend over a 20-year period. Among those surveyed in the DHS, 12% of adolescent women (aged 15-19 years) had begun childbearing – 9.6% have had a live birth and 2.5% were pregnant at the time of interview. Rural teenagers (13%) tend to start childbearing earlier than urban teenagers (10%);

Figure 3.18: Graph showing Teenage Fertility

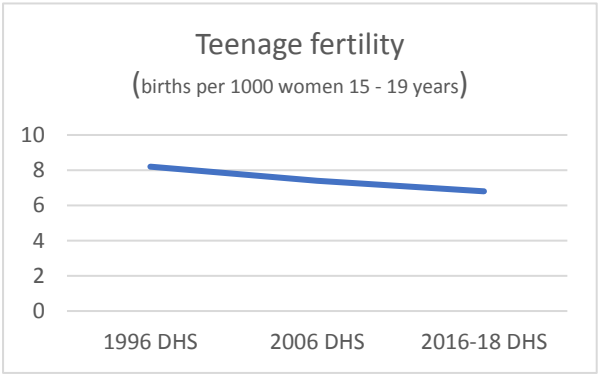
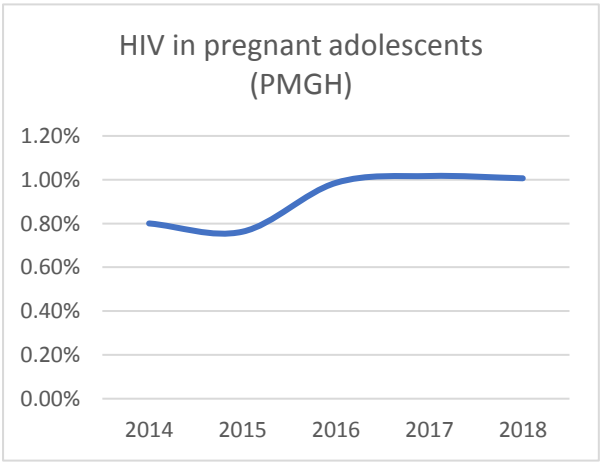


Figure 3.19: Pregnancy in Adolescents with HIV



- Adolescent pregnancy is associated with two to five times higher maternal mortality, as well as a higher neonatal and infant mortality among their children, as compared to women in their twenties;

- Family planning: amongst married teenagers, 18% are using some type of family planning, mostly injectable (6%) and implants (9%);

- In 2018, of those adolescents who attended antenatal clinic, 1% were infected with HIV. HIV prevalence in males has previously been

reported as slightly lower than females. Treatment of HIV (with ART) in adolescence is (10 – 14 years) 70% and (15 – 19 years) 86%.

Violence: Violence against women and children is endemic in Papua New Guinea, with one of the highest rates of family violence in the Asia- Pacific region. The DHS 2016-2018 shows that 50% of all girls have experienced physical or sexual violence by the age of 19 years;

Mental health:
In any given year, global estimates indicate about 20% of adolescents will experience a mental health problem, most commonly depression or anxiety.

School Health Programs: The School & Adolescent Health Program is jointly carried out by the Family Health Services Program in the National Department of Health, and the Department of Education. The introduction of adolescent health into schools starts at the lower primary school level up to the secondary high school level. The current activity in the School Heath Program: No information available;

According to the National Youth Commission, only 10% of school leavers each year end up in further education or gain jobs.

Risk factors for medium- and long-term concerns

Substance use

Alcohol: Monthly heavy episodic drinking (HED) - defined as drinking at least 60 grams or more of alcohol on at least one occasion in the past 30 days – is more prevalent worldwide among adolescents aged 15–19 years (11.7%) than among the total population aged 15 years or older (7.5%). It is also three times more likely among adolescent males (16.8%) than females (6.2%) (WHO 2014).

Smoking: A study of school aged children in NCD and Manus Island (Hiawalyer, 2002) showed that there were 12% of males and 8% of females who smoked cigarettes, and 13% of males and 10% of females who smoked marijuana.

Physical activity

No information available

Governance

The National Department of Health has developed a National Youth and Adolescents Health Policy in 2014 that guides the development of integration and establishment of youth friendly health services in PNG. The policy outlines an approach to strengthening services, improving access, address risky behaviours, addressing abuse and neglect of young people, and minimise adolescent pregnancy.

Challenges

- The absence of a strategic approach to address adolescent need.
- School health program has been lower priority.
- Adolescent health is not something only the health sector can address, but is closely aligned to educational opportunity, what is taught in schools and homes, employment opportunities, culture, community, friends, social media and sport.
- Adolescence is a time of great opportunity, to develop good habits that will avoid poor health outcomes during adult life, and a time to develop healthy relationships and social connections. Too often we take a negative view of adolescents as a time of trouble, but most adolescents are positive, aware and open to new ideas, and want to be physically and mentally healthy.

Life stages: Maternal and women's health

Concerns for women's health

While much of PNG society is built upon a patriarchal system of governance, women remain central to the strength of society. However, barriers exist in ensuring women may remain at the forefront of a stronger community and key contributors to society. The DHS 2016 – 18 revealed that of women and men aged 15 – 49 years, 23 % of women have had no opportunity for education (13% of men). Nearly two thirds of women have been subject to physical or sexual violence.

Figure 3.20: Picture of woman attending ANC

The risks of sexually active years and those of childbearing are borne out in a number of ways. For example:

- Younger women are infected with HIV at higher rates than males;
- Syphilis is found in 4.6% of all pregnant women in the national capital and between 1 and 8% in other parts of the country;
- Cervical cancer, with prevention and/or treatment now feasible through vaccination and effective screening, is the most common cancer of women in PNG. Around 12-15% of all women aged 30-59 years in PNG are HPV positive and at risk of cervical pre-cancer or cancer.
- Mortality in childbirth is high, with estimates varying from 200 (for health facility births) – 900 (for home births) deaths per 100,000 live births.

The reproductive health years of a woman's life bring her to access the health system more frequently than men. Gynaecological and child-bearing needs and in her role as mother requires the support of health services. For many reasons, the health system continues to struggle in meeting these needs. We can do better.

Focussing on women's reproductive health needs

Fertility: The total fertility rate (the average number of children that a woman bears in her lifetime is 4.2. There has been a very slow decline over some decades, yet this remains comparatively high.

Family Planning: Overall, 37% of women currently use some form of family planning. There remains an unmet need of a further 26% (DHS 2016-18)

Antenatal care provides an important point of contact for women during pregnancy, an opportunity for a check of their health and the growth of their baby, screening for complications and preparing for a facility delivery. In a 2019 study (ministerial taskforce), of those women who died after delivery that had delivered in the community, 57% had received no antenatal care, compared with 17% of those who delivered in a facility. The DHS (2016-18) reports that 76% of women who gave birth in the last five years attended for at least one antenatal visit. However, only half the women had four or more visits.

Support in childbirth by trained health providers provides a safer environment for mother and infant. Currently, about half (51%) of rural women and 85% of urban women deliver in a health facility (DHS 2016-18). Two pilot programs in incentivisation of facility birth are showing postive results in improving women's choice to deliver in a safe environment.

A way forward

A clear and coherent agenda for women's health is needed. This encompasses:

Figure 3.21: Picture showing mother and child

- the welfare of women in home and community where they can feel safe from violence;
- Health services that enable access to quality services for themselves and family;
- An acknowledgement of reproductive health rights, where choices of fertility are upheld, and safety of childbirth is assured;

There are a number of high impact interventions that can make a difference.

- To address reproductive health needs, services that provide quality and reach of family planning, comprehensive coverage of antenatal care, improving access (and incentivization) for supervised delivery, timely referral and post-partum care.
- A two-pronged approach to minimise cervical cancer through HOV vaccination and early detection and treatment programs
- Full access to HIV and other sexually transmitted infection treatments;
- Upskilling Training of rural female CHWs in advanced maternal and newborn care skills to provide quality care for women who attend their local health facility for supervised birth

Challenges:

- ❖ Strengthening the capacity of district and provincial services to provide for these minimal needs;
- ❖ Suitable up skilling of workforce;
- ❖ Universal reach of treatments for STIs
- ❖ Scaling up an adolescent immunisation program in the context of poor childhood vaccine coverage
- ❖ A need for gender disaggregated STI data.
- ❖ A nation wide incentivization program for rural and remote women to access their local health facility for supervised birth

People living with disability

What is disability?

Disability is a complex phenomenon, reflecting the interaction between features of a person's body and features of the society in which he or she lives. Consideration of disability is framed in three ways[35]:

- impairments (e.g. a problem in body function or structure),
- activity limitations (difficulty encountered by an individual in executing a task or action),
- Participation restrictions (a problem experienced by an individual in involvement in life situations).

For example, a recent survey of people with serious mental disorders in developing countries, showed that between 76% and 85% received no treatment in the year prior to the study'[36].

Figure 3.22: Diagram representation of global experience of Disability

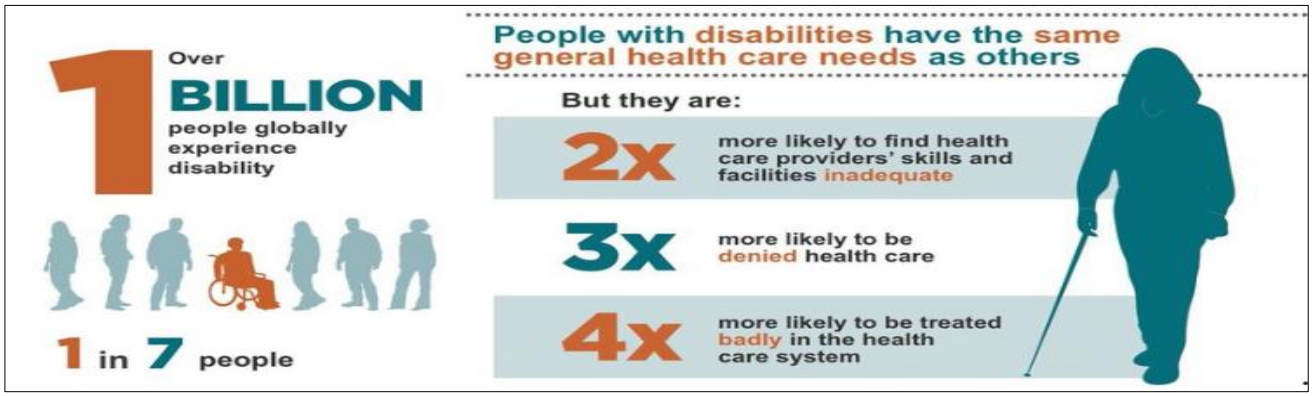


Figure 3.23: Picture of disable boy

The magnitude of disability in PNG:

There are no specific data captured within the PNG health system on disability. WHO estimates globally that approximately 15% of the population is affected by disability of some kind. This estimation equates to around 1.3 – 1.4 million people in PNG. The rise of diabetes and cerebro-vascular disease (leading to stroke) in the population will contribute to higher demand, with visual impairment, amputation and frailty associated with renal or cerebrovascular disease. Resurgent polio, the incidence of injury, the prevalence of mental ill-health each take their toll on the individual and their families and communities who support them. A 2018 study[37] on visual impairment in people over 50 years of age in PNG estimates 40,746 of these persons to be blind (5.6% of population), and a further 21,519 severely visually impaired (2.9%) and 79,463 moderately visually impaired (10.9%). The majority of these suffer from cataracts (88.6%) – a treatable condition.

[35] World Health Organisation definition
[36] World Health Organisation, World Report on Disability, 2011
[37] Lee L et al. *Br J Ophthalmology* 2018; 0: 1-5

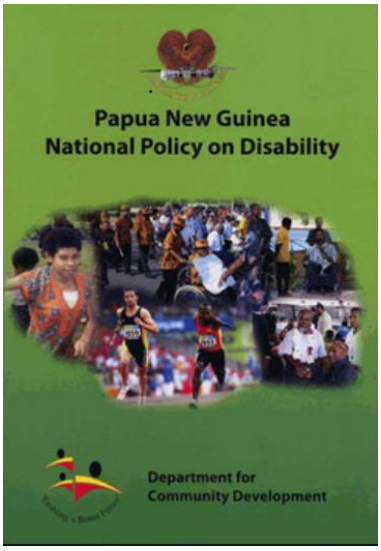
Impact of disability

Figure 3.24: Representation of possible actions to address of Disabilities

Persons with disability experience poorer levels of health than the general population, with greater vulnerability to preventable secondary conditions, co-morbidities, and age-related conditions, as well as a higher risk of being exposed to violence. There are unmet needs for rehabilitation services resulting in reduced quality of life. Lower educational achievements, with children being less likely to start school (10% - 60% globally) and less likely to complete education. On average, the employment rate for persons with disability, at 44% (globally), is just over half that for persons without disability (75%)[38]. The inactivity rate is about 2.5 times higher among persons without disability (49% and 20%, respectively). A lack of community living, and inadequate services leave people with disabilities isolated and dependent on others. The care for a person with disability has impact on that family's ability to tend to gardens and provide more generally.

Higher rates of poverty

Figure 3.25: Policy on Disability



People with disabilities thus experience higher rates of poverty than non-disabled people. A 2016 study[39] in Cambodia found that having disabled members increases the income required for a household to achieve the same standard of living as an otherwise similar household by 17%. Persons with disabilities and households with a disabled member experience higher rates of deprivations – including food insecurity, poor housing, lack of access to safe water and sanitation, and inadequate access to health care – and fewer assets than persons and households without a disability.

Programs to address disability

There are plans to provide surgical services to address the needs of the many people with cataracts. There are specific support services (Callan House, Cheshire Homes) that give social amenity to those living with disability. These are not health sector programs.

Challenges:

- Poorly developed understanding of role of health sector on disability;
- Limited current services;
- Increasing burden with changing epidemiology.

[38] World Health Organisation, World Report on Disability, 2011

[39] Palmer M, Williams J, McPake B, *The cost of disability in a low-income country*. Nossal Institute for Global Health, The University of Melbourne, 2016

Disease Profiles

- Human Immunodeficiency Virus (HIV)
- Sexually Transmitted Infections (STI)
- Malaria
- Neglected Tropical Diseases (NTD)
- Tuberculosis (TB)
- Non-communicable Diseases (NCD)
- Cancer
- Injury

Epidemiological Profile: HIV

The disease

The human immunodeficiency viruses (HIV) infect the body through blood and sexual secretions. Over time, the HIV causes an acquired immunodeficiency syndrome. AIDS is a condition in humans in which progressive failure of the immune system allows life-threatening opportunistic infections and cancers to thrive.

Figure 3.26: Diagram showing ways HIV can be transmitted

Prevalence (the number of people in the community living with the illness)

The prevalence of HIV in PNG in 2018 is estimated at 47413 persons (0.83% of population). This has increased from 31450 (0.71% of population) in 2010. Women (15 years and older) account for 59% of infected persons and 7% being children less than 14 years. Prevalence of 14.9% among female sex workers (FSW) and 8.5% among men-who-have-sex-with-men (MSM) and transgender (TG) people in NCD. The burden is highest in the Highlands region.

Incidence (new cases)

In 2018 there were 3300 new infections (40 cases for every 100,000 population) (females 45/100,000; males 35/100,000). This has increased from 2260 new cases in 2010. The HIV burden in PNG is concentrated in some sub-populations and geographic locations.

Trend

Figure 3.27: Graph showing HIV Incidence

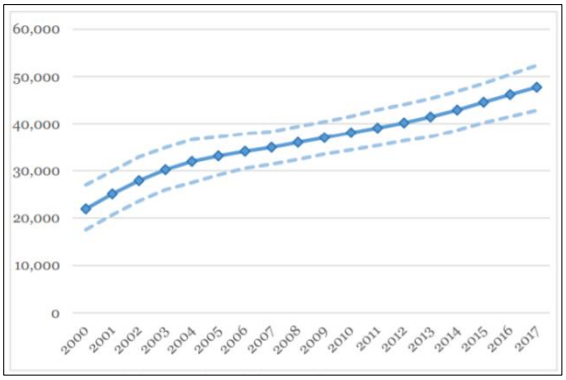
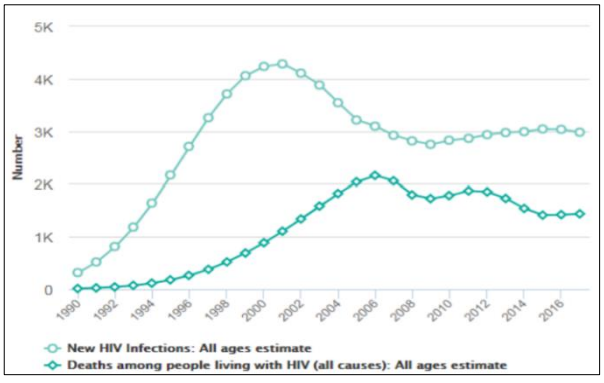


Figure 3.28: Graph showing new HIV infection



Between 2010 and 2017, the number of people living with HIV in PNG has increased by 26% (10,000). There are about 3000 new cases occuring every year. Annual deaths from AIDS related illness have decreased about 26% since 2010, yet still number about 1,000 a year.

Current prevention approaches and programs

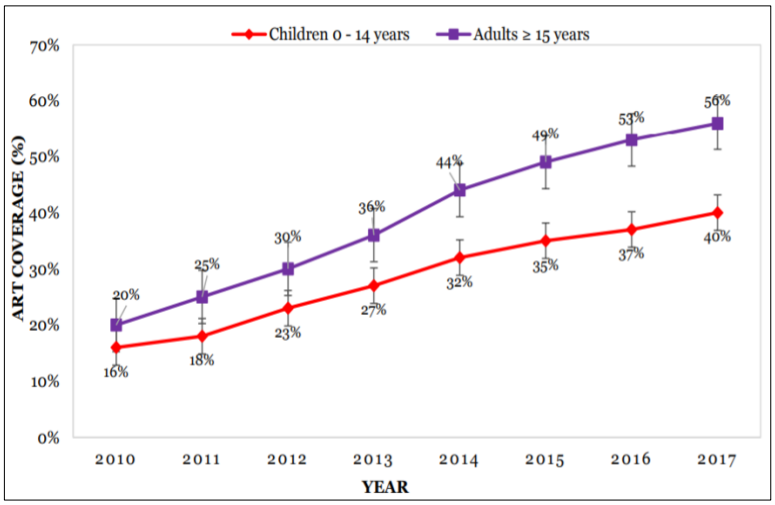
Risk awareness: There is limited knowledge of prevention strategies. Women and men in urban areas are more likely to be knowledgeable about HIV prevention than their counterparts in rural areas. Knowledge generally increases with age and educational attainment. In all, 24% of women and 26% of men have comprehensive understanding of prevention. (52% women, 58% men know that using condoms is protective against HIV, 68%/74% know limiting to one uninfected sexual partner is protective. (DHS 2016/18)

Current diagnosis and treatment approaches and programs

PNG along with many other countries signed to UNAIDS 90-90-90 targets. The focus is to ensure that 90% of people living with HIV know their status, 90% of those who test positive are started on ART and achieve viral suppression in 90% of those on treatment by 2020. In 2017, 72% of PLHIV know their status, 76% of positive patients are on ART. Only 2% of people accessed VL testing, yet 90% of those who did were virally suppressed.

In 2017, ART coverage for children 0 – 14 years is 40% (31 – 45), for adults 15 years and older is 56% (50 – 62). In total 827 (15%) of the PLHIV who tested positive were not registered in care, and hence did not commence treatment. Similarly, 736 (16%) of those who were registered at ART clinics were not initiated treatment.

Graph 3.29: Graph showing ART Coverage (%) 2010-2017



Prevention of Mother to child transmission requires testing in pregnancy to determine the presence of the virus and providing treatment during pregnancy to minimise risk of vertical transmission (to child). A total of 76 896 women were tested for HIV in ANC and labour ward in 2017. Of these, 593 (0.8%) were confirmed HIV positive. Forty one percent of these were commenced on ART. In 2015 (data incomplete) there were 19% of mothers with positive HIV serology who gave birth to HIV positive babies at PMGH. Vertical transmission rates have prevailed at these levels.

Exposed infants are expected to have the early-infant diagnosis (EID) of HIV done between 4 – 6 weeks or at the earliest opportunity thereafter. This is because mortality for HIV infected children is highest during the first few years of life and can be minimised if ART is commenced. In 2017, only 35% of the exposed infants had EID done. This adds urgency for the need for mothers to deliver in health facilities so that a clear message can be provided.

HIV and TB: all PLHIV in care a routinely screened for TB and those confirmed not to have the disease are initiated in isoniazid preventive therapy (IPT). In 2017, only 16% of HIV positive patients newly recruited in care were on IPT.

Challenges and expectations

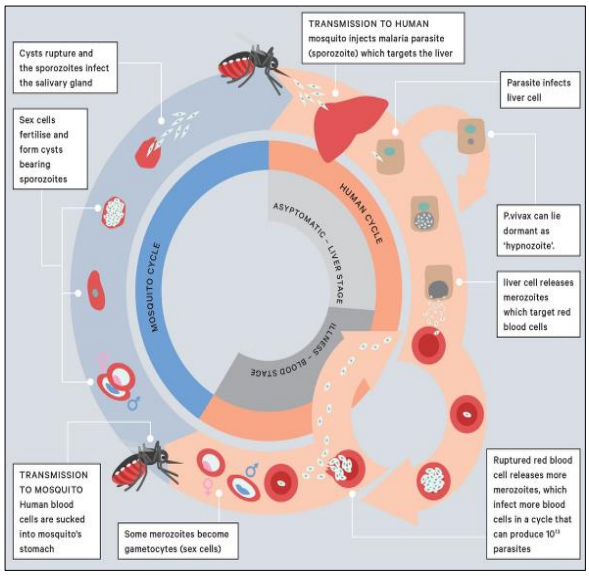
- Need for greater testing in pregnancy, and treatment of positive cases to prevent high level of vertical transmission;
- Earlier testing and treatment of exposed infants;
- Initiation of TB prevention therapy:
- Greater focus of prevention in high risk groups.

Malaria

The disease

Malaria is caused by infection with the plasmodium parasite (four species – falciparum, vivax, ovale, malarium). It causes high-fevers, chills and flu-like symptoms. The parasite grows in the liver cells and then the red cells of the blood. As the parasite reproduces and grows, inside the red cells, it destroys them, and invades others. If left untreated, these cycles continue affecting multiple organs. Infection follows a bite from an infected female Anopheles mosquito.

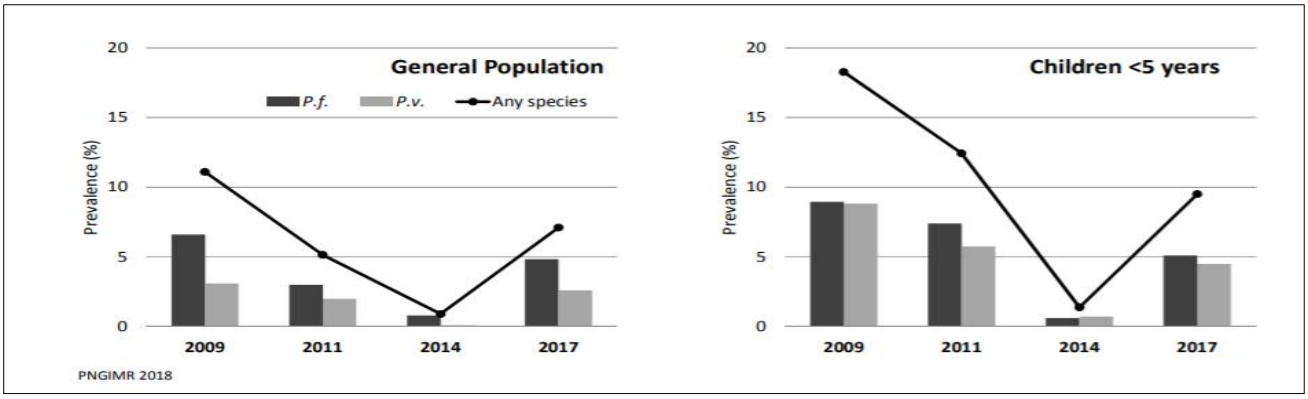
Figure 3.30: Diagram showing Malaria life cycle



Prevalence

The current prevalence is 7.1% of people living below 1600m altitude (above 1600 m altitude 0.9% infected), rising from less than 1% in 2013/14). (2010/11 survey 5.1%; 2013/14 survey <1 %; 2016/17 survey 7.1%).

Figure 3.31: Graph comparing Malaria Prevalence in general Pop vs Children <5yrs



Overall, 8.8% of children (less than 5 years) are infected. By region, overall, any species: Southern 4.2%; Highlands 0.7%; Momase 10.6%; Islands 2.8%. P falciparum is the most dominant parasite.

Incidence (new cases)

During 2018, there were 115 presentations to health facilities for every thousand population, about 1,000,000 presentations in total.

Trend

There has been a 15% increase in malaria presentations to health facilities during the past three years.

Current prevention approaches and programs

The primary program of prevention currently is separation of the mosquito from the individual. This is the rationale of the insecticide treated bed nets (ITN). Two recent surveys (IMR Malaria Indicator Survey 2016/17 and the DHS (2016/18) have examined current usage. Overall usage of ITN by individuals is 46% (urban) – 51% (rural); Household ownership is in the order of 70% - 80%. Target populations (under 5 years, pregnant) utilisation is 60% and 63% respectively.

Figure 3.32: Graph showing Malaria/1000 pop

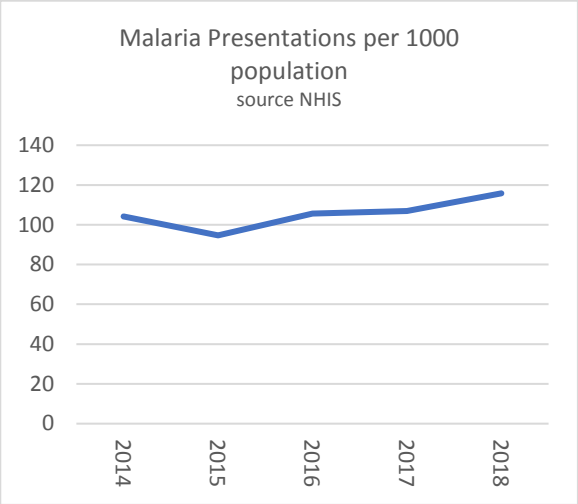


Figure 3.33: Graph showing access to LLIN and net use 2009 - 2017

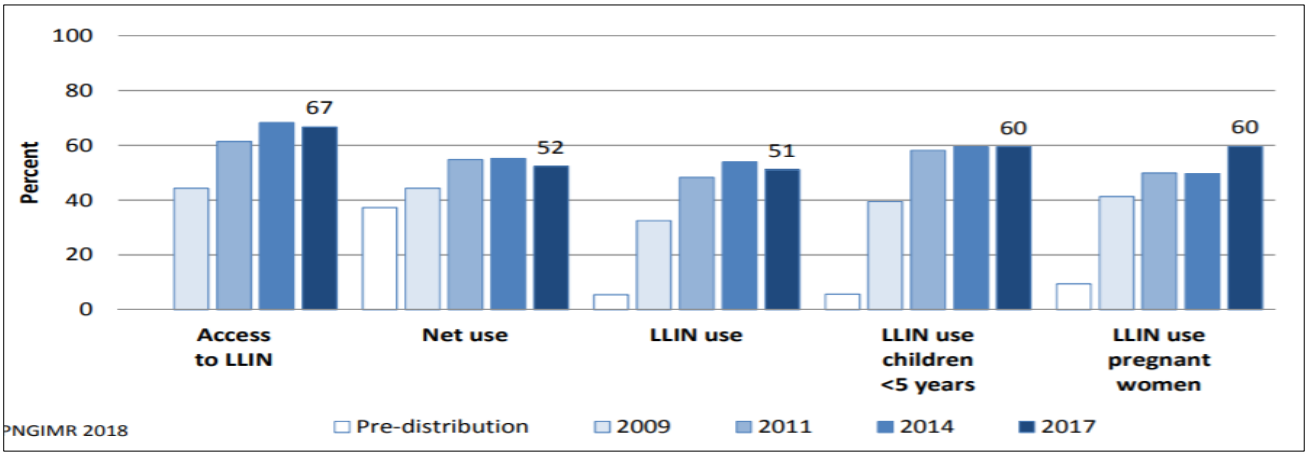
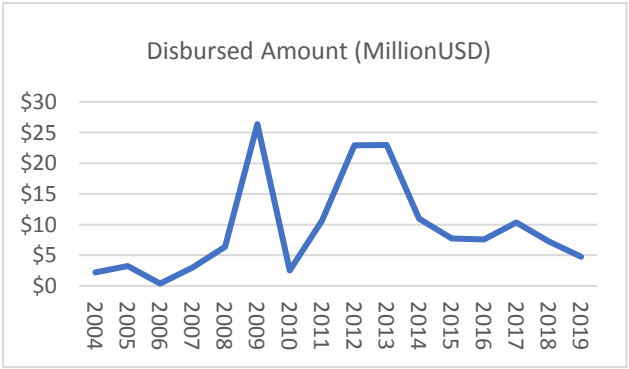


Figure 3.34: Graph showing US$ of disbursement fund



Two doses of preventive treatment in pregnancy provides some level of protection against malaria. Urban women (64%, rural 48% receiving at least one dose), and women with greater wealth resources are more likely to receive treatment. Islands region has the highest coverage (Southern 55.7%; Highlands 44.3%; Momase 45.1%; Islands 66.8%).

Government and external funding to the malaria program have decreased sharply since 2014, the consequence seen in increased incidence and prevalence.

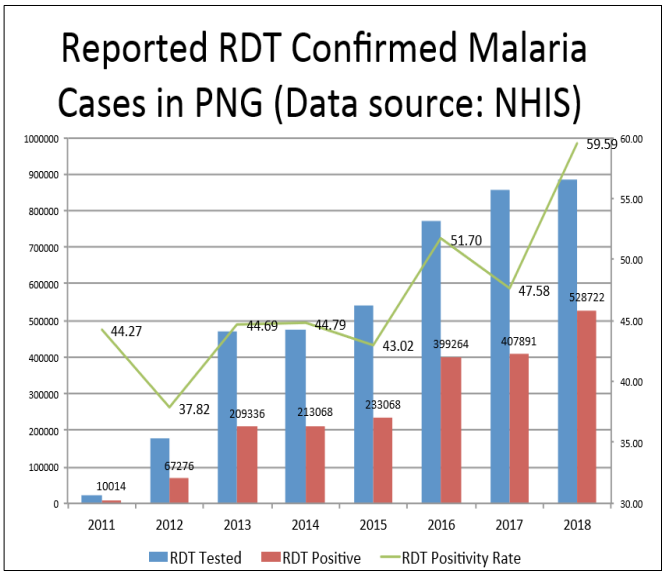
Current diagnosis and treatment approaches and programs

Confirmation of diagnosis by a Rapid Diagnostic Test (RDT) or blood test/microscopy is policy, so that treatment can be instigated. In 2018, nearly 90,000 RDT were done, with a positivity rate of 60%.

First line treatment is combination therapy, currently Artemether-lumefantrine (3-day course).

The recent DHS survey (2016-18) found about 45% of children (under 5 years) with fever attended a health facility for treatment. A diagnostic test (finger/heel prick) was performed on about half of these. The proportion of treatment positive cases receiving first line treatment has is 72%, below the target of 100%.

Figure 3.35: Graph showing RDT confirm Cases in PNG



Challenges and expectations

- Rising prevalence of malaria infection;
- Greater social mobilisation to achieve higher utilisation of ITN;
- Universal testing and treatment where clinical presentation is suggestive of malaria;
- Enhance funding to meet minimum program requirements;
- Maintenance of supply of RDT and medication.

Neglected Tropical Diseases[40]

The diseases

Neglected Tropical Diseases (NTD) are a collection of infectious diseases that carry a high burden upon the community. They include the following, with the highlighted infections of priority in PNG.

Figure 3.36: Table showing NTDs

Neglected Tropical Diseases					
Helminth infections	**Protozoal Infections**	**Arboviral**	**Ecto-parasitic**	**Bacterial**	**Fungal**
Hookworm	Amoebiasis	Japanese encephalitis	Scabies	Treponematosis	Mycetoma
Trichiasis	Giardiasis	Murray Valley encephalitis		Yaws	
Ascariasis	Cryptosporidiosis	Barmah Forest Virus		Congenital syphilis	
Lymphatic Filariasis	Balantidiasis	Ross River Virus		Intra cellular bacterial infections	
		Dengue		• Trachoma • Buruli Ulcer • Brucellosis • Cholera	

Figure 3.37: Graph showing ***Leprosy****:* Prevalence of leprosy is focussed in 6 provinces; NCD, CP, Gulf, WP, WSP & ENB.

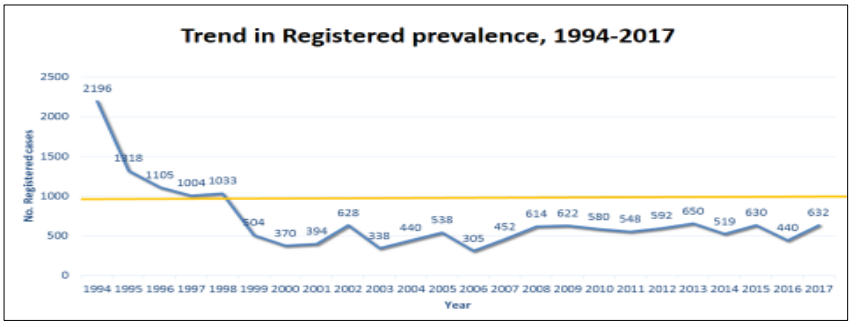
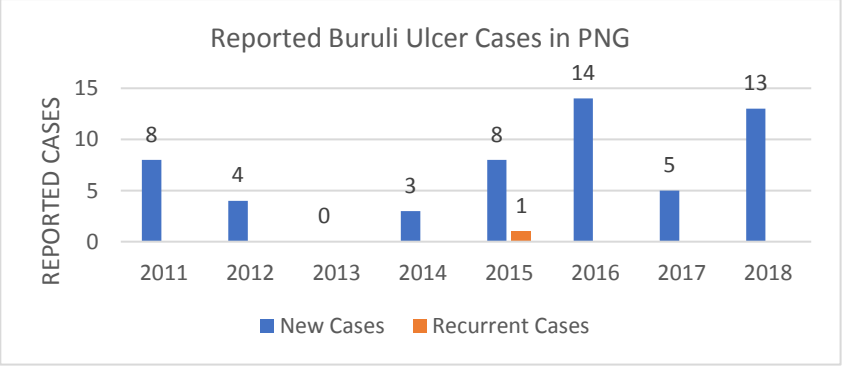


Figure 3.38: Graph showing **Buruli** Ulcers: cases have been reported only in the East Sepik Province.



[40] *information for this report to be completed*

Dengue:

Dengue seroprevalence was very high with an overall rate of 85.3%, and increased with age. More than half of seropositive individuals from Madang were greater than 11 years of age and about 40% were older than 20 years.[41]

Yaws *is now entrenched as a public health problem in the Islands region and Madang and Morobe provinces, with increasing trend over the past 7 years.* Mass treatment campaigns in the 1950s reduced the incidences of yaws, the current resurgence of the disease has been due to incomplete initial intervention coverage.

Figure 3.39: Reported Yaws in PNG

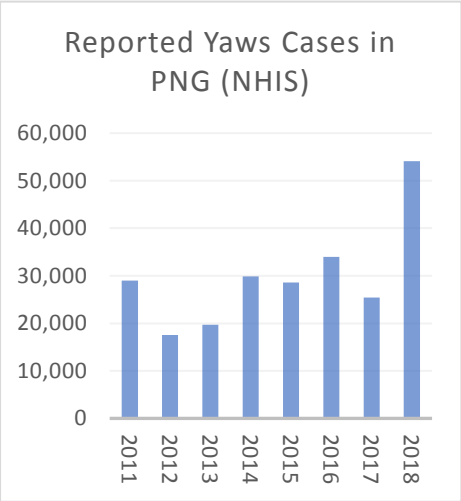
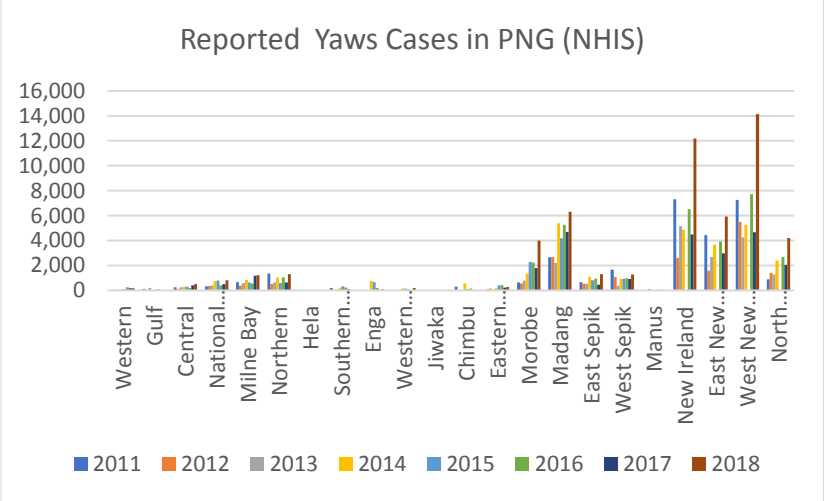


Figure 3.40: Graph showing Reported Yaws in PNG by province



Trachoma:

Figure 3.41: Table showing Prevalence of Trachoma in children 1-9yrs

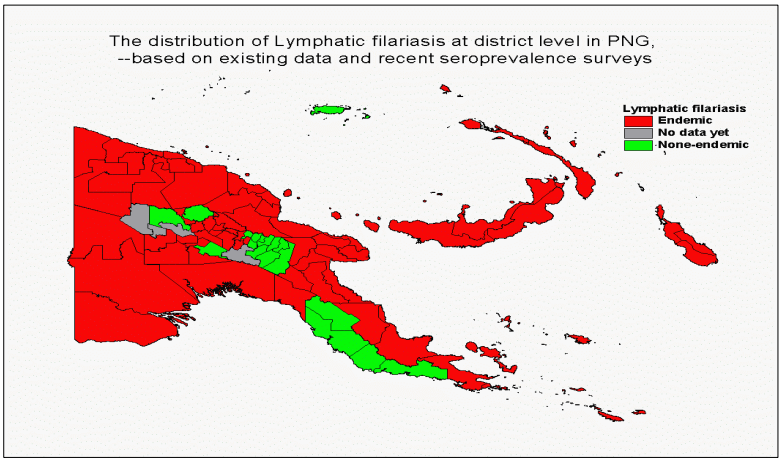
Prevalence of Trachoma Follicles in children 1-9 years by surveyed districts					
Province	District	Examined	1-9 yrs.	TF	Prevalence of TF (%)
Central	NCD	201	86	20	23.3
	Rigo	103	53	2	3.0
Madang	Ramu	147	100	8	8.0
Morobe	Markham	203	100	15	15.0
Southern Highlands	Mendi	34	21	4	19.0
	Nipa	198	100	15	15.0
East New Britain	Kokopo	139	100	3	3.0
	Rabaul	153	51	1	2.0
Western	South Fly	434	212	45	21.2
Total		1612	823	93	11.0

A recent study of examinations of 1612 children (aged 1 – 9 years) across 9 districts showed a prevalence of 11%, with variation of prevalence within and across provinces. There are no documented mass screening or treatment programs.

[41] (Luang-Suarkia D et al, Hyperendemic dengue transmission and identification of a locally evolved DENV-3 lineage, Papua New Guinea 2007-2010, 2018 https://doi.org/10.1371/journal.pntd.0006254)

Lymphatic filariasis:

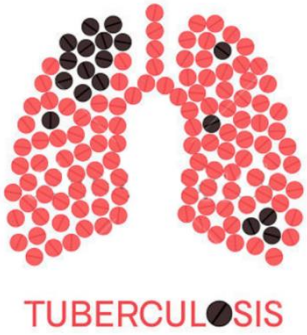
Figure 3.42: Map showing high endemic areas in PNG



Highly endemic in PNG. Mass Drug Administration has been implemented in one high endemic island province with plans to cover rest of Islands region before moving to mainland PNG. (date of assessment to be ascertained)

TB Epidemiological Profile

The disease



Tuberculosis (TB) is a disease caused by infection with the bacteria Mycobacterium tuberculosis. TB most commonly affects a person's lungs (pulmonary TB) yet can also affect other parts (extrapulmonary TB). It is spread via droplet (coughing, sneezing, speaking) and inhaled by other people – usually a family member/close friend. For most people, the infection remains inactive (Latent TB), not causing any damage, and unable to transmit the infection. TB disease develops when the bacteria become active and multiply. If the disease affects the lungs or throat, they may infect others. Active disease occurs more often in people with HIV/AIDS and people who smoke. Disease can cause cavitation of the lungs, weight loss and a wide range of symptoms if extra-pulmonary. It is treated with antibiotics, given over a period of 6 – 30 months.

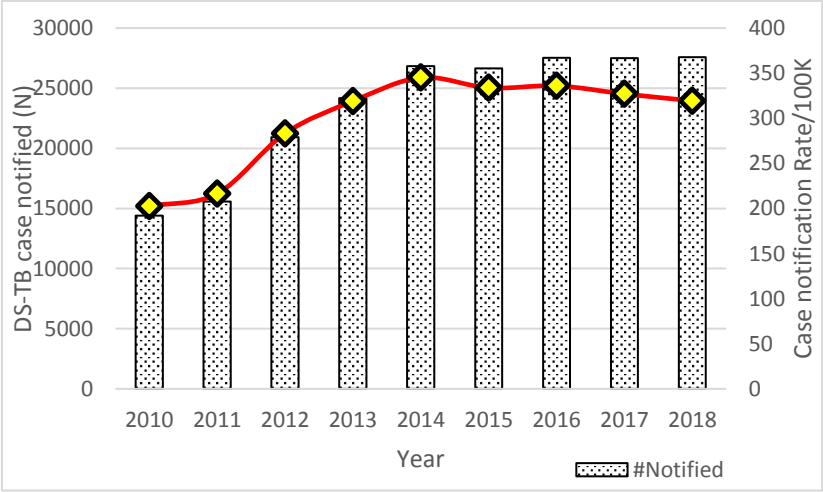
Infected persons

Prevalence is determined on a biannual basis through population screening. By international comparison, screening rates are low. In PNG, there have been 0.2% (2011), 0.4% (2014) and 0.4% (2016) of total population screened. (Cambodia 1.1% in 2013). About 15% of those screened were smear positive. Percentages vary across regions of PNG. Southern (0.78% screened, 15.8% positive); Highlands (0.22% screened, 7.6% positive), Islands (0.34% screened, 17.9% positive), Momase (0.44% screened, 17.9% positive).

Incidence (new cases)

In 2018 the estimated incidence was 432 per 100,000 popn. (about 37,000 cases smear positive). The cases notified were 74% of this number. Extrapulmonary TB account for 42% of all cases. There is a concentration of TB is several provinces, with NCD, Western, Gulf and West New Britain Provinces each with a case notification rate above 600/100,000.

Figure 3.43: Graph showing DS-TB case notification rate 2010-2018



The highest age cohorts for new smear positive cases is 15 – 24 years (males and females), and 55 – 64 years (males). Paediatric (</= 14 years) TB is high, 26.7% of all cases in 2016. These rates are the highest in Western Pacific Region. These represent recent transmission, indicating ongoing community transmission. Paediatric transmission rates are highest in Hela (51%) and West New Britain (48%, and lowest (<20%) in Manus, Jiwaka, Southern Highlands, Western Highlands. In 2016, there were 986 deaths as a result of TB reported.

Current prevention approaches and programs

The success of the program depends on adequate case finding and treating these to completion so that TB will not be further transmitted. There are approximately 275 Basic Management Units (BMU) and 114 laboratories with TB testing capacities across 22 provinces. In 2016, 0.4% of the population was screened. There is a high proportion of pulmonary TB results without laboratory confirmation. This results from limited microscopy facilities (n = 114) with weak referral systems.

Current diagnosis and treatment approaches and programs

Figure 3.44: Picture of a Doctor showing x-ray results

Treatment was completed by 69% of patients (2017 cohort), which is low compared to global standards (Global target = 90%). The success is higher for new smear positive, lower for retreatment cases. About 20% of cases are lost to follow-up. 'Lost to follow-up' and 'not evaluated' cases (combined, about a quarter of all cases

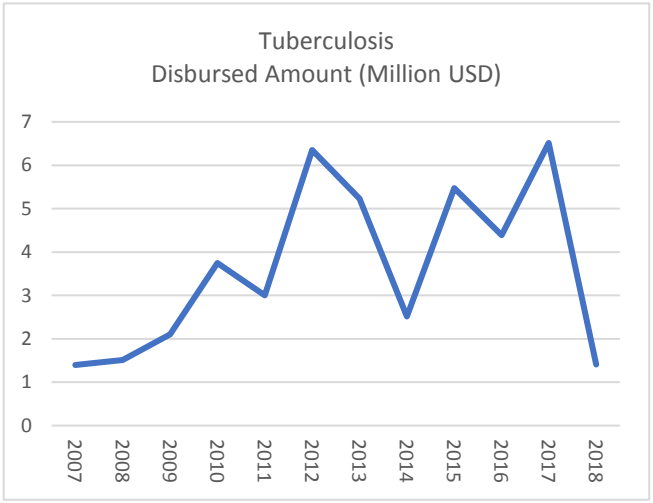
In 2018, 56% of new TB diagnosis patients were tested for HIV, with 7% of these testing positive. Eighty one percent of these were commenced on Anti-Retroviral Therapy.

Current estimates are that 3.4% of new TB cases, and 26% of retreatment cases have Drug Resistant-TB (428 cases in 2018). Treatment success for MDR- TB is 75%, and 63% for XDR-TB (2016 treatment cohort).

Funding:

Government and development partner funding has been inconsistent, and despite rising prevalence, there is a decrease in funds to the program.

Figure 3.45: Graph showing Disbursement (US$) for TB



Challenges

- Ongoing prevalence
- Availability of treatment and treatment centres
- Treatment completion rates relatively low
- Drug resistant TB at 3.4% of all new infections
- Decreased funding commitment.

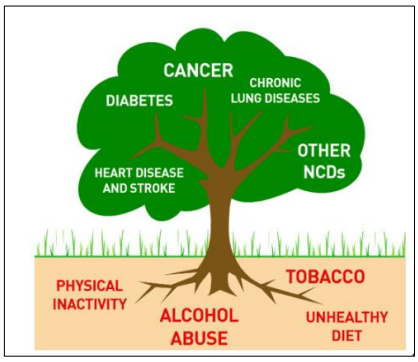
Non-Communicable Diseases

The diseases

The Non-Communicable Diseases (NCD) profiled here encompass (a) Cardiovascular disease (CVD), with its end stage organ diseases of myocardial infarction, acute coronary syndrome, congestive heart failure, stroke, kidney disease, and peripheral vascular disease; and (b) Diabetes. (*Note that cancer, chronic respiratory disease, injury, mental disease are profiled elsewhere).*

Figure 3.46: Cycle of NCDs

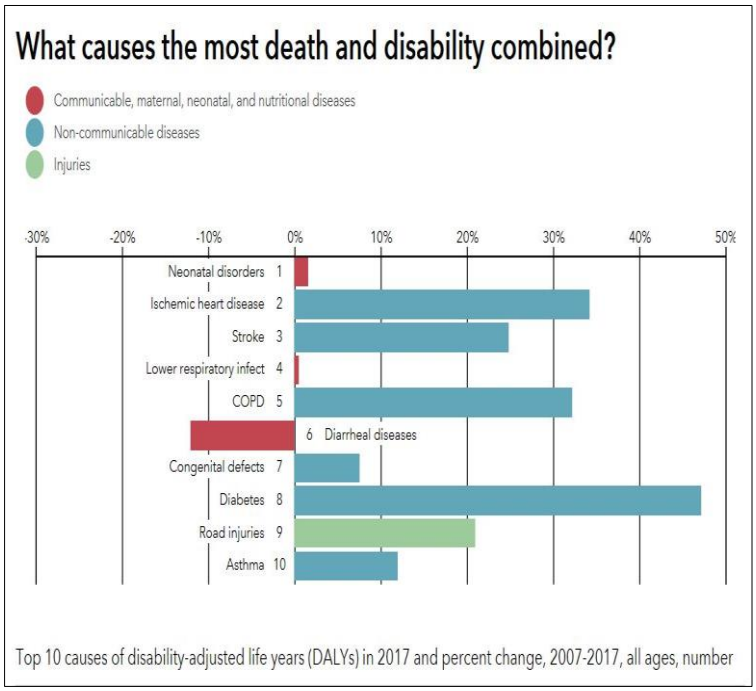
Figure 3.47: Systematic tree for NCD



The settings where CVD thrives is where there a source of energy rich food, more sedentary lifestyle, and where there is high prevalence of smoking. While risk factors of age and gender cannot be changed, factors that include tobacco smoking, high blood pressure, obesity, lack of exercise and high levels of blood lipids can be modified to decrease risk. It is estimated that these risks account for 75% of disease. These risks hence become the target of medical intervention to avoid the disability and death that become increasingly prevalent. Public health interventions provide the scope to prevent or delay the presence of these conditions.

Prevalence (the number of people in the community living with the illness)

Figure 3.48: Graph showing high causes for death



There is evidence that NCDs are becoming more common. Verbal Autopsy (VA) data gathered across three sites from 2009 – 2014 were compared with data from several VA activities conducted between 1970 and 2001. This showed a large increase in the fraction of deaths from 'emerging' NCDs (CVD, Diabetes, stroke, lung cancer) (from 0.9% to 14.7%); all NCDs accounted for 40.3% of all deaths[42].

Modelling undertaken by IHME (2017) shows Ischaemic Heart Disease, Stroke and Diabetes all within the top eight contributors to death and disability in PNG. During the 10 year period since 2007, these diseases show most change in their increased burden of

[42] Gouda HE et al, The epidemiological transition in Papua New Guinea: new evidence from verbal autopsy studies, International Journal of Epidemiology, 2019, 1–1

disease. By 2030, World Bank[43] models show the estimated cost of Cardiovascular Disease, Diabetes, Chronic Respiratory Disease and Cancer will be 9.1% of GDP and by 2040, 15.1%.

The risk factors that can be addressed

Figure 3.49: Table showing behavioural risk factors by sex

Behavioural risk factor	Males (%)	Females (%)	Total (%)
Current smoking (age-standardized rate) (2011)[a]	55%	27%	41%
Obesity in adults 20 years and over (%) (2008)[b]	11.8	20.1	..
Total alcohol per capita consumption, in liters of pure alcohol (2010)[a]	5.1	1.0	3.0
Consumption of less than 5 servings of fruit and vegetable per day (2007)[c]	99.1	98.6	98.9
Low physical activity (2007)[c]	9.0	10.9	9.9
Prevalence of raised fasting blood glucose among adults aged 25 years and over (%) (2008)[b]	15.2	14.7	..
Prevalence of raised blood pressure among adults aged 25 years and over (%) (2008)[b]	21.1	18.1	..

Sources: [a]World Health Organization, 2018b; [b]World Health Organization, 2012b; [c]World Health Organization, 2014b

There are limited prevalence studies for CVD and Diabetes in PNG. A recent study undertaken at three sites in PNG - West Hiri (peri-urban), Asaro (rural highland) and Karkar Island (rural island) showed that adult residents in the three different communities are at high risk of developing NCDs, especially the West Hiri peri-urban population. The survey showed the prevalence of current alcohol consumption at 43%, stress at 46%, obesity at 22%, hypertension at 22%, elevated levels of cholesterol at 24% and haemoglobin A1c at 34% were highest in West Hiri relative to the rural areas. However, central obesity at 90% and pre-hypertension at 55% were most common in Asaro whereas prevalence of smoking, physical inactivity and low high density lipoprotein-cholesterol levels at 52%, 34% and 62% respectively, were highest in Karkar Island. [44] The last STEPS survey was conducted in 2007 in PNG[45]. The 2016 Youth Tobacco Survey showed smoking prevalence to be 33% (40% male, 28% female). This was half the smoking prevalence found in 2007.

Current prevention approaches and programs

For those in the community who currently have low risk, the aim is to prevent disease. Behaviour modification and public policy (for example, tobacco legislation) have a role to play. This is called primary prevention. If illness is established, then secondary prevention measures are needed to prevent progression of that illness toward morbidities. Appropriate treatment, for example, for hypertension or hyperlipidaemia, can keep people healthy for as long as possible. Currently, the primary and secondary prevention programs in PNG are poorly developed. Legislation on tobacco, and limited public awareness campaigns on risk factors is not enough to influence the current trajectory of disease.

Current diagnosis and treatment approaches and programs

There is currently planning for high-level intervention for people with end-stage disease, with renal dialysis chairs and cardiac catheterisation laboratory mooted for PMGH. (Tertiary prevention: end stage disease → prolonging life). The cost effectiveness of this level of intervention is very much less than primary and secondary prevention.

Challenges

- ❖ The burden of NCD morbidity and mortality places them as a collective group of diseases of high significance;

[43] Hou X et al. *Pacific Possible. Health and Non-Communicable Diseases*. World Bank, 2016

[44] Rarau P, Vengiau G, Gouda H, et al. Prevalence of non-communicable disease risk factors in three sites across Papua New Guinea: a crosssectional study. BMJ Glob Health 2017;2:e000221. doi:10.1136/ bmjgh-2016-000221

[45] *Behaviour risk factors for NCDs in Papua New Guinea (sourced in HSIT report, p 25).*

- Societal factors play a large part in the inevitable rise of these diseases;
- There are important primary and secondary prevention contributions that the health sector can play. To date, there is minimal commitment to such measures. There is a strong economic and human case to invest in such measures.
- Treatment of end-stage disease is costly and of low value.

Cancer

The diseases

There is very little available data on the burden of cancer in PNG. Knowledge is dependent upon the data available through the Hospital Discharge Dataset. The most common cancer diagnoses on discharge are cancer of the cervix, cancer of the breast, oral cancers and liver cancer. A recent forum on cancer tabled a summary report outlining the concerns of a lack of screening, diagnostic and treatment services for cancer. Well-developed screening programs to identify cancers are not in place in PNG. Community are reported as not presenting to facilities with concerns of cancer, for the inability to access treatment. Without treatment, many cases of cancer will result in death.

Figure 3.50: Ways to reduce cancer

Incidence (new cases) and prevalence

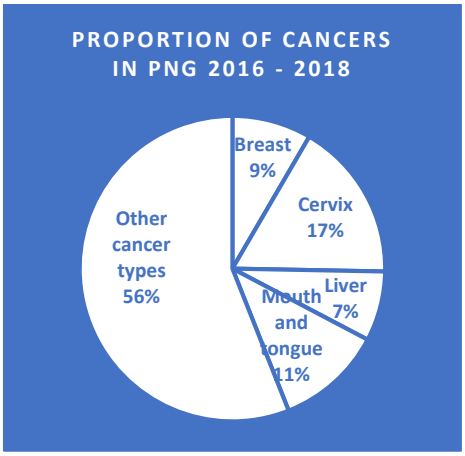
During the period 2016 – 2018, hospital discharge data (about 50% completeness) show that cancers account for about 3% of all discharges. Based upon modelling by WHO, this represents about a quarter of expected number of cases[46]. At any time, it is estimated (by the same modelling) that there are 20,609 people living with cancer, and about 7,500 deaths each year.

Figure 3.51: Table showing leading causes of Cancer (DHIS) for 2016-2018

Leading causes of Cancer:				
	Level 1 - 4 facility	Level 5 - 7 facility	Total discharges	percent of all cancers
Breast	163	613	776	8.4%
Cervix	269	1292	1561	16.9%
Liver	215	466	681	7.4%
Mouth and tongue	215	776	991	11.3%
Other cancer types	1,033	4,174	5,207	56%
All cancers	1,895	7,321	9,216	

Source: Discharge data 2016 - 2018 (National - about 50% complete).
Total discharges approximately 500,000 records.

Figure 3.52: Pie graph showing types of cancer in PNG



Cancer of the cervix is the most common form of cancer in PNG (17% of all cancers in those discharged from health facilities). Papua New Guinea has among the highest estimated burdens of cervical cancer globally, with an incidence 6.3 times that of Australia and New Zealand (age standardized rates 34.5 vs 5.5/100,000), and mortality 13.5 times greater (21.7 vs 1.6/100,000). Cervical cancer is the most common cancer among women in PNG and results in an estimated 1,500 deaths per year[47]. This is followed by cancer of the oral cavity (11%), breast cancer (8%) and liver cancer (7%). These 4 cancer types account for 44% of all cancer discharges.

[46] Global cancer observatory modelling 2018.
[47] Personal correspondence Andrew Vallely

Diagnosis and Treatment

Currently there is limited capacity for diagnosis of cancers within PNG. Few provinces have the level of services (for example, histopathology, radiology) to provide diagnosis. A lack of early referral and diagnosis results in many cases reaching hospital with end-stage disease, leaving few treatment options. Active treatment (for example, chemotherapy, radiotherapy) is not available or accessible for most residents, resulting in a poor prognosis. There is a lack of palliative and hospice care; most cases presenting for medical attention are at advanced stage, with subsequent poor outcomes.

At the Level 7 hospital (PMGH), there is one linear accelerator planned for PMGH, currently awaiting building modification. PMGH and Angau Hospital (Lae) hosts the only chemotherapy centres in the country.

Current prevention approaches and programs

In 2015, the Government endorsed a National Policy on Cancer which is currently being implemented by the Department of Health.

Primary Prevention (an intervention prior to the onset of disease -for example, behaviour modification, and immunisation) is the most effective way to minimise the personal burden and cost of cancer: Secondary prevention requires screening for early detection, and commencement of treatment prior to the cancer progressing. Of the most common cancers, with planning and suitable programming, opportunities exist for prevention or early intervention.

Cervical cancer: Cervical cancer is increasing. At PMGH, there has been a 65% increase in incident cases over the past 13 years. The primary cause of cervical cancer is Human Papilloma Virus (HPV). A recent study demonstrated that 12% - 15% of women of reproductive age are HPV positive. An effective primary prevention program is vaccination in early adolescence to prevent acquiring infection. Secondary prevention requires detection of HPV and treatment for it. Point of Care HPV test and treatment provided two or three times in a woman's lifetime is highly cost-effective strategies, reducing both cervical cancer incidence and cervical cancer mortality by 40-43%.

Breast Cancer: Screening for breast cancer to detect early disease (secondary prevention) is achieved through self-examination and/or mammography. Very few women have access to breast screening. Disease will often present in an advanced stage.

Liver cancer: the primary cause of liver cancer is chronic active hepatitis. The Hepatitis B vaccine will prevent most cases. It has been on the PNG immunisation schedule for nearly two decades, resulting in the next generation of adults largely protected against this disease. The vaccine is most effective if administered within 12 hours of birth. The low facility delivery rate results in lower levels of immunity to protect against liver cancer. It is likely that incidence will continue to rise.

Oral Cancer: almost all oral cancers are a result of chewing betel nut, an activity of strong cultural connection. While there is legislation around the sale of betel nut, there is little enforcement. There are regional differences in the prevalence of betel nut chewing, ranging from 26.8% in the highland's population to 95.4% on the north coast of PNG. Betel quid without tobacco has been demonstrated to be associated with the development of oral cancer in PNG, both in a case-control study and systematic review[48]. PNG is stated to have the highest rate of oral cancers in the world. It has not been possible to validate this assertion.

[48] Pollaers K et al. Oral and oropharyngeal cancer in Oceania: Incidence, mortality, trends and gaps in public databases as presented to the Global Oral Cancer Forum, Translational Research in Oral Oncology Volume 2: 1–8, 2017

Lung cancer: Smoking prevalence (2014): males 55%; females 27% (Total 41%). Programs to address smoking is focussed on the legislative support for the WHO FCTC, smoke free policy in all government buildings, and increasing community awareness of the hazards of smoking. Further leveraging of increased tobacco excise was introduced in late 2019.

Challenges and expectations

The most cost-effective way for PNG to manage cancer is through primary or secondary prevention programs of these common cancers. Examples of programs include vaccination (hepatitis B, HPV) and behaviour change (betel nut chewing, smoking); and early detection (HPV, breast self-examination). Strategic investment in diagnostic facilities and treatment capacity (including palliative measures) requires consideration of cost and reach.

Injury

Injury refers to any form of harm that causes physical consequences to the person. This may be unintentional or intentional. Injury encompasses falls, burns, poisoning, drowning, road trauma and the results of acts of violence. Globally, injuries account for 9% of all deaths. In PNG, recent data suggest that injury accounts for nearly a fifth of all deaths, similar to that from TB, HIV and malaria combined.

Prevalence

Domestic Violence: The Demographic and Health Survey (DHS 2016/18) reports that 59% of women aged 15 – 49 have ever experienced physical violence or sexual violence, and a quarter of all women have experienced both physical and sexual violence.

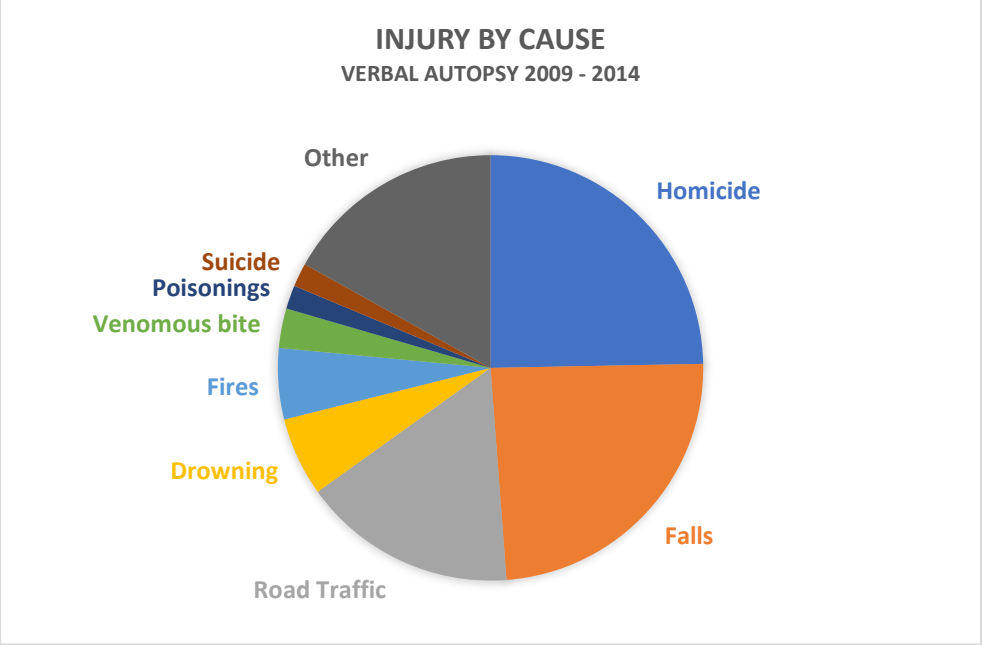
All forms of injury: Recent data suggests that injury is now more prevalent in PNG. A report of verbal autopsies (VA) across four districts from 2009 – 2014 showed that 19.1% of all deaths (male – 24%, female 13%) were a result of injury. Data from a series of verbal autopsies from 1970 – 2001 showed injuries then accounted for 8.8% of all deaths. The VA 2009 – 2014 explored the causes of injury. Nearly half result for violence and falls, and a sixth from motor vehicle accidents. The Global Burden of Disease modelling shows Road Trauma as the fifth biggest contributor to Disability Adjusted Life years in PNG.

Figure 3.53: Tables showing Global Burden of Disease modelling for Road Trauma.

Cause of injury	
Homicide	24.7%
Falls	24.1%
Road Traffic	16.3%
Drowning	6.0%
Fires	5.4%
Venomous bite	3.0%
Poisonings	1.8%
Suicide	1.8%
Other	16.9%

Proportion of deaths due to injury by Age Group (years)	
12 - 19	14.0%
20 - 49	23.3%
50 - 69	16.2%
70+	18.3%

Figure 3.54: Graph showing Injury by Causes from VA 2009-2014



Prevention programs

There are initiatives in prevention of domestic and interpersonal violence, and limited programming (outside of health sector) to address injury resulting from road traffic accidents.

Challenges:

Lack of prioritisation of injury as a public health issue.

Papua New Guinea National Health Plan

Situational Analysis, 2019

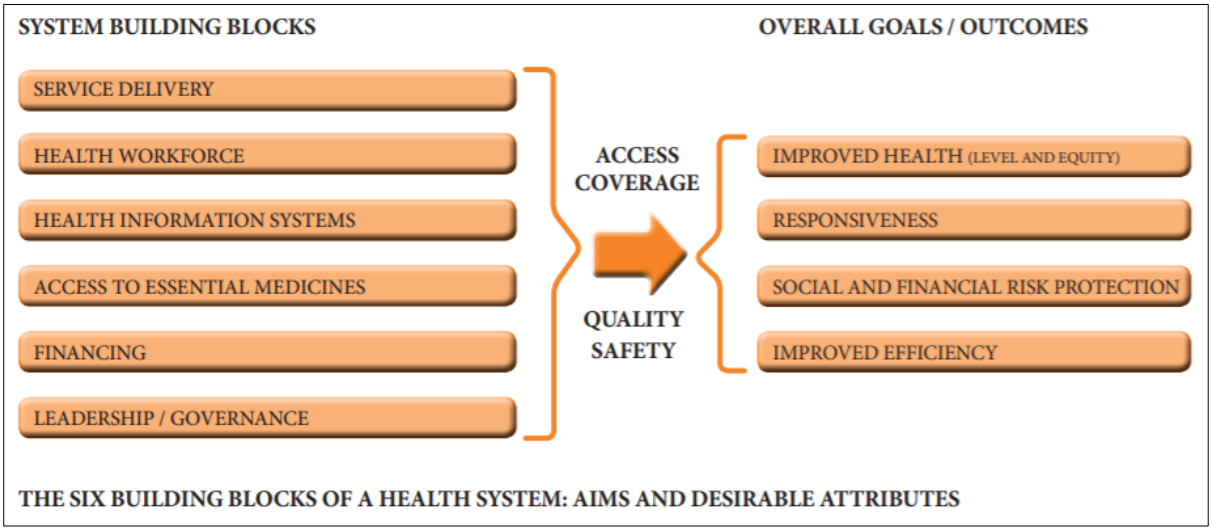
SECTION 4: DESCRIPTION AND ANALYSIS

Health Systems 2019

Overview of this chapter

A health system consists of all the organizations, institutions, resources and people whose primary purpose is to improve health. A health system needs staff, funds, information, supplies, transport, communications and overall guidance and direction to function. Strengthening health systems thus means addressing key constraints in each of these areas. The six building blocks contribute to the strengthening of health systems in different ways. Some cross-cutting components, such as leadership/governance and health information systems, provide the basis for the overall policy and regulation of all the other health system blocks. Key input components to the health system include specifically, financing and the health workforce. A third group, namely medical products and technologies and service delivery, reflects the immediate outputs of the health system, i.e. the availability and distribution of care[49].

Figure 4.1: Systematic Diagram of System Building Blocks



Source: WHO, 2010

Governance

Legislative Framework

There are a number of bedrock legislations that define specific role and scope to define health sector activity within PNG. These include: The Organic Law on Provincial Governments and Local-level governments 1998, National Health Administration Act 1997, Provincial Governments Administration Act 1997, Public Hospitals Act 1994, and Provincial Health Authorities Act 2007. Additional pieces of legislation also exist to support and regulate the health sector e.g. Medicines and Cosmetics Act, 1999, Public Health Act 1973, Medical Registration Act 1980, Tobacco Control Act, Mental Health Act 2015, Public Hospitals Act 1994.

The National Health Administration Act provides the framework for the planning and coordination of provincial health services and the roles and responsibilities of the various levels of government in health. Since enactment, there were difficulties encountered, particularly for the National Department of Health, where enforcement of health policy at provincial level could not be fulfilled. Rural health

[49] *World Health Organisation, Monitoring the building blocks of health systems: a handbook of indicators and their measurement strategies, 2010*

services were responsible to Provincial Level Government. To redress these concerns and provide clarity of role and function with the intent of providing an integrated health service delivery system (rural health services and hospital services) facilities and hospitals with provinces and districts are managed by a single health authority – The Provincial Health Authority (PHA). The Provincial Health Authorities Act was legislated in 2007 to provide for this. The PHA Act is cited:

> The main purposes of this Act are to –
>
> (*a*) improve the standard of public health of the people of PNG and the delivery of health services to the provinces and the National Capital District by providing for provincial health partnerships; and
> (*b*) The establishment of provincial health authorities; and
> (*c*) Provide for the delivery of curative services and public health services from provincial health authorities,
> and provide for other related matters.

By 2020, all provinces will execute the delivery of health services through a PHA.

Levels of administration

Governed by these respective legislations, the roles of various levels of administration in achieving an integrated service at district level within the health sector are clear. Provincial, district and local governments are responsible for funding and delivery of rural health services and implementing all policies and programs according to the set goal and vision of the national government. Health advisors coordinate the health planning process within the provincial government planning framework. Hospitals are auspiced within this arrangement, responsible for service delivery

Level 1 – 4 facilities: servicing rural and urban communities are responsible to the Provincial Health Authority. Funds for capital and services are provided through the respective PHA. Human resources are appointed through the PHA Chief Executive, and supervised/managed directly at provincial and district level. Level 5 and 6 facilities (Provincial and Regional Hospitals) are managed by the PHA.

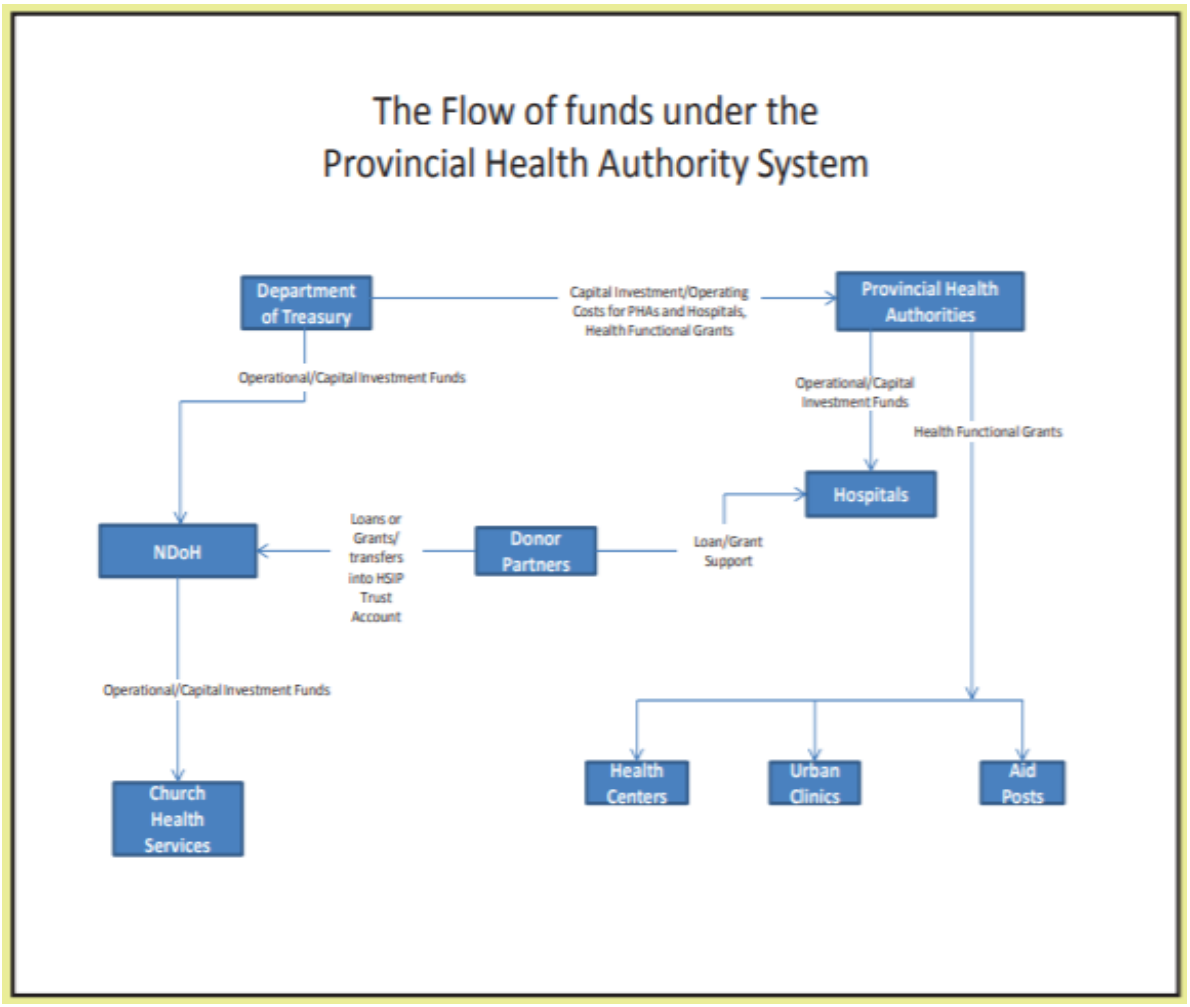
District Development Authorities are still being established, governed by the District Development Authority Act (DDA). The functions of the DDA include:

- Perform service delivery functions and responsibilities;
- Develop, build and maintain roads and other infrastructure;
- Approve disbursements of grants;
- Oversee planning and budget priorities;
- Develop 5-year plans, and conduct annual review of these rolling plans;

The National Department of Health has responsibility for setting policies, developing and monitoring standards and guidelines, procuring pharmaceuticals and medical supplies, surveillance, core health protection and disease control activities of national interest.

The level 7 facility, Port Moresby General Hospital, has its own management board.

Figure 4.2: Diagram of Flow of Funding in PHA



Sourced from District Health Manager's Guidebook, NDOH 2016

Leadership and management

Policy development

It is noted that the NDoH has achieved high work output on policy development and drafting (and passage) of legislation during the current health plan. Many new polices have been developed, across a range of technical and administrative domains. The planning unit at NDoH provides the strategic direction for the health sector and supports the PHAs in their policy and planning capacity and progress.

Planning

The mid-term review of the 2011 – 2020 advised that focussed strategic priorities be identified for the remaining of the planning period. These priorities have been developed in collaborative manner at national level. There, remains, however, an ambitious agenda that includes xx program activities. The document reflects a focus on national level, despite a national agenda of decentralisation of governance and management within eh health sector.

There are several rich data sources within PNG health sector. A framework to monitor high level activity and outcomes is available for quarterly review and in an annual report, the Sector Performance Annual Review. These instruments support management decisions at district, provincial and national level.

Detailed district and provincial services plans have been prepared within every province, providing direction for activity across the nation. The reporting against these plans is not certain and considered likely that further diligence in reviewing progress is needed.

Partnerships

There is a proud history of collaborative approaches to addressing health care in PNG. The churches have played and continue to play a central role in delivery of health care, particularly at rural level. Currently, there are 40 – 50% of rural facilities run by churches. These are heavily subsidised by government funding, formalised through a partnership agreement. In 2017, 8% of the health budget was channelled through Church health services for service provision.

Development Partners provide generous support to the sector. Multilateral Development Partners (MDP) assist in various ways, including the provision of large concessional financing (for example, Asian Development Bank, Global Fund to Fight AIDS, TB, and Malaria, and the World Bank) and/or a focus on technical assistance, training, and in some cases, the supply of commodities (for example, UNFPA, WHO, UNICEF). Bilateral Development Partners (for example, DFAT, JICA, MFAT, China AID) provide a mix of support modalities, and direct support to several the MDPs. Non-Government and Faith-Based Organisations support public health and service provision through finance, program (for example Marie Stopes International, Rotary Against Malaria), service (for example YWAM) and advocacy.

There is acknowledgement of intersectoral and central agency partnerships, particularly within government departments as an essential strategy for effective governance and service delivery.

The coordinated approach to such partnerships is governed by the National Department of Health. There are several instruments to give effect to these partnerships. These include, for example, Partnership Agreements (x 52) and Development Partner forums. The Health Services Improvement Program (HSIP) was established as a mechanism to facilitate a coordinated and integrated approach to partner contributions, built upon the principles of a Sector Wide Approach, where partners and government respected a common strategy (National Health Plan), with the Government setting the agenda and reporting to a Development Partner forum through an agreed instrument (Performance Monitoring Framework). Over the past decade, it is observed that there has been a divergence from this centralised coordination. This may be a consequence of the decentralisation of the governance of the health sector (through the establishment of Provincial Health Authorities), where DPs may engage directly with players outside of the NDoH. The visibility of DP funds is less now, with the NDoH expressing uncertainty of the how much funding is provided by DPs. The NDoH has expressed its hope that the HSIP or similar modality may again be central to DP assistance within the sector.

Regulation

Regulatory and enforcement roles of the National Department of Health

Figure 4.3: Table Showing Regulatory Boards in NDOH

PHARMACEUTICAL SERVICES STANDARDS/PHARMACY BOARD	MEDICAL BOARD OF PAPUA NEW GUINEA
• Oversee enforcement of Medicines and Cosmetics Act 1999 and said Regulation 2002	• Registration of Personnel
• Product Registration	• Registration of Premises

• Registration of personnel	• Implement Health Practitioners Act
• Inspection and Registration of Pharmaceuticals Establishment Premises, Warehouse, Pharmacy Outlets	NURSING AND MIDWIFERY COUNCIL OF PNG
• Testing of quality of medicines	• Registration of Personnel
• Monitoring of Adverse Drug Events	• Accreditation of Nursing Institutions (Schools)
• Monitor and Control Ethical Advertising and Promotion of Pharmaceuticals and Supporting Guidelines in PNG.	• Curriculum development
• AMR issues	• Implement Nursing and Midwifery Act
• MTC committees	RADIATION SAFETY and CONTROL
• CBPM Pharmacy Assistants	• Facility registration and Accreditation.
• Curriculum development	• Personnel registration
ENVIRONMENTAL HEALTH BRANCH	• Equipment registration
• Water and Sanitation Hygiene Standards	
• Food Standards and sanitation	TOBACCO CONTROL
• Noise and air pollution compliance	• Registration and Licensing of premises.
• Vector and Water Bourne disease Control	
• Health Inspection role	HEALTH PROMOTION
• Implement Public Health Act	• Health IEC related materials (posters, billboards) and advertisement control

The health sector, through a number of pieces of legislation, is required to maintain quality standards (for example, medical products, pharmaceuticals, currency of skills of workforce), and enforcement/compliance where public health is at risk (for example, food hygiene). These encompass the following domains:

1. Registration of Pharmaceuticals, Health Technologies, Food, Tobacco and Radiation. Products: Pharmaceutical Products, Food Sanitation, Water, Second-hand Clothes, Poisons and Dangerous Substance and Baby Feeds.
2. Health Professionals registration and licensing including competency standards development
3. Accreditation and Licensing of Health Institutions, Pharmaceuticals and Food Establishments and health facilities.
4. Good Governance of systems, processes and practice in ensuring compliance and adherence to set standards and legal provisions.

There is a wide range of legislation in place to support these matters of quality and public health. For the most part, the enforcement and compliance comes down to the National Department of Health. The capacity of the respective Branches has been very limited, with insufficient funding and inadequate staffing. The consequences of sub-optimal regulation and a lack of compliance oversight is likely to contribute to public health and clinical risk and ongoing health inequity. There are no detailed analyses available to determine the level of compliance and enforcement activities within PNG, nor the consequences of a lack of these activities.

System inputs

Human resources

The health workforce is a critical component of the health system, with health workers providing services and support, and administrative staff providing the direction, resources and platform of these services. Consideration of health workforce includes the scope and size of the workforce to meet the service and support needs; education and training at pre-service and in-service phase; recruitment, retention, and industrial processes; supportive and encouraging environment; and a regulatory framework to ensure quality and safety.

Current workforce

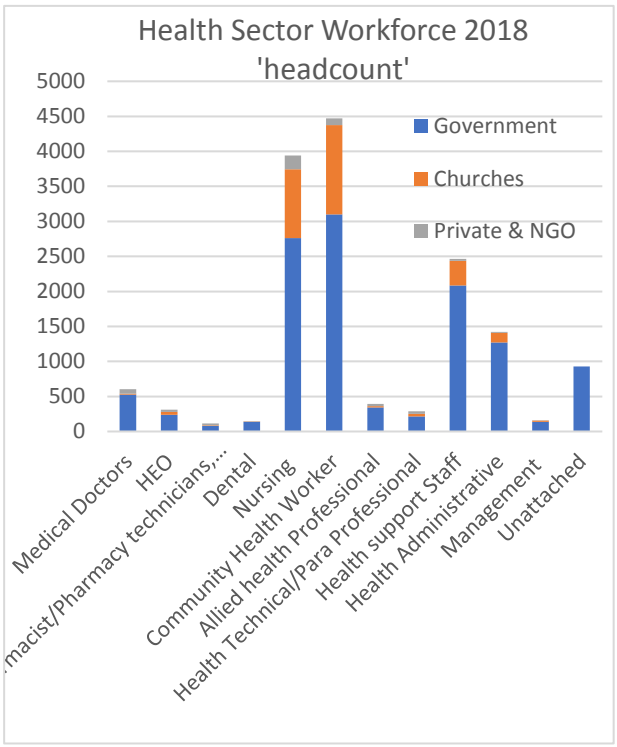
What is the size of the current workforce?

In 2018, the scope of workforce is tabulated as follows:

Figure 4.4: Table showing Categories of Health Workforce

Categories of Health workforce	Gov't	Church	Private & NGO	Total
Medical Doctors	526	14	62	602
HEO	238	40	35	313
Pharmacist/Pharmacy technicians, Pharmacy Assistant	79	6	30	115
Dental	137	1	4	142
Nursing	2762	982	197	3941
Community Health Worker	3101	1276	92	4469
Allied health Professional	343	19	33	395
Total Health Professionals				**9977**
Health Technical/Paraprofessional	216	37	35	288
Health support Staff	2087	350	28	2465
Health Administrative	1270	136	16	1422
Management	137	17	4	158
Unattached	927	0	0	927
TOTAL	**11,823**	**287**	**536**	**15,237**

Figure 4.5: Graph of Health Workforce



Source: National Dept of Health draft HRH strategic Plan 2021 - 2030

The age profile of the workforce provides an indication of pending retirement. The high number of unknown age weakens the ability to estimate the imminent needs of the workforce. The current age profile of the workforce is detailed:

Figure 4.6: Table showing Cadre of Health Workforce by Age

Health workforce	< 25 yrs.	25-34 yrs.	35-44 yrs.	45-55 yrs.	55-64 yrs.	>65 yrs.	unknown
Medical Doctors	0%	17%	18%	5%	4%	2%	53%
HEO	0%	20%	26%	8%	5%	4%	37%
Pharmacist & asst.	0%	21%	31%	13%	5%	1%	29%
Dental	0%	15%	16%	15%	13%	4%	36%
Nursing	1%	23%	21%	12%	8%	3%	32%
CHW	0%	16%	22%	17%	12%	4%	28%
Allied Health	0%	15%	17%	16%	7%	3%	42%

Is the supply adequate to need?

The National Health Service Standards specify the ceiling requirements of each cadre. With time, the ceilings will need to be revised to meet the WHO proposals of health worker ratio of 4.45,1,000 population (currently 0.97). There are numerous vacant positions in the health workforce, with filled positions representing just 72.2% of allocated positions. Vacancies/unfilled positions exist in key areas. The shortfall in the established ceilings are provided, which is particularly acute in government services.

Figure 4.7: Table showing Categories of Health Workforce and their shortfalls

Categories of Health workforce	Government	shortfall	Churches	Shortfall
Medical Doctors	526	40.56%	14	22.22%
HEO	238	40.35%	40	27.27%
Pharmacist/Pharmacy technicians, Pharmacy Assistant	79	46.62%	6	14.29%
Dental	137	44.53%	1	75%
Nursing	2762	30.50%	982	10.40%
Community Health Worker	3101	23.58%	1276	6.31%
Allied health Professional	343	33.78%	19	9.52%

It is noted that priority programs (for example, medical supply) carry high levels of vacancy. Demand for health services is driven by a number of health and demographic factors, including concentration and age structure of the population. The draft HRH Strategic Plan specifies a target of 4.45 health professionals per 1000 population[50], which by the year 2030, requires a health professional workforce size of about 47,000, an increase of 31,000. The cost of this expanded workforce is projected to be 7 times that of the current workforce.

The WB Service Delivery by Health Facilities report undertook a survey 60 health facilities from level 3 and 4, and all facilities Level 5 - 7. This showed at Level 3 & 4 HF, about 85 % of staff positions were filled. However, for clinical staff, there were fewer filled positions, particularly so for doctors (53% - 56%), HEOs (68% - 78%) and nurses (74% - 80%). At levels 5/6 facilities, 87% of positions were filled and at Level 7, 77%.

What is the range of quality, skills and knowledge of the current workforce?

There is evidence that suggests that current health worker skills do not meet expectation. Two recent surveys show that a number of health workers are not following treatment protocols. The PNG IMR Malaria Indicator Survey showed that only about half of all fever cases that attend a facility are tested for malaria. The Ministerial Task force on Maternal and Newborn Health cited staff skills as a concern in the provision of quality of care, resulting in poor outcomes. A 2018 study[51] revealed numerous deficiencies in skilled care at delivery. The task force noted that CHW advanced maternity and newborn care upskilling is not done widely. The Health Facilities Survey[52] found that maternal-care related knowledge and child-care related knowledge was low (slightly above 50%) for all health workers (including doctors). However, the knowledge indexes for STI were relatively high (between 80 and 90%).

[50] A regional aspiration provided by WHO to fulfil UHC.
[51] EENC Assessment in 8 hospitals, 2018, NDoH, WHO)
[52] Service Delivery in Health Facilities in PNG, World Bank Group, 2018

Pipeline: pre-service training

PNG needs more health workers. Modelling projects a need for 3400 – 4200 new graduates joining the workforce each year from 2021 – 2025, increasing to 7,000 to 8,000 new graduates each year thereafter until 2030. Target numbers are provided in the accompanying table. The training capacity in the tertiary education sector does not exist at this point to meet these needs. The estimated annual cost of pre-service training will increase from K8.9M in 2020 to K121.44 by 2030. Alternative, longer term modelling is required.

Figure 4.8 Table Showing Cadre by 1000/pop

Cadre	number	Per 1000 popn.
Doctors	3514	0.27
Nurses	23780	1.81
HEOs	4004	0.31
CHWs	27048	2.06
Total	58346	4.45

Current graduate output:

Figure 4.9a: Table showing Graduate outputs 2009 - 2018

	Doctors	HEO	Nurses	CHW	Anaesthetic Scientific Officer	Dental Therapist	Medical Laboratory Technician	Public Health	Radiation Therapist
2009	39		167	239	12	6	6	30	0
2010	41	42	186	239	10	7	0	20	0
2011	35	63	213	292	5	2	7	9	0
2012	49	51	191	256	9	5	6	16	0
2013	44	49	253	346	9	1	4	21	0
2014	42	25	268	385	7	5	13	20	0
2015	48	49	220	371	8	2	7	14	6
2016	42	52	466	483	7	1	5	17	6
2017	42	52	439	434	0	0	0	0	0
2018	42	59	386	172	0	0	0	0	0
Total	**424**	**442**	**2789**	**3217**	**67**	**29**	**48**	**147**	**12**
Annual Average	**42**	**44**	**279**	**322**	**6.7**	**2.9**	**4.8**	**14.7**	

Figure 4.9b: Table showing Graduate outputs 2009 – 2018 *(Continued)*

	Dentist	Oral	Pharmacist	Medical Imaging	Medical Laboratory Technologist	Physiotherapist	Environmental Health Officer	Health Managers
2009	16	2	25	18	20	0	0	0
2010	11	3	15	17	18	5	18	17
2011	13	0	24	13	21	-	28	27
2012	17	2	18	6	11	12	21	21
2013	17	2	12	15	21	17	18	20
2014	5	3	18	11	21	19	27	15
2015	11	2	23	9	15	18	28	26
2016	6	5	20	9	12	20	0	19
2017	0	0	0	0	0	20	0	27
2018	0	0	0	0	0	25	28	22
Total	96	19	155	98	139	136	168	194
annual average	**9.6**	**1.9**	**15.5**	**9.8**	**13.9**	**15.1**	**16.8**	**19.4**

Undergraduate programs in health are offered by Divine Word University, University of Papua New Guinea, Pacific Adventist University, University of Goroka and Lae Unitech. The above tables provide a summary of example graduate outputs from 2009 – 2018.

Nursing: there are a total of 16 nursing schools, 9 fully accredited and 4 provisionally accredited and 3 are newly established. In 2018, there are 386 graduates from these nursing schools. There are 5 midwifery training schools (nursing is a pre-requisite). From 2011 – 2018, there were 461 graduates from midwifery training schools. There is capacity for specialist nursing training through UPNG.

Community Health Workers: there are a total of 20 CHWTS, 16 fully accredited, 2 provisionally accredited, and 2 are newly established. In 2018, there were 172 graduates from these training schools.

Maintaining skills and commitment

To meet quality and maintain currency of skills and knowledge, health workers need to commit to lifelong learning.

Supervision

Supportive supervision is a critical component of health worker programme performance. There are three key functions of supportive supervision: management (ensuring performance), education (promoting development) and support (responding to needs and problems)[53]. In the 6 years from 2013 – 2018, there were 360 health workers trained in supervision. Notably, these were nearly all CHW and Nursing Officers. There were only 6 HEOs and no medical officers. The NHIS reports that at least one supervisory visit was received in 53% of health facilities during 2018. The Health facility survey reports that 34% of Level 3 & 4 government facilities, and 23% of level 3 & 4 church facilities have never received a supervisory visit. This same survey showed inconsistent and a narrow breadth of activities during supervision.

In-service training

Health workers are frequently engaged in training. Programs and activities target their trainings upon need. For example, from 2016 – 2019, 200 CHWs from lower level facilities were trained in maternal and newborn care. From 2011 – 2016, training conducted through the Reproductive Health Training Units (no longer functional) reached 2000 health staff. There is, however, no resource that provides the detail as to who has been trained across the heath workforce, and whether the training is targeted to the priorities of the respective community. Limitations to in-service training include cost, and the ability to free up time to travel for training. While there has been discussion on an in-service training unit within each province, details are sketchy. Opportunities to strengthen in-service training on-site or in district facilities will strengthen with greater communication connectivity.

[53] Assegaai T, Schneider H, *National guidance and district-level practices in the supervision of community health workers in South Africa: a qualitative study.* Human Resources for Health **volume 17**, Article number: 25 (2019)

Data to drive the right people in the right places

Human Resource Information System

A centralised Human Resource Information System (HRIS) is central to understanding the workforce. Matters raised above, including who and where heath workers are placed, their pre-service and in-service training, their age, and professional status can be captured for planning and appropriate staffing to meet need. It is expected that the PNG HRIS will be operational by 2020.

Strategic Planning

There is an appreciation of the magnitude of the health workforce need. The magnitude of need, across people, training institutions and funding, will require considered planning that addresses short term and long-term development. Initial development of this plan has commenced.

Looking after the workforce: Safety for the workforce and safety for the community

A regulated environment

The process of registration and licensing is designed to protect the public from harm perpetrated by incompetent health care workers[54]. The Medical Registration Act 1980 provides the Legislative Framework for health workers in PNG through the establishment of a Medical Board (Medical Practitioners, Dental Practitioners and Allied Health Workers) and a Nursing Council.

Management of the health workforce

The draft HRH strategic Plan provides an assessment of the working environment for health workers, bearing out weaknesses in recruitment and deployment, poor working conditions and limited career progression, inadequate incentivisation, all leading to worker dissatisfaction and low productivity.

Valuing the workforce and respecting the community requires a considered appraisal and positive steps for this key input into the health system.

Summary points:

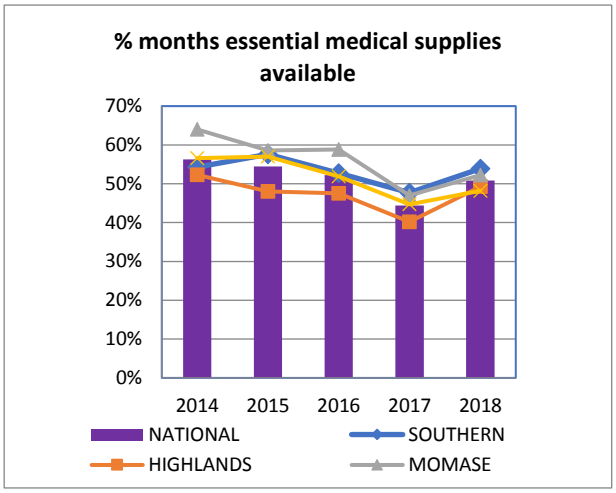
- Health worker: population ratios have decreased from 1.25/1000 population (2011) to 0.97 (2018). The WHO benchmark is 4.45 HW/1000 population.
- The annual graduate outputs from higher education (training) schools is about 10% of need in order to reach the WHO ratio benchmark.
- The health worker deficits are across all cadres, noting some of the highest shortages exist in priority program areas;
- There is evidence of insufficient skills and knowledge of health workers in health facilities; less than half of facilities receive regular supervision. Infrastructure and program for in-service training is not in place.

[54] McKimm, J et al. 2013, Regulation and licensing of healthcare professionals: A review of international trends and current approaches in Pacific Island countries, Human Resources for Health Knowledge Hub, Sydney, Australia.

Medical Supply

The supply and provision of medication at health facilities is a central need for prevention and management of illness. It is an expectation of the community. Supply and management of medication and vaccines is a complex process at the interface of health system supports (financing, ICT, infrastructure, leadership), personnel and commodities. The National Department of Health is presently structured in two arms: Pharmaceutical Service Standards and Medical Supply.

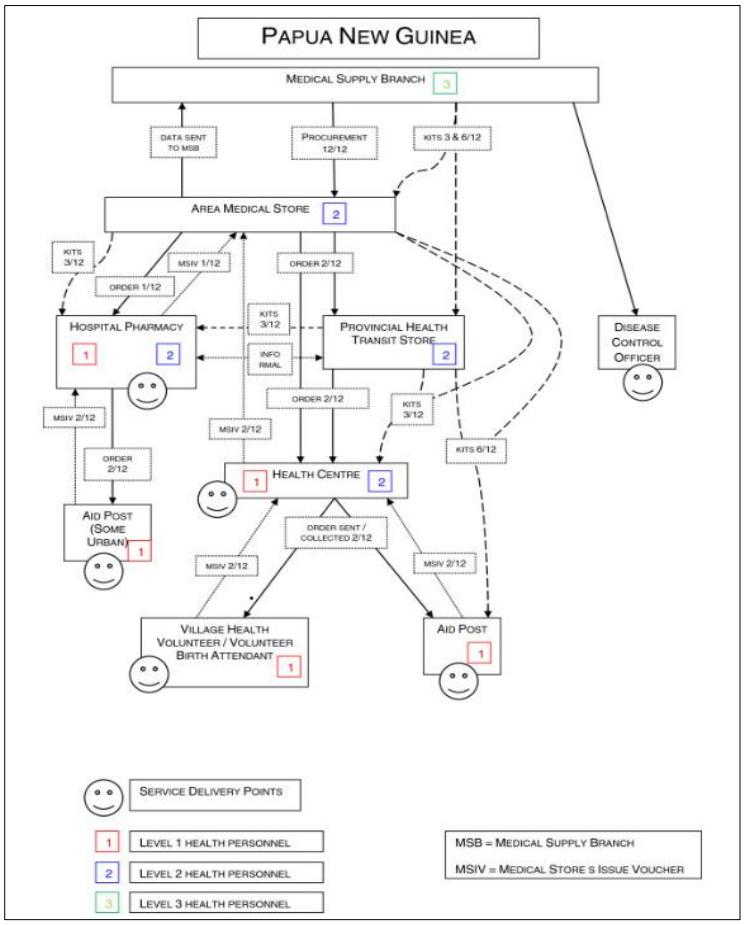
Figure 4.10: Percentage of months for Availability of medical supplies



Current supply to facilities shows that facilities are adequate stocked with essential medications through the year for 51% facility-months (NHIS, 2019). A 2013 study[55] of tracer medications by an independent assessment showed adequate supply to 64% of facilities – comparable to other countries. The medical supply systems continues as a hybrid of a "push system", where kits are provided to all centres to meet a number of clinical needs, and a "pull system" where facility staff request for medication that is then provided through a supply chain. That supply chain involves a number of stages, including Area Medical Stores, provincial transit stores and facilities. In recent years, monitoring of medical supply has been undertaken by electronic means (mSupply), dependent upon data literacy and connectivity. The kits have enabled supply to many remote facilities, providing a level of equity in access to medication.

There remains, however, general concern of the supply systems. These include that the supply of medication is inefficient, with siphoning from supply chain and theft, leading to intermittent stock-outs of essential

Figure 4.11: Flow chart showing of Medical Supply Branch



[55] Burnett Institute, Medical Supply Reform Impact Evaluation Papua New Guinea, Year One evaluation report, 2013.

medication and subsequent cost burden upon provincial facilities and potential adverse outcomes. Erratic government funding, delays in procurement, insufficient consumption information from facilities and constraints with communication and connectivity all impede effective supply.

Oversight of pharmacy standards and quality of medicines has been strengthened through the establishment of a Pharmaceuticals Supply Branch (2011) and Medicines Quality Assessment Laboratory (2018).

The 2013 study found that there is scope for considerable improvement in the storage, handling and rational usage of medicines in health facilities, although many facilities are clearly making good use of increasingly available essential medicines to manage significant health priorities. It is well established that capacity to manage medical supply effectively requires trained pharmacists and pharmacy assistants, with a key role in oversight and strengthening the skills of dispensary staff. However, nearly half the pharmacy assistant positions are currently vacant.

In response to recognition of these concerns, a number of reform process and activities have been initiated. These include establishment of high-level steering committee, new Procurement Legislation (cross-sectoral) effective since April 2019, revision of the medical catalogue to better reflect the current morbidities, an increase in budget, scaling up of mSupply and eNHIS, and the refurbishment and construction of Area Medical and Provincial Transit Stores.

Financing

Budget and expenditure

Facility-level

How much does it cost to run a health facility?

The report "Service Delivery by Health Facilities in PNG" outlines the budget, expenditure and financing a health facility. Excluding capital expenses, and including salary costs, the average annual cost of facility operation varies from K 1.6 million for a level 3 and 4 church-run facility to K57.7 million for the level 7 facility (PMGH). Personnel inputs account for 62% – 67% of running a health facility. There is considerable variability in expenditure items at Level 3 and 4 level between church and government run facilities. For example, Level 3 and 4 public facilities spend K83,000 annually on travel and subsistence, whereas church facilities typically spend K11,000. Paradoxically, church centres spend 21% of their total on transport and fuel, compared with 0.3% in public facilities. Anecdotes suggest that the higher level of outreach from Church facilities account for the higher fuel costs. Church centres spend nearly three times as much on drug supply.

Figure 4.12: Table showing

	WB study 2013 (excluding capital) Level 3 and 4 facilities				Level 5& 6 Public facilities	Level 7
Expenses	Public		Church			
Total	3,168,116		1,647,172		15,802,231	57,722,758
salary	2024717	64%	999458	61%	67%	65%
benefit	83376	3%	15607	1%		
utility, rent maintenance	17699	1%	99037	6%		
operational and office	962809	30%	436765	27%		
training	5000	0%	2604	0%		
drug	51472	2%	71041	4%	0.8%	1.8%
other	23043	1%	22660	1%		

Facility Budget

The same report concludes that Level 3 and 4 health facilities are severely under-funded. Actual expenditure in level 3 and 4 public facilities is only 28% of the reported budgeted amount, while actual expenditure was about 52% in church facilities. It is implied that facilities lack authority or have little control on budget or expenditure levels. The policy of Facility Based Budgeting will in part address this, allowing facilities to have access to budget resources to improve their effectiveness. It is also speculated that funds are dispersed with timing that cannot facilitate timely spending. In comparison, level 5 and 6 facilities spent 92% of their budgets and the Level 7 facility overspent its budget by about a fifth. Rural facilities are not gaining the access to the same funds as the larger facilities.

Whole of sector expenditure

The expenditure levels of the PNG health sector have decreased during the past decade. Overall, there is less expenditure in real terms; the percentage of GDP expended in health has reduced to a third of its levels in 2011, and the proportion of government spending by the heath sector has halved in the last 8 years.

Figure 4.13: Health Function Grants 2011-2018

	2011	2012	2013	2014	2015	2016	2017	2018
Health Function Grants GoPNG (PGK Millions)								
NDoH	468.4	386.9	495.4	785.2	315	332.4	478.9	600.9
Hospitals	572.9	374.4	344	393.7	310.1	374.4	344	393.7
Health Function Grant	99.8	112.6	116.8	40.4	10.3	112.5	116.8	149.9
PHAs	85.7	199.9	187.9	197.2	279	199.9	187.9	197.2
NACS	83.6	15.9	11.3	13.9	7.7	8.8	7.4	1.1
IMR	14.4	18.2	12.7	12.2	9	12.3	9.3	4.2
CHS	149	101.8	215.3	223.5	265.2	101.8	120.9	117.1
Total nominal terms Expenditure	**1473.8**	**1209.7**	**1383.4**	**1666.1**	**1196.3**	**1142.1**	**1265.2**	**1464.1**
Total real terms Expenditure	**881**	**619**	**708**	**800**	**547**	**497**	**525**	**578**
Development Partner contributions PGK Millions								
HSIPTA	19.01	46.50	12.08	17.44	17.02	5.04	7.03	44.99
IMFS	138.9	113.4	260.7	378.7	307.3	3.0	1.0	150.5

Figure 4.14: Graph for expenditure per capita

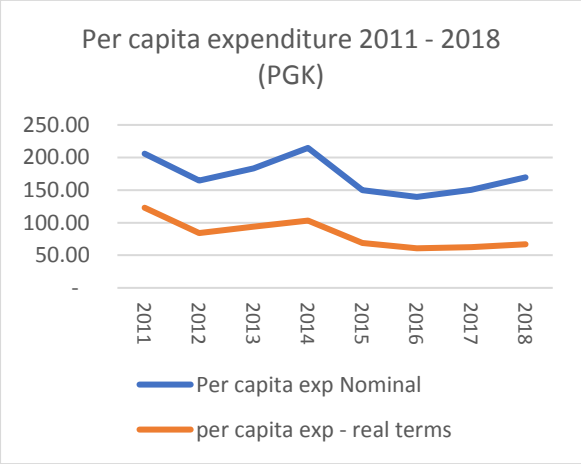


Figure 4.15: Graph showing % of Health

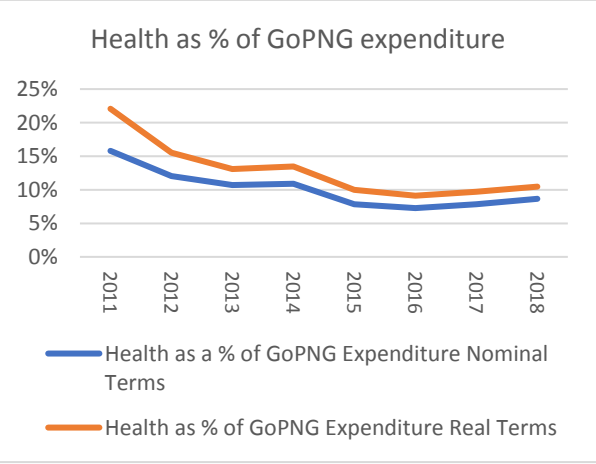


Figure 4.16: Graph showing % of GDP for Health 2011-2018

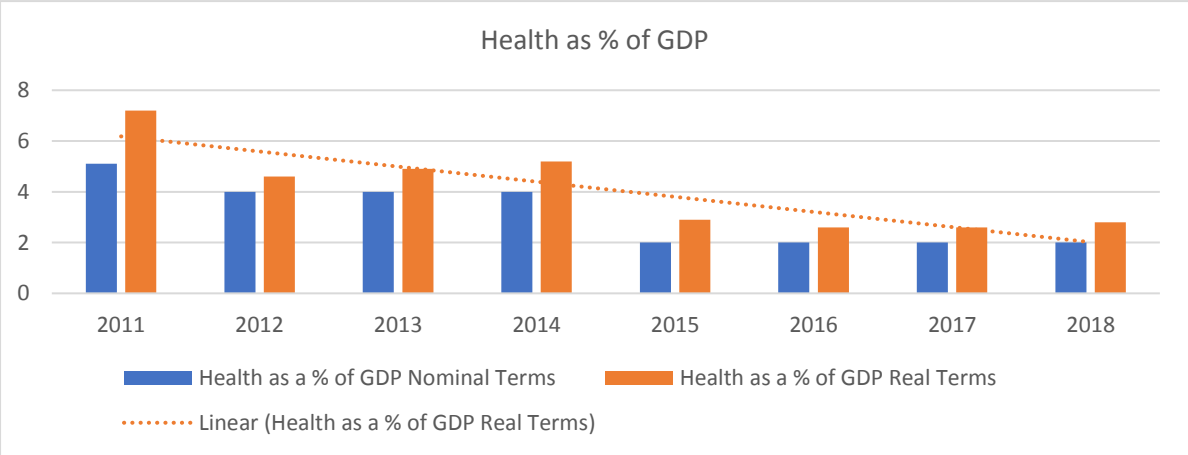
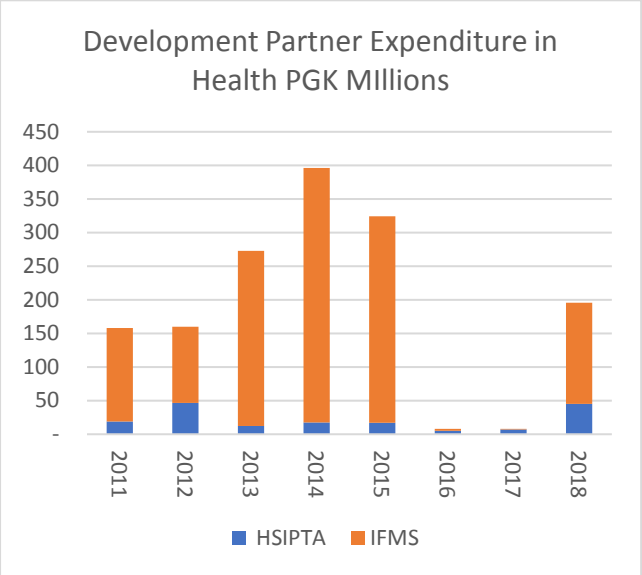
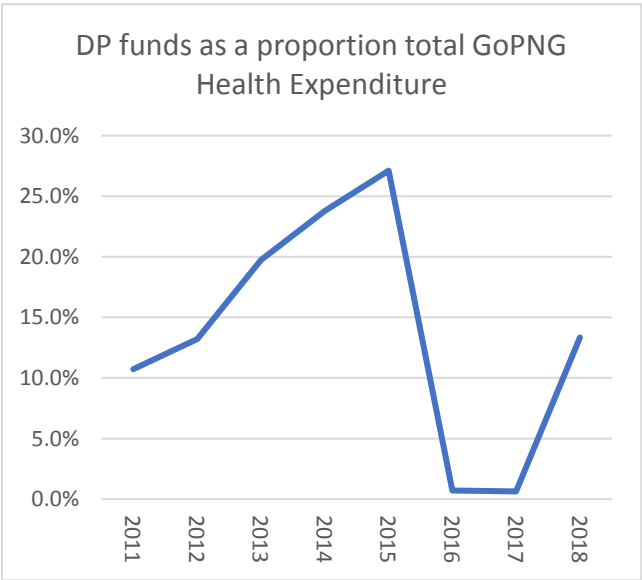


Figure 4.17: Graph showing DPs expenditure in Health



During this time, Development Partner (DP) contributions have also decreased. It is observed that there is decreasing input, and considerable year to year variation of expenditure of HSIPTA and IFMS funds (range from 1% - 26%). There is no central record of DP contributions direct to provinces or other recipients outside of NDoH. On a real term expenditure basis, the Development and private sector contribution to the health sector is about 20%. Going back to 1997, this was I the order of 30%, demonstrating increased commitment by GoPNG.

Figure 4.18: Graph showing DPs funding for as is to GoPNG expenditure



Where is the money spent?

From current accounting records, it has not been possible to discern the proportion of expenditure at level of service or within specific programs. The data collated is not sufficiently granular to do so. Nonetheless, more than 80% of costs in delivering services occur at the district level[56].

Summary points

- Government funding is the main source of finance for the health sector (about 80%)

[56] Grundy J, Dakulala P, Wai K, Maalsen A, Whittaker M. Papua New Guinea Health System Review. Vol 9 No. 1 New Delhi: WHO, Regional office for South east Asia, 2019, p.86

- Funding to the sector has decreased by several measures: one a per capita basis (in 2018 xx per capita); as a proportion of whole of government expenditure (from 22% in 2011 to 10% in 2018 in real terms); as a proportion of GDP (from 7% in 2011, to 2% in 2018).
- Development Partner contributions have been erratic, and overall declined. The full extent of those contributions is not recorded centrally.
- The cost of running a Level 3 and 4 rural health facility is 3.2 Million Kina each year in government centres, and 2.2 Million Kina in church centres.
- Rural health facilities spend a low proportion (28% in public facilities, 52% of church facilities) of their budget allocation

Health Services and Infrastructure

Health services

Overview:

The National Health Service Standards (NHSS), developed in 2011, remains the key policy document, outlining the levels of service, expectations of each of those levels, including function, staffing, equipment and scope of practice. The NHSS has determined the quality expected of these levels and provides a process of accreditation that ensures quality and standard.

OVERVIEW OF LEVELS OF HEALTH SERVICES (NATIONAL HEALTH SERVICE STANDARDS, 2011)

Figure 4.19: Table showing Levels of NHSS 2011

Level	Description	Roles and functions
1	Aid post	Minimum standards for basic health care (outpatient services) and public health/primary health care/community-based programs in rural and remote settings incl. community support (communities, homes, schools, workplaces). Standard treatment guidelines are implemented and practised.
2	Community Health Post	Same as level 1 plus provide some inpatient short stay care as well as greater regularity and integration of outreach/mobile services (i.e. family and reproductive health, health children (incl. Immunisation), TB, HIV/AIDS prevention, malaria prevention and nutrition programs (breastfeeding, infant growth monitoring) and school and dental health.
3	Rural Health Centre	Provide medical, child health, maternal health, minor surgical services (incl. public health, primary health care). Provide inpatient care and some minor clinical support services, and core support to Level 1 and level 2 (incl. outreach and supervision).
3	Urban Health Centre	Provide medical, child health, maternal health, minor surgical services, excluding inpatient services. Provide 5-day x 8 hours of services with 24 hour on-call; provide day ward services with discharge or referral for further treatment. Conduct deliveries within midwifery context. Conduct primary health/family health services, family planning, disease control, health promotion and prevention, incl. healthy Islands programs, nutrition and medical services.
4	District Hospital	Provide medical, child health, maternal health, minor surgical services (incl. public health). Provide clinical support services. Provide inpatient care. Provide Senior Medical Officer in rural medicine and medical officer rural health.
5	Provincial Hospital	Provide medical, child health, maternal health, minor surgical services (incl. public health). Provide inpatient care. Provide on-site clinical and management support services. Provide some sub-specialty services; Provide a provincial referral role.
6	Regional Hospital	Provide medical, child health, maternal health, minor surgical services (incl. public health). Provide inpatient care. Provide on-site clinical and management support services. Provide some sub-specialty services; Provide complex treatment of patients from its individual region by referral.
7	National Referral Hospital	Provide medical, child health, maternal health, minor surgical services (incl. public health). Provide inpatient care. Provide on-site clinical and management support services. Provide full range sub-specialty services; Provide a nation-wide referral role for urgent and critical care.

It is expected that health workers at these levels 1 – 4 provide integrated care of 'Essential packages of services. These facilities also have a role to support Public Health programs (for example, TB treatment centre, diagnosis of malaria) and frontline in the maternal and child health programs, include management of childbirth and neonatal care. Some districts have hospitals that support these functions. Level 5 Hospitals and Level 6 (Regional Hospital) may take on a role as a "Centre of Excellence", where the hospital holds a specific interest in a clinical discipline (for example, Diabetes, Cancer), and developing appropriately clinical and public health approaches to these that could be applied nationally. While clinically focussed, these hospitals still have an important role in support of public health programs. The level 5 and 6 hospitals support all health workers through the provinces. The National Referral Hospital, Port Moresby General Hospital, is the seat of a number of clinical leads for national programs.

Facilities: challenges, constraints and opportunities

The current state of level 1- 4 facilities:

Level 1: Aid posts. There has been a steady decline in the function of aid posts over a period of at least 10 – 20 years, where increasingly, there have been closures of aid posts, currently in the vicinity of 40%

Level 2: Community Health Posts: The initial 32 Community Health Posts have been constructed with further planned in coming years. There is expectation that these facilities will provide a higher level and quality of clinical and public health service closer to community, and in doing so, achieve better health outcomes, better program outcomes and relieve the burden of patient load from higher level facilities. These outcomes will need to be assessed in the short-medium term to guide the further roll out and changing landscape of health facilities. In the creation and planning of Community Health Posts, a number of "health sub-centres" are identified to transition to Community Health Posts. The transition toward CHP will need to consider the blend of skills, staffing/population ratios, geography and morbidities in order not to negatively impact on community access to services.

Level 3 and 4 health centres, urban clinics and District Hospitals: The challenges faced by level three facilities; particularly rural health centres are outlined above. There is a capital development plan for new district level hospital, with the aspiration of every district hosting a level 4 facility.

A decline in utilisation, falling coverage rates for key public health and clinical programs is a cause for concern. There are opportunities for change. Most particularly, the establishment of PHAs wrest the planning, staffing and funding of services at a more local level. The institution of eNHIS provides a new capacity to determine how villages are accessing services. For example, it can be determined where women may go for antenatal care or delivery, or where people may access for standard primary health care. This information provides the opportunity to develop new models of service that better meet community need. Opportunities for new approaches to services through, for example, use of mobile phone technology and telemedicine may enable better reach to remote villages, and greater access for all to higher levels of support. The landscape of structured services is changing. Models of service that are responsive to these changes, built upon evidence and prepared to be innovative.

In 2018, the following count of facilities holds (Source NDoH, Nov. 2019):

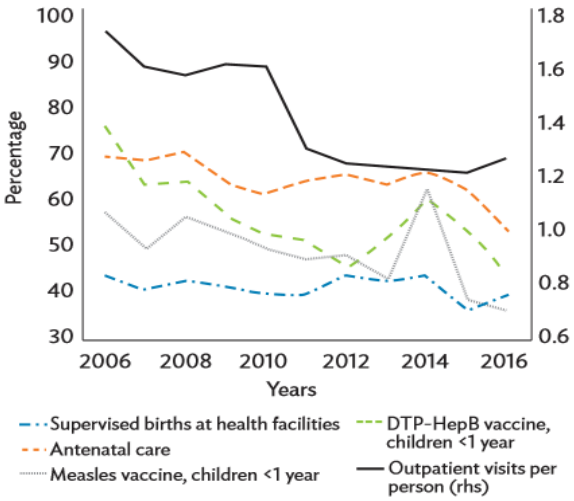
Figure 4.20: Table showing count of facilities

	Aid Post			Community Health Post	Health Centre		Health Sub Centre		Urban Health Centre		District & rural Hospital	Prov Hospital	Reg hospital	Nat referral hospital
Level facility	**1**			**2**	**3**		**3**		**3**		**4**	**5**	**6**	**7**
	Cl	**Op**	**%Op**	**Op**	**Cl**	**Op**	**Cl**	**Op**	**Cl**	**Op**	**Op**	**Op**	**Op**	
Western	47	90	66%			11		24		4	2	1		
Gulf	24	68	74%			11		9		1		1		
Central	38	59	61%	1	1	8	1	30		1		1		
National Capital District									3	23	1			1
Milne Bay	38	95	71%	5		36		2		1	1	1		
Northern	39	38	49%			6		9		1	2	1		
Southern Highlands	66	74	53%	1		7		31		2	1	1		
Hela	45	56	55%			5	2	25		1	1			
Enga	74	84	53%	6		8	3	22		4	1	1		
Western Highlands	33	42	56%	9		5	1	19		5			1	
Jiwaka	39	32	45%	2		7		18		3		1		
Chimbu	6	74	93%			8	1	25		1		1		
Eastern Highlands	90	92	51%			6		25		4		1		
Morobe	136	154	53%			20		21		12			1	
Madang	66	115	64%		1	17	2	23		3	1	1		
East Sepik[57]						10	1	29		6	1	1		
West Sepik	98	109	53%	1		9	1	24		1	1	1		
Manus	24	55	70%			10				2		1		
New Ireland	23	63	73%			7		19		4	1	1		
East New Britain	32	75	70%			10		16		3	2		1	
West New Britain	22	115	84%	1		7		19		6		1		
ARoB	98	81	45%			9		24		1	1	1		
Grand Total	**1038**	**1571**	**60%**	**26**	**2**	**217**	**12**	**414**	**3**	**90**	**16**	**17**	**3**	**1**

[57] Data incomplete

Accessibility and utilization

Figure 4.21: Graph showing Health Service Utilization



DTP = diphtheria, pertussis (whooping cough), and tetanus; HepB = hepatitis B.

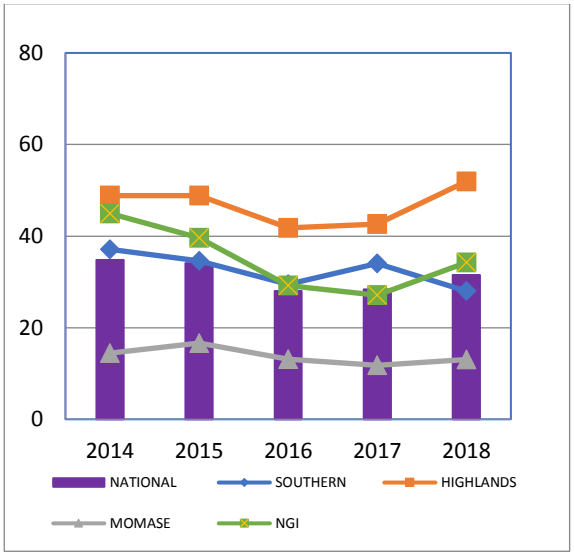
Source: National Department of Health.

Utilisation of facilities is declining. A number of indicators show of this declining use, including:

- Outpatient attendance
- Quality
- Antenatal care,
- Supervised delivery,
- Outreach
- Immunisation coverage

It is the responsibility of Level 3 services to take programs to remote and outlying villages, enabling and extended coverage of public health and primary care programs. Maternal and Child health outreach has been a feature of the PNG health system for over 60 years. It remains an important function of the Level 3 and Level 4 service, and a critical service for the communities. Not surprisingly, there is a correlation between outreach service and immunisation coverage. As the outreach activity has declined, so too, has immunisation coverage.

Figure 4.22: Total outreach clinics held/1000 children <5 yrs, 2014-2018



Outreach activity depends on planning, staff availability, funds, supplies and commitment. Many facilities have stated that planned outreach cannot occur as there has been a decrease in funding to health centres. Many centres are not staffed at the defined thresholds.

Outreach services are embedded to bridge the service gap for remote areas. It is estimated that 60% of EPI services are primarily accessed through outreach programs. However, outreach activities are far below sufficient across regions. Momase shows the lowest rate of outreach services with only 24% of the remote area populations covered. Other regions covered 44% – 50%. The NHIS reports outreach activity to be well short of expected service activity:

The recent GAVI report Programme Support Rationale emphasises the linkage between outreach and service. It states "there is strong evidence, that where outreach happens regularly, coverage improves. In Milne Bay, achieved the highest ratio of rural outreach clinics to population under 5 years in 2014 of

124, and achieved that same year 96.01% coverage for measles for children under 1 year of age. However, in 2016 when outreach dropped to only 97, measles coverage also dropped to 63.9%"[58].

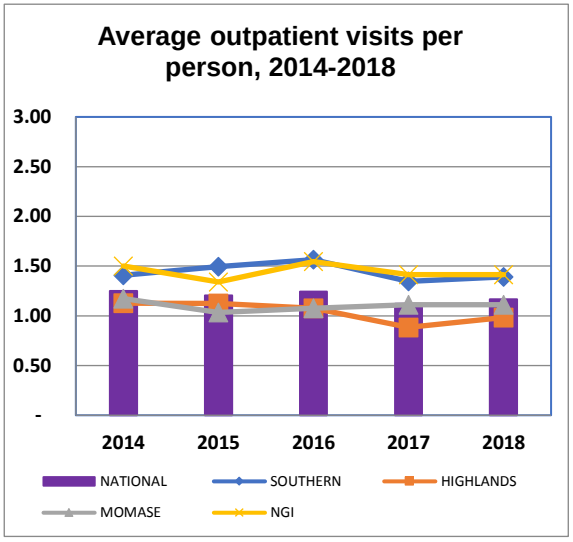
Outpatient attendance

NHIS outpatient attendance data shows a general decline in outpatient attendance of health centres, a trend that has continued over 10 years.

Why are people not accessing the facilities?

- Distance to facility;
- Availability and cost of transport;
- Lack of supply;
- Quality of facility;
- Attitude of staff;

Figure 4.23: Average outpatient visits/person



The eNHIS data is demonstrating that access choices by the community are determined by factors other than proximity. Nonetheless, the WB Facility survey demonstrates that most patients seek care in the closest facilities from home. Travel time to the facility (most typically by walking) rages from 43 minutes in New Guinea Islands to 88 minutes in Momase region. The Maternal Taskforce survey found that 65% of people lived less than an hour from facility and 80% less than 2 hours. The average travel time in this survey was 30 minutes (higher for level 2 facilities). Access in remote areas is a greater concern. Respondents of the IMR Malaria indicator survey (2016/17) stated the most common reason for not using the health facility was distance from the facility and availability and cost of transport. Other reasons included lack of medical supplies in facility; the physical quality of the facilities, the quality of care; and that the facility was closed. The Maternal Taskforce survey found that attitudes of staff, poor facility support (limited washing and toilet facilities, lack of waiting houses, no food preparation areas), distance to facility, and costs within the facilities were all barriers to utilisation.

Equity considerations: Most centres are found to have capacity to manage persons with disabilities. Wealth has a significant bearing on access, with poorer households more likely to seek medical care from Level 3 and 4 services rather than other facility types.

Quality of service

Condition of facilities (infrastructure)

The Health Facilities survey (2018) demonstrates the need for major building repairs and emphasized the lack of toilets (about one third reported an adequate number of toilets), stable supply of electricity and consistent water supply (over half level 3 and level 4 facilities require repairs to their water supply system). The majority of health facilities require a major repair. PMGH required no infrastructure, electrical or plumbing repairs.

[58] GAVI PSR, 2018

Figure 4.24: Table showing Infrastructure Indexes for health facilities surveyed (2018)

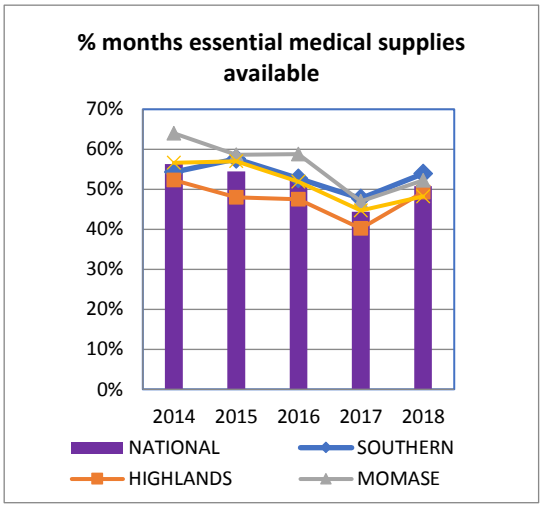
	Condition of toilet	Not many repairs needed	Condition other structural	Condition overall
Level 3 – 4 Public	38.6	38.6	66.0	51.3
Level 3 – 4 Church	57.6	46.4	73.7	62.0
Level 5 – 6	75.6	65.6	89.7	79.5
Level 7	100	100	100	100

The Maternity taskforce review found that maternity waiting houses were present in only 13% of facilities (sample 34 facilities in 4 provinces). Like the Health Facilities Survey, construction frequently did not meet national standards. For example, facility plans not being reviewed (provincial staff may not be aware of the facility construction); frequently there were no funds for maintenance. The taskforce found 80% of facilities were connected to a water supply line; only 8% of facilities had functional hand hygiene stations available in delivery ears (clean sinks with running water, soap and hand towels) and 13% had alcohol hand gel. Clean and functional toilets for delivery rooms – 44%; General waste bins in delivery room – 64%; medical waste bins in delivery room: 25%.

These findings echo those of the 2012 survey of 142 facilities that found 67% of clinic rooms and 77% of health worker accommodation needed rehabilitation, only 55% had year-round water supply, 41% of clinics had refrigeration, 40% electricity and 50% had toilets[59].

Supplies and communication equipment

Figure 4.25: % month for essential Msupplies



The difficulties of medical supply have been widely reported. Recent data provides affirmation of these difficulties. The Health Facilities survey (2018) concluded the 'massive improvement' is required for supply chain and drug procurement. An aggregated assessment of drug availability (continuous availability for 30 days of 45 different drugs) provide an index of 49.1 for level 3 and 4 public sector health facilities and 54.3 for level 3 and 4 church-run facilities. Some basic drugs were reported not available on continuous basis in many facilities, including PMGH. The present first line treatment drugs for malaria, artemether-lumefantrine, were available in only 59% of Level 3 and 4 Public sector health facilities. Similarly, with vaccines, the availability index for Level 3 and 4 facilities was 73.7. These data confirm the picture demonstrated through NHIS over the past decade.

The maternal taskforce review found a lack of contraceptive supplies/stock outs. For antenatal care, there was a lack of a number of supplies, for example, iron/folate and BP equipment were available in only 61% and 66% respectively. Syphilis, HIV testing in PMGH was curtailed to 65% with stock outs of

[59] Howes S et al *A Lost Decade? Service Delivery and reforms in Papua New Guinea 2002 – 2012*, 2014, Canberra

testing kits. The taskforce noted that a lack of essential supplies limits capacity to conduct effective ANC. Newborn care supplies similarly showed deficiencies of equipment, diagnostic requirements and medical supplies.

The Health Facility survey (2018) showed that rural facilities fell short of basic equipment and supply requirements for Antenatal Care and for delivery and neonatal equipment. The maternal taskforce identified important deficiencies in support for delivery: 82% had functional delivery bed in each delivery area, 88% supplies for cutting cord; 58% supply of oxygen. Only 54% of facilities had oxytocin available.

Facilities survey (2018) similarly found that only 48 – 56% of health centres and district hospitals had telephone/radio. The National Inventory of Health Facilities (2018) revealed 42% of facilities with a functioning radio/telephone.

Staffing (dealt with in more detail elsewhere):

Health centres (Level 3 and 4) are predominantly clinically staffed by CHWs. There are an average of 10 CHW per facility, with currently 85 – 89% of these filled. The average number of nurses per facility is 5.6 in public facilities (74% filled) and 9.72 in Church facilities (80% filled); there are an average of 1.46 HEOs in public facilities (78% filled) and 0.64 HEOs in Church facilities (69% filled). Provider knowledge in the key areas of child and maternal health services are low, with better knowledge on Sexually Transmitted infections.

The Health facility report also bears out shortcomings in supervision, both the degree in supervision and the quality of supervision. About 43 percent of providers at level 3 and 4 public health facilities reported their last supervisory interaction at more than 6 months or never. For level 3 and 4 church-run facilities, 36 percent reported last interaction at more than six months or never. During supervisory visits, only about 13% are reported to have observed consultations, and 19% to have checked records.

Hospital services

At hospital level, there are various measures widely accepted internationally as measures of quality within the hospital sector. These include a range of patient safety and cause specific concerns. Data collection and reporting by the hospitals is currently not sufficient to report on these global measures. Several clinical sections capture the effectiveness of program and clinical outcome (for example, Paediatric Department, Maternity Health services). Reports are published annually from these units. The NHSS provides a detailed approach to accreditation of hospitals. This provides a 'policy lever' to ensure that hospitals do institute measures to quality maintenance and improvement. Since the adoption of the National Health Service Standards, there are xx persons trained as hospital surveyors, and only one hospital has undertaken an accreditation survey.

Outputs:

Not surprisingly, the case mix of conditions differs with the levels of facilities, where the higher level (hospital) facilities deal with more severe and complex conditions. At level 3 and 4 facilities, the patient mix is dominated by infectious diseases, while the importance of noncommunicable diseases increases significantly at the higher level health facilities. Discharges related to infectious and poverty-related diseases, such as VPD, respiratory illness, diarrhea, malaria, TB, child malnutrition, typhoid and leprosy, account for about 66% of cases in level 3 and 4 public facilities and 42% of church run facilities[60]. During the survey period, Church and Government Level 3 and 4 centres have approximately the same number

[60] Facilities Survey, table 5.3

of outpatients, but Church services have more than twice the inpatient days. Church facilities organized twice as many outreach patrols as the public health facilities.

The cost of running a facility, however, is converse to this activity. In 2014, the estimation of cost of running a level 3 and 4 public sector facility is about K3.2 million per year, while expenditure per year for a level 3 and 4 church run facility was about K2.3 Million. Church facilities spend significant more on fuel and transport than public facilities. The cost of running higher level services is K16.5 million for level 5 or 6 facility, and K88.5 million for PMGH. Personnel costs account for about 62 percent to 67 percent of total recurrent expenses (excluding capital items) (the Monash costs of services report showed similarly about 60% of costs are in salary items).

Referral

The hierarchy of service levels defined in the NHSS is premised upon the capacity for more complex clinical needs to be managed at higher levels of facilities. Similarly, it if a patient can be managed closer to home at a lower level facility, referral in that direction assists in achieving a more efficient health system and allows patients to be closer to their supports. An effective patient referral system ensures close relationships between all levels of the health system are maintained and assists people to receive the best possible care closest to home. An effective referral system also assists in making cost-effective use of hospitals and primary health care services. Patient retrieval is an element of the referral system, where the urgent nature of the patient's condition requires clinical support. The retrieval system needs a level of organisation to ensure the right patients(of priority) are transferred to the right places.

The referral system is frequently hampered by difficulties of transport, funding, weather and geography. Recognition of the capacity of each level of health services will assist in appropriate utilisation of patients and transfer between those levels of service.

The World Health Organisation (WHO) states that a good referral system can help to ensure:

- People receive ideal care at the appropriate level at lower cost,
- Hospital services are efficient and cost effective and
- Primary health services are well used with standards of service enhanced.

With the establishment of Provincial Health Authorities, referral guidelines have been developed. These guidelines are a necessary instrument for each PHA and will need local adaptation and a strategy that ensures all clinicians, at each level, are familiar with the processes of referral.

Synopsis of key points:

- A significant proportion (30% - 60%) of existing health level 3 and level 4 facilities are in need of major repairs. At the very least, adequate toilets, safe building infrastructure and stable water and electricity supply is required for all health facilities.
- About 40% of aid posts are closed;
- Accessibility of health services is declining, with aid post closures, and declining utilization. Outreach services have markedly declined, in part attributed to decreased available funding.
- Service quality, monitored by availability of supply and health worker knowledge, is inadequate; there are unfilled positions (25 percent of nurse and CHW positions unfilled at Level 3 and 4 facilities). Supervision is sparsely conducted, with evidence of poor quality. There are examples, however, of the positive benefit of supervision.

- Health facility and outreach services are the main carriage of clinical and public health efforts of the health sector to meet community need. There is a need to identify and resolve impediments to the provision of health care services at level 3 and level 4 facilities.

Clinical Governance and medical standards

National leadership in clinical governance is provided by the National Department of Health through the Medical Standards Division, Pharmaceutical Services Standards Division and the respective Boards/Councils for professional staff.

Standards encompasses a number the following:

Professional staff – maintenance of professional standards. Regular upskilling and maintenance of professional standards is required by all clinical staff. Typically, well developed health systems link annual licensing/registration with evidence of continuing professional development. The PNG licensing system (for example, Nurses Council, Medical Registration Board) does NOT require this evidence, with the likely result that many professional/clinical staff do not maintain currency. The Maternity Services Ministerial taskforce (2019) health workers conducting deliveries for thirty years reported that they had never received upskilling on midwifery.

The Medical Standards Branch is advocating for the development of Professional Colleges, whose function it will be to provide education opportunities for the respective specialty areas. To date, there are professional societies/Colleges in paediatrics, obstetrics, internal medicine and surgery.

Clinical Practice:

Standard Treatment Manuals ensure that clinical treatments provided by health staff are consistent with best practice. PNG has been developing standard treatment protocols since 1971, and these currently exist in Paediatrics, Obstetrics, surgery, medicine, public health. There are established formularies that guide suitable drug regimes for the PNG environment. There has been regular revision of the clinically focussed standard treatment manuals. It is observed that there is good adherence by health workers to these protocols. However, the 2016-18 DHS identified deficiencies of adherence to treatment protocols in the treatment of malaria[61].

Clinical chiefs provide a focal point for clinical protocols and practice of excellence. Their role extends to set strategic direction, through advocacy and through expertise to develop clinical units that meet with national need. Clinical chiefs have been appointed to a range of clinical specialties.

Annual reports from clinical units is still not routine. The paediatric and maternity services units each produce an annual morbidity and mortality report. For other specialties, this is not the case, with ad hoc reports lacking data complete from all hospitals. The lack of consistent hospital data precludes performance analysis and undermines the ability to develop programs and services tailored to need and developed upon current interventions. The reports from paediatrics, for example, provide an excellent opportunity to look at current approach to childhood illness and refine the clinical practice to achieve best outcome.

[61] Among children with a fever in the 2 weeks preceding the survey who took antimalarial medication, only 72% received Artemesin based combination therapy.

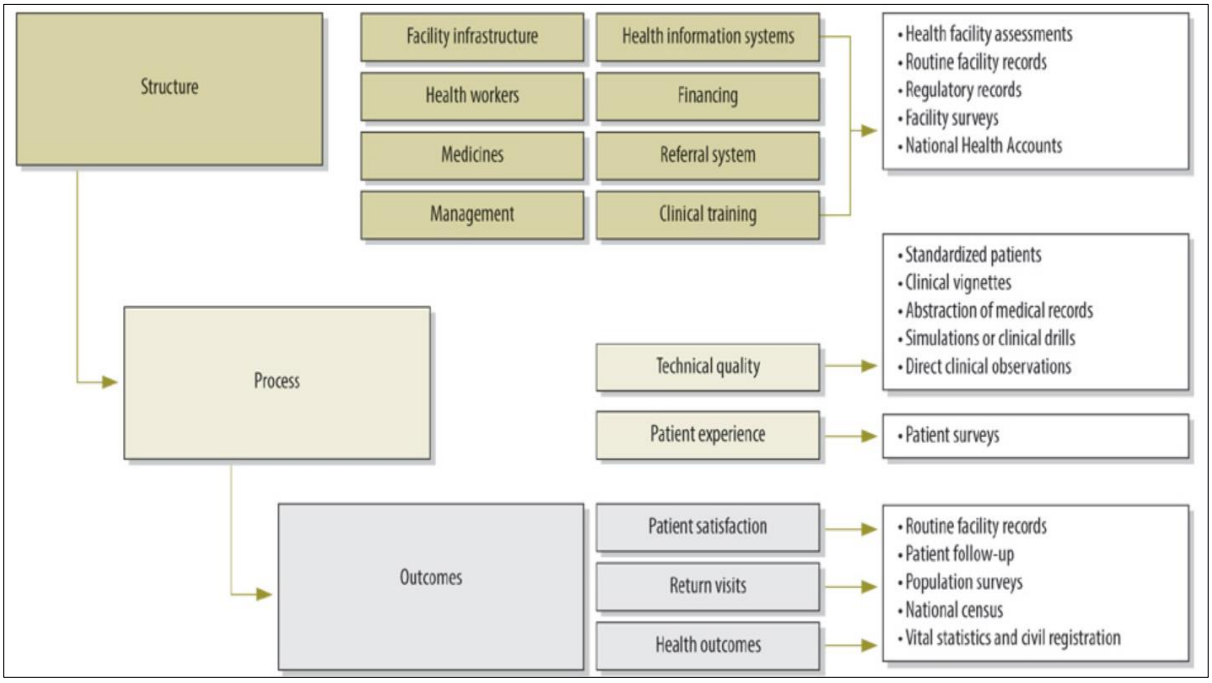
Facility standards and quality of care

Standard designs for health facilities have been developed. This are tailored to the function of each facility level and incorporate the needs of access for disabled persons.

Accreditation: The NHSS has developed a comprehensive template for hospital accreditation. The intent is that hospitals undertake an accreditation process every 1 – 5 years. This requires a pool of surveyors. To date, however, only one hospital (a private hospital) has completed its first accreditation exercise.

Quality of hospital care. There has been increasing recognition within the MSD of the need for oversight of quality in the hospital sector. Measuring quality is not just about the technical outcomes, but also examines responsiveness, acceptability by the community, and analysis at various stages of the patient experience. The following diagram provides a framework for considering quality. Measures (right hand column) encompass both routine hospital data, as well as periodic survey.

Figure 4.26: Diagram of Framework for considering quality of Hospital care



Domains of Quality of Care[62]

Hospital efficiency measures are not available. There is scant detail to monitoring of bed occupancy and/or average lengths of stay across most hospital facilities.

[62] Yoko Akachi [a] & Margaret E Kruk; Quality of care: measuring a neglected driver of improved health, *Bulletin of the World Health Organization* 2017;95:465-472. doi: http://dx.doi.org/10.2471/BLT.16.180190

Support and Development

Information Systems

The following summary is fully extracted from an Asian Development Bank review, undertaken in September 2019. Health Information Systems Review and Assessment Report[63]. The report is an analysis of Health Information Systems in PNG providing an assessment of the current situation of information systems and opportunities for development.

As a means to address health priorities and service deliveries, Health Information Systems (HIS) have been gaining use in PNG. The increasing introduction of digital technology and information systems capability across PNG's healthcare system is a complex and evolving challenge.

Core information systems for health information management (eNHIS), medical commodities (mSupply) and financial management (IFMS) are scaling nationally and gaining in use at local levels. National and regional commitment to utilize eHealth and the data generated by health information systems is undergoing wide scale adoption. eNHIS is deployed in 44% of PNG's provinces. An approved PNG eHealth Strategy and an eHealth Steering Committee are both in place.

Core clinical systems are gaining adoption as they are earmarked for national scale implementation in 2020-2022. Systems are:

- eNHIS – the national health information management system (HIMS)
- mSupply – a medical commodities management system
- IFMS – an Integrated Financial Management System (IFMS) including public staff HR and payroll (Alsesco previous name, now called Ascend model)
- Verbal Autopsy (VA) – a mobile system to record deaths and code cause of death outside of health facilities
- Electronic Medical Records (EMRs)
- eHRIS - an electronic human resources database and information system.

It is observed that these core systems are stand alone, not connected, not standardized and not yet governed fully by the National Department of Health (NDOH). Missing are national guidance for an integrated HIS architecture, data standardization and data sharing mechanisms for interoperability. These typically would be indicated in a National ICT Strategy and Policy and elaborated fully in topic specific guidance. Other information systems exist, yet less well developed or not well integrated to core systems:

- Master facility list (MFL)
- Master patient index (MPI)
- Laboratory information management system (LMIS)

[63] Health Information Systems Review and Assessment report, ADB Consultant Report, September 2019 ADB

- Vertical disease systems for HIV/AIDs, TB and Malaria
- Integrated Disease Surveillance System (IDSR)

Civil Registration and Vital Statistics (CRVS) information is collected by PNGCIR with at National Identity (NID). The process collects birth and deaths hardcopy forms with data keyed at the national level. The CRVS electronic database is maintained at the Department of Communication Data Centre located across from the NID in Port Moresby.

Of major significance are efforts underway at regional and national levels for integrated health information systems. A unified national HIS is coming into place with the national rollout of eNHIS under the Health Services Sector Development Program (HSSDP). Partners are requesting their program data be integrated with eNHIS and in some cases for data collection to fall within the eNHIS. At local level, Western Highlands Provincial Health Authority is advancing point of service ehealth to improve healthcare delivery by combining disparate core health information systems (eNHIS, mSupply, EMR, IFMS). This data is made available to the health facilities within the PHA's region via ISP and satellite connectivity. This emerging development shows great promise as a model for other provinces and to achieve PNG national scale.

While these accomplishments and crucial advancements are positive, challenges exist hindering PNG's ability to reach the goals of the nation's Health Plan and eHealth strategy. Issues exist mainly around the categories of HIS policy and governance; data architecture; standards for interoperability; data use, accessibility; ICT infrastructure and workforce.

Key issues to address include:

i. ICT and HIS policies and guidances not yet in existence. Strategy, planning, system use and standards to guide local and national levels are needed.
ii. Electronic patient data is mostly not yet available. The rate of adoption for EMRs and hospital patient level HIS remains low. EMRs and registries containing point of service patient data have been implemented in less than 5 locations.
iii. Data is under-utilized and not fully considered as 'an asset'.
iv. Analytics is in initial stage and could significantly enhance data use, provide insights for improving patient health and for disease surveillance.
v. Infrastructure and Internet connection is weak and inadequate at the NDOH and many health facilities hindering HIS implementation and use. With Internet upgrades, marine cables, and use of satellites at PHAs, improvements are coming.
vi. Data Centre(s) for health data do not yet exist at regional and national levels.
vii. The public health IT workforce are not well trained on global informatics best practices. Availing opportunities for peer learning and engagement in industry resources could help.
viii. Budgets, regional and national, do not contain adequate funding for HIS. ix. An eHealth / digital health investment plan with costing is needed.

Opportunities include:

i. Creating policies and guidance for HIS inclusive of architecture, HIS and Electronic Medical Records (EMR), standards, patient identification. Implementing a National ICT strategy and action plan.
ii. Accelerating national eHealth activities by strengthen governance with the eHealth Steering committee convening routinely working from an established roadmap inclusive of timelines, milestones and responsibilities.
iii. Providing national guidance for HIS integration, standards and interoperability.
iv. Advancing the adoption of patient level systems (eg EMRs)
v. Establishing a PNG national health information enterprise architecture and roadmap providing a scalable module architecture for a unified HIS.
vi. Utilizing the eNHIS national scale rollout to integrate various health programs' disparate data to form a unified system and platform (Verbal Autopsy, HIV/AIDs, IFMS for instance).
vii. Leveraging the PHA proposed architectures and supporting the generation of a 'PHA toolkit' by the WHPHA for use to accelerate progress by PHAs.
viii. Enhancing country HIS ownership with NDOH hosting core information systems currently housed with development partners.
ix. Increasing data access and use at all health levels by implementing a robust data driven strategy with tools that include advanced analytics and health command centre.
x. Establishing best practices Data Centres, regional and national points taking advantage of cloud and existing centres.
xi. Utilizing innovative technologies such as telemedicine, drones and block chain to reach the rural, underserved and strengthen supply chain governance.

Population

Population data used within the health sector is derived from the National Statistics Office. The data are drawn from the National Census 2011, with projections from earlier censuses. Inconsistent projections and reported erroneous populations resulted in a revision of the populations based upon longer growth rate trajectories. These revisions were endorsed by NSO and are held within the National Department of Health. Refinement and update of these data will be next done with the 2020 national census.

Civil Registration and Vital statistics are not routinely captured. Current development of these systems is in place, although it is expected that this development will take a number of years. In the interim, alternative approaches to capturing vital statistics data have been explored, including for example, using Village recorders for birth registrations, and undertaking verbal autopsies to gain better insight into the cause of scope of deaths.

Performance monitoring

A sector performance monitoring and evaluation framework accompanies the national health plan, providing a set of 29 core indicators. Annual assessment of progress against these indicators is provided by the National Department of Health as a trigger to reflect on policy and steer strategy to ensure progress is made toward the agreed objectives. Good governance of the health sector requires this analysis. Implementers of programs at all levels require this analysis. Anecdotes, however, suggest that district reporting and regular district management meetings are inconsistent across the country. Data on the regularity of district reviews are not available at national level.

Research

Research is essential in strengthening health systems through improving systems performance and the impact of public health. It provides evidence to questions within the health system that can be used for effective program development or policy making, contributing to quality health outcomes.

Leadership and governance in research

In 2012, the National Department of Health (NDoH) of Papua New Guinea (PNG) initiated the development of the National Health & HIV Research Agenda 2013-2018 (NHHRA). The rationale behind this initiative was to support and strengthen the National Health Research Policy (2012) and research planning for the National Health Plan (2011- 2020). The peak body that oversees health research in PNG is the Medical Research Advisory Committee (MRAC). All research must be submitted to the MRAC for ethical review before conducting research in the country. Each Research Institutions and Universities also have their own Research and Ethics Committee. The Health Research Unit, a body within the NDoH to provide secretariat for research, is currently placing more emphasis on operational research as an essential component of strengthening health systems research.

The PNG Medical Research Advisory Committee (MRAC) oversees the scientific approval and ethical clearance for all health research in PNG to ensure rights, dignity, safety and wellbeing of all participants are protected during the research study. While MRAC continues to review and approve all types of research proposals, results from the recently established MRAC database demonstrated discrepancies in research addressing priority health issues in PNG.

In 2012, the National Department of Health (NDoH) of Papua New Guinea (PNG) initiated the development of the National Health & HIV Research Agenda 2013-2018 (NHHRA). The rationale behind this initiative was to support and strengthen the National Health Research Policy (2012) and research planning for the National Health Plan (2011- 2020), responding to the lack of a strategic research agenda for health and HIV in PNG. A review of the national research agenda (date?) found:

- The NHHRA was not broadly distributed, both nationally and internationally.
- NDoH needed to use NHHRA to advocate for more funding into research
- All PNG institutions carrying out health research were encouraged to use the NHHRA for internal planning and research funding applications.
- A health research “clearinghouse” was established within NDoH
- A need to review MRAC and proposed a PNG Health Research Council (HRC), aiming for a more user-friendly systems for ethics review;
- The need to establish a national health research grants program with responsibility for allocating research funds.

Limited progress has been made toward these recommendations.

Partnerships and collaborations.

Research Institutions play an important role in undertaking all types of research in Papua New Guinea. These includes the Papua New Guinea Institute of Medical Research (PNGIMR), National Research Institute (NRI), and the National Agricultural Research Institute (NARI). Universities have a key role in deepening knowledge. Local universities include University of Papua New Guinea (UPNG), Pacific Adventist University (PAU), University of Goroka (UoG), University of Technology (UNITECH), Divine Word University (DWU) and University of Natural Resources Environment (UNRE).

Within the UPNG- SMHS, this included partnership with participating University Medical Centres and Hospitals, in PNG, PMGH, at the UPNG (SMHS) in particular, TAPREC, The Charles Campbell Toxicology Laboratory (Snake Envenomation Research Laboratory), The Emerging Infectious Diseases Laboratory, The Micronutrient Laboratory, The Medical Science Research Laboratory, The Drug Quality Monitoring Laboratory, The Medical Biodiscovery and Biomedical Laboratory. International research units partner with PNG, including Case Western University (USA), University of Sydney (Australia), University of Melbourne (Australia), James Cook University (Australia), Burnet Institute (Australia), La Trobe University (Australia), and University of Adelaide (Australia), Murdoch Children's Research Centre in Melbourne (Australia).

Research Output

Research is aligned with the eight (8) key result areas of the National Health Plan 2011-2030 priorities and the four (4) research domains (reproductive and child health, communicable diseases, lifestyle diseases, and health systems strengthening). From 2010 – 2018, there were 1342 papers presented at the annual Medical Symposium. The PMGIMR continues to publish a quarterly journal for peer-reviewed research.

NATIONAL DEPARTMENT OF HEALTH

SECTION 5: ANNEX

Papua New Guinea

Demographic and Health Survey 2016 – 2018

Health Sector Summary
November 2019

This paper summarises the findings of the Demographic and Health Survey of 2016 - 18 that are relevant to health programs. The survey was conducted under the auspices of the National Statistics Office gaining information from over 16,021 households (sampled systematically from across all provinces, in urban and rural areas), interviewing 15,198 women (aged 15 – 49) and 7,328 men (aged 15 – 49) from geographic regions across Papua New Guinea. This summary has been prepared from secondary sources – drawn entirely from the National Report of the Demographic Health Survey 2016 - 18, published in November 2019.

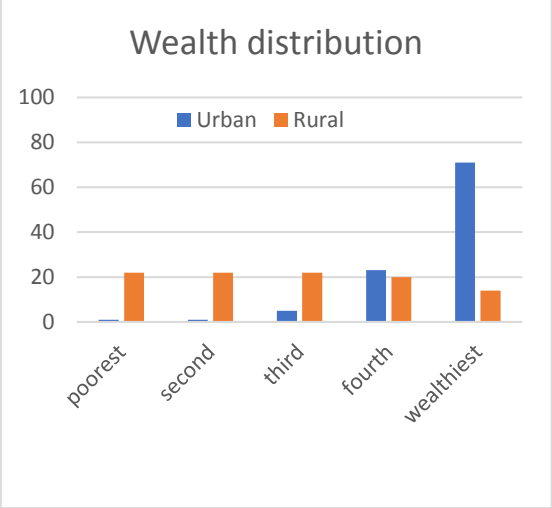
Population:

The population is living longer:

- Median age 21.2 years; (18.3 years in 1996);
- Population less than 15 yrs.: 42% (unchanged over 20 years);
- Population over 65 years: 2.4% (1.8% in 1996);
- Living conditions:
- Persons per household: 6.0 urban; 4.9 rural
- Reliance on spring/river for water:54%;
- Toilet: flush:29%; pit: 52%; none: 17%;

Key findings

Household and population characteristics

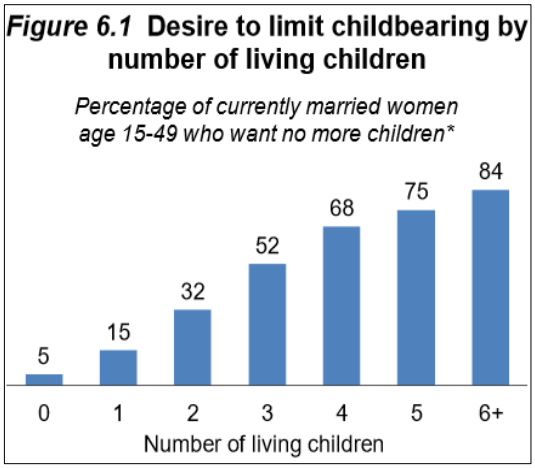


- **Drinking water***:* 46% of households have access to an improved source of drinking water (83% urban, 42% rural);
- **Toilets**: only 29% of households use improved toilet facilities (60% urban, 26% rural). Most commonly, an open pit or pit latrine is used. Seventeen percent of households do not have any toilet (unchanged over past decade).
- **Hand washing** facilities were observed in 57% of households.
- **Food insecurity**: 25% of population experience severe food insecurity, with highest rates in Western Province.
- **Household size**: average household size is 6.0 persons in urban centres, and 4.9 persons in rural centres.
- **Education**: 23% of women and 13% of men have had no formal education. Educational attainment is closely correlated with household wealth.
- **Tobacco use**: 26% of women and 60% of men smoke tobacco.

Fertility preferences

Just over one quarter of currently married women want another child; 46% want no more children (or are sterilised); 40% of currently married men (15 – 49 years) want no more children (or are sterilised).

Women consider 3.0 children to be ideal family size on average, while men prefer 3.6 children. On average, women are bearing 1.2 children more than their desired number of children.



Fertility patterns

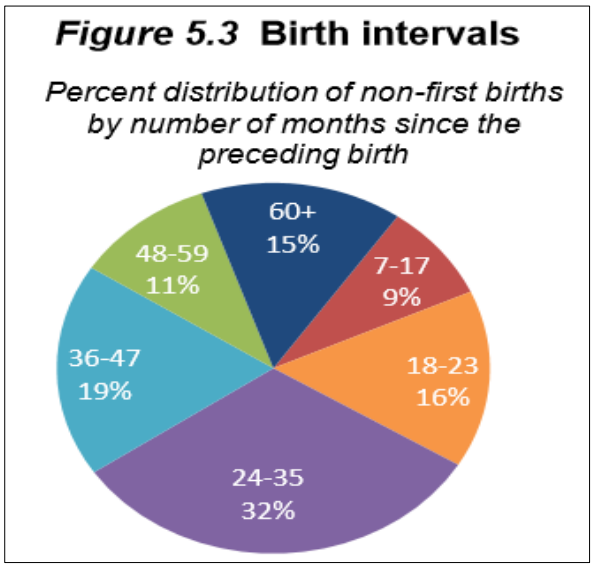
The **total fertility rate** (average number of children a woman will bear in her lifetime) is 4.2 (urban 3.5, rural 4.4) – slightly down from 4.4 in 2006.

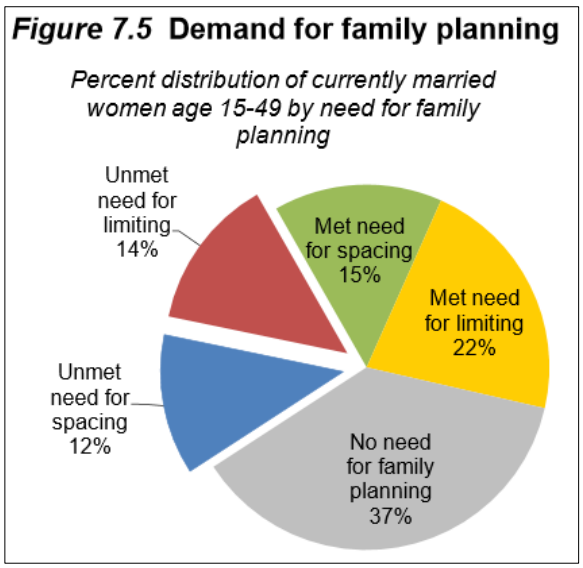
The median **birth interval** is 33.2 months.

The median age in **giving birth to first child** is 21.9 years (for women aged 25 – 49 years). (20.8 years in 2006)

For women aged 15 – 19 years, 12 percent have either given birth or are currently pregnant. (27.8% in 2006)

Family planning





Contraceptive use among currently married women has increased from 32% in 2006 to 37% in 2016-18 (modern methods 31%).

The most widely used **methods** are injectable (9%), implants (9%) and female sterilisation (8%);

In total, 63% of women have a current demand for family planning, yet only 37% are using some form of contraceptive method, leaving an **unmet need for family planning** in 26% of women.

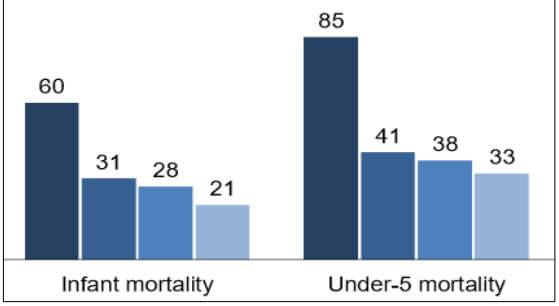
Infant and child mortality

Under 5 years mortality: For the 5-year period preceding the survey, the under 5 mortality rate was 49 deaths per 1000 live births (urban = 41, rural = 49); the infant mortality rate was 33 deaths per 1,000 live births (urban = 27, rural = 34). These have decreased from 79 deaths per 1000 births and 57 deaths per 1000 births respectively in 2006.

Infant mortality is highest in the circumstances of maternal age < 20 years, 7th or more baby in the family, a birth interval less than 2 years, mothers without education and/or of the lowest wealth quintile.

***Figure 8.2* Childhood mortality by previous birth interval**

Deaths per 1,000 live births for the 10-year period before the survey



Pregnancy and Maternal Health Care

Antenatal Care: Most women (76%) attend for at least one antenatal visit during their pregnancy. About half attend for at least four visits. Only 17% attend for an antenatal visit during the first trimester. The main difficulties that women have in attending antenatal care is having money for treatment and the distance to the facility. Only 38% of women who attend antenatal care received tetanus toxoid (to protect against neonatal tetanus).

Supervised births: Only 55% of births occur in a supervised environment (in a health facility). There is a strong association between level of education and health facility delivery.

Complications of delivery were experienced by 61% of women, with the most common being prolonged labour (36%), excessive bleeding following birth (32%), and premature rupture of membranes (28%)

Post natal Care: Following their last birth, 51% of women did not have any follow up care after delivery within the 2 days of delivery; 53% of newborns did not receive a post-natal check-up.

Iron supplementation in pregnancy: Of women who gave birth during the previous five years, 28% had not taken any iron supplement during their most recent pregnancy.

***Figure 8.3* Perinatal mortality by mother's age at birth**

Deaths per 1,000 pregnancies of 7 or more months' duration in the 5-year period before the survey

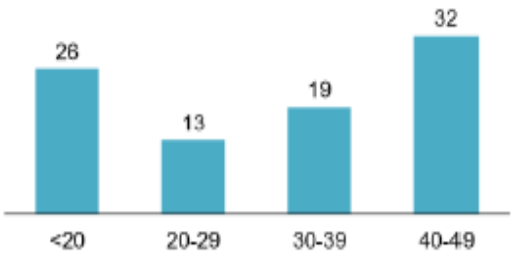
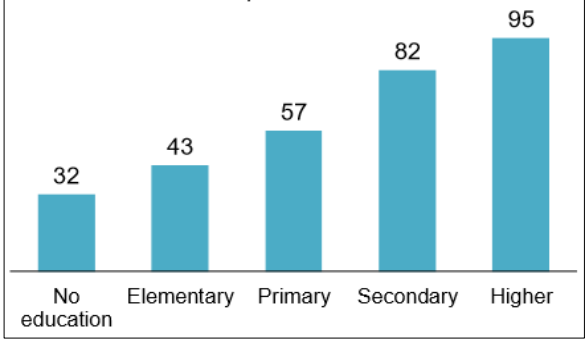


***Figure 9.4* Skilled assistance at delivery by mother's education**

Percentage of live births in the 5 years before the survey assisted by a skilled provider



Child health

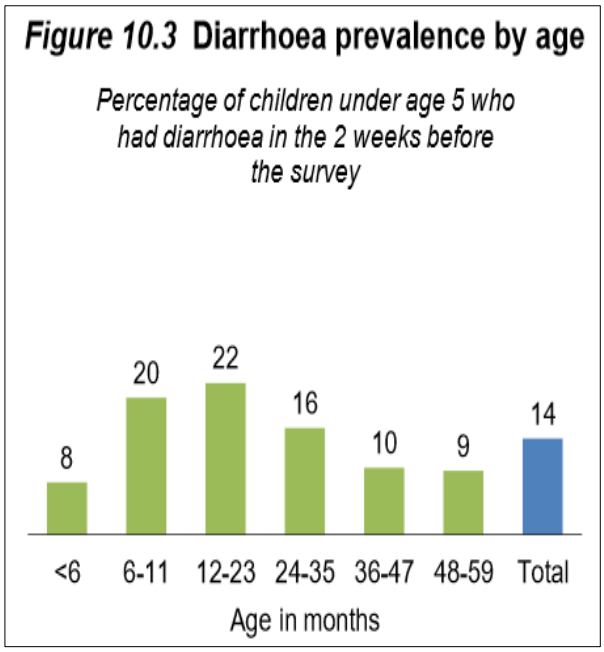
Low birth weight: Among children with known birth weight (written record or mother's recall), 13.6% weighed less than 2,500 gm.

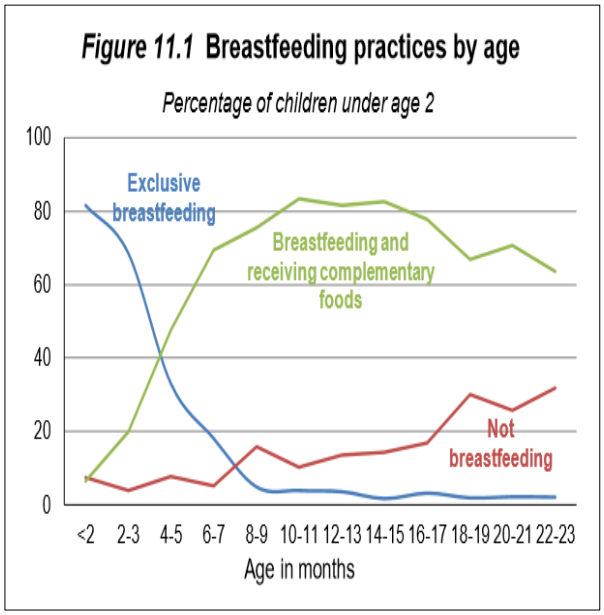
Vaccination: Based on cards or mothers' recall, children aged 12 – 23 months, 35% of children had received all basic vaccinations (one dose BCG, three doses DPT, three doses OPV, one dose measles vaccine). Sixty-nine percent of children have received BCG, 64% first dose pentavalent, and 64% have received polio 1. The attrition from 1st dose pentavalent (indicator of access) to 3rd dose pentavalent indicator of utilisation) is from 64% to 42%, revealing both poor access and poor use of services. Twenty four percent of children aged 12 – 23 months had not received any vaccinations. In 2006, 52% (now 35%) had received all basic vaccinations, and 7% (now 24%) had not received any vaccinations), showing improvement.

Treatment seeking: 63% of children under 5 years who had Acute Respiratory Tract infection in the two weeks prior to survey sought advice or treatment (no change from 2006), 50% sought advice or treatment for fever and 38% with diarrhoea. Two thirds of those who sought treatment for diarrhoea received some sort of Oral Rehydration Therapy.

Breastfeeding: the majority of infants (91%) are breastfed, with 62% of children breastfed exclusively until 6 months of age. The median duration of exclusive breastfeeding is 4 months, and any breastfeeding is 24 months.

Micronutrient supplementation: 7% (aged 6 – 59 months) were given iron supplements in past 7 days, and 31% given Vitamin A supplements in past 6 months.





Malaria:

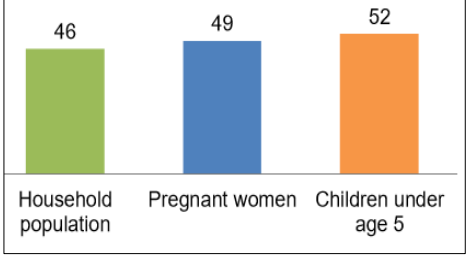
Bed nets: 69% of households own at least one insecticide treated bed net (ITN), and 46% of the household population slept under ITN the night before the survey. About half of children under 5 years (52%) and pregnant women (49%) slept under ITN the night before the survey.

Preventative treatment during pregnancy (three or more doses of SP/Fansidar) during 2 years before survey was taken by 24% only.

Of children who had a fever and sought treatment promptly (28% in total), 28% had diagnostic testing (8% in Highlands region). Among those who received treatment, only 72% received artemesin-based combination therapy.

Figure 12.5 **Insecticide-treated net (ITN) use**

Percentage who slept under an ITN the night before the survey



HIV/AIDS: knowledge and behaviour

Knowledge about HIV transmission: About a quarter of men (27%) and women (23%) demonstrated comprehensive knowledge about HIV transmission and prevention, and about half of men and women know that HIV can be transmitted in pregnancy, during labour and through breastfeeding.

HIV testing: 25% of women and 19% of men have ever been tested for HIV and received the results.

Attitude: 44% of women and 43% of men expressed discriminatory attitudes toward people living with HIV.

Sexually Transmitted Infections: during the 12 months preceding the survey, 11% of women and 9% of men reports having had an STI and/or symptoms of an STI.

Adult and maternal mortality

The **lifetime risk of a pregnancy-related death**: The probability of a woman who has just reached 15 years of age dying before the age of 50 years is 92 for every 1000 women aged 15 years; For a man, 107 of every 1000 men aged 15 years can be expected to die before 50 years of age.

Definitions: Maternal Mortality Ratio measures the number of maternal deaths (excludes deaths that result from accident and injury) for every 100,000 live births. The Maternal Mortality Rate is the number of maternal deaths per 1,000 women aged 15 – 49 years; that is, a death occurring during the pregnancy or delivery, or within 42 days following delivery or termination of pregnancy. Pregnancy-related mortality rates and ratios provide rates for pregnancy related deaths irrespective of cause during pregnancy and delivery and up to 2 months following delivery or termination of pregnancy. Previous DHS surveys used the indirect sisterhood method (longer period of estimation, smaller sample size – and so less accurate), whereas the current survey used the direct sisterhood method, and hence not comparable.

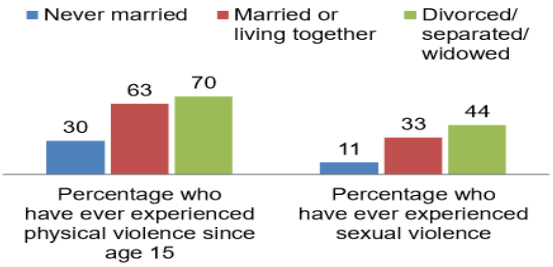
The **estimated maternal mortality ratio (MMR) is 171** (95 – 247) deaths per 100,000 live births. The pregnancy related maternal mortality ratio is 205 (121 – 290) deaths per 100,000 live births.

Domestic Violence

Attitudes towards wife beating: 70% of women and 72% of men believe that a husband is justified in beating his wife in at least one of five specified situations.

More than half (56%) of women 15 – 49 years have experienced physical violence since age 15, and 28% have experienced sexual violence.

Figure 16.1 **Women's experience of violence by marital status**



Papua New Guinea
National Health Plan 2021 – 2030

Position Paper – short version – September 2019

The current profile of health and disease, experience of implementation of the current and prior health plans and an analysis of the structural and operational elements of the health system provides the basis of this Position Paper. The purpose of the Position Paper is to provide direction to the development of the National Health Plan for the coming decade. It recognises that there is an urgent need to meet service needs and develop program to stem disease concerns, and yet also acknowledges that structural elements are required that reach beyond the planning period.

Policy consideration	• The NHP will be framed by the national agenda provided in PNG Vision 2050 and the PNG Strategic Development Priorities 2010 – 2030; • Global Sustainable Development Goals promote 'physical and mental health and wellbeing, and to extend life expectancy for all'.
Achievements and concerns in the 2011 – 2020 planning period	• Resources to the sector have decreased – reduction in funding to the sector in real terms, lower staff-population ratios; rural facility failures • Program outputs and outcomes show the consequences of these constraints, for example, with less outreach leading to less antenatal and immunisation coverage; resurgent disease – for example, malaria and HIV. • There have been positive gains, with overall lower mortality and malnutrition, and evidence of improvements of paediatric outcomes; • There are disease programs that need focus, particularly non-communicable diseases. • Governance of the sector is now in full transition toward provincial/district responsibility for service
A new Vision for the NHP	*Health and well-being can be enjoyed by all, through preventing ill health, identifying and addressing health risks and emergent disease,*

	and providing health care with compassion and with the quality deserving of all peoples of PNG. The core priorities are: a) A focus on people and their home environments. b) Engagement with the social sectors. c) A focus on disease prevention and health promotion. d) Development of services that are responsive to need and available to all. e) Embracing Governance and Leadership.

Universal Health Coverage	The pre-requisites for services to meet the needs of all are: • Increased financing, growth in workforce, effective supply, suitable and functional facilities, effective leadership, strengthening health information and vital statistics, research and adoption of innovation; Models of care are adapted to be contemporary, and address disadvantage, notably: • Rural communities are engaged, and service models responsive to need, giving consideration to new ways of meeting need (for example, Village Health Assistants, community Health Posts) • Urban population needs are met, particularly with a focus on the poor in urban settings; • Referral facilities are of high quality, and regional Centres of Excellence developed to steward interventions that support national need (for example, diabetes, cancer care, malaria).
Health Priorities	• Improved information systems and responsiveness to analysis to guide service and program development; • Infectious disease programs maintain funding to address current concerns and be vigilant for new diseases; • Non-Communicable disease program addressed, with emphasis on prevention; injury, cancer and mental ill-health can no longer be neglected; • Targeted approaches to the needs of population cohorts, in particular, newborn and children, adolescence, women in their reproductive years and those living with disability.
Acknowledge risk and grasp opportunity	• Joint collaboration across Social Service sectors lays fertile ground for enhanced service delivery; • New governance structures and available technology brings the health system closer to the community; • Emergent diseases, climate change and susceptibility to natural disasters require ongoing attention; • Services fulfil their “Healthy Islands” approach through an engaged community focussed upon health rather than disease.

Position Paper September 2019
Directions of the National Health Plan 2021 – 2030

Background and purpose

1. The Health Sector of Papua New Guinea is stepping forth into a new planning phase to encompass the decade 2021 until 2030. In preparation for this plan, an analysis of performance against the National Health Plan (NHP) 2011 – 2020 has been undertaken, and a snapshot of the current health concerns and the systems to support health services has been developed. Collectively, the experience of implementation, the current profile of health and disease, and an analysis of the structural and operational elements of the health system has provided the basis of this Position Paper. The purpose of the Position Paper is to provide direction to the development of the NHP.

2. The NHP is framed by the PNG Vision 2050, which is executed through the PNG Development Strategic Plan (DSP) 2010–2030. Health is one of the vital elements in the development strategies given the aim to "*achieve an efficient health system which can deliver an internationally acceptable standard of health services*". The NHP 2021 – 2030 will be a plan for all people of PNG and championed by the workers of the health system.

International context

3. The NHP will be implemented in the context of international treaties and goals. The Sustainable Development Goals (SDG) promote 'physical and mental health and wellbeing, and to extend life expectancy for all'. To do so, we must achieve universal health coverage (UHC) and access to quality health care. No one must be left behind[64]. Health has a central place as a major contributor to and beneficiary of sustainable development policies.

National Health Plan 2011 – 2020 progress and achievements

4. The NHP 2011 – 2020 aimed to strengthen primary health care for all and improve service delivery for the rural majority and urban disadvantaged. Analysis has found the sector to be operating in environment that is severely under-resourced. Health expenditure has reduced from 22% to 10% of total GoPNG expenditure. Clinical workforce-population ratios have reduced 20 – 25% to 0.97/1,000. The physical stock of health facilities has an infrastructure that is failing, with 30 – 60 % of Level 3&4 facilities in need of significant remediation. This has had a direct impact on services, with decreased utilisation, and volatile program outcomes. This situation must be turned around in order to realise better health outcomes.

5. Priority program areas have been subject to the weaknesses of funding shortfalls, inadequate staffing and supervisory support, faltering outreach, and inconsistent supply. Despite these challenges, positive achievements are observed. Early childhood mortality and prevalence of malnutrition have decreased, in addition to positive clinical outcomes in hospital. This is

[64] Transforming our world: the 2030 agenda for sustainable development. New York (NY): United Nations; 2015 (https://sustainabledevelopment.un.org/post2015/transformingourworld).

countered by persistently high levels of unsupervised childbirth and low-level coverage of antenatal care, placing both mother and newborn at risk. There remain significant infectious disease threats, with high prevalence of HIV and other Sexually Transmitted Infections, Tuberculosis and Malaria. The programs to address these threats demonstrate susceptibility to fluctuation in funding support. Other concerns continue to emerge, both infectious and non-infectious diseases, including cardiovascular disease, diabetes, cancers, and mental illness.

6. During the planning period 2011 - 2020, the administrative structures have progressed to place responsibility for service delivery through Provincial Health Authorities. The National Health Service Standards have provided definition to roles at each level of health service and specified the quality of service. Community Health Posts have been developed as a means to rejuvenate local level service provision. These transitions remain as unfinished business.

Building the health of the Nation: a new National Health Plan

Principles

7. A vision for the health and well-being of the people of Papua New Guinea acknowledges that:

   - family and village are at its core;
   - that service should reach all people, with particular effort for those where disadvantage is most evident;
   - that public, church, community and private institutions work together with governance, administrative, and service approaches and structures are distinguished by excellence and responsive to need;
   - improving health requires a whole of government approach, with particular effort from the social sectors;
   - that health services are fit for purpose, aware of need and responsive to need with interventions based upon evidence, and willing to apply innovation to meet challenges.

Vision

8. The vision of the National Health Plan 2021 – 2030 is that ***health and well-being can be enjoyed by all***. Such achievement requires the effort of all sectors. The health sector will contribute its part to this vision ***through preventing ill health, identifying and addressing health risks and emergent disease, and providing health care with compassion and with the quality deserving of all peoples of PNG*.**

Core priorities

9. The NHP 2021 – 2030 will be committed to:

   f) A focus on people and their home environments. Papua New Guinea is steeped in tradition that honours culture and family. Attaining and maintaining health, determined as much by environments and lifestyle as it is by biology and health services, is guided by person, spirituality and culture;

g) **Engagement with the social sectors.** The determinants of health lie in nutrition, education, household income, shelter, water and environments. Servicing health needs at community level has greater opportunity if working with other social service sectors;

h) **A focus on disease prevention and health promotion.** PNG faces the dual burden of both communicable and non-communicable disease. Wherever possible, effort will be made to strengthen the individuals and their environments to protect populations from experiencing disease. While recognising that there is a need for specialised and quality care to address illness, greater reach and less suffering can be expected through preventing the onset (primary prevention) and progression (secondary prevention) of illness. This requires considered balance between the primary and tertiary levels of health service. Prevention efforts are defined by the *"Healthy Islands" approach*, encompassing behaviour modification and risk mitigation, addressing environments, and utilising policy and legislative approaches to support better health.

i) **Development of services that are responsive to need and available to all**. When illness or disability besets an individual, it is a right of that individual to access affordable and quality health care. The health sector of PNG fully commits to this agenda of *Universal Health Coverage*.

j) **Governance and Leadership**: In fulfilment of the legislative obligation that support the Constitution of Papua New Guinea, notably the Organic Law of Provincial and Local Level Government, the health sector has transitioned to a new National Health System, where Provincials Health Authorities (PHA) take carriage of service needs of their communities and the National Department has a support role in setting standards and facilitating synergies in health systems and public health programs, and holding programs and provinces *accountable* to the communities.

Universal Health Coverage

10. Universal health coverage (UHC) is defined as ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship[65]. This underpins the approach to the provision of health care in Papua New Guinea, with a number of pre-requisites and aspirations:

- **An increase in Health Financing**. During the period 2011 – 2020, the financial commitment of public funds to the health sector has both declined in real terms from 7% of Gross Domestic Product (GDP) to 2.8 % of GDP and been erratic in commitment. This is less than half of the global average. Development Partner support for health sector financing has decreased. The Alotau Accord II committed to minimise 'out of pocket' expenditure through the availability of free health care. *The health sector will advocate for a greater share of GDP* in order to strengthen its systems, and fully realise free health care through all publicly funded health services.
- **Rapid scale up of Health workforce**. A workforce that is skilled to address priority needs and placed in locations that enable quality of care for all communities. The size, distribution, competency and performance of the health workforce will be central to delivery on the NHP.

[65] World Health Organisation. *Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals.* Geneva, 2015

The current number of clinical health workers falls well short of international standard. Enhancement will require support from the Higher Education sector and firm commitment to reach minimum population ratios. The capacity of health workers to reach their potential is dependent upon supportive supervision and regular and accessible in-service training to adopt positive and contemporary approaches to their efforts in health care.

- **Improved capture and use of Health Information**. PNG has enjoyed a strong foundation of information to support the development of its health programs. However, it risks being left behind, with observation of the quality, utilisation and fragmentation of systems inform program and provision of suitable health care models is lagging. New data technology and digital communication provides opportunity to use information in powerful new ways that support performance understanding, and shape decision making. These technologies provide the prospect of enhancing clinical support even in the most remote settings.

- **Medical supplies available when and where they are needed.** The consistent provision of medical supplies and vaccines to all levels of health facilities has been challenging in the PNG setting, yet vital to ensure quality of care is provided. Recent structural reforms in supply and quality assessment of medications show promise that avoidance of drug shortages can be achieved. However, further reform is needed, with focus on management of supply and information of consumption at facility level vital in the supply chain. Suitable distribution of innovative medical products show promise. For example, the improvement of treatment outcomes achieved through oxygen concentrators demonstrates the positive difference that can be made.

- **Health facilities meet both basic needs at community level and capacity for higher levels of care at referral centres**. The infrastructure that supports health care delivery has weakened, noted by aid post closures (greater than 50% across the country) and deterioration of health centres (30% – 60% of level 3 and 4 facilities assessed to be in need of major repair). Many facilities do not have toilets, quality water supply or electricity. Just 8% of delivery rooms have hand-washing facilities. Declining utilisation by the community reflects this concern. The development of a new type of rural health facility, the Community Health Post, potentially provides a prototype for a new approach and standard. Possibilities to extend higher level health care close to home through 'telemedicine' exist. Confidence and capacity will be built into the health systems through suitable Centres of Excellence at regional and national locations.

- **Effective leadership and governance within the institutions and its people**: Governance concerns the actions and means to ensure that needs are addressed in a systematic manner. It ensures that a strategic policy framework exists and is combined with effective oversight, partnerships, regulation, attention to system design and accountability. The effectiveness of health policies and plans is greatly enhanced if developed in collaboration with other sectors, taking into account the broader socioeconomic, environmental and cultural contexts within which the health sector functions[66]. The transition toward a decentralised health sector, and a definitive shift toward a community-led health service requires vigilance in strong decision making. The positive role of Churches in the provision of health care is a distinguishing feature of PNG. The support of Development Partners in achieving the policy and service objectives

[66] Ibid

has been essential. It remains that this support will yield greatest benefit when in harmony with the unifying agenda of the National Health Plan.

- **Research and adoption of innovation**. Research promotes equity. Generating evidence of what is working and what is not, understanding the elements of quality and where this could be improved, and seeking knowledge of people's behaviour is critical in bringing the best to health care. PNG's strong focus on research, for example, through its annual medical symposium, the acclaimed Institute of Medical Research, and its own research journal provides the ground to bring the best to its people. The evidence provided by research enables the introduction of new approaches and technologies to enhance health.

Service Models of Care

Rural populations

11. Improving utilisation, strengthening the infrastructure and quality of the failing stock of health facilities and a re-focus on community engagement provides an opportunity for development of suitable service models appropriate for the new decade. This may include a rationalisation of existing services (for example aid posts), and development of new services (for example Community Health Posts, Telemedicine). Services must be accountable for quality (medical supply, timely reporting, skilled staff, service outcomes), and Provinces are responsible for effective facilitation, through, for example, referral systems to Level 5 and 6 facilities, program expertise and support, and supervision. Consideration will be given to develop/strengthen a new cadre of "Village Health Assistant" as a means to key in the interest of the village/community with the health service and other attributes that make a healthy village. Joining hands with other social service sectors provides opportunity prevent disease, and better service remote communities in a joint manner. The philosophy of this approach is a locally pitched understanding of Primary Health Care.

Urban populations

12. It is observed that urban populations are growing, frequently without the planning necessary to support infrastructure, work and social amenity. This risks a growing class of poor within the urban setting. Analysis of the health needs of these settlement populations is required and development of services, appropriate to this need will have a level of precedence.

Referral Centres

13. **Hospitals and Centres of Excellence:** The strength of the peripheral services to serve the rural majority is dependent upon a central hub at provincial level (the hospital), and exemplars at district level. Where the clinical needs of rural populations cannot be met at village level, an effective referral service providing a continuum of care to enable access to a network of specialist services is provided. The calibre and quality of care at this level will be ensured by suitable and judicious development of skills and services, and accreditation to operate at agreed scope and quality of care is built into the referral system. Achieving an appropriate balance of financial and personnel investment at hospital and rural facilities will be guided by equity considerations (where *all* may benefit from investment) and maximal health outcome for the whole of community. A network of Centres of Excellence will be developed as focal points to develop best practice and meet specific health concerns.

Health priorities

Information systems

14. Current understanding of health priorities is informed health by information systems, periodic local and national surveys, village 'verbal autopsies', mathematical modelling and direct observation. Possibility of deeper understanding of burden of disease is availed through development of an improved National Health Information, and the beginnings of a vital events registration systems (births and deaths). Health priorities are determined through consideration of prevalence, impact (morbidity and mortality), the ability and cost to intervene, and the capacity for outbreak if not contained.

Infectious Diseases

15. There is undoubted recognition that infectious diseases remain of high concern for the whole of the population. Despite decades in the battle against the old foes of, amongst others, tuberculosis, malaria, measles, lymphatic filariasis, and sexually transmitted infections, and more recent concerns of HIV and global pandemics, there remains a need for significant effort to keep these at bay. Acute infections, most commonly respiratory and gastrointestinal, and acute and chronic skin infections require capacity to treat efficiently. Vaccine Preventable Illness have persisted in PNG with low levels of vaccine coverage.

Noncommunicable Diseases and other health concerns

16. In more recent years, the spectre of non-infectious diseases has loomed ever more greatly and now entrenched as the dominant threat to health and wellbeing. With increased access to energy-rich foods, shifting lifestyles and the pervasiveness of tobacco and alcohol, the concerns of cardiovascular disease, diabetes, chronic respiratory disease, injury and mental disturbance claim their toll. Cancers, especially oral, breast, cervical, and liver cancers are a significant cause for mortality.

Life stages

17. Such diseases sit in the context of specific threats to health at different stages of life.

    - Newborns and young children remain at highest risk of mortality. Improvements in nutrition have provided some protection against illness and mortality. Improvements in the care of the newborn are demonstrated, yet only reach those that seek care. Vaccine-preventable illnesses continue to pose threat where vaccine coverage remains stubbornly

low. Focus will be on newborn care, childhood nutrition, quality of clinical care and effective immunisation coverage.

- Adolescents (10-19 years) are of an age that provides opportunity for positive engagement in the health sector, as sexual and reproductive health, mental health and avoidance of risk-taking (for example, injury, substance misuse) become important. A renewed focus on early adolescence provides opportunity to pitch message on risk, promote awareness of sexuality and family planning, introduce the support required during pregnancy, and potentially the introduction of a vaccine to prevent cervical cancer.
- Reproductive health risks and the vulnerability of women in experiencing intimate partner violence and difficulty in accessing appropriate health services has been recognised as a national priority. Ongoing effort to ensure that women are supported for the health needs throughout their reproductive years remains paramount.
- Disability at any age group has not been strongly recognised as a need in the PNG health system. Programs to address modifiable causes and strengthening capacities for individuals and their families has considerable individual and society benefit. It is likely that there will be an increased ageing population. Planning services and supports for now and in the future is necessary.

Risks and challenges

18. The environment and climate of implementation is one of risk. While PNG has a growing economy, it has a dependency upon the expectations of a narrow range of revenue sources and a history of inconsistent allocation to the health sector. The country is susceptible to the shocks of natural disasters, that threaten lives and infrastructure. The impacts of changing climate, already observable, for example, in drought events, warmer temperatures at higher altitudes and inundation of coastal villages will affect the profile of illness. Capacity of surveillance systems to identify disease clusters and urgent events is still poorly developed, leaving susceptibility to intrusion of new disease risk.

National Health Plan 2021 – 2030

Opportunity

19. The National Health Plan 2021 – 2030 holds the promise of shepherding in a new era of health for PNG. It is a time where

    - Technology will enable communication and information transfer to ensure responsiveness to need;
    - Administrative structures give recognition to the primacy of service at provincial and district level, with the national level assuming its role of promoting and qualifying service standards;
    - There are epidemiological transitions, with a persistence of infectious diseases, a recognition of injury, cancer, mental ill-health as significant concerns, and a rising tide of non-communicable disease;
    - Vulnerability to natural disasters, global warming and tribal conflict persists;

- National government acknowledges the possibilities of the social service sectors uniting to meet community need;
- A commitment is given to all peoples of PNG have any opportunity for good health and access to services when they are needed.

Policy Priorities

20. The Plan will consolidate the directions toward "back to basics" approach of the NHP 2011 – 2020 in providing health services for the majority population. However, with a sense of urgency, the new NHP will establish a new policy direction, in which:

    - A minimum health budget is secured, and an investment in achieving the required health workforce;
    - The decentralised health system is held accountable to standards, with performance clearly defined and upheld by the national level;
    - A targeted approach to service provision where Social Service sectors jointly work toward improved services and address social determinants of health, with configuration of services to reflect an emphasis on accessibility for all, achieving Universal Health Coverage;
    - New models of services that engage communities are developed and reflect access opportunities at district level. Heath services priorities will be supported by novel evidence-based approaches, and shared responsibility through regionally based centres of excellence that champion program, policy and clinical approaches;
    - There is a greater focus on disease prevention and promotion of positive health and village life;
    - Regulation and compliance enforcement is a necessary instrument to foster progress.

Use of this Position Paper

21. Following wide consultation and consideration of this Position Paper, detailed strategy will be developed and costed, with due logic and priority assigned. Commitment will be gained for implementation in a harmonised manner from Districts, Provinces and from the National Department of Health. A commitment of support is sought from Development Partners and other sectors and Central Agencies for the agenda of the National Health Plan. A framework for Performance Monitoring concurrent with the development of strategies, with strong emphasis to be given on equity and community engagement, in addition to system outputs and health outcomes and impacts.

Health Sector Strategic Priorities 2016-2020
Progress update September 2019

Performance against targets revised strategic priorities 2016 – 2020

Leadership, Governance and Partnership

Outcome Target	Progress
Leaderships and management structures and reporting arrangements are implemented to improve efficiency and effectiveness of service delivery	PHA NDoH structures Changes put into place. Still to development firm documentation of roles and relationships of various levels of health system into the future.

	Progress
Operational Targets	
1. All Health Sector agencies are compliant with all Statutory Requirements under relevant legislations including the Public Services Management Act 2014 (revised), Public Finance Management Act 1995 and the Public Service General Orders.	Regulations
2. All Provincial Health Authorities are compliant with Provincial Health Authorities Act 2007	Currently 12 in place, 3 more appointed, remainder by end of year.

3. All Public Hospitals are compliant with Public Hospital Act 1994.	Very little accreditation activity taken place. Unable to report on this.
4. All non PHA Provinces are compliant with National Health Administration Act 1997 and Provincial Administration Act 1998	Full transition to PHAs by end of year.
5. All Agency Heads implement the National Health Service Standards	Measurable?
6. All Agency Heads develop and implement a five-year Strategic Implementation Plan in line with the Health Sector Strategic Priorities 2016-2020	
7. All Agency Heads develop and implement Annual Implementation Plans (AIPs)	Mechanism to check this?
8. All Agency Heads develop and implement a Governance Charter	Completed – Implemented?
9. All health leaders and managers receive at least one managerial and leadership training.	
10. All district hospitals and health centres receive at least one supervisory visit from provincial and district management staff annually.	NHIS report: 2014: 42% of facilities received supervisory visit 2015: 48% 2016: 56% 2017: 52% 2018: 53%

11. Conduct quarterly and annual reviews to track annual work plans against National Health Plan implementation targets.	Requires provincial input
12. All health agencies implement the National Health Sector Partnerships Policy 2014 and partnerships agreements.	

Performance against targets revised strategic priorities 2016 – 2020

Functional Health Infrastructure and Equipment

Outcome targets	Progress
Rehabilitation and refurbishment of priority health infrastructures identified to meet the National Health Service Standards.	The emphasis on construction has been at Provincial level – with the development of operating theatres are Kavieng, Modilon and Popondetta Hospitals and the development of a surgical and diagnostic centre at Goroka. Medicine and Quality Control laboratory at NDoH. 23 Community Health Posts have been constructed. Planning for district level hospitals underway.

Operational targets	Progress
1. At least 85 % of Aid Post fully functional	58% of aid posts open (NHIS)
2. At least 95% of health facilities have running water and sanitation facilities	The maternity services taskforce found **80%** of facilities were connected to a water supply line ^; Facility report (2018) found **7% - 8% of level 3 & 4** facilities were connected with water supply line^^.

	Toilet facilities at level 3 and 4 facilities: adequate number: 35% (govt.), 36% (church); repairs needed on these in 55%/48% respectively. ^^ NHIS (2018) shows 48% of facilities with water to delivery room.
3. Rehabilitate and Upgrade the PMGH, Mt Hagen and Angau Regional Hospitals to meet standards	All at planning stage (confirm)
4. Master Planning for New Gerehu Hospital, New Central Hospital and new Nonga Hospital.	At conceptual stage
5. Construction of new Enga Hospital	At planning stage
6. Install standardised Medical Equipment and Static plants identified under the respective Provincial, Hospital and Provincial Health Authorities Plans.	No data
7. Rehabilitate and upgrade health priority infrastructures captured in respective Provincial, PHAs and Hospital Plans and Health MTDP	No data – require PHA/Provinces inputs
8. Established at least one Community Health Post in each province.	23 constructed to date in initial provinces. Evaluation has not been undertaken; preliminary discussion around second phase development current.
9. Implement priority infrastructures and medical equipment under the Health Workforce Enhancement Plan and Medical Supplies Reform Plan.	

Data sources: ^ Maternity task force report, 2019; ^^Services Delivery by Health facilities in PNG, World Bank group, 2017

Performance against targets revised strategic priorities 2016 – 2020

Provincial Health Authority Reform

Outcome targets	**Comment**
All provinces establish effective provincial health service delivery mechanisms through the Provincial Health Authority Reforms.	Roll out of Provincial Health Authorities in 15 provinces; the remaining 6 will be achieved by end of 2019.

Operational targets	**Comment**
1. Conduct awareness and advocacy on the merits of PHA reforms with members of parliament and central agencies.	
2. Implementation of short-term recommendations of the Independent Review of PHAs.	
3. Roll out of PHAs to more provinces in the country.	
4. Advocate for amendments to the Organic Law on Provincial and Local Level Government to allow for PHA implementation to be compulsory.	
5. All PHAs establishment and operations is consistent with the PHA Act 2007, Public Finance Management Act 1995, Public Management Act 2014 (revised) and General Orders	
6. All PHA develop and implement a Governance Charter.	

Performance against targets revised strategic priorities 2016 – 2020

Health Financing

Outcome targets	**Progress**
Improve the medium-term resourcing of PNG's health system, through direct government financing, development partner support and through efficiency gains across the system.	The health sector has continued to work closely with the relevant government agencies like Treasury and Finance since the early years of the current NHP, to ensure that the sector 's MTTD 2011-2015 is in line with the Government MTDP. In addition, the sector has continued to collaborate with health sector DPs to ensure that their support is in line with the aspirations of the current NHP 2011-2020.

Operational targets	**Progress**
1. Full alignment of all health sector agencies, development partners and stakeholders in the health sector to national PFM reforms, which include a unified, sector led approach with costed multi-year estimates for major policies and strategies across the health system.	This is work in progress. For example, The out- going Minister for Health Sir Puka Temu initiated this process when he recently called for and had one on one direct consultation with relevant DPs, as part of his strategy to reinstate the SWAp mechanism in health. The SWAp approach in health is in line with the Paris Declaration on Aid Effectiveness. The approach the former Health Minister Sir Temu was embarking on is also consistent with the budget reforms that both Treasury & National Planning introduced since 2015, such as the Sector Wide Budgeting in Health. Previously, health was part of the social sector, in terms of the budget process. The PFM reforms in health in terms of the budget process, also includes the signing of the final health sector budget submission by the Minister for Health, before it is presented to the government, part of Ministerial oversight to the health sector budget process.
2. Fully costed Medium Term Expenditure Framework for all health sector policies and	This is still work in progress. Right now, the MTEF is a high-level economic modelling tool. It captures the costing of higher-level sector priorities, and policies.

national strategies across major programs in health.	It also provides information at the higher or aggregate level only. That is, the resources are usually not in detail and or disaggregated by specific sub programs in health for instance. In future, we would like to expand on it, and make it more user friendly for PHAs i.e., provide more detail information on costing, as well as on resource availability so that PHAs can easily use it for their annual, and medium-term planning, and budgeting The health sector MTEF forms part of the PFM reforms in health. It has a 3-year time frame i.e. a base year, and two outer years. Basically, the MTEF matrix contains costs of the priority programs in health over a 3-year period, and resource available over the same period. The costs are then matched against the resource available to see if there are funding gaps that need to be filled. The MTEF matrix is designed in such a way that, it can easily link to the SWAp mechanism.
3. Identify appropriate medium-term financing options in line with the national budget reforms and the Government's fiscal framework.	This is already happening in the health sector in PNG. The examples include: i) Ensuring that health sector agencies meet the submission deadlines of budgets, ii) Review existing health legislations, and use the relevant health legislations to collect nontax revenue in health E.g. Food Safety Act, Public Health Act, Tobacco Control Act, Pharmacy & Cosmetic Act, Hospital Charges Act, Dental Charges Act, Medical Board Registration Act, etc, etc.

	iii) The NDoH was invited to be part of the Non-Tax Revenue team formed by the government in 2014 to assist in collecting nontax revenue, as part of the non- tax revenue measures. This went through the budget process, without having to go back to Parliament, to review the relevant pieces of legislations that authorizes the generation of non- tax revenue.
4. Identify viable and appropriate midterm and long-term financing strategy in the sector, taking into account the graduation and transition phase of development partner's support in the medium term.	One of the long-term financing strategies in the short to long term is, the adoption of a social health insurance scheme. However, this strategy is yet to be implemented in PNG. The reasons for this are: i) The government does not have the fiscal capacity to implement it; ii) It has a high administrative cost, and iii) PNG does not have the expertise to manage the scheme, as the scheme itself is complex The government will reconsider the adoption of this health financing option in the future when the domestic economy is fully developed.
5. Introduce a health specific chart of accounts across the entire health system in PNG to improve resourcing across the system as well as the transparency and efficiency in the usage of funds.	A standard PHAs Chart of Accounts has been developed. It was recently endorsed by the NDoH SE. It has already been configured into the IFMS framework by the DoF IFMS team. The IFMS using the standard PHAs Chart of Accounts has already been successfully rolled out to the East Sepik, and the New Ireland PHAs. It will soon be rolled out to Manus, West Sepik, and West Sepik PHAs. This is the five (5) target PHAs for 2019. The roll out to the rest of the PHAs in PNG will begin in 2020.
6. Roll out of facility-based budgeting across all districts.	The FB template has been developed. Training and roll out of the FBB will be implemented in New Ireland, Morobe, and Eastern Highlands PHAs, as soon as funding for this activity is made

	available. Training and roll out to the rest of the PHAs will also follow suit, pending availability of funding.
7. Improve efficiencies across the health system in order to create fiscal space by improving the productivity mix of health inputs into every facility, implementing improvements in basic planning and budgeting and determining alternative financing modalities through PPP arrangements and other alternatives.	Already happening in the sector. Examples include: i) Adoption and implementation of Sector Wide Budgeting in health, led by the NDoH as the Lead Agency in Budget Coordination, and Preparation since 2015. Health is now a sector of its own in terms of the new Budget Reform process. In the past it used to be part of the Social Sector. ii) A separate Alesco Payroll system for Christian Health Service worker by NDoH & DPM has already been established. For the Catholic health workers, it is still work in transition iii) Some PHAs have already signed Service Agreements with open members of Parliament of their respective districts, and are now accessing DSIP funds to build their health infrastructures like upgrading of their aid posts, health centres etc. West New Britain PHA is a good example. Some like the Hela PHA has singed Service Agreement with Oil Search, and Oil Search has come in a big way to assist to assist Hela PHA to rebuild some of its health facilities that were destroyed during the recent earthquake in Health, and Southern Highlands. Others are yet to do so as DDAs in some of their districts are yet to be set up. iv) NDoH collaborated with RPHSDP to assist PHAs develop their Service Plans. So far 12 PHAs now have their own Service Plans. These PHAs are now using these Service

	Plans to market their health projects to the open members of Parliament for funding support
8. Regularly produce annual National Health Accounts reports to inform health financing policies and strategies.	The first PNG NHA Survey was done. It led to the production of the 2012 NHA Report. The second NHA Survey 2014 and 2015 has been completed. The NDoH is now in the process of imputing the NHA expenditure data into the NHA Production Tool to produce the NHA Tables. Out of the Tables the write up of the 2014/2015 NHA Report will commence. It is anticipated that the final PNG 2014 and 2015 NHA Report will be produced in September, and the results used for the purpose of informing policy decisions with regard to health financing in PNG. The HEU team is already planning for the next NHA Survey, and the team agreed to recently in one of its NHA meeting that the next NHA Survey will be for the period 2018. The PNG NHA Surveys and reports are being strongly supported by the Technical Assistance, and funding by the WPRO in Manila.
9. Develop Regulatory Framework on the establishment of the Health Endowment Fund	This activity is partly being assisted by the Legal Unit of the NDoH through the Tobacco Control Act of PNG. There is a provision in the Act that allows the NDoH to set up a Health Promotion Trust Fund or Trust Account. The purpose of this Trust Account is to hold licensing fees that will be charged to manufacturers, and importers of tobacco products in PNG on an annual basis. The share of how much health is to retain of the licensing fees will be determined by consultations amongst relevant stakeholders like Customs, Treasury, and the NDoH. Expenditure out of the Trust Account will be used to meet the costs of health promotion activities, targeting the users of tobacco products in PNG. This exercise is also in line with the current government's nontax revenue measures that aim to support the government's main revenue base which is revenue from direct taxes.

	Currently the government's revenue performance since 2015 has been heavily impacted by the sharp drop in prices of PNG's major export commodities, including prices of oil and gas in the world markets.
10. Consolidate implementation of the Free Primary Health Care and Subsidized Specialized Health Services.	The most effective way of consolidating this high-level government policy in the health sector in PNG is to simply improve the PFM systems in the country at all levels of the government. This cannot be achieved by the health sector alone, but by way of whole of government approach. For example, we just need to improve the budget process at all levels of the government system. This includes timely disbursements of health sector agencies operational funds like the Health Function Grant, CHS Operational & Staffing Grants, Hospital Grant, and in right amounts using the formula 40/30/20/10. That is, 40% of the funds is released during the first quarter, 30% during the second quarter, 20% during the third quarter, and 10% during the quarter of the year. As, alluded to above we also need proper budgeting at all tiers of health facilities, in the form of Facility Based Budgeting (FBB). This will assist the sector in determining the actual cost requirements by facilities on an annual basis, so that this forms part of the health sector budget submission that will be presented to Treasury on an annual basis. In turn this will allow Treasury to use the sector budget as the basis for advocating for health, during the budget negotiation at the higher level. As such, there is no need for the government to continue to allocate K20.0 Million annually for the purpose of implementing the free health care policy in PNG. This is because the annual K20.0 million free health care, budget does not represent the true cost of health care in PNG, let alone the real cost of free health care in PNG. Hence it is not an effective and efficient way of funding and implementing the free health care policy. The rollout of the "one system tasol" or PHA is also another avenue where the free health care policy can be consolidated. In addition, the rollout of the IFMS to the PHAs, using the standard PHAs Chart of Accounts (CoA) as alluded to above, is yet another way of consolidating the implementation of the free health care policy.

	Finally, but not the least, effective collaboration with other stakeholders like Christian Health Services, Catholic Health Services etc, using the Public Private Partnership Policy (PPPP) in health, can also pave the way for consolidating the implementation of the free health care policy in PNG. As the saying in Health goes, "Health is everybody's business."

Performance against targets revised strategic priorities 2016 – 2020

Health Promotion

The Health Promotion unit have advised on an inability to report against these targets, as there has been very little activity. This stems from a lack of budget. The unit has flagged that this will not change until the Unit is appropriately funded. The following table cannot be completed in the absence of progress in this priority.

Outcome targets	**Comment**
1. Develop a robust multi-sectoral approach, in all settings, to **address the social determinants of health and health inequalities.**	Healthy Islands policy remains priority
2. Increase the effective and efficient use of resources to promote the health of the population and reduce the cost burden of **chronic disease**.	

Operational targets	**Comment**
1. Behaviour change communication (BCC) provided to all individuals at the facility and community levels.	
2. Implement Healthy Islands concept through the Health Promotion Policy.	
3. Establish one healthy market per province.	
4. Launch two healthy schools in every province.	
5. Launch one healthy village per province.	

6. All health sector stakeholders implement a package of BCC programs focusing on TB, Tobacco, Cancer, HIV, other Non-Communicable Diseases and emerging diseases.	
7. Implement Health in All Policies Approach in Addressing Social Determinants of Health.	

Performance against targets revised strategic priorities 2016 – 2020

TB program

Outcome targets	**Baseline**	**Target**	**Current**	**Comment**
1. Reduce TB prevalence rate	541 per 100,000 popn. (2012) (estimate)	339/100,000	In 2018 the *estimated* incidence was 432 per 100,000 popn. (about 37,000 cases smear positive). The cases notified were 74% of this number.	Prevalence is not a term applied to TB. Program advise to focus on incidence.
2. Reduce TB mortality rate	54 per 100,000 popn. (2012) (estimate)	30/100,000		No recent studies

Operational targets	**Baseline**	**Target**	**Current**	**Comment**
1. Implementation of local TB care and prevention strategy to				
(a) increase the case notification rate	355 per 100,000 popn. (2015)	93/100,000	340/100,000 (2018)	

(b) achieve treatment success rate (DS-TB) by a. Strengthening National Tuberculosis Program (NTP) to support the provinces. b. Strengthening capacity and ownership at provincial and district levels. c. Developing capacity of the health care workers to implement DOTS. d. Improving laboratory services. e. Strengthening drug procurement and supply management systems. f. Strengthening recording and reporting systems. g. Improving diagnosis and management of childhood TB. h. Conducting TB awareness using media.	70% (2015)	88%	69%	16% lost to follow up; 11% not evaluated 2% died; 1% failed treatment
2. Improve the programmatic management of Drug Resistant TB focusing on high prevalent provinces (Western, Morobe, Madang and National Capital District) through; a. Improving early detection and diagnosis of Drug Resistant TB. b. Improving the Programmatic Management of Drug-Resistant TB.			Treatment success rate: MDR-TB = 75% XDR-TB 63%	

c. Building at least one isolation facility in provinces with MDR/XDR TB.				
3. All Agency Heads increase coverage of TB testing for patients with HIV from 24% (in 2013) to 91% in 2020 through strengthening the TB/HIV collaborative activities.			56% (2018)	

Performance against targets revised strategic priorities 2016 – 2020

Maternal Health

Outcome targets	**baseline**	**target**	**current**	**comment**
Total fertility rate	3.8	3.6	4.2	Most recent data 2011 census
Contraceptive prevalence rate of women aged 15-49 years using modern contraceptives	32.7%	40%	37% (DHS 2016/18)	Recent escalation of implant uptake may see change here.
Couple years of protection per 1,000 women of reproductive age (15-44 years)	70	300	126 (2018)	

Operational targets	**baseline**	**target**	**current**	**comment**
Increase coverage of pregnant women having access to at least one antenatal care visit	63% (2015)	80%	45% (NHIS 2018) 76% (DHS 2016/18)	Difference in rates through NHIS and DHS (consistently different)
Increase supervised deliveries	44% (2015)	60%	32% (NHIS 2018) 55% (DHS 2016/18)	Declining trend
Ensure family planning services are provided in all facilities.				No data

Agency Heads to implement priorities of the National Family Planning, Sexual Reproductive Health, Health Gender Policy and Youth and Adolescent Policy.				
Revise the Village Health Volunteer Policy.			Policy revised	
Agency Heads implement the Village Health Volunteer Policy.				
Agency Heads ensures availability of staff with midwifery skills at all district hospitals and community health posts.				Data does not provide specificity to this level.
Availability of an Obstetric and Gynaecologist specialist at all provincial hospitals.			36 obstetricians in public hospitals	The distribution of these is not provided
Agency Heads ensure the availability of at least two midwives at all hospitals.				No data

Performance against targets revised strategic priorities 2016 – 2020

Child Health

Outcome	Baseline given in 2016 – 2020 priority paper	Target	Current performance	Data sources	Comment
Decrease Neonatal Mortality from 28 to 25 per 1,000 live births.	28 per 1,000 live births	25 per 1,000 live births	20 per 1,000 live births	DHS 2016-18	
Decrease Infant Mortality Rate from 50 to 40 per 1,000 live births.	50 per 1,000 live births	40 per 1,000 live births	33 per 1,000 live births	DHS 2016-18	
Decrease Under Five Mortality Rate from 63 to 48 per 1,000 live births.	63 per 1,000 live births	48 per 1,000 live births	49 per 1,000 live births	DHS 2016-18	

Decrease proportion (%) of low birth weight from 7% (in 2015) to under 5%.	70 per 1,000 births	50 per 1,000 births	100 per 1,000 births (2018) 75/1000 live births (2017, PMGH)	NHIS 2018	
Decrease proportion (%) of moderate and severe weight for age amongst children under five from 23% (in 2015) to under 20%.	23%	<20%	21%	NHIS 2018	
Decrease incidence of diarrhoeal diseases amongst children under 5 from 300 per 1,000 to less than 250.	300 per 1,000	<250 per 1,000	197 per 1,000	NHIS8 201	

Operational Targets	**Baseline given in 2016 – 2020 priority paper**	**Target**	**Current performance**	**Data sources**	**Comment**
Pneumonia case fatality rates at health facilities from 2.31% (in 2015) to 1.6%.	2.31%	1.6 deaths per 1000 admissions	Pneumonia 3.5%^ Severe pneumonia 9.6%^ 1.9% (2018)^^	^ 2018 Child Morbidity and Mortality report ^^ NHIS	2018 CFR lowest in 10 years
Immunisation coverage rate for measles from 59% to 95% amongst children less than one year.	59% coverage	95% coverage	^ 52.9% (MCV2); ^^ 32% (MCV2) ^^^ 37% (MCV1)	^ DHS 2016 – 18 ^^ NHIS, 2018 ^^^ EPI SA, 2018	Rates have continued to decline steadily
Attendance of births by skilled personnel in all hospitals from 40% (in 2015) to 64%.	40%	64%	^32% ^^ 56%	^NHIS, 2018 ^^DHS 2016/18	
Coverage of third dose of pentavalent vaccine amongst	54%	80%	^ 59.1% (Pentavalent3)	^ DHS 2016 – 18	

children less than one year from 54% (in 2015) to 80%.			^^ 39% ^^^ 45%	^^ NHIS, 2018 ^^^ EPI SA, 2018	
Improve management of referred cases of births from rural centres by provincial hospitals.					No data available
Improve child feeding practices in infants up to six months of age.	36% DHS 2006 baseline exclusive breastfeeding at 4 – 5 months of age		33%	^ DHS 2016 – 18 Exclusive breastfeeding at 4 – 5 months of age	
Fully functional cold chain system.			Cold Chain equipment (CCE) inventory (2017): 16% of CCE is non-functional		

Performance against targets revised strategic priorities 2016 – 2020

Water, Sanitation and Hygiene

Outcome targets	**Baseline**	**Target**	**Current (IMR malaria indicator survey 2016/17)**	**Comment**
1. Increased proportion (%) of rural population using improved drinking water source	33% (2014)	40%	35.1%	No further project activity since 2013.
2. Increased access of urban population to an improved drinking water source	88% (2014)	95%	88.8%	
3. Increased access of rural population using improved sanitation	13% (2014)	20%	8.5%	
4. Increased access of urban population using improved sanitation	56% (2014)	60%	55.5%	

Operational targets	**Baseline**	**Target**	**Current**	**Comment**
1. All Agency Heads establish at least one improved drinking water source in a rural area in each province.			There have been **no projects/activity** embarked upon during this period; OIC in WaSH in each province (PDCO). National Dept – 4 officers.	Policy, monitoring and implementation. Currently no projects.
2. All Agency Heads establish increased access to sanitation facilities in at least one major market and all major sporting fields in each province.			There have been **no projects/activity** embarked upon during this period;	
3. All Agency Heads implement hand washing facilities in all health facilities and health training institutions.			Only **8%** of facilities had functional hand hygiene stations available in delivery areas (clean sinks	

			with running water, soap and hand towels) and 13% had alcohol hand gel^.	
4. All Agency Heads implement one source of safe drinking water in all health facilities and health training institutions.			The maternity services taskforce found **80%** of facilities were connected to a water supply line ^; Facility report (2018) found **7% - 8% of level 3 & 4** facilities were connected with water supply line^^	
5. All Agency Heads ensure all health facilities have a good waste management system.			General waste bins in delivery room – 64% ^; Medical waste bins in delivery room: 25%^.	
6. All Agency Heads ensure all health facilities implement Infection Control measures.			Clean and functional toilets for delivery rooms – 44%^;	
7. All health stakeholders implement alternate electricity supply system in at least 25% facilities (especially in rural and remote areas).			Level 3 and 4 facilities: Government facilities: 35% connected to electricity line; 48% with backup generator; Church facilities: 28% connected to electricity line; 76% with backup generator. ^^	
8. Establish an active case surveillance in affected areas (El Nino or La Nino) to assess impact on communities and health facilities.			Draft strategy and action plan developed on Climate Change and Health. Surveillance systems in place (see outbreak response report)	

Data sources: ^ Maternity task force report, 2019; ^^Services Delivery by Health facilities in PNG, World Bank group, 2017

Performance against targets revised strategic priorities 2016 – 2020

Malaria

Outcome targets	Baseline	Target	Current	Comment
1. Decrease death rate associated with Malaria per 100,000 population from 40 to 30.	40	30	NHIS data	
2. Reduce incidence of Malaria cases from 102 (in 2015) per 1,000 population to 75 per 1,000 population and eliminate incidence of malaria by 2030.	102 (in 2015)	75	2014: 102 2015: 93 2016: 104 2017: 105 2018: 118	Source NHIS

Operational targets				
1. All health sector stakeholders ensure improved diagnosis and appropriate treatment are available from all health facilities.			RDT and ACT availability - NHIS	
2. All health sector stakeholders to ensure households have access to long lasting insecticidal nets (LLIN) and is used by 80% of children.		80%	69% HH have at least one ITN; 52% of children under 5 slept under ITN 72% of children under 5 slept under ITN when HH has an ITN	Source DHS 2106/18
3. All health sector stakeholders ensure children less than five years diagnosed with fever are treated with appropriate anti-malarial drugs increases from 18% (in 2015) to 60%.	18% (2015)	60%	48% of children with fever whom sought treatment; 25% had blood test; of those who took an antimalarial medication, 72% took ACT	Source DHS 2106/18

Performance against targets revised strategic priorities 2016 – 2020

HIV/STI

Outcome targets	baseline	target	current	comment
1. Increase accessibility HIV infected persons to antiretroviral drugs from 79% in 2015 to 100%.	79%	100%	76% of positive patients are on ART	Denominator has been revised
2. Decrease HIV prevalence amongst pregnant mothers from 1% (in 2015) to less than 1%.	1%	<1%	1.84% (PMGH annual report, 2018) 0.8% nationally	

Operational targets	baseline	target	current	comment
1. All health sector stakeholders ensure increase in HIV testing of pregnant mothers in antenatal clinics and treatment is provided to 90% of positives.		90% of pregnant women with positive HIV receive treatment	A total of 76 896 women were tested for HIV in ANC and labour ward in 2017. Of these, 593 (0.8%) were confirmed HIV positive; Between 2010 and 2017, the proportion of pregnant women accessing ART for PPTCT has increased from 5% to **41%** respectively	
2. All Agency Heads ensure establishment of at least one HIV counselling site in every district.			All districts covered.	
3. All health sector stakeholders increase awareness and support to general population including marginalised and special groups.			82% of women and 90% of men have heard about AIDS; 24% of young women and 26% of young men have comprehensive knowledge of HIV prevention (DHS 2016/18). Awareness of HIV infection among HIV-positive FSW in the lowest of the three targets, ranging from 39.3% to 43.9%. (IBBS, 2018);	

4. Conduct Integrated Bio-Behavioural Surveillance and implement strategy to reduce prevalence amongst most at risk population.			Completed 2018	

Performance against targets revised strategic priorities 2016 – 2020

Performance Monitoring

Outcome targets	Progress
1. All Agencies are compliant with all statutory requirements set out under relevant legislations guiding their establishments and operations	Not all agencies are compliant with all statutory requirement
2. Effective integrated Monitoring and Evaluation Framework for the health sector	Current M&E framework is not integrated for Health Sector thus when reporting systems were developed there is no link of information to a central management information system.

HIS Performance Improvement Objective	**Strategic Interventions**	**Output**	**Achievement**
HIS Governance and Leadership (Policy and Resources)			
1. To develop and enforce relevant regulatory arrangements to maximize data collection, reporting, processing and sharing by all providers	1.1. Develop an NHIS policy	HIS Policy Developed	HIS policy was developed in 2014 but in the draft form awaiting the ICT policy to be completed first.
	1.2. Establish a mechanism for regular consultations on the integration of private for-profit providers in the NHIS reporting system	Establishment of eNHIS	eNHIS was developed in 2014 and implemented in 5 Provinces in 2015 and 3 additional provinces in 2018

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	1.3. Build capacity for the Health Informatics Committee to fulfil its mandate and meet regularly	Capacity building for HIC	No training conducted
	1.4. Define national health data Quality Standards in line with WHO/HMN gold standards	Establishment of data quality mechanism	No data quality mechanism in place
	1.5. Develop and publish a standard dictionary for all data sets	Standard dictionary for all datasets developed	No standards dictionary developed
	1.6. Monitor implementation of the NHP (2011-2020) - joint annual reviews	Conduct annual assessment of the health sector done annually	SPAR reports done annually from 2013-2018
2. To harmonize the functions of the NHIS	2.1.Regular review of standard definitions of health indicators to facilitate national, regional and international comparisons	Review of health indicators conducted	Review on the indicators has not been done since the implementation of the M&E strategic plan
	2.2. Rollout and strengthen the application of the ICD classification of diseases	Training of ICD-10 and software installation	Training conducted for all provincial hospitals in 2006,2007,2014 & 2015
	2.3. Standardize data collection procedures	Data collection procedure standardized	Public Health programs and other disease programs that report to NHIS used NHIS standard forms for all health facilities in PNG
	2.4. Establish mechanisms for regular consultations amongst owners of NHIS subsystems	Mechanism established for consultation of NHIS sub systems	NHIS sub systems have their own reporting mechanisms developed

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
3. To improve the quality of health information	3.1. Adapt and apply data audit tools and conduct regular data quality audits	Audit tools developed for regular data quality audits	No standard audit tools been developed for data quality audits
	3.2. Include NHIS and M&E practices in integrated supervision and feedback system	NHIS and M&E integration supervision practices	There is no integration of reporting with M&E supervision practices implemented since the development of integrated supervision checklist developed by WHO in 2016
	3.3. Conduct a comprehensive assessment/reviews of the NHIS every 5 years using HMN framework	Comprehensive assessment of NHIS conducted	There is no assessment conducted
4. To strengthen ICT infrastructure for the health sector to facilitate data processing, transmission and sharing	4.1. Develop an ICT policy for the health sector	ICT Policy developed	ICT policy developed in 2015 is still outstanding till 2019
	4.2. Conduct an assessment of ICT hardware and software at all health facilities	Assessment of ICT hardware and software	No assessment conducted
	4.3. Define technical standards and a minimum ICT infrastructure package for all levels of the health systems	Technical standards and minimum ICT Infrastructure identified	ICT will provide update
	4.4. Establish an appropriate basic information and communication technology (ICT) infrastructure (telephones, internet access, e-mail) for each level of the health system	ICT infrastructure developed	No ICT infrastructure developed

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	4.5. Establish central and provincial level "data warehouse with capacity to respond to information and data sharing needs of various stakeholders	Data warehouse developed	No data warehouse developed
5. To provide a critical mass of HIS human resources that are needed at all levels of the health system	5.1. Establish appropriate HIS personnel requirements, assess staffing and training needs, evaluate training capacities and design HIS training programs	Developed training assessment needs for HIS personnel	HIS training need analysis conducted but yet to develop a carrier pathway for HIS personnel
	5.2. Establish a human resources data base that tracks the number of health professionals by major category working in either the public or private health sectors	Human resource data base developed	Human Resource information system was developed and yet to be fully implemented
	5.3. Build provincial capacity to roll out HIS training programs or to subcontract training institutions to deliver the training	Training conducted for HIS officers	In2017 and 2018,HIS officers from 22 provinces were trained in Port Moresby
	5.4. Create and fill designated posts full time health information officer positions at provincial and district levels	Designated positions for HIS officers at the sub-national levels	HIS positions are only created for provinces only and not at the districts
HIS Data Management, dissemination and Use			
6. To increase data sharing, management, analysis and dissemination	6.1. Review/develop and implement written procedures for data management (collection, storage, cleaning, quality control, analysis and presentation and monitor implementation	Written procedures for data management, monitoring and implementation	No standard procedure developed for data management, monitoring and implementation
	6.2. Institutionalize periodic reviews of operational data sources	Periodic review of operational data sources	No periodic review conducted

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	6.3. Increase the use of "Wall charts and maps" depicting access trends or frequencies for important programs at all facilities	Wall charts and maps developed to depict access to trend or frequencies for programs in facilities	Mapper in eNHIS is now able to locate the disease outbreak and hotspots in real time across affected areas in PNG
	6.4. Ensure the production and dissemination of regular and timely hospital, district, provincial and national quarterly and annual reports	Dissemination of regular reporting from hospitals, districts and provinces in quarterly or annual basis	There is no effective mechanism or systems established for reporting
7. To promote access to information and improve the use of health information in decision making	7.1. Develop training programs to strengthen capacity of health staff to analyse, disseminate, interpret and use health statistics and information for monitoring, planning, performance assessment and problem solving	Training programs developed for capacity building	No training programs developed for the capacity building
	7.2. Institutionalize the use maternal audit forms at facilities that provide obstetric care	Maternal audit forms institutionalize	Maternal Registry been developed but is not used al all facilities
	7.3. Ensure the production of regular health reports at hospital, district, province and national levels	Regular health reports produced from hospitals, districts and national level	Regular reports not produced
HIS Data Sources: Population based surveys			
8. To increase the availability and use of population based and socio demographic data	8.1. Ensure districts and provinces have access to up-to-date census data and population projections	Districts and provinces have accessed to census and population projections	Health Sector has revised the population for health and have provided the updated populations to all provinces in 2018

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
9. To improve the availability and quality of survey data	9.1. Establish a mechanism for collaboration with national research institutions that conduct population-based surveys	Mechanism developed for collaboration with research institutions	No effective research mechanism developed for health sector with research institutions
	9.2. Develop a multiyear plan to coordinate household and other population-based surveys that collect health and health related indicators	Planned developed for household and other population-based survey	No plans for household and other population-based survey developed except for DHS
	9.3.Conduct training on household survey design, processing and analysis	Training conducted for household survey design	No trainings conducted for household survey design
	9.4. Conduct health facility surveys to evaluate the quality of services and drug availability	Health facility surveys conducted to evaluate quality of services and drug availability	Only Havoc surveys conducted based on requests
	9.5. Conduct Demographic and Health Surveys every 5 years	DHS conducted	DHS conducted in 2016-2018
	9.6. Develop and apply internationally accepted standards for conducting surveys (ethical issues, design and implementation, quality assessment, analysis and dissemination)	International Standard developed for conducting surveys	No international standards developed for surveys except for DHS
	9.7. Define national health research priorities for PNG	National Health Research priorities developed	National Health and HIV Research Agenda developed in 2013
	10.1. Conduct a comprehensive assessment of the CRVS systems	CRVS Comprehensive Assessment developed	CRVS comprehensive assessment for PNG will be done in July 2019

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	10.2. Build the capacity for hospitals to use ICD-10 coding and roll it out to all general and provincial hospitals	Capacity building for Hospitals to use ICD-10	Capacity building was done in 2006,2007,2014 & 2015
	10.3. Work with relevant government departments to expand the reach of Civil Registration	Collaboration with Civil registry and Health Department	CRVS committee formed in 2016 to coordinate CRVS in PNG. Members are from various government departments and development partners
HIS Data Sources: Service Records			
11. Ensure the availability of service records from private health service providers	11.1. Engage private providers of health services by inventorying them, sensitizing and informing them about legislation, providing them with the necessary standard forms which are simplified	Engagement of private providers of health services	There is minimum or no engagement with private providers of health services with the department in terms of reporting
Data Sources: Health Service, Financial and Administrative Records			
12. Strengthen mechanisms for reporting on health system finances, budgets and expenditures	12.1. Assess current availability of financial data and its usability to determine program and unit service costs		
	12.2. Develop and implement an integrated system for tracking budgets and expenditures by all financial agents, disaggregated by sub-national or district level - collaborate with the NEFC	Integrated systems developed to track all health delivery services	No integrated system for health sectors. All systems developed are operating in silos
	12.3. Introduce the use of health data as a basis for resource allocation	Health data used	

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	12.4. Conduct public health expenditure reviews		
	12.5. Build capacity for NDoH to conduct National Health Accounts (NHA) and conduct NHA studies every 2 years		
13. To expand and improve data and database on health infrastructure, human resources and logistics	13.1. Strengthen human resources, facilities and drug management support systems through assessment, procedures development (including data base development) and training		
Public Health and Disease Surveillance			
14.To strengthen the integrated disease surveillance system	14.1. Assess the performance of the current disease surveillance system and practices and develop a plan to improve the system and its procedures		
	14.2. Strengthen procedures for surveillance and outbreak response at central and provincial levels		
	14.3. Update case definitions of key epidemic prone diseases, diseases targeted for eradication/elimination and ensure cases are reported on a current reporting format		
	14.4. Strengthen or update national communications infrastructure for rapid surveillance notifications and response		

HIS Performance Improvement Objective	Strategic Interventions	Output	Achievement
	14.5. Strengthen linkages and partnerships between the public and private providers for notification, investigation and outbreak control activities		
	14.6. Review and develop more efficient outbreak investigation report formats and ensure report completion and submission		
	14.7. Strengthen district level surveillance procedures and data management for efficient notification, data entry, trend monitoring, threshold detection and outbreak investigation		

DISTRICT POPULATION PROFILES 2020 – 2030

2020														
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	9106318	326649	298573	984427	2259855	4722166	4384153								
Western	299351	12273	11304	38288	69610	154729	144622	**Morobe**	926432	32426	29385	107152	230286	482681	443752
Middle Fly	109062	4472	4118	13949	25361	56372	52690	Bulolo	132647	4643	4207	15342	32972	69110	63537
North Fly	99418	4076	3754	12716	23118	51387	48031	Finschaffen	77781	2722	2467	8996	19334	40525	37256
South Fly	90871	3726	3431	11623	21131	46970	43901	Huon	102231	3578	3243	11824	25412	53264	48968
Gulf	190153	7796	7212	22795	44677	98777	91376	Kabwum	71935	2518	2282	8320	17881	37479	34456
Kerema	116510	4777	4419	13967	27374	60522	55988	Lae	204690	7164	6492	23675	50880	106645	98044
Kikori	73643	3019	2793	8828	17303	38255	35389	Markam	84792	2968	2689	9807	21077	44177	40614
Central	317847	10807	10179	36569	74511	165954	151893	Menyamya	117729	4121	3734	13617	29264	61338	56391
Abau	66301	2254	2123	7628	15543	34617	31684	Nawaeb	60214	2108	1910	6964	14968	31372	28842
Goilala	47241	1606	1513	5435	11074	24665	22575	Tewae/Siassi	74415	2605	2360	8607	18497	38771	35644
Kairuku/Hiri	136106	4628	4359	15659	31907	71064	65043	**Madang**	719869	29515	26608	91170	169262	375253	344616
Rigo	68198	2319	2184	7846	15987	35608	32591	Bogia	112590	4616	4162	14259	26473	58691	53899
NCD	449470	13933	13276	41975	120104	245770	203700	Madang	170930	7008	6318	21648	40191	89102	81828
Moresby North East	171646	5321	5070	16030	45866	93856	77790	Middle Ramu	114118	4679	4218	14453	26833	59488	54631
Moresby North West	160258	4968	4734	14966	42823	87629	72629	Rai Coast	111003	4551	4103	14058	26100	57864	53139
Moresby South	117567	3645	3473	10979	31415	64285	53281	Sumkar	132205	5420	4887	16743	31085	68916	63289
Milne Bay	347546	11816	10955	42109	82370	181143	166403	Usino Bundi	79023	3240	2921	10008	18581	41193	37830
Alotau	123292	4192	3886	14938	29221	64261	59032	**East Sepik**	644053	25762	23263	82797	154308	322473	321580
Esa'ala	70437	2395	2220	8534	16694	36712	33725	Ambunti/Drekikier	103964	4159	3755	13365	24909	52054	51910
Kiriwina/Goodenough	82531	2806	2602	9999	19560	43016	39515	Angoram	129110	5164	4663	16598	30933	64645	64466
Samarai/Murua	71286	2424	2247	8637	16895	37155	34131	Maprik	108485	4339	3918	13946	25992	54318	54168
Northern	236700	9231	8590	29849	54655	124263	112436	Wewak	120044	4802	4336	15432	28761	60105	59939
Ijivitari	120916	4716	4388	15248	27920	63479	57437	Wosera Gawi	92725	3709	3349	11920	22216	46427	46298
Sohe	115784	4516	4202	14601	26735	60785	54999	Yangoru Saussi	89724	3589	3241	11535	21497	44924	44800

SHP	651001	24087	21697	47584	172388	332012	318990	**West Sepik**	316533	12661	11226	39966	74738	162787	153746
Ialibu/Pangia	91781	3396	3059	6709	24304	46808	44972	Aitape/Lumi	90972	3639	3226	11486	21480	46785	44187
Imbonggu	108560	4017	3618	7935	28747	55366	53194	Nuku	78427	3137	2781	9902	18518	40334	38094
Kauga Erave	98494	3644	3283	7199	26082	50232	48262	Teleformin	60646	2426	2151	7657	14319	31189	29457
Mendi/Munihu	174193	6445	5806	12732	46127	88839	85355	Vanimo/Green River	86488	3459	3067	10920	20421	44479	42009
Nipa /Kutubu	177973	6585	5932	13009	47128	90767	87207	**Manus**	66918	1873	1759	8168	16003	34550	32368
Enga	480691	16343	14656	33416	131772	249519	231172	Lorenagu	66918	1873	1759	8168	16003	34550	32368
Kandep	77228	2626	2355	5369	21171	40088	37140	**New Ireland**	212958	7241	6691	27948	47984	112930	100028
Kompiam	72230	2456	2202	5021	19800	37493	34736	Kavieng	95956	3263	3015	12593	21621	50885	45071
Lagaip/Porgera	148269	5041	4521	10307	40645	76964	71305	Namatanai	117002	3978	3676	15355	26363	62045	54957
Wabag	95721	3255	2919	6654	26240	49687	46034	**ENBP**	375825	12778	11814	45872	89068	197537	178288
Wapanamanda	87244	2966	2660	6065	23916	45287	41957	Gazelle	153292	5212	4818	18710	36329	80572	72720
WHP	442638	15050	13809	41279	114645	225745	216893	Kokopo	99623	3387	3132	12160	23610	52363	47260
Dei	86650	2946	2703	8081	22443	44191	42459	Pomio	76776	2610	2413	9371	18195	40354	36422
Mt Hagen	151392	5147	4723	14118	39211	77210	74182	Rabaul	46135	1569	1450	5631	10934	24249	21886
Mul/Baiyer	98697	3356	3079	9204	25563	50335	48361	**WNBP**	348596	13247	12168	46103	78947	187072	161525
Tambul/Nebilyer	105900	3601	3304	9876	27428	54009	51891	Kandrian/Gloucestor	105266	4000	3674	13922	23840	56490	48776
Chimbu	378381	11351	10435	31997	98915	196588	181793	Talasea	243330	9247	8494	32181	55107	130582	112750
Chuave	52559	1577	1449	4445	13740	27307	25252	**AROB**	334162	11695	10832	41119	80240	171724	162436
Gumine	52416	1572	1446	4432	13702	27233	25183	Central Bouganville	79143	2770	2565	9739	19004	40671	38471
Karimui/Nomane	52938	1588	1460	4477	13839	27504	25434	North Bouganville	139439	4880	4520	17158	33483	71657	67781
Kerowagi	79915	2397	2204	6758	20891	41520	38395	South Bouganville	115579	4045	3746	14222	27753	59396	56183
Kundiawa/Gembogl	85166	2555	2349	7202	22264	44248	40918	**Hela**	304955	10674	9726	23348	82040	155428	149526
Sina sina/Yonggomugl	55387	1662	1527	4684	14479	28776	26611	Komo Magarima	105226	3683	3356	8056	28308	53631	51595
EHP	717957	23693	21654	73156	184137	369648	348310	Koroba/Kopiago	114104	3994	3639	8736	30696	58156	55948
Daulo	51338	1694	1548	5231	13167	26432	24906	Tari/Pori	85625	2997	2731	6556	23035	43641	41984
Goroka	119175	3933	3594	12143	30565	61359	57817	**Jiwaka**	344282	12395	11335	31769	89195	175582	168699
Henganofi	92475	3052	2789	9423	23717	47612	44863	Anglimp/South Waghi	178944	6442	5892	16512	46360	91260	87683
Kainantu	152175	5022	4590	15506	39029	78349	73826	Jimi	69275	2494	2281	6392	17947	35330	33945

Lufa	76059	2510	2294	7750	19507	39160	36899	North Waghi	96064	3458	3163	8864	24888	48992	47072
Obura/Wonenara	49229	1625	1485	5016	12626	25346	23883								
Okapa	102877	3395	3103	10483	26385	52967	49910								
Unggai/Bena	74629	2463	2251	7604	19140	38424	36206								
2021															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	9346857	335358	306533	1010816	2319283	4846903	4499955								
Western	308930	12666	11666	39513	71837	159680	149250	**Morobe**	949964	33249	30131	109873	236136	494941	455023
Middle Fly	112552	4615	4250	14396	26172	58176	54376	Bulolo	136016	4761	4314	15732	33810	70866	65150
North Fly	102599	4207	3874	13123	23858	53032	49568	Finschaffen	79757	2792	2530	9225	19825	41554	38203
South Fly	93779	3845	3541	11995	21807	48473	45306	Huon	104828	3669	3325	12124	26057	54616	50212
Gulf	195325	8008	7408	23415	45892	101464	93862	Kabwum	73762	2582	2340	8531	18335	38431	35331
Kerema	119679	4907	4539	14347	28119	62168	57510	Lae	209889	7346	6657	24276	52173	109354	100535
Kikori	75647	3102	2869	9068	17773	39295	36351	Markam	86946	3043	2758	10056	21612	45299	41646
Central	326016	11085	10441	37509	76426	170219	155796	Menyamya	120719	4225	3829	13962	30007	62896	57823
Abau	68005	2312	2178	7824	15942	35507	32498	Nawaeb	61744	2161	1958	7141	15348	32169	29575
Goilala	48455	1647	1552	5575	11359	25299	23156	Tewae/Siassi	76305	2671	2420	8825	18967	39756	36549
Kairuku/Hiri	139604	4747	4471	16062	32727	72890	66714	**Madang**	743265	30474	27472	94133	174763	387449	355816
Rigo	69951	2378	2240	8048	16398	36523	33428	Bogia	116250	4766	4297	14723	27334	60599	55651
NCD	461561	14308	13634	43104	123334	252381	209179	Madang	176485	7236	6523	22352	41497	91998	84487
Moresby North East	176263	5464	5206	16461	47100	96381	79882	Middle Ramu	117827	4831	4355	14923	27705	61421	56406
Moresby North West	164568	5102	4861	15369	43975	89986	74582	Rai Coast	114611	4699	4236	14515	26948	59744	54866
Moresby South	120729	3743	3566	11275	32260	66015	54714	Sumkar	136501	5597	5045	17288	32095	71155	65346
Milne Bay	355678	12093	11212	43094	84298	185382	170297	Usino Bundi	81591	3345	3016	10333	19184	42532	39059
Alotau	126177	4290	3977	15288	29905	65764	60413	**East Sepik**	663310	26532	23959	85272	158922	332115	331195
Esa'ala	72085	2451	2272	8734	17085	37571	34514	Ambunti/Drekikier	107073	4283	3867	13765	25654	53611	53462
Kiriwina/Goodenough	84462	2872	2662	10233	20018	44022	40440	Angoram	132971	5319	4803	17094	31858	66578	66393
Samarai/Murua	72954	2480	2300	8839	17290	38024	34930	Maprik	111729	4469	4036	14363	26769	55942	55787

Northern	243138	9483	8824	30661	56141	127643	115494	Wewak	123633	4945	4466	15894	29621	61902	61731
Ijivitari	124205	4844	4507	15663	28679	65205	58999	Wosera Gawi	95497	3820	3449	12277	22880	47815	47682
Sohe	118933	4638	4316	14998	27462	62438	56495	Yangoru Saussi	92407	3696	3338	11879	22140	46267	46139
SHP	669229	24762	22304	48916	177215	341308	327922	**West Sepik**	324446	12978	11507	40965	76606	166856	157590
Ialibu/Pangia	94350	3491	3145	6896	24984	48119	46232	Aitape/Lumi	93246	3730	3307	11773	22017	47955	45291
Imbonggu	111599	4129	3719	8157	29552	56916	54684	Nuku	80388	3215	2851	10150	18981	41342	39046
Kauga Erave	101252	3746	3375	7401	26812	51639	49614	Teleformin	62162	2486	2205	7849	14677	31969	30193
Mendi/Munihu	179071	6626	5968	13089	47419	91326	87745	Vanimo/Green River	88650	3546	3144	11193	20931	45591	43059
Nipa /Kutubu	182956	6769	6098	13373	48448	93308	89649	**Manus**	68250	1911	1794	8330	16322	35238	33013
Enga	491603	16714	14989	34174	134763	255183	236419	Lorenagu	68250	1911	1794	8330	16322	35238	33013
Kandep	78981	2685	2408	5491	21651	40998	37983	**New Ireland**	218857	7441	6876	28722	49314	116058	102799
Kompiam	73869	2512	2252	5135	20250	38344	35525	Kavieng	98614	3353	3098	12942	22220	52294	46320
Lagaip/Porgera	151634	5156	4623	10541	41567	78711	72923	Namatanai	120243	4088	3778	15780	27094	63764	56479
Wabag	97894	3328	2985	6805	26836	50815	47079	**ENBP**	385259	13099	12110	47023	91304	202496	182763
Wapanamanda	89224	3034	2720	6203	24459	46315	42909	Gazelle	157139	5343	4939	19180	37241	82594	74545
WHP	454191	15443	14169	42357	117637	231637	222554	Kokopo	102124	3472	3210	12465	24203	53677	48447
Dei	88912	3023	2774	8292	23028	45345	43567	Pomio	78703	2676	2474	9606	18652	41367	37336
Mt Hagen	155343	5282	4846	14487	40234	79225	76118	Rabaul	47293	1608	1487	5772	11208	24858	22435
Mul/Baiyer	101273	3443	3159	9444	26230	51649	49624	**WNBP**	359159	13648	12537	47500	81339	192740	166420
Tambul/Nebilyer	108664	3695	3390	10134	28144	55418	53245	Kandrian/Gloucestor	108455	4121	3786	14344	24562	58202	50254
Chimbu	384814	11544	10612	32541	100597	199930	184884	Talasea	250703	9527	8751	33156	56777	134538	116166
Chuave	53452	1604	1474	4520	13973	27771	25681	**AROB**	344454	12056	11165	42385	82712	177013	167439
Gumine	53307	1599	1470	4508	13935	27696	25611	Central Bouganville	81581	2855	2644	10038	19590	41924	39656
Karimui/Nomane	53838	1615	1485	4553	14074	27971	25866	North Bouganville	143734	5031	4659	17686	34514	73864	69869
Kerowagi	81274	2438	2241	6873	21246	42226	39048	South Bouganville	119139	4170	3862	14660	28608	61225	57913
Kundiawa/Gembogl	86614	2598	2389	7324	22642	45000	41614	**Hela**	310139	10855	9892	23745	83434	158071	152068
Sina sina/Yonggomugl	56329	1690	1553	4763	14725	29265	27063	Komo Magarima	107015	3746	3413	8193	28790	54543	52472
EHP	734901	24252	22165	74883	188483	378371	356530	Koroba/Kopiago	116043	4062	3701	8885	31218	59145	56899
Daulo	52550	1734	1585	5355	13478	27056	25494	Tari/Pori	87080	3048	2777	6667	23427	44383	42698

Goroka	121988	4026	3679	12430	31287	62807	59181	**Jiwaka**	354370	12758	11667	32700	91808	180727	173642
Henganofi	94657	3124	2855	9645	24277	48735	45922	Anglimp/South Waghi	184187	6631	6064	16996	47718	93934	90252
Kainantu	155767	5140	4698	15872	39950	80198	75569	Jimi	71304	2567	2348	6580	18473	36365	34939
Lufa	77854	2569	2348	7933	19967	40084	37770	North Waghi	98879	3560	3255	9124	25617	50428	48451
Obura/Wonenara	50391	1663	1520	5135	12924	25944	24447								
Okapa	105305	3475	3176	10730	27008	54217	51088								
Unggai/Bena	76391	2521	2304	7784	19592	39330	37060								
2022															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	9593891	344305	314710	1037926	2380309	4975007	4618884								
Western	318816	13071	12039	40777	74136	164790	154026	**Morobe**	974093	34094	30896	112664	242134	507512	466581
Middle Fly	116154	4762	4386	14856	27010	60038	56116	Bulolo	139471	4882	4424	16131	34669	72666	66805
North Fly	105882	4341	3998	13543	24622	54729	51154	Finschaffen	81782	2862	2594	9459	20329	42609	39173
South Fly	96780	3968	3655	12378	22505	50024	46756	Huon	107491	3762	3409	12432	26719	56004	51487
Gulf	200638	8226	7610	24052	47140	104223	96415	Kabwum	75635	2647	2399	8748	18801	39407	36229
Kerema	122934	5040	4662	14737	28884	63859	59075	Lae	215220	7533	6826	24892	53498	112132	103088
Kikori	77704	3186	2947	9315	18257	40364	37340	Markam	89154	3120	2828	10312	22161	46450	42704
Central	334394	11369	10709	38473	78390	174594	159800	Menyamya	123785	4333	3926	14317	30770	64493	59292
Abau	69753	2372	2234	8025	16352	36419	33334	Nawaeb	63312	2216	2008	7323	15738	32986	30326
Goilala	49700	1690	1592	5718	11651	25950	23751	Tewae/Siassi	78243	2739	2482	9050	19449	40765	37478
Kairuku/Hiri	143192	4869	4586	16475	33568	74763	68429	**Madang**	767421	31464	28365	97193	180443	400041	367380
Rigo	71749	2439	2298	8255	16820	37461	34287	Bogia	120028	4921	4436	15201	28222	62568	57460
NCD	473977	14693	14000	44264	126652	259170	214806	Madang	182221	7471	6735	23078	42845	94988	87233
Moresby North East	181004	5611	5347	16904	48367	98973	82031	Middle Ramu	121657	4988	4497	15408	28605	63417	58239
Moresby North West	168995	5239	4992	15782	45158	92407	76589	Rai Coast	118336	4852	4374	14987	27824	61686	56650
Moresby South	123977	3843	3662	11578	33128	67791	56186	Sumkar	140937	5778	5209	17849	33138	73468	67470
Milne Bay	364001	12376	11474	44102	86270	189720	174282	Usino Bundi	84243	3454	3114	10669	19808	43914	40329
Alotau	129130	4390	4070	15645	30604	67303	61827	**East Sepik**	683143	27326	24675	87822	163674	342045	341098

Esa'ala	73772	2508	2325	8938	17484	38450	35321	Ambunti/Drekikier	110274	4411	3983	14176	26421	55214	55061
Kiriwina/Goodenough	86438	2939	2725	10473	20486	45052	41386	Angoram	136947	5478	4947	17605	32811	68568	68378
Samarai/Murua	74661	2538	2353	9046	17695	38914	35747	Maprik	115070	4603	4156	14793	27569	57615	57455
Northern	249751	9740	9064	31495	57668	131115	118636	Wewak	127330	5093	4599	16369	30507	63753	63577
Ijivitari	127583	4976	4630	16089	29459	66979	60604	Wosera Gawi	98353	3934	3552	12644	23564	49244	49108
Sohe	122168	4765	4434	15406	28209	64136	58032	Yangoru Saussi	95170	3807	3438	12235	22802	47651	47519
SHP	687967	25455	22929	50286	182177	350865	337104	**West Sepik**	332557	13302	11794	41989	78521	171028	161529
Ialibu/Pangia	96992	3589	3233	7089	25684	49466	47526	Aitape/Lumi	95577	3823	3390	12068	22567	49153	46424
Imbonggu	114724	4245	3824	8386	30379	58510	56215	Nuku	82398	3296	2922	10404	19455	42375	40022
Kauga Erave	104087	3851	3469	7608	27563	53085	51003	Teleformin	63716	2549	2260	8045	15044	32768	30948
Mendi/Munihu	184085	6811	6135	13455	48746	93884	90201	Vanimo/Green River	90866	3635	3223	11473	21455	46731	44136
Nipa /Kutubu	188079	6959	6268	13747	49804	95921	92159	**Manus**	69608	1949	1830	8496	16647	35939	33669
Enga	502762	17094	15329	34950	137822	260976	241786	Lorenagu	69608	1949	1830	8496	16647	35939	33669
Kandep	80774	2746	2463	5615	22143	41929	38846	**New Ireland**	224920	7647	7066	29517	50680	119273	105647
Kompiam	75546	2569	2303	5252	20709	39215	36331	Kavieng	101346	3446	3184	13300	22836	53743	47603
Lagaip/Porgera	155076	5273	4728	10780	42511	80498	74579	Namatanai	123574	4202	3882	16217	27844	65530	58044
Wabag	100116	3404	3053	6960	27445	51969	48147	**ENBP**	394929	13428	12414	48203	93595	207578	187350
Wapanamanda	91249	3102	2782	6343	25014	47366	43883	Gazelle	161083	5477	5063	19661	38176	84667	76416
WHP	466045	15846	14539	43462	120708	237683	228363	Kokopo	104687	3559	3291	12778	24810	55025	49663
Dei	91232	3102	2846	8508	23630	46528	44704	Pomio	80678	2743	2536	9847	19120	42405	38273
Mt Hagen	159397	5420	4973	14865	41285	81293	78105	Rabaul	48480	1648	1524	5917	11489	25481	22998
Mul/Baiyer	103916	3533	3242	9691	26915	52997	50919	**WNBP**	370041	14062	12917	48939	83804	198580	171462
Tambul/Nebilyer	111500	3791	3478	10398	28879	56865	54635	Kandrian/Gloucestor	111742	4246	3900	14778	25306	59965	51777
Chimbu	391355	11741	10793	33094	102307	203329	188027	Talasea	258300	9815	9016	34161	58498	138615	119686
Chuave	54361	1631	1499	4597	14211	28243	26118	**AROB**	355063	12427	11509	43690	85259	182465	172596
Gumine	54213	1626	1495	4584	14172	28167	26047	Central Bouganville	84093	2943	2726	10348	20193	43215	40878
Karimui/Nomane	54753	1643	1510	4630	14313	28447	26306	North Bouganville	148161	5186	4803	18231	35577	76139	72021
Kerowagi	82655	2480	2279	6990	21608	42944	39712	South Bouganville	122808	4298	3981	15112	29489	63111	59697
Kundiawa/Gembogl	88086	2643	2429	7449	23027	45765	42321	**Hela**	315411	11040	10060	24149	84853	160758	154653

Sina sina/Yonggomugl	57286	1719	1580	4844	14976	29763	27523	Komo Magarima	108834	3809	3471	8333	29279	55470	53364
EHP	752245	24824	22688	76650	192931	387301	364944	Koroba/Kopiago	118016	4131	3764	9036	31749	60150	57866
Daulo	53790	1775	1622	5481	13796	27694	26096	Tari/Pori	88561	3100	2825	6780	23825	45137	43423
Goroka	124867	4121	3766	12723	32025	64289	60578	**Jiwaka**	364753	13132	12009	33658	94498	186022	178729
Henganofi	96891	3197	2922	9873	24850	49885	47006	Anglimp/South Waghi	189583	6825	6242	17494	49116	96686	92896
Kainantu	159443	5262	4809	16246	40893	82091	77352	Jimi	73393	2642	2416	6772	19014	37430	35963
Lufa	79691	2630	2404	8120	20439	41030	38661	North Waghi	101776	3664	3351	9391	26368	51905	49870
Obura/Wonenara	51580	1702	1556	5256	13229	26556	25023								
Okapa	107790	3557	3251	10983	27645	55497	52293								
Unggai/Bena	78193	2580	2358	7968	20055	40259	37935								
2023															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	9847599	353496	323109	1065778	2442977	5106573	4741026								
Western	329018	13490	12424	42082	76509	170063	158955	**Morobe**	998835	34960	31681	115526	248284	520403	478432
Middle Fly	119871	4915	4527	15332	27874	61959	57912	Bulolo	143013	5006	4536	16541	35549	74511	68502
North Fly	109271	4480	4126	13976	25409	56480	52791	Finschaffen	83860	2935	2660	9699	20845	43692	40168
South Fly	99877	4095	3772	12774	23225	51624	48252	Huon	110221	3858	3496	12748	27398	57426	52795
Gulf	206095	8450	7817	24706	48422	107058	99037	Kabwum	77556	2715	2460	8970	19278	40408	37149
Kerema	126278	5177	4789	15138	29669	65596	60681	Lae	220686	7724	7000	25525	54857	114980	105707
Kikori	79818	3273	3027	9568	18753	41462	38356	Markam	91418	3200	2900	10574	22724	47630	43789
Central	342988	11662	10984	39462	80405	179081	163907	Menyamya	126929	4443	4026	14681	31551	66131	60798
Abau	71546	2433	2291	8232	16772	37355	34190	Nawaeb	64920	2272	2059	7509	16137	33824	31096
Goilala	50978	1733	1633	5865	11950	26616	24361	Tewae/Siassi	80230	2808	2545	9279	19943	41801	38429
Kairuku/Hiri	146872	4994	4704	16898	34430	76685	70187	**Madang**	792362	32487	29287	100351	186307	413043	379320
Rigo	73593	2502	2357	8467	17252	38424	35168	Bogia	123929	5081	4581	15695	29139	64601	59327
NCD	486726	15088	14377	45455	130059	266142	220584	Madang	188143	7714	6954	23828	44238	98075	90068
Moresby North East	185873	5762	5490	17358	49668	101636	84238	Middle Ramu	125610	5150	4643	15908	29535	65478	60132
Moresby North West	173541	5380	5126	16207	46372	94892	78649	Rai Coast	122181	5009	4516	15474	28728	63691	58491

Moresby South	127312	3947	3761	11889	34019	69614	57698	Sumkar	145518	5966	5379	18430	34215	75856	69662
Milne Bay	372519	12665	11742	45134	88289	194159	178360	Usino Bundi	86980	3566	3215	11016	20452	45341	41639
Alotau	132152	4493	4166	16011	31321	68878	63273	**East Sepik**	703569	28143	25413	90448	168568	352272	351297
Esa'ala	75498	2567	2380	9147	17893	39350	36148	Ambunti/Drekikier	113572	4543	4102	14600	27211	56864	56707
Kiriwina/Goodenough	88461	3008	2788	10718	20966	46106	42355	Angoram	141041	5642	5094	18132	33792	70618	70423
Samarai/Murua	76408	2598	2409	9258	18109	39824	36584	Maprik	118510	4740	4281	15235	28394	59337	59173
Northern	256544	10005	9310	32351	59237	134682	121863	Wewak	131137	5245	4737	16858	31419	65659	65478
Ijivitari	131053	5111	4756	16526	30261	68801	62252	Wosera Gawi	101293	4052	3659	13022	24269	50717	50576
Sohe	125491	4894	4554	15825	28976	65881	59610	Yangoru Saussi	98015	3921	3540	12600	23483	49075	48940
SHP	707230	26168	23571	51694	187278	360689	346543	**West Sepik**	340871	13635	12089	43039	80484	175303	165568
Ialibu/Pangia	99708	3689	3323	7288	26403	50851	48857	Aitape/Lumi	97966	3919	3474	12369	23131	50382	47584
Imbonggu	117937	4364	3931	8620	31230	60148	57789	Nuku	84458	3378	2995	10664	19942	43435	41023
Kauga Erave	107002	3959	3566	7821	28335	54571	52431	Teleformin	65309	2612	2316	8246	15420	33587	31722
Mendi/Munihu	189239	7002	6307	13832	50111	96512	92727	Vanimo/Green River	93138	3725	3303	11760	21991	47899	45239
Nipa /Kutubu	193345	7154	6444	14132	51199	98606	94739	**Manus**	70993	1987	1866	8665	16978	36654	34339
Enga	514175	17482	15677	35744	140951	266900	247275	Lorenagu	70993	1987	1866	8665	16978	36654	34339
Kandep	82608	2809	2519	5743	22645	42880	39727	**New Ireland**	231150	7859	7262	30335	52083	122577	108573
Kompiam	77261	2627	2356	5371	21180	40105	37156	Kavieng	104153	3541	3272	13669	23468	55231	48922
Lagaip/Porgera	158597	5392	4836	11025	43476	82325	76272	Namatanai	126997	4318	3990	16667	28615	67346	59652
Wabag	102388	3481	3122	7118	28068	53148	49240	**ENBP**	404841	13765	12726	49413	95945	212788	192053
Wapanamanda	93321	3173	2845	6487	25582	48441	44879	Gazelle	165127	5614	5191	20155	39134	86792	78334
WHP	478209	16259	14918	44597	123858	243886	234323	Kokopo	107315	3649	3373	13098	25433	56406	50909
Dei	93613	3183	2920	8730	24246	47743	45871	Pomio	82703	2812	2600	10094	19600	43470	39234
Mt Hagen	163558	5561	5102	15253	42362	83414	80143	Rabaul	49697	1690	1562	6066	11778	26121	23576
Mul/Baiyer	106628	3625	3326	9944	27617	54380	52248	**WNBP**	381253	14488	13308	50422	86343	204597	176658
Tambul/Nebilyer	114410	3890	3569	10670	29633	58349	56061	Kandrian/Gloucestor	115127	4375	4019	15226	26073	61782	53345
Chimbu	398008	11940	10976	33656	104046	206785	191223	Talasea	266126	10113	9289	35196	60270	142815	123312
Chuave	55285	1659	1525	4675	14453	28723	26562	**AROB**	365999	12810	11864	45036	87885	188085	177912
Gumine	55135	1654	1521	4662	14413	28645	26490	Central Bouganville	86683	3034	2810	10666	20815	44546	42137

Karimui/Nomane	55684	1670	1536	4709	14557	28930	26753	North Bouganville	152724	5345	4950	18793	36673	78484	74239
Kerowagi	84060	2522	2318	7108	21975	43674	40387	South Bouganville	126591	4431	4103	15577	30398	65055	61536
Kundiawa/Gembogl	89584	2687	2471	7575	23419	46543	43041	**Hela**	320773	11228	10231	24559	86295	163491	157283
Sina sina/Yonggomugl	58260	1748	1607	4927	15230	30269	27991	Komo Magarima	110685	3874	3530	8474	29777	56413	54271
EHP	769998	25410	23224	78459	197484	396441	373557	Koroba/Kopiago	120022	4201	3828	9189	32289	61173	58850
Daulo	55059	1817	1661	5610	14121	28348	26711	Tari/Pori	90066	3152	2873	6896	24230	45905	44162
Goroka	127814	4218	3855	13024	32781	65806	62008	**Jiwaka**	375440	13516	12361	34644	97267	191472	183966
Henganofi	99178	3273	2991	10106	25436	51063	48115	Anglimp/South Waghi	195138	7025	6425	18007	50555	99519	95618
Kainantu	163206	5386	4922	16630	41858	84028	79178	Jimi	75544	2720	2487	6971	19572	38527	37017
Lufa	81572	2692	2460	8312	20921	41998	39574	North Waghi	104758	3771	3449	9667	27140	53426	51332
Obura/Wonenara	52797	1742	1592	5380	13541	27183	25614								
Okapa	110334	3641	3328	11242	28298	56806	53527								
Unggai/Bena	80039	2641	2414	8156	20528	41209	38830								
2024															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	10108166	362938	331737	1094393	2507332	5241696	4866471								
Western	339547	13921	12822	43429	78957	175505	164041	**Morobe**	1024205	35848	32486	118460	254590	533621	490584
Middle Fly	123707	5072	4671	15822	28766	63942	59765	Bulolo	146646	5133	4651	16961	36452	76404	70242
North Fly	112767	4623	4258	14423	26222	58287	54480	Finschaffen	85990	3010	2727	9946	21375	44801	41188
South Fly	103073	4226	3892	13183	23968	53276	49796	Huon	113021	3956	3585	13072	28094	58885	54136
Gulf	211701	8680	8029	25378	49740	109970	101731	Kabwum	79526	2783	2522	9198	19768	41434	38092
Kerema	129712	5318	4920	15550	30476	67380	62332	Lae	226292	7920	7178	26173	56250	117900	108392
Kikori	81989	3362	3110	9829	19263	42590	39399	Markam	93740	3281	2973	10842	23301	48840	44901
Central	351803	11961	11267	40476	82471	183683	168120	Menyamya	130153	4555	4128	15054	32353	67811	62342
Abau	73384	2495	2350	8443	17203	38316	35069	Nawaeb	66569	2330	2111	7699	16547	34683	31886
Goilala	52288	1778	1675	6016	12257	27300	24987	Tewae/Siassi	82268	2879	2609	9515	20450	42863	39406
Kairuku/Hiri	150647	5122	4825	17332	35315	78656	71991	**Madang**	818114	33543	30239	103613	192362	426466	391647
Rigo	75484	2566	2417	8685	17695	39412	36072	Bogia	127956	5246	4729	16205	30086	66701	61255

NCD	499819	15494	14764	46677	133558	273301	226518	Madang	194258	7965	7180	24602	45676	101263	92995
Moresby North East	190873	5917	5638	17825	51004	104370	86504	Middle Ramu	129693	5317	4794	16425	30495	67606	62087
Moresby North West	178210	5524	5264	16643	47620	97445	80765	Rai Coast	126152	5172	4663	15977	29662	65761	60392
Moresby South	130736	4053	3862	12209	34934	71487	59250	Sumkar	150247	6160	5553	19029	35327	78321	71926
Milne Bay	381236	12962	12017	46190	90355	198702	182533	Usino Bundi	89807	3682	3319	11374	21116	46815	42993
Alotau	135244	4598	4263	16386	32054	70490	64754	**East Sepik**	724606	28984	26173	93152	173608	362805	361801
Esa'ala	77265	2627	2436	9361	18312	40271	36994	Ambunti/Drekikier	116967	4679	4225	15037	28024	58565	58403
Kiriwina/Goodenough	90531	3078	2854	10969	21456	47185	43346	Angoram	145259	5810	5247	18674	34802	72730	72529
Samarai/Murua	78196	2659	2465	9474	18533	40756	37440	Maprik	122054	4882	4409	15691	29243	61111	60942
Northern	263522	10278	9563	33231	60848	138345	125177	Wewak	135058	5402	4878	17363	32358	67623	67436
Ijivitari	134618	5250	4885	16976	31084	70672	63946	Wosera Gawi	104322	4173	3768	13411	24994	52233	52089
Sohe	128904	5027	4678	16255	29764	67673	61232	Yangoru Saussi	100946	4038	3646	12977	24186	50543	50403
SHP	727033	26900	24231	53141	192521	370788	356246	**West Sepik**	349393	13975	12391	44115	82496	179686	169707
Ialibu/Pangia	102500	3793	3416	7492	27142	52275	50225	Aitape/Lumi	100416	4017	3561	12679	23709	51642	48774
Imbonggu	121239	4486	4041	8862	32105	61832	59407	Nuku	86569	3463	3070	10930	20440	44521	42048
Kauga Erave	109998	4070	3666	8040	29128	56099	53899	Teleformin	66942	2678	2374	8452	15806	34427	32515
Mendi/Munihu	194538	7198	6484	14219	51514	99215	95323	Vanimo/Green River	95466	3819	3386	12054	22541	49097	46370
Nipa /Kutubu	198759	7354	6624	14528	52632	101367	97392	**Manus**	72406	2027	1903	8837	17316	37384	35023
Enga	525847	17879	16033	36555	144150	272959	252888	Lorenagu	72406	2027	1903	8837	17316	37384	35023
Kandep	84483	2872	2576	5873	23159	43854	40629	**New Ireland**	237553	8077	7463	31175	53526	125972	111581
Kompiam	79015	2687	2409	5493	21660	41015	37999	Kavieng	107038	3639	3363	14047	24118	56761	50277
Lagaip/Porgera	162197	5515	4945	11275	44463	84194	78003	Namatanai	130515	4438	4100	17128	29408	69211	61304
Wabag	104713	3560	3193	7279	28705	54355	50358	**ENBP**	415003	14110	13045	50653	98353	218129	196873
Wapanamanda	95439	3245	2910	6635	26163	49541	45898	Gazelle	169271	5755	5321	20660	40116	88971	80301
WHP	490690	16684	15308	45760	127091	250252	240439	Kokopo	110009	3740	3458	13427	26071	57822	52187
Dei	96057	3266	2997	8958	24879	48989	47068	Pomio	84779	2882	2665	10348	20092	44561	40218
Mt Hagen	167826	5706	5236	15651	43468	85591	82235	Rabaul	50944	1732	1601	6218	12073	26777	24167
Mul/Baiyer	109411	3720	3413	10203	28338	55800	53612	**WNBP**	392805	14927	13711	51950	88959	210796	182010
Tambul/Nebilyer	117396	3992	3662	10948	30406	59872	57524	Kandrian/Gloucestor	118616	4507	4140	15687	26863	63654	54962

Chimbu	404775	12143	11163	34229	105815	210301	194474	Talasea	274190	10419	9571	36262	62096	147142	127049
Chuave	56225	1687	1551	4755	14698	29212	27013	**AROB**	377272	13204	12229	46423	90592	193878	183392
Gumine	56072	1682	1546	4742	14658	29132	26940	Central Bouganville	89353	3127	2896	10995	21456	45918	43435
Karimui/Nomane	56630	1699	1562	4789	14804	29422	27208	North Bouganville	157428	5510	5103	19372	37802	80902	76526
Kerowagi	85490	2565	2358	7229	22348	44416	41073	South Bouganville	130490	4567	4230	16057	31334	67058	63431
Kundiawa/Gembogl	91107	2733	2513	7704	23817	47335	43772	**Hela**	326226	11418	10405	24977	87762	166270	159956
Sina sina/Yonggomugl	59250	1777	1634	5010	15489	30784	28467	Komo Magarima	112566	3940	3590	8618	30283	57372	55194
EHP	788170	26010	23772	80311	202145	405797	382373	Koroba/Kopiago	122063	4272	3893	9345	32838	62213	59850
Daulo	56359	1860	1700	5743	14455	29017	27342	Tari/Pori	91598	3206	2921	7013	24642	46685	44912
Goroka	130830	4317	3946	13331	33554	67359	63471	**Jiwaka**	386440	13912	12723	35659	100117	197083	189356
Henganofi	101518	3350	3062	10344	26037	52268	49251	Anglimp/South Waghi	200856	7231	6613	18534	52037	102435	98419
Kainantu	167057	5513	5039	17022	42846	86011	81046	Jimi	77757	2799	2560	7175	20145	39656	38101
Lufa	83497	2755	2518	8508	21415	42989	40508	North Waghi	107827	3882	3550	9950	27935	54991	52836
Obura/Wonenara	54043	1783	1630	5507	13861	27825	26219								
Okapa	112938	3727	3406	11508	28966	58147	54791								
Unggai/Bena	81928	2704	2471	8348	21012	42181	39746								
2025															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	10375780	372637	340600	1123792	2573421	5380472	4995308								
Western	350412	14367	13232	44818	81484	181122	169291	**Morobe**	1050220	36758	33311	121469	261057	547175	503045
Middle Fly	127665	5234	4821	16329	29687	65988	61677	Bulolo	150371	5263	4769	17392	37378	78345	72026
North Fly	116376	4771	4395	14885	27062	60153	56223	Finschaffen	88174	3086	2797	10198	21918	45939	42234
South Fly	106371	4361	4017	13605	24735	54981	51390	Huon	115891	4056	3676	13404	28808	60381	55511
Gulf	217459	8916	8248	26069	51092	112961	104498	Kabwum	81546	2854	2586	9432	20270	42486	39060
Kerema	133241	5463	5053	15973	31305	69213	64027	Lae	232040	8121	7360	26838	57679	120895	111145
Kikori	84219	3453	3194	10096	19787	43748	40470	Markam	96121	3364	3049	11117	23893	50080	46041
Central	360844	12269	11556	41516	84591	188404	172440	Menyamya	133459	4671	4233	15436	33174	69534	63926
Abau	75270	2559	2411	8660	17645	39300	35970	Nawaeb	68260	2389	2165	7895	16968	35564	32696

Goilala	53632	1823	1718	6170	12573	28002	25629	Tewae/Siassi	84358	2953	2676	9757	20969	43951	40407
Kairuku/Hiri	154518	5254	4948	17778	36223	80677	73841	**Madang**	844703	34633	31222	106980	198614	440327	404376
Rigo	77424	2632	2480	8908	18150	40425	36999	Bogia	132115	5417	4883	16732	31064	68869	63246
NCD	513265	15911	15161	47933	137150	280653	232611	Madang	200571	8223	7413	25402	47160	104554	96018
Moresby North East	196008	6076	5790	18305	52376	107177	88831	Middle Ramu	133908	5490	4949	16959	31486	69803	64104
Moresby North West	183003	5673	5406	17090	48901	100066	82937	Rai Coast	130252	5340	4814	16496	30626	67898	62354
Moresby South	134253	4162	3966	12538	35874	73410	60844	Sumkar	155130	6360	5734	19647	36476	80866	74264
Milne Bay	390157	13265	12298	47271	92469	203352	186805	Usino Bundi	92726	3802	3427	11744	21803	48336	44390
Alotau	138409	4706	4363	16770	32804	72139	66269	**East Sepik**	746272	29851	26955	95938	178799	373653	372619
Esa'ala	79073	2688	2493	9580	18741	41213	37860	Ambunti/Drekikier	120465	4819	4351	15486	28862	60316	60149
Kiriwina/Goodenough	92650	3150	2920	11225	21958	48290	44360	Angoram	149602	5984	5404	19232	35843	74905	74697
Samarai/Murua	80026	2721	2523	9696	18967	41710	38316	Maprik	125703	5028	4540	16160	30117	62939	62765
Northern	270690	10557	9823	34135	62503	142108	128582	Wewak	139096	5564	5024	17882	33326	69645	69452
Ijivitari	138280	5393	5018	17438	31929	72595	65685	Wosera Gawi	107441	4298	3881	13812	25742	53795	53646
Sohe	132411	5164	4805	16698	30574	69513	62897	Yangoru Saussi	103964	4159	3755	13365	24909	52054	51910
SHP	747390	27654	24909	54629	197912	381170	366221	**West Sepik**	358128	14325	12701	45218	84559	184178	173950
Ialibu/Pangia	105370	3899	3512	7702	27902	53739	51631	Aitape/Lumi	102926	4117	3650	12996	24302	52933	49993
Imbonggu	124633	4611	4154	9110	33003	63563	61070	Nuku	88733	3549	3147	11204	20951	45634	43099
Kauga Erave	113078	4184	3769	8265	29943	57670	55408	Teleformin	68615	2745	2433	8663	16201	35288	33328
Mendi/Munihu	199985	7400	6665	14618	52957	101993	97993	Vanimo/Green River	97853	3914	3470	12355	23104	50324	47529
Nipa /Kutubu	204324	7560	6810	14935	54106	104206	100119	**Manus**	73847	2067	1941	9013	17660	38128	35720
Enga	537783	18285	16397	37385	147422	279155	258628	Lorenagu	73847	2067	1941	9013	17660	38128	35720
Kandep	86401	2938	2634	6006	23685	44849	41552	**New Ireland**	244133	8301	7670	32039	55009	129462	114671
Kompiam	80809	2747	2464	5618	22152	41946	38862	Kavieng	110003	3740	3456	14436	24786	58334	51669
Lagaip/Porgera	165879	5640	5058	11531	45472	86105	79774	Namatanai	134130	4560	4214	17603	30223	71128	63002
Wabag	107090	3641	3265	7444	29356	55589	51501	**ENBP**	425419	14464	13372	51925	100821	223604	201815
Wapanamanda	97606	3319	2976	6785	26757	50666	46940	Gazelle	173520	5900	5454	21179	41123	91204	82316
WHP	503497	17119	15707	46955	130408	256783	246714	Kokopo	112770	3834	3545	13764	26726	59273	53497
Dei	98564	3351	3075	9192	25528	50267	48296	Pomio	86907	2955	2732	10607	20596	45679	41228

Mt Hagen	172207	5855	5372	16060	44602	87825	84381	Rabaul	52223	1776	1642	6374	12376	27449	24774
Mul/Baiyer	112267	3817	3502	10470	29078	57256	55011	**WNBP**	404707	15379	14127	53524	91655	217184	187525
Tambul/Nebilyer	120460	4096	3758	11234	31200	61435	59026	Kandrian/Gloucestor	122210	4644	4266	16163	27677	65583	56627
Chimbu	411656	12350	11353	34811	107614	213876	197780	Talasea	282498	10735	9861	37361	63978	151600	130898
Chuave	57181	1715	1577	4835	14948	29708	27473	**AROB**	388892	13611	12606	47853	93383	199850	189040
Gumine	57026	1711	1573	4822	14907	29628	27398	Central Bouganville	92105	3224	2986	11334	22117	47333	44772
Karimui/Nomane	57593	1728	1588	4870	15056	29922	27671	North Bouganville	162277	5680	5260	19968	38967	83394	78883
Kerowagi	86943	2608	2398	7352	22728	45171	41772	South Bouganville	134509	4708	4360	16551	32299	69124	65385
Kundiawa/Gembogl	92656	2780	2555	7835	24222	48139	44516	**Hela**	331772	11613	10582	25401	89254	169097	162676
Sina sina/Yonggomugl	60258	1808	1662	5096	15752	31307	28951	Komo Magarima	114480	4007	3651	8765	30798	58348	56132
EHP	806771	26624	24333	82206	206915	415374	391397	Koroba/Kopiago	124138	4345	3959	9504	33396	63270	60868
Daulo	57689	1904	1740	5878	14796	29702	27987	Tari/Pori	93155	3261	2971	7132	25061	47479	45676
Goroka	133918	4419	4039	13646	34346	68949	64969	**Jiwaka**	397763	14320	13096	36704	103050	202857	194904
Henganofi	103914	3429	3134	10588	26651	53501	50413	Anglimp/South Waghi	206741	7443	6807	19077	53561	105437	101303
Kainantu	171000	5643	5157	17424	43857	88041	82959	Jimi	80036	2881	2635	7385	20735	40818	39218
Lufa	85467	2820	2578	8709	21920	44004	41464	North Waghi	110987	3996	3654	10241	28754	56603	54384
Obura/Wonenara	55319	1826	1668	5637	14188	28481	26837								
Okapa	115603	3815	3487	11779	29649	59519	56084								
Unggai/Bena	83861	2767	2529	8545	21508	43177	40684								
2026															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	10650635	382601	349706	1153996	2641292	5523003	5127632								
Western	361625	14827	13656	46253	84091	186917	174708	**Morobe**	1076896	37692	34157	124554	267688	561073	515822
Middle Fly	131750	5402	4975	16851	30637	68099	63651	Bulolo	154190	5397	4891	17834	38328	80335	73856
North Fly	120100	4924	4535	15361	27928	62077	58022	Finschaffen	90413	3165	2868	10457	22474	47106	43307
South Fly	109775	4501	4145	14040	25527	56741	53034	Huon	118835	4159	3769	13745	29539	61914	56921
Gulf	223374	9159	8472	26778	52482	116034	107340	Kabwum	83618	2927	2652	9671	20785	43566	40052
Kerema	136865	5612	5191	16407	32157	71096	65769	Lae	237933	8328	7547	27520	59144	123966	113968

Kikori	86510	3547	3281	10371	20326	44938	41571	Markam	98563	3450	3126	11400	24500	51352	47211
Central	370118	12584	11853	42583	86764	193246	176872	Menyamya	136849	4790	4341	15828	34017	71300	65549
Abau	77205	2625	2473	8883	18099	40310	36895	Nawaeb	69994	2450	2220	8096	17399	36467	33526
Goilala	55010	1870	1762	6329	12896	28722	26288	Tewae/Siassi	86500	3028	2744	10005	21502	45068	41433
Kairuku/Hiri	158490	5389	5076	18235	37154	82751	75739	**Madang**	872155	35759	32236	110457	205069	454637	417518
Rigo	79414	2700	2543	9137	18616	41464	37950	Bogia	136409	5593	5042	17276	32074	71107	65301
NCD	527071	16339	15569	49222	140840	288203	238869	Madang	207090	8491	7654	26228	48693	107952	99138
Moresby North East	201280	6240	5945	18797	53785	110060	91220	Middle Ramu	138260	5669	5110	17510	32509	72072	66188
Moresby North West	187926	5826	5551	17550	50216	102758	85168	Rai Coast	134486	5514	4971	17032	31621	70105	64381
Moresby South	137865	4274	4072	12875	36839	75384	62480	Sumkar	160172	6567	5920	20286	37661	83494	76678
Milne Bay	399286	13575	12586	48377	94633	208111	191176	Usino Bundi	95740	3925	3539	12125	22511	49907	45832
Alotau	141648	4816	4465	17162	33571	73828	67820	**East Sepik**	768585	30743	27761	98806	184145	384825	383760
Esa'ala	80923	2751	2551	9805	19179	42178	38745	Ambunti/Drekikier	124067	4963	4481	15949	29725	62119	61947
Kiriwina/Goodenough	94818	3224	2989	11488	22472	49419	45398	Angoram	154075	6163	5565	19807	36915	77144	76931
Samarai/Murua	81898	2784	2582	9923	19410	42686	39212	Maprik	129462	5178	4676	16643	31018	64821	64641
Northern	278053	10844	10091	35064	64203	145973	132080	Wewak	143255	5730	5174	18416	34322	71727	71528
Ijivitari	142041	5540	5155	17912	32798	74569	67472	Wosera Gawi	110654	4426	3997	14225	26511	55404	55250
Sohe	136012	5305	4936	17152	31406	71404	64608	Yangoru Saussi	107073	4283	3867	13765	25653	53610	53462
SHP	768317	28428	25607	56159	203454	391843	376475	**West Sepik**	367081	14683	13019	46348	86673	188783	178298
Ialibu/Pangia	108320	4008	3610	7917	28684	55244	53077	Aitape/Lumi	105499	4220	3742	13320	24910	54256	51243
Imbonggu	128123	4741	4270	9365	33928	65343	62780	Nuku	90952	3638	3226	11484	21475	46775	44177
Kauga Erave	116244	4301	3874	8497	30782	59285	56960	Teleformin	70331	2813	2494	8880	16606	36170	34161
Mendi/Munihu	205584	7607	6852	15027	54440	104848	100736	Vanimo/Green River	100299	4012	3557	12664	23682	51582	48717
Nipa /Kutubu	210045	7772	7000	15353	55621	107123	102922	**Manus**	75317	2109	1980	9193	18012	38886	36431
Enga	549991	18700	16769	38233	150769	285492	264499	Lorenagu	75317	2109	1980	9193	18012	38886	36431
Kandep	88362	3004	2694	6143	24223	45867	42495	**New Ireland**	250896	8530	7883	32926	56533	133048	117848
Kompiam	82643	2810	2520	5745	22655	42899	39744	Kavieng	113050	3844	3552	14836	25473	59950	53101
Lagaip/Porgera	169644	5768	5172	11793	46505	88060	81585	Namatanai	137846	4687	4331	18090	31060	73098	64747
Wabag	109521	3724	3339	7613	30023	56850	52670	**ENBP**	436097	14827	13708	53228	103352	229217	206880

Wapanamanda	99821	3394	3044	6939	27364	51816	48006	Gazelle	177875	6048	5591	21711	42155	93493	84382
WHP	516639	17566	16117	48180	133812	263485	253153	Kokopo	115600	3930	3634	14110	27396	60761	54840
Dei	101136	3439	3155	9432	26195	51579	49557	Pomio	89088	3029	2800	10874	21113	46826	42263
Mt Hagen	176701	6008	5512	16479	45766	90118	86584	Rabaul	53534	1820	1683	6534	12687	28138	25396
Mul/Baiyer	115197	3917	3594	10743	29836	58750	56447	**WNBP**	416970	15845	14555	55145	94432	223764	193207
Tambul/Nebilyer	123604	4203	3856	11527	32014	63038	60566	Kandrian/Gloucestor	125913	4785	4395	16652	28516	67570	58343
Chimbu	418654	12559	11546	35402	109443	217512	201142	Talasea	291057	11060	10160	38493	65916	156194	134864
Chuave	58153	1745	1604	4918	15202	30213	27940	**AROB**	400869	14030	12994	49327	96259	206005	194863
Gumine	57995	1740	1599	4904	15161	30131	27864	Central Bouganville	94942	3323	3077	11683	22798	48790	46151
Karimui/Nomane	58572	1757	1615	4953	15312	30431	28141	North Bouganville	167275	5855	5422	20583	40167	85962	81313
Kerowagi	88421	2653	2438	7477	23115	45939	42482	South Bouganville	138652	4853	4494	17061	33294	71253	67399
Kundiawa/Gembogl	94231	2827	2599	7968	24634	48958	45273	**Hela**	337412	11810	10762	25833	90772	171971	165441
Sina sina/Yonggomugl	61282	1838	1690	5182	16020	31839	29443	Komo Magarima	116426	4075	3713	8914	31321	59340	57086
EHP	825810	27252	24907	84146	211798	425177	400634	Koroba/Kopiago	126248	4419	4027	9666	33964	64346	61902
Daulo	59050	1949	1781	6017	15145	30403	28648	Tari/Pori	94738	3316	3022	7253	25487	48286	46452
Goroka	137078	4524	4134	13968	35157	70576	66502	**Jiwaka**	409417	14740	13480	37779	106070	208801	200615
Henganofi	106367	3510	3208	10838	27280	54764	51603	Anglimp/South Waghi	212798	7661	7006	19636	55131	108526	104271
Kainantu	175035	5776	5279	17835	44892	90119	84917	Jimi	82381	2966	2712	7602	21343	42014	40367
Lufa	87484	2887	2639	8914	22437	45042	42442	North Waghi	114239	4113	3761	10541	29596	58261	55977
Obura/Wonenara	56624	1869	1708	5770	14523	29153	27471								
Okapa	118331	3905	3569	12057	30349	60924	57407								
Unggai/Bena	85840	2833	2589	8747	22016	44196	41645								
2027															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	10932931	392836	359060	1185028	2710992	5669393	5263538								
Western	373197	15301	14093	47733	86782	192899	180299	**Morobe**	1104249	38649	35025	127718	274487	575325	528924
Middle Fly	135966	5575	5134	17390	31617	70279	65688	Bulolo	158107	5534	5015	18287	39301	82375	75731
North Fly	123943	5082	4680	15853	28821	64064	59879	Finschaffen	92710	3245	2941	10723	23045	48303	44407

South Fly	113288	4645	4278	14490	26344	58556	54731	Huon	121853	4265	3865	14094	30290	63487	58367
Gulf	229450	9408	8702	27506	53910	119190	110260	Kabwum	85741	3001	2720	9917	21313	44672	41069
Kerema	140587	5764	5332	16853	33031	73030	67558	Lae	243977	8539	7739	28219	60646	127114	116863
Kikori	88863	3643	3370	10653	20878	46161	42702	Markam	101066	3537	3206	11689	25122	52657	48410
Central	379630	12907	12158	43677	88994	198212	181418	Menyamya	140325	4911	4451	16230	34881	73111	67214
Abau	79189	2692	2536	9111	18564	41346	37843	Nawaeb	71772	2512	2276	8301	17840	37394	34378
Goilala	56424	1918	1807	6492	13227	29460	26964	Tewae/Siassi	88698	3104	2813	10259	22048	46212	42485
Kairuku/Hiri	162563	5527	5206	18703	38109	84877	77685	**Madang**	900500	36921	33284	114047	211734	469413	431088
Rigo	81455	2769	2609	9372	19095	42529	38926	Bogia	140842	5775	5206	17837	33116	73418	67424
NCD	541250	16779	15987	50547	144628	295955	245294	Madang	213820	8767	7903	27080	50275	111460	102360
Moresby North East	206695	6407	6105	19303	55231	113021	93674	Middle Ramu	142753	5853	5276	18079	33565	74414	68339
Moresby North West	192981	5982	5700	18022	51567	105522	87459	Rai Coast	138856	5693	5132	17586	32649	72383	66473
Moresby South	141573	4389	4182	13221	37830	77412	64161	Sumkar	165378	6781	6113	20945	38885	86208	79170
Milne Bay	408630	13893	12881	49510	96847	212980	195649	Usino Bundi	98851	4053	3654	12519	23243	51529	47322
Alotau	144962	4929	4569	17564	34357	75555	69407	**East Sepik**	791566	31663	28591	101760	189651	396331	395234
Esa'ala	82817	2816	2611	10034	19628	43165	39652	Ambunti/Drekikier	127776	5111	4615	16426	30614	63977	63800
Kiriwina/Goodenough	97036	3299	3059	11757	22998	50576	46460	Angoram	158682	6347	5732	20399	38018	79451	79231
Samarai/Murua	83815	2850	2642	10155	19865	43685	40130	Maprik	133333	5333	4816	17141	31945	66759	66574
Northern	285616	11139	10365	36017	65949	149944	135672	Wewak	147539	5902	5329	18967	35349	73872	73667
Ijivitari	145904	5690	5295	18399	33690	76597	69307	Wosera Gawi	113962	4558	4116	14651	27304	57060	56902
Sohe	139712	5449	5070	17618	32260	73346	66365	Yangoru Saussi	110274	4411	3983	14176	26420	55213	55061
SHP	789830	29224	26324	57731	209150	402815	387016	**West Sepik**	376258	15050	13344	47507	88840	193502	182756
Ialibu/Pangia	111353	4120	3711	8139	29487	56790	54563	Aitape/Lumi	108137	4325	3835	13653	25532	55613	52524
Imbonggu	131711	4873	4390	9627	34878	67173	64538	Nuku	93225	3729	3306	11771	22012	47944	45281
Kauga Erave	119499	4421	3983	8735	31644	60945	58554	Teleformin	72089	2884	2557	9102	17021	37074	35015
Mendi/Munihu	211341	7820	7044	15448	55964	107784	103557	Vanimo/Green River	102807	4112	3646	12981	24274	52872	49935
Nipa /Kutubu	215926	7989	7196	15783	57178	110123	105804	**Manus**	76815	2150	2019	9376	18370	39660	37156
Enga	562476	19124	17150	39101	154191	291972	270503	Lorenagu	76815	2150	2019	9376	18370	39660	37156
Kandep	90368	3073	2755	6282	24773	46909	43459	**New Ireland**	257845	8767	8101	33838	58099	136733	121112

Kompiam	84519	2874	2577	5875	23169	43872	40646	Kavieng	116182	3950	3650	15247	26178	61610	54571
Lagaip/Porgera	173495	5899	5290	12061	47560	90059	83436	Namatanai	141664	4817	4451	18591	31920	75123	66541
Wabag	112007	3808	3415	7786	30704	58141	53866	**ENBP**	447043	15199	14052	54564	105946	234970	212073
Wapanamanda	102087	3471	3113	7097	27985	52992	49095	Gazelle	182340	6200	5732	22256	43213	95840	86500
WHP	530123	18024	16538	49438	137304	270362	259761	Kokopo	118502	4029	3725	14464	28084	62286	56216
Dei	103776	3528	3237	9678	26878	52926	50850	Pomio	91324	3105	2871	11147	21643	48001	43323
Mt Hagen	181313	6165	5656	16909	46961	92470	88844	Rabaul	54877	1866	1725	6698	13006	28844	26033
Mul/Baiyer	118204	4019	3687	11023	30615	60284	57920	**WNBP**	429604	16325	14996	56816	97293	230544	199061
Tambul/Nebilyer	126830	4312	3957	11828	32850	64683	62147	Kandrian/Gloucestor	129728	4930	4528	17157	29380	69618	60111
Chimbu	425771	12773	11742	36004	111304	221209	204562	Talasea	299876	11395	10468	39659	67914	160927	138951
Chuave	59142	1774	1631	5001	15461	30727	28415	**AROB**	413216	14462	13394	50846	99223	212350	200864
Gumine	58981	1769	1627	4988	15419	30644	28337	Central Bouganville	97866	3425	3172	12042	23500	50293	47573
Karimui/Nomane	59568	1787	1643	5037	15572	30949	28619	North Bouganville	172427	6035	5589	21217	41404	88610	83817
Kerowagi	89924	2698	2480	7604	23508	46720	43204	South Bouganville	142922	5002	4633	17587	34319	73447	69475
Kundiawa/Gembogl	95833	2875	2643	8104	25052	49790	46043	**Hela**	343148	12011	10945	26272	92315	174895	168254
Sina sina/Yonggomugl	62324	1870	1719	5270	16293	32380	29943	Komo Magarima	118405	4144	3777	9065	31854	60348	58057
EHP	845300	27895	25495	86132	216797	435211	410089	Koroba/Kopiago	128394	4494	4095	9830	34541	65440	62955
Daulo	60444	1995	1823	6159	15502	31120	29324	Tari/Pori	96349	3372	3073	7377	25920	49107	47242
Goroka	140313	4630	4232	14297	35987	72242	68072	**Jiwaka**	421413	15171	13875	38886	109178	214919	206493
Henganofi	108877	3593	3284	11094	27924	56056	52821	Anglimp/South Waghi	219033	7885	7211	20211	56746	111706	107326
Kainantu	179166	5913	5404	18256	45951	92246	86921	Jimi	84794	3053	2792	7824	21968	43245	41549
Lufa	89549	2955	2701	9125	22967	46105	43444	North Waghi	117586	4233	3871	10850	30464	59968	57617
Obura/Wonenara	57960	1913	1748	5906	14865	29842	28119								
Okapa	121124	3997	3653	12342	31065	62362	58762								
Unggai/Bena	87866	2900	2650	8953	22535	45239	42627								
2028															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	11222873	403352	368669	1216911	2782573	5819748	5403126								

Western	385140	15791	14544	49260	89559	199072	186068	**Morobe**	1132297	39631	35914	130962	281459	589938	542359
Middle Fly	140317	5753	5299	17947	32629	72527	67790	Bulolo	162123	5674	5142	18751	40299	84467	77655
North Fly	127909	5244	4830	16360	29744	66114	61795	Finschaffen	95065	3327	3015	10995	23631	49530	45535
South Fly	116913	4793	4415	14953	27187	60430	56483	Huon	124948	4373	3963	14452	31059	65099	59849
Gulf	235691	9664	8939	28254	55376	122432	113259	Kabwum	87919	3077	2789	10169	21854	45807	42112
Kerema	144411	5921	5477	17312	33930	75016	69395	Lae	250174	8756	7935	28935	62187	130343	119831
Kikori	91280	3743	3462	10942	21446	47416	43864	Markam	103634	3627	3287	11986	25761	53994	49639
Central	389387	13239	12470	44800	91281	203307	186080	Menyamya	143889	5036	4564	16642	35767	74968	68921
Abau	81224	2762	2601	9345	19041	42409	38815	Nawaeb	73595	2576	2334	8512	18294	38343	35251
Goilala	57874	1968	1853	6659	13567	30217	27657	Tewae/Siassi	90950	3183	2885	10519	22608	47386	43564
Kairuku/Hiri	166741	5669	5340	19184	39088	87059	79682	**Madang**	929767	38121	34366	117753	218615	484669	445098
Rigo	83548	2841	2676	9612	19586	43622	39926	Bogia	145419	5962	5375	18417	34192	75804	69615
NCD	555809	17230	16418	51906	148519	303916	251893	Madang	220769	9052	8160	27960	51909	115083	105687
Moresby North East	212255	6580	6270	19822	56717	116061	96194	Middle Ramu	147393	6043	5448	18667	34656	76833	70560
Moresby North West	198173	6143	5854	18507	52954	108361	89812	Rai Coast	143369	5878	5299	18157	33710	74735	68634
Moresby South	145382	4507	4294	13577	38848	79495	65887	Sumkar	170752	7001	6311	21625	40149	89010	81743
Milne Bay	418192	14218	13182	50668	99114	217964	200228	Usino Bundi	102064	4185	3772	12926	23998	53204	48860
Alotau	148354	5044	4676	17975	35161	77323	71031	**East Sepik**	815234	32609	29446	104803	195321	408182	407052
Esa'ala	84755	2882	2672	10269	20087	44175	40580	Ambunti/Drekikier	131597	5264	4753	16918	31529	65890	65707
Kiriwina/Goodenough	99307	3376	3130	12032	23536	51759	47548	Angoram	163426	6537	5903	21009	39155	81826	81600
Samarai/Murua	85776	2916	2704	10393	20329	44707	41069	Maprik	137319	5493	4960	17653	32900	68755	68565
Northern	293385	11442	10647	36997	67743	154022	139362	Wewak	151950	6078	5488	19534	36406	76080	75870
Ijivitari	149873	5845	5439	18900	34606	78681	71192	Wosera Gawi	117370	4695	4239	15089	28121	58766	58604
Sohe	143512	5597	5208	18097	33137	75341	68170	Yangoru Saussi	113571	4543	4102	14600	27210	56864	56707
SHP	811945	30042	27061	59348	215007	414094	397853	**West Sepik**	385664	15426	13678	48694	91061	198340	187325
Ialibu/Pangia	114471	4235	3815	8367	30312	58380	56091	Aitape/Lumi	110840	4434	3931	13995	26171	57003	53837
Imbonggu	135398	5010	4513	9897	35854	69054	66345	Nuku	95556	3822	3389	12065	22562	49143	46413
Kauga Erave	122845	4545	4094	8979	32530	62651	60194	Teleformin	73891	2956	2621	9330	17447	38001	35890
Mendi/Munihu	217258	8039	7241	15880	57531	110802	106457	Vanimo/Green River	105377	4215	3737	13305	24881	54193	51184

Nipa /Kutubu	221972	8213	7398	16225	58779	113206	108766	**Manus**	78344	2193	2059	9562	18736	40450	37895
Enga	575244	19558	17539	39989	157692	298600	276644	Lorenagu	78344	2193	2059	9562	18736	40450	37895
Kandep	92419	3142	2818	6425	25335	47973	44446	**New Ireland**	264988	9010	8325	34776	59708	140521	124467
Kompiam	86437	2939	2636	6009	23695	44868	41569	Kavieng	119400	4060	3751	15669	26904	63317	56083
Lagaip/Porgera	177433	6033	5410	12335	48640	92103	85330	Namatanai	145588	4950	4574	19106	32804	77204	68384
Wabag	114549	3895	3493	7963	31401	59461	55089	**ENBP**	458264	15581	14405	55934	108605	240868	217396
Wapanamanda	104405	3550	3183	7258	28620	54195	50210	Gazelle	186917	6355	5875	22814	44298	98245	88672
WHP	543959	18495	16969	50728	140888	277419	266540	Kokopo	121476	4130	3818	14827	28789	63849	57627
Dei	106484	3621	3322	9930	27580	54307	52177	Pomio	93617	3183	2943	11426	22186	49206	44411
Mt Hagen	186046	6326	5804	17350	48187	94883	91162	Rabaul	56255	1913	1768	6866	13332	29568	26687
Mul/Baiyer	121289	4124	3784	11311	31414	61857	59432	**WNBP**	442621	16820	15450	58538	100241	237530	205093
Tambul/Nebilyer	130140	4425	4060	12137	33707	66372	63769	Kandrian/Gloucestor	133659	5079	4666	17677	30270	71727	61932
Chimbu	433009	12990	11941	36616	113196	224970	208039	Talasea	308963	11741	10785	40861	69971	165803	143161
Chuave	60147	1804	1659	5086	15723	31249	28898	**AROB**	425943	14908	13807	52412	102280	218890	207051
Gumine	59984	1799	1654	5072	15681	31165	28819	Central Bouganville	100881	3531	3270	12413	24224	51842	49038
Karimui/Nomane	60581	1817	1671	5123	15837	31475	29106	North Bouganville	177738	6221	5761	21871	42679	91339	86399
Kerowagi	91453	2744	2522	7733	23907	47514	43938	South Bouganville	147324	5156	4775	18128	35376	75709	71614
Kundiawa/Gembogl	97462	2924	2688	8242	25478	50636	46826	**Hela**	348982	12215	11131	26719	93884	177868	171114
Sina sina/Yonggomugl	63383	1901	1748	5360	16569	32931	30453	Komo Magarima	120418	4215	3841	9219	32395	61374	59044
EHP	865249	28554	26096	88165	221913	445482	419767	Koroba/Kopiago	130577	4570	4165	9997	35128	66552	64025
Daulo	61870	2042	1866	6304	15868	31855	30016	Tari/Pori	97987	3430	3125	7502	26361	49942	48045
Goroka	143625	4740	4332	14635	36836	73947	69678	**Jiwaka**	433761	15616	14281	40026	112377	221216	212543
Henganofi	111446	3678	3361	11356	28583	57379	54067	Anglimp/South Waghi	225451	8117	7423	20804	58409	114979	110471
Kainantu	183395	6052	5531	18687	47036	94423	88972	Jimi	87279	3142	2874	8054	22612	44512	42767
Lufa	91662	3025	2765	9340	23509	47193	44469	North Waghi	121031	4357	3985	11168	31356	61725	59305
Obura/Wonenara	59328	1958	1789	6045	15216	30546	28783								
Okapa	123982	4091	3739	12633	31798	63834	60149								
Unggai/Bena	89940	2968	2713	9164	23067	46306	43633								

2029														
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	11520672	414155	378541	1249669	2856086	5974176	5546497								
Western	397464	16296	15009	50836	92425	205442	192022	**Morobe**	1161057	40637	36827	134289	288608	604922	556135
Middle Fly	144808	5937	5468	18521	33673	74848	69959	Bulolo	166240	5818	5273	19227	41323	86613	79628
North Fly	132002	5412	4985	16883	30695	68230	63773	Finschaffen	97479	3412	3092	11275	24231	50788	46692
South Fly	120654	4947	4556	15432	28057	62364	58290	Huon	128122	4484	4064	14819	31848	66753	61369
Gulf	242102	9926	9182	29023	56882	125762	116340	Kabwum	90152	3155	2859	10427	22409	46970	43182
Kerema	148339	6082	5626	17783	34853	77056	71283	Lae	256528	8979	8137	29670	63766	133654	122875
Kikori	93762	3844	3556	11240	22030	48706	45057	Markam	106266	3719	3371	12291	26415	55366	50900
Central	399394	13579	12791	45951	93627	208532	190862	Menyamya	147544	5164	4680	17065	36676	76872	70672
Abau	83312	2833	2668	9585	19530	43499	39813	Nawaeb	75464	2641	2394	8728	18758	39317	36146
Goilala	59361	2018	1901	6830	13916	30994	28367	Tewae/Siassi	93261	3264	2958	10787	23182	48590	44671
Kairuku/Hiri	171026	5815	5477	19677	40093	89296	81730	**Madang**	959984	39360	35483	121580	225720	500421	459564
Rigo	85695	2914	2744	9859	20089	44743	40952	Bogia	150145	6156	5550	19016	35303	78268	71878
NCD	570760	17693	16859	53303	152514	312092	258669	Madang	227945	9346	8425	28869	53596	118823	109122
Moresby North East	217965	6757	6438	20355	58243	119183	98782	Middle Ramu	152183	6240	5625	19274	35783	79330	72853
Moresby North West	203503	6309	6011	19005	54379	111276	92228	Rai Coast	148029	6069	5471	18748	34806	77164	70864
Moresby South	149292	4628	4410	13942	39893	81633	67659	Sumkar	176302	7228	6516	22328	41454	91903	84399
Milne Bay	427977	14551	13491	51854	101433	223064	204913	Usino Bundi	105381	4321	3895	13346	24778	54933	50448
Alotau	151826	5162	4786	18395	35983	79132	72693	**East Sepik**	839609	33584	30327	107937	201161	420386	419223
Esa'ala	86738	2949	2734	10509	20557	45208	41530	Ambunti/Drekikier	135531	5421	4895	17423	32472	67860	67672
Kiriwina/Goodenough	101631	3455	3204	12314	24087	52971	48660	Angoram	168313	6733	6079	21638	40326	84273	84040
Samarai/Murua	87783	2985	2767	10636	20805	45753	42030	Maprik	141425	5657	5108	18181	33884	70811	70615
Northern	301365	11753	10937	38003	69586	158212	143153	Wewak	156493	6260	5653	20118	37494	78355	78138
Ijivitari	153949	6004	5587	19414	35547	80821	73128	Wosera Gawi	120879	4835	4366	15540	28961	60523	60356
Sohe	147415	5749	5350	18590	34039	77391	70025	Yangoru Saussi	116967	4679	4225	15037	28024	58565	58402
SHP	834679	30883	27819	61009	221027	425688	408993	**West Sepik**	395306	15812	14020	49912	93337	203298	192008

Ialibu/Pangia	117676	4354	3922	8601	31161	60015	57661	Aitape/Lumi	113611	4544	4029	14345	26825	58428	55183
Imbonggu	139190	5150	4639	10174	36858	70987	68203	Nuku	97945	3918	3474	12367	23126	50371	47574
Kauga Erave	126284	4673	4209	9231	33441	64405	61879	Teleformin	75739	3029	2686	9563	17883	38951	36788
Mendi/Munihu	223341	8264	7444	16325	59142	113905	109437	Vanimo/Green River	108012	4320	3831	13638	25503	55548	52463
Nipa /Kutubu	228188	8443	7605	16679	60425	116376	111812	**Manus**	79903	2237	2100	9752	19109	41254	38649
Enga	588302	20002	17938	40897	161271	305378	282924	Lorenagu	79903	2237	2100	9752	19109	41254	38649
Kandep	94517	3214	2882	6571	25910	49062	45455	**New Ireland**	272328	9259	8556	35739	61362	144413	127915
Kompiam	88400	3006	2695	6145	24233	45887	42513	Kavieng	122707	4172	3855	16104	27649	65071	57637
Lagaip/Porgera	181461	6170	5533	12615	49744	94194	87268	Namatanai	149621	5087	4701	19636	33713	79343	70278
Wabag	117150	3983	3572	8144	32114	60810	56339	**ENBP**	469767	15972	14766	57338	111331	246914	222853
Wapanamanda	106775	3630	3256	7423	29270	55425	51350	Gazelle	191608	6515	6023	23387	45410	100711	90897
WHP	558156	18978	17412	52052	144565	284659	273497	Kokopo	124525	4234	3914	15199	29512	65452	59074
Dei	109264	3715	3409	10190	28300	55724	53539	Pomio	95966	3263	3017	11713	22743	50441	45526
Mt Hagen	190901	6491	5955	17803	49444	97360	93542	Rabaul	57667	1961	1813	7039	13667	30310	27356
Mul/Baiyer	124454	4232	3882	11606	32234	63472	60983	**WNBP**	456033	17329	15918	60312	103279	244727	211307
Tambul/Nebilyer	133537	4540	4166	12453	34587	68104	65433	Kandrian/Gloucestor	137708	5233	4807	18212	31187	73900	63809
Chimbu	440370	13211	12144	37239	115120	228794	211576	Talasea	318324	12096	11111	42099	72091	170827	147499
Chuave	61170	1835	1687	5173	15991	31781	29389	**AROB**	439062	15367	14232	54027	105430	225632	213428
Gumine	61003	1830	1682	5159	15947	31694	29309	Central Bouganville	103988	3640	3371	12796	24970	53439	50548
Karimui/Nomane	61610	1848	1699	5210	16106	32010	29601	North Bouganville	183213	6412	5939	22544	43994	94152	89060
Kerowagi	93007	2790	2565	7865	24314	48322	44685	South Bouganville	151862	5315	4923	18687	36466	78041	73820
Kundiawa/Gembogl	99119	2974	2733	8382	25911	51497	47622	**Hela**	354915	12423	11320	27173	95480	180892	174023
Sina sina/Yonggomugl	64461	1934	1778	5451	16851	33491	30970	Komo Magarima	122465	4286	3906	9376	32946	62418	60047
EHP	885668	29227	26712	90245	227150	455995	429674	Koroba/Kopiago	132797	4648	4236	10167	35725	67684	65113
Daulo	63330	2090	1910	6453	16243	32606	30724	Tari/Pori	99653	3488	3178	7630	26809	50791	48862
Goroka	147014	4852	4434	14980	37705	75692	71322	**Jiwaka**	446470	16074	14700	41198	115669	227697	218771
Henganofi	114077	3765	3441	11624	29258	58733	55343	Anglimp/South Waghi	232056	8354	7640	21413	60120	118348	113708
Kainantu	187723	6195	5662	19128	48146	96651	91072	Jimi	89836	3234	2958	8290	23274	45816	44020
Lufa	93826	3096	2830	9560	24064	48307	45519	North Waghi	124577	4485	4102	11495	32275	63534	61043

Obura/Wonenara	60728	2004	1832	6188	15575	31267	29462								
Okapa	126908	4188	3828	12931	32549	65340	61568								
Unggai/Bena	92062	3038	2777	9381	23612	47399	44663								
2030															
Province_District	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**	**Province_District**	**Population**	**Exp_births**	**<1**	**1 - 4**	**WRA_49**	**Male**	**Female**
PNG	11826545	425253	388683	1283326	2931585	6132792	5693754								
Western	410183	16817	15489	52463	95382	212016	198167	**Morobe**	1190548	41670	37762	137699	295939	620287	570261
Middle Fly	149441	6127	5643	19114	34751	77243	72198	Bulolo	170463	5966	5407	19716	42373	88813	81650
North Fly	136226	5585	5144	17424	31678	70413	65814	Finschaffen	99955	3498	3170	11561	24846	52078	47878
South Fly	124515	5105	4702	15926	28954	64360	60156	Huon	131376	4598	4167	15195	32657	68448	62928
Gulf	248687	10196	9432	29812	58429	129183	119504	Kabwum	92442	3236	2932	10692	22979	48163	44279
Kerema	152374	6247	5779	18266	35801	79152	73222	Lae	263044	9207	8343	30424	65386	137049	125996
Kikori	96313	3949	3653	11546	22629	50031	46282	Markam	108965	3814	3456	12603	27086	56772	52193
Central	409658	13928	13119	47132	96034	213891	195767	Menyamya	151292	5295	4799	17498	37607	78824	72467
Abau	85453	2905	2737	9832	20032	44617	40836	Nawaeb	77381	2708	2454	8950	19235	40316	37065
Goilala	60887	2070	1950	7005	14273	31790	29097	Tewae/Siassi	95629	3347	3033	11061	23771	49824	45806
Kairuku/Hiri	175421	5964	5618	20183	41123	91591	83830	**Madang**	991184	40639	36636	125532	233056	516684	474499
Rigo	87898	2989	2815	10113	20605	45893	42005	Bogia	155025	6356	5730	19634	36451	80811	74214
NCD	586114	18169	17313	54736	156617	320487	265627	Madang	235353	9650	8699	29807	55338	122685	112668
Moresby North East	223828	6939	6611	20903	59809	122389	101439	Middle Ramu	157129	6442	5808	19900	36946	81908	75221
Moresby North West	208978	6478	6173	19516	55841	114269	94709	Rai Coast	152840	6266	5649	19357	35937	79672	73167
Moresby South	153308	4753	4528	14317	40966	83829	69479	Sumkar	182032	7463	6728	23054	42801	94889	87142
Milne Bay	437992	14891	13806	53067	103806	228284	209708	Usino Bundi	108806	4461	4022	13780	25583	56718	52088
Alotau	155378	5283	4898	18826	36825	80984	74394	**East Sepik**	864713	34589	31233	111164	207176	432956	431757
Esa'ala	88767	3018	2798	10755	21038	46266	42501	Ambunti/Drekikier	139584	5583	5042	17944	33443	69889	69695
Kiriwina/Goodenough	104009	3536	3279	12602	24651	54210	49799	Angoram	173345	6934	6261	22285	41532	86793	86553
Samarai/Murua	89837	3054	2832	10885	21292	46824	43014	Maprik	145654	5826	5261	18725	34897	72928	72726
Northern	309562	12073	11234	39037	71479	162515	147047	Wewak	161173	6447	5822	20720	38615	80698	80475

Ijivitari	158137	6167	5739	19942	36514	83019	75117	Wosera Gawi	124493	4980	4497	16004	29827	62333	62160
Sohe	151425	5906	5495	19095	34964	79496	71929	Yangoru Saussi	120464	4819	4351	15486	28862	60316	60149
SHP	858050	31748	28597	62718	227215	437607	420445	**West Sepik**	405188	16207	14370	51160	95670	208381	196808
Ialibu/Pangia	120971	4476	4032	8842	32034	61696	59276	Aitape/Lumi	116451	4658	4130	14703	27496	59889	56563
Imbonggu	143087	5294	4769	10459	37890	72975	70113	Nuku	100393	4016	3560	12676	23704	51630	48763
Kauga Erave	129820	4803	4327	9489	34377	66209	63612	Teleformin	77632	3105	2753	9802	18330	39925	37707
Mendi/Munihu	229595	8495	7652	16782	60798	117094	112502	Vanimo/Green River	110712	4428	3926	13979	26141	56937	53775
Nipa /Kutubu	234577	8679	7818	17146	62117	119635	114943	**Manus**	81493	2281	2142	9947	19489	42075	39418
Enga	601657	20456	18345	41825	164932	312310	289346	Lorenagu	81493	2281	2142	9947	19489	42075	39418
Kandep	96663	3287	2947	6720	26498	50176	46487	**New Ireland**	279871	9516	8793	36729	63062	148414	131458
Kompiam	90406	3074	2757	6285	24783	46928	43478	Kavieng	126106	4288	3962	16550	28415	66873	59233
Lagaip/Porgera	185580	6310	5658	12901	50873	96332	89248	Namatanai	153765	5228	4831	20179	34647	81540	72225
Wabag	119809	4073	3653	8329	32843	62191	57618	**ENBP**	481558	16373	15137	58777	114126	253111	228446
Wapanamanda	109198	3713	3329	7591	29935	56683	52515	Gazelle	196418	6678	6174	23974	46550	103239	93179
WHP	572724	19473	17867	53411	148338	292089	280635	Kokopo	127651	4340	4013	15581	30252	67095	60556
Dei	112115	3812	3498	10456	29038	57179	54937	Pomio	98375	3345	3092	12007	23314	51707	46668
Mt Hagen	195884	6660	6111	18268	50735	99901	95983	Rabaul	59114	2010	1858	7215	14010	31071	28043
Mul/Baiyer	127703	4342	3984	11909	33076	65128	62574	**WNBP**	469850	17854	16401	62139	106408	252142	217710
Tambul/Nebilyer	137022	4659	4275	12778	35489	69881	67141	Kandrian/Gloucestor	141881	5391	4953	18764	32132	76140	65742
Chimbu	447857	13436	12351	37872	117077	232684	215173	Talasea	327969	12463	11448	43375	74276	176003	151968
Chuave	62209	1866	1716	5261	16263	32321	29889	**AROB**	452585	15840	14670	55691	108677	232582	220002
Gumine	62040	1861	1711	5246	16218	32233	29807	Central Bouganville	107191	3752	3475	13190	25739	55085	52105
Karimui/Nomane	62658	1880	1728	5298	16380	32554	30104	North Bouganville	188855	6610	6122	23239	45349	97052	91803
Kerowagi	94589	2838	2609	7999	24727	49143	45445	South Bouganville	156539	5479	5074	19262	37589	80445	76094
Kundiawa/Gembogl	100804	3024	2780	8524	26352	52373	48431	**Hela**	360948	12634	11512	27635	97103	183967	176981
Sina sina/Yonggomugl	65557	1967	1808	5544	17138	34060	31497	Komo Magarima	124547	4359	3972	9536	33506	63479	61068
EHP	906570	29917	27343	92375	232511	466757	439814	Koroba/Kopiago	135054	4727	4308	10340	36333	68834	66220
Daulo	64825	2139	1955	6605	16626	33376	31449	Tari/Pori	101347	3547	3232	7759	27265	51654	49693
Goroka	150484	4966	4539	15334	38595	77478	73006	**Jiwaka**	459552	16544	15130	42406	119058	234369	225181

Henganofi	116769	3853	3522	11898	29948	60120	56649	Anglimp/South Waghi	238856	8599	7864	22041	61882	121815	117040
Kainantu	192153	6341	5795	19579	49282	98932	93221	Jimi	92468	3329	3044	8533	23956	47158	45310
Lufa	96040	3169	2897	9786	24632	49447	46593	North Waghi	128227	4616	4222	11832	33221	65395	62832
Obura/Wonenara	62162	2051	1875	6334	15943	32005	30157								
Okapa	129903	4287	3918	13237	33317	66882	63021								
Unggai/Bena	94235	3110	2842	9602	24169	48518	45717								

based on 2011 Census and Health Adjusted Growth rate