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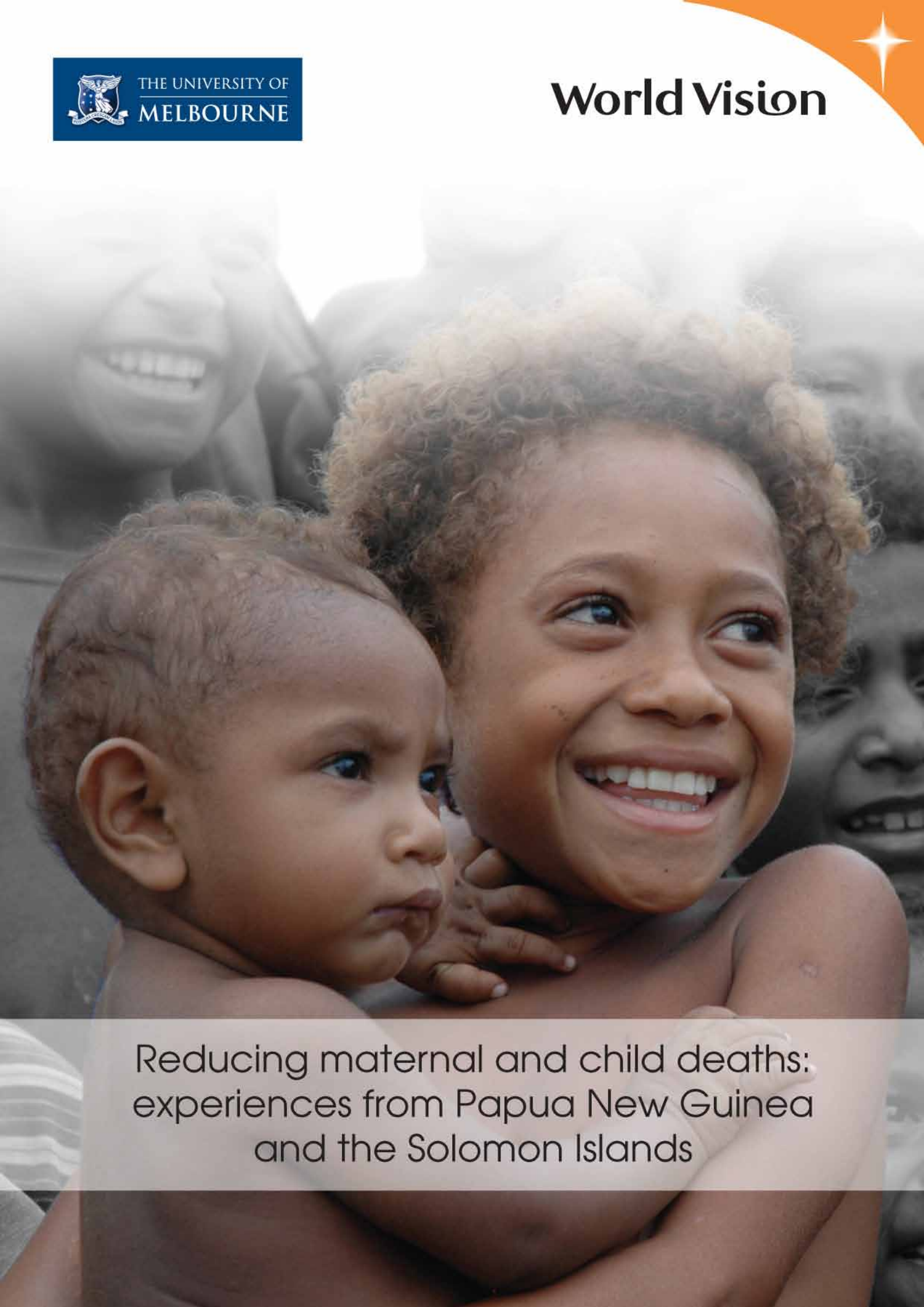


Reducing maternal and child deaths: experiences from Papua New Guinea and the Solomon Islands

Introduction

"You cannot start saving the most vulnerable infants and children without first ensuring the health of their mothers." [1]

Sarah Brown, Patron of the White Ribbon Alliance for Safe Motherhood, January 2009

Health is fundamental to development. In Asia, where the largest reductions in poverty have been achieved, 30–50 percent of economic growth between 1965 and 1990 has been attributed to favourable demographic and health changes.[2]

Close linkages exist between maternal and child mortality and morbidity, human development and poverty.[3] The first two years of a child's life may determine disadvantage and inequity for a lifetime. During these years, nutrition is critical to cognitive development, growth, freedom from infectious diseases and survival.

There is extensive literature on the interventions which can improve maternal and child health: nutrition, hygiene practices, antenatal, birthing and postnatal care, emergency obstetric and newborn care, and prevention and treatment of common childhood diseases.[4]

While such interventions are well known, research into options for delivering them, especially at the community and district level, are less readily available. Political will and improved resourcing are fundamental to achieving universal access to interventions, but there are other requirements.

A stronger focus on people is needed, particularly improved human resources for maternal and child health, and mechanisms to make decentralised systems work. The latter is a challenge in remote areas and involves trying to bring services as close as possible to where people live, while balancing the need to have properly trained, responsible and skilled health staff, improved coordination and supervision.

Good examples of progress in maternal and child health are available from many parts of the world, but examples in Melanesia have received less prominence. Papua New Guinea (PNG), the largest country in Melanesia, and the Solomon Islands share many characteristics. They both offer positive experiences that are also broadly relevant to other Pacific Island countries, and to similar, relatively small countries throughout the world.

The purpose of this policy brief is to highlight some examples of progress in PNG and the Solomon Islands which are in need of continued and increased support from these governments, donor countries and Non-Government Organisations (NGOs).

PNG and the Solomon Islands: a snapshot

Papua New Guinea

Population: 6.5 million
Population growth rate: 2.7%
Land area: 463,000 square kilometres
GDP per capita: US$ 593

PNG has among the most rugged terrain in the world. Only three percent of roads are paved and air transport is often the only mode of transport. About 40 percent of PNG's population live in poverty.[5] About 80 percent are living in 'hard to reach' areas, limiting easy access to health services and creating difficult logistics for outreach.[6]

PNG has a maternal mortality ratio of 733 per 100,000, making it the second highest maternal mortality ratio in the Asia Pacific region, second only to Afghanistan.[7] About 53 percent of mothers receive delivery assistance from health professions: nine percent from doctors, 40 percent from nurses, four percent from midwifes.[8] The causes of maternal mortality include postpartum haemorrhage, puerperal sepsis, ante-partum haemorrhage, eclampsia and anaemia. Fewer than 35.7 percent of women are using modern family planning methods.[9]

The challenges for reducing maternal and child mortality are many, including difficult geographic access, fragile health systems, limited human resources, weak financial governance and management and poor service delivery in many rural areas. This history has eroded trust in services, raising social and cultural barriers and inhibiting women's and children's access to care.

The encouraging news is that in recent years, child death rates have decreased substantially. In 1990, the under-five mortality rate was 94 per 1000 live births and in 2006 it was 75.[10] The infant mortality rate has dropped from 69 per 1000 in 1990 to 54 in 2006.[11] However there has been little change in neonatal mortality.

These reductions suggest that many of the interventions introduced in the last 10 years are having an impact on child health in PNG. These include the better coordination and integration of child health programs, training for paediatricians to be leaders of child health in their provinces, training of child health nurses and improved vaccination coverage – especially for measles. There have been no deaths from measles reported in the past three years.[12]

Solomon Islands

Population: 460,100
Population growth rate: 2.8%
Land area: 30,400 square kilometres
GDP per capita: US$ 593

The Solomon Islands is still recovering from civil unrest between 1999–2003 which caused major disruptions to the health system. Services are being rebuilt but progress has been made in the area of maternal and child health.[13]

The under-five mortality rate has dropped from 121 per 1000 live births in 1990 to 70 in 2007.[14] The infant mortality rate has dropped from 86 to 53.[15] The reported maternal mortality ratio is 140 per 100,000 births, down from 550 in 2000.[16] Some 85 percent of births are attended by a healthcare professional.[17]

According to WHO, a reduction in childhood mortality and morbidity from diarrhoeal diseases in the Solomon Islands is attributed to the improved status of sanitation, water supply, personal hygiene and breastfeeding. A reduction in mortality due to neonatal causes is attributed to the improved status of maternal health services, supported by improved paediatric care and immunisation.[18] The fall in maternal deaths has coincided with the increased training and deployment of midwives throughout the country (see following example).

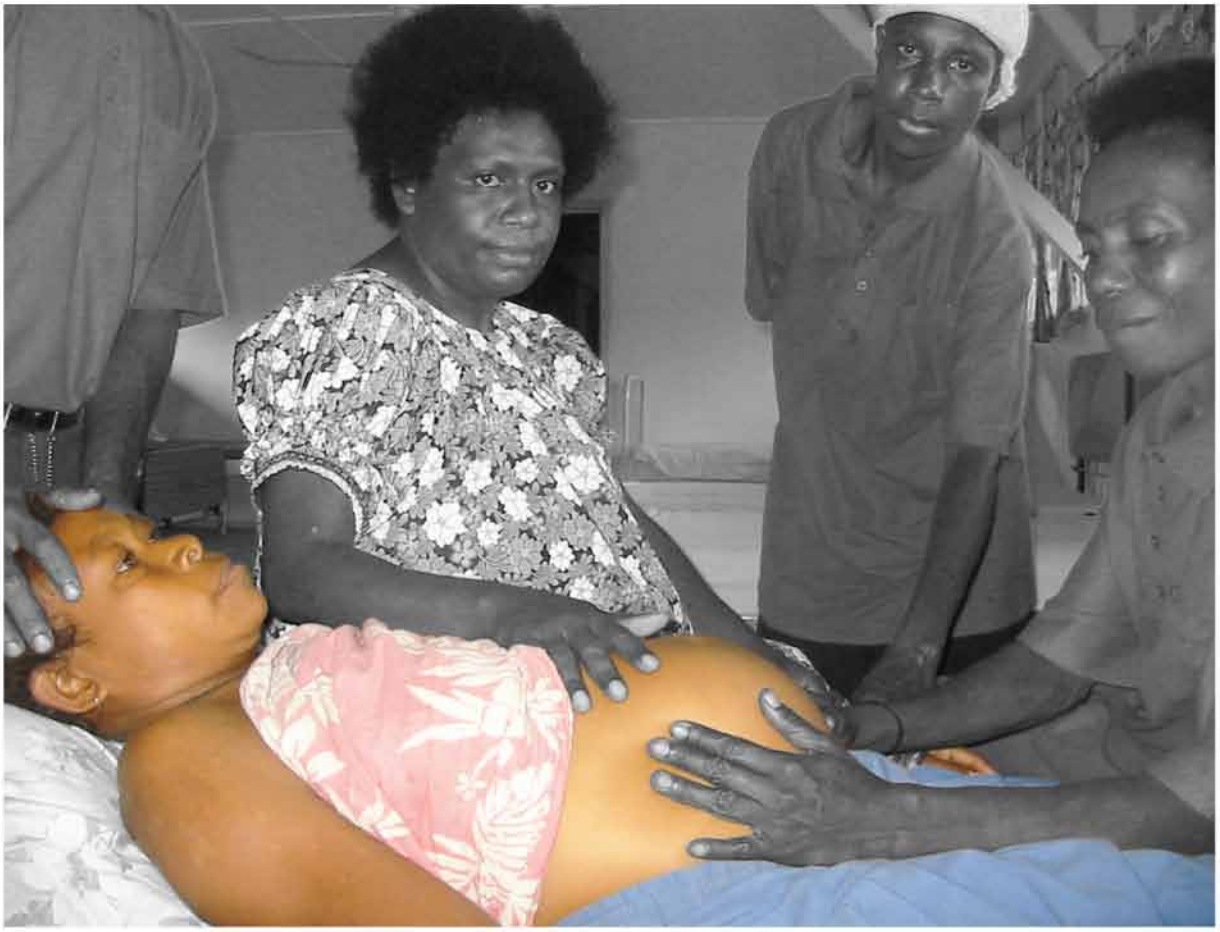
Accessing formal education is a major problem for women, with only 17 percent literate. While school enrolment figures for girls are increasing, they are still among the lowest in the region.[19]

Significant disparity in services and outcomes still exists between provinces, and current interventions need to be supported and expanded for improvements in maternal and child health to continue.


Philippine Sea
Northern Mariana Islands (U.S.)
Saipan
Hagåtña
Guam (U.S.)
MARIANA TRENCH
Challenger Deep (world's greatest ocean depth, -10924 m)
Wake Island (U.S.)
FEDERATED STATES OF MICRONESIA
Yap
Koror
PALAU
Palikir
CAROLINE ISLANDS
Majuro
Tarawa
Equator
Yaren District
NAURU
Manado
Halmahera
Sorong
Ceram
Ambon
Banda Sea
Jayapura
Wewak
New Ireland
PAPUA NEW GUINEA
New Guinea
Madang
Bougainville
SOLOMON ISLANDS
New Britain
Solomon Sea
Honiara
Dili
EAST TIMOR
Timor
Timor Sea
Arafura Sea
Torres Strait
Port Moresby
Guadalcanal
SANTA CRUZ ISLANDS
Darwin
Gulf of Carpentaria
Coral Sea Islands
(AUSTRALIA)
Coral Sea
VANUATU
Port-Vila
New Caledonia (FRANCE)
Cairns
KING LEOPOLD RANGE
MACDONNELL RANGE
GREAT DIVIDING RANGE
Townsville
Mount Isa
Mackay
Noumea
GREAT SANDY DESERT
Rockhampton
Gladstone
GIBSON DESERT
Alice Springs
AUSTRALIA
SIMPSON DESERT
Brisbane
Gold Coast
GREAT VICTORIA DESERT
Lake Eyre
Kingston
Norfolk Island (AUSTRALIA)
FLINDERS RANGE
Broken Hill
LORD HOWE RISE
NEW CALEDONIA BASIN
Lord Howe Island (AUSTRALIA)
Whyalla
Newcastle
Sydney
Adelaide
Canberra
Wollongong
Bendigo
Mount Kosciuszko
Great Australian Bight
Melbourne
Geelong
Tasman Sea
NEW ZEALAND
Auckland
Hamilton
Indian
Hobart
Tasmania

Examples of progress in PNG and the Solomon Islands

The following section uses case studies to highlight examples of progress in maternal and child health outcomes, which could be expanded and supported by governments, donors and NGOs.



Midwives and nurses trained in child health

A common factor among countries that have succeeded in lowering maternal and neonatal mortality rates has been the presence of skilled health workers – doctors, nurses or midwives – at births. [20]

An important priority in the Pacific region is to meet the existing shortages of human resources, including trained midwives and child health nurses.

Example: Solomon Islands Diploma in Midwifery

The Solomon Islands currently has a total of 122 midwives and is projected to have 139 by the end of 2009. These are distributed across the country. Of these, 110 have been trained through the Solomon Islands Diploma in Midwifery. The diploma was established in 2001 and highlights the potential for producing skilled midwives over a relatively short period of time. The student midwives spend 18 weeks in the capital, Honiara, learning theory in classrooms. The remainder of the course – a further 23 weeks – is undertaken in practical training at the National Referral Hospital in Honiara, and in provincial hospitals under the supervision of trained clinical educators. At the conclusion of their studies, the graduate midwives return to the provinces where they were originally posted by the government. [21]

With its strong clinical focus, the midwifery course is now seen as a model to increase the number of child health nurses. In 2007, participants at a National Summit on Child Health agreed that a similar child health nursing course was necessary in Solomon Islands. [22] Currently, only a select few Solomon Islands nurses receive training in child health in PNG. In recent years, training has been undertaken for provincial nurses on the management of seriously ill children, using the WHO Pocketbook of Hospital Care for Children and the Integrated Management of Childhood Illnesses. A clinical child health diploma would build on this, and support the National Child Health Plan. The Plan calls for improved child health clinical and public health nursing capacity in the provinces, and the creation of positions of provincial coordinators of child health to oversee the plan's implementation. Building strong local institutions of training will be essential for a sustainable workforce in Pacific countries, and this should receive greater support from the regional community.

More training is but one element of addressing the maternal and child health human resources crisis in the Pacific. Providing appropriate support and continuing professional development for nurses, incentives for service in remote communities, and safe housing and schooling for nurses' children, will all be required to sustain a rural workforce. In many remote places in the foreseeable future, it will remain difficult to attract graduate nurses or midwives to work. In these locations, properly trained and supported community health workers can provide essential maternal and child health services.

A further important consideration is the approach taken by health workers once they are practising in hospitals and clinics. PNG health department research has found considerable dissatisfaction among patients about the information and service they receive including a tendency to chastise pregnant women and mothers. This has been reinforced by the recent report of the Ministerial Taskforce on Maternal Health in PNG.[23] In one study, fear of health workers' responses was identified as a major reason for mothers of critically ill newborns not seeking care.[24] Nurses and doctors work under difficult and sometimes extreme conditions, often with poor resources and limited support. Staff attitude and behaviour could be addressed within health training curriculla, and through better support for rural health workers. In many provinces, it has become clear that demand for health services, communication and health worker morale are enhanced by outreach clinical services and education between hospitals, district health centres, local health centres and villages. Such liaisons, providing opportunities for health worker supervision and ongoing education, are essential in a decentralised health system.

There are sometimes difficult barriers to overcoming the human resource crisis. In PNG, the Nursing Council has declined to register any midwifery graduates for the past decade, as the graduates did not fulfil the statutory (legal) requirements for registration. One of the problems was the lack of clinical experience provided under the current course. At the time of writing, the curriculum is being revised to include sufficient clinical training: a timely and urgent requirement.[25]

Community-based health services

The majority of people in PNG and the Solomon Islands live in rural areas and don't have close access to formal health care.

Models of community-based services are multiple: from village volunteers; formally trained community health workers, midwives, nurses or doctors within health clinics in communities; and mobile patrols from health centres. There are some currently disease specific community-based models that may have broader relevance to the care of chronic disease in the community. These include the Directly Observed Treatment (DOTS) strategy for the management of tuberculosis. Models are not mutually exclusive; several may coexist for a strong community-based health system. Community-based health care is not synonymous with volunteers with limited training. While some studies from south Asia have used volunteers with limited (about 2-6 weeks) training, in PNG, for example, Community Health Workers (CHWs) have undergone 12 months of training in a formal school with a standardized national curriculum. While village health volunteers is a model favoured by many NGOs, and one that has received prominence in published studies from south Asia, it is not the model adopted by many governments.

Appropriate models of community-based health services are particularly important to PNG currently. The model currently proposed by the PNG National Department of Health in their next 10 year plan is to employ registered nurses, or community health workers who have undergone 12 months formal training – including training in IMCI, immunisation and midwifery skills – to deliver care in community health posts. These were formerly called aid-posts, and in the 1960s and 1970s provided health care to the majority of PNG's population. Like aid-posts, the proposed community health posts would be the lowest level of the formal pyramidal district health system.

Mobile maternal and child health patrols and village aid posts used to be a feature of health services in Papua New Guinea, but these have declined in the past 20 years. The reasons are multiple: inadequate resourcing, difficulty accessing funds through complex centralised channels, law and order problems in some areas, deteriorating road conditions in others, and lack of supervision and support to community health workers. Some provincial hospitals maintain outreach services. It is notable that services are better and communication between provincial hospitals and district health centres function well where multidisciplinary teams conduct visits.

Models of community health workers from other locations

Much of the evidence for the value of community health workers in reducing mortality comes from settings where neonatal and infant mortality is very high. In these settings community-based care, education and support are likely to have the greatest impact on survival. Many key basic health and social interventions are especially suitable for delivery by community health workers and through community support groups. The evidence for this is particularly compelling for reductions in neonatal mortality. More than 10 years ago, Indian doctors Abhay and Rani Bang and colleagues showed that home-based neonatal care, including management of sepsis, is acceptable, feasible, and reduced neonatal and infant mortality by nearly 50 percent among a malnourished, illiterate, rural study population where neonatal mortality was very high.[26] More recently, it has been shown that neonates who received a postnatal home visit had 34 percent lower neonatal mortality, with most of the mortality reduction in those who were visited within the first three days after birth.[27]

Community interventions can encourage mothers in seeking health facility care. In a cluster-randomised trial in Nepal, where female facilitators formed women's groups and led them in action-learning for perinatal health (around the time of birth) there were significant improvements in neonatal and maternal mortality. Women within the intervention groups were more likely to receive antenatal care, give birth within a health institution with a skilled birth attendant, and more likely to have a hygienic delivery than were controls.[28]

Traditional birth attendants

In the 1970s, difficulties in accessing skilled birth attendants led the World Health Organization (WHO) to promote the training of Traditional Birth Attendants (TBAs), who were usually older women living in villages. However, in 1999, WHO concluded that there was no evidence that the training of TBAs had led to reductions in maternal deaths.[29] In Pakistan, training TBAs and integrating them into an improved health care system was achievable and effective in reducing perinatal mortality; and showed a plausible (though not statistically significant) reduction in maternal mortality.[30] In PNG, a qualitative study of traditional (or village) birth attendants undertaken in 2001 found that they were motivated to help women in their community but some stopped assisting because of family or financial pressures or lack of support. Difficulties encountered by the women included that they were ill-equipped to deal obstetric complications.[31] An additional issue in the Pacific is the effectiveness of volunteers. Even where volunteers receive nominal payment, consistency and accountability for tasks without regular supervision may be lacking.[32]

Other successful community-based models

One specific model of community-based care that is succeeding is the DOTS strategy for the treatment of tuberculosis (TB). Having community-based providers of TB medications supervised by the formal health system has proved to be the best model in countries throughout the world. DOTS is working effectively in PNG and the Solomon Islands. It relies on supervision of providers, patient support, good lines of communication, and effective drug supplies. DOTS providers are often respected community members, or in the case of children, may be the child's mother.

Summary

There is some evidence that the village-based health worker model can increase community participation, health seeking and knowledge, and thus have an important role. They can have a role in the recognition of serious illness, and facilitate care seeking. In some countries they have been shown to reduce neonatal mortality. In some settings, they may improve maternal outcomes. In targeted programs like DOTS, community delivery of drugs can be highly effective in providing ongoing treatment. Village-based volunteer health workers will complement the community health post or health centre model that form part of a formal district health network, but they cannot replace it. Strengthening the community health services within the government or church run health system will be most crucial, with properly trained nurses and community health workers.

Example: Begasin Bugati Rural Development Program

In 2002, World Vision began a multi-sectoral program funded by AusAID in Madang Province, PNG, aimed at influencing a range of quality of life indicators using a series of interventions in community health, water supply, sanitation, food security and economic livelihoods.

One hundred and twenty village health volunteers were trained and supported by traditional birth coordinators, made up of former and existing community health workers and midwives at health facilities. The community experienced a 53 percent increase in the number of pregnant mothers seeking antenatal care at health facilities, a 28 percent increase in birth deliveries at health facilities and an 84 percent increase in the number of people seeking treatment at health facilities. Reported cases of malnutrition dropped by 12 percent, access to safe drinking water increased by 50 percent and the number of households applying sound hygienic practices increased by 45 percent. [33]

One component of the program considered most successful by the project staff was some aspects of improved governance. Under PNG law, voluntary structures called ward development committees (WDC) exist to support the local representative of the ward, the lowest level government administrative area. Ward members are responsible for supporting basic services, including aid (community health) posts. Since the end of the project, one of the farmer participants, active in the WDC training, secured funding from private and government sources to build an aid post (pictured on the opposite page). The community is now building accommodation for a community health worker and the province has committed to provide a community health worker for the aid post. The farmer has now been elected as the local ward member (pictured on the opposite page), which he attributes to the training and support he received under the program.

In summary, the project highlights the importance of strong linkages between informal and formal health services.

Family Planning

Access to family planning is acknowledged as a key strategy to address maternal mortality. According to the Population Reference Bureau, it is one of the most highly effective and cost-effective interventions. Preventing closely spaced births has been estimated to save the lives of two million infants and children annually. [34] It is recommended that couples should wait at least two years between the birth of babies.

The age of a mother also increases the chance of maternal death, with mortality rates for women aged 15–19 twice as high as for older women. Research suggests that pregnant girls aged 10–14 have a risk of mortality five times greater than pregnant women aged 20–24.[35] In PNG, 30 percent of maternal deaths are among teenage mothers.[36]

The report of the PNG Ministerial Taskforce on Maternal Health states that fewer than half of PNG women with two children want any more children, and after the third child, the desire to have more children drops dramatically. The report recommends quality voluntary family service provision be immediately strengthened as a primary intervention and urges a target family prevalence rate of 65 percent by 2020.[37]

The following is an example of outreach services involving data collection, where a key goal was to improve the accessibility of family planning.

Example: The Solomon Islands Family Health Card

The Solomon Islands Family Health Card, adapted from the Fijian system, has been introduced in several provinces, and is a good example of routinely collected village-based data. First trialled in Choiseul Province, nurses make home visits to record family health data, including household numbers, church, age of mother, number of children, immunisation status of children, tetanus status and family planning method used. Within the first year there was an increase in family planning uptake reported – from 4.2 percent to 10.2 percent.[38] The increase appeared to be because the couples that nurses contacted through the outreach wanted access to family planning, but had been reluctant to come to clinics.

Another key factor was the approach of the nurses. Instead of the family entering the nurse's 'territory' of the clinic, the nurse is a guest or visitor at their home. A more equal relationship has been conducive to conversation. It has been found that couples are more likely to ask questions about their own problems while the nurse has more time than in the clinic to respond. In particular, they have been more comfortable discussing family planning or sensitive matters than in a clinic or group. Importantly, unlike many clinic encounters, the adult male member of the household is often present, and this can stimulate discussion on issues previously not raised.

At the National Child Health Summit in the Solomon Islands in 2007, the Family Health Record Card was proposed as a national means of collecting routine population-based data to complement health facility data.[39] Expansion of the card in Isabel, Makira and Guadalcanal provinces was supported by the Solomon Islands Government, UNICEF and the World Bank in 2005, although more support is needed to sustain this vital tool to improve the health system.[40]


Jones Lang
LaSalle

Community Education and Support Networks

Men's health education

"The birth of a child, particularly a first child, is often a landmark moment in a man's life. It can crystallize his sense of himself as a caring responsible human being on whom other people depend." [41]

Creating a supportive environment for maternal and child health requires increased community education and support networks for women and children.

In many Melanesian societies, much of the decision making in the family is the responsibility of men. With targeted education and awareness, these decisions could be better informed and potentially save lives. Men are missing from many health promotion activities which primarily target women.

The involvement of Melanesian men in the care of their partners and children is needed through deliberately targeted programs that counter traditional gender barriers. This will encourage the empowerment of women and family support for the needs of children. Evidence has shown that men are more likely to be engaged fathers when they are included in their children's lives, through the support of families and friends, and when they feel positive about themselves and their relationships. [42]

Example: Reproductive health education for men: the flow-on benefits for women and children

In Makira Province in the Solomon Islands, programs were undertaken to improve men's education and awareness of reproductive health. A decreased maternal death rate and increased contraceptive prevalence rate has since been recorded. Men's health worker training was developed through the use of male peer educators. A separate male clinic was established, men were included in reproductive health decision making and were encouraged to be nearby for the birth of their children. These were part of broader health programs for men. In Central Province, men's health programs were developed for public servants, community leaders, politicians and church leaders.

The factors for success that were identified included taking services to where men are – the workplace, markets, church, travel settings, ports, truck stops. It also involved using trained male staff, providing out of hours services, integrating reproductive health male clinics with general clinics and taking a holistic approach that included issues of lifestyle, masculinity and community, as well as health. It required support from stakeholders such as churches and NGOs, the health department and community venues such as sports groups. An important flow-on benefit for women and children was the changed attitude project staff witnessed in the men. After receiving the health education, men were more likely to allow their wives and daughters to attend health clinics, a key issue for women and children needing care. Sexual Health and Family Planning Australia and the Australian Reproductive Health Alliance have been major supporters of these men's programs.

Support Networks

Broader determinants are crucial to understanding the potential impact of any intervention and the obstacles to reducing child mortality. A recent analysis of data from 152 countries found that gross national income (GNI) per capita, female illiteracy and income equality predicted 92 percent of the variance in child mortality.[43] In low income countries, where most child deaths occur, female illiteracy was more important than GNI per capita, and both were more important than public expenditure on health.

A recent study from The Gambia showed that community and social networks, personal support for caregivers in the home, and financial autonomy were more important determinants of child mortality than access to health services.[44] This study found non-traditional determinants for child mortality included:

- having no help with meal preparation
- having no one to relax with
- having no one to give good advice
- having no autonomy over how money is spent, and
- needing to do odd jobs to pay for health care.

Strengthening Health Systems

"Health systems are not just mechanical structures to deliver technical interventions the way the post-office delivers a letter. Health systems are core social institutions; the way people are treated has the potential to worsen, or to mitigate, the effect of poverty and social disadvantage on health and development." [45]

Where maternal and child mortality are high, health systems are likely to be poor. Dr Clement Malau, PNG's Health Department Secretary, has highlighted the urgent need to reinvigorate primary health care and service delivery to counter the country's poor health indicators. An additional $K4 billion is needed, on top of the current health budget of $K6 billion. According to Dr Malau, the system suffers from a lack of clarity in coordination at the national level, lack of delineation of national and provincial functions, serious drug supply and governance issues, in addition to poor human resource, budget and asset management.[46]

A new National Health Plan is under development in PNG and is attempting to emphasise services for the rural majority and urban poor, including the trial of new community health posts as a means of extending services. In response to the dramatic increase in maternal deaths, the PNG Ministerial Task Force on Maternal Mortality, was convened late in 2008. The report of the taskforce emphasises the critical role of health system strengthening and states that decentralisation in PNG has seriously compromised the quality and functioning of health services including maternal health.[47]

The governments of PNG and the Solomon Islands have recently refocused on child health as a national priority. In response to the joint launch in 2006 by WHO and UNICEF of the Child Survival Strategy for the Western Pacific Region, PNG and Solomon Islands Governments have now both developed comprehensive Child Health Plans. These plans have adopted the Strategy's focus on technical interventions, based on the Lancet Child Survival Series, which emphasises safe motherhood, neonatal care, breastfeeding and complimentary feeding, micronutrient supplementation, vaccination and the Integrated Management of Childhood Illnesses program.[48] In both countries this has been accompanied by better coordination of child health services, improved human resources and leadership in child health, evidence-based policy development, and reductions in mortality.

Even with imperfect health systems, there are many examples of countries that have targeted the most serious health problems in remote or poor communities. Mexico has taken a pro-poor approach to health care delivery, combining vertical interventions with broad-based health systems strengthening using a so-called "diagonal approach". This has resulted in marked reductions in child mortality over the last 20 years.[49] Tanzania prioritised local level funding for interventions to combat diseases affecting women and children, with marked reductions in mortality. Similarly, Peru introduced new vaccines into the poorest areas before trying to achieve universal coverage, and Bangladesh and Brazil introduced the Integrated Management of Childhood Illness strategy in the poorest regions first.[50]

These examples illustrate the potential for targeted approaches to the poorest areas and are in line with the policy directions in PNG and the Solomon Islands.

"The greatest gains in maternal, neonatal and child survival depend on effectively reaching the poorest and most marginalised, who suffer the greatest burden of disease." [51]

The Integrated Management of Childhood Illness (IMCI)

The IMCI program promotes the accurate identification of common childhood illnesses in primary care settings, appropriate combined treatment, and timely referral of severely ill children. In the home setting, it promotes appropriate care seeking behaviours, improved nutrition and preventative care, and adherence to prescribed treatment. It was developed by WHO and UNICEF to promote an integrated and broad response to child health needs.

Many countries have adopted IMCI with varying strategies for implementation, levels of coverage achieved, government commitment and external support. While many countries have adopted IMCI as a case management strategy, few have managed to implement the community or home-care components.

The results of the first randomised trial of IMCI evaluated its impact on mortality and nutritional outcomes.[52] In 10 districts in Bangladesh, IMCI proved an effective case management strategy, improving standardised management of common illnesses, and increasing health service utilisation. IMCI was also associated with increased rates of breastfeeding and nutrition practices, and lower prevalence of stunting.

Rapid improvement in child survival was seen in the entire study area over five years. This was associated with increases in rates of breastfeeding, maternal education, sanitation, housing, electricity and mobile phone ownership. In the final two years of the study the mortality rate was 13 percent lower in IMCI than in comparison areas. Although not statistically significant, this would be very substantial if applied over a longer period and across the whole country.

In many countries in the 1990s, the introduction of IMCI was strongly funded by external donors, with a focus on in-service training for health workers in IMCI case management. Within the last ten years, global donor support for IMCI has waned, leaving health departments with a commitment to often complex IMCI programs added on to their maternal and child health programs, often incompletely integrated and now inadequately funded. Now there are even more vertical programs focusing on individual diseases, and even greater need for integrated strategies for child survival.

In many countries, during the early period of strong donor funding of IMCI, little effort went into incorporating IMCI training in schools and colleges of nursing, community health and medicine. For IMCI to evolve into a sustainable part of the health culture, program simplification, and far greater support for health training colleges and existing maternal and child health systems must occur.

Increased access to primary and secondary education

Research shows the direct relationship between girls' education and reduced maternal and child mortality.

Statistics show that for each additional year of education achieved by 1000 women, two maternal deaths will be prevented.[53] Reduced maternal death rates are attributed to better knowledge of health care practices, improved nutrition, spacing of births and expanded use of health services.[54]

Research shows the dramatic impact of maternal education on child survival. In PNG there is an inverse relationship between maternal education and under five mortality rates[55] as the following table shows:

Educational standard	Under-5 deaths/ 1000 live births
No education	95
Grade 1-5	79
Grade 6	63
Grade 7+	45

These results are attributable to the fact that educated mothers are more likely than illiterate mothers to give birth in a hospital, seek out a skilled health attendant for their birth, vaccinate their child, breastfeed their children for longer, take an ill child to a health centre and send their children to school.

The report of the Ministerial Task Force on Maternal Mortality in PNG has strongly endorsed the PNG Government's recent decision to introduce universal free primary education by 2010.

Conclusion

Strengthening health systems and improving human resources for maternal and child health in PNG and the Solomon Islands are critical goals, if recent progress is to continue, increase and the Millennium Development Goals for Maternal and Child Health are to be achieved.

We strongly endorse the policy directions of the PNG and Solomon Islands governments, and encourage donor countries and relevant NGOs to support these governments in the following ways:

- Strengthen support to health training schools and colleges to increase the number of midwives and child health nurses and increase the number of community health workers with midwifery and child health skills in both countries.

- Support the initiatives contained in the National Child Health Plans in both countries.

- Support government initiatives to reduce maternal mortality in PNG, and build on recent progress in maternal and reproductive health in the Solomon Islands.

- Support expanded family planning.

- Advocate for free education for all children, especially to improve school participation among girls.

- Ensure that remote rural areas and poor urban settlements with the highest rates of child and maternal health problems are given priority support, using appropriate, effective and sustainable models of community-based health care delivery.

- Support men's health education to redress the gender imbalance in health education, and promote positive effects for the health of women and children.

- Support systems for birth registration and mandatory reporting of maternal, neonatal and child deaths, and systems for village-based data recording.


SPIDER

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Note to readers: The photographs used in this publication have not been manipulated. Black and white and colours have been used in the same image but the colours have not been enhanced.

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