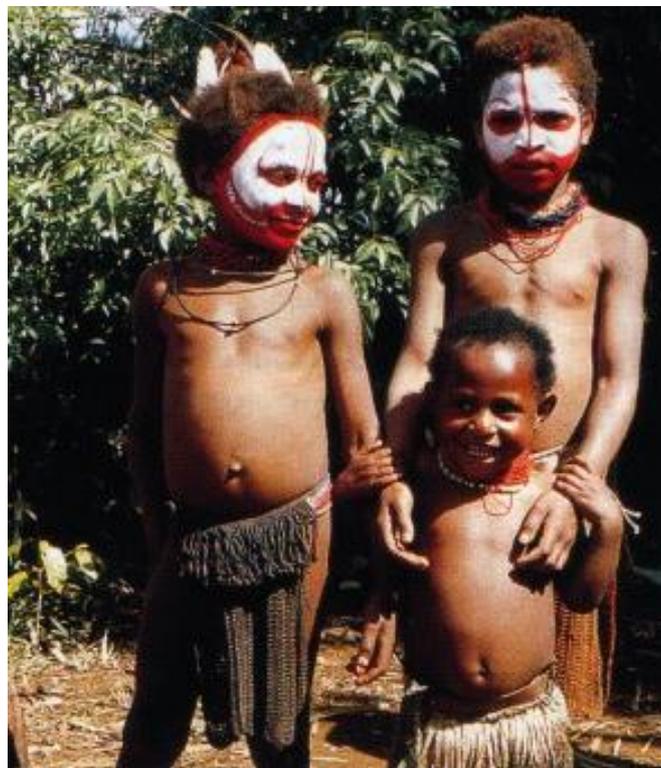




PAPUA NEW GUINEA

CHILD HEALTH POLICY AND PLAN

2009-2020



Updated edition 2015



Children at Buk Bilong Pikinini. Port Moresby, PNG 2013

Photo: Ness Kerton / Department of Foreign Affairs and Trade, the Australian Government 2013

Papua New Guinea Child Health Policy and Plan 2009-2020 (Updated 2015).

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PNG National Department of Health and Paediatric Society of PNG

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FOREWORD

It is with great pleasure that I introduce this updated PNG Child Health Policy and Plan.

Improving child health and education are vital for the future of Papua New Guinea. Sadly, in the last 30 years, child death rates in PNG have been among the highest in the Asia and Pacific regions. The encouraging news is that in recent years child death rates have reduced, and this is because of a comprehensive approach that is outlined in this plan. However there is still a very long way to go to achieve acceptable child survival, health and development. Improvements in child health have not been shared by all. The poor have missed out. Also child survival gains are not evenly distributed throughout the country. Some districts have child mortality rates that are 3-4 times higher than the better performing districts. The challenges are many, including difficult geographical access, weak health systems and limited human resources. Preventable and treatable diseases such as pneumonia, diarrhoea, malnutrition, HIV and tuberculosis remain some of the biggest causes of child death. Many of these diseases also cause disability and long term problems that limit quality of life, educational outcomes and productivity.

The good news is that there are effective interventions to reduce the burden of these illnesses, all of which are included in this Child Health Policy and Plan, and child health indicators are starting to improve. The plan emphasizes the importance of primary health care, improving quality of care, disease prevention and improving the human resources for health. Much can be done, even with limited resources, because of the commitment of people.

This Child Health Policy and Plan complements our overall National Health Plan and Medium Term Development Framework. The aim of the National Health Plan is to improve the health of all Papua New Guineans through the development of a health system that is responsive, effective, affordable, acceptable and accessible to all people. This National Child Health Plan shows the detail of the child health component of the overall National Health Plan, and sets out activities and programs that will result in the post-MDG aspirations being achieved.

With sufficient investment in child health and education, this plan can be fully implemented and our goals for Child Health can be achieved. Non-health sector policy contexts are also vital; there needs to be improvements in community development and engagement for better use of health facilities and care seeking, increased access to education and improved literacy for girls and women, curbing of domestic violence, increased male involvement in families, and the more equitable sharing of the favourable economic conditions.

This plan will be used at National, Provincial and local level; by Provincial Health to guide their annual implementation plans; and to inform health workers, the community and the Government's partners about child health priorities and the approaches being adopted.

Special thanks are due to the Paediatric Society of PNG, Family Health Services Branch and the Child Health Advisory Committee of the National Department of Health for their key roles in reviewing and revising this plan.



Hon. Mr. Michael B Malabag, MP

Minister for Health & HIV & AIDS

ACKNOWLEDGEMENT

Improving child and maternal health is a major commitment of the PNG National Department of Health and Provincial Departments of Health. To achieve the Millennium Development Goals for Child Health and the post-MDG goals of sustainable development, will require that all people responsible for the health and wellbeing of children focus on the one strategy and work with commitment together. This policy and plan outlines a comprehensive approach that will result in real and sustained improvements in health services for children.

It is a tragedy that children in PNG still die unnecessarily, from preventable and easily treatable diseases, malnutrition and neglect. Our health service can contribute substantially, not only to preventing these deaths, but by the respectful and caring way we treat children and their families, in minimizing the effects of social disadvantages and poverty on health and development. We should treat people as we would want to be treated ourselves; with timely, considerate and effective care and good communication.

The first edition of this document was developed between 2007 and 2009, and was substantially updated between 2014 and 2015. Many people contributed ideas and suggestions or reviewed various drafts. Contributions to the writing of this plan were made by members of the Paediatric Society of Papua New Guinea; Family Health Services of Department of Health; Child Health Advisory Committee; Division of Child Health, School of Medicine and Health Sciences, University of Papua New Guinea; and Centre for International Child Health, University of Melbourne.

On behalf of the National Department of Health, I would like to convey my sincere gratitude to all that were involved in reviewing and revising this very comprehensive and evidence-based Child Health Policy, Plan and Strategic Implementation Plan for 2016-2020.

I look forward to this Child Health Policy and Plan being promoted and implemented at all levels of governance by all cadre of health workers, as well as everyone else who contribute one way or the other in the development and well-being of the children of Papua New Guinea. I would ask you to please read this document carefully and do what you can to help us implement it.



Mr. Pascoe Kase
Secretary for Health

ABBREVIATIONS

IMCI	Integrated Management of Child hood Illness
ART	Antiretroviral therapy
HIV	Human Immune Deficiency
AIDS	Acquired Immune Deficiency Syndrome
NDoH	National Department of Health
CHP	Child Health Policy
EPI	Expanded Program on Immunization
IYCF	Infant and Young Child Feeding
PPTCT	Prevention of Parent to Child Transmission
WHO	World Health Organization
WPRO	Western Pacific Regional Office
UNICEF	United Nations International Children
UPNG	University of Papua New Guinea
SMHS	School of Medicine and Health Sciences
NGO	Non Government Organization
CHW	Community Health Worker
FBO	Faith Based Organization
HEO	Health Extension Officer
ANC	Antenatal Clinic
TB	Tuberculosis
PTB	Pulmonary tuberculosis
EPTB	Extra-pulmonary tuberculosis
FDC	Fixed Dose Combination
MDR-TB	Multi-drug resistant tuberculosis
PCR	Polymerase Chain Reaction
NHIS	National Health Information System
MDG	Millennium Development Goal
CHAC	Child Health Advisory Committee
CAP	Community Action Program
VHV	Village Health Volunteer
VBA	Village Birth Attendant
DHS	Demographic Health Survey
HFS	Health Facility Survey
AIP	Annual Implementation Plan
HSIP	Health Sector Improvement Program

SIA	Supplementary Immunization Activity
STM	Standard Treatment Manual
DOTS	Directly Observe Treatment Strategy
BFHI	Baby Friendly Hospital Initiative

EXECUTIVE SUMMARY

The first edition of the national Child Health Plan was produced in 2009. It was designed as a road-map for the development of health services for children in PNG from 2009 to 2020, and was incorporated as the child health component of the National Health Plan 2011-2020.

The Plan was reviewed in 2014 and 2015 by members of the PNG Paediatric Society, the National Department of Health and the University of PNG, and this revised Policy and Plan was endorsed on 3rd June 2015. It is recognised that much progress had occurred in the first five years of the Plan. These included: reducing malaria, increasing the use of insecticide-treated bed nets, the introduction of new vaccines against pneumonia and meningitis, slowing of the HIV epidemic, PCR for early infant diagnosis of HIV, improved paediatricians coverage in provinces, better surveillance and outcome data at hospital level. In addition there have been other improvements: training, improved guidelines, and increased zinc and vitamin A. However there is much work to be done, many old problems exist and new problems have emerged. This updated version of the Child Health Policy and Plan aims to re-frame efforts in the next five years 2016-2020.

Background to the first edition

The first edition of the Child Health Plan 2009-2020 followed the World Health Organization (WHO) and the United National Children's Fund (UNICEF) launching the joint Child Survival Strategy for the Western Pacific Region in 2005.¹ In September 2005, at the fifty-sixth session of the Western Pacific Regional Committee of the World Health Organization, the PNG Government, through the Health Minister supported and endorsed the WHO/UNICEF Regional Child Survival Strategy.² This strategy was designed to put child health higher on the political, economic and health agendas, renew efforts to reduce child mortality with support being mobilized by the regional office and donors, and expand current child and reproductive health activities. For the development of the first edition of the Child Health Plan meetings and consultations were held between July 2007 and September 2008 with child health people from the Department of Health, the Child Health Advisory Committee (CHAC), the PNG Paediatric Society, the University of PNG, nursing personnel, provincial health staff, nutritionists and members of the community.

Major recommendations of the WHO/UNICEF Regional Child Survival Strategy were to have technical interventions that have proven effectiveness in reducing child mortality in low income countries, outlined in the Lancet Child Survival Series of 2004. The Regional Child Survival Strategy focuses on the importance of integrated service delivery and continuum of care, universal access to key child survival interventions as a goal with a focus on major causes of mortality, scaling up and quality improvement at all levels of the health system. The key child survival interventions are: safe motherhood, neonatal care, breast feeding and complimentary feeding, micronutrient supplementation, the Expanded Program on Immunization (EPI), the Integrated Management of Childhood Illnesses (IMCI) and improving the quality of hospital care, malaria control and insecticide treated materials. In PNG three other components have been added to the essential list: HIV prevention and antiretroviral treatment; scaling up TB prevention and treatment; and promoting family planning.

The Western Pacific regional strategy also called for:

- One effective high level co-ordination mechanism (such as a Child Health Committee)
- One integrated national plan for child survival
- One national monitoring and evaluation system measuring core child survival indicators

This Child Health Policy and Plan 2009-2020 describes a balanced and integrated program that incorporates almost all of the essential interventions proven to reduce child mortality in low income countries,³ in an integrated service delivery. This document emphasizes the strong EPI that has developed over years. The policy and plan also emphasizes the importance of Safe Motherhood, Neonatal Care, and case management which are crucial to reducing the high rates of neonatal mortality. 'Integration' should be between all child health programs, and between maternal and child health, and between child health and disease-specific programs, such as Roll-Back Malaria, nutrition, the National TB program and HIV.

This document includes sustainable activities in service delivery, training and continuing education which have been introduced successfully in recent years, and which strengthen each level of the health service. The plan also describes the co-ordinating committee (Child Health Advisory Committee, CHAC), which has responsibility for implementation, oversight, and monitoring.

This plan also describes the core indicators that would enable progress to be monitored by CHAC. These are simple, measurable, and objective indicators of progress towards establishment of sustainable programs with high coverage, and progress toward the achievement of the Millennium Development Goal targets, particularly MDG-4 (the reduction of the under five mortality rate by two thirds between 1990 and 2015. In PNG this target is an U5MR of around 32 per 1,000 live births).

The Child Health Policy and Plan recognizes that other areas are important to child health in PNG, including adolescent health, family planning and maternal health. Adolescent health has been largely neglected by medical services in many countries, including PNG; paediatricians have concentrated on children aged 0-12 years, and adult physicians have focused on those over 18 years of age. A focus on adolescents is an opportunity to protect children from acute and chronic infections including STDs, HIV/AIDS, lifestyle diseases, chronic non-communicable disease and social problems which result in the majority of the disease burden in adults in PNG. It is also an opportunity to promote good health for future mothers and fathers. Family planning is crucial to achieving progress in child and maternal survival and other health outcomes. Nutrition is important to ensure that girls enter their reproductive years in good health and minimize complications during pregnancy and delivery.

The plan recognizes the central importance of people if the technical interventions known to be effective for child survival are to be scaled up. Increased training of child health nurses and nutritionists, training of pediatricians as leaders in child health, and teaching the components of this plan in pre-service nursing, community health worker, HEO, and under-graduate medical training will be important.

Throughout the plan we have listed key messages for provincial health staff. These are designed to assist you implement the plan. At the end of the plan we have listed key contacts. If you have any questions about the child health, please contact the relevant people.



Figure 1. Map of Papua New Guinea

VOLUME I
CHILD HEALTH POLICY 2009–2020
UPDATED 2015

CHAPTER 1. BACKGROUND

Improving child health, education and welfare are vital for the future of Papua New Guinea. Improving child health and reducing child deaths has profound economic and social benefits for a country. Between the 1970s and 1990s, child death rates in PNG were among the highest in the Asia and Pacific regions. The encouraging news is that in recent years child death rates have reduced, and this is because of the comprehensive approach that is outlined in this policy and plan. Significant progress has occurred in the last 10 years, but there is still a very long way to go to achieve acceptable child survival, health and development.

The challenges are many, including difficult geographical access, weak health systems and limited human resources. Preventable and treatable diseases such as pneumonia, diarrhoea, malnutrition, neonatal sepsis, birth asphyxia, HIV and tuberculosis remain some of the biggest causes of child death. Many of these diseases also cause disability and long-term problems that limit quality of life, educational outcomes and productivity. Many problems have emerged, including social problems within urban environments, the challenges of adolescent health, the care of children with chronic illnesses, and child and family mental health.

The good news is that there are effective interventions to reduce the burden of these conditions, all of which are included in this Child Health Policy and Plan, and child health indicators are starting to improve. The policy and plan emphasizes the importance of primary health care, improving quality of care, disease prevention and improving the human resources for health.

1.1 Global and historical context

In 2005, the World Health Organization (WHO) and the United National Children's Fund (UNICEF) launched the joint Child Survival Strategy for the Western Pacific Region.¹ In September 2005, at the fifty-sixth session of the Western Pacific Regional Committee of the World Health Organization, the PNG Government, through the Health Minister supported and endorsed the WHO/UNICEF Regional Child Survival Strategy.² This strategy was designed to put child health higher on the political, economic and health agendas; renew efforts to reduce child mortality with support being mobilized by the Regional office and donors; and expand current child and reproductive health activities.

1.2 Need for and intent of the policy

To assist a better understanding of the current situation and to provide some baseline data the Child Survival Country Profile: Papua New Guinea was published in 2006. This policy and plan was developed in response to the WHO/UNICEF Regional Child Survival Strategy. A series of meetings and consultations were held between July 2007 and June 2009 with child health people from the Department of Health, the Child Health Advisory Committee, the PNG Paediatric Society, nursing personnel, provincial health staff, nutritionists and members of the community.

Major recommendations of the WHO/UNICEF Regional Child Survival Strategy are to have technical interventions that have proven effectiveness in reducing child mortality in low income countries, outlined in the Lancet Child Survival Series. The Regional Child Survival Strategy focuses on the importance of integrated service delivery and continuum of care, universal access to key child survival interventions as a goal with a focus on major causes of mortality, scaling up and quality improvement at all levels of the system. The key child survival interventions are: safe motherhood, neonatal care, breast feeding and complimentary feeding, micronutrient supplementation, the Expanded Program on Immunization, the Integrated Management of Childhood Illnesses (IMCI) and improving the quality of hospital care, malaria control and insecticide treated materials. In PNG three other components have been added to the essential list: HIV prevention and antiretroviral treatment; scaling up TB prevention and treatment; and promoting family planning.

1.3 Audience

This policy and plan will be used at national, provincial and local level to guide their annual implementation plans and to inform health workers, the community and the Government's partners about child health priorities and the approaches being adopted. The policy and plan will also be shared with international

development partners, donor agencies, NGOs and other stakeholders both within the public and private sector.

CHAPTER 2. POLICY DIRECTIONS

2.1 Policy goals

The goals of the Child Health Policy and Plan are to reduce child mortality and to improve the general quality of health and development of the children of Papua New Guinea.

2.2 Policy objectives

The objectives of the Child Health Policy are:

- To improve the quality, access and delivery of health services to children and young people of Papua New Guinea
- To reduce the neonatal, infant and under five year old mortality as per the Millennium Development Goals (MDG-4)
- To reduce the burden of childhood tuberculosis and HIV
- To address chronic non-communicable diseases of children
- To build a comprehensive and sustainable child health program for the post-2015 agenda

2.3 Policy principles

It is the right of every child to good health and protection from harm. The Government of Papua New Guinea recognizes that and had been a signatory to the 1989 United Nations Convention of the Rights of the Child.

Furthermore, the Government of Papua New Guinea recognizes that the future of this young and developing nation depends on the wellbeing of its most important resource - the children, who will be the leaders of the nation.

Thus the Government of Papua New Guinea recognizes this Child Health Policy as the instrument through which its vision and goals of developing a better Papua New Guinea becomes a reality.

2.4 Guiding principles of partnership in Child Health Policy

The scope and level of partnership for child health in Papua New Guinea depends on the following principles:

Responsibility for Policy

The overall responsibility for health policy formulation (including the Child Health Policy and Plan), monitoring and evaluation and the health status of the children of PNG is maintained by the Government of Papua New Guinea through the National Department of Health. The National Department of Health will consult its partners and aims for consensus in all cases of common concern.

Responsibility for Service Provision

Provision of health services to the children of Papua New Guinea pertains to the different service delivery partners: Government agencies (hospitals, health clinics, provincial, district and public health offices), church health services, non-government organizations (NGO), private health care organizations, schools and universities of health care worker training and development partners (local and international partners and agencies).

Complementarities

All external partners shall strive to support and complement the services of Government and other institutional agencies, and align with the content of this policy and plan, rather than run parallel services.

Identity and Autonomy

The identity and autonomy of each partner is respected.

Equity

The allocation of resources for implementation of the Child Health Policy and Plan shall be made in accordance with disease burdens, the most effective use of resources, and with the aim of reducing inequity.

Transparency and Accountability

Inputs, outputs and outcomes pertaining to the attainment of the child health goals are agreed to, reported by, and shared among partners.

2.5 Population policy

Paediatricians, obstetricians and other maternal and child health workers are aware that one of the factors in PNG that has the potential to derail all the positive gains made so far is uncontrolled population growth. PNG now has almost a 3% population growth rate with a projected doubling time of 20 years. This means that in 10 years time the child and adolescent population will have been increased by around 2 million.

This will put immense pressure on resources with a requirement in commensurate increases in number of health facilities, personnel, schools, jobs etc. Moreover there will most likely be detrimental effects on overall socio-economic status of families, provision of education and increase in social discord, urban drift, food insecurity, degradation of the environment, the further loss of biodiversity, natural flora and fauna, and land shortages and increase in land disputes.

There is abundant evidence of an adverse effect on child health and mortality of narrow birth spacing. Infant mortality is very high for children born following a birth interval of less than 2 years after the previous birth; IMR is 71 per 1,000 live births, compared with 42 per 1,000 live births for children born 3 or more years after the previous birth.

The Paediatric Society, the Society of Obstetricians & Gynaecologists and Family Health Services advocates that population policy needs to be dealt with at the highest levels, with the utmost urgency. The country's political leadership must be made aware of the need to address this issue at the national level and legislate for a concerted effort, and at a community level. This will require mobilisation of all segments of society as the ill effects of the population explosion will impact on all areas of life.

2.6 Core government commitments and policies

This Child Health Policy and Plan complements PNG's overall National Health Plan (2011-2020), Medium Term Development Framework, and builds on the previous National Health Plan 2001-2010. The aim of the National Health Plan is to improve the health of all Papua New Guineans through the development of a health system that is responsive, effective, affordable, acceptable and accessible to all people. This Child Health Policy and Plan shows the detail of the child health component of the overall National Health Plan, and sets out activities and programs that will result in the MDG and post-MDG aspirations being achieved.

Thus, this Child Health Policy and Plan applies to:

- The total health care system in Papua New Guinea provided by government, faith-based organizations, NGOs and private health services.
- All health care facilities and non-facility based services such as those provided in homes and villages
- All registered health care workers

The Child Health Policy and Plan can be read together with other key policy documents, including:

- Constitution of Papua New Guinea (1975)
- Papua New Guinea National Strategic Plan: 2010 – 2050 (September 2008)
- Organic Law for Provincial and Local Level Government (Department of Provincial and Local Level Government Affairs, November 1998)
- National Health Plan 2001 – 2010 (National Department of Health, August 2000)
- Corporate Plan 2009 – 2013 (National Department of Health, 2008)
- National Health Plan 2011 – 2020 (National Department of Health, 2009)

- Minimum Standards for District Health Services in Papua New Guinea (Ministry of Health, May 2001)
- Policy on Partnership in Health (Ministry of Health, 2002)
- National Policy on Expanded Program on Immunization (National Department of Health, 2004)
- National Nutrition Policy (March 1995, Revised 2015)
- National Policy on Integrated Management of Childhood Illness (National Department of Health (National Department of Health, 2009)
- National Policy on Family Planning (National Department of Health, 2009, Revised and updated 2014)
- National Policy on Sexual and Reproductive Health (National Department of Health, 2008, Revised and updated 2014)
- Village Health Volunteer Policy (National Department of Health, July 2000)
- Health Workplace Policy on HIV&AIDS (Ministry of Health, December 2005)
- Community Health Posts Strategy (Ministry of Health, 2009)
- National Health Reform Legislation 2009

2.7 Legislation

The Child Health Policy and Plan (CHPP) in its formulation and implementation notes the importance of a sound legislative environment to support the goals, objective and strategies of the plan

The CHPP acknowledges the presence of the following Legislations under the Ministry of Health that have bearings on the health of children in the country.

- National Health Administration Act 1997
- Organic Law on Provincial and Local Governments
- Public Hospital Act 1994
- HIV/AIDS Management Act
- Provincial Health Authorities Act 2007
- Christian Health Services Act
- Medicines and Cosmetics Act
- Food Sanitation Regulation 2001
- National AIDS Council 2007 (Amendment) Act 2007
- Institute of Medical Research (Amendment) Act 2007
- Other Legislation relevant to child health but placed under the administration of other government departments includes the following.
- Adoption Law
- Civil registration
- Child Welfare Act
- Education law (for primary school education)
- Deserted Wives and Children Act
- The CHPP is also mindful of Government's commitment to the international agreements and obligations relevant to adolescent and child health as listed below.
- Millennium Development Goals

- Convention on the Rights of the Child (CRC)
- International Conference on Population and Development (ICPD)
- In the term duration of the CHPP, it is recommended that the following new legislation be considered by the NDoH for the promotion of health of children.
- Code of Marketing of Breastmilk Substitutes
- Food safety and Food Standards
- Child Protection– Lukautim Pikiñini Act 2009

CHAPTER 3. HEALTH SYSTEMS

WHO has proposed a framework of six building blocks to analyse health systems. The six building blocks are service delivery, information, medical products and technology, human resources, health financing, and leadership. This policy and plan recommends, by order of priority, the following three components of Health Systems to be seriously addressed.

- Human resources
- Service delivery
- Medical products and technology

3.1 Human resources

Numbers

The Child Health Policy and Plan advocates for more appropriate numbers of paediatric health staff to be in place during the tenure of the plan. The paediatric health workforce includes paediatricians, non-specialist doctors, rural health doctors, child health nurses, general nurses, nutritionists, community health workers, social workers and allied health staff. Ongoing assessment of the required number of paediatric staff in the workforce needs to be undertaken at least every three years especially as new hospitals and other health facilities are built and current services are expanded.

Training

Undergraduate training of additional students in medicine needs to be supported and negotiated with the Higher Education section under the Ministry of Higher Education, Research, Science and Technology.

Service training of the paediatric health workforce is strongly supported and promoted by the Child Health Policy and Plan, as is continuing professional development. In the Child Health Policy and Plan this is outlined in several sections: including Section 5.5; and Appendix 1: Projection of Paediatrician Training 2015-2020, which tabulates and outlines the required number of paediatric health workforce for the nation at all levels. Furthermore, Appendix 2: Projection of Paediatrician Sub-specialty Training 2015-2020, outlines the need for specialized training in the discipline. Indeed attaining and maintaining the right number of the paediatric health workforce will ensure the proper implementation and achievement of the Child Health Policy and Plan. There is a need for scaling up the training of paediatric nurses, general nurses and other cadres of health workers including laboratory staff and biomedical technicians who have a role in activities relating to health service provision for children and mothers.

Welfare of health workers

The welfare of doctors and paediatric staff should be seriously considered as a priority issue. Indeed the performance of health staff is greatly enhanced when their welfare is adequately addressed and satisfied. Basic family concerns such as housing, security, transport, telecommunication, water and electricity, depending on the station of assignment, should be ensured. Good welfare consideration of staff will lead to enhanced performance and greater job satisfaction.

3.2 Service delivery

The Child Health Policy and Plan supports the new projects of Community Health Posts for improving service delivery. It also promotes the concept of Primary Health Care in service delivery for rural and community level. Up-scaling and improving the quality of services in the provincial and district hospitals is promoted during the tenure of Child Health Policy and Plan. The Child Health Policy and Plan advocates for the resumption of services at closed aid posts. Management authorities for aid posts need to prioritise resource allocation to these stations as their role and services are vital for early management and referral of the population.

Laboratory services should be available at all district hospitals. Needless to mention, basic diagnostic instruments and equipment should be made available to health centres for early diagnosis of conditions such as malaria and anaemia. Chest radiographs, bacteriology facilities (including cerebrospinal fluid microscopy and culture and blood culture and bacterial antigens) should be available at all provincial hospitals.

3.3 Medical products and technology

The Child Health Policy and Plan requires the maintenance of adequate medicine and drug supplies in all health facilities. The further development of basic equipment and technology appropriate to the level of health services provided should also be ensured.

- Provision of all medicines contained in the Standard Treatment Manual.
- The introduction of new medicines to treat resistant infections including multi-drug resistant (MDR) tuberculosis and multi-resistant bacterial infections, and second-line therapy for HIV.
- An oxygen supply program based on oxygen concentrators and pulse oximeters in all provincial and rural hospitals and major district health centres in the country. Where power supplies are inadequate solar power will be trialled.
- To improve immunization coverage, health facilities including community health posts need a functioning refrigerator. Missed opportunities in vaccination lead to disease outbreaks.
- The use of medical communication technologies is a priority for provincial and rural hospitals. Modern methods of communication such as mobile phones, radio or telemedicine via the Internet should be explored to improve the quality of care in remote areas, timely medical referrals, and continuing education for remote health staff.
- Newer diagnostic technologies for tuberculosis should be evaluated and introduced if they are found to be effective. Guidelines will be developed for the appropriate use of GeneXpert MTB/RIF to help detect multi-drug resistant tuberculosis.
- Rapid diagnostic tests for other diseases, such as encephalitis and meningitis will be evaluated for effectiveness and added value.
- Further developments of computerised reporting systems, including the Paediatric Hospital Reporting (PHR) program.

CHAPTER 4. POLICY CONTENT

The Policy document is broken up into program areas, but there is integration across all of these programs. This document outlines the policies, which are expanded upon in the Child Health Policy and Plan, and the specific activities to achieve these, timelines and costing are detailed in the Strategic Implementation Plan, which is in Section II of this document.

4.1 Integrated management of childhood illness (IMCI)

IMCI provides a strategy for training primary health workers in primary care case management of common illnesses in children. Since the initial adaptation work of IMCI in PNG in 1998, progress has been gradual. The Child Health Policy aims in IMCI between 2009 and 2020 include to:

- Improve the co-ordination and structure for IMCI
- Expand and sustain IMCI training in all provinces and districts
- Improve integration between programs and ensure that IMCI is taught in all courses of child health

4.2 Expanded Program of Immunization

Childhood vaccines have been responsible for substantial advancements in child health and reductions in mortality in PNG in the last 30 years. The EPI is a major component of the Child Health Policy and Plan. The policy aims and the strategies required to achieve these aims are carefully described separately within the PNG *Comprehensive Multi-year Plan National Immunization Programme 2011-2015* and EPI policy.

4.3 Standard treatment guidelines

The aim of the Standard Treatment Manual is, according to the preface of the first edition, to: ‘allow the busy nurse, health extension officer or doctor to prescribe quickly standard treatments that are simple, safe and effective’. The STM is now in its ninth edition. The policy aim is to have the latest child health recommendations in the Standard Treatment Manual available to and used by every health worker when managing children.

4.4 Neonatal care

In PNG neonatal mortality makes up 50% of infant mortality, so reducing neonatal mortality is vital to improving child survival. Two thirds of neonatal deaths are associated with high risk pregnancies, labour and delivery. Although there are many factors, prematurity, low birth weight, deliveries that are not supervised by skilled health workers, and neonatal sepsis account for the majority of deaths in the first month of life in PNG.

Efforts to reduce neonatal mortality are closely linked to safe motherhood programs, including the National Strategic Action Plan to Reduce Maternal and Newborn Mortalities and the WHO Integrated Management of Pregnancy and Childbirth (IMPAC). Antenatal clinics (ANC) continue to be important to prevent neonatal illness.

The policy aims in neonatal care are to provide the highest possible level of care for newborns in health facilities and within communities:

- Encourage access to the highest possible quality ANC and delivery care by skilled birth attendants
- Ensure that Essential Early Newborn Care is provided to all newborns
- Implement Minimal Standards of Neonatal Care in provincial and district hospitals and health centres
- Promotion of breast feeding (see also breast feeding, nutrition and micronutrients section of this plan, below)
- Provide understandable information on newborn care available to all mothers
- Develop centre of excellence for neonatal care and training at Port Moresby General Hospital and major provincial hospitals

- Support a program of neonatal care and resuscitation training for nurses, midwives and doctors, as part of Hospital Care for Children training

4.5 Breast feeding, nutrition and micronutrients

Nutrition is a vital but neglected part of health care in Papua New Guinea. The rates of malnutrition are unacceptably high and contribute substantially to high child mortality, poor growth, poor development, and high infectious disease morbidity. About 11% of all paediatric hospital admissions have severe malnutrition. An even greater percentage of children in hospitals and the community suffer from moderate malnutrition, which increases the risk of death from pneumonia, diarrhoea, tuberculosis, HIV and malaria. Two-thirds of all child deaths are associated with moderate or severe malnutrition. Between 2009 and 2020 the National Department of Health aims to:

- Support, protect and promote exclusive breast feeding from birth up to 6 months
- Support adequate complementary feeding from 6 months onwards
- Increase human resource capacity for child nutrition among nurses, doctors and nutritionists
- Improve co-ordination between programs
- Community promotion of proper breast feeding practices and adequate complementary feeding
- Improve vitamin A coverage
- Achieve high coverage of deworming
- Improve health facility and community services for management of malnutrition
- Support programs for school health and nutrition

4.6 Quality improvement in hospital care

Families will bring their children to health facilities if they are confident they will receive good care and are treated with kindness and respect. Improving community demand requires quality health services, community engagement and awareness of the signs of childhood illness.

In many hospitals and health centres there are major deficiencies in drug supplies, basic equipment, buildings and facilities, training and support for health staff, and provision of a family friendly environment.

Improving the management of malnourished children, improving triage and emergency care, oxygen administration, supportive care and monitoring apply whether children have pneumonia, tuberculosis, HIV or less common conditions. These can be partly addressed by a program of training for nurses, better use of guidelines, better facilities and equipment, improved data collection to follow outcomes and measure impact, and a focus on key areas such as malnutrition. Efforts to improve the availability of food supplies on hospital wards, improve the detection of children at high risk of malnutrition and improve malnutrition management of are also crucial. The policy aims in quality improvement are to:

- Ensure all sick children have access to good quality care
- Improve oxygen systems and the treatment of pneumonia
- Standardized hospital data reporting and paediatric surveillance
- Improve the care and management of adolescents in hospitals and other health facilities
- Improve the co-ordination and care for children with chronic illnesses

4.7 Pneumonia

Acute lower respiratory infection is the most common cause of serious illness and death in children in PNG, accounting for 27% of all hospitalisations. Pneumonia and bronchiolitis are particularly prevalent in highlands provinces, where they accounts for 30-40% of all admissions. A comprehensive strategy to address pneumonia is outlined in the Child Health Policy and Plan. Pneumonia policy is a cross-cutting issue that involves most program areas in this policy and plan.

4.8 Malaria

Malaria is endemic in all coastal provinces of PNG. An objective of the current PNG National Health Plan is to reduce malaria disease and mortality by 50% by 2020. In 2009-2014 4.8% of mortality in children was from malaria. Between 2009 and 2020 the policy aims in childhood malaria include:

- Improve the prevention and management of malaria among mothers and children
- Improve the tendering process, procurement and supply of all essential drugs and supplies
- Improve leadership, research and co-ordination of the childhood malaria

4.9 Tuberculosis

Childhood tuberculosis (TB) is a large burden in PNG. Childhood TB represented over 30% of all TB treated in PNG in 2005-6. This is twice the expected case load of paediatric TB and indicates that there is a high community transmission rate and that the TB control programme is not functioning well. It also reflects the impact of HIV epidemic on TB cases. Pulmonary and extrapulmonary TB contribute substantially to high rates of child mortality, malnutrition, chronic respiratory disease and impaired neurological and cognitive development. Improving the detection, prevention and management of children with TB was considered by the Paediatric Society as a major priority in child survival, and was added to the list of goal areas identified by the Western Pacific Region. The policy aims in childhood TB by the National TB Program and between 2009 and 2020 include:

- Improve the ability of health workers to diagnose and treat TB
- Improve co-ordination and leadership of child TB
- Address multi-drug resistant TB in children
- Address high rates of non-adherence, defaulting and relapse among children with TB

4.10 HIV

PNG has a generalized HIV epidemic. Based on improved surveillance, mainly using antenatal clinic data, the revised national HIV prevalence rate is estimated at 0.92%, down from previously reported 2% some years ago. To effectively address childhood HIV involves strengthening prevention strategies for adults, and addressing specific areas of disease prevention and treatment among newborns and children. The policy aims in childhood HIV between 2009 and 2020 include to:

- Improve the prevention of HIV infection in newborns
- Improve the care of children with HIV
- Improve co-ordination and leadership of child HIV

4.11 Paediatrician training

Paediatricians are crucial to maintaining progress in child health and survival. The paediatrician's role in provinces is multi-faceted. They need to provide the highest standard of appropriate care to all children, to teach other staff about child health, to manage the child health service, to play a supportive role to public health services and primary health care providers. Particularly they need to liaise with Provincial Health Advisors to ensure that child health programs are planned for and implemented in their provinces. Much of the progress in child health in the last decade has been because of the leadership and technical support provided by provincial paediatricians. The policy aims in this area include:

- Achieve the National Health Minimum Standard for specialist paediatricians
- Develop a paediatric workforce with appropriate subspecialty skills
- Support programs for continuing professional development for paediatricians, paediatric trainees, child health nurses and other child health workers

4.12 Child health nurses and midwives

Child health and midwifery nursing need a major influx of resources. The policy in this area is to achieve the standard of one child health nurse and one midwife in every health centre, and at least one per shift in every hospital. To do so more paediatric nursing courses are urgently needed.

4.13 Community health workers

PNG has a policy of upgrading aid post to be community health posts. The intention is to have these staffed by three officers; one of whom is a community health worker with training and skills in maternal and child health care. The services that will be offered at community health posts for mothers and children will include all essential MCH services: antenatal care, deliveries, basic newborn care, immunizations, growth monitoring, and management of common childhood illnesses, and referral of very sick children.

4.14 Continuing professional development

It is a policy of the PNG Department of Health that some form of effective continuing professional development should be available to all health workers.

4.15 Adolescent health

A healthy adolescence requires informed and safe choices about risk-taking behaviour such as smoking, alcohol and other drugs, sexual activity, diet and relationships. Adolescence is a time when interventions and healthy choices may reduce the risk of chronic physical illness in adulthood, and reduce the risk of adverse mental health and substance abuse problems. The programs currently in place to address issues affecting adolescence are very limited. The policy aims in this area are to:

- Provide appropriate facilities for adolescent health services
- Improve human resources for adolescent health
- Provide training for a paediatrician in adolescent health, to act as a national resource-person for this area
- Provide training for other health workers in adolescent health

4.16 Cancer, heart disease, paediatric surgery

While childhood cancer and heart disease are not as common as infectious diseases, adequate resources need to be allocated to ensure the effective management of these conditions:

- Improve the management of childhood cancer and ensure wide access to services
- Improve the management of congenital and acquired heart disease in children and ensure wide access to services

4.17 Child protection and social services

Many children are at risk of neglect and abuse, with little social support or protection. Such children include many orphans, adopted infants, displaced children, abandoned babies, and those living in crowded conditions in urban settlements. The number of orphans is increasing because of HIV and the breakdown of traditional village structures. Natural disasters or civil conflict give rise to displaced children, unplanned urbanization is increasing, all meaning the number of at risk children is increasing. The consequences are extreme, including malnutrition, physical and emotional injury, preventable infection with HIV and other sexually transmitted infections.

1. Improved reporting, documentation and surveillance systems for child abuse and neglect are needed
2. Improved preventative and treatment services need to be in place for children at risk of neglect and abuse
3. Health workers can make a major contribution to identifying at-risk, abused or neglected children and through liaison with social and legal services help to mitigate the effect on health and development of the child

Legislation, strategies and training for health workers in protection, prevention and management of child abuse and neglect are required

4.18 Child disability

Many children in PNG live with disabilities. Diseases causing disability include birth asphyxia, low birth weight, congenital anomalies, meningitis, chronic infection including HIV and tuberculosis, trauma, and malnutrition. These illnesses may result in cerebral palsy, the most common physical disability in childhood, or result in sensory loss such as blindness, deafness, or intellectual and learning problems, and epilepsy. Health consequences include malnutrition, increased risk of pneumonia, skin problems and dental decay. In addition to direct health consequences children with disabilities are vulnerable to socio-economic exclusion and disadvantage; more than 90% of children with disabilities in developing countries do not attend school. Children with disabilities are also at increased risk of physical and sexual abuse, and neglect. This policy aims to:

- Prevent disability through improved newborn care, vaccines, improving rates of breast feeding and child nutrition and improving child safety through legislation
- Improve developmental screening, referral and support services for children with disability

CHAPTER 5. MONITORING AND EVALUATION

Implementation of this Child Health Policy and Plan will be monitored on an ongoing basis by collection of performance indicator data, by regular reviews by the Child Health Advisory Committee and the annual mid-year reviews by the Paediatric Society.

5.1 Policy development in child health

In line with the WHO / UNICEF Regional Child Survival Strategy recommendations, in 2006 the Department of Health established a National Child Health Advisory Committee. The Child Health Advisory Committee (CHAC) has a key role in coordinating and supervising Child Health activities. The CHAC reviews all child health policy areas, new evidence and information and provides recommendations to the National Department of Health. It meets quarterly, overseeing many child health activities. It is a vital link between child health workers, institutions and the NDOH.

Having a forum for discussion of policy issues is essential. The NDoH supports the Paediatric Society to meet twice a year to discuss and formulate child health policy, and to report back to the Child Health Advisory Committee on recommendations and progress of the Child Health Policy and Plan.

- Support the Child Health Advisory Committee as the major technical advisory body on child health
- Support the Paediatrics Mid-Year meeting each June, and the Paediatric Mini-Symposium in September as forums for child health policy advice and oversight of progress to the Department

VOLUME II
SECTION I. CHILD HEALTH PLAN

CHAPTER 6. INTRODUCTION

6.1 Child health in PNG: recent progress and current challenges

Papua New Guinea is a high priority country for the achievement of the Millennium Development Goals, because the baseline child, infant and neonatal mortality rates and the maternal mortality ratio were among the highest in the Western Pacific Region. Other targets, such as those for universal primary education and poverty alleviation also have much scope for improvement. The PNG MDG-4 target is for a reduction in under-five mortality from 90 (in 2000) to 32 per 1,000 live births and a reduction in infant mortality from 64 (in 2000) to 24 per 1,000 live births. The goals are feasible and achievable, although the timeframe needs to be extended beyond 2015 to the end of the life of this plan (around 2020).

In terms of child survival interventions, PNG now has, included in this plan, almost all of the technical strategies identified by the Bellagio group in the Lancet Child Survival Series in 2003. However, coverage for most essential interventions has been low, with many remote communities missing out on many essential services. Coverage for preventative and treatment strategies is limited by relatively weak health systems, particularly affecting remote rural areas. Health systems have been weakened by low levels of financing, lack of supervision and support for rural health workers, limited human resources, deficiencies in building and equipment maintenance, drug procurement and distribution, limited community engagement with the health service, and low health worker morale in many areas.

However, the health system in PNG also has several great strengths, and systems are changing with more provinces taking responsibility for policy implementation and active implementation. Much progress is being made through the Provincial Health Authorities that are being established. The other great strength in PNG is the strong commitment by nurses and paediatricians to the health and welfare of all children. Recent successes in PNG have included:

- Achieving much higher measles vaccine coverage than ever before, through incorporating 3-4 yearly supplemental immunization activities into the routine EPI
- The designation of PNG as polio-free
- Progress in technical policy including the publication of the 9th edition of the Standard Treatment Manual for children, which includes zinc as treatment for diarrhoea, six-monthly vitamin A supplementation to all children
- Haemophilus influenzae type b vaccine, successfully introduced as the pentavalent vaccine in 2008
- Introduction of the pneumococcal conjugate vaccine in 2014
- Increase in the number of paediatricians serving clinical and public health needs of provinces, and the development of substantial capacity of paediatricians in IMCI, EPI, HIV, neonatal care, public health, child nutrition, research, oncology and cardiology. There have been 30 paediatricians trained since 2000, and these people are filling many important roles in child health throughout the country

The National Department of Health, the Paediatric Society and other partners are committed to overcoming the obstacles to achieving higher coverage with standard treatment and essential preventative interventions. In the development of this plan a consultative process was undertaken to review the child health program for its content and coverage of essential interventions, identify the obstacles to achieving better coverage, make recommendations about how these obstacles can be overcome, and describe mechanisms for evaluating whether action is taken and whether improvements occur. This provided an important framework for addressing these issues over the next decade.

However, there are several major obstacles to achieving MDG-4. The HIV epidemic shows some signs of slowing, but HIV infection still accounts considerable proportion of child deaths. The establishment of parent to child prevention (PPTCT) programs in all provinces is going a long way to addressing this; however, unless HIV is better controlled among adults, infants will continue to be affected. Tuberculosis in children is also a major obstacle to achieving improved child health, leading to severe chronic disease, disability and malnutrition. The high rates of childhood TB reflects the weak TB control system, and now multi-drug resistant TB represents new challenges. Other obstacles to achieving MDG-4, and general improvements in child development, are the poor social situations in many urban settlements and some rural communities and poor nutritional outcomes. Infants and children in many urban settlements live in extremely

crowded and often unstructured households, where breast feeding often gives way to early weaning, poor quality complementary feeding, bottle feeding, and where informal adoption is common. In these environments deaths due to combinations of severe malnutrition, diarrhoeal disease, acute respiratory infection and tuberculosis are too common. It will be essential to address malnutrition to achieve reductions in under-five mortality. A significant constraint to services being delivered within such communities is their sometimes dangerous and volatile environments, which makes them places into which health workers are understandably reluctant to venture.

If MDG-4 is to be achieved by 2020 there will need to be major focuses on improving, supervising and supporting rural health services; on outreach EPI services; on infant and young child nutrition and growth monitoring linked to vaccines; on economic development that benefits poorer communities and those in remote rural areas; and targeting poorer communities in both rural and urban areas to improve essential health services and education. But it is feasible with a co-ordinated effort.

6.2 Child mortality

In PNG in 2000 the estimated under-five mortality rate was 92 per 1,000 live births, a slight down-ward trend on the consistently high mortality rates seen throughout the 1980s and 1990s. Since 2004 there has been a concerted effort by child health organizations in PNG to systematically improve the situation. In 2004 the estimated under-five mortality was 88 per 1,000 live births. In 2014, for the year 2012 UNICEF's *State of the World's Children* lists the under-five and infant mortality rates as 68 and 48 per 1,000 live births respectively. The neonatal mortality rate was estimated at 24 per 1,000 live births in 2012. These data are consistent with earlier trends from the 2006 Demographic and Health Survey (DHS). Mortality data from the latest PNG census (2011) are not yet available. PNG's modified MDG-4 target is an under-five mortality rate of 32 per 1,000 live births by 2015. Feasibly this could be achieved by around 2020 if there is a slight increase in current rate of progress.

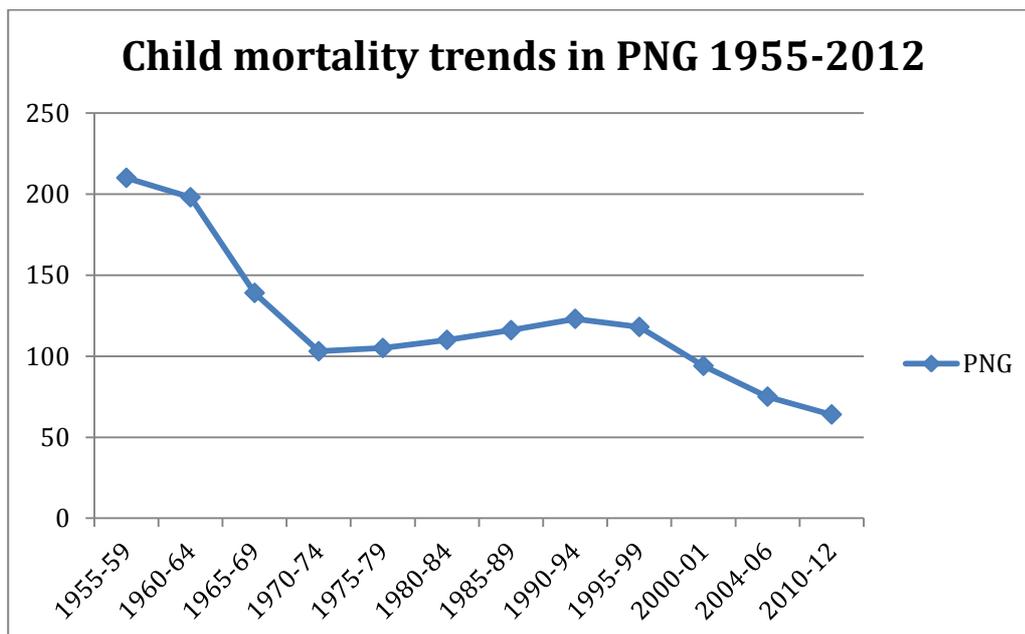


Figure 2. Mortality trends for children in the first 5 years of life in PNG, 1955-2012⁴⁻⁷

6.3 Common causes of childhood illness and death

Since 2009 data have been gathered annually on the common causes of child admissions using the Paediatric Hospital Reporting system.^{8,9} Pneumonia remains the most common reason for admission (27% of

admissions in 2009-14), followed by neonatal conditions (20% of admissions), diarrhoeal disease (10% of admissions) and malaria (6% of admissions). In the post-neonatal period, pneumonia (23% of deaths) and meningitis (24% of deaths) were the leading causes of death. Neonatal deaths accounted for 28% of all hospital deaths. The leading causes of death in neonates were: birth asphyxia (53% of neonatal deaths), neonatal infections (27% of neonatal deaths) and very low birth weight (35% of neonatal deaths). In the post-neonatal period, children presenting with HIV (12.1% case fatality rate), malnutrition (23.3% case fatality rate), meningitis (19.2% case fatality rate), tuberculosis (13.2% case fatality rate), and severe pneumonia (9.6% case fatality rate) had the highest risk of death. *Severe malnutrition either directly caused or contributed to 36% of all deaths in 2012.*⁸ In previous studies in Goroka and Port Moresby either moderate or severe malnutrition was a factor in two-thirds of all child deaths.^{10;11}

There are several references summarizing the common causes of childhood illness and mortality in PNG.

6.4 Health facility network

PNG has a network of base or provincial referral hospitals, district hospitals or health centres at a district level, and health sub-centres, urban clinics and aid posts at a village and community level. However access to primary care services is poor in many areas, because of remoteness, poor road conditions and the closure of many aid posts. In 2006 only 69% of 2633 aid posts were considered open, and several provinces had very low proportions of aid posts open (Eastern Highlands 34%, Enga 44%, East Sepik 51%). NHIS data suggests only 36-50% of births occur in a health facility.

6.5 Human resources in child health

Without increased numbers of trained health staff this plan cannot be fully implemented, and PNG's MDG-4 goal will not be reached.

There is a need for many more child health nurses and midwives. In the first five years of this plan (2009-2013) there have been investments in midwifery training, with increased training places at School of Medicine and Health Sciences (SMHS), University of Papua New Guinea, and other midwifery schools, supported by the Australian Government. However the same progress has not occurred in child health / paediatric nursing. In 2014 there is only one post-graduate child health nursing courses in PNG. This is at SMHS, Taurama Campus. This school trains about 20 midwives and paediatric nurses annually. Another child health course in Goroka University was closed down around 2009 after a few years of functioning. A review of PNG's nursing workforce in 2002-3 estimated that there was a need for 435 more midwives and 200 more paediatric nurses. Each of the four regions in the country needs one post-graduate midwifery course and one child health nursing course.

Reviewing and standardizing the curricula of courses which teach maternal and child health (community health workers, child health / paediatric nurses, midwifery, HEO, medical students) to ensure the content contains essential child health training interventions and the contents of this plan was done in the first five years of this plan.

Since the closure of the Nutrition Course at the College of Allied Health Sciences (CAHS) in 1982, there has been a steady decline in number of nutritionists and nutrition positions in provinces. In 2009 nutrition positions were filled in 9 provinces and in 3 provinces nutrition positions have been vacant for extended periods of time. The number of nutrition positions at Health Department Head Quarters had declined from 7 to 2.

There has been an increase in the number of paediatricians since 2000. Thirty paediatricians have graduated from SMHS between 2000 and 2014. Now paediatricians are working in 17 of 22 provinces, and many hold other senior positions within the NDoH, University, National Capital District and working with non-government child health organizations. However, there is still a major short-fall of paediatricians. Without at least two paediatricians in each of the provinces it is very difficult for paediatricians to focus on both public child health and clinical issues. Central, Gulf, Western Province, Manus and the two new provinces Hela and Jiwaka still do not have a paediatrician, so less specialist expertise is available to these provinces' child health activities. This plan sets out a workforce and training plan and timeline for achieving this (see paediatricians training and Appendix 1 and 2).

There is now increasing need for paediatricians to take national 'portfolio' responsibility for key aspects of child health. This approach is reflected in this plan, with paediatricians since 2009 being identified to provide

leadership in neonatal care, childhood tuberculosis, Infant and Young Child Feeding (IYCF) and adolescent health, childhood cancer, and heart disease. There is a need for further training and credentialing in these and other specialist areas.

The SMHS is understaffed, with as few as 40% of teaching positions unfilled in 2013.

Gaps are not just in training, but in workforce planning, accreditation of certain cadres of health workers (including child health nurses), and incentives for rural service.

In many districts village health volunteers – which include village birth attendants and other village health workers - have a role in delivering maternal and child health services in remote communities. Village health volunteers are mostly supported by churches and other non-government agencies. This cadre of health workers is currently unregulated, and there is little standardization of practice or quality assurance. There is a need to determine appropriate content and durations of training, skill-set, standards of practice, supervision, remuneration, and integration with the formal health system. There is evidence from other countries that village health workers can reduce neonatal mortality. The effect of village birth attendants on maternal mortality is less certain. The links between VHWs, community health (aid) posts, and government and church run health centres still needs to be strengthened.

6.6 Population issues and Family Planning

The Paediatric Society of PNG and Family Health Services Division of the National Department of Health are aware that one of the factors in PNG that has the potential to derail all the positive gains made so far is uncontrolled population growth. PNG now has almost a 3% population growth rate with a projected doubling time of 20 years. This means that in 10 years time the paediatric population will have been increased by around 2 million.

These will put immense pressure on resources with requirements for commensurate increases in number of health facilities, personnel, schools, jobs etc. Moreover there will most likely be detrimental effects on overall socio-economic status of families, provision of education and increase in social discord, urban drift, food insecurity, degradation of the environment and land shortages.

In addition, for the health of families there are major consequences of unplanned pregnancies and lack of access to family planning. There is abundant evidence of an adverse effect on child health and mortality of narrow birth spacing. Infant mortality is very high for children born following a birth interval of less than two years after the previous birth; IMR is 71 per 1,000 live births compared with 42 per 1,000 live births for children born three or more years after the previous birth.

The Paediatric Society and Family Health Services advocates that population policy and family planning availability needs to be dealt with at the highest levels, with the utmost urgency. The country's political leadership must be made aware of the need to address this issue at the national level and commit to a concerted effort. This will require mobilisation of all segments of society as the ill effects of the population explosion will impact on all areas of life.

The Paediatric Society will undertake within its own membership to more actively promote family planning in the clinical setting as well as advocate for wider solutions to population control. In this we work closely with the Obstetrics and Gynaecology Society.

CHAPTER 7. PROGRAM AREAS

7.1 Integrated Management of Childhood Illness (IMCI)

IMCI is a primary care case management approach to common diseases of children. IMCI involves different activities and interventions aimed at the care of sick child, prevention of childhood diseases, and promotion of healthy growth of children. IMCI has the potential to make a major contribution to health system reforms and it fits into the governmental priority agenda to upgrade the aid posts to community health centers, in order to improve access to basic health services in rural settings.

Since the initial adaptation work of IMCI in PNG in 1998, progress has been slow. IMCI went through adaptation 1999-2000, and the program was piloted in Heganofi and Madang districts in 2001, supported by WHO. At the same time the Australian Government supported training in the IMCI 10-step checklist in many provinces, and the development and piloting of the young infant IMCI checklist. But 15 years later coverage is low. National coverage will only be achieved if provinces take this on, if program simplification occurs, and if IMCI is more adapted to be taught in pre-service health training colleges. In 2009, there was an update of IMCI diagnostic algorithms and was included in the *National Plan of Roll-Out of all Components of IMCI Strategy*. This document explains in detail the activities of IMCI implementation.

Progress in the components of IMCI in PNG

Training for case management

Since 1999 Training of Trainers courses have been done throughout the country, driven initially by the Australian Government Women's and Children's Health Program. This training was in the 10-step checklist and of five day duration, often combined with reproductive health training. District training courses followed in 2000-2002. In 2003 the young infant checklist was finalized and 10 day trainings were conducted, especially in the pilot districts supported by World Health Organization (WHO) and in East Sepik. In 2005, 10 day training courses were done again in regions to strengthen provincial and eventually district training supported by the HSIP.

Until now only a few provinces have made substantial progress in district training. There have been insufficient follow-up visits after training and limited supervisory visits with case management observation, both of which are recommended to optimize the effect of training on clinical practice.

IMCI training can be included in provincial and district annual implementation plans (AAPs), along with follow-up visits after training and supervisory visits with case management observation. This has not happened in most provinces in the last decade.

Pre-service training commenced with training tutors in 2003-2004 initially in Lae for the Goroka and Lae Schools of Nursing. Community health worker schools have incorporated IMCI from 2004. Some schools have developed their own syllabus incorporating IMCI training. The University of PNG now ensures that medical students learn IMCI in their clinical practice at the children's outpatient department of Port Moresby General Hospital, and IMCI is included in the Bachelor of Clinical Nursing (Midwifery and Child Health) program at the SMHS.

Health systems issues

Although limited, there is some evidence of health system strengthening and impact on quality of care. A study done in 2007-8 showed that in districts in which IMCI training had been carried out, case management was more comprehensive and communication with parents was better (Moses Moti, MPH thesis). Improving health systems at a district level will take much more than IMCI training, it will in part require communities to take responsibility for the governance and oversight of health centres, through local boards. This is increasingly done successfully with schools, where local boards monitor the quality of teaching and take responsibility for maintaining infrastructure and support to teachers. This model of community engagement is worth trying in district health centres.

Future needs

Improving co-ordination and structure for IMCI

For IMCI to be sustained, co-ordination should be strengthened at all levels of health system. At the National level, a National IMCI coordinator will assist the Child Health Technical Advisory and Chief Pediatrician to coordinate IMCI and represent IMCI on the Child Health Advisory Committee (CHAC). The implementation of IMCI is also supported by NDoH Advisor for the Child Health and Manager of Family Health Branch. At the provincial and district levels the positions of provincial and district coordinators would greatly assist in IMCI implementation. The IMCI coordinators should be responsible for organizing IMCI trainings for health staff and village health volunteers / workers, follow-up after training visits, supervisory visits with case management observation, arrange logistics operations for IMCI, contacting the health facilities (including aid posts) on regular basis and supporting health information system regarding child health. IMCI coordinators should also ensure that child health programs are well reflected in annual work plans.

A database of all IMCI trainers and trained health workers should be developed and maintained.

The implementation of IMCI strategy at the district level should be based on the local district plans.

Incorporation of Infant and Young Child Feeding (IYCF) counselling training, supervision and follow-up into the national IMCI program will be important for sustaining improvements in child nutrition.

Sustaining IMCI

- Expansion and sustaining of IMCI will require:
- Inclusion of IMCI and IYCF training
- Follow-up after training and supervisory visits with case management observation into provincial annual implementation plans
- Incorporation of IMCI and IYCF into pre-service and post-graduate training
- Establishing a proper structure to implement and sustain IMCI on the provincial and district level through IMCI provincial and district coordinators

Implementation of components of the IMCI Strategy are described in IMCI Policy document and *National Plan of Roll-Out of All Components of IMCI Strategy*.

Key messages for Provincial and District Health Staff

- Create and fill positions of provincial IMCI coordinators
- Create training units at a provincial hospitals
- Include IMCI and IYCF training in your annual implementation plans
- Include “follow-up after training” as part of your IMCI training

Support community engagement in local health services, this may include appointing local ‘community health boards’ to oversee the activities of health centres, rural hospitals and aid posts

7.2 Expanded Program of Immunization

Immunization services are provided through the network of around 700 Maternal and Child Health (MCH) clinics run from health centres and hospitals. Modes of delivery are static, mobile and opportunistic, and services are routine and supplementary. It has been estimated that 30% of the children are reached through outreach services, although the frequency and regularity of mobile services is variable, and have diminished over time.

There is now a policy to extend EPI delivery to a community health post level. This will require the upgrading of aid posts, training of more community health workers, and installation of cold chain equipment at an aid post level, many of which will require solar-powered vaccine refrigerators.

Supplemental immunization activities (SIA) were done in 1996 for polio eradication and in 2003-2005 and again in 2008-09 and 2014 in response to epidemics of measles. These were remarkably successful, at one stage bringing the measles vaccine coverage to an estimated average level of 86% of one year old children. Now, integrated MCH outreach activities are being encouraged from the national level and SIAs will be conducted at sub-national levels where routine coverage is below average.

Administratively, EPI is under the Family Health Branch in the Health Improvement Branch of the Department of Health. At the national level, the EPI management team includes an EPI Manager. In addition, the team includes; a Cold Chain / Logistics Officer, and a Vaccine Management Officer.

At the regional level, there are four Regional Cold Chain Logistics Officers based in one province within the region; all are funded by DFAT and supported by WHO. Provincial Cold Chain Logistics Officers are responsible for the management of vaccines at provincial level with support from the provincial family health coordinator. At the district level, EPI is managed by the district manager through the health facility nurse in charge.

Up to June 1995 the EPI had a vertical reporting system. Since, July 1996, EPI reporting systems are organized as part of NHIS. Though timeliness of the reporting has improved considerably, there still remain problems of data completeness and accuracy.

The Health Department is strengthening disease surveillance, including that for diseases targeted under EPI through the introduction of an integrated surveillance system in the Disease Control Unit to which most of its reports flow through NHIS and sentinel reporting.

The broad aims of the EPI program include:

- High quality immunization services that reach every child and mother
- Elimination of measles
- Maintenance of PNG's polio-free status. Based on WHO recommendations, to replace oral polio vaccine (OPV) with inactivated (injectable) polio vaccine (IPV) in 2018 to achieve the "End-Game for Global Eradication of Polio".
- Introduction of Rubella vaccine as measles-rubella in 2015
- Elimination of maternal and neonatal tetanus
- Control of hepatitis B, and improve birth-dose coverage
- Introduction of new vaccines against the commonest causes of mortality in children, building on the introduction of Hib (*Haemophilus influenzae* type b) vaccine in 2008. In particular, in 2014 the introduction of a conjugate vaccine against *Streptococcus pneumoniae*, the commonest cause of bacterial pneumonia and meningitis. The vaccine is PCV 13, the 13-valent pneumococcal conjugate vaccine. This is supported by Gavi, the Vaccines Alliance
- Introduction of Human papilloma virus (HPV) vaccine in school health and adolescent health programs
- Improving vaccine preventable disease surveillance system. This includes Acute Flaccid Paralysis (AFP) and Acute Fever and Rash (AFR) surveillance, plus outbreak identification of whooping cough and cholera. The Paediatric Hospital Reporting system also provides a mechanism for hospital-based surveillance for VPDs utilizing a network of paediatricians at provincial hospitals
- Ensure all children receive at least 2 doses of vitamin A, at 6 and 12 months, according to the Vitamin A policy. Expand vitamin A supplementation in to second year of life by adding two additional doses at 18 and 24 months
- Consideration of the role of rotavirus vaccine in reducing deaths from diarrhoea, and the gathering of disease-burden information. This is underway with rotavirus studies having been conducted in Port Moresby and Goroka, showing that rotavirus causes about 40% of all diarrhoea cases admitted to hospital

The targets and strategies required to achieve these aims are more fully described within the *Papua New Guinea Comprehensive Multi-Year Plan National Immunization Programme 2011-2015*.¹² Key activities include management and planning at a national, provincial and district level, training and supervision, monitoring and evaluation, surveillance and laboratory support, cold chain and logistics, effective schedules for service delivery, improving communication and community links and revitalizing school-based immunisation programs. Strengthen the integration of vaccine distribution with other programs and activities, particularly IMCI, long lasting insecticide-treated mosquito net distribution, vitamin A, hospital services, and family planning will be important for efficient delivery of child health interventions.

Supporting birth registration will be important for better understanding coverage of vaccines at a village level.

Key messages for Provincial and District Health Staff

- Support immunizations at every opportunity
- Outreach MCH services are an important way to reach many rural children and mothers, make sure these are functioning in your province
- Improve the facilities and services at community health posts to increase coverage of vaccines in remote villages
- Support and organize targeted Supplementary Immunization Activities (SIA) sub-nationally, especially in the poor performing districts
- The Hib vaccine and the new pneumococcal conjugate vaccine will prevent many cases of meningitis and pneumonia.
- Raise awareness of the importance of vaccination and these new vaccines
- Immunization is everybody's business, everyday!
- During immunization activities, do growth monitoring (plot weight on the growth chart), give vitamin A and offer family planning.

7.3 Standard Treatment and Clinical Guidelines

The first edition of the PNG Standard Treatment Manual was published in 1975, and the ninth edition in 2011 (reprinted with corrections in 2013).¹³ The *PNG Standard Treatment Manual* is probably the longest running evidence-based treatment guideline in a developing country, and has a unique place in the health culture of PNG.¹⁴ The research underpinning the original STM and its subsequent editions have also influenced development of global paediatric treatment recommendations, such as the WHO programs for Acute Respiratory Infection and IMCI.

The original aim of the Standard Treatment Manual was, according to the preface to 'allow the busy nurse, health extension officer or doctor to prescribe quickly standard treatments that are simple, safe and effective.'

Child health has become increasingly complicated in the last two decades, but there is still a need to keep it as simple as possible for front-line health workers. The ninth edition (2011) included several changes, including changes to TB treatment with the introduction of fixed-dose combination therapy, HIV, care of the septic child, use of ceftriaxone in meningitis, zinc for diarrhoea and other areas.

The STM may need to be simplified to maintain its relevance to primary health workers.

The activities required in the life of this plan include:

- Revising the 2016 (Tenth Edition) Standard Treatment Manual
- Revision of other Paediatric Treatment Manuals

Other technical resources will need updating and printing in the life of this plan, including Paediatrics for Doctors in PNG and Child Health for Nurses and HEOs.

The WHO Pocketbook of Hospital Care for Children will need to be purchased and distributed annually, along with the training CD.

Key messages for Provincial and District Health Staff

- Encourage all health staff to carry and use the STM whenever they provide care for a child
- Support training courses for health staff in Standard Treatment and Hospital Care for Children

7.4 Neonatal Care

Neonatal deaths are those that occur in the first 28 days of life. The neonatal mortality rate in PNG is estimated to be about 24-28 per 1,000 live births, comprising about 40% of infant mortality. Two thirds of neonatal deaths are associated with high risk pregnancies, labour and delivery. Although there are many factors, prematurity, low birth weight, deliveries that are not supervised by skilled health workers and early neonatal sepsis account for the majority of neonatal deaths in PNG. Only about 50% of mothers deliver their babies in a health facility with a skilled birth attendant. Most births are not officially registered; so many still-births and neonatal deaths are not counted.

Efforts to reduce neonatal mortality are closely linked to safe motherhood programs, including the National Strategic Action Plan to reduce Maternal and Newborn Mortalities, the WHO Integrated Management of Pregnancy and Childbirth (IMPAC), and Early Essential Newborn Care.

Quality antenatal care (ANC) is important in the prevention of maternal complications and neonatal illness. ANC interventions include maternal screening for common diseases like malaria, syphilis and HIV, and haemoglobin checks to identify anaemia. All pregnant mothers should have a minimum of three ANC visits during pregnancy, have two tetanus toxoid injections if primiparous (and one if multiparous), and take prophylactic anti-malarials and iron / folate throughout the pregnancy. All mothers with high risk pregnancies need qualified medical personnel to supervise the delivery, and emergency obstetric care must be available.

Increasing health facility deliveries and improving the quality of early essential newborn care is vital to reducing neonatal mortality in PNG. This will require increased number of nurses who have midwifery skills, improvements in primary and district health facilities, and community demand.

Early essential newborn care

Many newborn babies do not receive basic care in the first hour after birth. Babies born in a village without a skilled attendant may be subject to asphyxia (lack of oxygen), birth trauma, cold exposure or infection, and these are often not recognized or treated in timely and appropriate ways. However, even babies born in a hospital or health centre may miss out on essential newborn care. They may be left to become hypothermic, they may be excessively suctioned leading to stress, and they may be separated from their mother and not have the opportunity to feed from the breast and stay warm. Each of these stresses lead to an increased risk of infection, hypothermia, hypoglycaemia and death. Early essential newborn care requires that babies are dried thoroughly, put immediately in skin-to-skin contact with the mother, assessed for adequacy of breathing, have delayed cord clamping for 1-3 minutes until pulsations stop, are allowed to suck on the breast early so they receive colostrum, and not be separated from their mother.

It is essential for a newborn baby to receive good nutrition at the start of his or her life to ensure good growth and development. Breast milk provides all that the baby needs to grow and be healthy. In the 2005 National Nutrition Survey, 84% of mothers initiated breast feeding within 24 hours. However, few breast fed in the first hour. In some health facilities, “pre-lacteal” feeding (i.e. feeding of formula before breast milk) is still done. Breast feeding should be initiated within one hour of birth, and skin-to-skin contact established to encourage early initiation of breast feeding. Improving breast feeding techniques and support for new mothers will help eliminate pre-lacteal feeding.

The *International Code of Marketing of Breast-Milk Substitutes* is an essential tool to ensure that babies are exclusively breast fed in all health facilities.

Early Essential Newborn Care, the WHO *Action plan for healthy newborn infants in the Western Pacific Region (2014–2020)*, also includes the care of the sick and low birth weight newborn. This is taught in Hospital Care for Children training.

Appropriate models of neonatal care

Improving neonatal care requires models of care that are appropriate at each level of the health service: health centres, district hospitals, referral hospitals. The model of care involves training for nurses, CHWs and doctors, guidelines, basic equipment, physical infrastructure, drugs, referral criteria, audit and reporting

of outcome data. The model of care will focus on the management of common illnesses in newborns: neonatal sepsis, low birth weight, birth asphyxia and congenital malformations.

Improving training in neonatal care is important, as currently the number of nurses trained in neonatal care is inadequate, and all who deliver newborns should be trained in early essential newborn care.

Needs assessments will be conducted of what is required for provincial and district hospitals, and health centres to achieve minimal standards of neonatal care in equipment, staffing, physical facilities. Standards of neonatal care at different hospital levels have been developed, endorsed by the Ministry of Health and published by the Paediatric Society in the PNG Medical Journal.^{15;16}

Care of the low birth weight baby

Low birth weight (LBW) babies should remain with their mothers, so they receive the benefit of skin-to-skin warmth and breast feeding.

Guidelines for the management of very low birth weight babies (VLBW 1,000-1,500g) are contained in the WHO *Pocketbook of Hospital Care for Children*, and the *PNG Standard Treatment Manual*. Training on care of the LBW and VLBW baby is contained within the Hospital Care for Children training program.

The target for improving survival in low birth weight infants will be those that are more than thirty weeks gestational age or weighing 1,000g or more. Currently the mortality rate for VLBW babies (1,000-1,500g) is high (35% of 1700 admissions in 2009-14). With improved models of neonatal care this can be reduced.

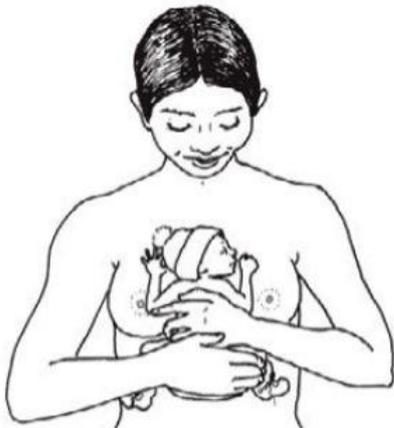


Figure 3. Skin-to-skin contact keeps baby warm and encourages breast feeding

(From Early Essential Newborn Care, WHO Western Pacific, 2014)

Neonatal sepsis

Sepsis is a common cause of neonatal death. Umbilical cord infection is a common cause of neonatal sepsis in PNG, and much of the problem occurs in babies born in villages. Appropriate cord care would prevent this. To increase the proportion of newborns receiving this essential newborn care, an information brochure for mothers and a pre-packed newborn cord care kit is being developed. This kit will include a vial of gentian violet, cotton wool swabs and soap, plus the New Mother's Brochure, which will explain all the interventions that every newborn should receive (early breast feeding, Vitamin K, Hepatitis B and BCG vaccines).

Baby Friendly Hospital Initiative

This was started in 1989, supported by WHO and UNICEF and was implemented in three hospitals in PNG. However, donor funds ceased and the impetus for continuing was less. The BFHI is as important as ever, with increasing pressures on mothers to feed in alternative ways, the mounting evidence that early solid feeding is a major risk factor for pneumonia, HIV and uncertainty around breast feeding, and the lack of enforcement of the Baby Feeds Supply (Control) Act 1984. Having policies of exclusive breast milk feeding in hospitals in PNG is important to showing a lead to mothers and the community on the importance of breast

feeding. A recent initiative in ANGAU Hospital showed that the BFHI can be successfully introduced without external funding.

A centre of excellence for neonatal care

PNG needs a facility for training nurses in good quality neonatal care, and the large population of Port Moresby requires a facility for sick newborns to receive the best care that can be provided. There are over 14,000 babies born in Port Moresby each year. The Neonatal Unit at PMGH admits about 1,000 sick newborns each year, mostly with low birth weight, prematurity, sepsis and birth asphyxia. In the first five years of this plan a new neonatal unit was built. Having centres of excellence in neonatal care in major provincial hospitals, emphasizing Early Essential Newborn Care, low cost technology and standard treatment provide a good model for other provincial hospitals throughout the country. The aim is not to strive for high technology neonatal intensive care units, but units that support essential newborn care and, where safe, high quality care for babies with very low birth weight, sepsis, birth asphyxia, correctable congenital malformations and other sick babies can be provided, with their mothers. Improvements are needed for many neonatal units in provincial hospitals in the next five years.

Activities

Below are some other important activities in neonatal care in provinces:

- Promote and train staff in early essential newborn care, as described above.
- Develop and implement models of neonatal care at district hospitals. Review hospitals to assess to what degree they comply with minimal standards of neonatal care, and what would be required to achieve this level (space, basic equipment, essential drugs, human resources, training, auditing, infection control measures, etc)
- Undertake facility improvements to labour wards and special care nurseries
- Train staff in care of the sick newborn, neonatal resuscitation and early essential newborn care through the Hospital Care for Children training
- A Neonatal Resuscitation flow chart has been developed for labour wards and special care nurseries. This will be distributed to all hospitals and health centres where babies are born. Neonatal resuscitation training will be done, integrated within the WHO Pocketbook of Hospital Care for Children course
- Modify neonatal resuscitation for training health workers/volunteers in management of birth asphyxia at health centres and community levels
- Promote and train staff in Kangaroo Mother Care as part of the quality of care for very low birth weight babies

Improve the reporting of neonatal diseases (low birth weight, birth asphyxia, neonatal sepsis and congenital malformations) through the Paediatric Hospital Reporting program and the existing NHIS

Key messages for Provincial and District Health Staff

- Promote and train staff in early essential newborn care
- Review hospitals to assess what would be required to achieve standards of neonatal care (space, basic equipment, essential drugs, human resources, training, auditing, infection control measures, referral guidelines, etc)
- Undertake facility improvements to labour wards and special care nurseries
- Train staff in care of the sick newborn, neonatal resuscitation and early essential newborn care through the Hospital Care for Children training
- Encourage skin-to-skin ('Kangaroo') care
- For assistance with neonatal care issues contact the provincial paediatrician

7.5 Nutrition and Malnutrition

Nutrition is a vital but often neglected part of health care in Papua New Guinea.

Malnutrition

The rate of malnutrition is unacceptably high and contributes substantially to high child mortality, poor growth and neurodevelopment and high infectious disease morbidity. The Paediatric Hospital Reporting program data indicates that 11% of 97,000 children admitted to hospitals between 2009 and 2014 had severe malnutrition, and the mortality rate was 18%. A recent (2014) survey at Port Moresby General Hospital showed the rate of severe malnutrition to be as high as 20% among in-patient children. Most of the malnutrition at PMGH was associated with other chronic illnesses, but under-feeding and low calorie intake is a potent cause. In addition, many other children suffer from moderate malnutrition, which increases the risk of death from pneumonia, diarrhoea, tuberculosis, HIV and malaria.^{10;11} Two-thirds of all child deaths in PNG are associated with moderate or severe malnutrition.

The 2005 National Nutritional Survey showed over half of all children under five years of age had some degree of malnutrition. Contributing factors towards malnutrition include early weaning, inappropriate feeding, adoption and infections. Improving rates of exclusive breast feeding for six months and improved quality of complementary feeding is crucial to achieving better nutrition throughout childhood.

The National Nutrition Survey showed that stunting and underweight are a serious public health problem (prevalence above 40%). Levels of stunting and wasting are particularly high in the first two years of life. The prevalence is higher in rural than in urban areas, and Momase is the region where the highest proportion of children are affected.

Given the high prevalence of malnutrition in the second year of life, nutrition services should be expanded, and opportunities must be created to reach children between 13 and 24 months old. Many children do not attend well-baby clinics once immunizations are completed. More emphasis should be placed on education on adequate complementary feeding, both in quality and quantity, and on growth monitoring and plotting the weight chart with each vaccine.

Breast feeding promotion

There is a need to promote proper breast feeding practices, and to integrate different programs that have a nutrition component. Existing programs include IMCI, Infant and Young Child Feeding (IYCF) and the Baby Friendly Hospital Initiative (BFHI). IYCF trains health workers to support breast feeding and effective complementary feeding, and aims to improve knowledge and skills among adolescents and soon-to-be-parents. Apart from health workers, targeted groups for training include village health volunteers, school health workers, and mothers of high risk babies (such as low birth weight), nutritionists and teachers.

The WHO recommends initiation of breast feeding within the first hour of life, exclusively breast feeding for the first 6 months of life, and continued breast feeding until two years of age or older. Reviews have shown that initiation of breast feeding within the first 24-hours of birth is associated with a 45% reduction in all cause and infection-related neonatal mortality, and is thought to mainly operate through the effects of exclusive breast feeding.

There are impediments to improving infant nutrition in PNG, including private businesses and public service facilities that don't provide breast-feeding friendly work environments, infant formula companies that promote their products to midwives and young mothers, and pharmacies and other outlets illegally selling infant feeding bottles. These obstacles need to be addressed by education, updating of the existing legislation by including provisions of the International Code of Marketing Breast-Milk Substitutes and enforcing existing legislation.

Complementary feeding

Health workers should become conversant in what to advise mothers on the introduction of adequate complementary feeding. Mothers and caregivers often introduce foods too early, and very often complementary foods are not sufficiently energy dense, not frequent enough, and have low protein content.

Micronutrients

Support should be given to efforts to fortify staple foods, such as rice and flour with multiple micronutrients including iron, iodine, zinc, thiamine, riboflavin and folate. Locally grown foods that are naturally full of micronutrients should be identified and encouraged to be grown in family food gardens. This will require collaborative effort from the different stakeholders such as agriculture.

Vitamin A

The target population for vitamin A supplementation is children six months to five years. The current Standard Treatment Manual recommends two doses, given at six and 12 months. To improve vitamin A coverage it would be valuable to expand vitamin A supplementation into the second year of life, by adding additional doses at 18 and 24 months. Vitamin A is delivered through EPI. There is a need to record vitamin A administration in the NHIS and Baby Health Record Book. Include a dose of vitamin A to post-natal mothers.

Deworming

De-worming with albendazole should be given with vitamin A at 12 months of age, then at regular intervals thereafter, every 3-4 months if possible.

Zinc

Zinc is part of standard treatment for children with diarrhoea and malnutrition. Zinc is currently not widely available in PNG, and efforts should be put into distribution of zinc to all health facilities.

Growth monitoring every time a child receives vaccines

Growth monitoring is an important part of child health. Its impact is dependent on whether staff have weighing scales, are able to understand how to plot a weight chart accurately, understand the meaning of a flat or falling weight line, and counsel the caregiver appropriately. In remote areas in PNG there is a lack of weighing scales. Health workers can take a history of the child's dietary intake and counsel mothers and other caregivers on feeding appropriate for the child's age. In addition, evaluation of milestones is helpful to assessing the nutritional and development state of the child. Measuring mid upper arm circumference (MUAC) is useful in areas where scales are lacking. Regular growth monitoring is an important part of child health in PNG, and it should occur at least at every vaccine visit and every presentation with illness.

The ability to measure height would allow identification of severe acute malnutrition (SAM) and moderate acute malnutrition (MAM). Again, impact will be highly dependent on staff understanding how to measure and plot height, and their acceptance.

Nutritional support to sick and malnourished children

The mortality rate for severe malnutrition in provincial hospitals is 20%. Currently, in most hospitals, children with acute severe malnutrition do not receive the frequency or volume of feeds they need, basic complications such as hypoglycaemia and hypothermia are not monitored for. A staged, systematic approach to the management of acute severe malnutrition follows WHO and PNG standard treatment guidelines, and is part of the Hospital Care for Children training course. Improvements in the management of severe acute malnutrition in PNG hospitals may reduce the very high mortality rate among children with severe malnutrition.

There is a need for hospitals to improve services, both for in-patients and in the community for children with poor nutrition.

In most hospital Nutrition Rehabilitation Units (NRU) have been closed down or operating under difficult circumstances. The re-establishment of nutrition rehabilitation units and the appointment of nutritionists in hospitals are important.

Training in the management of acute severe malnutrition.

Training in the outpatient management of moderate acute malnutrition

There is a need for provincial health offices to work with departments of agriculture to support better nutrition in the community.

Some countries have replaced NRU's with community-based distribution of RUTF (ready-to-use therapeutic foods). Development of local manufactured RUTF is crucial to sustaining supply. This requires coordinated inter-sectoral collaboration (including DAL, NARI, UNITECH, SMHS, DOH-Nutrition and Food Safety).

Human resources for nutrition

It is of concern that the number of nutritionists has decreased over the years. PNG has no dieticians in the Department of Health, let alone dieticians specializing in child health. Use of ready-to-use therapeutic feeds should be explored in children with malnutrition, tuberculosis and HIV. There is a great need for dieticians and nurses to assist with the implementation of nutrition programs in hospitals and the community.

The Health Department Nutrition Unit has proposed to create at least one position for dieticians at Level 1 and Level 2 (combined with a training program for local dieticians). Dieticians could advise on food services for malnourished children.

Given the central importance of nutrition there is a need for a paediatrician trained in nutrition to help provide national leadership in this area.

Essential nutrition requirements

Affordable and proven nutrition interventions through actions at health facilities, in communities and through communication channels are available. In summary, these include:

- Exclusive breast feeding (EBF) from birth to six months
- Adequate complementary feeding from about 6–24 months with continued breast feeding for at least two years
- Appropriate nutritional care of the sick and severely malnourished children
- Adequate intake of vitamin A for women and children
- Adequate dietary intake of iron for women and children
- Adequate supplementation to pregnant women with: iron, folic acid, and calcium
- Adequate intake of iodine by all members of the household

Reduction in malnutrition and its consequences therefore depends on interventions started before or during foetal development and infancy.

Key messages for Provincial Health Offices

- Every time attends a health centre to receive vaccines, they should be weighed and have their weight plotted on their growth chart in the Infant Record Book. A flat or falling weight curve indicates the child requires help. Don't wait until a child has severe malnutrition to do something about it
- Re-establish a Nutrition Rehabilitation Unit in your province
- Train staff in nutrition and the management of acute severe malnutrition, using IYCF training and the WHO Hospital Care for Children courses
- Create a position for a nutritionist in the province and nutrition officers for your districts
- Promote exclusive breast feeding from birth up to six months of life, and support education for mothers in complementary feeding
- Have breast feeding friendly policies in all work environments
- Enforce the Baby Feeds Supply (Control) Act 1984 (under revision: this Act after it is completed will be called the Infant and Young Child Feeding Act, and will prohibit the selling of infant feeding bottles without a prescription from a paediatrician)
- Support your hospitals to be accredited as 'Baby Friendly'

7.6 Improving Quality of Hospital Care

In many hospitals and health centres there are problems in supplies of drug and basic equipment, buildings and facilities, limited training and support for health staff, and lack of a family and child friendly environment. Improving the quality of paediatric care will improve outcomes and generate community demand. Improving the management of malnourished children, triage and emergency care, oxygen administration, supportive care and monitoring is relevant whether children have pneumonia, tuberculosis, HIV, or less common conditions. This can be addressed by a program of training for nurses, better use of guidelines, better facilities and equipment (including oxygen), and improved data collection to follow outcomes and measure impact. Efforts to improve the availability of food supplies on hospital wards, improve the detection of children at high risk of malnutrition, and improve malnutrition management are also crucial.

Paediatricians and child health nurses have important roles in improving quality within hospitals and throughout their provincial and district health services.

Standards are available, in official technical guidelines such as the Standard Treatment Manual and the WHO Pocketbook of Hospital Care for Children. Outcome data are being monitored in many hospitals and quality improvement initiatives started based on these data.

WHO Pocketbook of Hospital Care for Children training course

Training in clinical guidelines and quality of care is designed to improve the holistic management of sick children at a hospital level. It was adopted in 2009, and successful training courses conducted in Kimbe, Wabag, Mendi, Goroka, and Mt Hagen. The training addresses all the stages of management of any sick child, and teaches health workers how to use the guidelines in everyday clinical practice. The 4-day training course is a vehicle for teaching about current issues and changes to treatment (such as the improvements in the management of childhood TB, changes to Prevention of Parent to Child Transmission, new vaccines, use of zinc in diarrhoea, improved management of malnutrition, Early Essential Newborn Care). Copies of the WHO Pocketbook have been distributed to colleges of training, the School of Medicine and to hospitals, through the paediatricians. Training CDs are available from the Paediatric Society.

Improving oxygen supplies and the management of severe pneumonia

In PNG the most common cause of death among children under five years old is pneumonia. Hypoxaemia (low oxygen levels in the blood) is the major complication of pneumonia leading to death. Hypoxaemia is also a complication of other common diseases, particularly among newborns. Children with severe pneumonia need both antibiotics and oxygen, but oxygen shortages are common due to the cost and complex logistics of transporting oxygen in cylinders. Detection of hypoxaemia using clinical signs can be difficult. Pulse oximetry is the most reliable, non-invasive way of detecting hypoxaemia. In 2003 the Health Department and the Paediatric Society started a trial of oxygen concentrators, machines that generate oxygen from ambient air, and pulse oximeters. It was hoped that the installation of a reliable, sufficient and cheap source of oxygen in hospitals coupled with the use of pulse oximetry would make a significant difference to child survival rates in PNG. The oxygen concentrator / pulse oximeter project was implemented successfully in 9 hospitals by 2008, reducing mortality from pneumonia in the first five hospitals by 35% (from 5% to 3.2%).^{17,18}

There will be an expansion of the oxygen concentrator / pulse oximeter program to all provincial and rural hospitals and major district health centers in the country. Funding will be required for equipment, installation, commissioning and training (for clinical staff and hospital engineers), and for the oxygen team (paediatrician, biomedical engineer and nurse administrator) to provide regular support to each of the hospitals involved.

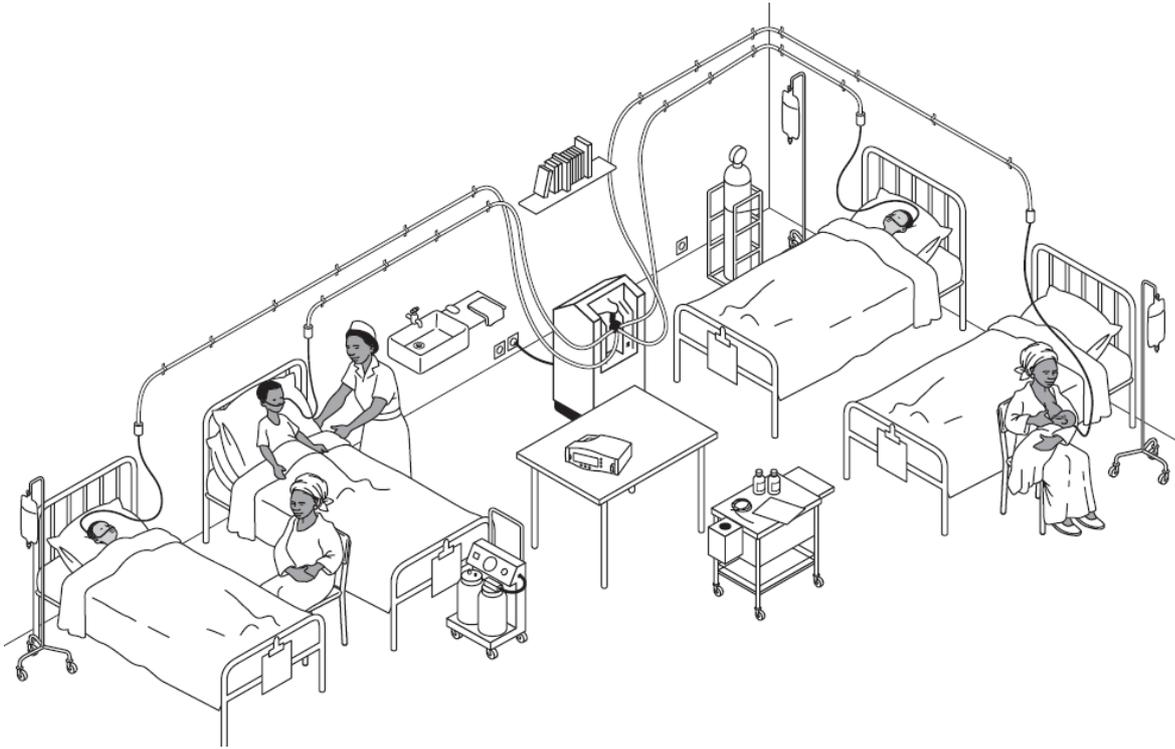


Figure 3. A high dependency unit in a provincial hospital will improve quality of care

Paediatric Hospital Reporting (PHR) program

In 2009 a computer program called Paediatric Hospital Reporting (PHR) was introduced to standardize hospital statistics, understand disease burdens and monitor mortality rates and quality of care. The program records all admissions and outcomes, common diagnoses in sick children, and outcomes. This program produces standardized reports and calculates case fatality rates. The diagnostic classifications used are consistent with ICD-10 classification system, WHO guidelines and PNG standard treatment classification systems. A single data summary sheet is generated by the program for any selected time period describing admissions, deaths and case-fatality rates for common diseases, co-morbidities, vaccine-preventable diseases and age-specific mortality rates. The data from all hospitals are combined, and the lessons in terms of policy and practice are considered by the Child Health Advisory Committee. Five annual reports of child morbidity and mortality have been published (2010-2014). The program has enabled the reporting of the causes and outcomes of over 97,000 admissions in 17 hospitals over six years.

With the introduction of new vaccines, such as Hib vaccine in 2009 and pneumococcal vaccine in 2014, and the increased efforts to identify and control outbreaks of measles, and to maintain PNG's polio-free status, there is a need to increase the quality, timeliness and accuracy of vaccine-preventable disease surveillance. In 2008 there was a strengthening of vaccine-preventable diseases (VPD) reporting. The system is coordinated at the Health Department, jointly by the Disease Control Branch and Family Health Services. These departments work with provincial and national health offices, aiming for timely responses to reported outbreaks. The PHR also enables reporting of hospital presentations of all vaccine preventable diseases: measles, rubella, acute flaccid paralysis, pertussis, tuberculosis, Hib and pneumococcal meningitis, tetanus.

Hospital outreach services

Hospitals should support rural health services by regular outreach to rural health clinics. These can be coupled with teaching, assessments of equipment, drug and infrastructure needs, clinical reviews of patients and encouragement for rural health staff.

Improving the care of children with chronic illnesses

In every district or province there are many children with chronic non-communicable illnesses: epilepsy, asthma, rheumatic or congenital heart disease, cerebral palsy, diabetes, cancer, or the long-term effects of neonatal illness. While each condition is uncommon compared to pneumonia and febrile illnesses, taken together these chronic conditions comprise a very large burden of disease. Preventable complications, including malnutrition, poor control of the primary disease, non-compliance with prophylaxis and loss to follow up lead to a large burden on the health system of complications and preventable deaths, and a large social and economic burden on families and communities. Children with chronic conditions need consistent long-term follow up and care. Models of care for chronic conditions need to include basic and ongoing care at a primary health and district level, and specialist care at a provincial hospital level. This requires clear treatment plans, effective communication between primary and referral levels, parental education and empowerment, and mechanisms to provide medicines for less common diseases near where the patients live.

Even less addressed than chronic physical conditions are mental health and developmental problems. Some services for children with developmental problems such as cerebral palsy, impaired vision and deafness exist, but are rudimentary and often dependant on philanthropy. Services for disabled children need to be better coordinated and supported, and specific skills in holistic care for such children need to be taught in health training curricula for nurses, doctors and paediatricians.

Improving hospital care for sick adolescents

Providing appropriate facilities for sick adolescents is an important initiative. A model of an adolescent area in a children's ward will be developed (see adolescent health).

Key messages for Provincial Health Offices

- Each province needs at least 2 paediatricians to care for sick children and to support provincial child health programs. If you don't have the required number, consider creating a provincial position
- Good quality hospital care depends on trained staff, including child health nurses, consider sending nurses for post-basic training in midwifery or child health nursing
- Make sure all health workers who treat children have a copy of the PNG Standard Treatment Manual and the WHO Pocketbook of Hospital Care for Children
- Conduct training in Hospital Care for Children for your provincial and district health staff who treat children
- Oxygen is an important intervention for children with pneumonia and other common problems, invest in oxygen concentrators and pulse oximeters, and if needed solar power for health centres and district hospitals

7.7 Pneumonia

Acute lower respiratory infection is the most common cause of serious illness and death in children in PNG, accounting for 30-40% of all hospitalizations. Pneumonia, the commonest cause of ARI, is particularly prevalent in highlands provinces. A comprehensive strategy to address pneumonia is outlined in this Child Health *Policy and Plan*. Interventions to reduce pneumonia morbidity and mortality are included in many program areas, but are brought together in this section to illustrate the multi-faceted strategy required.

Causes

The major bacteria causing pneumonia are *Streptococcus pneumoniae* (pneumococcus or Sp) and *Haemophilus influenzae* (Hi). The most common pathogenic Sp serotypes are 2, 5, 6B, 7, 14, 19F, 23F. Both typable and non-typable strains of Hi cause pneumonia in PNG children; about 20% of all Hi strains are Hi type b. Viruses, particularly respiratory syncytial virus (RSV) and influenza are also common, and occur in seasonal outbreaks. Viruses are often associated with secondary bacterial infection. In the last 10 years with the increase in HIV infection, other pathogens are increasing in prevalence. In HIV affected children *H. influenzae* and *S. pneumoniae* are the most common causes; however, *Pneumocystis jiroveki*, *Staphylococcus aureus*, and enteric Gram negative bacilli (such as *Klebsiella* spp and *E. coli*) are found more commonly in HIV-infected than HIV-uninfected children. Tuberculosis is also a common pathogen in HIV-infected and uninfected children causing pneumonia.

Pneumonia mortality is highest in children with malnutrition, neonates, young infants and those with HIV.

Risk factors for pneumonia include:

- Indoor air pollution, including smoke from fires for cooking or warmth inside poorly ventilated houses
- Parental smoking (throughout infancy and childhood, and in-utero exposure to cigarette toxins)
- Low birth weight and prematurity
- Absence or inadequate of breast feeding, such as among adopted children
- Feeding of solids and semisolids in the first weeks or months of life, a common practice in some parts of PNG
- HIV infection

In this plan, given its importance to child health and mortality pneumonia is reflected in almost all program areas: EPI, IMCI, neonatal care, quality improvement in hospital care, paediatric surveillance, standard treatment and clinical guidelines, human resources and others.

Treatment

Treatment of pneumonia occurs in primary health centres, district and provincial hospitals and referral hospitals. For decades the Standard Treatment Manual has guided treatment of pneumonia. In recent years health workers have been trained in IMCI algorithms, although the roll-out of this has been fragmented. STM and IMCI case management instructions are consistent with each other, and the IMCI Checklist is incorporated into the STM. Lack of availability of standard antibiotics in some health facilities at various times has reduced access to good treatment. Absence of basic equipment such as oxygen, oxygen cannulae, nasogastric tubes and intravenous cannulae are common everyday problems in many hospitals, and need to be addressed.

Training on the management of severe pneumonia is provided in the WHO Hospital Care for Children training course. This includes management of complex and simple cases, and identification and management of complications and comorbidities including hypoxaemia, malnutrition, HIV, anaemia and heart failure. It includes all stages of management, including triage, history, examination, diagnosis, treatment, supportive care and monitoring, discharge planning and follow-up.

A program started in 2004 to improve oxygen supplies and pneumonia treatment has produced good results. This program, based on use of oxygen concentrators and pulse oximeters for detection of hypoxaemia

reduced case fatality rates in five hospitals by 35%. This program is now in many hospitals and will be extended to all provincial hospitals and district level hospitals during the life of this plan.

During the life of this plan, a simple system of CPAP (continuous positive airway pressure) will be trialled in an effort to further reduce mortality from ARI and neonatal respiratory distress. CPAP is highly effective in Western countries, and is increasingly being used in developing countries in Africa and Asia, and has been shown to significantly reduce mortality in children with pneumonia in Bangladesh. CPAP may be an adjunct to antibiotics, oxygen and good supportive care.

During the life of this plan there will be consideration of changing from chloramphenicol to benzylpenicillin (or ampicillin) and gentamicin as first line treatment for severe pneumonia in the Standard Treatment Manual tenth edition.

Prevention

Immunisation

Immunisation with existing vaccines in the EPI schedule (pertussis, BCG, measles) helps prevent certain types of pneumonia. In 2008 PNG introduced the Hib vaccine, which will prevent a proportion of pneumonia due to *Haemophilus influenzae*.

Vaccine strategies against *S. pneumoniae* (pneumococcus) have previously been trialled in PNG. The pneumococcal polysaccharide vaccine was used in the 1980s showing protective effect against all-cause mortality when given to infants as young as nine months. PNG has funding support from Gavi for the introduction of pneumococcal conjugate vaccine (PCV). The vaccine is the 13-valent pneumococcal conjugate vaccine which contain most of the serotypes commonly found in studies in PNG children. Use of PCV13 commenced in 2014.

Other types of prevention

These are equally as important as immunisation and include:

- Reducing indoor air pollution by reducing cigarette smoke exposure throughout infancy and childhood, and in-utero cigarette exposure, and reducing cooking smoke exposure in homes
- Improving rates of exclusive breast feeding and childhood nutrition
- Improving nutrition in very low birth weight babies and other maternal strategies to reduce prematurity
- Prevention of parent to child transmission of HIV
- Early care seeking when children have signs of pneumonia

Surveillance

There are two methods of surveillance: laboratory and clinical. In 2007-08 a laboratory-based surveillance system for meningitis was established in eight sentinel sites. This system is designed to monitor the effectiveness of the introduction of Hib and pneumococcal vaccine, and is also providing valuable information on the burden of other vaccine preventable meningitis pathogens, particularly pneumococcus. Sustaining this system will rely in part on hospitals purchasing latex agglutination test kits for detecting CSF pathogens. Latex antigen test kits should be included on the medical catalogue of drugs and diagnostics.

The Paediatric Hospital Reporting system enables the standardised reporting of hospital admission data on pneumonia and other common childhood illness, and case fatality rates. In the six years 2009-14 the PHR documented 26,000 cases of pneumonia, with an overall case fatality rate of 5%. Severe pneumonia makes up more than 40% of all pneumonia cases admitted to hospitals and has a case fatality rate of about 10%. Sustaining this surveillance system will require effort and some small ongoing resources, computer being purchased for the paediatric wards, and having ward clerks and nurses trained in basic data entry.

Key messages for Provincial Health Offices

- Create community awareness of the dangers of indoor air pollution (cigarette smoke and cooking smoke) on children's lungs

- Support introduction of the pneumococcal conjugate vaccine (PCV 13) against *Streptococcus pneumoniae*, the most important bacterial cause of pneumonia
- Other vaccines also prevent pneumonia: measles, BCG, pertussis, and vitamin A also prevents pneumonia
- Promote exclusive breast feeding, avoidance of early solid feeding
- Make improvements to services at community health (aid) posts, to include immunization services and IMCI case management and standard treatment

7.8 Malaria

Malaria is endemic in all coastal provinces of PNG, and is increasingly found in the highlands region. An objective of the PNG National Health Plan was to reduce malaria disease and mortality by 50% by 2010. In the early 2000s it was estimated that 7% of mortality in children under the age of five years was from malaria.

Malarial drug resistance is a major problem. Rates of resistance to chloroquine and amodiaquine are high. In the 2005 Standard Treatment Manual artemisinin-based combination therapy was introduced. In 2012 the proportion of deaths from malaria had fallen to 4%, and the case fatality rate for children hospitalised with malaria was between 3-5%. Reductions in malaria deaths have been largely due to better prevention methods, particularly the use of insecticide-treated bed-nets.

The Roll-Back-Malaria Strategy was introduced in an effort to reduce the burden of malaria.

Current principles of treatment and malaria control include:

Prevention with long lasting mosquito nets

Prevention measures include protection against mosquito bites and chemoprophylaxis against malaria. Insecticide-treated bed-nets are one of the safest methods of preventing and controlling malaria. Studies from other countries have found that use of these insecticide-treated materials leads to a 19% reduction in child mortality, 40-60% reduction in infection, and also a reduction in maternal anaemia, pre-term delivery and low birth weight. Use of insecticide treated nets also has an important effect on population-based malaria control. The blood meal is denied for the female mosquito and this prevents development of eggs and results in a reduction in vector population and reduced transmission. Bed-nets have been widely distributed in PNG, with uptake rates of 30-40%. These rates are low, but there has still been a significant effect on malaria cases and severity. Falciparum malaria is now much less common, while Vivax malaria - not as well prevented by bed-nets - remains a major problem in PNG.

People living in endemic areas, and travelers to such areas, should be encouraged to adopt protective habits and use protective measures against mosquito bites. These include closing doors and windows in the evenings to prevent entry of mosquitoes into houses; using mosquito repellent lotions, creams, mats or coils and regular use of bed nets.

Diagnosis and treatment

Investigations for malarial parasites, either a blood slide or rapid diagnostic test, should be done where possible in all cases of fever, and treatment with effective doses of antimalarials should be administered, according to severity classification based on the Standard Treatment Manual. Many patients fail to complete treatment due to either lack of understanding, belief that when feeling well treatment is no longer necessary, and sometimes due to perceived or real adverse effects.

Activities and future directions

Improvements in the management and control of malaria in children will be closely aligned with the overall malaria control program.

Key issues in the next few years include:

- Improve supplies of artemether-lumefantrine, and increase use of rapid diagnostic tests to guide treatment of children with fever
- Ensuring that the formulations of all standard antimalarial drugs are appropriate for children
- Supporting efforts to increase the use of diagnostics in clinical decision making
- Considering the implications of research in PNG and elsewhere on intermittent chemoprophylaxis measures for infants (IPTi)
- Introducing artesunate suppositories for pre-referral treatment in health centers, and including this in the Standard Treatment Manual

- Improving reporting mechanisms from the district to provincial health level and to NHIS, and improving the reporting of malaria cases and case fatality rates from hospitals
- Establishing the extent of other causes of fever, such as dengue, by utilizing new technologies for diagnosis
- Improving the tendering process, procurement and supply of all essential drugs and supplies. Establish a sustainable mechanism to deliver antimalarial drugs and related supplies to all levels of the health service

Create a position of National Coordinator of childhood malaria, to establish seminal sites for surveillance, provide evidence for treatment and prevention recommendations, and link other child health programs (such as IMCI, hospital care, standard treatment) and with the malaria department

Key messages for Provincial Health Offices

- Artemether-Lumefantrine (Coartem) is highly effective treatment for malaria
- Coartem is safe and effective, but costs more than older drugs, so it is important that we improve diagnosis of malaria. Support the use of rapid diagnostic tests in deciding who to treat
- Bed-nets save lives. Distribute them at every opportunity

7.9 Tuberculosis

Childhood tuberculosis (TB) is a huge burden in PNG. In 2009-14 there were over 7,000 children admitted to hospitals participating in the PHR program, and over 800 deaths, with a case fatality rate of 11%. This represents a fraction of the cases of TB in children. Childhood TB reflects high the transmission rate of TB in the community. Treatment completion rates are far too low, and children ceasing treatment even before the completion of the intensive phase is a common reason for relapse with worse forms of TB, many untreatable, and this leads to severe chronic disability and many preventable deaths. Pulmonary and extrapulmonary TB contribute substantially to child mortality, malnutrition and impaired neurological and cognitive development. Improving the detection, prevention and management of children with TB was considered by the Paediatric Society as a major priority, and was added to the areas of child survival identified by the Western Pacific Region. Ensuring children with TB are identified and complete treatment under supervision should be the primary aim.

Progress in child TB will require reforms to the way TB is treated. In 2010 there was the introduction of paediatric fixed-dose combinations (FDC), but these have been problematic because of poor availability.

Some of the problems of TB include:¹⁹

- Lack of TB drug supplies
- Too early discharge
- The lack of formal supervision in the community
- Children ceasing treatment even before completion of the intensive phase
- Lack of implementation of preventative strategies, including isoniazid preventative therapy

Some recent improvements to the management of TB in children include:

- Introduction of fixed-dose combination therapy
- Training health workers on child TB management. Training on tuberculosis is now incorporated within the Hospital Care for Children course, and training modules have been developed for this and piloted in the highlands provinces in 2013-2015
- The 2011 Standard Treatment Manual included standardized regimens for FDC therapy. Ethambutol replaced streptomycin for all cases requiring four drugs in the two-month intensive treatment phase, regardless of age. Elimination of the use of streptomycin was because of ototoxicity and painful injection, and high risk of streptomycin resistance

Essential measures to reduce child TB

- *Improve diagnosis:* TB in children is diagnosed on the basis of clinical features: epidemiology, history and examination. Chest x-ray, acid-fast bacilli testing and GeneXpert MTB/RIF on gastric aspirate or sputum for older children, and Mantoux testing are useful if available. Screening should be done for all child contacts of adults with TB. Screening does not need complex tests, it can be done by based on symptoms and signs, thus can be done in health centres and district hospitals
- *Do not discharge patients with TB too early.* Keep all children in hospital for the full duration of their intensive phase treatment (2 months) whenever this is feasible. To do this child and family friendly health facilities are needed, where children can go to school while they receive supervised treatment
- *Address community follow-up:* have outreach TB nurses follow-up patients from hospital wards to home and supervise their care
- *Address poor drug supplies:* ensure TB drug availability in all health facilities where TB is treated and train health staff in their use
- *Prevention:* ensure that in TB clinics a nurse should screen all exposed children and start isoniazid preventative therapy if the child does not have symptoms of TB

TB and HIV

Where HIV viral particle PCR testing is available, HIV-exposed newborns should have a PCR test at six weeks of age. If the HIV PCR test is negative, BCG should be given. In health facilities where the PCR test is not available, BCG should be given to all newborns of HIV affected mothers at birth, and the infant closely followed up. It is an aim to have HIV PCR testing of HIV affected infants introduced in all hospitals during the life of the Child Health Policy and Plan.

HIV-infected children who do not have a clinical diagnosis of TB should be started on isoniazid prophylaxis to prevent TB.

Ensure availability of tuberculin solution (purified protein derivative, PPD) in hospitals. Mantoux testing still has an important role in child TB diagnosis and it should be available at all hospitals.

GeneXpert testing and multi-drug resistant TB in children

During the life of this plan there will be use of GeneX-pert MTB/RIF testing in more provincial hospitals, and development of guidelines for testing indications and interpretation. GeneXpert diagnoses TB disease and Rifampicin resistance, and is the first step in identifying children with multi-drug resistant (MDR) TB. However, GeneXpert should not be relied upon to diagnose TB, as it is insensitive. TB is still diagnosed on the basis of clinical features (epidemiology, history, examination, and radiology, Mantoux testing and Xpert if available).

GeneXpert testing should be done on all children who are:

- Contacts of known MDR cases or suspected MDR cases
- Relapsed or re-treatment cases
- HIV positive
- Failing treatment despite supervised treatment and proven adherence

Guidelines for treatment of MDR-TB are available from the National TB program, and will be finalised and incorporated into training.

Key messages for Provincial Health Offices

- Fixed-dose combination therapy for TB has been introduced, including for children
- Children with TB should not be discharged until (1) they complete the intensive phase of TB drugs, (2) their parents or caregivers understand the disease and the importance of adherence to TB medicines, and (3) they have a safe and supportive environment to go home to. If children are discharged early there is a high risk of defaulting and relapse with a worse form of TB. This causes many preventable deaths of children
- Every province needs paediatric TB nurses and a disease control officer who can liaise between hospitals, health centres and families affected by TB
- Support training for health staff in child TB management, as part of the Hospital Care for Children course

7.10 HIV AND AIDS

PNG has a generalized HIV epidemic. The first case of HIV was detected in PNG in 1987. Based on improved surveillance, mainly using antenatal clinic data, the revised national HIV prevalence rate is estimated at 0.92%, down from previously reported 2% some years ago. Although a recent report also indicated HIV rates to be levelling off, the drivers of HIV in PNG are still the same, therefore, we cannot be complacent about HIV in PNG.

The best way in preventing children from being exposed to the HIV virus is to keep their parents negative (Primary Prevention). However, the data shows that PNG has a generalized epidemic with heterosexual transmission being the most common mode of transmission. This, in combination with the slow start in trying to control the epidemic, has exposed many parents and their children to the HIV virus and subsequently many children have developed AIDS.

A major priority in HIV among children is the Prevention of Parent to Child Transmission (PPTCT). This treatment is being extended throughout the country. Drugs are available but human resources are increasingly stretched. Antiretroviral programs for mothers and children are now available in many of the major hospitals. The human resource implications of scaling up HIV treatment and prevention programs has not been fully appreciated and is providing stresses and challenges for provincial health systems, and those at Port Moresby General Hospital. There is an urgent need for providing a paediatric HIV nurse and a midwife trained in PPTCT in each province.

In 2012 the Department of Health adopted a policy of initiating treatment for all HIV-positive women diagnosed during pregnancy, regardless of whether a CD-4 count can be done or not. This is in line with WHO policy in this area.

In the last ten years AIDS and HIV related infections have been in the top ten commonest causes of admissions and deaths in paediatric wards. Assuming that a third of the exposed children may become infected, there will always be a group of children who will require ART as part of managing their illness.

For children with HIV infection in PNG life until recently has been of poor quality with numerous recurrent infections and malnutrition requiring multiple admissions to the children's wards. HIV has been a huge burden on individual families and on an overburdened health system. Introducing ART has increased survival and improved quality of life for many HIV-positive children.

HAART therapy was introduced into the public health system in 2003. Paediatric ART formulations became available in 2007-8. This has made treatment a lot more child friendly and easier for the family to adhere to. Management has to be age specific (as children are not small adults), and needs to include cotrimoxazole prophylaxis for pneumocystis pneumonia (PCP), isoniazid for prevention of tuberculosis, and nutritional rehabilitation and support.

To assist with malnutrition ready-to-use therapeutic food (RUTF, e.g. Plumpi-Nut) has been made available since 2007, but has not been widely used. Moreover malnutrition in this setting requires more than RUTF and hence it is recommended that each facility providing care for HIV infected children must set up its own nutritional rehabilitation program.

Paediatric HIV management should be an integral part of management of childhood illnesses and must be included in training for those who run MCH services. Paediatric HIV and AIDS have been included in the standard treatment for children in into the Hospital Care for Children training course and IMCI.

Priorities in paediatric HIV

- (1) PPTCT: Strengthen the implementation of the PPTCT program in provinces. Increase counseling and testing, PPTCT and ART in all provincial hospitals.
- (2) Antiretroviral therapy
 - Increase access to ARV to level 1-5 hospitals
 - Update to newer and more effective regimens
- (3) Cotrimoxazole and isoniazid prophylaxis
- (4) Inclusion of HIV step in IMCI check list, and training on HIV in Hospital Care for Children training
- (5) Feeding and nutrition
 - Exclusive breast feeding for the first six months of life for all HIV exposed children should be encouraged because its protective effect outweighs the risk of breast milk related transmission
 - Emphasize avoiding mixed feeding (formula and breast milk) because of the increased risk of HIV transmission
 - Strengthen and support nutritional programs in health care and community settings for HIV exposed and infected children, including the use of RUTF.
 - Replacement formula feeding in exceptional cases, where it is safe, feasible, available, affordable. Discuss with paediatrician first
- (6) Emphasize involvement of fathers (husbands) and the supportive role that the wider family can play. Fathers' involvement is important for family planning, support and further contact tracing
- (7) Involvement of senior clinicians providing care and treatment to children infected and affected by HIV
- (8) Family planning practices should be discussed during clinic visits

(9) Adolescent services for primary prevention of HIV

Key messages for Provincial Health Offices

- Prevention of Parent to Child Transmission of HIV is a high priority and will reduce the number of HIV affected children. Please support the PPTCT program, childhood ART and HIV care in your province
- Support the training of paediatric nurses and midwife trained in HIV, to coordinate the HIV prevention and treatment program

7.11 Training of paediatricians

The paediatrician's primary role in a provincial hospital is to provide the highest standard of appropriate care to all children. However it is equally important for him/her to play a supportive role to public health services, surrounding district hospitals, and primary health care providers.

It is necessary to increase specialist manpower in order to effectively provide a supportive role at the provincial level. The ultimate aim is to cover all provincial hospitals with an adequate number of paediatricians.

Training of paediatricians for the next 10 years

Currently five provinces (Manus, East Sepik, Gulf, Hela and Jiwaka) do not have a paediatrician. Between 2014 and 2016 the likely increase in workforce, taking attrition into account is between 0-4, and between 2017 and 2018 the possible increase is between 6 and 10. It is thus highly unlikely that all provinces will have a paediatrician by 2016, but it is possible by 2018.

As per National Health Minimum Standards on specialist (paediatrician) manpower requirement for hospitals, there must be a minimum of two paediatricians in all provincial hospitals and five in Level 1 hospitals (PMGH). In addition there is a need to train young paediatricians in subspecialty areas and a need for young paediatricians to take on academic roles in teaching and research. If the minimal standards are to be reached by 2020 it is imperative that a minimum of six DCH candidates enter the programme each year and continue into MMed training. This requires active recruiting. In the longer term, the National Health Plan envisages the establishment over a time frame of 20 years of four regional hospitals with PMGH or a new hospital as a National Referral Hospital offering high quality tertiary level services. This will require a workforce of at least 60 practicing paediatric clinicians.

Sub-specialty training

In order to improve the standard of clinical practice and in line with the continuous medical education program the Paediatric division recognizes the need to support selected essential areas of sub-specialization. Currently these areas are paediatric cardiology, neonatology, HIV medicine, and paediatric oncology. To achieve the long term aims of the National Health Plan it will be necessary to also train for the following areas: paediatric infectious diseases including malaria and tuberculosis, paediatric nutrition and malnutrition, and paediatric intensive care. It will also be necessary to strengthen paediatric input into disability services, child welfare services and adolescent health. It is important to ensure that there are positions established to allow those with subspecialty expertise to function effectively and efficiently. Appendix 2 outlines a plan for such training.

The training of Paediatricians in these areas should not detract from the primary aim of providing and maintaining high quality general paediatric services at provincial level.

Key messages for Provincial Health Offices

- Every province needs at least two paediatricians to provide clinical care and to work closely with the provincial health office or Provincial Health Authority to implement the child health programs
- If your province doesn't have enough paediatricians, create these positions
- Provide support for young medical officers entering the training programme in child health (Diploma of Child Health) in your province

7.12 Child health nurses and midwives

Child health nursing need a major increase in resources. In the first five years of this plan (2009-2013) there have been investments in midwifery training, with increased training places at School of Medicine and Health Sciences (SMHS), University of Papua New Guinea, and other midwifery schools, heavily supported by Australian Government, Department of Foreign Affairs and Trade (DFAT). However the same has not occurred in child health / paediatric nursing. There were three post-graduate child health nursing courses in PNG, now there is only one. This is based at the School of Medicine and Health Sciences, University of Papua New Guinea, Taurama Campus. This school trains about 20 new midwives and 15 paediatric nurses annually. Previous paediatric nursing programmes in Goroka and Pacific Adventist University in NCD are no longer running such courses.

A review of PNG's nursing workforce in 2002-3 estimated that there was a need for 435 more midwives and 200 more paediatric nurses. So more post-graduate programmes in child health nursing are needed; one in each region. The establishment of these programmes will need considerable support in terms of suitably qualified staff, infrastructure and resources. Selection processes, accreditation, recognition of skills and remuneration issues need to be addressed if paediatric nurses, once trained, are to stay in the clinical workforce.

Key messages for Provincial and District Health Staff

- Each of the four regions in PNG should have a paediatric / child health nursing training course
- There should be a child health nurse and a midwife in every health centre, and at least one on every shift in hospitals
- Send some of your nurses for paediatric nursing training
- Ensure your province has positions at the appropriate level for your staff when they have completed their training programs



Figure 4. Paediatric nurses are essential to running children’s wards, improving public child health and implementing all aspects of this plan

7.13 Community Health Nurses

PNG is moving towards upgrading aid post to be community health posts. The intention is to have these staffed by three officers; including at least one community health worker with training and skills in maternal and child health care. The services that will be offered at community health posts for mothers and children will include all essential MCH services: antenatal care, deliveries, basic newborn care, immunizations, growth monitoring, and management of common childhood illnesses, and referral of very sick children. Staff will also help encourage the Healthy Islands concept within communities.

Given the number of aid posts to be staffed, there will need to be marked increases in the number of CHWs trained and major support given to CHW training schools.

7.14 Continuing professional development

A Continuing professional development (CPD) program is important for all child health workers in PNG. Various CPD-related activities exist currently however there is no systematic program. A CPD program needs to be developed for child health and general nurses, non-specialist doctors, HEOs and paediatricians. Attendance and participation in annual medical and nursing symposiums, in-service training, clinical attachments and postgraduate training for health workers should be supported. Health workers from rural and remote areas should be included in these CPD-related activities.

CPD for paediatricians

The Paediatric Society of Papua New Guinea is a professional body made up of all paediatricians working in the country and membership is open to all child health workers. Members of the society must aim to be up to date with new and emerging information on child health diseases and clinical practices around the world. A CPD program for paediatricians should be developed with the support of the Paediatric Society, the NDoH and the Medical Board of PNG. An accreditation process should be developed as part of the CPD program as a measure of a paediatricians' performance and professional standards. The CPD program should involve five main areas of a paediatricians' practice that contribute towards the accreditation process:

- Involvement in teaching and training of doctors, nurses and community health workers in child health
- Involvement and participation in regular monthly auditing of clinical practice and outcomes
- Involvement in research and access to relevant clinical journal
- Attendance and participation at annual Medical Symposia and Paediatric Society meetings
- Involvement as an active team member of either NDoH, Provincial DoH, non-government child health organizations, hospital or clinical units

A successful CPD program requires funding to be sustainable as most paediatricians have limited access to the internet and relevant medical journals. The program is to be supported with an accreditation process to be developed by the Paediatric Society in collaboration with the Medical Board of PNG.

Activities for the CPD program:

- CPD Scoring form incorporating five main areas of paediatricians practice to be sent out annually
- Quarterly hard copies of journal articles on relevant topics and other relevant literature to be sent out
- Annual CPD test/quiz Paediatric Society in collaboration with Medical Board to develop the Accreditation process for paediatricians
- Paediatric Society and Medical Board to issue Certificate of Accreditation for successful completion of CPD program annually as a prerequisite for medical board registration

CPD for other health workers

CPD-related activities should be strengthened and supported for child health nurses, midwives, HEOs and other doctors involved in child health by their respective professional organizations, Paediatric Society and

NDoH. In-service training, clinical attachments and postgraduate training for child health workers are some of the activities that need to be supported. Access to relevant child health literature and training in usage of clinical guidelines should be available to health workers involved in child health.

Key messages for Provincial Health Office

- Support CPD activities for your midwives, child health nurses, HEOs, doctors and paediatricians in your province
- Support and strengthen networking and sharing of information among all child health workers in your province

7.15 Adolescent Health

The WHO definition of an adolescent is an individual between the age of 10 and 19 years, an age group that overlaps the paediatric with the early adult population. In Papua New Guinea, almost a quarter of the population (22.5%) is made up of adolescents. The adolescent population in PNG are being marginalised as a result of the lack of appropriate health and social services. Health programs and services targeting adolescents require multi-sectoral approaches and should involve the NDoH, National Department of Education, National Youth Commission and Department of Community Development.

The School Health Program jointly carried out by the Family Health Services in the National Department of Health and the Department of Education aims to deliver immunization to school aged children, and education on sexual and reproductive health (SRH). SRH problems are among the major health challenges facing adolescents and there are many barriers in delivering an effective SRH education and services to adolescents by the School Health Program. These barriers include lack of teacher training, lack of education materials, low school attendance by girls and the very high school dropout rates. The NDoH has no existing health program for adolescents in urban and rural areas of PNG.

Non-governmental organizations and churches deliver the bulk of services for the adolescent population in PNG. The services provided include education and related SRH services such as STI and HIV prevention and treatment, life skills training and involvement in activities that deter them from involving in social problems such as smoking, alcohol and drug abuse. The lifestyle choices made by adolescents have a major impact on the rate of non-communicable diseases in adulthood. The prevention of teenage and unwanted pregnancies will contribute towards addressing population growth concerns. Therefore, the NDoH should support these organizations in carrying out their programs with funding and technical resources.

The Paediatric Society should support the Adolescent Health section of NDoH in the development and finalizing of the National Youth and Adolescent Health Policy. This policy aims to set guidelines for the provision of health services targeting the adolescent population in the community. Paediatricians should support and be involved with existing programs and activities of government and non-governmental organizations that target adolescents in the community within the provinces they work in.

The care of sick adolescents admitted to hospitals in Papua New Guinea should be shared between the paediatric and adult medical units. The current cut-off age for admission to a paediatric ward is 12 years old while the adult wards admit 18 years and above. The management of chronic cases such as congenital or acquired heart problems, epilepsy, cerebral palsy and multiple congenital abnormalities in this age gap is also an issue. There is currently no allocated ward space and appropriate facilities for sick adolescents in hospitals within PNG.

A model of adolescent services within a hospital

Hospitals in PNG should support appropriate clinical care of sick adolescents by the introduction of an adolescent unit. The allocated ward space could be part of the children's ward, with appropriate facilities that contribute towards improved clinical outcomes. An adolescent unit could be made up of a paediatrician, an adult physician, an obstetrician, a social worker and nurses who deliver non-judgemental clinical service and education to adolescents. The continuity of care of adolescents with chronic clinical problems could be coordinated between paediatricians, adult physicians and obstetricians within the adolescent unit. An adolescent consultation clinic should be set up for follow up care. The unit should also work in collaboration with other government and non-government organizations in the community that deliver preventative and curative health services for adolescents and youths.

There is a need for interested paediatricians, adult physicians, obstetricians, social workers and nurses with interests in adolescent health to receive appropriate training.

Key messages for Provincial Health Offices

- Establish an adolescent centre in your province which can provide services to adolescents
- Involve your hospital Paediatrician, obstetrician or physician in programs targeting adolescents and youths in the community
- Support school health programs including immunization activities

- Support the training of health workers in adolescent health
- In the life of this plan immunization against HPV, the cause of cervical cancer will be introduced

7.16 Childhood Cancer, Heart Disease and Paediatric Surgery

Childhood cancer

The resources required for the management of paediatric cancer in PNG are inadequate. The priority of resource allocation in child health is given to the prevention and management of acute infections and related deaths. Childhood cancer, although not as common as infections, is not rare. Therefore adequate resources need to be allocated to ensure the effective management of childhood malignancies. This should include the availability of effective chemotherapy and appropriate supportive care for children with the intent to cure and humane palliation for children with complicated or advanced cancers.

The true burden of paediatric malignancies in PNG is unknown; however, cancer is reported to be amongst the top 10 causes of admissions in major hospitals in the country.

The following are common childhood malignancies among hospital admissions (in order of decreasing prevalence):

1. Leukemia – AML, ALL, CML
2. Lymphomas (Burkitt Lymphoma, NHL- other than Burkitt, Hodgkin's Disease)
3. Neuroblastoma
4. Retinoblastoma
5. Wilms Tumor
6. Brain tumors

There has been a notable difference in the pattern of clinical presentation compared to other parts of the world, and a change in the incidence of leukaemia in the last three decades. Studies done in the 1970s reported that leukaemia was not very common in PNG; however, more recent studies have shown that it has become the commonest malignancy in children.

The barriers to adequate management of paediatric cancers in PNG include:

- Late presentations and delayed diagnosis
- Inadequate diagnostic facilities and manpower: pathology, medical imaging, timely surgical services
- Unavailability of standardized cancer protocols
- Unavailability of drugs for chemotherapy, supportive care, palliative care
- Inadequate supportive care and facilities: nutrition, blood products, isolation areas
- No central data base for cancer surveillance
- Poor social support of patients and their families during treatment
- Limited ward space for children needing radiotherapy referral

Future plans

Paediatricians to work with provincial health and NDOH to run community awareness programs that encourage early health seeking behaviour.

To work in collaboration with CPHL and NDOH to improve diagnostic services:

Pathology: Haematology, Biochemistry, Histopathology

Medical Imaging: X-rays, Ultrasound, CT scan

Establishing an arrangement between provincial hospitals and CPHL to enable biological specimens to be sent for analysis and results sent back to hospitals in a timely manner

Standardize paediatric cancer management by use of a standard cancer management manual for paediatricians

To work with hospital pharmacies and the PNG Pharmaceutical Board to ensure the availability of drugs required for chemotherapy, supportive care and palliative care

Encourage active involvement of hospital social workers department in the support of patients and families during treatment

Establish a paediatric cancer unit (10 beds in PMGH and Lae), identify 2-4 beds in provincial hospitals for use by cancer patients

Improve facilities for supportive care like nutrition, hand washing and hygiene, and blood products, and child friendly facilities

Support central co-ordination and improve data collection and surveillance on pattern of childhood malignancies and treatment outcomes

Establish a twinning relationship with an overseas paediatric oncology unit for specialist advice and opinion

Identify key nurses for skill development in childhood cancer especially in safe chemotherapy preparation, administration and recognition and treatment of chemotherapy side effects (possibly one in each major hospital)

Continued support for paediatric oncology training for nurses

Paediatricians to train in oncology

Short courses for registrars and nurses on management of cancers and palliative care

Children with heart disease

The problem of heart diseases in PNG is relatively small compared to the other major infectious diseases and nutritional health problems. However, they are an important cause of chronic disease in children, with poor quality of life, high rates of morbidity and mortality and high costs to families if left untreated. Congenital heart disease is the largest group. Although there are limited population-based data, congenital heart disease affects 0.8% of infants born in most countries; therefore in PNG could be expected to affect 1,000 infants per year. Rheumatic heart disease is also common. Cardiomyopathies are uncommon and lifestyle cardiac diseases are seen in the adult population. Pericardial disease is mainly infective with tuberculosis the predominant cause. Staphylococcus aureus pericarditis is less common, but linked to more common skin disease, impetigo and nutritional deficiencies.

Current situation of management of cardiac diseases

Management of cardiac disease has been a well established program with historically selected cases sent to Australia for surgery and since 1993 annual visits by an Australian team of volunteers working together with the local PNG team with both closed and open cases being performed at Port Moresby General Hospital.

Provincial paediatricians identify and manage cardiac patients who are then entered into regional cardiac registries. Each year the two paediatricians with cardiology training then visit the regional and provincial centres to review children on the registries. This screening process is to identify children who may benefit optimally from cardiac surgery: those who require one procedure for a complete repair, and likely to subsequently have a normal quality of life without significant complications.

Final selection takes place at PMGH by a paediatric cardiologist from Australia in consultation with the local team and cardiac surgery team. Operations are done for the selected patients by the visiting team from Australia. The results have been very good with a mortality rate of less than 2%, and good long-term quality of life for the vast majority of children.

Over the last few years there has been an increasing amount of training and responsibility transferred to the local PNG team, to the extent that in 2009 all closed heart operations and a number of open cases were performed by the national team.

Funding for the operations comes from a number of sources including the Australian Government, NDoH, fund raising by the public and volunteer services of the Australian volunteers.

Future plans in the management of cardiac disease

Cardiac surgery will continue to pose a significant problem for resource-poor countries like PNG. Despite the increasing capability of PNG cardiac teams to manage these patients there is unlikely to be complete transfer of the overall program to PNG.

There may some merit in initially establishing a basic local cardiothoracic unit which will be capable of performing closed operations throughout the year whilst continuing to increase their participation with the

visiting teams in the open heart program. This will continue to require substantial training of selected personnel in overseas units. Components in this plan should include:

- Formation of cardiothoracic unit at PMGH
- Continuing training for the paediatrician currently under cardiology training, and to identify a second paediatrician for further training
- Identification and training of at least two anaesthetists / intensivists
- Identification of an additional surgeon for future training
- Supporting training of two persons identified as perfusionists
- Continuing training of operating theatre and intensive care unit staff

Key messages for Provincial Health Offices

- Many children with cancer can be cured if they are diagnosed early and receive early treatment
- All children with suspected cancer should be referred to the provincial paediatrician. We have a paediatrician who has specialised in children's cancer who can provide advice
- All children with surgical problems should be referred to a provincial hospital and assessed by a general surgeon or paediatric surgeon
- The cardiac program (Operation Open Heart) in PNG has been running since 1994. Children with heart disease can receive medical treatment, and some can receive surgery and be fully cured. Refer early to your paediatrician

7.16 Child protection and social services

Child abuse and neglect

There is a need to support social services for children. In PNG some children are at higher risk of abuse or neglect. These include orphans, adopted infants, displaced children, and those living in crowded conditions in urban settlements. The number of orphans is increasing because of HIV and the breakdown of traditional village structures. Natural disasters or civil conflict give rise to displaced children, unplanned urbanization is increasing, all meaning the number of at risk children is increasing. The consequences are extreme, including malnutrition, physical and emotional injury, preventable infection with HIV and other sexually transmitted infections.

All paediatricians need to be advocates for marginalised and at risk children. More support is needed for community groups working with at-risk children and their families. More social workers are needed. Having a paediatrician within the National Department of Health who is trained in the area of child abuse and other areas of child protection is an aim for the next five years.

Reducing domestic violence

Domestic violence against mothers and physical and sexual abuse against children destroy families and destroy the psychological, emotional, spiritual and physical developments that are necessary in childhood and adolescence. It is the responsibility of everyone to speak out against such violence, and to build communities and families in which such violence is unacceptable. Health workers, teachers, community groups and neighbours need to identify and report child abuse and domestic violence.

Universal education

In the longer term child survival and improved child health and development cannot be achieved without concurrent increases in access to education. Achieving universal primary education, higher participation in secondary and tertiary education and maintaining quality of education will be as important for child and maternal health as any interventions within the health sector. There are several barriers, including school fees and available places. These need to be addressed by advocacy and legislative change.

Birth registration

Vital registration of births and deaths is important for public and population health. Health workers can promote vital registration when dealing with pregnant mothers, at delivery, and at times of infant immunization. They should also register any death appropriately. Birth registration will be emphasised on the Infant Record Book, and in health worker training in newborn care.



7.17 Children with disabilities

Our national disability policy emphasises the protection of human rights, inclusiveness, barrier free services and partnerships for an estimated 1 million people with disabilities (PWD) living in PNG. An estimated 5% of children in PNG have a disability (CWD) although there is little data on exact numbers. Most PWD and CWD live in rural areas with ~2% being able to access support services such as community based rehabilitation and special education resource centres.

In PNG illnesses causing disability are common and include meningitis, birth asphyxia, tuberculous meningitis, trauma, and prematurity/low birth weight. These illnesses may result in cerebral palsy, the most common physical disability in childhood, blindness, deafness, intellectual problems and epilepsy. Health consequences include malnutrition, increased risk of pneumonia, skin problems and dental decay. In addition to direct health consequences children with disabilities are vulnerable to socio-economic exclusion and disadvantage. It has been estimated that more than 90% of children with disabilities in developing countries do not attend school. Children with disabilities are also at increased risk of abuse and neglect. For example, the annual incidence of violence experienced by children with disabilities in some countries is several times greater than the rate experienced by children without disabilities. In spite of the extent of these problems, research into the situation of children with disabilities in PNG is limited.

Prevention of disability

Up to two thirds of childhood disability is preventable and therefore a focus on disability will require strategies for prevention, many of which are outlined in this Plan. These include:

- Vaccines against meningitis, including Hib, *S. pneumoniae*, BCG
- Strategies to improve newborn care: encouraging facility-based deliveries, skilled midwives, neonatal resuscitation
- Improving rates of exclusive breast feeding, reducing malnutrition, reducing anaemia and micronutrient deficiencies
- Strategies to improve child safety, such as car seat belt legislation, bicycle helmets, fire safety
- Strategies to improve water and sanitation

Support services for children with disabilities

Many disabilities in children are not preventable, and children will continue to live with disability despite optimal prevention strategies being in place. Improving support to services for children living with disabilities is essential to improve their quality of life, health and development, and entails a cross-sector approach as well as a multi-disciplinary approach in health.

Support services for CWD are mostly run by community-based organisations, with limited external funding. These community organisations face many challenges, including lack of data on number and type of disabilities in PNG or where and how CWD live; and poor infrastructure hindering access to CWD. There are also challenges in terms of inclusive education and health for CWD which include accessibility to these services as most live in rural areas, and there is a lack of local expertise. In regard to health, our lack of local expertise in areas such as developmental screening, audiometry, speech therapy, Braille instruction, occupational therapy, physiotherapy, optometry, orthopaedics and ENT remain some of our biggest challenges.

Support services for CWD can be improved by:

- Birth registration for all children, including babies born with disabilities
- Registration of all children with disabilities seen by provincial and referral hospital paediatric teams
- Strengthen referral pathways for CWD from all provincial peripheral health facilities to enable registration
- Strengthening or establishment of developmental screening programs for children at early education centres and in major hospitals.

- Increasing support to community organizations who work with disabled children.
- Strengthening multi-disciplinary health services for children with disabilities
- Training of nurses and paediatricians in supporting children with disabilities and their families

7.18 Urban and environmental health

The health of children in urban environments is of increasing concern. Well planned, child friendly and clean urban and rural environments can contribute to child health and development, but unsafe environments lead to transmission of infectious diseases, malnutrition, injuries, and psychological problems that can have devastating consequences. Additional effort will be needed in the coming years to provide services that address these needs. These require a multi-sector effort, involving health and education authorities, town planning, other city or local government departments, and community organisations.

Features of healthy environments for children:

- Lack of crowding in housing
- Public safety measures (e.g. speed limits on roads, seat-belt legislation, smoke detectors in homes)
- Sewage and sanitation
- Hygienic waste disposal
- Clean water
- Healthy food, fresh fruits and vegetables
- Access to preventative health care (vaccines, growth monitoring), primary health care and referral level health services
- Access to schools and education so children can reach their full potential
- Parks and play-grounds, sporting ovals and sporting teams for children to join
- Trees and gardens
- Clean air, limiting pollution
- Music
- Books
- Freedom from domestic violence and abuse of all kinds
- Freedom from bullying and peer violence
- Drug free environments

Paediatricians and other child health workers have a role in advocacy for healthy environments for children, in both rural and urban areas.

NCD health is developing primary care services. In the life of this plan there may need to be better definition of the role and credentialing of General Practitioners who look after children.

7.19 Child health research

The Child Health *Policy and Plan* strongly supports the further development of child health research and research capacity in the country. All program areas mentioned in this Child Health *Policy and Plan* have research needs, and priorities should be developed according to research that will best address high burdens of morbidity and mortality. Some of the most useful research will be operational, to gain a better understanding of how to implement effective programs and interventions in the PNG context. Other research will be epidemiological or addressing key technical questions, such as the effectiveness of new preventative or treatment strategies or the precision of new diagnostic technologies for common diseases. For program areas that are relatively new in PNG, research may be required to develop and evaluate service delivery models. Training paediatricians in research methodology is important to sustain an evidence-based child health service. In the last five years high quality research projects have been done by paediatric registrars in training through the DCH and MMed, and this increases research capacity and addresses key issues in child health. Some examples of such research are listed below:

- Meningitis and encephalitis – aetiology and new diagnostics
- Adoption practices and consequences
- Rubella infection in newborn babies
- Rotavirus diarrhoea – disease burden estimates
- Sexual abuse of children
- PPTCT and ART in children – descriptions of cohorts and outcomes
- Malnutrition
- Rheumatic Heart Disease
- Dengue
- Tuberculosis – new diagnostics
- Oxygen therapy and pneumonia
- Lung function in village and town children
- Neonatal care – standards at district hospitals
- Measles vaccine – the value of the six-month dose

CHAPTER 8. CHILD HEALTH ADVISORY COMMITTEE

In line with the WHO *Regional* Child Survival Strategy recommendations a National Child Health Advisory Committee was established in 2006. The Child Health Advisory Committee has a key role in co-ordinating and supervising child health activities. This committee reviews all child health policy areas, new evidence and information and provides recommendations to the National Department of Health (NDOH). The committee has wide representation, including that from NDoH, the IMCI programme leader, UNICEF and WHO, University of PNG, and a community breast feeding support group. It meets quarterly, overseeing many child health activities. It is a vital link between child health workers, institutions and the NDOH. The CHAC has made recommendations or resolutions concerning all the activities mentioned in this document. A recent advance has been the appointment of an IMCI leader to be a member of the committee. General support to the policy, coordinating, and monitoring roles of the CHAC will be very important to maintaining a coordinated approach to child survival.

The CHAC comprises of:

- Director, Family Health Services
- EPI spokesperson
- IMCI Paediatrician
- Nutritionist
- Chief Paediatrician
- WHO representative
- UNICEF representative
- UPNG representative
- Susu Mamas representative
- Director, Office of Lukautim Pikinini, Department of Community Development

VOLUME II

SECTION II

**STRATEGIC IMPLEMENTATION PLAN 2015-
2020**

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: POLICY DEVELOPMENT IN CHILD HEALTH											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Policy development in child health	Printing of Revised <i>Child Health Policy and Plan</i>	X	X	X					Number of revised <i>Child Health Policy and Plan</i> printed	NDoH	NDoH
	Support the Paediatrics Mid-Year meeting each June, and the Paediatric Mini-Symposium in September as major forums for child health policy development advice to the Department	X	X	X	X	X	X	X	Meetings successfully conducted twice a year Meeting report and recommendations completed and submitted to CHAC Recommendations considered by CHAC Number of recommendations adopted and enacted	Family Health Services Paediatric Society	GoPNG DPs Donor Agencies
	Support the Child Health Advisory Committee as the major technical advisory body on child health	X	X	X	X	X	X	X	Meetings conducted quarterly Meeting report with recommendations completed and distributed	Family Health Services Chair, CHAC	NDoH

STRATEGIC IMPLEMENTATION PLAN: 2014-2020												
PROGRAM AREA: INTEGRATED MANAGEMENT OF CHILDHOOD ILLNESS (IMCI)												
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required	
		2014	2015	2016	2017	2018	2019	2020				
All health workers managing sick children to be equipped with skills and knowledge to implement IMCI and Standard Treatment	IMCI training modules completed for pre- and post-service training. Trainings implemented in provinces and districts	X	X	X	X	X	X	X	X	The number of institutions, provinces and districts that have organized and run trainings Number of health workers trained in IMCI Strategy	NDoH Provincial and District Health Offices Development partners WHO UNICEF	GoPNG (NDoH, PSIP, DSIP, LLGSIP) Development partners and other donor agencies
	Establishment of training centres in provincial hospitals		X	X	X	X	X	X	X	Number of Regional Centers of Excellence for training established	NDoH Provincial and District Health Offices IMCI coordinator	GoPNG (National, Provincial and District level)
	Follow-up and supervision are implemented at the provincial level	X	X	X	X	X	X	X	X	Follow-up and supervision are incorporated into provincial annual implementation plans	Provincial Health Offices	
	IMCI training, follow-up and supervision included in provincial and district implementation plans	X	X	X						Provincial and district plans that include IMCI training	Provincial and District Health Offices	
	Develop a database of all IMCI trainers and trained health workers, including follow-up and supervision	X	X	X	X					Database developed	National IMCI coordinator	
	Infant and Young Child Feeding (IYCF) should be incorporated into IMCI training		X	X						IYCF integrated with IMCI	National IMCI coordinator	
	Coordination of IMCI strengthened at all levels of the health system	Advocate for Provincial and District IMCI Coordinator positions to be created and filled	X	X	X	X	X	X	X	X	Number of Provinces and districts with IMCI coordinators employed	NDoH Provincial and District Authorities Development partners Donor agencies WHO UNICEF
Strengthen engagement at community level and with GPs and NGOs	Establish mechanisms for community participation and ownership of the IMCI Strategy	X	X	X	X	X	X	X	X	Number of communities actively involved and participating in the community IMCI activities	NDoH IMCI Coordinators at all levels VHV coordinators at all levels Community Health Post	GoPNG (National, PSIP,DSIP)

												officers	
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STRATEGIC IMPLEMENTATION PLAN: 2014-2020					
PROGRAM AREA: EXPANDED PROGRAM OF IMMUNIZATION (EPI)					
Strategic objectives	Activities	Timeframe	Process indicators	Responsible persons	Resources required
Refer to the <i>Papua New Guinea Comprehensive Multi-Year Plan National Immunization Programme 2011-2015</i>					

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: STANDARD TREATMENT AND CLINICAL GUIDELINES											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
To have current evidence-based clinical guidelines for diagnosis and treatment of children available to every health worker	Revise the Standard Treatment Manual 10th edition (2016)	X	X						STM revised and submitted to publisher	Dr Wendy Pameh Prof Nakapi Tefuarani Paediatric Society	NDoH (FHS and Office of Chief Paediatrician)
	Publish and distribute the 2016 Standard Treatment Manual to all health workers in the country		X	X	X	X	X	X	Approximately 30,000 copies printed and appropriate numbers distributed to every PHO and every health facility in the country	Family Health Services Provincial Health Offices Technical Advisor Child Health Chief Paediatrician	GoPNG (National, PSIP, DSIP)
	Revision and reprinting of Paediatrics for Doctors in PNG		X	X	X	X	X	X	Paediatrics for Doctors in PNG revised and 10,000 copies printed per year	Professor of Child Health Chief Paediatrician	GoPNG (PSIP, DSIP)
	Revision and reprinting of Child Health for Nurses and HEOs in PNG (Green book)		X	X	X	X	X		Child Health for Nurses and HEOs in PNG revised and 10,000 copies printed per year	Professor of Child Health Chief Paediatrician	GoPNG (National, PSIP, DSIP)
	Distribute WHO Pocketbook of Hospital Care for Children	X	X	X	X	X	X	X	1,000 copies purchased per year from WHO Geneva	Technical Advisor Child Health Chief Paediatrician	GoPNG (National, PSIP, DSIP)
	Distribute Shann's Drug Doses	X	X	X	X	X	X	X	200 copies per year	Paediatric Society	DPs

STRATEGIC IMPLEMENTATION PLAN: 2014-2020												
PROGRAM AREA: NEONATAL CARE												
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required	
		2014	2015	2016	2017	2018	2019	2020				
To implement Minimal Standards of Neonatal Care in provincial and district hospitals and health centers	Conduct needs assessments of what is required for provincial and district hospitals, and health centers to achieve minimal standards of neonatal care (physical facilities, basic equipment, essential drugs, human resources, training, auditing, infection control measures)	X	X							Number of hospitals in which needs assessment conducted Report produced	National Newborn Care Coordinator, Dr Roland Barnabas, Newborn Care Specialist Provincial paediatricians	GoPNG (National, PSIP, DSIP)
	Undertake a program to upgrade health facilities neonatal and labour ward services to achieve minimal standards			X	X	X	X	X		Number of hospitals in which upgrading of neonatal and labour ward facilities underway	NDoH Provincial Health Offices	Responsibility for funding will depend on needs per health facility – GoPNG (PSIP, DSIP, LLGSIP)
Promotion of breast feeding	Revitalization of the Baby Friendly Hospital Initiative in all provincial hospitals	X	X	X	X	X	X	X	Number of hospitals accredited as Baby Friendly	Paediatric Society Family Health Services Provincial Hospitals SuSu-Mamas	GoPNG (National, PHAs)	
Making information available to all mothers on newborn care	Publish the New Mothers brochure on newborn care	X	X						Brochure reviewed and submitted to printer	Dr Theresa Rhongap Dr James Amini Paediatric Society		
	Print and distribute Baby Book and New Mothers Brochure to all health facilities where babies are born or antenatal care is given, and to community mothers groups: 200,000 deliveries per year		X	X	X	X	X	X	250,000 Copies printed per year and appropriate numbers distributed to every PHO and health facility in the country	NDoH	GoPNG (National, PSIP, DSIP, LLGSIP)	
Support a program of neonatal care and resuscitation training for nurses, midwives and doctors	Print and distribute the neonatal resuscitation poster to all hospitals and health centers where babies are born	X	X	X					6, 000 copies of poster printed for every health facility Poster distributed	WHO Family Health Services	Go PNG DPs	
	Conduct neonatal training using the modules in the WHO Pocketbook of Hospital Care for Children and Early Essential Newborn Care	X	X	X	X	X	X	X	Number of health workers trained in neonatal resuscitation	National NBC coordinator Provincial paediatricians National IMCI coordinator	Go PNG (PHAs, PSIP, DSIP)	
	Support neonatal clinical attachments (4-6 weeks) to level 1 and 2 hospitals for nursing	X	X	X	X	X	X	X	Number of health workers from Level 3 and 4 hospitals completing	Provincial Health Offices Provincial Hospitals	PHAs, PSIP	

	offices from level 4 and 3 hospitals								such attachments (at least 15 per year)	Provincial paediatricians	
Improved information on neonates	Reporting through the PHR Program	X	X	X	X	X	X	X	Number of hospitals reporting through the PHR program	Provincial paediatricians	
Develop a centre of excellence for neonatal care, for training and good model for other provincial hospitals	Build a new Special Care Nursery at PMGH, as a centre of excellence in neonatal care, emphasizing basic newborn care, low cost technology and standard treatment would provide a model for provincial hospitals throughout the country	Achieved in 2013-2014						Funding achieved for new Special Care Nursery Building commenced Building completed and new SCN opened	NDoH Other donor partners		

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: BREAST FEEDING, NUTRITION AND MICRONUTRIENTS											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Increase human resource capacity for child nutrition	Recruit a Senior National Nutritionist	X	X						Nutritionist recruited and working within NDoH	NDoH	GoPNG
	Create a nutritionist position in all provincial hospitals	X	X	X	X	X	X	X	Positions created within new NDoH structure	NDoH, Provincial Hospitals	GoPNG
	Develop a training program for local nutritionists	X	X	X	X	X	X	X	Training program developed	Nutrition section, FHS SMHS	
	Have a paediatrician trained in nutrition and malnutrition to help provide national leadership		X	X	X	X	X	X	Paediatrician identified and trained	Paediatric Society	
Care of the child with severe malnutrition	Roll out the multi-faceted approach to improving severe malnutrition care in hospitals	X	X	X					Evaluation of the pilot program at PMGH done and the program rolled out to number of hospitals	Dr Michael Landi Dr Henry Welch Prof Trevor Duke Paediatric Society	GoPNG DPs Donor Agencies
Community promotion of breast feeding and adequate complementary feeding	Conduct IYCF training in all provinces	X	X	X	X	X	X	X	Number of provinces in which IYCF training conducted	Nutrition section, FHS WHO	GoPNG DPs
	Revise Infant and Young Child Feeding Act (revised Baby Feeds Supply (Control) Act 1984)	X	X	X	X	X	X	X	IYCF Act endorsed and passed by NEC and Parliament	Nutrition section, FHS Paediatric Society NDoH SuSu Mamas Community groups	GoPNG DPs
Improve vitamin A coverage	Expansion of vitamin A supplementation into the second year of life, by additional doses at 18 and 24 months Add dose of vitamin A for post-natal mothers	X	X	X	X	X	X	X	Vitamin A supplementation extended to 18 and 24 months olds and also percentage of postnatal mothers given vitamin A	Nutrition section, FHS Paediatric Society Child Health Advisory Committee NDoH	
Achieve high coverage of deworming	Albendazole for deworming, given with vitamin A at 12 months, and at 6 monthly intervals thereafter	X	X	X	X	X	X	X	Percentage of children receiving Albendazole at 12 months of age	FHS Child Health Advisory Committee Paediatric Society	

Improve health facility and community services for management of malnutrition	Increase the availability of zinc sulphate as treatment for children with diarrhoea and with malnutrition	X	X	X	X	X	X	X	Evidence of widespread availability of zinc in health facilities and appropriate use of zinc by health workers	NDoH Provincial Health Offices	Incorporated within normal operational activities
	Production of locally manufactured RUTF								Number of health facilities where RUTF is available	DAL NARI UNITECH SMHS DOH – Nutrition and Food Safety	
Support improved nutrition in the community	Encourage the fortification of staple foods, such as rice and flour with multiple micronutrients including iron, zinc, thiamin, riboflavin and folate								Inter-sectoral collaboration to encourage fortification	DAL Provincial Health Offices Nutrition section, FHS	

STRATEGIC IMPLEMENTATION PLAN: 2014-2020												
PROGRAM AREA: QUALITY IMPROVEMENT OF HOSPITAL CARE												
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required	
		2014	2015	2016	2017	2018	2019	2020				
Develop human resource capacity for child health	Training in Hospital Care for Children in every province	X	X	X	X	X	X	X	X	Training courses run in each province	WHO Family Health Services PSPNG Provincial hospitals	GoPNG Provincial health training funds RE Ross Trust BMGF
Improve oxygen systems and the treatment of pneumonia	Expand the oxygen systems program to all provincial and rural hospitals and major district health centers in the country	X	X	X	X					Number of provincial and district hospitals which have the oxygen system	Provincial Health Offices Provincial Hospitals Family Health Services Health Facility Branch	NDoH PHAs PHO DHO DPs, donor agencies
	Maintain the oxygen program with review visits and training				X	X	X	X		Number of hospitals in which annual review visits conducted	NDoH (Family Health Services, Clinical Services and Health Facility Branch)	GoPNG (PHA, PSIP, DSIP) DPs, donor agencies
	Implementation trial of bubble-CPAP for neonatal care and pneumonia treatment	X	X	X	X	X	X	X	X	Bubble-CPAP trialed and evaluated	Dr Francis Pulsan Prof Trevor Duke Provincial paediatricians	UPNG
Standardized hospital data reporting and paediatric surveillance	Extend the Paediatric Hospital Reporting System to all provincial hospitals in the country	X	X	X						Number of hospitals participating by sending in data quarterly	Paediatric Disease Surveillance Officer, Edilson Yano Provincial paediatricians Dr James Amini Prof Trevor Duke	GoPNG (NDoH, PHA, PSIP)
	Support human resource capacity and logistics within Family Health Services and provincial hospitals for Paediatric Surveillance and Hospital Reporting	X	X	X	X	X	X	X	X	Position created within new structure Number of hospitals participating by sending in data quarterly	Paediatric Disease Surveillance Officer Family Health Services	National position created during restructuring
Surveillance system for vaccine preventable diseases	Funding for latex agglutination antigen testing for CSF pathogens	X	X	X	X	X	X	X	X	Number of hospitals reporting use of latex agglutination	National EPI Manager TA Child Health Medical Supply Branch	Go PNG (NDoH, PH)

Improved care for children with chronic conditions	Implement models of care for children with chronic conditions, including clear treatment plans, clear communication between primary and referral levels, parental education and mechanisms for supply of less common medicines at primary care level		X	X	X	X	X	X	Number of hospitals that have adopted models for complex case management	Paediatric Society	
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STRATEGIC IMPLEMENTATION PLAN: 2014-2020					
PROGRAM AREA: PNEUMONIA					
Strategic objectives	Activities	Timeframe	Process indicators	Responsible persons	Resources required
See program areas: IMCI; EPI; Standard Treatment and Clinical Guidelines; Neonatal Care; Nutrition and Malnutrition; and Quality Improvement of Hospital Care					

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: MALARIA											
Improvements in the management and control of malaria in children will be closely aligned with the overall malaria control program											
Strategic objectives	Activities	Timeframe							Responsible persons	Process indicators	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Improve the prevention and management of malaria among mothers and children	Update malaria guidelines in the 10th Edition of the Standard Treatment Manual. Include artesunate suppositories for pre-referral treatment in health centers	X	X						Revised treatment guidelines included in STM Evidence of availability and use in health centers	Paediatric focal person for malaria Prof Tefuarani and Dr Wendy Pameh (as STM Editors)	
	Support efforts to increase the use of rapid diagnostic tests in clinical decision making	X	X	X	X	X	X	X	Evidence of increased use of RDTs	Family Health Services	Global Fund for Malaria NDoH
	Consider the implications of research on intermittent chemoprophylaxis measures for infants (IPTi)		X	X					Studies reviewed by Paediatric Society and CHAC	Paediatric Society Child Health Advisory Committee	
	Improve the tendering process, procurement and supply of all essential drugs and supplies. Establish a sustainable mechanism to deliver antimalarial drugs and related supplies to all levels of the health service	X	X	X	X	X	X	X	Antimalarials available at all levels of the health system		
Improved data and surveillance for malaria	Improve reporting mechanisms from the district to provincial health level and to NHIS, and improving the reporting of malaria cases and case fatality rates from hospitals	X	X						Reports on malaria CFR from the Paediatric Hospital Reporting System Number of hospitals providing reports	Paediatric Disease Surveillance Officer	
	Develop sentinel site surveillance for malaria in 4 regions	X	X	X	X	X	X	X	Four regional sentinel sites established (comprising of one microscopist and one clerk)	National Malaria Program Paediatric focal person for malaria	NDoH PHAs DPs Donor Agencies

STRATEGIC IMPLEMENTATION PLAN: 2014-2020										
PROGRAM AREA: TUBERCULOSIS										
Strategic objectives	Activities	Timeframe						Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019			
Improve the ability of health workers to prevent, diagnose and treat TB	Improve the availability of fixed-dose combination (FDC) therapy for childhood TB	X	X	X				FDC drugs distributed to all health centers that are Basic Medical Units, and hospitals	Dr Harry Poka (paediatric TB focal person) National TB Program Provincial Health Offices	NTP StopTB
	Update Standard Treatment Manual to include: improved paediatric regimens for FDC therapy; indications for the use of GeneXpert MTB / Rif; and when to suspect MDR-TB	X	X	X				STM updated	Dr Harry Poka (paediatric TB focal person) Paediatric Society	NTP StopTB
	Provide training for health workers in the use of fixed-dose combination therapy, child TB detection, case management, and MDR-TB using Hospital Care for Children training and National TB program guidelines	X	X	X				Number of provinces in which this child TB training is done	Dr Harry Poka National TB Program	NTP StopTB
	Ensure all children complete Intensive Phase treatment under health supervision (in hospitals or other facility supervised by TB health workers), and ensure an effective model of better follow-up at a district and community level	X	X	X	X			Model of completion of IP in hospital trialed and evaluated	National TB Program Dr Harry Poka Paediatric Society	NTP StopTB
	Implement preventive therapy for asymptomatic contacts of adult TB cases and HIV-infected children							Preventive therapy is available at all levels of the health system	Dr Harry Poka (paediatric TB focal person) Paediatric Focal person for HIV/AIDS National TB Program Provincial Health Offices	
	Improve coordination and leadership of child TB	Create and fund a position of TB Paediatrician, as the focal point for child TB		X	X	X	X	X	Position created within new NDoH structure	National TB Program

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: HIV AND AIDS											
Strategic objectives	Activities	Timeframe						Process indicators	Responsible persons	Resources required	
		2014	2015	2016	2017	2018	2019				2020
Improve the prevention of HIV infection	Increase voluntary counseling and testing, PPTCT and ART and ready-to-use therapeutic feeds to 20 hospitals	X	X						Number of health facilities where RUTF is available Number of health facilities where PPTCT and ART are available	Paediatric Focal person for HIV/AIDS Dr Mobumo Kiromat CHAI PNG	NDoH National HIV roll-out program
	Update to newer and more effective PPTCT and ART regimens	X	X	X					Treatment guidelines updated to include newer regimens	Paediatric Focal person for HIV/AIDS Paediatric Society Dr Mobumo Kiromat CHAI PNG	NDoH National HIV roll-out program
	Establish adolescent services that include primary prevention of HIV	X	X	X	X	X	X	X	Number of provinces in which appropriate adolescent services established	Dr Wendy Pameh (as adolescent health focal person) NDoH TA - YAH Provincial hospitals Provincial paediatricians Community groups / NGOs	
Improve the care of children with HIV	Increase access to ART in all provincial hospitals	X	X	X	X	X	X	X	Number of provincial hospitals where ART is available		NDoH National HIV roll-out program
	Ensure all affected children receive cotrimoxazole and isoniazid prophylaxis	X	X	X	X	X	X	X	Number of health facilities where preventive therapy is available	All health facilities All paediatricians Paediatric Society	NDoH PSIP DSIP
	Provide nutritional support to children with HIV, including ready-to-use therapeutic feeds	X	X	X	X	X	X	X	Number of health facilities where RUTF is available	Provincial and district hospitals CHAI PNG UNICEF	
Improve coordination and leadership of child HIV	Create and fund a position of HIV Paediatrician, as the focal point for child HIV		X	X	X	X	X	X	Focal position created		
	Train a paediatric HIV nurse and PPTCT trained midwife in each province								Number of provinces where HIV nurse and PPTCT midwives are		

										trained		
	Inclusion of HIV in the IMCI checklist and in Hospital Care for Children Training									HIV is included in the checklist and training		

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: PAEDIATRICIANS TRAINING											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Achieve the National Health Minimum Standard on specialist (Paediatrician) manpower: a minimum of two Paediatricians in all provinces and 5 in Level 1 hospital (PMGH)	Train new paediatricians to achieve the minimal standards of two paediatricians in each province by 2018	X	X	X	X	X	X	X	Number of new paediatricians trained each year	SMHS Chief Paediatrician	GoPNG Donor partners
	Increase Paediatric Training positions at PMGH to six	X	X	X	X	X	X	X	Number of new trainees entering the DCH and MMed programs	SMHS Chief Paediatrician	GoPNG Donor partners
	Encourage provinces to create service positions for registrar training	X	X	X	X	X	X	X	Number of provinces with registrar positions	SMHS Chief Paediatrician	GoPNG Donor partners
Develop a paediatric workforce with appropriate subspecialty skills	Support training in cardiology, neonatology, HIV medicine, adolescent health, oncology and nutrition	X	X	X	X	X	X	X	Persons identified to receive training in these specialty areas Training organized and completed Number of paediatricians fulfilling these roles	SMHS NDoH Other educational institution partners	GoPNG Development partners Donor partners
	Develop an accreditation process for paediatricians, supported by continuing professional development activities								Number of CPD activities offered Accreditation process developed	Paediatric Society NDoH Medical Board of Papua New Guinea	
Improving the evidence base for child health	Research projects for MMed / DCH		X	X	X	X	X	X	Research projects completed	SMHS	GoPNG Donor partners

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: CHILD HEALTH NURSES AND COMMUNITY HEALTH NURSES											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
To achieve the standard of one child health nurse in every health centre and at least one per shift in every hospital	Establish a course in post-basic paediatric nursing in each of 4 regions	X	X	X	X	X	X	X	Number of graduate child health nurses	SMHS Pacific Adventist University Goroka University Other training colleges	GoPNG DPs Donor Agencies
Strengthen continuing professional development for child health nurses	In-service training, clinical attachments and postgraduate training should be supported								CPD activities offered		

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: ADOLESCENT HEALTH											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Provide appropriate facilities for adolescent health services	Strengthen existing school clinics to provide information to adolescents	X	X	X	X	X	X	X	Number of school clinics where information is available	Department of Education	
	Establishment of adolescent drop-in centers in provinces	X	X	X	X	X	X	X	Number of provinces in which appropriate adolescent services established	Dr Wendy Pameh (as adolescent health focal person) NDoH TA - YAH Provincial hospitals Provincial paediatricians Community groups / NGOs	GoPNG (PSIP)
	Create model of adolescent areas in children's wards in hospital		X	X					A model of adolescent hospital care is developed at PMGH	Dr Wendy Pameh NDoH – TA YAH	PMGH GoPNG
Improve human resources for adolescent health	Provide training for a paediatrician in adolescent health, to act as a national resource-person for this area	X	X						Paediatrician having undergone some training in this area	SMHS Other educational institution partners	GoPNG DPs Donor Agencies
Support immunization programs for adolescents	Introduction of HPV vaccine		X	X					HPV vaccine successfully introduced	TA – YAH School Health and EPI	GoPNG DPs Donor Agencies
Strengthened national coordination, technical assistance and leadership	National Department of Health, leadership in adolescent health	X	X						YAH Program and Coordination mechanism already established at NDoH level	TA – YAH Program	GoPNG

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: HEART DISEASE, CHILDHOOD CANCER											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Improve the management of childhood cancer and ensure wide access to services	Revise guidelines for managing paediatric cancer. Develop referral guidelines	X	X						Completion of paediatric cancer guidelines at www.pngpaediatricsociety.org	Dr Gwenda Anga Paediatric Society	GoPNG DPs
	Support central coordination and improve data collection and surveillance on pattern of childhood malignancies	X	X	X	X	X	X	X	Number of hospitals participating by sending in data quarterly	Dr Gwenda Anga Paediatric Society	See Paediatric Hospital Reporting System
	Improve diagnostic services, particularly histopathology services								Provincial hospitals have in place arrangements with CPHL for specimen analysis	CPHL Chief Pathologist Dr Gwenda Anga	NDoH national function
	Ensure appropriate drug regimes are available, including drugs for effective palliative care	X	X	X	X	X	X	X	Evidence of uninterrupted stocks of essential chemotherapy and analgesia		NDoH national function
	Support a young paediatrician to train in oncology (refer also to paediatricians training)								Completed in 2013-2014	SMHS Royal Children's Hospital, Melbourne	RE Ross Trust
	Establish Paediatric Cancer Units (10 beds ward) attached to PMGH and National Cancer Unit in Lae		X	X	X				Evidence of improved services for children with cancer	NDoH PMGH Paediatric Department Angau Hospital	GoPNG PMGH ANGAU
	Skill development for 5 nurses in childhood cancer	X	X	X	X	X			Number of nurses trained in childhood cancer management	PMGH Other educational institution partners	GoPNG PMGH
	Implement supportive care during treatment, including social workers and nutritionists								Supportive care available at PMGH and Lae		
	Develop a community awareness campaign								Community awareness campaign		
Improve the management of heart disease and support surgical	Support the annual Operation Open Heart	X	X	X	X	X	X	X	Number of children having surgery each year through OOH	Prof Nakapi Tefuarani Dr Mathias Tovilu Dr Cornelia Kilalang	GoPNG DPs Donor Agencies
	Support the training of two paediatricians in	X	X						Paediatrician identified and training	SMHS	GoPNG

	cardiology									completed	PMGH Other educational institution partners	Donor Agencies
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STRATEGIC IMPLEMENTATION PLAN: 2014-2020												
PROGRAM AREA: CHILD PROTECTION AND SOCIAL SERVICES												
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required	
		2014	2015	2016	2017	2018	2019	2020				
Improved reporting, documentation and surveillance systems for child abuse and neglect	Improve child abuse reporting in all provincial hospitals, through the PHR (inpatients) and through the Family Support Units Ensure reporting of all cases of suspected child abuse to police	X	X	X	X	X	X	X	X	Child abuse reporting systems in place	Provincial health authorities Provincial hospitals Provincial paediatricians FHS Chief Paediatrician	
Improved preventative and treatment services for children at risk of physical and sexual abuse, and neglect	Establish Family Support Units in all Provincial hospitals. These will provide medical, social, legal, and psychological support services to child victims of sexual or physical abuse, and to mothers suffering from domestic violence	X	X	X	X	X	X	X	X	Number of provinces with functioning Family Support Units, staffed with social worker, nurses trained in child abuse and access to legal services and mental health support services. Number of cases managed by these units annually.	Provincial health authorities Provincial hospitals Provincial paediatricians FHS Chief Paediatrician	
Health workers better prepared to contribute to identifying and managing at-risk, abused or neglected children	Paediatrician trained in legislation, strategies for protection, prevention and management of child abuse and neglect	X	X	X	X	X	X	X	X	Paediatrician trained in child abuse and child protection	Paediatric Society	
	Incorporation of training on child abuse and child protection in MCH courses and post-graduate child health nursing courses	X	X	X	X	X	X	X	X	Incorporation of training on child abuse and child protection in MCH courses and post-graduate child health nursing courses	Paediatric Society	
Strengthen leadership for child health	National Department of Health leadership / technical assistance in child protection		X	X	X					Evidence of coordination between NDoH, police, legal and social services and other stakeholders	NDoH Paediatric Society	Go PNG DPs Donor Agencies

STRATEGIC IMPLEMENTATION PLAN: 2014-2020											
PROGRAM AREA: CHILD DISABILITY											
Strategic objectives	Activities	Timeframe							Process indicators	Responsible persons	Resources required
		2014	2015	2016	2017	2018	2019	2020			
Strengthened multi-disciplinary health services for children with disabilities	Establishment or strengthening of developmental screening programs in early education centres and major hospitals			X	X	X	X		Number of screening programs available in EECs and health facilities	Dr Beryl Vetuna Dr James Amini Paediatric Society	GoPNG DPs Donor Agencies
	Improved referral pathways			X	X	X	X		Referral pathways in operation	Dr Beryl Vetuna Dr James Amini Paediatric Society	GoPNG DPs Donor Agencies
	Increased support to community organizations who work with disabled children			X	X	X	X		Evidence of increased coordination with community organizations	Dr Beryl Vetuna Dr James Amini Paediatric Society	GoPNG DPs Donor Agencies
Training of nurses and paediatricians in supporting children with disabilities	Incorporation of training on disability in MCH courses and post-graduate child health nursing courses			X	X	X	X		Disability included in MCH and child health nursing courses		
	Paediatrician trained in child disability and rehabilitation			X	X	X	X		Paediatrician trained in child disability and rehabilitation	Dr Beryl Vetuna Dr James Amini Paediatric Society	GoPNG DPs Donor Agencies
	Nurse trained in developmental screening of children			X	X	X	X		Nurse trained in developmental screening	Dr Beryl Vetuna Dr James Amini Paediatric Society	GoPNG DPs Donor Agencies
Improve awareness of child safety in the community to prevent disability	Advocacy for strategies to improve child safety, such as car seat belt legislation, bicycle helmets, fire safety								PHR program data to inform advocacy for child safety legislation		
Strengthen leadership to improve support for children with disability	National Department of Health leadership / technical assistance in disability								Evidence of co-ordination between NDoH and other stakeholders	NDoH Paediatric Society	GoPNG DPs

Appendix 1. Projection of paediatrician training 2015-2020

Hospital Classification	Current (2015)	Projected need by 2020	Additional required by 2020
Level 1 Hospitals: National Referral Hospital			
1. PMGH	5	7	3 *
2. UPNG (Lecturers)	2	3	2 *
Level 2 Hospitals: Regional Referral Hospitals			
1. Angau, Lae - MOMASE	3	4	2 *
2. Mt. Hagen – Highlands Region	1	3	2
3. Nonga, Rabaul – Islands Region	1	3	2
4. PMGH - (Southern/Central/NCD)	1	2	1
Level 3 Hospitals: General Specialist Hospitals			
1. Goroka	2 (+1)	3	0
2. Alotau	1	2	1
3. Madang	2	2	0
4. Wewak	1 (-1)	2	1
Level 4 Hospitals			
1. Daru	1	1	
2. Kerema	0	1	1
3. Popondetta	1	2	1
4. Kundiawa	1	2	1
5. Wabag	1	2	1
6. Mendi	1	2	1
7. Vanimo	1	2	1
8. Lorengau	0	1	1
9. Kavieng	1	2	1
10. Buka	1	2	1
11. Kimbe	1	2	1
Total			24 additional paediatricians required from 2015 to 2020

* Assumes attrition / retirement

Appendix 2. Paediatrician sub-specialty training 2015-2020

Sub-Specialty Areas	Current	In-Training	2015-2020
Paediatric Cardiology	1	1	5
Southern Region (Port Moresby)	1	1	2
Momase Region (Lae)			1
Highlands Region (Mt. Hagen)			1
New Guinea Islands	1		1
Paediatric Oncology	0	0	2
Port Moresby	1	1	1
Lae			1
Neonatology	0	1	2
Port Moresby	0		1
Lae	0		1
Goroka	0		1
Paediatric HIV Medicine	1	0	4
Southern Region (Port Moresby)			1
Momase Region (Lae)			1
Highlands Region (Mt. Hagen)			1
New Guinea Islands (Rabaul)			1
Respiratory Medicine and TB	0	0	4
Southern Region (Port Moresby)			1
Momase Region (Lae)			1
Highlands Region (Mt. Hagen)			1
New Guinea Islands (Rabaul)			1
Disability / Rehabilitation	0	0	2
Port Moresby			1
Lae			1
Nutrition / Malnutrition	0	0	4
Southern Region (Port Moresby)			1
Momase Region (Lae)			1
Highlands Region (Mt. Hagen)			1
New Guinea Islands (Rabaul)			1

The workforce plan does not mean an additional paediatrician should be trained in each of these sub-specialty or program areas in addition to the general paediatrician workforce projections in Appendix 1. Rather the skills in each of these areas should exist at a regional level. In most cases it is envisaged that general paediatricians will be up-skilled in such areas to provide services in their regions.

Appendix 3. Child health contact addresses

Your provincial paediatrician will be able to guide you on all questions relating to child health and paediatrics. The following are resource people for program areas. They may change contact details during the life of this plan.

For updated information from the Paediatric Society of PNG, see www.pngpaediatricsociety.org

IMCI

Dr Gilchrist Oswyn, Paediatrician Milne Bay Province and IMCI National Coordinator

alotaugh@daltron.com.pg

Merolyn Jonathan, IMCI coordinator NDoH

Dr Patrick Kiromat, Paediatrician Alotau

EPI and vaccines

Dr William Lagani, Manager, Family Health Services william_lagani@health.gov.pg

Tel: 301 3706

Gerard Sui: EPI coordinator NDoH, gerard.sui2011@gmail.com

Dr Tarcisius Uluk, Paediatrician Kimbe tarcisiusuluk@yahoo.com

Dr Fiona Kupe, Paediatrician NCD Health dr_fkupe@yahoo.com

Standard Treatment Manual for Common Illnesses

Your provincial paediatrician or

Dr James Amini, Chief Paediatrician Port Moresby General Hospital jmamini9@gmail.com

Prof Nakapi Tefuarani, Professor of Child Health SMHS UPNG ntefuarani@datec.net.pg

Dr Wendy Pameh, Senior Lecturer Child Health UPNG wpameh@global.net.pg

Newborn Health

Dr Roland Barnabas, Paediatrician PMGH rabarnabas@yahoo.com

Frieda Sui, Neonatal coordinator NDoH freda_sui@health.gov.pg

Dr Gamini Vali, Paediatrician PMGH gvboma@gmail.com

Dr Theresia Rongap, Paediatrician Lae

Nutrition, breast feeding and malnutrition

Dr Michael Landi, Paediatrician mlandi@live.com

Eileen Dogimab, Nutrition NDoH

Dr Theresia Rongap, Paediatrician Lae trongap@gmail.com

Dr Fiona Kupe, Paediatrician dr_fkupe@yahoo.com

Susu Mamas Toll Free Hotline 7200 MAMA (720 06262)

Hospital Care for Children training program

Dr Ilomo Hwaihwanje, Paediatrician Goroka: wohuiereke_i@hotmail.com

Dr Magdalynn Kaupa, Deputy Chief Paediatrician Highlands Region: magdalynnkp@yahoo.com

Dr Martin Sa'avu, Paediatrician Mendi: martinsaavu@yahoo.com.au

Dr Doreen Panauwe, Paediatrician Wabag dpanauwe@gmail.com

Malaria in children

Dr Jimmy Aipit, Paediatrician Madang jimmyaipit@yahoo.com.au

Dr Jason Vuvu, Paediatrician PMGH

Tuberculosis in children

Dr Harry Poka, Paediatrician Kundiawa harrywerakepoka@gmail.com

Dr Francesca Failing, Paediatrician Lae failingf@yahoo.com

Dr Angai Dama, Paediatrician Goroka
Dr Henry Welch, UPNG

HIV in children

Dr Mobumo Kiromat, Paediatrician PMGH
Dr Gamini Vali, Paediatrician PMGH

Paediatrician training

Dr James Amini, Chief Paediatrician PMGH jmamini9@gmail.com
Professor John Vince, Deputy Dean SMHS UPNG jvince@datec.net.pg
Dr Paulus Ripa, DMS Mt Hagen paulus.ripa@gmail.com

Adolescent and School Health

Dr Wendy Pameh, SMHS, UPNG, wpameh@global.net.pg
Maluo Magaru, Coordinator School Health Program, NDoH
Dr Mary Paiva, Paediatrician Tabubil

Childhood cancer

Dr Gwenda Anga, Oncology Paediatrician, PMGH: gwendaanga@gmail.com
Dr Francesca Failing, Paediatrician Lae failingf@yahoo.com

Heart disease in children

Professor Nakapi Tefuarani, Professor of Paediatrics SMHS UPNG ntefuarani@datec.net.pg
Dr Cornelia Kilalang, Cardiology Paediatrician PMGH ckilalang@yahoo.com
Dr Mathias Tovilu, Cardiology Paediatrician mattovilu@gmail.com
Dr Tarcisius Uluk, Paediatrician Kimbe tarcisiusuluk@yahoo.com

Paediatric surgery

Dr MacLee Mathew, Paediatric Surgeon and DMS Kaviang Hospital

Child disability

Dr Beryl Vetuna, Paediatrician Rabaul bvetuna@gmail.com
Dr Kauve Pomat, Paediatrician Wewak

Continuing Professional Development

Dr Wendy Pameh wendy.pameh@gmail.com
Dr Paulus Ripa paulus.ripa@gmail.com
Professor Trevor Duke trevor.duke@rch.org.au

For general information about this Child Health Policy and Plan and information on the Child Health Advisory Committee contact Dr William Lagani, Coordinator Child Health Advisory Committee. william_lagani@health.gov.pg. Tel: 301 3706

Appendix 4. Core indicators and monitoring

There are several systems for data collection that are relevant to children:

- The National Health Information System (NHIS)
- Vaccine preventable disease surveillance
- Acute flaccid paralysis surveillance
- Acute Fever and Rash surveillance
- Demographic and Health Survey (DHS)
- Census
- Paediatric Hospital Reporting System
- EPI program data
- National TB program
- HIV program including Prevention of Parent to Child Transmission (PPTCT) data

This Plan would require the following information be collected, reported and published annually:

Statistic	Mechanism for data collection
Population based	
Under-5 mortality rate	DHS / Census
Infant mortality rate	DHS / Census
Neonatal mortality rate	DHS / Census
Proportion of infants exclusively breast fed to 6 months of age	DHS / Census / National Nutrition Surveys
Percentage of children who are <80% expected weight for age (underweight or malnourished)	DHS / Census / National Nutrition Surveys
Coverage rates for vaccines	EPI program
Vaccine preventable disease incidence	NHIS / Paediatric Reporting System
Percentage of children who are fully immunized by age 1 year	EPI program vaccine coverage surveys / DHS
Percentage of babies who receive Heb B vaccine in first 24 hours of life	EPI program vaccine coverage surveys / NHIS / DHS / Paediatric Reporting System

Percentage of mothers attending 3 or more ANC's	NHIS / DHS / Census census
Percentage of primiparous mothers receiving 2 doses of tetanus toxoid	EPI program data DHS
Percentage of mothers receiving IPT	NHIS
Percentage of mothers having supervised health facility deliveries	NHIS / DHS
Percentage of children who sleep under a bed-net	NHIS / DHS / Census
Health facility-based outcome data	
Disease and age-specific case fatality rates for children	Paediatric Hospital Reporting System
Case fatality rates for neonates	
Case fatality rates for VLBW, birth asphyxia and neonatal infections	
Case fatality rates for severe pneumonia	
Case fatality rates for diarrhoea	
Case fatality rates for meningitis	
Case fatality rates for malaria	
Case fatality rates for severe malnutrition	
New cases of paediatric HIV	Paediatric Reporting System / HIV program data
Access to prevention of parent to child transmission (PPTCT) prophylaxis	PPTCT program
New cases of meningitis due to Haemophilus influenzae type b and Streptococcus pneumonia meningitis	Paediatric Hospital Reporting System
Cases of childhood TB, TB treatment completion rates and hospital case fatality rates for childhood TB	National TB program DOTS data system Paediatric Hospital Reporting System
Health facility-based program data	
Number and distribution of health workers trained in IMCI	IMCI program data
Proportion of health facilities that have a trained midwife	Human resources mapping data
Proportion of health facilities that have a trained child health nurse	Human resources mapping data
Proportion of health facilities with a microscopist or RDT's	Human resources mapping data

Number and distribution of health workers trained in Hospital Care for Children	Hospital Care for Children program data
Proportion of health facilities that have a nurse trained in IYCF counselling	Human resources mapping data IMCI program data

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Prof Nakapi Tefuarani	Dr Mary Baki
Dr Mobumo Kiromat	Dr Roland Barnabas
Dr William Lagani	Dr Tarcisius Uluk
Dr Gilchrist Oswyn	Dr Michael Landi
Dr Hilda Polume	Dr Joe Kubu
Dr Job Hawap	Dr Jimmy Ipit
Dr Paulus Ripa	Dr Stella Jimmy
Prof Trevor Duke	Dr Jason Vuvu
Dr Benjamin Tahija	Dr Martin Sa'avu
Dr Tito Langas	Dr Stanley Hanap
Dr Patrick Kiromat	Dr Fiona Kupe
Dr Beryl Vetuna	Dr Gamini Vali
Dr Ilomo Hwaihwanje	Dr Mary Paiva
Dr Theresa Rongap	Dr Rosemary Kipalan
Dr Alphonse Rongap	Dr Sharon Kasa
Dr Magdalynn Kaupa	Dr Doreen Panauwe
Dr Naomi Pomat	Dr Louis Samiak
Dr Wendy Pameh	Dr Kauve Pomat
Dr Kone Sobi	Dr Dale Frank
Dr Harry Poka	Dr Jerry Tanumei
Dr Cornelia Kilalang	Dr Francesca Failing
Dr Angai Dama	Dr Paul Wari

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