

## Accelerating Maternal and Child Health Gains in Papua New Guinea

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# Accelerating Maternal and Child Health Gains in Papua New Guinea: Modelled predictions from closing the equity gap using LiST

## Abstract

**Background:** Many priority countries in the countdown to the Millennium Development Goals deadline are lagging in progress towards maternal and child health (MCH) targets. Papua New Guinea (PNG) is one such country beset by challenges of geographical inaccessibility, inequity and health system weakness. Several countries, however, have made progress through focused initiatives which align with the burden of disease and overcome specific inequities. This study identifies the potential impact on maternal and child mortality through increased coverage of prioritised interventions within the PNG health system.

**Methods:** The burden of disease and health system environment of PNG was documented to inform prioritised MCH interventions at community, outreach, and clinical levels. Potential reductions in maternal and child mortality through increased intervention coverage to close the geographical equity gap were estimated with the Lives Saved Tool (LiST).

**Results:** A set community-level interventions, with highest feasibility, would yield significant reductions in newborn and child mortality. Adding the outreach group delivers gains for maternal mortality, particularly through family planning. The clinical services group of interventions demands greater investment but are essential to reach MCH targets. Cumulatively, the increased coverage is estimated to reduce the rates of under-five mortality by 19%, neonatal mortality by 26%, maternal mortality ratio by 10% and maternal mortality by 33%.

**Conclusions:** Modest investments in health systems focused on disadvantaged populations can accelerate progress in maternal and child survival even in fragile health systems like PNG. The critical approach may be to target interventions and implementation appropriately to the sensitive context of lagging countries.

## Introduction

In the pursuit of the Millennium Development Goals (MDG) for maternal and child health – i.e. MDG 4 aimed to reduce the under-five mortality rate by two thirds, and MDG 5 designed to reduce the maternal mortality ratio by three quarters and achieve universal access to reproductive health between 1990 and 2015 – the 75 countries in which 95% of maternal and child deaths take place have been prioritised as ‘countdown countries’ [1]. Papua New Guinea (PNG), where this study takes place, is one of the countdown countries off track to meet the MDG 4 and 5 targets [1].

PNG is a lower middle income country located in Melanesia, a sub region of Oceania. Their population has been estimated at 7.3 million and the vast majority (over 87%) live in rural and remote areas. They are also highly diverse, with more than 800 languages spoken and hundreds of different cultural and ethnic groups co-existing to date. The country gained its independence from Australia in 1975 and similar to other countdown countries is with lagging development progress. It is beset by characteristic challenges of geographical inaccessibility, owing to rugged terrain and lack of transportation; weak health system, related to allocations of funding which did not consider variations in provincial sources of revenue, costing structures and local infrastructure; and varying poverty rates within regions and provinces, associated with ecology, agriculture, traditional structural and social disadvantage. Recent estimates put under-five mortality at approximately 63 per 1,000 live births and maternal mortality at 230 per 100,000 live births [2]. However, debate exists over the accuracy of these estimates [3]. Previous studies suggest geographical disparities are evident in under-five mortality and service coverage between rural and urban populations as well as inter- and intra-regional variations [4, 5].

Despite efforts and investments from the government and development partners, health services in PNG have deteriorated in the past 20 years [6]. The National Health Plan 2011-2020 sets out to improve health service delivery [4]; however immediate and focused action must be taken for urgent progress in maternal and child health in the country. We acknowledge that the realisation of health goals in PNG will require long-term, strategic action across all sectors to address underlying issues such as lack of infrastructure, poor educational outcomes, gender inequities, governance issues and income generating opportunities for poor and rural communities [7, 8]. Nevertheless there are concrete policies and programmes under the leadership of the health sector that can foster improvements in health outcomes for the population. Our objective in this paper is to illustrate the potential for such programmes to improve maternal and child health in the country.

Indeed, evidence of the most cost-effective reproductive, maternal, newborn and child health (RMNCH) interventions to address their burden of mortality already exists [9]. Epidemiological modelling tools like the Lives Saved Tool (LiST) are also available for researchers and policymakers to estimate the gains in maternal, newborn and child mortality that could be achieved by increasing delivery and coverage of alternative RMNCH interventions. Recent papers [10-13] have used this approach to illustrate the impressive mortality gains that can be achieved under ideal conditions in which the coverage of a comprehensive list of interventions is increased to ambitious targets (i.e. 90%). However, to illustrate more context-specific gains that can be achieved the most cost-effective RMNCH interventions and coverage targets need to consider the long-term constraints facing the health system, while also using the example of the realistic achievements within the country as an anchoring point.

On these grounds, our study aims to use the available epidemiological and health system evidence for PNG to identify priority RMNCH interventions that are feasible for rapid increases in coverage in the local context. The interventions are considered in groups and a stage-wise strategy is utilised. We additionally used LiST to explore the potential impact on maternal, newborn and child mortality of the proposed groups focusing on increasing coverage to close the geographical equity gap.

## **Methods**

We employed a series of steps to estimate the impact of increasing coverage of feasible priority services for RMNCH. We first considered the burden of disease for mothers and children in PNG and summarised the major health system constraints documented in PNG. Second, with this foundation we established a list of priority, feasible evidence-based RMNCH interventions for focused increased coverage. Third, we set benchmark coverage targets that are feasible based on current achievements in the local context. Finally, we used LiST to model their expected impact on maternal, newborn and child mortality.

### *Selecting interventions*

To select the highest priority RMNCH interventions the global burden of disease data was used to identify the leading causes of maternal, newborn and child mortality and morbidity in PNG [14]. These were aligned with the global evidence on the most cost-effective RMNCH interventions [9]. On this basis we selected those interventions that would have the largest

impact on mortality. Intervention selection was refined based on the existing health system platforms and constraints in PNG. The analysis of the health system was framed by the World Health Organization's (WHO) Building Blocks framework assessing service delivery, workforce, information systems, financing and leadership, and governance [15]. Priority RMNCH interventions were selected and developed into groups, based on similarities in delivery at health system platform or staff, and considered feasible for increasing within the main health system levels: community, outreach, and clinical, of PNG.

### *Setting coverage targets*

This analysis is underpinned by an equity focus, given that significant disparities are evident in mortality and coverage of essential RMNCH interventions, with analyses having identified geography as a leading driver of inequity in PNG [5]. With the aim of illustrating the impact on mortality of closing the geographical inequity gap, the analysis set the coverage targets of the interventions to increase to a level equal with the average of the five provinces with highest reported coverage for that intervention as recorded in 2011. National Capital District was excluded as a non-characteristic district being the only urban setting in the nation. We chose the leading five of the 20 provinces on coverage of each specific intervention because it reflects targets that have been achieved in the country, within the existing health system environment, but most important because it focuses the attention on the health outcome gains that can be achieved by closing the existing equity gap.

### *Modelling impact with LiST*

The impacts of the three groups, cumulatively, were assessed with respect to under-five, neonatal and maternal mortality rates as well as the maternal mortality ratio which more suitably expresses the impact of family planning. Modelling of the impact of the intervention groups was estimated using the LiST [16] software, developed for the Spectrum [17] suite of software, based on the Lancet's child survival series [18-22]. Spectrum is a well-established freely downloadable program utilising projection software to assess changes in demographics based on pre-set criteria. It utilises numerous applications, each disease or disease group specific, to predict population and mortality outcomes based on changes in coverage of specific interventions. Cause-specific mortality estimates within LiST draw on proven interventions for which effectiveness is taken from the evidence reviewed by the Child Health Epidemiology Reference Group (CHERG) [23]

and appraised for quality with GRADE criteria [24]. Further details about the criteria used to assess interventions and assumptions used in LiST can be found elsewhere [17].

LiST modelling required multiple data inputs; baseline mortality rates for mothers and children, proportional causes of death, and coverage levels for RMNCH interventions. Once a baseline model was created, a scenario was constructed by entering the theoretical increases in coverage levels into the software to generate estimates of impact on mortality.

### *Data sources and ethics*

The Global Burden of Disease study [14, 25] and recent health system reviews [4, 6, 26-36] informed the contextual understanding. Baseline coverage values for the RMNCH interventions, and calculations for the target coverage levels used in modelling, were sourced from the PNG National Health Information System (NHIS) [27], UNICEF [37] and UNAIDS [38], using the most recent data reported from these three sources (i.e. the year 2011). For modelling in LiST, mortality rates and cause of death data were sourced from the WHO databank [32]. Full ethics review of this study from an institutional review board was not sought as the datasets were anonymous, with no identifiable information on survey participants.

## **Results**

### *The burden of disease for MCH*

The under-five mortality rate (U5MR) declined in PNG from 133 deaths per 1,000 live births in 1990 to 69 in 2011, however, the progress is unequal across the country [5, 39]. Infections are the leading burden for children with pneumonia and diarrhoea claiming the most lives [14, 32]. The neonatal mortality rate (NMR) is declining more slowly than the U5MR; only shifting from 32 deaths per 1,000 live births in 1996 [40] to 26 in 2011 [32] and accounts for approximately 40% of all under-five deaths [28, 32]. Most newborn deaths are due to prematurity, birth asphyxia and trauma, sepsis, pneumonia, tetanus, congenital anomalies and meningitis [14] and 8.7% of newborns are of low birth weight (<2500g) [27] with an alarming case fatality rate of 32% [28].

For women of reproductive age (WRA) infectious diseases and maternal disorders persist as the leading causes of mortality and morbidity and for adolescent women (aged 15-19) maternal disorders are the number one cause of death [14]. Poor sexual and reproductive health of women

is a significant burden with the high national total fertility rate of 4.1, only 26% of WRA use modern contraceptives [31] and 7% begin childbearing before the age of 19 [37]. For WRA sexually transmitted infection (STI) rates are as high as 22% [41] and HIV, although on the decline at approximately 0.5-0.7% prevalence among reproductive age adults (15-49 years), young women (15-24 years) have double the prevalence of their male counterparts: 0.4 vs 0.2% [42]. The maternal mortality ratio (MMR) has seen limited improvement; from 388 to 288 deaths per 100,000 live births in the last two decades [43]. Estimates of the MMR in PNG are uncertain and vary at points in time: for instance from 733 in 2006 as per the PNG Demographic and Health Survey compared to 230 in mathematical models of 2010 to 545 per in-country agency and health facility records of 2009; however, all methods are subject to limitations. The DHS data is known to be methodologically flawed. The mathematically modelled estimates draw on very little data and are at the mercy of the accuracy of that data. While the health facility and agency reports are subject to well-known underreporting and reporting error with no cross validation [3]. MDG target monitoring will thus vary between sources and one must be consistent within a chosen estimation method. Haemorrhage, abortion, sepsis, eclampsia and obstructed labour have been reported as the leading causes of maternal death [6, 14, 44].

#### *The health system challenges*

The coverage and quality of RMNCH services is low and has deteriorated in the last 20 years [27]. The public hold low confidence in the health system based on their experiences of closed facilities, shortage of personnel, drugs and supplies, and staff attitudes towards patients [6].

The challenges to RMNCH service utilisation are inaccessibility and low quality of care [45]. In terms of health service delivery, more than 40% of all aid posts closed between 1990 to 2000, and a further 781 closed by 2010, most in rural areas [4, 6]. Outreach clinics to rural and remote villages that provide essential immunisation, nutrition monitoring, antenatal care and family planning have stalled from an already low level [4]. The health workforce of PNG comprises low skill sets, shortage in number and unequal distribution of trained health workers [6, 30, 36]. The recording in the health information system is incomplete with limited indicators and submission of reports in many sites [27]. The system has inadequate storage and distribution of medical supplies as well as theft and illegal sale [4, 6, 46, 47]. Government health spending is limited with only 3.3% of GDP allocated to health in 2011 [34] and has in the past been directed at poorly accessed provincial hospitals [4, 6] with incomplete accountability and governance at service delivery points [29, 45]. Grounded in the National Health Plan 2011-2020 the national

government is initiating systems changes to tackle these challenges and strengthen a focus on rural health care.

### *Three priority RMNCH groups of interventions*

The groups, shown in Table 1, were designed for implementation building from community level, adding the outreach, and moving to incorporate the clinical level of care, with a focus on disadvantaged regions. This approach favours interventions and mechanisms of service delivery which can be implemented with improved systems, training and minimal additional infrastructure. This does not detract from the need for comprehensive RMNCH services, rather is intended to represent interventions for immediate focus for maximum impact through targeting the cause of death patterns in PNG. The groups align strongly with the WHO Regional Reproductive Health Framework for all three objectives: to increase coverage and quality of RMNCH services; to address inequity; and to strengthen community actions to improve RMNCH [48].

### *The impact on maternal and child mortality*

To illustrate the gains that could be feasible if equity gaps were closed, coverage targets were set at the average of the five provinces reporting the highest coverage of each intervention, excluding the National Central District. The baseline and target coverage levels of the interventions are shown in Web Appendix 1. The reductions in mortality achieved as a cumulative result of the modest increased coverage of the intervention groups are shown in Figure 1, while the impacts on specific causes of death are reported in Figures 2 and 3.

Commencing increases with the community-level group would yield significant reductions in neonatal and under-five mortality however falls short for meeting the needs for maternal survival. The NMR would decline by 10%, largely through prevention of sepsis and tetanus in newborns and from kangaroo care for premature and low birth weight newborns. The U5MR would reduce by 11% from improved management of diarrhoea and pneumonia. The community-level interventions impact only moderately on maternal mortality, through clean home birth practices, as they cannot address obstetric emergencies.

Complementing the community-level with the outreach services most significantly delivers gains for maternal mortality. Cumulatively, the two groups would reduce the MMR by 7% and the maternal mortality rate (MMRate) by 31%. This arises largely from the increased coverage of both short and long-acting modern contraceptive methods. The focus on increasing 'at least 2+



ANC' for pregnant women rather than 'at least one visit' is a mechanism for increasing quality of care and thereby more effectively impacts on their mortality and morbidity. For instance, women receiving at least two visits, not only one visit, can receive full iron-folic acid supplementation (180 days), two or more tetanus toxoid injections to afford full protection to the newborn, and STIs and HIV testing plus the follow-up treatment.

The clinical-level interventions demand greater health system investment over a somewhat longer term but are an essential target for newborns, children and mothers. Overall, increasing coverage to equal levels across provinces of the three groups would reduce the NMR by 26%, the U5MR by 19%, the MMR by 10% and MMRate by 33%. The additional gains of the clinical-level services arise from skilled care addressing asphyxia, prematurity, sepsis and pneumonia for newborns, and for mothers from prevention and management of haemorrhage, pre-eclampsia and sepsis. The increase of prevention of parent to child transmission of HIV (PPTCT) and family planning services help to curb the increasing burden of HIV for children. Reductions in deaths from 'injury' and 'other' are a result of fewer births from increased family planning.

## **Discussion**

Grounded in context-specific analysis, the findings of our modelling exercise suggest that investments in health services through the implementation of three feasible RMNCH groups of interventions would lead to accelerated health gains. These groups target those health interventions that maximise and build on the existing health system resources. The results of the scenario predict substantial reductions in maternal and child mortality of 10 to 33%. The results are presented as estimates as the exact precision is constrained by the paucity and limited reliability of burden of disease and health information system data of PNG, as is well documented [49, 50]. The analysis is nonetheless based on the best available data at present.

The health system improvements required for the implementation of the proposed groups of interventions cannot be underestimated, but recent initiatives gaining momentum in PNG are bringing broad progress throughout the health sector and provide ground for further improvements. They include the removal of health service user fees, free primary education, increases in small businesses, stronger curriculums, more health workforce schools, and emerging policies on Village Health Volunteers (VHVs). In particular, strengthening of rural health services is occurring through a coordinated health workforce across districts, rural clinics and VHVs, improvements and clarity in VHV training and role, reinforced clinical services at rural clinics, and boosts to community-based and clinical health services. As echoed by recent

studies, such developments in the country combined with a focus on reducing inequity have the potential to accelerate progress to RMNCH goals [51, 52].

The community-level set of interventions proposed in this study are all evidenced to be safely and effectively delivered by lay health workers with no academic training or peripheral health professionals with minimal formal training [53-55]. Settings with extremely remote areas, cultural diversity, low income and critical health workforce shortages have realised significant results in maternal and child survival with limited change in many of the underlying barriers through strong voluntary lay health workers programs [55]. In PNG this represents improved services by their existing VHV cadre. Currently the training and role of VHVs varies widely and most are attached to faith-based organisations and non-government organisations. Such factors as well as limited integration with clinic services, minimal support and incentive systems might explain the limited success of community-level interventions in the country [51]. However, the government of PNG is now revitalising community-level services and is undertaking steps to create a more structured and effective VHV cadre [56]. These developments will support increases in coverage of community-based interventions, such as those modelled in this study.

Outreach for RMNCH is a well-established activity in the PNG health system, however, infrequent services hinder results. Delivering quality short-, long- and permanent acting family planning, quality ANC for 2+ visits, and child immunisation through outreach not only increases coverage directly but also increases health service utilisation through referral and promotion [49, 50]. For effectiveness, however, the outreach mechanism will require adequate infrastructure at aid posts, strengthening of supply chains, and improvements to the management, remuneration and motivation of staff to undertake the routine outreach visits as is presently mandated. Disadvantaged provinces where staff shortages are most severe must be prioritised for resource and staff allocation. A more effective chain linking nurses and midwives with CHWs and VHVs may improve coordination, ease the workload, improve motivation, and increase demand in outreach activities [57]. An aspect of this may be through renewed efforts in the Health Extension Officer (HEO) role, created in the 1960s in PNG to focus on rural health services, which was well poised between medical officer and nurses at District Health Centres and Hospitals. However attention slid without fully embedding them, absence of target post numbers to stimulate recruitment, and little support in ongoing training and professional development [36, 58]. Capable of both administration and delivery of clinical services this cadre could directly increase the reach, scope and quality of rural health services pertinently for community and clinical groups of interventions. As the CHWs workforce has been the focus for re-invigoration

in recent years, with steps such as increased recruitment and training this model may be increasingly feasible and fruitful.

The clinical-level interventions are essential for higher impact. The proposed focus is particularly on quality of care in the short-term to ensure effective service that actually impacts on health outcomes. In-turn, quality, responsive, considerate care is a driver of demand and utilisation of health services [43]. Recent developments such as providing PNG medical officers with the option to focus on rural health care through post-graduate studies are addressing some of the key challenges that the country faces to provide high quality clinical services in remote sites. Other investments required include revised training for midwives, nurses and medical officers to ensure the required skill sets for all skilled birth attendance signal functions, safe provision and reversal of long-acting reversible contraceptives; supply of more expensive and specific medicines and equipment; and more specialised supervision and support.

Highest returns for investment will be yielded through an equity focus [59] with prioritisation of the poorest rural populations. The greatest gains will demand investment in regions like Momase, where we see some of the highest mortality and lowest health service coverage. The value of investing in RMNCH with strengthening of the health system at these three levels is likely to be multi-fold in the long-term with significant social and economic benefits arising from improvements in equity.

As with any mortality modelling exercise, our estimates are based on the assumption that the coverage targets set for the identified interventions can be achieved. We have chosen the average of the five highest coverage levels reported by provinces for each intervention as such targets to reflect the gains that are feasible if the equity gap is closed. These targets, however cannot be used to examine what levels of intervention coverage can be achieved under alternative health system investments (i.e. increasing aid posts vs. improving health facilities). The precision of impact estimates is also limited by the accuracy and reliability of source data, which as documented elsewhere is a notable challenge in PNG [5]. However, the Department of Health is endeavouring to strengthen the health information system which will enhance the rigour of health planning and management, estimates of future impact and costing exercises.

With a lens on the disease burden and health system environment an analysis of the potential impacts on mortality is an effective means to guide the prioritisation of health investments. Our findings suggest that even modest investments in health systems with a focus on disadvantaged rural populations can contribute to accelerated progress in the maternal, newborn and child

survival even in fragile health systems, like PNG. The critical approach for lagging countdown countries is to target interventions and implementation appropriately to the sensitive context.

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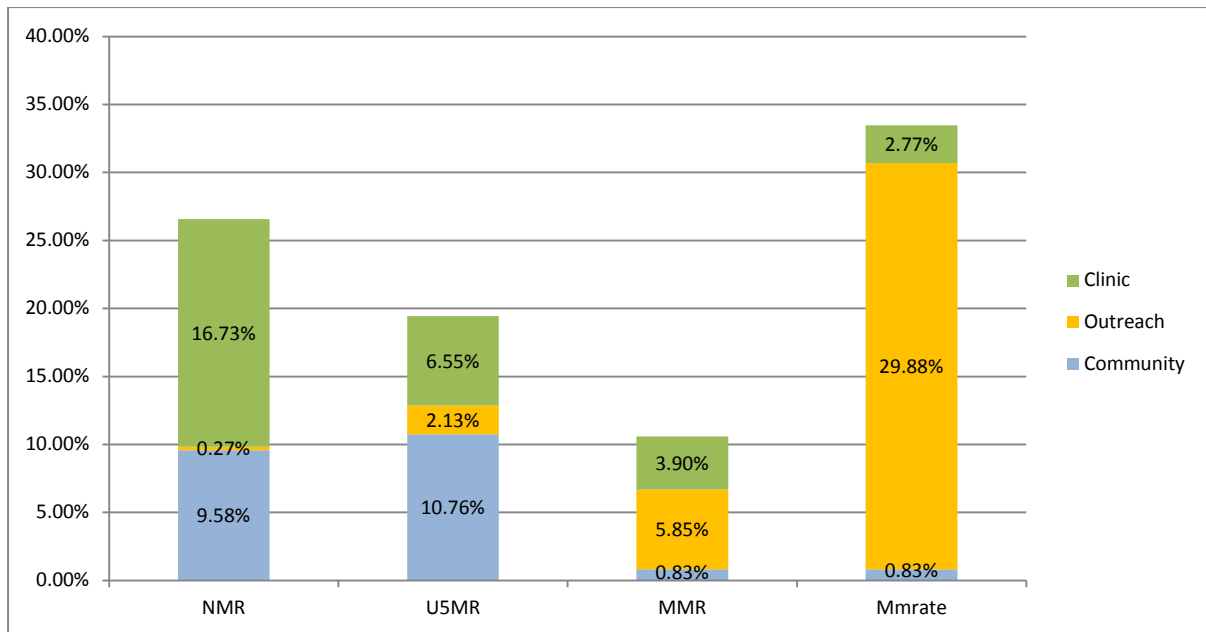
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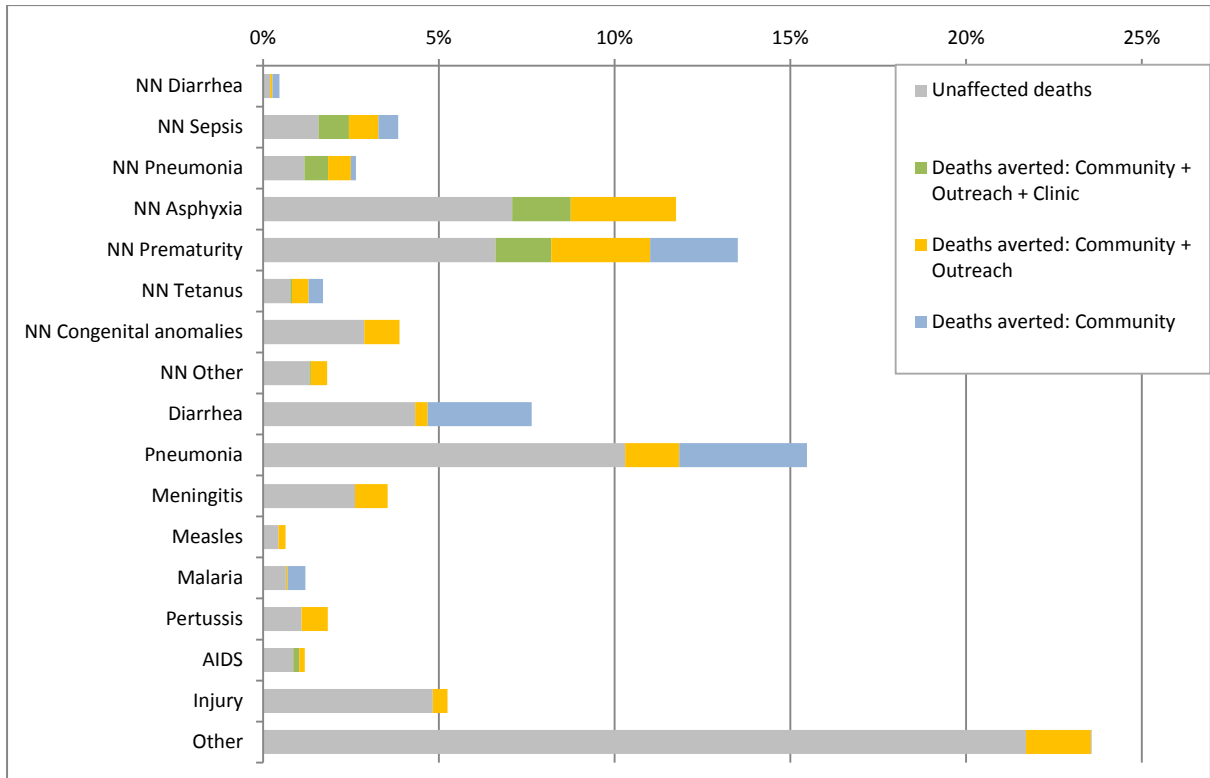
**Figure 1:** Impact on mortality, reduction on mortality by intervention group



Source: Authors' modelling estimates based on LiST. NMR, neonatal mortality rate; U5MR, under-five mortality rate; MMR, maternal mortality ratio; MmRate, maternal mortality rate

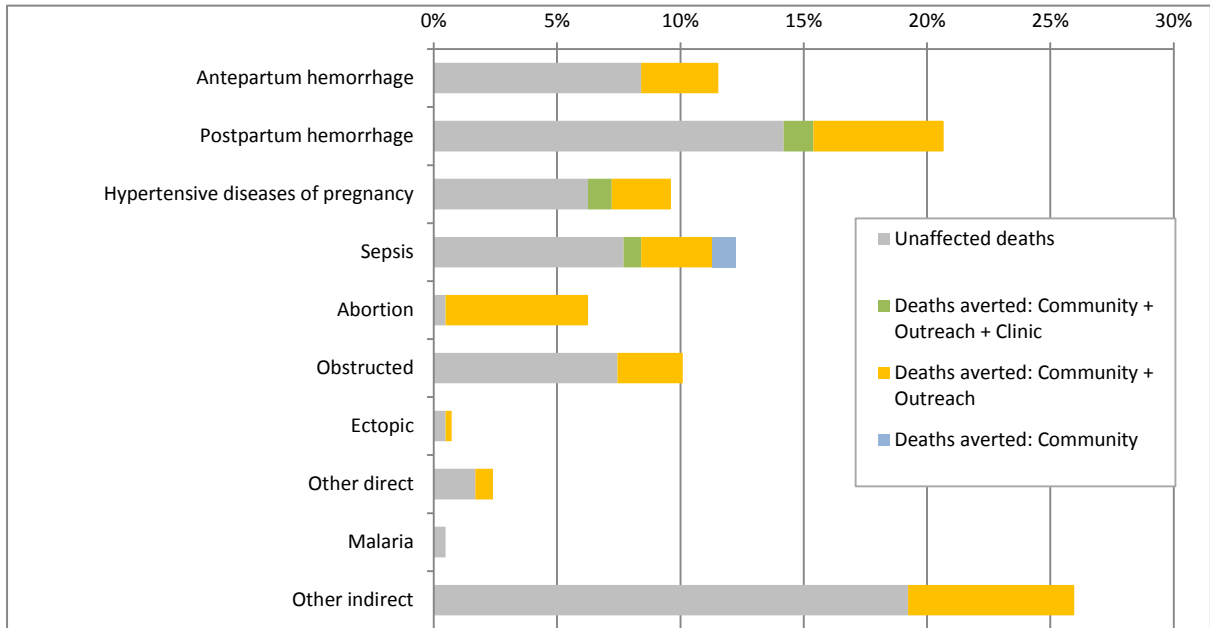


**Figure 2:** Impact on newborn and child mortality, reduction by cause of death



Source: Authors' modelling estimates based on LiST. NN, neonatal

**Figure 3:** Impact on maternal mortality, reduction by cause of death



Source: Authors' modelling estimates based on LiST

**Table 1:** Groups of selected priority RMNCH interventions

Community-level group	Outreach group	Clinical-level group
<p><b>Preventative maternal and child care</b></p> <ul style="list-style-type: none"> <li>- Distribution of clean delivery kits</li> <li>- Exclusive breastfeeding to 6 months</li> <li>- Infant &amp; young child feeding</li> <li>- Bednets for malaria prevention</li> </ul>	<p><b>Family planning</b></p> <ul style="list-style-type: none"> <li>- Short acting: pills and condoms</li> <li>- Long acting: injection</li> <li>- Permanent: tubal ligation and non-scalpel vasectomy</li> </ul>	<p><b>Family planning</b></p> <ul style="list-style-type: none"> <li>- Short acting: pills and condoms</li> <li>- Long acting: injection, IUD</li> <li>- Permanent: tubal ligation and non-scalpel vasectomy</li> </ul>
<p><b>Home-based newborn care</b></p> <ul style="list-style-type: none"> <li>- Cord and thermal care</li> <li>- Kangaroo care for LBW</li> <li>- Early initiation of breastfeeding</li> </ul>	<p><b>Antenatal care</b></p> <ul style="list-style-type: none"> <li>- 2+ ANC visits</li> <li>- Iron folate supplementation</li> <li>- Tetanus toxoid vaccination 2+</li> <li>- Syphilis detection and treatment</li> <li>- Malaria case management</li> <li>- IUGR detection</li> </ul>	<p><b>Facility-based delivery/ SBA</b></p> <ul style="list-style-type: none"> <li>- Clean birth</li> <li>- Active management 3<sup>rd</sup> stage labour</li> <li>- Antibiotic intrapartum</li> <li>- Magnesium sulphate</li> <li>- PPTCT</li> <li>- Neonatal resuscitation</li> </ul>
<p><b>Management of childhood (&lt;5) illness</b></p> <ul style="list-style-type: none"> <li>- Vitamin A supplementation</li> <li>- Oral antibiotics for pneumonia</li> <li>- Zinc + ORS for diarrhoea</li> <li>- Anti-malarial for treatment</li> </ul>	<p><b>Childhood immunisation</b></p> <ul style="list-style-type: none"> <li>- Measles</li> <li>- Pentavalent - 3 doses (representing all essential childhood immunisations)</li> </ul>	<p><b>Neonatal case management</b></p> <ul style="list-style-type: none"> <li>- Injectable antibiotics for neonatal infection</li> </ul>

## Web Appendix 1: Coverage levels for interventions as inputs to LiST modelling

Service	Intervention modelled	Baseline	Target	Data source
<b>Community-level group</b>				
Preventative maternal and child care	Distribution of clean delivery kits	0	44.3	NHIS
	Exclusive breastfeeding to 6 months	62	68	NHIS
	IYCF	53	76	NHIS
	Bednets for malaria prevention	53	76	NHIS
Home-based newborn care	Cord and thermal care	42.7	53	NHIS
	Kangaroo care for LBW	42.7	68	NHIS
	Early breastfeeding (within 1 hour of birth)	53	76	NHIS
Community-level management of childhood illness	Oral antibiotics for pneumonia for U5 pneumonia	50	70	NHIS
	Zinc + ORS for U5 diarrhoea	50	70	NHIS
	Vitamin A supplementation	50	70	NHIS
	Anti-malarial for treatment of child malaria	50	70	NHIS
<b>Outreach group</b>				
Family planning	Pills and condoms	25	42.9 (Method mix 20% each)	NHIS
Antenatal care	2+ ANC visits	62	68	NHIS
	Iron folate supplementation	62	68	NHIS
	Tetanus toxoid vaccination 2+	62	68	NHIS
	Syphilis detection and treatment	62	68	NHIS
	Malaria case management	62	68	NHIS
	Foetal growth restriction detection	62	68	NHIS
Childhood immunisation	Measles	50	69	NHIS
	Pentavalent - 3 doses	53	76	NHIS
<b>Clinical-level group</b>				
Facility-based delivery/ skilled birth attendance	Labour and delivery management	10	33	NHIS
	Clean birth	12	33	NHIS
	AMTSL	4	33	NHIS
	Antibiotics	4	33	NHIS
	Magnesium sulphate	4	33	NHIS
	PMTCT	0	68	NHIS
	Immediate assessment and stimulation	10	33	NHIS
	Neonatal resuscitation	0	33	NHIS
Family planning	Injection (Depo), implant, IUD, pills,	25	42.9 (Method	NHIS

	condoms		mix 20% to each)	
Neonatal case management	Injectable antibiotics for neonatal infection	42.7	68	NHIS