Report on the Summative External Evaluation of the Catalytic Initiative (CI)/ Integrated Health Systems Strengthening (IHSS) Programme in Mozambique

Undertaken by the Medical Research Council South Africa in partnership with the University of the Western Cape and Save the Children

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Suggested citation

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ACRONYMS

ACT	Artemisinin-based combination therapy
ANC	Antenatal care
APE	Agente Polivalente Elementares
BF	Breastfeeding
CCM	Community Case Management
CI	Catalytic initiative
CHW	Community Health Worker
DFTAD	Department of Foreign Affairs, Trade, and Development Canada
DHS	Demographic Health Survey
DOT	Directly Observed Therapy
DPT	Diphtheria, Tetanus, Pertussis vaccine
EBF	Exclusive breastfeeding
FRELIMO	Mozambique Liberation Front
GDP	Gross domestic product
GRM	Government of the Republic of Mozambique
HP	Health post
iCCM	Integrated community case management of common childhood illnesses
IHSS	Integrated health systems strengthening
IMCI	Integrated management of childhood illnesses
IMNCI	Integrated management of neonatal and childhood illnesses
LiST	Lives saved tool
LLIN	Long lasting Insecticide treated net
MCWH	Maternal, child and women's health
MDG	Millennium Development Goals
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal, Neonatal, and Child Health
M&E	Monitoring and evaluation
MISAU	Ministry of Health Mozambique
NCHW	National Child Health Weeks
NGO	Non-governmental Organisation
NHS	National Health Strategy
NMR	Neonatal mortality rate
ORS	Oral rehydration salts
PEPFAR	The United States President's Emergency Plan for AIDS Relief
PHC	Primary Health Care
RACE	Rapid Access Expansion 2015 Programme
RBF/PBF	Results-based financing / Performance-based financing
RED	Reach Every District
RDT	Rapid Diagnostic Test
SWAp	Sector Wide Approach
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
U5MR	Under-five Mortality Rate
WHO	World Health Organization

EXECUTIVE SUMMARY

Background

The Integrated Health Systems Strengthening (IHSS) support through the Canadian International Development Agency (DFTAD) and the United Nations Children's Fund (UNICEF) began in 2007 and continued until 31 May 2013. It was designed to support the implementation of the National Health Sector Strategic Plan 2007- 2012. The aim of this programme was to provide support and "financing to intensify national efforts towards Millennium Development Goals (MDGs) 4 and 5, by focusing on high impact and cost-effective interventions all through integrated services, delivered by front-line health workers at community and health facility level". The main purpose of the IHSS support was to strengthen the health system by extending coverage of essential prevention and curative services addressing the main causes of child mortality to underserved areas. Initial activities aimed at strengthening district planning and outreach activities to provide critical services such as immunisation, vitamin A, protection from malaria, and the promotion of better nutrition, especially exclusive breast feeding. Improved management of childhood illness was attempted through extensive retraining of clinical staff in fixed facilities in Integrated Management of Childhood Illnesses (IMCI). Policy dialogue and planning for more effective outreach resulted in a large effort to revitalise the Community Health Workers (CHWs) - here called Agente Polivalente Elementares (APEs)- programme to include iCCM activities and supplies to enable modern diagnosis and treatment of malaria, diarrhoea and pneumonia in the community. This important initiative has only now begun to go to scale across the country and will require several more years of support and evaluation before its impact can be reliably measured.

During phase one of the IHSS the focus was on providing support for strengthening immunisations, vitamin A supplementation, infant and young child feeding, procuring and distributing ITNs, training and quality improvement in child care in facilities. Policy dialogue resulted in allowing the use of selective modern drugs by community workers. This paved the way for implementation of the full iCCM package delivered by newly trained APEs. The revitalisation programme began in 2010 in 8 districts (of 142) and expanded to 50 districts the next year with close to 1000 APEs, largely with DFATD and UNICEF support. Other donors have helped with continued expansion, which is slated to reach all districts by mid-2014 with over 3500 APEs trained and supported.

Evaluability

An evaluability exercise prior to the external evaluation was not undertaken because it was not called for in the Request for Proposal of Services (the terms of reference of the external evaluation) and would have been cost prohibitive given the amount of funding for the evaluation. Evaluability exercises are not mandatory under UNEG Norms for Evaluation in the UN System.[1]

Evaluation Rationale

DFATD and UNICEF called for an external evaluation of the IHSS programme to be conducted at the end of the program in "Schedule A for Grant Funding to a UNICEF Program".[2] As the IHSS programme has come to an end, this external evaluation is intended to fulfill this requirement and is pursuant to the terms of the document "Request for Proposal of Services" (the terms of reference for the external evaluation) signed by DFATD and UNICEF.[3]

Purpose and objectives

The purpose of this external evaluation was two-fold:

- To evaluate the effect of the IHSS programme on coverage of a limited package of proven, high impact, and low cost maternal and child health interventions in Mozambique.
- To inform programme and policy decisions in Mozambique and regionally.

The objectives of the evaluation were to assess the effect of the IHSS programme on the following:

- Relevance: In terms of alignment to national priorities and plans, enhanced policy environment, multi-sectoral collaboration and promotion of gender equity.
- Effectiveness: Effect on strengthening the six World Health Organization (WHO) building blocks of the health system, and the capacity of government and/or civil society organizations to train, equip, deploy, and supervise front-line health workers to deliver a limited package of proven, high impact and low cost health interventions.

- Impact: Effect on coverage of selected maternal, newborn and child health and nutrition interventions, particularly integrated community case management (iCCM), which were supported by the IHSS programme, as well as the effect on the number of additional lives saved by the IHSS programme calculated using the Lives Saved Tool (LiST) disaggregated by groups of interventions (e.g. iCCM) and by individual interventions according to the phases of the programme.

- Sustainability: The cost of implementing iCCM and the organisational and financial sustainability of this programme.

Scope of the Evaluation

The scope of the external evaluation was focused on estimating the plausible effect of the IHSS programme on coverage of interventions funded by the IHSS programme, and estimating the additional lives saved by the programme (together with other relevant interventions), using LiST. The evaluation scope was limited to assessing the plausible contribution of the IHSS programme to observed changes in coverage of selected indicators due to the lack of true comparison areas (as similar programmes were being implemented across the country) and the lack of feasibility of a randomized intervention/control design. Geographically the scope of the external evaluation included thirty-three districts in Phase I and 144 districts in Phase II. Temporally, the scope of the external evaluation included the period 2000-2006 (secular trend) prior to the start of the IHSS programme, the period 2007 to 2010 known as Phase I of the IHSS programme; and the period 2010 to March 2013 known as Phase II of the IHSS programme.

Intended Audience

The intended audience of this external evaluation includes the Ministry of Health of Mozambique, DFATD, UNICEF, other UN agencies, and governmental and civil society partners at national, regional, and global levels.

Methodology

A mixed method approach to this evaluation was used[4, 5] involving quantitative, qualitative and economic evaluation methods. For analysis of coverage, trend analysis was performed using a non-parametric test of trend across years and wealth quintiles for the Demographic Health Survey (DHS) and the Multiple Indicator Cluster Survey (MICS) surveys. Data to assess implementation activities, utilisation and quality of care were taken from routine programme data collected by UNICEF from APE reports. The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework.[6]

Using household survey data, we used LiST to investigate the extent to which changes in child mortality could be attributed to increases in intervention coverage. On the basis of measured baseline mortality values and changes in coverage, we forecasted child mortality by cause over three time periods (2000-07, Phase I 2007-10 and, Phase II 2010-13).

The costing component, for the purpose of this evaluation assessed the additional costs incurred by the health services (including donor funding) due to the introduction of the APE programme specifically for the treatment of malaria, diarrhoea and pneumonia in children under five as well as unit treatment costs with current and increased levels of utilisation.

A cost per life saved was not calculated, for several reasons. 1. The methodology for assessing lives saved using the Lives Saved Tool (LiST) is based on modelled estimates, not measured outcomes linked to specific interventions 2. The lives saved analysis reflects inputs across the health system resulting in coverage change which include, but are not limited to, IHSS inputs 3. The coverage change and lives saved identified in the LiST analysis cannot be allocated to different levels of the health care system (e.g. community level) in a reliable way, and 4. The costing analysis was based on *additional costs* and not the full cost of providing the iCCM set of interventions. Not being able to quantify the total cost of health system strengthening, in particular at APE level, it is not possible to ascertain the full cost of delivering iCCM. Use of these costing figures would, therefore, be inappropriate as it underestimates the full costs (government and donor costs combined) of delivering iCCM.

The effect of contextual factors (including socioeconomic progress, policy changes, epidemiological changes and complementary and competing interventions by other donors and government) were described using data from document reviews and relevant databases and from extensive interviews with MISAU and other key informants nationally, in health districts and communities served by APEs. The evaluation team visited two provinces for field work (Gaza and Inhambane) in addition to three days spent in Maputo.

Findings

Relevance

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1. To what extent did the programme's objectives reflect a health systems strengthening approach, including:
   a. alignment with the health policies, planning and health surveillance of the Government? and
   b. training, equipping, deploying and supervising front-line health workers to deliver the selected high impact and low cost health interventions?
2. To what extent did the programme's objectives include a focus on women's participation and a gender equality approach?

The IHSS programme supported the Government of the Republic of Mozambique (GRM) initiatives to broaden coverage to underserved populations through improved outreach and strengthened district health services and re-establishment of a strengthened APE programme in remote communities. It formed a key part of the GRM MDG strategy.

Effectiveness

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3. To what extent were the objectives related to health system strengthening (including policies, planning and health surveillance) and training, equipment, deployment, and supervision of front-line health workers achieved?
4. To what extent were the objectives related to women's participation and gender-equality achieved?
5. To what extent did coverage of the selected high impact and low cost interventions in the target populations increase? What additional coverage is plausibly attributable to the programme?
6. What aspects of the IHSS programme worked? Why did these aspects work?
7. What aspects of the IHSS programme did not work? Why did these aspects not work?
8. What were the major factors influencing the achievement or non-achievement of the IHSS programme objectives?

Early IHSS funding and support focused on the adoption of the Reach Every District approach and National Child Health Weeks along with funding for procurement and distribution of insecticide treated nets for under five. These initiatives served to increase access for underserved populations and strengthen facility and district health services. Although the DHS 2011 survey was conducted just as the first 8 pilot districts for the APE programme were initiated, there is data from smaller surveys to show increased care seeking in areas served by APEs and suggestions of a shift to earlier treatment closer to home in APE areas. There was a strong and nearly universal request from communities that APEs spend some time each day at a fixed place and time (home or health post) to enable consultation. Data from interviews conducted as part of this evaluation demonstrated a high appreciation for the work of APEs, not only with regard to the treatment of iCCM diseases, but also to their effectiveness in achieving improved hygiene and nutrition practises in their communities.

The fall in under-five mortality rate (U5MR) documented by the various national surveys is impressive and convincing evidence of improved health across the country. Attribution of this finding to IHSS, or any other programme, is not possible at this time. Improving trends were seen over the period in malaria treatment, use of ORS, of Vitamin A and ITN coverage, and immunisation, particularly measles.

A narrowing gap between the richest and poorest wealth quintiles was noted for most measured parameters.

Impact

> 9. Was a reduction in child mortality observed amongst target populations? Based on plausible attribution of coverage, how many lives were saved?

The main causes of under-five deaths in Mozambique in 2010 included malaria, pneumonia, AIDS, diarrhoea and complications from prematurity.[7] The LiST analysis estimated higher mortality rates than those of the DHSs in both the pre-IHSS period and the IHSS period, indicating that the coverage changes cannot account for all factors relating to child mortality reductions, or that the model is not accurately capturing the mortality impact of the coverage changes. During Phase I of IHSS (2007-2010), the LiST modelled analysis indicated an additional 20,500 lives were saved, with 82% of these lives saved due to increases in coverage of interventions also supported by the IHSS programme (16,100 deaths averted over 3 years). Since these numbers are annually calculated based on deaths averted as compared to the baseline mortality rate, the cumulative number should be interpreted with caution. Across each year, IHSS-focus interventions came across as leading interventions averting the greatest proportion of deaths averted indicating the scale up of these interventions has potential to save lives. Without endline data for Phase II, assumptions were applied for coverage of IHSS interventions with similar results as Phase II. Until higher coverage of APEs is achieved and their work pattern more settled, it is difficult to attribute lives saved to the IHSS programme. Though lives saved in Phase I from malaria prevention and treatment, case management of diarrhoea, and PMTCT, and promotion of breastfeeding could partly reflect the start of the IHSS programme in 2008 and other similar programmes throughout the country.

Sustainability

> 10. What is the additional cost per treatment for each of the 3 iCCM conditions?
> 11. What is the cost of increased utilisation?
> 12. What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends?
>   a. Are committed financial and human resources sufficient to maintain benefits and results?
>   b. Is the external environment conducive to maintenance of results?

The financial costs of the APE programme are predominantly the fixed costs of training, supervision, monthly stipend, and equipment supply, costing $752/APE/year. At current levels of treatment activity for children under five (currently 99 cases/APE/year), the cost per child treated is about $9/malaria case including RDT confirmation, and about $7.9/diarrhoea or pneumonia case where drugs account for only 10% of the cost/case. Obviously, a higher number of cases treated will reduce unit costs, as the fixed costs remain the same and the increment for drugs is a small percentage of total cost.

With 2000 APEs, iCCM of under-fives would represent 0.54% of total public health expenditure and 1.77% of the government's own health expenditure, indicating a strong likelihood of financial sustainability of the programme. The appearance of strong support for community based activities in the 2013-2018 Strategic Health Plan suggests that sustained support to the APEs and expansion to reach all remote villages is likely to be a priority.

Conclusions

Relevance

The IHSS programme in Mozambique has effectively supported the government commitment to higher coverage of essential health services with particular attention to the more remote areas, located more than 8 kms from a fixed health facility. Starting with outreach activities through RED and six-monthly Child Health Days, wide distribution of bed nets, improved immunisation follow-up, and improved quality of treatment through IMCI, the reach of the health system has been extended.

Effectiveness

With the initiation of the revitalised APE programme in 2010 a major effort to provide practical prevention and promotional activities to each rural household was complimented by modern treatment of the most common childhood diseases: malaria, diarrhoea and pneumonia. When fully implemented throughout each district, with one worker for each 1,000 population or less, one can expect a further significant fall in mortality. Efforts to sustain and improve current training, supervision and reporting in the APE system is expected to yield even further objectively measurable progress. Financial commitment to sustain recurring costs of the system (stipends and drug resupply) will be critical.

Impact

Determining impact of the IHSS programme on lives saved would be premature at this point given the very recent implementation. However, IHSS-focus interventions came across as leading interventions averting the greatest proportion of deaths averted in the LiST model, indicating that the scale up of these interventions has potential to save lives.

Sustainability

A list of specific recommendations for consideration is provided with emphasis on continued donor support, strengthened training and supervision, exploration of means to reduce drug costs and presumed wastage, and better collection and use of data to inform action. Consideration to delay further expansion of the APE system is suggested to enable strengthening those already working and applying the lessons to new areas. Slow but gradual expansion of the tasks and role of APEs seems warranted given the wide community appreciation of their work and the benefits to be derived from a broader set of interventions.

Lessons learned

Relevance

- The IHSS programme has strengthened the PHC capacity in rural areas through a series of programme design and support, first at district level (RED), then in level I facilities (IMCI), and in outreach to rural communities distant from health facilities (RED, Child Health Weeks with immunizations, vitamin A, LLINs and nutrition promotion). The revival of the APE programme through the IHSS programme has been well designed and piloted prior to roll-out and is now covering up to a million of under-fives (or 25% of the 3.9 million under-fives) with health education and iCCM services, and it has increased access by 50% of the under-five population that previously had no access to basic PHC services.

Effectiveness

- Currently supervision is very limited and may threaten the quality of care and morale of APEs.

Impact

- Mozambique has achieved notable progress in reducing under-five mortality and is nearly on track to meet the target for Millennium Development Goal 4 for child survival. The IHSS support focused heavily on improving childhood vitamin A and immunisation coverage through the NCWH and RED approach, in addition to national distribution of bed nets and an emphasis on facility based Integrated Management of Neonatal and Childhood Illnesses (IMNCI). These interventions are all likely to have played a major role in the modelled deaths averted.

Sustainability

- Diminishing donor support leaves many health programmes in the country uncertain – as the Prosaude funds shrink, many PHC activities are jeopardized.

Recommendations

Relevance

- Various mechanisms to ensure donor and NGO coordination and adherence to norms for the programme need to be explored in order to ensure systematic implementation, while allowing flexibility to explore alternative approaches to improvements. Clear mechanisms to evaluate, and report on, the results of trials such as the RaCE project are needed.

- The expansion of the role of experienced APEs should be explored with only incremental addition of tasks as APEs demonstrate competence and interest in taking on more services. Family Planning, TB DOTS, and first aid are among the high priority services as expressed by the communities. These should be piloted and carefully evaluated on a small scale as important operational research.

Effectiveness

- Barriers faced by the Government of Mozambique to regularize the APE workforce need to be overcome. This will require negotiations with Ministry of Finance and revisions of HR requirements in the country. The World Bank is apparently working on a justification for the use of APEs by the MOH. APE subsidies are seen as critical to the sustainability of the programme, and constraints to regularize this cadre (age, minimum educational requirements) are not absolute as evidenced by payments by other ministries to village level workers.

- The sale of items other than iCCM drugs needs to be considered at set costs, and APEs would repurchase drugs from health facility. As this may not reduce overall costs substantially as the major recurring cost is for malaria diagnosis and treatment, pilot trials on cost recovery need to be conducted. This mechanism is being implemented in other countries implementing iCCM.

- Recognition of the large curative role APEs play may require revision of APE time allocation to allow fixed time to see patients, even if service delivery at health posts rather than outreach home visits is still discouraged, as this is a strong and consistent demand of communities.

- Activities to generate increased demand for use of APEs should be designed and implemented.

- Supervision needs to become regular, even if only at health facility during APE monthly visit with use of checklists and written suggestions to APEs. Different models for this can be explored – e.g., SAVE and Malaria Consortium in the RaCE project are piloting specific APE supervisory tools. Supervision activities need to be reported and sent upwards to different levels of care to enable monitoring of supervision at each level.

- Continued education should be done at monthly health facility visits using the set materials provided by the MISAU training unit. Quarterly refresher training of 1-2 days can reinforce old, and introduce new, skills.

- A four-month continuous training model should be compared with episodic incremental training of 1 month every quarter for 4 rounds, or another modification to allow field application of knowledge and skills between education sessions.

- APEs need training and monthly supervision on proper use of registers and reports. Register redesign should consider removing the large space for address (seldom used), insist on quantities dispensed in the treatment columns and print every other line in grey to enable tracing across the page break. A smaller number of pages will encourage carrying registers to the field as current size is too large and heavy to carry on home visits, and often the APEs carry a small notebook to write down notes from health visits which are then rewritten into the register, increasing the chances of errors.

- A feedback mechanism from province to districts and health facilities on APE activities and supervision should be designed and prepared quarterly by each province and sent to all lower levels as well as the national level.

- Experienced and well-functioning APEs could be "promoted" to a supervisory or mentoring role for surrounding APEs, thereby, providing an internal career path and incentive for good work. In such cases, a modest increase in stipend would be needed. This model has been utilised in other places, such as Malawi.

Impact

- Use of LQAS surveys is recommended once every couple years to validate the routine data but also to use for annual planning, identification of priority districts and sub-district areas, bottleneck analysis, and monitoring interventions not captured by the HMIS (e.g. BF, ITNs, etc.).

- In order to measure the effectiveness in preventive activities to help set targets for APE work, a set of indicators (3-4) should be developed. Potential indicators could include: % women using family planning, % under-twos fully immunised; % exclusive BF under 6 months; % under-fives sleeping under bed nets; % referral slips returned from the health facility. However, it must be emphasized that targets for treatment must NOT be set, as this could drive curative activities at the expense of other preventive activities.

Sustainability

- MISAU needs to find alternative means of sustained funding for its APE programme, in the interim-at least for recurring costs, such as stipends, drugs, and supervision.
- Discussions should be held jointly with Ministry of Finance and Ministry of Health to emphasize the limited burden that APEs' subsidies would have on government funding, in order to facilitate government commitment to take on this responsibility and signal to donors goodwill to share costs for other aspects of the APE delivery platform.
- In the short term it is essential that donor funding for this programme is maintained as alternative sources are explored to ensure continuity of services.
- Attempts must be made to obtain longer-term commitment from donors to support the essential components of the APE programme and a similar mechanism of common funding pool that will allow MoH to allocate funds to essential services where shortfalls occur. UNICEF has provided a stop gap measure in many instances to date. It will also be important to consider the possibility of establishing a common fund dedicated only to supporting the APE programme.
- At this critical juncture, the World Bank and the Global Fund should be encouraged to support the APEs as a mechanism to deliver integrated PHC at community level in hard to reach and

vulnerable communities. This would align with the World Bank's desire to support results-based financing/ performance-based financing (RBF/PBF) and the Global Fund's desire to move away from support to vertical programs. There will be opportunities in 2014 to propose such moves through the CCM of the Global Fund and the World Bank Focal Points.

- Many of the above issues are amenable to field operational research, which should be the priority over the next year or two to determine the best way forward. Further issues to explore through operational research include:

  o Explore APE impact on health utilisation and coverage of essential services – are more people receiving services or just shifting provider from health facility to APE?

  o Administrative challenges need to be evaluated and options to regularize the system and solve problems in the field should be explored in order to reduce dependence on partners– finance, supplies, information flow.

  o Role and functions of community committees and volunteers at village level should be evaluated to explore opportunities for collaboration.

- The expansion of APE numbers in the country should be put on hold until the above issues are resolved. It is more important to improve the existing system's quality and resolve apparent problems than to forge ahead with expanding the APE workforce, support of which could well jeopardize sustainability.

1.   Background

1.1   Country context

Mozambique is situated in South East Africa, bordered by the Mozambique Channel in the East, Tanzania, Malawi and Zambia in the North East, Zimbabwe in the West, and South Africa and Swaziland in the South West. A former Portuguese colony, Mozambique gained independence in 1975. However, the country's development was hindered until the 1990s by a prolonged war, mass refugee movements and internal displacement, economic dependence on South Africa, and severe weather extremes. A UN-negotiated peace agreement ended the fighting in 1992. In December 2004, President Joaquim Chissano stepped down after 18 years in office. His elected successor, Armando Emilio Guebuza remains in office.

Although Mozambique is classified as a low income country the World Bank argues that:

> "Mozambique has emerged from decades of war to become one of Africa's best-performing economies. One of the poorest countries in the world at independence, the country has enjoyed a remarkable recovery, achieving an average annual rate of economic growth of 8 percent between 1996 and 2008, the highest growth rate among African oil importers."
> http://maps.worldbank.org/afr/mozambique

However, this growth has not resulted in the anticipated poverty reduction and jobs creation. The national per capita GDP is $542 with PPP (purchasing power parity) per capita $1,100 (2011). In July 2012 the population was estimated to be 23.5 million, with 3.8 million under five years of age (http://www.ine.gov.mz). It is estimated that 54% of this population lives below poverty line. The vast majority (62%) of the people live in rural areas and only 29% of the rural population has access to an improved water source.[8] Furthermore, large inequities in coverage of key maternal and child survival interventions persist.

1.2   Mozambique's Health system and burden of disease

The health sector in Mozambique follows the political and administrative structure of the country and is composed of three levels: central, provincial (11) and district (144) whose functions provide health care for the Mozambican population, the vast majority of whom receive health services through the public health sector, i.e., the National Health System (NHS). The NHS is organised into four levels of care. Level I corresponds to the 1,314 nurse/ medical technician run-Health Centres in the country whose role is to implement the Primary Health Care (PHC) strategy. These are the first contact points for the population with the formal health services. The Health Centre is responsible for the health coverage of a population within a defined geographical area, i.e., within a 25 km radius. Level II includes small district hospitals, of which there are 66 across the country, whose function is to provide secondary health services, and these represent the first level of referral for patients requiring care beyond the scope of the Health Centres. Levels III and IV are made up of provincial and specialised hospitals for clinical conditions that require more specialised curative care.[9] There are 10 of these across the country.

In 2011, 2.75% of GDP was spent by the public sector (government + donor funds) on health. This proportion is not adequate to meet the requirements of the numerous health needs in Mozambique. The conditions of many health facilities are inadequate with only half reported to have electricity while only 60% have running water. The NHS is predominantly nurse-driven with physicians making up only 3.2% of the 34,500 government health workers. Access to care is a further challenge, with only 60% of the population estimated to live within an average of 14 km radius from a health facility and 36% within a 30 minute walk.[10] This results in only half of the country's total rural population of 16.7 million being served by health facilities. According to the 2013-2017 Strategic Plan, the goal of the Government of the Republic of Mozambique (GRM) is to increase coverage of PHC services by 20%, thereby reducing the proportion of those lacking access by about half.[9]

Provision of health care is also provided by the not-for profit private sector, largely foreign NGOs and religious institutions. The for–profit private sector is, however, mainly confined to urban areas, and its use is constrained by the low income of the majority of the population.

1.3   Policy, plans and programmes for MCWH prior to the IHSS programme

In 1977, the newly independent Mozambican government adopted a Primary Health Care approach and within a year had introduced programmes utilising community health workers or Agente Polyvalente Elementares (APEs) as an integral part of the health system. Based on socialist principles for equitable access to health through the expansion of the rural health network, a policy was adopted for the nationalisation of the health and education sectors alongside an emphasis on community empowerment. Under Samora Machel's government, APEs took their place among a plethora of community mobilizers and volunteers working not only in health but also in agriculture, education, and social development. Trained primarily in health promotion with limited curative functions, the APEs were unpaid volunteers who were part of the Mozambique Liberation Front's (FRELIMO) socialist vision for rural development. Taught by the state, APEs would be supported by collectives and paid according to the means of the people they served. During the civil war years, the health system became a target of sabotage and destabilization, and the APE programme was suspended in 1989, although many APEs remained actively engaged with NGOs and were sporadically supplied with medicines by the state.[10]

The chaotic war environment resulted in the destruction of half of the country's health facilities and severely disrupted public health programmes. The post-war recovery period under UN supervision attracted emergency and humanitarian interventions from the international community and a multitude of non-governmental actors and donors. This left Mozambique's health system fragmented and verticalised, leading to calls to coordinate and harmonize planning and financing. In the 1990s, a Sector-Wide Approach to health programming (SWAp) was adopted and a common fund, called ProSaude was established.

Important milestones in the recent history of maternal and child health in Mozambique can be seen in the timeline in Appendix A. These include the adoption of the health package "Integrated Management of Childhood Illnesses" (IMCI) in 1998, backed by WHO, UNICEF, USAID and NGOs. In 2002, the Ministry of Health (MISAU) signed the Declaration of Millennium Development Goals (MDGs). This became a major driving force to establish greater rural health coverage through outreach activities. By July of 2006, the Government had progressively implemented the policy of removal of user fees for childcare, antenatal care, caesarean section operations and family planning.

The revitalization of the APE programme began officially in 2010, following a series of important policy decisions and extensive dialogue within MISAU and amongst donors. However, mention of the importance of community health workers, and the need to revitalize the APE programme dates back to MOH Strategic Plans in 2001 and 2007-2011.

2.   Object of Evaluation: The IHSS programme

The IHSS support through DFTADUNICEF began in 2007 and continued until 31 May 2013. Initially it was designed to support the implementation of the National Health Sector Strategic Plan which was to run 2007- 2012. The aim of this programme, as documented by UNICEF, is to provide support and "*financing to intensify national efforts towards Millennium Development Goals (MDGs) 4 and 5, by focusing on high impact and cost-effective interventions all through integrated services, delivered by front-line health workers at community and health facility level.*"[11]

The CI/IHSS programme in Mozambique focused on providing technical support to the Ministry of Health, from the central level down to the districts. UNICEF support covered all 10 provinces in the country, spanning 40 districts. Figure 1 highlights the different actors involved in supporting the APE programme in the country. As can be seen from the figure, the World Bank (Banco Mondial) focuses on the three Northern provinces. APE subsidies ($40 USD per month per APE) are still, however, covered by UNICEF. UNICEF, both through financial support from DFATD and USAID spans the remaining majority of the country. Other partners involved include Save the Children in Nampula and Gaza, Malaria Consortium in Inhambane, and World Vision in Zambezia providing focused support such as supervision, supply chain management, monitoring and financial programmatic support, with UNICEF still providing APE and district training support in those regions.

Figure 1: Map of Mozambique showing APE programme partners.
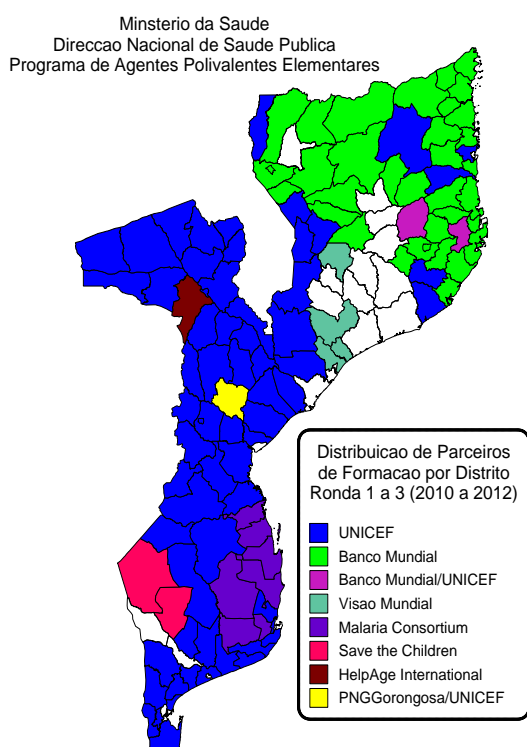
Source: Mozambique CI Progress Report 2012-2013

Community outreach strategies (Phase I: 2007- mid 2010)

The history of CI/IHSS support in Mozambique can be broken to two phases, i.e., 2007- mid 2010 and mid- 2010 to mid-2013, the first of which focused on a package of five components:

(1) Reaching Every District (RED) Approach;
(2) Integrated Management of Neonatal and Childhood Illnesses (IMNCI) including activities for Community Case Management (CCM) of common childhood diseases;
(3) Vitamin A Supplementation through biannual National Child Health Weeks (NCHWs);
(4) Distribution of long lasting insecticidal nets (LLINs); and
(5) Promotion of Breast Feeding

Reach Every District – RED

The initial focus (since 2008) of the IHSS initiative was on the RED approach. RED comprised detailing an annual District-specific "microplan" with outreach through mobile teams to remote sites quarterly. Activities in the districts varied but aimed to address the major causes of morbidity and mortality along with an element of health promotion. Starting with an initial 33 districts, MOH rolled out the initiative to an additional 33 each year, reaching the entire country (144 districts) by 2012. DFATD funds supported the scale-up of RED to 66 districts. An evaluation of the initiative was undertaken, and based on the positive findings, it was recommended that MISAU use RED as a national strategy. Since 2011, the government has taken full financial and technical ownership of the RED strategy nationwide. Although this programme is integrated and comprehensive (outreach treatment for malaria, pneumonia and diarrhoea, provision of information and education on major causes of death for children including AIDS, deworming, Vitamin A, immunisation, provision of nets, nutritional screening), it has been driven by professional health workers, and quarterly visits to communities simply do not suffice with respect to the provision of these services. As such, community members and community health workers were only engaged in organising the communities for the visits every 3 months and not in the delivery of care.

IMNCI

Although MISAU adopted IMCI as policy in 1998, it took years to plan the training and prepare trainers and teaching materials, all of which were largely under the lead of WHO. By 2006, 130 out of 140 districts with some 2000 health professionals newly trained in IMCI were implementing IMCI but this was based entirely in health facilities, and the only role of CHWs (APEs, TBAs, and activists) was to encourage families to seek care in health facilities when needed. In 2008, UNICEF supported MISAU in the development of training manuals for community based-IMNCI and helped fund training workshops in all three regions of the country. CHWs were trained in some RED districts, and by 2009, 21 districts in 7 provinces were implementing a model of community-based newborn care. CI/IHSS funding was used for provision of community IMNCI follow up kits and other resources. Standard IMCI training continued, and by 2012, a total of 2413 health workers were trained. Supervision and reporting of IMCI activities, however, seem to have diminished in recent years with increasing attention to iCCM.

National Child Health Weeks

In 2008, bi-annual National Child Health Weeks (NCHWs) were held as a way to provide all eligible children with a defined package of child survival interventions and to support the global polio eradication effort. Activities have varied each year but have included vitamin A supplementation, nutritional screening, deworming, routine immunisations, especially of single dose vaccines such as measles, net distribution, social mobilization, and IEC for breast feeding. High coverage has been achieved for these selected interventions with 90% of children vaccinated with OPV3 and 75% measles coverage reported.[8]

Insecticide-treated bed nets

CI/IHSS funds were used to contribute to Long-lasting Insecticide Treated net (LLIN) coverage in Mozambique with a total of nearly one million nets distributed for pregnant women and children under five since 2007. The 1 million LLINs from IHSS constitute roughly coverage for 25% of the near 4 million under-fives (or 50% if one assumes 2 children per net). Besides procurement and distribution of nets, financial contributions were used for logistical, human resources and IEC materials as well as residual spraying in RED districts funded by CI/ IHSS.

Breastfeeding promotion and nutrition interventions

CI/IHSS funds were used to support MISAU national breastfeeding promotion campaigns in 2009-2010 as well as more localised provincial community-based infant and young child feeding initiatives in 2011.

National Revitalization of Community Health Workers and iCCM activities: (Phase II: mid-2010 to mid-2013)

The second phase of activities undertaken by UNICEF with CI/IHSS funds focused on the national revitalisation of Community Health Workers (APEs) and iCCM activities. By 2010, there were an estimated 1000 APEs still working in the country under the previous programme, but they were poorly supervised and had irregular access to medicines. With the push to reach MDGs, and the recognition that a substantial population lived far from fixed health facilities, however, there emerged renewed interest in APEs. In 2010, a Revitalisation of the APE Programme was planned and initiated by MISAU. The new policy document defines deployment location, introduces monthly subsidies (~$40/month) for APEs and makes provisions for supervision from the nearest health facility and medicine supply provided from the centre in standard "kits". The training of the APEs takes place over four months during which four modules covering health promotion, disease prevention (80%), and curative skills (20%), including intensive training of four to five weeks in iCCM, are provided. Each APE serves communities of between 500 and 2000 inhabitants living between 8 and 25 km from a health facility and facilitates the link between health staff and the community.[10]

Following the approval by MISAU for the 'Programme for the Revitalization of Community Health Workers (CHWs)', both departments within MISAU, as well as various donor agencies and NGOs participated in defining the tools and manuals for its roll out. Started as a pilot in 8 districts across 8 provinces in 2010, with financial support for the revitalization of the programme by various partners,

iCCM was initiated by the newly trained cadre of 179 APEs starting in early 2011. According to UNICEF, the pilot served to fine tune iCCM and develop operational guidelines before it was implemented at scale. It was then scaled up by 42 districts in 2012, reaching 120 districts in 2013, with a further expansion to all 140 rural districts expected to be covered by mid-2014.

The programme is in the process of going to scale with many lessons to be learnt from the policy development process and roll out. Due to the stage of implementation of the programme, the current evaluation serves as a mid-term assessment of this process and not as an endline evaluation.

Table 1: IHSS and UNICEF interventions in Mozambique

IHSS selected interventions	Activities supported by DFATD IHSS funds	Activities supported by UNICEF grant matching funds
Correctly assess, classify and treat pneumonia, diarrhoeal disease and malaria	Training of APEs, supervision and monitoring, developing and printing training material	Production of flipcharts for APEs
Reach every District/Immunisation	Funding of NCHW, Training of Health workers to support micro-planning, supplies related to cold chain, Communication for Behaviour and Social change, support to mobile teams/outreach activities.	Child health weeks in 2011 funded through other UNICEF sources
Long Lasting Insecticide treated net distribution to pregnant women and under-fives	Purchase and Distribute ITNs (pregnant women in RED districts, pregnant women in ANC, Under-fives in unsprayed RED districts & campaigns) Training/Capacity Building on logistic management, training of health workers on communication for behaviour and social change	Supported through UNICEF matching funds. Contribution of more nets from other partners (e.g. GFATM: The Global Fund to Fight AIDS, Tuberculosis and Malaria, the US President's Malaria Initiative) a universal campaign – whereby all people living in 'at risk' areas have access to LLINs (an average of one LLIN per two people)
Vitamin A supplementation and deworming	Since early 2008, twice yearly provision through NCWH. Vitamin A supplementation has been integrated in the Maternal and Child Survival Package delivered through	Child health weeks in 2011 funded through other UNICEF sources

	routine services in health centres.	
Breastfeeding promotion	Training on breastfeeding and Baby Friendly Hospital Initiative, breastfeeding promotion activities starting from 2009 through NCHW, National Salt Iodization Week, training on nutrition rehabilitation in three districts	Supported through UNICEF matching funds
IMNCI	Development with partners and the MOH of training manuals which define a comprehensive community-based newborn care with home visits on key days during the first month of life (3, 7, 14, and 28) Training of staff, supportive supervision, and monitoring of results to measure progress. Support for provision of some materials (neonatal resuscitation kits, material for community IMNCI).	Supported through UNICEF matching funds

3.   Evaluation Rationale, Purpose and Objectives

3.1   Evaluation Rationale

DFATD and UNICEF called for an external evaluation of the IHSS programme to be conducted at the end of the program in "Schedule A for Grant Funding to a UNICEF Program".[2] As the IHSS programme has come to an end, this external evaluation is intended to fulfill this requirement and is pursuant to the terms of the document "Request for Proposal of Services" (the terms of reference for the external evaluation) signed by DFATD and UNICEF.[3]

3.2   Purpose and Objectives

Purpose

The purpose of the external evaluation was two-fold:

1. To evaluate the effect of the IHSS programme on coverage of a limited package of proven, high impact, and low cost maternal and child health interventions in Mozambique.
2. To inform programme and policy decisions in Mozambique and regionally.

Objectives

To assess the effect of the IHSS programme on the following:

Relevance:

- Contribution to an enhanced policy environment for child survival
- Alignment with national priorities and plans
- Strengthened multi-sectoral collaboration
- A health systems strengthening approach, a focus on women's participation and a gender equality approach.

Effectiveness:

- Strengthening the health system (including all six health system building blocks namely health workforce, service delivery, information, supplies, financing and leadership/ governance[12]).
- The capacity of government and/or civil society organizations to train, equip, deploy, and supervise front-line health workers to deliver a limited package of proven, high impact and low cost health interventions.

Impact:

- Coverage of selected maternal, newborn and child health and nutrition interventions (promotion of breastfeeding and vitamin A supplementation), particularly integrated Community Case Management (iCCM) of diarrhoea, malaria and pneumonia, which were supported by the IHSS programme.
- Number of additional lives saved by the IHSS programme calculated using the Lives Saved Tool (LiST) disaggregated by groups of interventions (e.g. iCCM) and by individual interventions according to the phases of the programme.

Sustainability:
- Costs of implementing iCCM.
- Financial sustainability of this programme.

3.3   Scope of the Evaluation

The scope of the external evaluation was focused on estimating the plausible effect of the IHSS programme on coverage of interventions funded by the IHSS programme, and estimating the additional lives saved by the programme using LiST. Any interventions not funded by the IHSS programme but necessary in order to execute the LiST estimation and construct a robust plausibility argument were considered to be within the scope of the external evaluation.

Plausibility for this evaluation was defined as "apparently true or reasonable, winning assent, a plausible explanation"[13]. As defined by the OECD-DAC attribution represents *"the extent to which an observed development effect can be attributed to a specific intervention or to the performance of one or more partners taking account of other interventions, (anticipated or unanticipated) confounding factors, or external shocks"*. In assessing plausibility of attribution, the external evaluation attempted to "rule out external factors [factors outside of the programme] which might have caused the observed effects".

The scope of the evaluation was limited to plausible contribution due to the presence of one or more of the following conditions in each of the targeted countries:
- non-existence of true comparison areas due to the national scale of the programme; and
- the infeasibility of a randomized intervention/control design due to political and ethical considerations.

Geographically the scope of the external evaluation includes the following areas:
- Mozambique – thirty-three districts in Phase I and 144 districts in Phase II;

Temporally, the scope of the external evaluation included the period 2000-2007 (secular trend) prior to the start of the IHSS programme, the period 2007 to 2010 (Phase I of the programme), and the period 2010 to March 2013 (Phase II of the programme).

3.4   Evaluability

An evaluability exercise prior to the external evaluation was not undertaken because it was not called for in the Request for Proposal of Services (the terms of reference of the external evaluation) and would have been cost prohibitive given the amount of funding for the evaluation. Evaluability exercises are not mandatory under UNEG Norms for Evaluation in the UN System.[1]

3.5   Intended Audience

The intended audience of this external evaluation includes the Ministry of Health of Mozambique, DFATD, UNICEF, other UN agencies, and governmental and civil society partners at national, regional, and global levels.

3.6   Research Questions

Relevance

1. To what extent did the programme's objectives reflect a health systems strengthening approach, including:

a. alignment with the health policies, planning and health surveillance of the Government? and

b. training, equipping, deploying and supervising front-line health workers to deliver the selected high impact and low cost health interventions?

2. To what extent did the programme's objectives include a focus on women's participation and a gender equality approach?

Effectiveness

3. To what extent were the objectives related to health system strengthening (including policies, planning and health surveillance) and training, equipment, deployment, and supervision of front-line health workers achieved?

4. To what extent were the objectives related to women's participation and gender-equality achieved?

5. To what extent did coverage of the selected high impact and low cost interventions in the target populations increase? What additional coverage is plausibly attributable to the programme?

6. What aspects of the IHSS programme worked? Why did these aspects work?

7. What aspects of the IHSS programme did not work? Why did these aspects not work?

8. What were the major factors influencing the achievement or non-achievement of the IHSS programme objectives?

Impact

9. Was a reduction in child mortality observed amongst target populations? Based on plausible attribution of coverage, how many lives were saved?

Sustainability

10. What is the additional cost per treatment for each of the 3 iCCM conditions?

11. What is the cost of increased utilisation?

12. What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends?

a. Are committed financial and human resources sufficient to maintain benefits and results?

b. Is the external environment conducive to maintenance of results?

4.   Methodology

The evaluation used a mixed method approach in that quantitative, qualitative and economic evaluation methods were utilised[4, 5]. Baseline data and secular trends in key indicators (in terms of coverage, financial inputs and implementation strength) were all taken into account in the evaluation. The effect of contextual factors (including rapid socioeconomic progress, policy changes, epidemiological changes and complementary and competing interventions by other donors and government) were described using data from document reviews and relevant databases. Contextual data to support the quantitative coverage data was collected during key informant interviews with national stakeholders, key district personnel, community health workers, their supervisors, beneficiaries, and, where relevant, community-based leaders/structures involved in supervision.

Data collection occurred at national, provincial, and district levels. Thereafter, each set of data was analysed and reported on independently. The analyses and their separate findings are brought together and synthesised at the level of interpretation in this report. The evaluation approach aims to provide data which can be used for future decision-making. It also provides recommendations for improvements to the programmes as they are scale up, as well as providing lessons for other countries. The limitations of each of the evaluation methods are described in detail in section 7 'Strengths and limitations of the evaluation'.

The Mozambique country evaluation framework was based on a preliminary Country Logic Model (Appendix B), which was developed following a desk review and attempted to outline the implied logic of the program. The Country Logic Model outlines the intended outcomes of the IHSS programme and the pathways by which these outcomes were intended to be achieved. As iCCM only started in Mozambique in the 5th year of the CI/IHSS funding period, the in-country visit and data analysis serve to explore the process of policy development, programme piloting and issues around the current scale-up. Aside from policy development, the team explored factors of implementation including training, supervision, monitoring and evaluation (M&E), supplies and logistics for the programme. Furthermore, in order to comment on the resource implications of the programme and its potential for sustainability, a costing component of the evaluation was undertaken. The costing exercise served to quantify both the national and external donors' contribution to the health sector, and specifically to the programme, in addition to exploring opportunities to reduce costs by adapting programme commodities based on the country's needs and consumption patterns. Mozambique presents an example of how iCCM has been integrated into a larger government programme focused on increasing access and coverage towards meeting MDG targets.

IHSS programme activities prior to the revitalisation of the national APE programme were explored in relation to their effect on overall health systems strengthening and coverage of key maternal and child health indicators, namely the RED strategy, NCHWs and LLIN distribution efforts.

4.1 Quantitative data sources and analysis

4.1.1 Coverage trend analysis

A full list of all indicators collected for coverage and Lives Saved Tool (LiST) analysis can be found in Appendix C. Data sources for the coverage and LiST analyses included the Mozambique DHS 1997, 2003, 2011; MIS 2007; and MICS 2008. For the anthropometric data, the 1997 and 2003 Z scores were recalculated using the 2006 WHO growth reference standards to make them comparable with the 2011 DHS. As the APE programme only started as a pilot in 2011, there is no endline data source for the quantitative analysis. DHS 2011 data can be used to assess coverage of earlier IHSS programmes, namely LLIN, vitamin A, infant feeding and immunisation coverage. Datasets were available for all the three DHS surveys and MICS survey (with only some indicators used); however, only point estimates of the coverage prevalence were available from the MIS survey. The evaluators were unable to reliably calculate exclusive breastfeeding rates from MICS 2008 so this was also omitted from trend analysis. Point estimates and sample sizes for these indicators were drawn from published reports.

The statistical software Stata12 was used in the analysis as it has sample survey analysis capabilities in particular for computing point estimates and confidence intervals of indicator coverage as well as for trend analysis. Trend analysis was performed using a non-parametric test of trend across years and wealth quintiles on data for national and rural areas. A significance level of $p<0.05$ was used to determine whether changes actually took place. The complex sampling design of these DHS/MICS surveys, such as regional and rural/urban stratification, clustering at enumeration areas, and sampling weights (due to non-proportional sampling) were taken into account.

Some adjustments were made to indicators from DHS surveys in order to align them with definitions used in MICS surveys. The following changes were made: the denominator and numerator for tetanus vaccination, IPT/Fansidar during pregnancy, early breastfeeding and postnatal care, which had been calculated over a 5-year period in DHS have been restricted to live births in the two years preceding the survey to correspond with MICS surveys. Pharmacy has been excluded from care-seeking providers in both DHS and MICS data for fever and suspected pneumonia.

Graphical presentations of the derived results in the form of line graphs and bar charts with confidence limits were generated in Excel.

Data to assess implementation strength, utilisation, and quality of care was taken from routine programme data collected by UNICEF as well as a quantitative survey by Save the Children from Nampula province released in 2013, and an endline report from Malaria Consortium in Inhambane province from 2012 reporting iCCM coverage trends from 2010- 2012.[14, 15] The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework[6]

In order to assess the plausible contribution of the IHSS programme to changes in coverage (if any were observed) coverage levels in the implementation areas (rural areas) were compared with the national coverage levels over the period of implementation for which data was available (2008 to 2011). Furthermore, an assessment of a significant difference in the average annual rate of change in coverage of pertinent indicators between the rural areas and the national level estimates was made, in addition to a comparison of the annual rate of change between the pre-IHSS period (2003-2008) and during IHSS implementation (2008-2011). Linear rates of change were assumed, which were

calculated by subtracting the end line point estimate from baseline point estimate, divided by the total number of years within the time period of analysis. Using the statistical formulae for variance and confidence intervals for proportions, these were calculated for rate of change. In order to assess whether the annual rates of change within the relevant time periods were significantly different from each other the 95% confidence intervals around the changes are reported.

It is important to note, however, that depending on the year in which the IHSS programme was implemented, the time period of analysis utilised to capture IHSS programme implementation often did not capture the entire period of implementation, as the DHS survey conducted in 2011 was prior to the end of the programme period (2013).

Contextual factors and relevant data from qualitative interviews were considered. Where the contribution of the IHSS programme is not clear this has been stated.

4.1.2   Lives saved analysis

Using household survey data as described above, LiST was used to investigate the extent to which changes in child mortality could be attributed to increases in intervention coverage. On the basis of measured baseline mortality values and changes in coverage, child mortality was forecasted over three time periods:

o   Prior to the start of the programme (secular trend): Under-five lives saved from the year 2000 to the start of the IHSS programme implementation (roughly 2000-2007)
o   Phase I: Under-five lives saved from the start of the IHSS programme implementation up to the early period of iCCM implementation (roughly 2008-2010)
o   Phase II: Under-five lives saved from the start of iCCM implementation to present (roughly 2010-2013)

Coverage data for key indicators, representing the scope of the IHSS programme as well as broader health system indicators, were extracted from all of the available household surveys and other datasets for each time point available and entered into the projections (see Appendix C). When coverage data for immunisations was not available from national surveys (e.g. for Hib and HepB), WHO/UNICEF coverage estimates were used.[16]

LiST is a free and widely used module in a demographic software package called Spectrum, which allows the user to compare the effects of different interventions on the numbers of maternal, neonatal and child deaths and stillbirths, as well as on stunting and wasting.[17] The tool can assess the extent to which the decline in child mortality could be attributed to increases in intervention coverage. LiST uses country-specific or region-specific baseline information on mortality rates and causes of death as well as background variables (fertility, exposure to Plasmodium falciparum, stunting rates) and current coverage of more than 60 interventions and their associated effectiveness values relative to specific causes of death and risk factors to estimate the deaths averted, overall and by specific interventions. The modelling methods have been widely reviewed and published.[18, 19] The analysis was done with the computer programme Spectrum/Lives Saved Tool, version 4.62.

For the first time period, 1997 was used as the baseline year with the first year of intervention in 2000 and projected forward to 2007 using all available data on changes in intervention coverage and

nutritional status. For Phase I, 2007 was used as the baseline year with mortality data from the MICS 2008, with the first year of implementation in 2008 and projected forward to 2010 using all available data on changes in intervention coverage and nutritional status. For Phase II, 2010 was as the baseline year with mortality data from DHS 2011, with the first year of implementation in 2011. Due to the lack of national end line data for 2013, an illustrative scenario for Phase II was applied whereby coverage of the iCCM interventions (ORS and zinc for treatment of diarrhoea, ACT treatment for malaria, and pneumonia care seeking) were assumed to increase by 15 percentage points between what was reported in the DHS 2011 and the endline of 2013, whilst all other IHSS programme-supported interventions increased by 5 percentage points. The results are presented as cumulative lives saved for each period with the per annum lives saved and cumulative lives saved. The changes in mortality produced by LiST were compared with those produced by national household surveys.

Table 1 shows the data sources used for the baseline characteristics - population, fertility, mortality rates, causes of death and nutrition – for the Mozambique LiST analyses. These were modified when necessary to best reflect the annual population and births.

Table 2: Additional data used to create LiST projections

Indicator	Source
Population served	National Institute of Statistics
Total fertility rate	DHS and MICS all years
Stunting, wasting rates	DHS 1997 and 2011 and MICS 2008
Cause of death	CHERG trend analysis
Mortality (under-5)	DHS 1997 and 2011 and MICS 2008

4.1.3   Costing

The costing for the purpose of this evaluation addresses the following question: *What are the additional costs incurred by the health services (including donors funding) due to the introduction of the curative interventions by APEs for malaria, diarrhoea and pneumonia (iCCM) in children under five years of age?*

Costs are incurred in 2 phases, at times overlapping:

- Design phase. This phase covers formative research, meetings and workshops for the design of the intervention, design of the training curriculum, and design of materials. This phase is a 'one-off', not repeated as the programme is rolled out to new districts. These costs can be very significant, but are not included in the costing as they will not take place again, as such they would artificially inflate the cost of scaling up the programme and distort calculations relating to its sustainability.
- Implementation/running phase: this is the focus of this costing.

The implementation of iCCM takes place in the context of existing health services and other activities for the APEs. APEs do not limit their curative activities to children under five but cover also older children and adults. They also provide preventative services to the community. The table below shows which costs are included in the costing exercise. The focus on additional costs

is to ensure that costs are not double-counted when put in the perspective of the existing health budgets and assessment of sustainability.

Table 3: Costs included in, and excluded from, the costing

Costs NOT included	Costs Included
Initial one-off design costs for iCCM	iCCM training: APEs, supervisor, district, provincial and national
Salaries of nurse supervisor, district, provincial, national coordinators	APEs Subsidy: Share of iCCM for under-fives
Basic training of supervisors	Supervision allowances: district, provincial and national coordinators - Share of iCCM for under-fives
Basic training of nurse supervisors, district, provincial, and national coordinators	APE kit for iCCM – excluding drugs and tests
	Drugs and diagnostic tests for the 3 conditions
	Overheads

Data on costs was collected and analysed in the following way:

Share of iCCM for under-fives:

The share of APEs activities and costs for curative visits for malaria, diarrhea, and pneumonia in under-fives was calculated as follows:

A. Share of APEs' activities for curative visits for all ages was estimated at 66%, based on reports from stakeholders and observations, much higher than the 20% set by policy guidelines.
B. Of the curative visits in year 2012-13, 70% were for children under five.
C. All children under five curative visits were for the three conditions (malaria, pneumonia and diarrhoea)
D. iCCM for children under five was, thus, calculated as 46.2% of the total APE cost: D=A*B*C

Table 4: Share of iCCM for under-fives.

% APE time on iCCM	66%
% iCCM time on under-fives	70%
% APE on iCCM under-fives	46.2%

Fixed Costs by APE for iCCM for under-fives: (independent from the number of treatments)

The ratio of 46.2%, calculated above, was used for calculating fixed costs for iCCM for children under five.

- iCCM training cost per APE: Initial training, including training material, has been allocated five life years, in the absence of refresher training. An annual attrition rate of 3.75%

(average between 2% and 5%) was applied.

- APEs' subsidy
- APEs' kit: bag, equipment, including bicycles, and excluding consumables, were expected to need replacement after three years (three life years).
- Supervision and management. These costs included:
    - iCCM orientation and supervision training for supervisors, district, provincial and national coordinators. An annual attrition rate of 3% was applied. This training has been allocated five life years in the absence of refresher training.
    - Supervision allowances for district, provincial, and national coordinators.
- Overheads of 5%.

All fixed costs are annualized, according to the number of life years, and calculated by APE. The approach of presenting Annualized Costs was used in order to better understand the costs and sustainability of a maturing programme.

The fixed costs per APE for iCCM for under-fives are then expressed as fixed costs per treatment by dividing the annualized fixed costs per APE by the number of treatments per APE in 2012. Year 2012/13 was chosen because it represented the highest level of activity.

Variable Costs (dependent on the number of treatments)

- Drugs & diagnostic tests per treatment for each of the three conditions.

Cost per treatment per condition = Fixed cost per Treatment + Variable costs specific to each condition

iCCM Additional Costs 2012 = Cost per treatment for each condition x number of treatments in 2012

Recognizing that in order to implement iCCM, other systems strengthening inputs were necessary, including some IMCI training for health workers, an average 15% increase in iCCM costs was modeled to give the cost of iCCM+ for children under five. This percentage is clearly much higher at the beginning of iCCM implementation but decreases annually over the implementation period. An average 15% increase in iCCM costs was modelled to estimate the cost of iCCM+. This value is based on estimated costs of health system strengthening inputs but will vary over time and between regions depending on the existing capacity before introduction of iCCM and on the maturity of iCCM implementation.

In order to assess whether higher numbers of treatments per APE would be possible, the time spent on the iCCM for under-fives was calculated, assuming the length of the home visit at 30 minutes and the travel time per home visit as an additional 30 minutes. In addition 3 hours a month was allocated for the iCCM share of supervision meeting, refilling of kits at the same meeting and transport of patients to health centers when required.

Scenarios: Increase in coverage

- Increase in number of treatments per existing APEs per year: increases of 15% and 30% were modeled.
- Increase in the number of districts covered by iCCM: the model uses UNICEF target number of APEs for its 2017 projections and assumes current as well as increased (+30%) number of treatments per APE.

Financial sustainability of the programme:

iCCM and iCCM+ Additional Costs 2012 are calculated as a percentage of total Public health expenditure (government + donors) and as a percentage of government only health expenditure. Data on public health expenditure was extracted from index Mundi. Similar calculations are made extrapolating to an increased number of APEs. All unit costs were provided by UNICEF Mozambique.

However, iCCM can only function as part of a complete APE programme. In the context of Mozambique this includes the prevention and APE activities targeting children over five and adults. Thus, the cost of the whole programme is estimated by extrapolating from the cost of iCCM for under-fives. APE programme sustainability in terms of proportion of total public health expenditure and proportion of the government's own expenditure is analyzed.

This evaluation has quantified both the additional cost incurred by the health system and the estimated under-five lives saved due to changes in coverage of healthcare interventions. A cost per life saved was not calculated, for several reasons. 1. The methodology for assessing lives saved using the Lives Saved Tool (LiST) is based on modelled estimates, not measured outcomes linked to specific interventions 2. The lives saved analysis reflects inputs across the health system resulting in coverage change which include, but are not limited to, IHSS inputs 3. The coverage change and lives saved identified in the LiST analysis cannot be allocated to different levels of the health care system (e.g. community level) in a reliable way, and 4. The costing analysis was based on *additional costs* and not the full cost of providing iCCM. Not being able to quantify the total cost of health system strengthening in particular at APE level, it is not possible to ascertain the full cost of delivering iCCM. Use of these costing figures would, therefore, be inappropriate as it underestimates the full costs (government and donor costs combined) of delivering iCCM.

4.2 Qualitative data sources and analysis

The country visit took place in early July 2013. Individual interviews and focus group discussions were held with UNICEF staff and other partners, representatives of the Ministry of Health Mozambique (MISAU), Provincial and District health and supervisory staff, nurses at Health Centres, APEs, Community Committee members and mothers in communities where APEs were working.

The Team visited 3 Provinces in the south (Maputo, Gaza, and Inhambane) covering 6 districts, 10 villages and about 50 APEs. The list of potential interviewees was discussed in advance with the UNICEF country team, who pre-scheduled appointments with partners and officials of MISAU and arranged all field visit interviews and focus groups. In compiling this list consideration was given to gaining as wide a range of opinions as possible so as to ensure a fair representation of how the IHSS programme was experienced in Mozambique. The interviews were conducted by one or more members of the country field team. Where necessary, the services of an interpreter were used. The interpreters were sourced by the team, with the suggestion of UNICEF. All interviews took place either at the offices of the interviewees, at the health centres, or in the communities. Most interviews were audio recorded with permission of the interviewees, and the researchers took field notes.

The analysis of qualitative data from the country visit was conducted by two members of the country field team. It was based on the typed interview notes, observations from the field and reflections from the annual reports, as well as inclusion of information from relevant literature. This analysis was conducted both deductively and inductively. Deductively, the team sought to find answers to predefined questions, e.g., 'How did this intervention fit within the policy environment?' or 'What evidence was there of health systems strengthening on the ground?'. Inductively, the team tried to understand what new information and insights could be gleaned from the interviews and the team's observations. Based on this analysis, the data were grouped into categories, the results of which are reported in narrative form in this report.

5. Findings

5.1 Relevance

5.1.1 Policy environment

The evolution of health policy over the past 15 years clearly shows a move towards community-based services and an effort to reach out to the poorest and most remote areas. Earlier policies attempted to reinforce the rural health infrastructure but the most recent policy document – the 2013-2017 Health Strategic Plan – shows clear commitment to services at the community level and a key role of APEs. UNICEF played a significant role in catalysing this move towards community-based services aimed at reaching the underserved population.

Renewed interest in PHC and revitalisation

As previously noted, Mozambique has had a long commitment to community-based health providers since Independence in 1975, but the past decade has shown renewed commitment to maternal and child health in the country.

> "*The first thing was a political decision to make Maternal and Child Health priority; it's been 10 years since that decision was made.*" [MISAU informant]

Policy dialogue in the beginning of the millennium reiterated this commitment and sought means to reach the poorest populations in rural areas, as evidenced by MISAU documents. In 2010 a new Minister of Health took renewed interest in PHC and in particular sought to address Mozambique's high rates of infant and neonatal mortality and the task of meeting the MDG targets for health. This shift in leadership was cited as being critical to a conducive policy environment for iCCM.

> "*The ministry has changed, with new leadership, they believe that the APEs are important.*" [MISAU informant]

Community involvement strategies initially emphasized activities in the rural health centres with IMCI training and the delivery of integrated packages of MNCH outreach activities through the RED strategy and biannual Child Health Weeks along with public education campaigns on important health behaviours such as breastfeeding. Attempting to achieve high coverage of promotional and curative health services by adopting a community health worker scheme through the revitalisation of the national APE programme built on these health system strengthening activities and remains the centrepiece of the MISAU primary health care strategy today.

> "*The country is embarking on their new strategic plan (2013-2018). This strategic plan identifies APEs as a key component of the system. So we now again, in MISAU, agree that the APE programme is key to increase the coverage of health services and as a result, we need to support them.*" [MISAU informant]

Despite this apparent support, the official launch of the APE programme was delayed and occurred only in August 2013, but even then, the expected participation of the Prime Minister did not happen. This was reported by informants as leading to concerns around the future sustainability of the programme*.*

Reach Every District (RED) strategy

The RED strategy involved strengthening supportive supervision and supply chains for medications and commodities, establishing monitoring systems, and using Health Brigades to deliver the integrated and comprehensive package of outreach services. Visits are organized quarterly from health centres using Health Brigades made up of health professionals with assistance for community mobilization from community leaders, volunteers/activists, and APEs where operating. The RED approach and NCWH were cited by interviewees in MISAU as a mechanism that served to reinforce the capacity of districts to plan and implement routine child survival activities, creating a platform for integrated delivery of maternal and child survival packages.

The value of the RED approach was clearly indicated by a high level MISAU official who stated:

> *"We would like to expand [RED] to other programme; it is a very important platform. In fact we feel it is crucial that the platform of RED expands. RED includes family planning and other outreach services. It also strengthens logistics, and other activities can be added. But we need resources to expand it."* [MISAU informant]

Although RED was cited by informants interviewed in MISAU as a necessary and successful programme, since the financial takeover by the government, it is no longer as operationally effective as funding from the ProSaude has been cut due to alleged concerns with transparent spending:

> *"Right now we are using RED, but there are a lot of difficulties. There are challenges with HR and finances. Making plans are easy. Executing and monitoring the plans are the bigger challenge."* [MISAU informant]

Similarly, RED was considered successful as noted by EPI staff in MISAU:

> *"If we do a comparison of the time when we had the support of RED and now when support has terminated, the quality [of the data] has reduced."*

Donor environment

The post war rehabilitation effort in the 1990s coordinated by the UN attracted many donors and agencies into Mozambique. Currently, there are over 26 multilateral and bilateral donors and numerous NGOs and contractors operating in the health sector alone. This makes for a particularly difficult coordination, implementation and evaluation environment. Furthermore, dependency on donors and the inherent leverage they derive from their support is considerable. WHO reports that in 2007, foreign organizations contributed 70% of the health sector's budget, a figure that was projected to increase.[20]

The pressure to meet the varied funding cycles and reporting requirements across these donors was frequently cited in our discussions with MISAU informants, making the timing for the release of budgeted funds less than dependable.

> *"There are so many partners and plans, so we often get bogged down in the details, in the more administrative side of the work. Poorer countries so often have to submit to what [is] asked for, and this can be difficult to complete requirements and some programmes actually don't get completed. The commitment is there, the money is there but mechanisms to access*

and manage the funds on a daily basis is so impossible, we don't access the money. Then we are blamed for not being able to use the money."[MISAU informant]

MISAU informants cited examples of donors withdrawing support due to lack of agreement on standards to follow such as tasks of the APEs or data to be collected. This has resulted in pressures on both UNICEF and MISAU to take extraordinary measures to keep community programmes working smoothly. UNICEF funding was often cited as being more flexible and responsive to these shortfalls. For example,

"If we want 1000 bikes- UNICEF will get them. In other cases it's a never-ending process, and we don't get done what is needed to secure them and so we don't succeed in getting them." [MISAU informant]

The SWAp promised to be a mechanism in which the health sector strategy would be efficiently coordinated amongst all partners under the leadership of MISAU, to be financed under a common basket fund. Initially the SWAp approach or ProSaude, attracted enthusiastic support from donors:

"The Mozambique health SWAp soon became widely cited in international health policy circles, particularly as the agreements and processes linked to it – the partner code of conduct, sector strategy, coordination and review mechanisms – were developed and implemented fairly rapidly. To many external observers, the health SWAp in Mozambique epitomised all the advantages of working sector wide: improved government leadership, greater sector policy and strategic focus, more effective use of aid to the health sector and lower transaction costs."[21]

However, tensions among partners developed that often superseded the agreed compromises necessary to have a common programme. Government staff were overwhelmed by the number of, and pressure from, donors. Activities were swamped with missions from abroad numbering over 100 per year.

By 2010 alleged transparency issues led to substantial decline in SWAp funding, and the arrival of large global health initiatives such as the Global Fund, PEPFAR (The United States President's Emergency Plan for AIDS Relief), and GAVI have changed coordination dynamics over the years.[22] This is important given that USAID (PEPFAR) and Global Fund made up nearly half of overseas development assistance (ODA) to basic health services in the period 2008-2012. Despite hopes that the SWAp would not only result in increased domestic health expenditure but also see a reduction in earmarked vertical programmes, HIV/AIDS programmes, including those channelled through U.S Government funding, resulted in the opposite, with an increase in vertical funding channeled into Mozambique.

"Global Fund is a different case, for us [it] is very complicated, the information system is completely different from the information system used by UNICEF and the other partners. We agreed on the SWAp approach that we would (all) use the same information so with other partners we use that approach." [MISAU informant]

In 2012 there was a halt to all funding through the SWAp resulting in a considerable crisis in the availability of funding for health programmes, as explained by a government source. The crisis resulted

from an audit by the Global Fund in which funds were unaccounted for, resulting in donors pulling out. As one MISAU informant explained:

> *"This is happening because last year there was an audit from the Global Fund, and it concluded that the government could not account for 55 million dollars between 2008 and 2010. Of course these numbers are changing. The second audit report could not account for 10 million. After a new assessment, only 3 million dollars were not accounted for, not 55 million as was initially stated. During this audit process all the cooperation partners stopped funding the Basket Fund. As a result, the country was not able to do all of the National Health Weeks, only one was conducted last year. No residual spray or nets were done last year. TB drugs could not be purchased. ARV drugs also were in shortages."* [MISAU Informant]

As a result, planned health activities have been severely compromised.

> *"We feel that the funds going to the basket are reducing, and there is no predictability of funds. For example last year, only in the second semester did funding come through. This year there has been a $90 million commitment, only two or three donors put in this money. All the plans that were designed cannot be implemented because of funding shortages.*" [MISAU informant]

Currently, there is a move by the GRM to develop an institutional reform programme to improve the financial management for health in the country. Discussions are ongoing between GRM and Global Fund around building capacity of systems for drug management, information, and supply chain management.

> *"These institutional reforms are to ensure that MISAU is well prepared to absorb all the incentives carried out by partners such as the Catalytic Initiative."* [MISAU informant]

Worse still, some donors have withheld funds to leverage desired actions by the GRM. UNICEF has stepped in to "bail them out" on such occasions, but with considerable stress on other UNICEF programmes.

Economic context and implications for future funding

Public health expenditure per capita increased by 13.4% (in current US$) between 2007 and 2011, but demands on infrastructure repair and building an expanding health workforce and demands for higher pay (doctors were on strike in mid-2013), place extraordinary stress on the limited health budget. Mozambique has experienced a reduction in the national budget allocation to the health sector. Data shows that between 2000 and 2007 expenditure on the health sector fell from 17.9% to 12.6%. According to Mozambique's 2008-2010 Mid-term expenditure framework, 12.7% of the national budget was allocated to health, and by 2012, only 7.7% of the national budget was allocated to health. Within the government health budget, the share of the government's own expenditure decreased from 47% in 2007 to 31% in 2011. Mozambique, however, receives significant external contributions to its health sector. Between 2000 and 2011, external contributions as a proportion of the health budget increased from 25.3% to just under 70%. (http://www.factfish.com/country/mozambique) With some two thirds of the health budget sourced from international aid, government health programmes are highly vulnerable. Furthermore, Mozambique has received considerable donor funding for maternal, newborn and child health (MNCH), increasing considerably from $64 million in 2003 to $147 million in 2010.[23] Mozambique is poised for an economic boom with the recent discovery

of considerable coal and natural gas resources. This has resulted in the expectation by some that future revenues will be available for investment in the health infrastructure of the country, which one informant noted could have a negative effect on donor investment in the health sector.

> *"It is likely that some donors from the health sectors will leave, partly due to financing challenges, but there will also be an increasing perception among donors that there is more government revenue due to gas and coal fields. There is no infrastructure to bring this into the market, but the perception that government revenue is beginning to increase dramatically is there. [There is a question about] how the resources are being used, [will they be] to fund the elite or a more equitable social development, those will become key political issues. [The] perception of an increasing government budget will run ahead of revenue and partners will withdraw prematurely."* [Implementing partner]

5.1.2 Multi-sectoral collaboration and alignment

Other government ministries and departments including Home Affairs, Agriculture, and Education are said to have been involved in formulating the community health programme policies.   Inter-sectoral collaboration was noted at local levels where community projects find that collaboration advances multiple goals. In at least two provinces (Zambezia and Nampula), several NGOs working across various sectors have convened local planning groups comprising volunteers in agriculture, education, and community development as well as health to assist each other in achieving shared goals.

Aligning partner and sector expectations for the APE programme was cited as a challenge as evident in the development of the training curriculum.

> *"Developing materials was difficult, everyone wanted to include everything and more, and even after the curriculum was decided, people still wanted to change it and add things."* [MISAU informant]

Even after the establishment of the APE roles and responsibilities, there is increasing interest in the utilisation of the APEs by different NGOs for a myriad of additional tasks aligned to their specific organisational mandates including HIV testing and DOTS (Directly Observed Therapy Shortcourse for TB).

One notable feature is the lack of involvement of the Ministry of Finance, noted by a number of informants to be a key reason why the APE subsidies have not been absorbed into the government personnel payment system.

> *"Only now, the World Bank is beginning to engage with MOF around a broader health financing strategy. MOH has asked World Bank to make a health financing proposal to take to MOF."* [Implementing partner]

Role of partners - advocacy and technical support at central level

UNICEF has played a seminal role throughout the development and adoption of iCCM in helping frame policy from within the MISAU and to develop the numerous guides and materials to launch the effort. Its technical staff work with MISAU staff and are seen as part of the MISAU team.

> *"UNICEF is key, everyone sees UNICEF as a key partner. UNICEF is one of the more flexible organisations in supporting MoH and finding support for different activities."* [MISAU informant]

UNICEF credibility at MISAU was also noted by partners.

> "*UNICEF is respected in the ministry and partners have used the strategy to use UNICEF to advocate on their behalf."* [Implementing partner].

UNICEF was able to make use of an existing platform of community based services to advocate for iCCM. While the previously existing APE strategy was developed and driven by MISAU, four different working groups for formulating the re-launch of the APE programme were set up with MISAU and partners, with UNICEF serving on the main coordination as well as technical subgroups.

> *"The organisations were not involved in the drafting of policy, but worked on designing the programme and informing the policy." [*Implementing partner]

While UNICEF and other partners are closely involved, there is clearly a sense of ownership by MISAU. As one government informant noted:

> "*This [policy] is not influenced by donors. We as government have to decide what tasks to give them. We involve our partners in the planning process, partners do not put their agenda on us, we decide our priorities."*

Thus, while the APE programme is clearly national policy and fully "owned" by MISAU, financial support for the programme is still exclusively donor provided, with considerable technical input from partners for the development of training, supervisory, M&E tools and job aides.

There has been considerable support by donors and agencies in the shift in emphasis away from rehabilitating the previously devastated health infrastructure towards focusing on community outreach, in which APES provide health services through door-to-door visits. The IHSS programme was cited by some as being catalytic and especially helpful in expanding PHC through community outreach and in reaching MDG targets.

> **Box 1:** Collaboration and appreciation of partner involvement by agencies and MISAU alike
>
> *"There has been good collaboration between the main partners, and there has been a good match that has enabled them to deliver results-not necessarily in a timely way, but ensuring good quality. The working groups have also been helpful."* [International partner]
>
> *"First I want to say our data shows that child survival is improving - the indicators are improving. We have technical support - colleagues with us, supporting us in supervision, with the activists [volunteers] and APEs. They support us not only financially but technically. They are a big help in strategic support for us here at MISAU."* [Ministry of Health informant]

5.1.3 Women's participation and gender equality

The recruitment of women as APEs has been made a priority by MISAU and has been outlined in the APE National Policy 2010. UNICEF data however, shows that only 30% of APEs trained with DFATD funds were female though this varied across districts. In Bilene district in Gaza, for example, the ratio was reversed with 60% of APEs trained being women. Recruiting women to become APEs is particularly difficult in the north due to cultural constraints, low educational levels of women (APEs are supposed to have had a minimum of 7 years schooling) and strong reluctance of spouses to allow wives to pursue a 4 month training course that takes them out of the home to live in district level accommodation.

> It "*depends on the provinces, there are cultural differences between provinces, in the North it is very hard to have women working outside the house, even for domestic activities. In the North only men do that work, in the South women do that work. In the Central region it is more common to see women riding the bicycle, in the South it's very hard to see. So there are some differences."* [MISAU informant]

Community Health Committees that the team met with had substantial numbers of female members who participated actively in community discussions. However, the evaluators were told that this gender balance is not found throughout Mozambique, especially in the more remote areas.

In many respects, female APEs have better access to homes for visiting, where they are expected to spend a majority of their work time. Some of the older, more experienced APEs were also TBAs and respected as long time health workers, even before the APE programme trained them. However, in the visited community in the South, mothers did not seem to have a preference for either male or female APEs.

At a higher level, most of the 1300 health centres are staffed with a majority of female nurses, many of the district and provincial staff interviewed were female, and a majority of the informants in MISAU were professional women.

5.2 Effectiveness

5.2.1 Availability and access (human resources, supplies and commodities)

5.2.1.1 Human resources: APEs

APEs are selected through a nomination process involving members of their community, often by a pre-existing health committee. The importance of this community involvement in the selection of APEs was cited as a critical feature of their acceptance and success.

> *"We need to have people that are very well involved and very well accepted within the communities. We see that in many communities APEs are not performing very well because the APEs are not part of that community, they don't know the culture or have the insight."* [MISAU informant]

Nomination and selection were described as being due to good character or to being respected in the community.

> *"The community has always respected us; that's why we were selected."* [Group of APEs]

APEs are often drawn from a cadre of former volunteers or health activists or are drawn from a pool of APEs who were functioning in their communities prior to IHSS.

The importance of transparent and community wide participation in the process was highlighted by community members as ensuring maximum ownership and investment in the programme.[19] However, concerns regarding the selection of APES at community level have been discussed in some policy documents, which note that selection in the past has been exposed to social and political pressure. While the official policy is that APEs must have 7th grade education level and speak Portuguese, in practice, this is often overlooked in instances where they are requested for by the community or if they have been working previously as APEs.

> *"If the community chooses someone with less than a 7th grade, the district has to comply with the choice."* [District APE supervisor]

The visited District and Provincial directors all verbalised the commitment to recruiting more women and working to equalise the proportion of males and females in the programme.

Deployment of APES

Although APEs are recruited at the community level there are only 25 allocated per district regardless of the population, with communities at a greater distance from health facilities given priority for having an APE. For example,

> *"In Mabone district, the APEs were placed in relation to their distance to health facility giving priority to those who were far away, in one instance up to 50km."* [APE Coordinator Mabone].

Another cited criteria for deployment of APEs was the presence of village Health Committees who would serve to supervise and support the APEs locally.

This system leads to inequitable per capita allocation of APEs across provinces, ranging from one APE per 500 to over 3500 population. As a result, the areas which are more remote and in greater need for APE support, do not receive the support and funding they require to address their health needs. On the other hand, 25 APEs per district can be seen as a practical decision to restrict training group numbers per district while the programme rolls out.

Training

A total number of 3318 frontline workers were trained with DFATD funds throughout the IHSS programme time period (see Figure 2 below). A large proportion of these workers were nurses and clinicians trained in IMCI and iCCM in the beginning phase of the IHSS programme. Training for the first cohort of new APEs began in 2010 with graduation in early 2011. Up to May 2012, 1215 APEs had been trained in total, of which 905 were trained with IHSS funds. Of UNICEF trained APEs, only 30% were female. An additional 1580 APEs were trained in the first half of 2013 with 650 more to complete the training programme starting at the end of 2013, bringing the expected total to 3450 by mid-2014. All 905 APEs trained with UNICEF IHSS funds were supplied with the initial equipment, monthly drug kits, and supplies to start their job.

The critical role of UNICEF in the training process for the APEs was cited by one development partner:

> *"Without UNICEF, training would not have happened, the programme would not be running even at the scale that it is. It was catalytic."* [International partner]

Master trainers were taught nationally and then offered 3-5 days training at regional workshops to APE district supervisors who then led the training for the APEs along with other district staff. Thus, capacity was built in every implementing district. The training includes community diagnosis skills, health promotion concepts and techniques, identification of health problems for referral, treatment of common diseases including iCCM management and use of drugs, reports and monthly information flow. Supervisors are also given guidance on how to assess and ensure quality service by APEs.

Figure 2: Number of frontline health workers trained under the IHSS programme 2007-2013

- Number of APEs trained in CCM with CI funds — 905
- Number of nurses/clinicians trained in IMCI and iCCM — 320
- Number of nurses/clinicans trained in IMCI — 2093
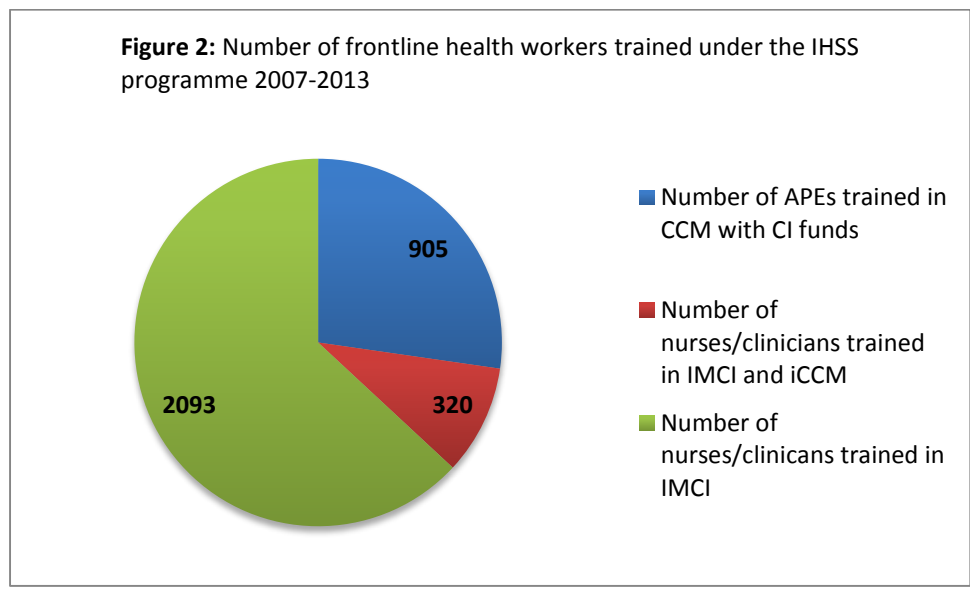
The training programme is designed to run for four months during which time the APEs reside at the district town, returning home only on weekends. Time is divided between classroom and field practice. The iCCM component, i.e., clinical management of malaria, diarrhoea, and respiratory illness comprises 4-5 weeks of training. Where considerable numbers of former APEs were selected for the programme, a two month course was provided to bring them up to date with new knowledge, skills, and use of new medicines and procedures. To date, some 1000 former APEs have been retrained and activated as part of the programme. Forms were developed by MISAU, with the assistance of UNICEF, for supervisors to help assess clinical competency and implementation in the field. However, to the evaluators' knowledge, no formal evaluations of the quality or outcomes of the training were conducted.

Visits by the team to APEs in the field revealed responses to numerous clinical questions with appropriate answers (danger signs, drug dosages, nutritional guidance) indicating adequate training for the iCCM tasks allotted to those interviewed.

Training materials for the APE programme were developed by MISAU with help from partners. UNICEF was one of the partners that took the lead and coordinated the development, field testing, and production of the materials. Their support was noted by one MISAU informant.

> *"It was in [UNICEF's] flexibility where there were gaps and delays [that was most valuable], we could approach them and they would solve them. During trainer training we had a lot of support in designing the materials. They have been very present as technical support; they are not just there for financing and logistics. In terms of developing the training materials, we needed help with the health promotion material. At first it was too much material and not very practical, and the APEs could not make very good use of it. They helped a lot with the revision of the material."*

APE training and health education materials, specifically a flip chart, were developed and field tested by UNICEF in 2012. They were widely available during field visits and showed evidence of regular use by APEs. These appear to be highly appreciated and generally well understood. While it was difficult to tell if they were used in the home health education and promotion activities, in general mothers recognized the flip charts and were familiar with the messages they contained.

Apparently the APE register and monthly reporting form were not designed prior to the pilot training so APEs were not trained either in the use of the register and forms, nor, more critically, in understanding how this data would be useful in their own work. This is being remedied in the current training but is needed in a refresher course for those already trained. Many APEs and supervisors expressed a desire for refresher training every few months.

From Pilot to Scale up

The training of APEs is supported by partners in different provinces and supervised at the provincial level. This proved challenging in terms of coordination and with administering the roll out at provincial level.

After the pilot, scale up of the programme proved to have its challenges as expressed by one MISAU informant.

> *"When we first began we did only 8 districts, a small number, so it was easy to manage, but the following year we went to do whole country, after we had tested, revised and finalised the materials. We were training the whole country, and it was difficult to meet the training schedule. In particular it was difficult to get all the materials printed on time; there were delays (some training took place without the training manuals)."* [MISAU informant]

On one site visit, it was noted by the team that the APEs had still to receive the full training curriculum though they had finished the training over a year ago.

> *"Until now they haven't gotten the 2nd modules from the curriculum, and they only got the third module last month."* [APE district Supervisor]

The de-centralisation of the training process proved difficult to implement at provincial level and to coordinate from the central level.

> *"We also need support with supervision (of training). We don't know what is happening at the provincial level, between the supervisors and our provincial focal points in terms of what has worked with the training and where the weak points are. Here at the central level, we don't have the capacity to go to the provinces and the districts to supervise. This should happen in the provinces and involve someone from provincial coordination and someone from the training institutions."* [MISAU informant]

The job description and training of APEs emphasises health promotion and preventive activities with only 20% of time meant to be allocated to curative care, including iCCM. In fact, iCCM is only one small component of a much larger set of mandated activities (see appendix G).

> *"As far as their orientation goes, they have more time in the community doing preventive than curative services. They have means to tend to children, not only children, but currently there is a focus on children for referrals and prevention. Our main investment should be in prevention, so this is of great benefit to the Ministry of Health."* [MISAU informant]

Not all informants agreed with this as one partner mentioned:

> *"The APE programme falls under the Department of Health Promotion, which emphasizes prevention. In reality, 90% of their time is spent treating people, and 10% is spent on promotion-especially in the Northern provinces."* [Development partner]

APEs are expected to travel from house to house within their catchment area, identifying health hazards, and encouraging health behaviours, building latrines, promoting hand washing, nutrition, family planning, screening and referring. In fact, many of the APEs interviewed in the field described spending several hours at home each day, receiving patients and dealing with illness (interviews indicated 4-12 patients seen/day with a maximum mentioned 20). They also described night and weekend visits to manage acute medical problems.

> *"We have set hours but if there is a child vomiting, they might wake me up any hour. There is a health committee, they will fetch one of the members at night first."* [APE]

However, all APEs described extensive outreach, walking from house to house and interacting with families, mostly mothers, demonstrating health promotion activities such as hand washing. Interviews

with mothers groups during field visits showed a great deal of education takes place through APE home visits and group meetings focusing on nutrition, hygiene, latrine building and child care. Overall, 2-3 hours are spent daily in curative services and 3-4 hours in health promotion and home visits. Most APEs interviewed stated they owned small plots of land that they tend to supplement livelihood, and a few run tiny shops near their homes.

Many APEs indicated they would like further training to handle a wider range of complaints including TB DOTS, first aid, family planning and adult health issues. This is reflective of demand from the communities they serve.

> *"They want us to provide more adult services, for example, treating coughs, and they want medicines - especially injections."* [APE]

Some partners reported wanting to add to their tasks, and other programmes also envision shifting tasks to APE level.

> *"There is a need to balance the strain of not putting too many responsibilities on the APEs. Now there is an interest in this cadre amongst other partners with different agendas that may pose a threat to overwhelming the APEs. There is some pressure from donors to increase the curative role of the CHWs."* [UNICEF informant]

However, MISAU is hesitant to increase APEs' scope of work and overburden the fragile system until there is greater evidence of good quality of current services provided and trials to show that increased tasks would not diminish the all-important health education activities.

Subsidies/stipends

In contrast to earlier times, APEs are now meant to receive a subsidy or payment of about $40/month, a significant amount in poor rural areas but less than a living wage.

> *"The subsidy of 1200 (Mts) does not even buy a sack of rice, which today costs 1500 (Mts), so it is not enough. With our machambas (small farms) we survive, so we reserve some time to work on them, or we could not support our families."* [APE]

Late and unreliable payment is a frequent complaint:

> *"The subsidy is felt to be too little and [the APEs] are owed for 3 months. This has had demoralizing effect."* [District APE Supervisor]

Delays in disbursement from UNICEF for the payments of subsidies to provinces are often a result of both non-timely requests being made from the district to province, not allowing for sufficient processing time, and a lack of justification linked to the budget request.

Furthermore, there are no separate allowances for travel to the health facility to obtain medicine kits, to assist the poor in referral, for bicycle repairs or other contingencies. UNICEF has often had to arrange for money transfers to districts as administrative systems are unable to reliably transfer these funds in many areas. At least one donor has been unwilling to provide subsidies, forcing UNICEF to make the payments in order to keep the programme running in those districts.

The uncertainty of stipend payment and the inability of the GRM to assume these recurring costs are frequently cited as a major threat to the programme. Government regulations around age and education requirements for the recruitment of personnel are often overlooked in some sectors when shortages of qualified staff result in vacancies in required positions. One of the arguments around the inability to absorb the APEs into the government system is a failure of many of them to meet the minimum educational requirements stipulated by government. Making allowances in this regard could result in other sectors demanding the same for their staff.

High level MISAU officials reiterated the importance of provision of subsidies for APEs, recognizing the importance of remuneration for their work.

> *"We start with the assumption that anybody who is working, even at the district level, they feel the impact of globalization. At the peripheral level people have internet access and access to communication. In this context, the APE is in the community and witnesses this change. The APEs need to survive. So we need to pay for fuel and food, so that APEs have proper conditions of living. The APE is a factor of development at the community level and should be seen holistically. We should not think the same way as we did after independence, that APEs are purely volunteers. We need to have a responsibility for [to] them.... But it is not enough to give them training and drug kits, we need to support the APE with subsidies."* [MISAU informant].

Attrition

Motivation and retention of APEs that have been trained in iCCM is a critical factor to long term success of the strategy. So far, as the APE programme is in its second year, data regarding attrition in Mozambique is sparse. In the visited districts, attrition was less than 10%, sometimes far less, and due to illness or alternative work rather than dissatisfaction.

However, some factors can be identified as threats to retention. Dissatisfaction and irregularity of subsidy payment was frequently cited by APEs as a demoralising factor that could lead to seeking other work opportunities.

Males face easier alternative job opportunities and are generally more educated.

> *"There are plenty of men but sometimes they are young with education level that gives them other employment possibilities, so they stay with us for a time and then they leave to go to other opportunities - there are no incentives for them to stay....Women stay on, once they have begun."* [MISAU informant]

Field interviews demonstrated a strong sense of pride and satisfaction by APEs in serving their communities. While they described many difficulties such as the distances to travel on foot, costs incurred to obtain monthly medicine kits, and especially the lateness and inadequacy of the $40 monthly payment, they seemed satisfied with their work and motivated by the support of the people they serve.

APE Supervision

Regular supportive supervision is important for both quality and motivation of the APEs. UNICEF telephone interviews with district supervisors from 8 provinces representing 753 APEs from January to March 2013 reported extraordinary high levels of supervision at 98% and very high supervision with observation of case management at 77% within the past 3 months. In contrast, effective supervision was cited as one of the most critical features needing support for the programme. As one implementing partner noted:

> *"Supervision is not yet where it should be - we have some who don't do registers and data, we need to insist on monitoring, and it needs to be local. We need more training and incentives to do regular supervision. I think it is normal in the initial phase that things falter, but we are following it. It must be local and depending on the provincial level.* [International partner]

The first level of APE supervisor is a health professional in the nearest health facility who is responsible for overseeing the work of each APE through monthly visits to the village, and when the APE comes to the facility to submit the monthly activities report and collect subsidy and medicine kits. As field visits are highly dependent on availability of a vehicle and petrol from the district, they are often less regular, occurring about once in three months in many cases. Even then, they are often said to last only 10-20 minutes. Adequacy of supplies are checked, registers are observed and inspected with corrective actions taken. In some of the districts visited, APEs and health staff reported using the APE registers to assess case management, i.e., incorrect columns ticked, poor correlation between complaint and the treatment given.

> "*Because of transport, we don't always have fuel to supervise. We look at the registers and talk to them to correct things."* [APE supervisor]

Furthermore, APE visits to health facilities were cited as often used in lieu of village site visits by supervisors when they were unable to make scheduled visits. In these cases, APE reporting forms served as a tool to discuss cases and quality.

Some APEs said the supervisors were helpful in solving clinical problems but most suggested referral for anything the APE encounters out of the standard list of symptoms they can treat. However, most APEs indicate they can contact the health facility staff by cell phone for consultations and in turn, are informed by phone when a supervisor is planning a village visit. Use of the well-designed supervision check lists were inconsistent across districts visited by the evaluation team.

One APE noted she would have liked to have more support on her home visits:

> *"We would like our supervisor to work at least one day with us when we are doing the home visits, to accompany us. To support us, and to see what we are doing well or doing wrong during the home visits."*

The second level of supervision is by the APE programme coordinator in the district who is often also in charge of health promotion in the district. They are expected to visit at least seven APEs per quarter. As APEs were trained by this same person who supervises their work in the field, this assures that there is potential for good follow-up and reinforcement of the principles taught. A Provincial

coordinator oversees all the districts and is usually responsible for more administrative matters, such as organising training, drug supply, stipends, reports etc.

> "*Province to district supervision happens every three months and generally works, but supervision from the districts is more of a problem. The APEs have to travel great distances. They go to the health facilities and get supervision when they collect their medicines.*" [Provincial Health Director, MISAU]

A major concern was the overburdening of health workers with added duties of management of the APEs.

> "*The biggest assumption is that MISAU has sufficient health personnel to carry out their clinical duties in addition to supervision* for CHWs." [UNICEF informant]

This sentiment was echoed for supervisory staff at more senior levels.

> "*I think that is one of the issues, the APE coordinators are doing so much stuff already and supervision is not a priority.*" [Implementing partner]

Testing of different models for supervision in Nampula and Inhambane provinces is currently being planned by Save the Children and Malaria Consortium, with oversight by MISAU. One area will have a dedicated full time APE supervisor for each district; in other areas they will test use of mobile phones to improve M&E and supervision communication.

5.2.1.2 Human resources: other levels

Community Committees

There is a long history of community committees in Mozambique, extending back to the early independence era. All communities with APEs have a health committee. These committees are said to substantially assist the APEs, especially in reinforcing health promotion and gaining legitimacy and support for the programme. In most cases, these committees selected the person to be trained as an APE. The evaluation team met committees, composed of both men and women, during each village visit. The committees meet regularly, as often as weekly, to discuss health matters with the APEs and are said to reinforce improved health behaviours amongst their neighbours (use of bed nets, construction of latrines, promotion of breastfeeding, seeking immunisations). They also meet at the nearest health facility on occasion to discuss problems. Some health committees consist of both community committee members and health facility staff.

> "*We understand that community participation is a good strategy to deal with local problems; it's why we have community committees-which APES are a part of.*" [MISAU informant]

Volunteers and other community health cadres

Mozambique has a vast array of volunteers reflecting a verticalised, programme-driven health system. The newly trained APEs are distinct from other community-level activists and volunteer cadres many of whom had training in specific tasks but who are not fully integrated into the Ministry of Health plans or activities.

In fact, there are volunteers in all development sectors, most recruited and trained by NGOs aiming at individual programme activities in education, agriculture and social welfare as well as health. In recent years, volunteers have been fielded to distribute vitamin A, to motivate for HIV testing, to observe DOTS, and to promote family planning, none uniformly or across the entire country.

Box 2: Integrating volunteers into a national system

"We had in the past a vast number of community volunteers all over the country in different areas, nutrition, malaria, diarrhoeal disease, many areas. … They still exist but we say that we want to have APEs instead of the volunteers because volunteers are directed only for the one specific group (or problem) and APEs can provide a more integrated approach, so APEs will be more appreciated than volunteers. And the plan is to reduce the number of volunteers because now we have now almost 30 or 40 types of volunteers. You may get closer to the people that way, but to supervise and control different groups is very difficult and the control was only done by NGOs, the government was not involved in that control [in terms of] supervision, and we didn't know what the volunteers [were doing]." [MISAU informant]

"Other volunteers are supported through external initiatives, the APE programme is a government owned programme so everything is streamlined and has to be approved by MISAU….One of the challenges of the programme was that it was not decided how APES would work with other community health workers; this is a huge problem." [International partner]

5.2.1.3 Supply of medicines/commodities and stockouts

On completion of training, each APE receives a bicycle, flashlight, register book, shoulder bag and referral slips. Monthly medicine supplies come as two pre-packaged "kits", one for malaria testing and treatment and one with all other expendable supplies comprising twenty items. Determining the contents of this kit took a couple of years of negotiations with doctors and the pharmacy department, as the APEs received dispersible Amoxicillin (for children) and Zinc tablets even before they were issued to health facilities. Please refer to Appendix F for kit contents. Quantities in the kit are fixed though subject to review and revision as the programme finds excess or stock-outs of certain items. The cost of kits is a major recurring cost driver of the programme (currently at $300/APE/month). A careful quantification study is currently underway funded by USAID. While a demand-pull system has been suggested, most observers indicated that only the set kit is practical at this time.

The cost of transporting the kits is very substantial, and bicycles were of little or no value in this task in the areas visited by the team as they were only reached by long sandy roads where even pushing a bicycle is difficult.

> *"About 90% of my community is not accessible by bicycle because of the sand."* [APE]

Repairs to bicycles are considered too expensive so they are largely left unused or in disrepair.

> *"There are sometimes delays [in the receipt of the kits]. For July we did not get them yet. Normally it comes from the health centre. Hopefully if it is the week of the mobile brigade so the car brings it to there. I then have to go and fetch it. It takes about 2.5 hours to get there, but the kit is too big to carry, so I ask my child to help, or sometimes her father goes by bicycle to get it. There is no car from that road to here."* [APE]

The evaluation team's limited inspections showed a few well organized kits in the APEs' homes or adjacent health posts but most were rather disorganised. All APEs interviewed denied over-supply, except for gloves. Correlation with registers did not reveal accounting for the number of items received, e.g., 200 sachets of ORS but only 12 cases of diarrhoea listed. Many APEs give out ORS packets to mothers so they have it at home or just give it to kids as a tonic. Paracetamol seems to be given to virtually everyone. Convulsions are said to be a big complaint but only 6 ACT suppositories were dispensed, for presumed cerebral malaria. In general, adequacy of drug supply was widely reported.

Figure 3: Percent of APEs with no stock-out of essential iCCM commodities, mid 2012- 2013, UNICEF Final Report to DFATD
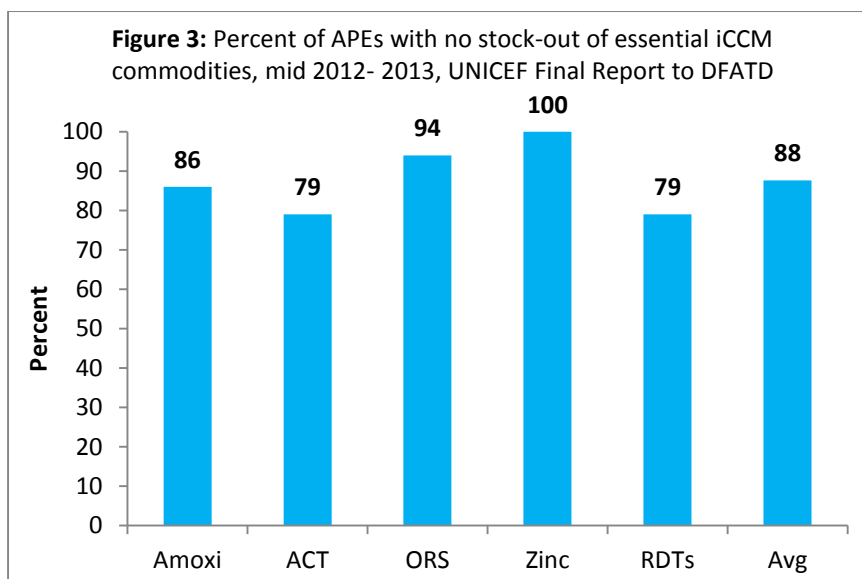
Data from 8 provincial APE coordinators who participated in a telephone survey reporting on the period from mid-2012 to mid-2013 indicate that malaria kits had the highest level of stock-outs (21% for ACT and RDTs) (Figure 3). This information was corroborated during the evaluators' interviews and during field visits.

> "Last year there were huge stock-outs of RDTs nationally amongst APEs, and MISAU prioritized to stock health facilities instead." [UNICEF informant]

Reasons for this were cited as due to delays in payments or delays from suppliers sending the kits.

> "At the moment, there is a stock-out of kits because funders have not disbursed funding." [MISAU informant]

5.2.2 Utilisation and quality of care (monitoring and evaluation, quality improvement)

Utilisation

As this cadre of newly trained APEs are recognised by the community, their consultation numbers have increased. Monthly reports from the routine APE information system show a rising number of iCCM consultations, with an average of 46 annual iCCM cases per APE (about one per week) reported in period 5 (June 2011 – May 2012) compared to 142 cases (three per week) in period 6 (June 2012 – May 2013). The average number of children seen and treated with iCCM per month varies widely with a national average of about fifteen/month through phase 6, though this varies widely from less than ten to over sixty. These numbers, while covering only the 3 iCCM diseases in children under five, show a surprisingly low case load and do not seem at all consistent with the medicine use in the kits which contain many times that average number of treatments for these three priority conditions. This, however, does not represent the full range of curative consultations carried out by each APE daily nor does it represent overall workload, of which a significant proportion of time is spent in promotional and preventive activities and home visits.

A recent study, published in 2013 by Save the Children,[14] in Nampula province comparing health seeking in APE (intervention) and non–APE (control) areas for children under five shows a dramatic

shift of first consultation from health facilities to APEs, obviously due to the relative convenience of the nearby APE (Figures 4 and 5). There is some indication of a decline in those not seeking any care for fever in the APE-served areas but this is not observed for ARI or diarrhoea.

Figure 4: Percent of children under five with illness who sought no care, Nampula province 2013

	fever	ARI	diarrhea
Intervention	14	35	40
Control	25	29	39

Figure 5: Percent of children under five with illness taken to APE or Government Health Facility (HF) in Nampula province.

	fever taken to APE	fever taken to HF	ARI taken to APE	ARI taken to HF	diarrhea taken to APE	diarrhea taken to HF
Intervention	87	11	83	8	86	10
Control	1	89		85		82

Data from the same report from Nampula does, however, show that when there is an APE in a community, caregivers are inclined to use his/her services before going to a government health facility (Figure 4), though no studies on health facility utilisation in APE areas have yet been conducted.

> "*For the impact of the APE programme on health facility use, we do not have information at the moment to make any conclusions. Since we have this community involvement for a long time, this is a good time to do an assessment on whether the APEs programme affected health service demand.*" [MISAU informant]

The shift to care seeking from an APE for iCCM can be seen in data reported from an evaluation conducted by the Malaria Consortium in Inhambane province,[15] which shows that from 2010 to 2012, the percentage of children with fever, suspected pneumonia or diarrhoea who sought no care

decreased from 42% (95% CI: 30.5%- 57%) to 28% (95% CI: 22%- 34%). There was also a doubling in the proportion of children who sought assistance from an APE (8% - 21%) (Figure 6).

Figure 6: Percent of children under five with any of three illnesses who sought care, by provider. Inhambane province
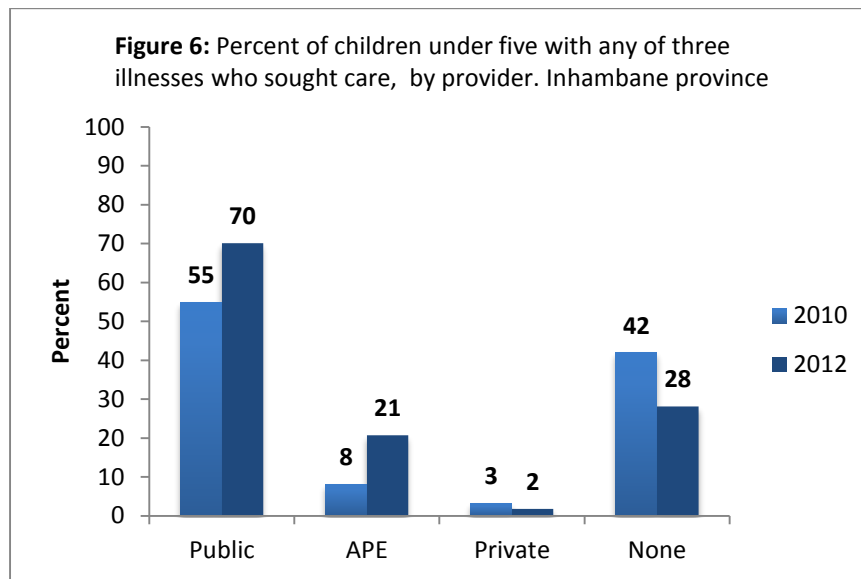
The overall trends emerging from evaluations conducted in these two provinces are encouraging as they point to increased utilisation of health services in general and APEs in particular. This was mirrored in discussions with one APE who noted:

> "One thing we have noticed is that before we were trained, there seemed to be fewer cases of malaria in our communities, but now there were more, so we thought about this and thought our health promotion was not working, but then we realised that people were not reporting and not going to facilities. They were treating them at home, but now there are many more cases being reported, and we understood how to interpret this. With health promotion, now people are doing tests, and they are more aware and so they want to know the status of their health." [APE]

Health Posts

While official policy does not encourage health posts, many communities have asked APEs to have fixed hours when they can be consulted in their homes, rather than sought somewhere in the field while making home visits. Communities served by the original APEs often built health posts to provide a convenient place at which to seek care. The Revitalisation of APE plan specifically forbids establishment of such posts, preferring to have APEs spend most of their time and effort in visiting homes and promoting healthy living. However, throughout our interviews we were told of the importance in the eyes of the community of having APEs available at a fixed place to enable consultations by patients seeking care.

> "They (the community) want a fixed post. They just keep coming. I need to be here or the people can't find me at certain hours. This was a better system." [APE]

Many community members expressed the desire for their local APE to have a structure from which to work, though they also noted that they could see the benefit of having their APE do house to house visits.

Cell phone contact has also helped in accessing APE care with community members stating that they would often contact their APE through this medium in emergencies.

The referral to facilities is greatly enhanced by the referral slip which enables "fast track" consultation:

> *"They refer children using a referral slip, and the advantage is if you arrive with the slip you don't have to wait in the queue, you are seen directly. And when you get your medicines, the APE does the follow up. So the benefits are positive in terms of identification and follow up of patients."* [Health Committee member]

The public support and enthusiasm for the programme, even in its fledgling stage, is strongly evident. Communities uniformly applaud the APE programme and support moves to enhance its effectiveness and scope:

> *"Yes, the communities are very happy as a result of the programme. There have been a lot of changes in their lives. The provision of care has expanded significantly."* [USAID]

This sentiment was echoed at the provincial level:

> *"Now we are able to be closer to the community, and I can get information about what is happening 170km away from here."* [Informant from the District office]

> *"And for those who are doing work, the community is happy with the work they are doing."* [District APE supervisor]

Monitoring and evaluation

The APE programme is monitored through a single set of twenty six data items collected in a register maintained by each APE. Case consultations and iCCM diagnoses and treatments given for each patient seen are recorded. The monthly APE report summarises this data and reports any deaths, referrals, lectures given, and numbers of participants attending. Each health facility collates the forms from their supervised APEs and sends to the district, which in turn collates returns from all participating health centres and forwards to the province. The province enters the combined data into Excel spreadsheets and forwards it electronically to the responsible unit in MISAU.

UNICEF was a key partner in helping MISAU with the design and development of the M&E tools for the APE programme and operationalising the routine monitoring system for the programme. While the Director of HMIS at MISAU oversaw the development of these forms, technical staff from various partners participated in the choice of data items collected. UNICEF paid for the printing and distribution of the registers and monthly summary forms. As the registers were designed, printed, and distributed after many APEs had completed training, in some cases, they reported lacking direct guidance in their use or interpretation. Furthermore, the registers reflected treatment regimens available in the new drug kits before many of the kits had been distributed, which caused some confusion for APEs in recording.

At this stage, the routine monitoring system for the APE programme functions parallel to, and independent from, the national HMIS as the reports from health facilities are numerous and not yet consolidated into a uniform functional information system.

A MISAU informant described the challenges with the national information system:

"Everyday all programme managers want information about their own programme, and that is a problem because where we gather the information is at one health post or one health center and one nurse or one technician should gather all the information. They have three, four, five books and that is bad. We do not have reliable information. In my opinion we should simplify. Everyone wants to know some things. But we have to discuss what kind of key information we need because the approach we have is not sustainable, and it is not used at all levels." [MISAU informant]

MISAU is starting to use DHIS2 to manage health data. The APE reports will be integrated into this system once it has been shown to function reliably. While UNICEF has focused on operationalising the official government system, it was noted that some partners were using APEs to collect more data than authorised.

"Any tool that is designed has to go through the HMIS department. Even at the provincial level, they have to go through the provincial directorate to discuss with them. Sometimes planning department is not involved at all [in development of the tools], and partners do it on their own, and later they cannot see that they are duplicating information collection or information that HMIS cannot capture." [MISAU informant]

Furthermore, donor reporting demands have placed pressure to include more indicators in the system, which increases the reporting burden and reduces the quality of data collected. For example, one donor was said to be

"pushing APEs to have separate reporting for malarial drugs to ensure proper accountability, this is an added burden on them." [UNICEF informant]

Quality of data was cited as a major challenge.

"We do not have the capacity yet to monitor the quality of the information coming from their activities." [MISAU informant]

One experienced observer expressed considerable reservation about the quality of APE data, but the high percentage of reporting – consistently about 90% of expected monthly returns received – suggests that APEs are, at least, reliably submitting the required forms.

The current APE information system only captures diagnosis and curative aspects of APE work while much of their focus is on prevention and promotion, which is not monitored nor quantified through this reporting system. At this early stage in the programme, one of the greatest challenges may be in evaluating the long-term benefits of the coordination and community mobilization that have been put in motion in the communities. Changing beliefs and practices is a slow process that is difficult to assess and does not lend itself to quick improvements in indicators. Yet without it, other health system-strengthening interventions are unlikely to be sustainable.

"APEs provide health education and health promotion but the weakness is that we are yet to capture all that information in the HMIS. That is difficult; we are talking about behaviour and attitudes. We would like to do more in depth studies. We need to see more than numbers but

behaviour change is hard to evaluate. There needs to be more investment. It's a process that takes time." [MISAU informant]

Our observations in the field showed the registers to be used but often not carried on home visits due to their bulk. Many APEs carry a small notebook and transfer information to the register on return home. Inspection of registers showed occasional discrepancies between diagnosis and treatment provided and the centrefold of the register, which divides the two halves of the large book, makes continuity of case information occasionally irregular, as each patient's information is supposed to be filled on one line. The page used for supervisor comments was only rarely used, and supervisors are not using registers to set goals nor are expectations recorded or discussed. Supervisors do not appear to use the monthly reports for any calculation of indicators or evaluation purpose. Thus, this info system serves just to collect numbers with no use or feedback to the APEs. However, all APEs we interviewed had a precise measure of the number of households they serve, and many knew a population total and number of children. Thus, local denominator data is available, and coverage indicators could readily be calculated.

Quality of care and quality improvement

There have been no studies yet of the quality of APE work, but the supervisor check list contains many checks on proper storage and use of drugs, proper review of case diagnosis and their treatment, accuracy of data, and reporting of community activities. Special studies will be needed to assess the impact of health education work but findings from the interviews conducted as part of this evaluation indicated a wide recognition of many of the key messages and changes in cultural misunderstandings of disease. Whether suggested actions are carried out needs to be objectively assessed.

Box 3: Community responses to effects of APE education and health promotion

"Yes, they do… accept the advice. People used to use traditional medicine for malaria and now they do not. They did not understand malaria, and they have stopped using traditional medicine." [Mother]

"Yes – there is a way [for preventing malaria], by sleeping under mosquito nets and keeping everything clean." [Mother]

5.2.3   Trends in coverage of selected maternal and child health indicators

This section includes analysis of coverage for selected maternal and child health indicators from 1997 to 2011. Descriptions include changes at the national level, rural areas, and poorest wealth quintiles. Only figures for indicators included in the coverage trend analysis are included in this section. ITN coverage for children under five, IPTp for pregnant women, and PNC were excluded from the statistical trend analysis due to lack of more than two comparable data points across survey years. Where confidence intervals are not presented, data was not available for statistical analysis (MIS 2007) or indicators could not be reliably calculated [(Exclusive Breastfeeding: EBF) from MICS 2008]. In these cases, point estimates were taken from published reports. All significant trends for coverage in select indicators for the following figures are marked with **. National and regional coverage profile figures,

which include indicators not part of the trend analysis, can be found in Appendix G. These profiles have been included as an analysis product for in-country stakeholders such as the Ministry of Health.

Table 4 below provides a summary of changes in the main IHSS programme intervention indicators in the rural areas. Data from 1997 was not used as a baseline as the changes in coverage from this time to 2003 mark a period of post-war reconstruction, reflecting large gains from previous years of neglected and largely decimated health infrastructures. Baseline was taken at 2003 for vitamin A supplementation and measles vaccine coverage as these interventions formed part of the first NCWH campaign, which launched in March 2008 with a result that coverage changes would be reflected in the MICS that was collected in October/ November of that year. The year 2008 was used as a baseline for the other coverage indicators as these interventions were slower to roll out under the IHSS programme and would not have been captured in the 2008 MICS. The indicators are discussed in detail in the text and graphs below.

Table 5: Summary of all trend indicators included

Indicator	Mozambique Rural areas				
	DHS 2003 (pre IHSS) % (95% CI)	MICS 2008 (baseline) % (95%CI)	DHS 2011 (endline) % (95%CI)	Average annual rate of change pre-IHSS (2003-2008). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2008-2011). Data shown as % per year with confidence intervals
Tetanus toxoid vaccination of pregnant women (at least 2 doses)	54 (51 - 57)	65 (63 - 67)	51 (48 - 54)	2.20 (1.71 - 2.69)	-4.63 [-5.41 - (-3.85)]
Early breastfeeding	67 (64 - 70)	65 (63 - 67)	77 (75 - 79)	-0.50 [-0.97 - (-0.03)]	4.20 (3.49 - 4.91)
Exclusive breastfeeding	32 (28 - 37)	38 (N/A)	40 (36 - 45)	1.20 (0.07 - 2.33)	0.80 (-1.10 - 2.70)
IPT	No Data	39 (N/A)	17	-	-7.2 [-7.9 - (-6.6)]
Vitamin A supplementation*	43 (41 - 46)	65 (63 - 68)	69 (66 - 71)	4.38 (4.07 - 4.69)	1.07 (0.60 - 1.53)
Measles immunisation*	71 (67 - 75)	69 (66 - 73)	78 (74 -81)	-0.30 (-0.91 - 0.31)	2.80 (1.91 - 3.69)
DPT3 immunisation	66 (61 -70)	69 (64 -73)	73 (69 - 77)	0.60 (-0.03 - 1.23)	1.50 (0.57 - 2.43)
ITN	No Data	22 (N/A)	33 (N/A)	-	3.8 (3.2 - 4.3)
Care-seeking of suspected pneumonia	53 (47- 59)	65 (57 - 71)	44 (33 - 55)	2.38 (1.24 - 3.52)	-6.90 [-10.31 - (-3.49)]
ORS coverage	42 (37 - 47)	37 (34 - 41)	50 (45 - 56)	-0.86 [-1.67 - (-0.05)]	4.33 (2.94 - 5.72)
Care-seeking for fever	46 (42 - 50)	No Data	50 (45 - 55)	-	-
Malaria treatment	16 (13 - 19)	27 (23 - 31)	32 (28 - 36)	2.18 (1.71 - 2.65)	1.67 (0.54 - 2.80)

*IPTp = intermittent preventive treatment of malaria for pregnant women; ITNs = Insecticide Treated Nets; DPT = diphtheria, pertussis and tetanus; N/A: Not Available? * Used 2003 as a baseline*

🟥 Decrease in annual rate of change between pre-IHSS and IHSS period

⬜ Stable annual rate of change between pre-IHSS and IHSS period

🟩 Increase in annual rate of change between pre-IHSS and IHSS period

5.2.3.1 Antenatal care

Tetanus toxoid vaccination in pregnant women

Nationally, only 29% of pregnant women reportedly received at least 2 tetanus toxoid injections in their last pregnancy in 1997. This proportion rose to 57% in 2003 and peaked at 67% in 2008 but fell back to 56% by 2011 (Figure 7). This trajectory was seen across provinces, with the exception of Nampula province that showed a steady increase from 24% in 1997 to stabilize around 68% in both 2008 and 2011 (data not shown). There was an average annual rate of coverage change of 2.2% in the period leading up to the IHSS programme implementation (2003- 2008) compared to a statistically significant decrease of 4.6% per year during the implementation of the programme (2008- 2011). Mozambique achieved elimination of maternal and neonatal tetanus in 2010,[24] and therefore the decline seen in coverage of two doses of tetanus toxoid vaccination during pregnancy may be due to the higher levels of lifetime tetanus protection in the population.

Figure 7: Percent of women with a live birth in the last 2 years who received at least 2 doses of tetanus toxoid vaccine during last pregnancy
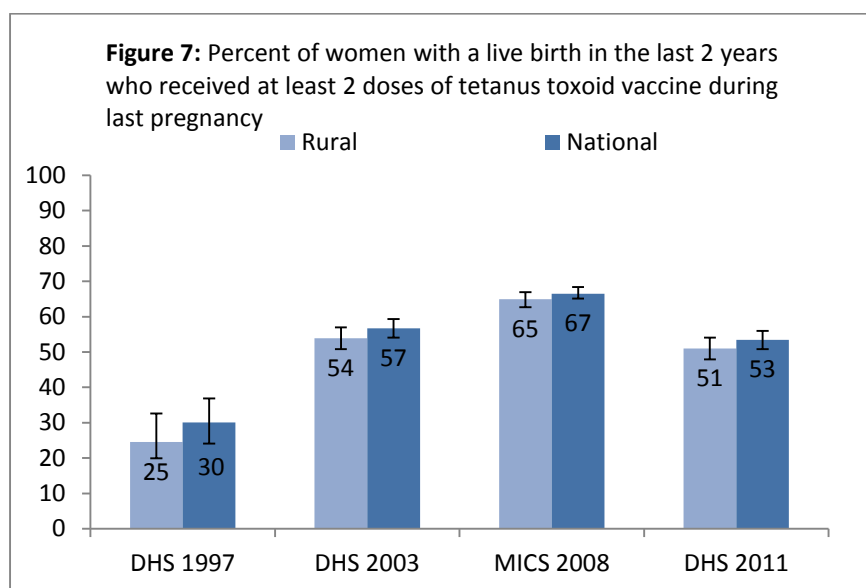
There was a significant upward trend in coverage noted in the poorest quintile from 1997 to 2011 (Figure 8). The confidence intervals did not overlap from 1997- 2003 and in 2011 (data from MICS 2008 was not available) when comparing coverage in the richest and poorest quintiles indicating no improvement in equity between these two groups. The significant change for the poorest quintile occurred prior to the IHSS programme (1997- 2003) while no significant change can be seen when comparing 2003 to 2011 in this group. The IHSS programme in Mozambique did not focus on the delivery of tetanus toxoid in antenatal care services. Therefore, it is not plausible that any changes were due to this programme.

Figure 3: Tetanus toxoid vaccination coverage in the richest and poorest wealth quintiles
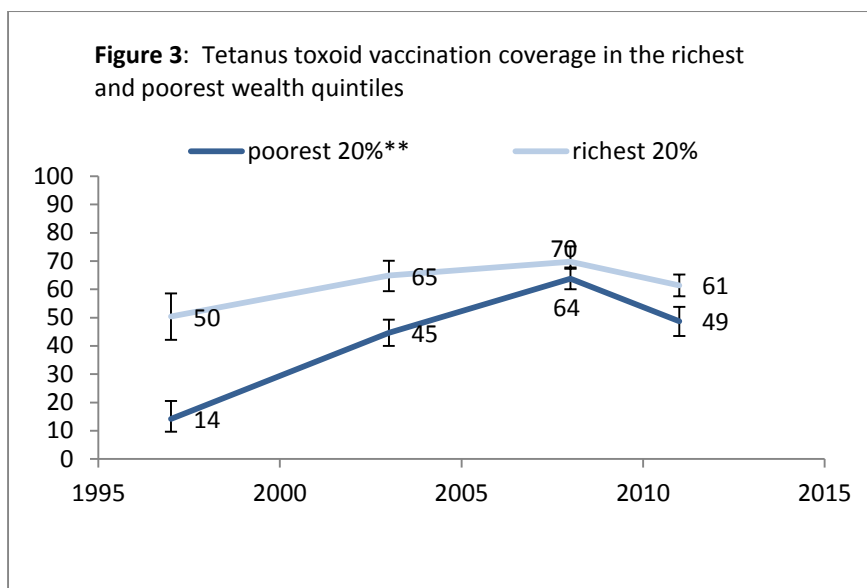
Malaria prevention in pregnancy

Data on the proportion of pregnant women who received two or more doses of SP/ Fansidar during their last pregnancy appears problematic across reporting surveys. In 2007, the Malaria Indicator Survey reports coverage at 16% and 14% for national and rural estimates, respectively. This nearly triples the following year to 43% and 39% as reported in the MICS but sharply drops down to 20% and 17% in 2011 DHS (Figure 9). This spike in coverage between 2007 and 2008 is evident across provinces. However, in Gaza, Manica, Maputo City, Tete, and Zambezia provinces, coverage shows an overall large decline between 2007 and 2011. Only Nampula province shows a large increase from 5% in 2007 to 35% and 36% in 2008 and 2011, respectively. IPTp data was not collected for 1997 and 2003. No trend analysis was done, as only DHS 2011 had data that could calculate estimates with confidence intervals, so coverage changes could not reliably be assessed. The average annual rate of coverage change during the IHSS programme period (2008- 2011) was -7.2%. This changes drastically if taking the 2007 MIS survey estimate which would estimate an average of 1% annual increase.

Figure 9: At least two doses of SP/ Fansidar given in pregnancy
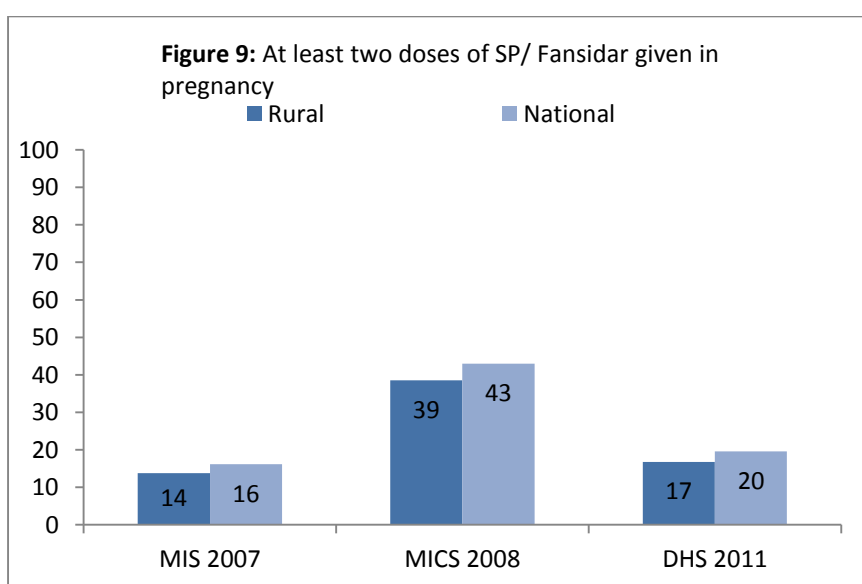
5.2.3.2 Postnatal Care

Data for postnatal check of the mother within two days of birth is only available in the 2003 DHS. This limited data shows a national coverage of 12%, with massive provincial variation with the highest coverage in Maputo City at 75% and the lowest in Zambezia at 5%. UNICEF funded training of nurses in IMNCI, including the promotion of early postnatal care. The lack of data for this indicator makes it impossible to draw any conclusions on the plausibility of an impact of these interventions.

5.2.3.3 Infant feeding

Early initiation and Exclusive Breastfeeding

National rates of exclusive breastfeeding in the first six months of life showed a statistically significant upward trend starting at around 30% in 1997 and 2003, rising to 43% in 2011 (p<0.000) (Figure 10). There is noted variation across provinces, with Zambezia and Nampula reporting a huge rise in exclusive breastfeeding rates starting at 2% in 1997 and increasing to 36% and 42% respectively in 2011. The southern provinces of Inhambane and Gaza, however, show a large decrease, with Inhambane more than halving its 1997 rate of 81% to 32% in 2011 and Gaza starting at 82% and dropping to 60% in 2011 (data not shown). The national trend in exclusive breastfeeding was mirrored in the rural population, which showed a similar significant upward trend from 1997 to 2011 (p<0.000) (Figure 10). Due to smaller sample sizes, the confidence intervals are wide and overlap between 1997 to 2003 and 2003 and 2011 (CIs are not available for 2008 MICS). There was no significant difference between the national and rural average annual rates of coverage change during the IHSS programme period nor when comparing the pre-IHSS and IHSS programme implementation periods. Thus, rates of EBF were maintained. The promotion of exclusive breastfeeding and the launch of the BFHI was included in the package of interventions delivered through the IHSS programme, however it was largely limited to support of a national awareness campaign, which did not roll out until 2009.

Figure 10: Percent of children 0-6 months exclusively breastfed

Figure 11: Percent of women with a live birth in the past two years who put their newborn infant to breast within one hour of birth
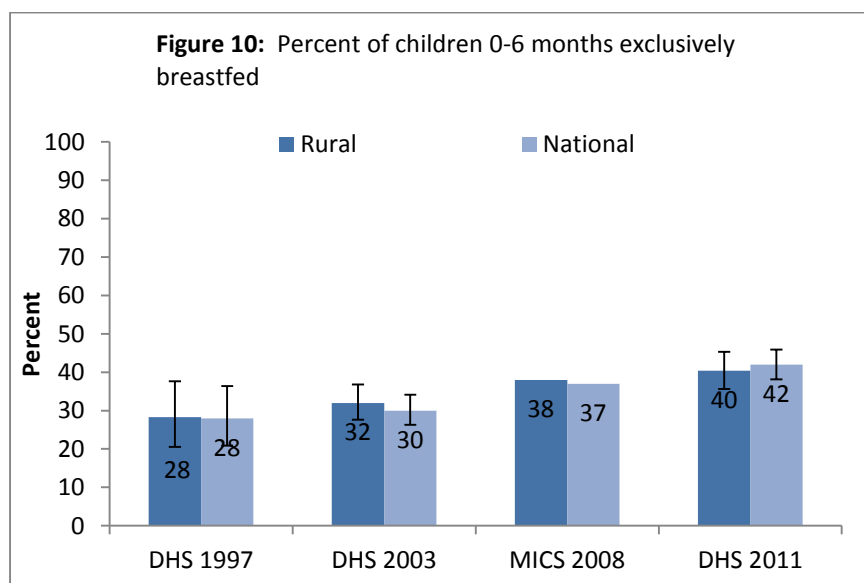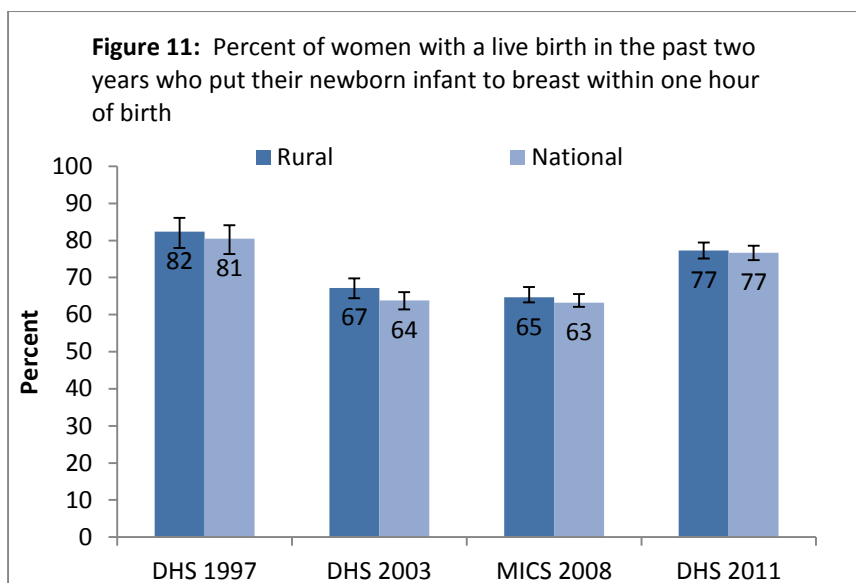
With regards to early breastfeeding in the rural areas, coverage rates fluctuated, dropping from 82% in 1997, down to 67% in 2003 and further dropping to 65% in 2008. Thereafter, coverage rose to 77% in 2011 (Figure 11). This was mirrored in the national coverage. There was a significant rise in average annual rate of coverage change for this indicator when comparing the pre-IHSS and IHSS programme period in the rural areas. There was a small but negative average annual rate of coverage change between 2003 and 2008, which improved to positive 4.2% average annual coverage change during the IHSS programme implementation period. It is plausible that the significant increase in early initiation of breastfeeding was related to the activities of promoting breastfeeding that were part of the IHSS programme.

5.2.3.4 Preventive Care

LLIN/ITN coverage in under-fives

The percentage of children under five reported sleeping under an LLIN/ ITN the previous night increased many fold over the relevant funding period. The average annual rate of coverage change in the rural population from 2008 to 2011 was an average of 3.8% per year (no sample size was available for 2007 to compare). While data for trend analysis was not available for ITN coverage, the increase from baseline (2007) to end line (2011) shows a large coverage increase of almost 30 percentage points both rurally and nationally (Figure 12). This increase is seen across provinces with Nampula province showing the greatest increase of 3% to 51% over the same time period. For national and provincial profiles refer to Appendix G.

There is very little difference between the point estimates for coverage comparing the richest to the poorest wealth quintiles from baseline (2007) through the programme funding period, showing equitable coverage of ITNs (Figure 13). Rates rose sharply in both quintiles, and the overlapping confidence intervals in 2011 indicate no statistical significant difference in coverage.

Provision and distribution of ITNs (along with IRS in relevant areas) formed a large part of Phase I IHSS programme initiatives with over 1 million ITNs procured and distributed to households with pregnant women and children under-five with IHSS funds. Furthermore, funding was utilised to promote

behaviour change and campaigns for net usage. It is plausible to attribute the observed coverage changes in part to IHSS funds, bearing in mind that other partners and donors contributed to the efforts to increase coverage.

Figure 12: Percent of children under five who slept under an insecticide treated net the previous night

Figure 13: Percent of children under five who slept under an insecticide treated net the previous night by richest and poorest wealth quintile
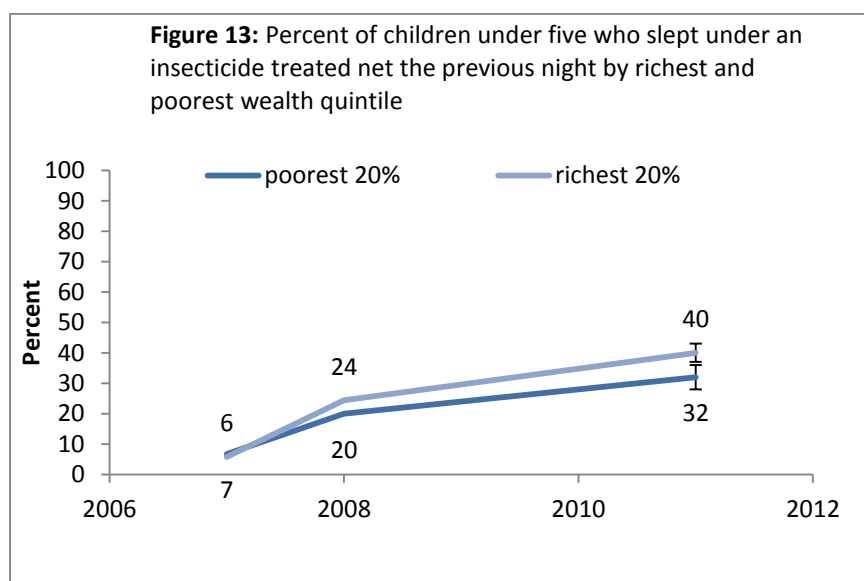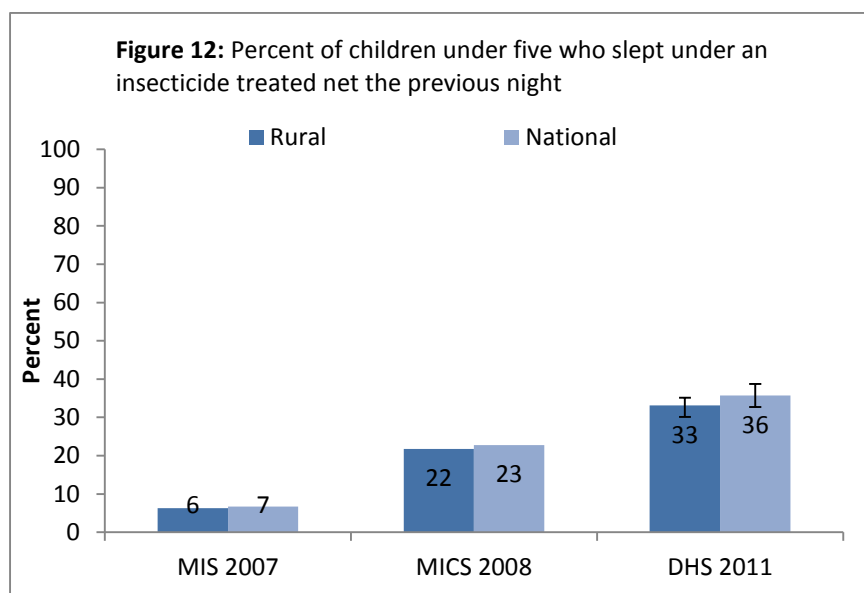
Vitamin A supplementation

Nationally, the proportion of children between the ages of 6 and 59 months receiving at least one dose of vitamin A supplementation in the past 6 months steadily increased from 50% in 2003 to 75% in 2011 (p<0.000). This shows a 50% increase. The biggest proportional change occurred between 2003 and 2008, thereafter only increasing three percentage points from 72% to 75% with overlapping confidence intervals indicating no statistically significant difference in coverage from 2008 to 2011. Coverage in the rural areas also increased significantly from 43% in 2003 to 65% in 2008; however, the confidence intervals for 2008 and 2011 overlap (Figure 14).

Figure 14: Percent of chidren aged 6-59 months who received at least one high-dose vitamin A supplement in the 6 months preceeding the survey

Rural** National**

DHS 2003 — 43, 50
MICS 2008 — 65, 67
DHS 2011 — 69, 73
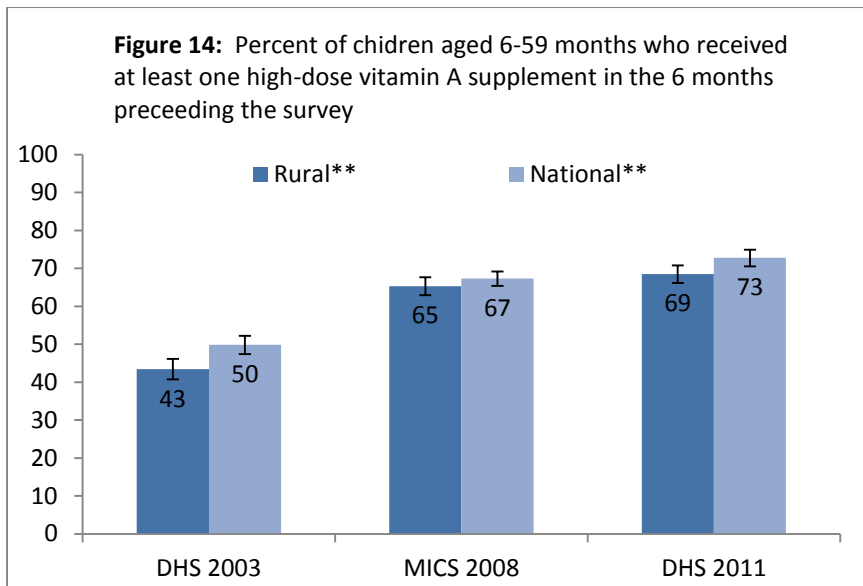
There was no visible change in the gap between the richest and the poorest wealth quintile though there was a statistically significant upward trend in coverage of the poorest (Figure 15). Vitamin A supplementation was included in the integrated package of services delivered during the NCHWs and RED campaigns. As the first biannual NCHW was held in March of 2008, and data was collected for the MICS in October/November of that year, the baseline data available to compare coverage comes from the 2003 DHS. Given this timing, it appears that the NCWH (through IHSS funding) contributed to the significant increase in vitamin A supplementation coverage and the greater equity observed between 2003 and 2008, as well as the coverage maintenance between 2008 and 2011.

Figure 15: Vitamin A coverage of children aged 6-59 months in the richest and poorest wealth quintiles

poorest 20% ** richest 20%

richest 20%: 70, 76, 89
poorest 20%: 39, 58, 64
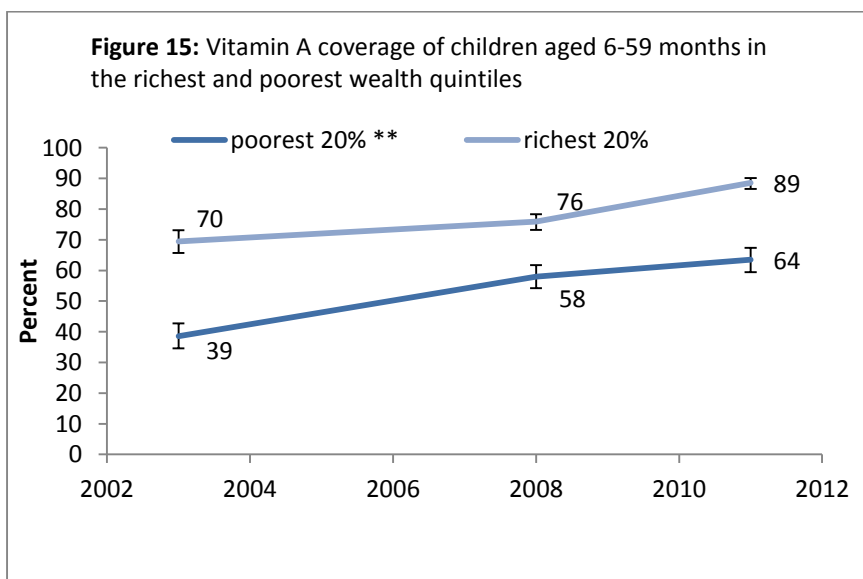
Measles and DPT3

DPT3 and measles vaccination coverage for children age 12-23 months increased significantly in the post-war period (1997- 2003) both nationally and at the rural level (Figures 16 and 17). No significant increase in DPT3 coverage occurred thereafter; note the overlapping confidence intervals for both national and rural estimates. Baseline coverage for measles coverage is taken as 2003 as this antigen was included in the first NCHW that started in March 2008, and therefore reflected in the 2008 MICS. While no statistically significant change in measles coverage can be seen between 2003 and 2008, measles coverage rates increase significantly from 2008 to 2011. This is also evident when examining the statistically significant higher average annual rate of coverage change for measles when comparing these two periods. This increase was not mirrored in the DPT3 coverage rates, which stayed the same. There was no difference in average annual rate of coverage change between national and rural estimates for either antigen. Rural and national immunisation trends for both antigens were highly significant from 1997 to 2011 (p=0.000) (Figures 16 and 17).

Figure 16: Percent of children aged 12-23 months who recieved DPT3 vaccine

Figure 17 : Percent of children aged 12-23 months who received measles vaccine
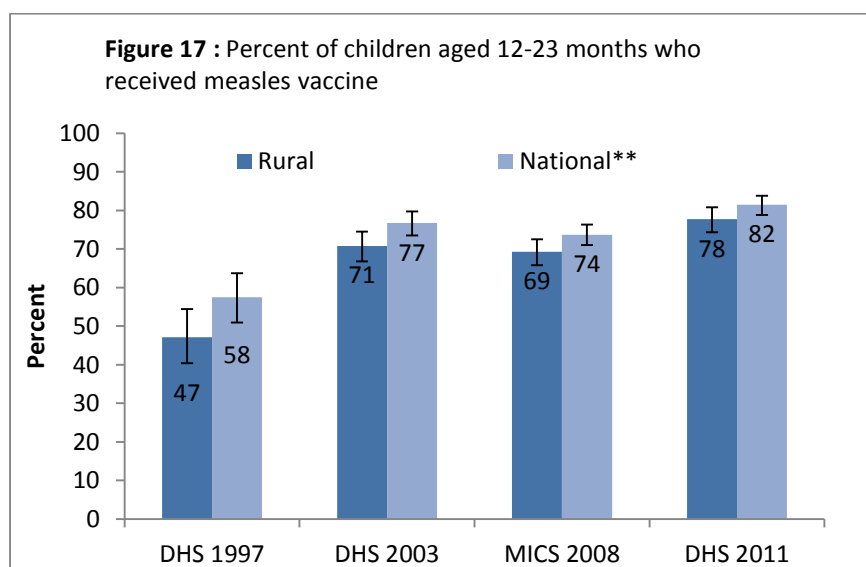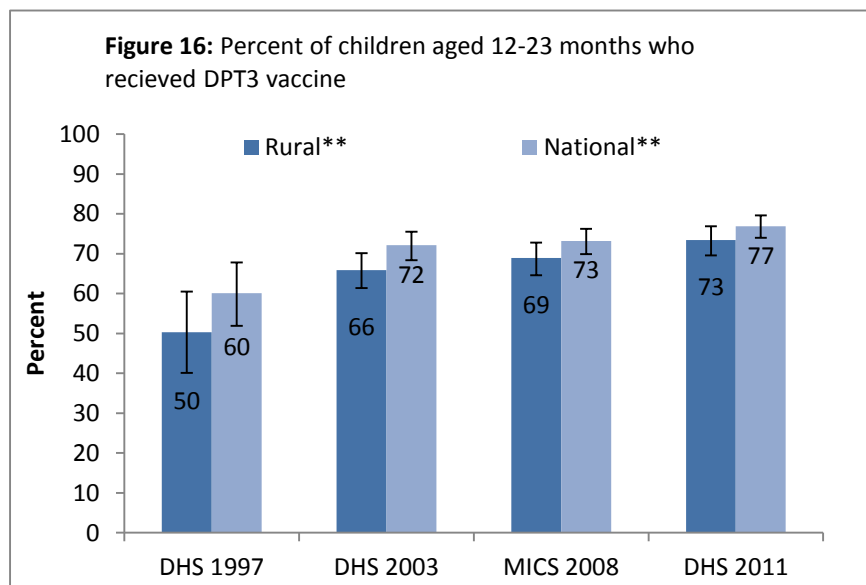
Accomplishments can be seen when comparing the richest and poorest quintiles. While the rich stayed the same achieving very high coverage across all years for both DPT3 and measles, a steady and highly significant (p<0.000) rise in coverage for both vaccines in the poorest quintiles is noted over time (Figure 18 and 19). The greatest gains in vaccination coverage in the poorest quintile for both antigens were seen in the immediate post-war period (1997- 2003) after which coverage rates for DPT3 were largely maintained; note the overlapping confidence intervals between 2003 and 2008, and 2008 and 2011. Measles coverage amongst the poorest did appear to accelerate from 2008 to 2011 indicating better access of these services by the poor during the majority of the programme implementation period. It appears that the gap between these quintiles is closing though there remains a significant difference in coverage when comparing the richest and poorest as the confidence intervals do not overlap between these two groups.

Figure 18: DPT3 coverage of children aged 12-23 months in the richest and poorest wealth quintiles

Figure 19: Measles vaccination coverage of children aged 12-23 months in the richest and poorest wealth quintiles
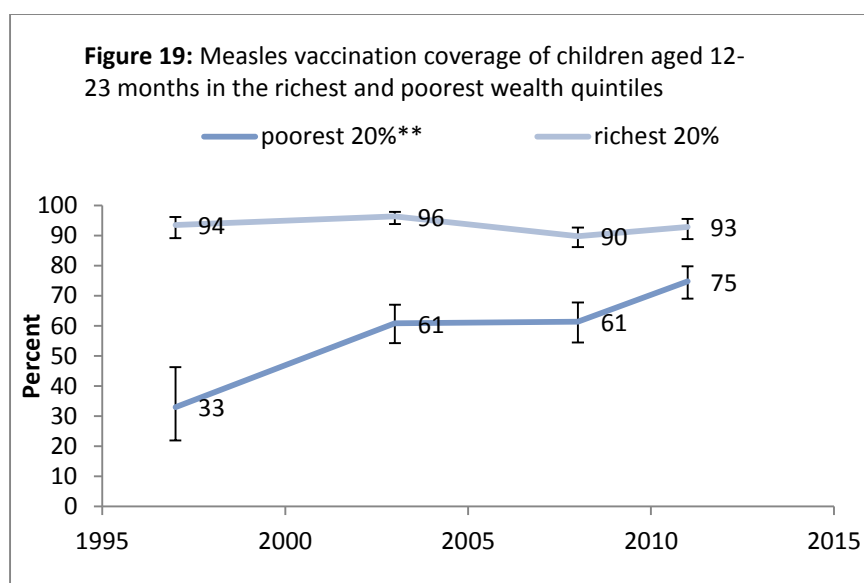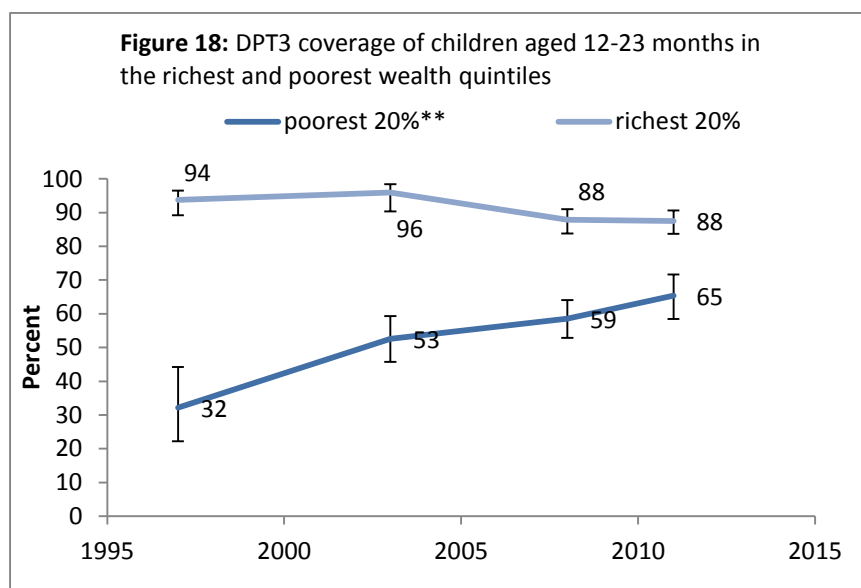
Significant resources were put into increasing access to routine childhood vaccinations throughout the first phase of the IHSS programme period in Mozambique through the National Child Health Week outreach campaigns and the RED strategy, and it is highly plausible that the IHSS programme could have contributed to the success in accelerating measles vaccination coverage and the maintenance of DPT3 coverage during the implementation period.

5.2.3.5 Curative care for malaria, pneumonia and diarrhoea

The end line survey (DHS) for this evaluation was conducted in the second half of 2011, the same period during which the first 8 districts with new APEs were initiated. This data, therefore, reflects the situation at the very start of the revitalized APE programme and iCCM. Towards the end of 2011, approximately 1050 new APEs had started their training. During this time there were approximately 1000 original APEs, nearly equivalent to the number of newly recruited APEs, spread across the country that had not yet been trained in iCCM. It is, therefore, not plausible to attribute changes in coverage of malaria, pneumonia, and diarrhoea in under-fives to the APE programme. Though not evident yet in the available data, it is expected that the revitalization of the programme will help to increase care seeking and treatment rates rurally and close the equity gap for these indicators. UNICEF has trained 2400 frontline health workers in IMCI and community IMNCI as part of the IHSS programme, which could have had some effect on these indicators.

Care seeking for suspected pneumonia

The proportion of children under five with symptoms of ARI that were taken to an appropriate provider increased significantly both nationally and rurally between 1997 and 2003 (Figure 20) but then stagnated between 2003 and 2008 in the pre-IHSS period. Thereafter, the proportion dropped significantly in both national and rural populations.

Figure 20: Percent of children under five with suspected pneumonia taken to an appropriate health provider
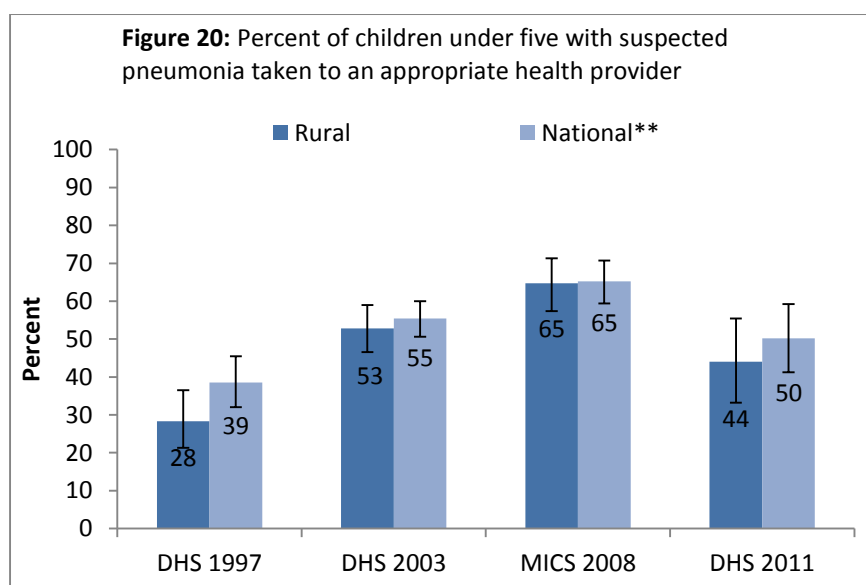
Prior to the IHSS programme (1997- 2003), available data shows marginal but significant difference between care seeking for suspected pneumonia when comparing the richest and poorest quintiles. There appears to be an increase in equity for care seeking starting at baseline (2008) but continuing

through the funding period of the programme with overlapping but wide confidence intervals. The reasons for wider confidence intervals in suspected pneumonia in 2011 is probably due to a smaller sample sizes, due to the definition change for suspected ARI (Figure 21). It is, therefore, difficult to make conclusions regarding significant change in this indicator during the IHSS programme period. The validity of data collected on antibiotic treatment for suspected pneumonia in household surveys has been questioned,[25] and this data is only included in Appendix G.

Figure 21: Care seeking for children under five 5 with suspected pneumonia in the richest and poorest wealth quintile
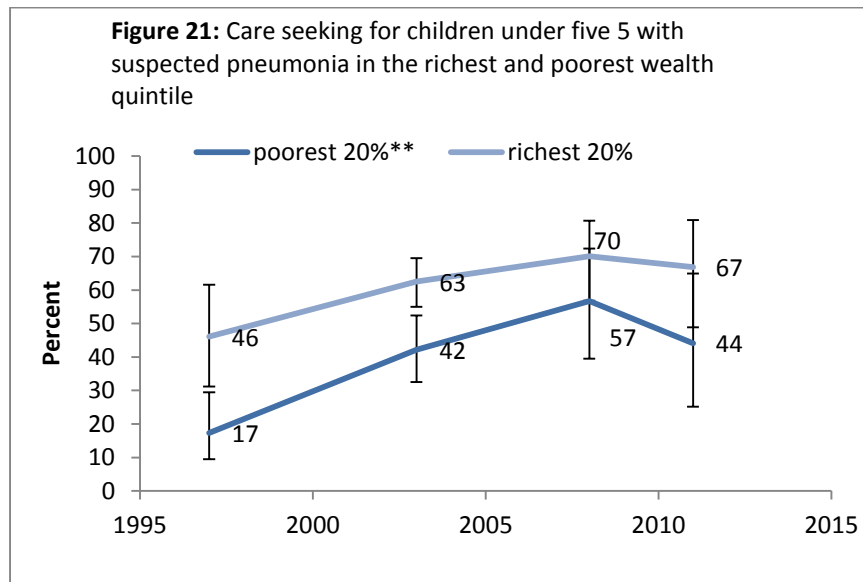
Care seeking and treatment of children with suspected malaria

The proportion of children under five with fever in the past two weeks whose mothers sought care from an appropriate provider increased over the 13-year time span of the surveys, both nationally and rurally (p<0.000) (Figure 22). No data for careseeking for fever was available for 2008. The greatest increase in care seeking occurred between 1997 and 2003 but there was no statistically significant change between 2003 and 2011 as evidenced by overlapping confidence intervals for both rural and national populations indicating that rates were maintained over this time period. Therefore, it appears that careseeking for both fever and suspected pneumonia remained stagnant over the time period 2003-2011.

There is a positive trend in seeking for fever in the poorest wealth quintile (p<0.000) (Figure 23) rising from 12% in 1997 to 48% in 2011; however, rates stagnated between 2003 and 2011 in both quintiles. The gap between rich and poor remained statistically significant over time.

Figure 22: Percent of children under five with fever taken to an appropriate health provider
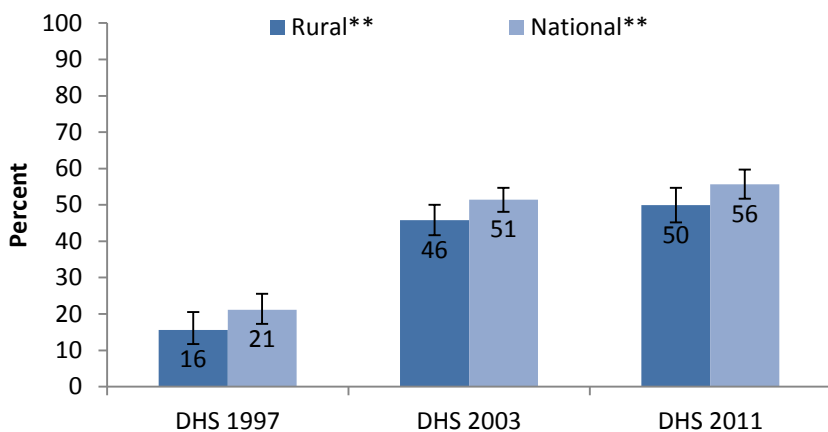
Figure 23: Care seeking for children under five with fever in the richest and poorest wealth quintiles
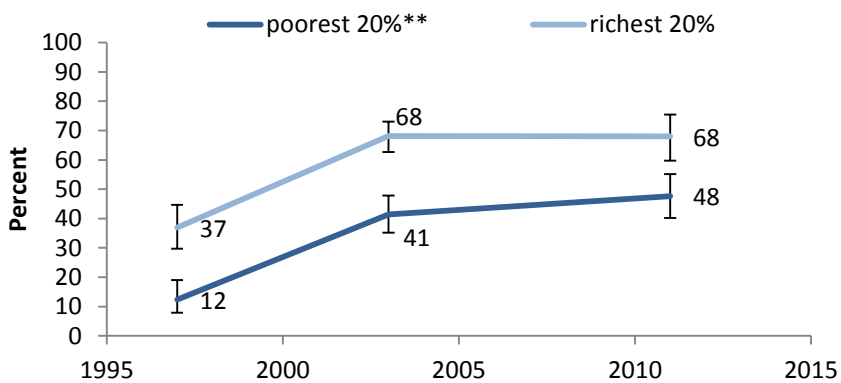
Figure 24: Percent of children under five with fever in the last two weeks treated with any antimalarial
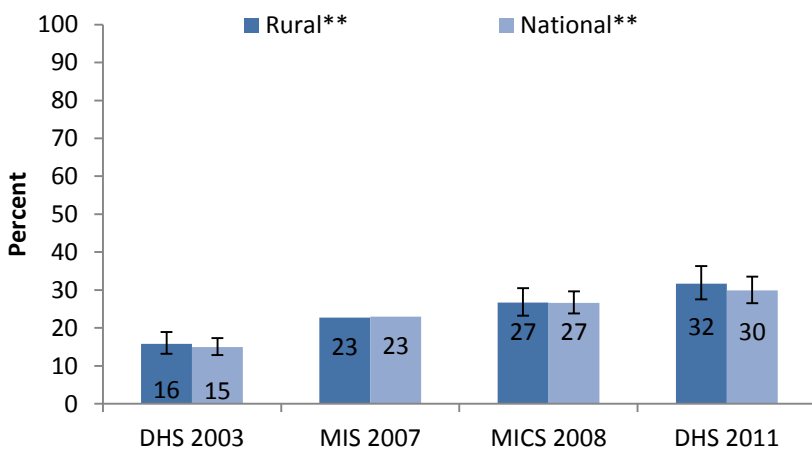
The proportion of children with suspected malaria that received treatment with any antimalarial increased steadily from 15% in 2003 to 30% in 2011 nationally (p<0.000) (Figure 24). There was a similar pattern seen in coverage of the rural population with 16% in 2003 to a twofold increase of 32% in 2011 (p<0.000) (Figure 25). There is no statistical difference (in either rural or national rates) when comparing the proportion (with overlapping CIs) or average annual rate of coverage change between 2008 and 2011, indicating that pre-IHSS programme gains in coverage were maintained during this period.

Though ACT for the treatment of malaria was adopted in 2004, the cost of ACTs remained a concern and its use was not scaled up until the introduction of rapid diagnostic tests that permitted accurate diagnosis of malaria in 2010. Data on treatment for malaria in children under five with ACTs is only reported starting in the 2008 MICS. National rates are negligible at 2% in 2008 but show an increase to 15% in 2011. Increased coverage can be seen across provinces, except for Maputo, which reported no usage. Nampula, Sofala and Niassa report the highest usage of ACT at 26%- 33% in 2011 (see Appendix G).

When comparing treatment between richest and poorest quintiles with antimalarials, there are very similar coverage rates from 2003 to 2008 but in 2011 this splits with increased coverage among the poor and decreased among the rich. One possible explanation for this is that RDTs would have been introduced and perhaps more available to the richer population, and so those who have fever in the richest population are being tested and a smaller proportion are being treated for confirmed malaria. Whereas in the poorer population, it is likely that those with fever do not get the test and, therefore, a higher proportion will be given treatment but not all of them would have needed it (Figure 25). Statistically, there does not appear to be a significant increase in treatment in either quintile between 2008 and 2011, though a larger sample size would enable better estimation of this.

Figure 25: Treatment with any antimalarial amongst children under five with fever in richest and poorest wealth quintiles
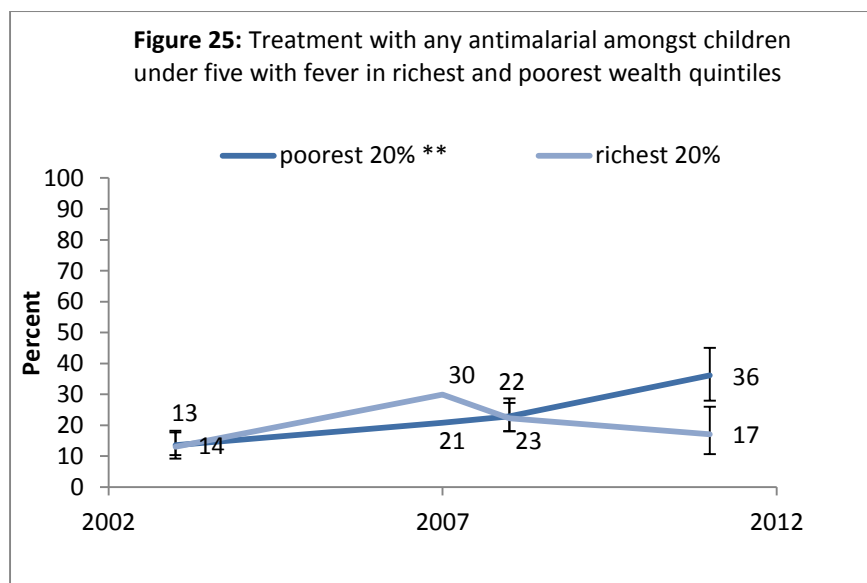
Treatment of diarrhoea with ORS

While the national trend for ORS use for diarrhoea was not significant over the examined 13-year time span (Figure 18), the rural trend for ORS coverage was highly significant (p<0.000) (Figure 26). The average annual rate of coverage change for ORS in rural populations in the IHSS period significantly increased to 4.3% per year, up from a negative rate of -0.86% in the period preceding the programme. Importantly, ORS usage showed a statistically significant decline, both nationally and in rural populations, in the pre-IHSS period (2003- 2008) that was reversed after the start of the IHSS programme. There is no statistically significant difference between national and rural coverage rates.

The change in ORS coverage for the poorest is positive for trend when looking at the 13 year time span (1997- 2011) (p<0.000) (Figure 27). Difference in coverage between the richest and poorest populations for ORS narrowed between 1997 and 2008 with the equity gap rendered insignificant between these two groups at the baseline of the programme (2008). Thereafter, rates in the richest quintile increased significantly while rates in the poorest quintile were maintained without significant change. Attribution of the IHSS programme to the increase in ORS coverage is difficult to ascertain, as iCCM had not been rolled out by the time end line data had been collected. ORS coverage would mostly have occurred at facility level and, therefore, plausible attribution would stem from training of frontline staff in IMCI.

Figure 26: Percent of children under five with diarrhoea treated with ORS

Figure 27: Use of ORS for children under five with diarrhoea in the richest and poorest wealth quintiles
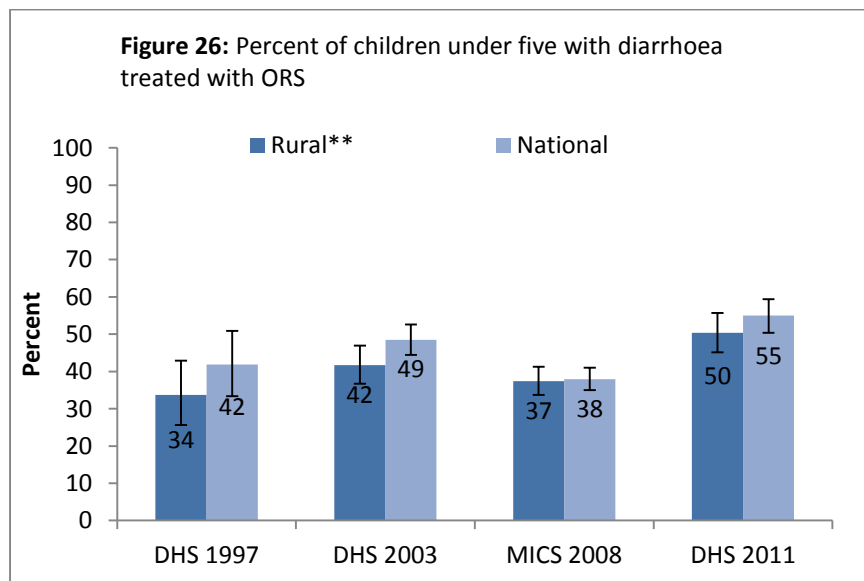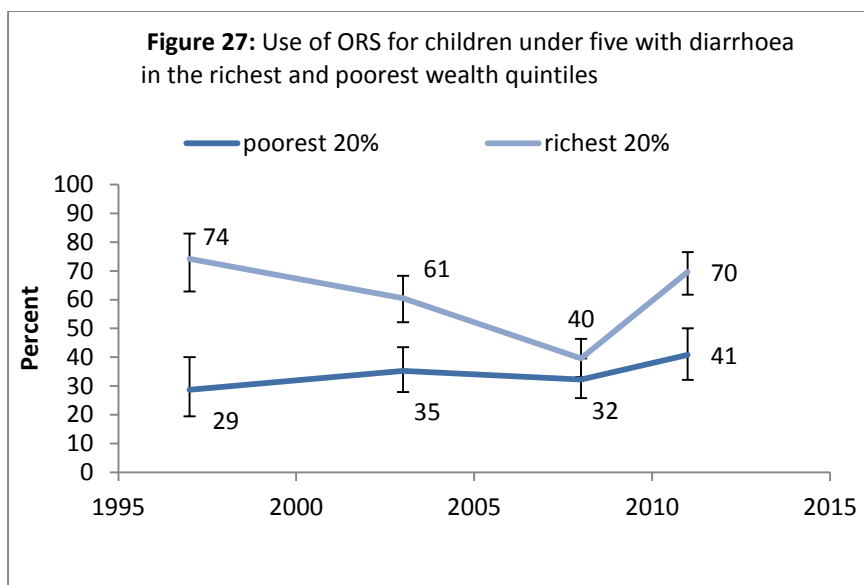
5.2.3.6 Care seeking for fever, suspected pneumonia and diarrhoea by provider

In 2003, 37% of children with fever, ARI, or diarrhoea from the poorest quintile sought care from a public facility. Eleven percent (11%) sought care from 'other' sources of care (private pharmacy, drug vendor/store, shop, traditional healer, other) and half were not taken to any provider for care. In comparison, in the richest quintile, in which over half sought care from a public facility, only 5% reported seeking care from 'other' sources, and 36% sought no care at all. In 2003, no care was sought from an APE across the poorest and richest wealth quintiles, or amongst the rural population, which is reflective of the fact that the revitalisation of the programme had not yet begun, and no community case management training had started.

By 2011, there is a shift towards care seeking in the poorest wealth quintile with a rise in the proportion seeking care in public facilities (45%) and 6% reporting seeking care from a community health worker (note the 'arrow' in Figure 28). In the richest quintiles, there is very little change in care seeking between 2003 and 2011. When looking at the rural population alone, the percentage of those who sought care for their children from 'other' providers decreased from 10% to 3% and 4% (note the 'arrow' in Figure 28) reported seeking care from a community health worker.

Figure 28: Care seeking by provider: Rural residence, 2003-2011
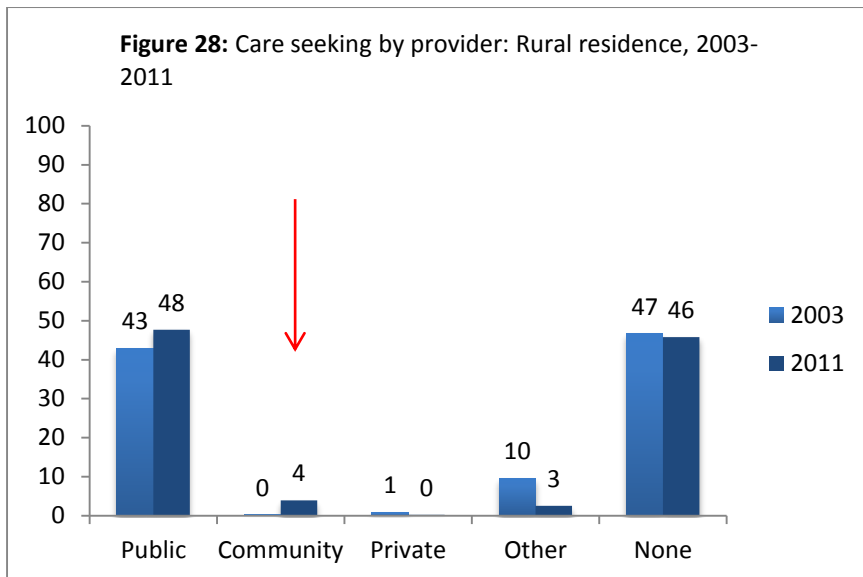
Of those who sought care from appropriate providers, there was also an increase in the proportion of those who saw a community health worker (Figures 29, 30a and 30b).

In spite of the fact that the 2011 DHS was carried out in the earliest months of the new APE programme that was only covering 8 districts (5% of total districts), a shift towards APEs for first level care of iCCM illness can be seen. The IHSS funding was cited by many key informants to be catalytic in the revitalization of the APE programme, thus these early gains can be plausibly attributed to the IHSS programme.

Figure 29: Care seeking by appropriate provider in poorest/ richest quintiles: 2003- 2011
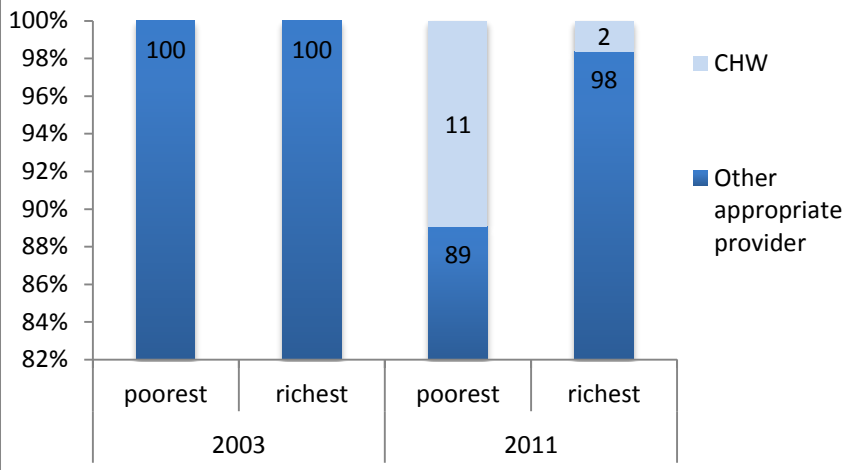
Figure 30a: Care seeking by appropriate provider in 2003 for rural residents
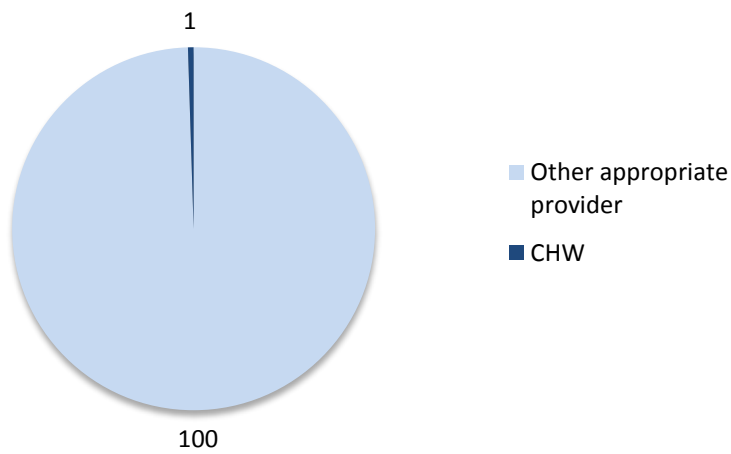
Figure 30b: Care seeking by appropriate provider in 2011 for rural residents
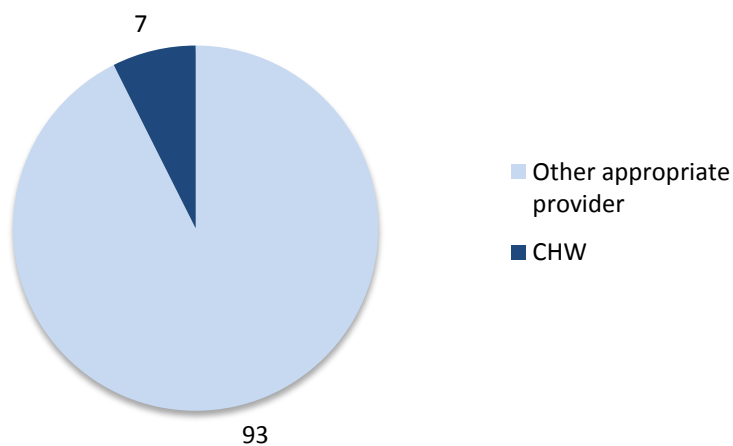
5.2.3.7 Additional maternal and child health indicators not included in the statistical trend analysis

These indicators were not directly targeted by the IHSS programme but are included here to give a complete picture of the state of maternal and child health services in the country over the period of IHSS programme implementation. Figures for these indicators can be found in Appendix G.

Antenatal care

ANC visits

There is a steady rise in the estimated proportion of pregnant women attending at least one antenatal care visit between 1997 and 2008, rising from 65% to 92%. However, this trajectory did not continue into Phase I of the IHSS programme, with rates maintained at 90% in 2011. A similar pattern can be seen in the proportion of women who received at least 4 or more ANC visits, starting at 37% in 1997 and peaking at a reported 56% in 2007, with a reported rate of 51% in 2011. This is mirrored across provinces.

Childbirth

Skilled attendance at birth

National skilled birth attendance rates rise 10 percentage points from 44% in 1997 to 54% in 2011. Again, no increase can be seen by 2011. Predictably, the highest skilled birth attendance rates were seen in the capital Maputo City at 91% in 2011, with the lowers rates reported in Zambezia at 26% in the same year. Nampula province steadily rose from 29% in 1997 to align itself with the national average of 55% in 2011, peaking in 2008 at 63%.

Nutrition indicators

Complementary feeding

Nationally, the proportion of children between the ages of 6 and 8 months who were breastfed and received complementary foods decreased from 83% in 1997 to 70% in 2011. Decreases in point estimates were seen across all provinces.

Stunting and underweight

Nationally, the proportion of children under five who are underweight for age has decreased from 24% to 15% from 1997 to 2011. Rates for stunting and severe stunting, however, have remained relatively constant nationally at above 40% and across provinces, with the exception of Niassa province which showed the biggest decline of 13 percentage points (60% to 47%) between 1997 and 2003, predating the IHSS programme years. Thereafter, stunting rates in this province remained at 47% up to 2011. Conversely, stunting rates in Nampula had increased 10 percentage points (45% to 55%) between 1997 and 2011. This steady increase in point prevalence of stunting rates can also be seen in Inhambane province over the survey years.

5.3   Impact

5.3.1   Change in child mortality

In 2012, approximately 84,000 children under the age of five years died in Mozambique according to UN estimates. Mozambique has made remarkable progress in reducing the under-five mortality rate (U5MR) and is nearly on track to meet the target for Millennium Development Goal 4 for child survival. According to UN estimates, under-five mortality has reduced 61% from 233 deaths per 1000 live births in 1990 to 90 deaths per 1000 live births in 2012 (Figure 31).

Figure 31: Millennium Development Goal progress
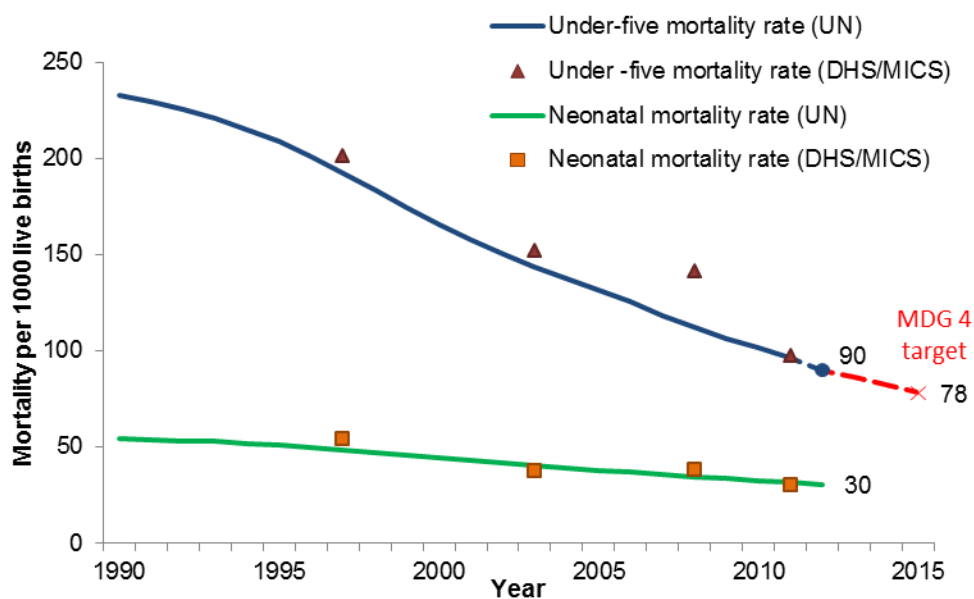
Data sources: IGME 2013 mortality estimates (www.childmortality.org), 1997, 2003, and 2011 Mozambique DHS; 2008 Mozambique MICS.

The average rate of reduction is 4.3% per year, higher than the regional average (2.7% per year), according to UN estimates.[16] National survey data reported U5MR at 201 deaths per 1000 in 1997, 141 per 1000 in 2008, and 97 per 1000 for 2011, which is an average reduction of 5.2% per year between 1997 and 2011. Mortality rates varied greatly across provinces with the highest U5MR in Zambézia (142 deaths per 1000 live births) and the lowest in Inhambane (67 deaths per 1000 live births). Nampula had greatest annual rate of reduction at 11.1% per year and Zambézia the slowest at 1.8% per year (Figure 32).

Figure 32: Under-five mortality rates for provinces and country since 1997
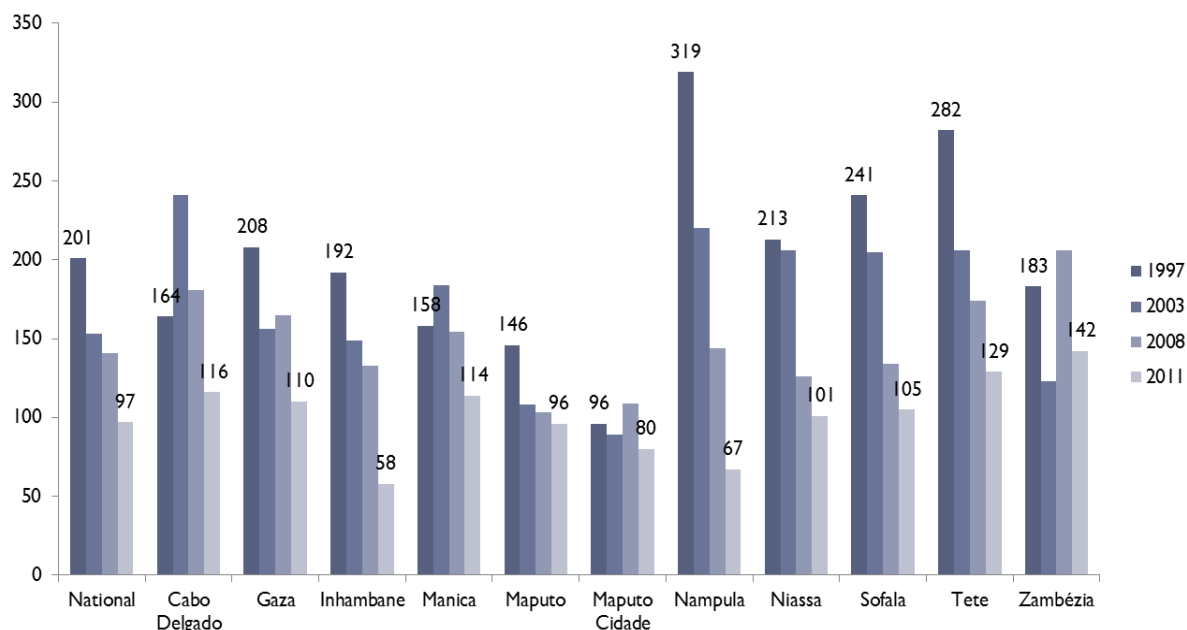
Data source: 1997, 2000, and 2011 Mozambique DHS; 2008 Mozambique MICS. Note: National U5MR for the 5- year period preceding the survey and regional U5MR for the 10-year period preceding the survey

A third (34%) of child deaths occur in the first month of life, and this is an increasing proportion from 23% in 1990. The neonatal mortality rate (NMR) is reducing slower than U5MR at only 2.7% per year since 1990, according to UN estimates. National survey data reports greater progress for NMR at 4.2% per year with an NMR of 54 in 1997 and 30 in 2011.

The main causes of under-five deaths in Mozambique are: malaria (19%), pneumonia (11%), AIDS (10%), complications from prematurity (10%), diarrhoea (10%), and intrapartum-related (birth asphyxia) and severe neonatal infection (both at 9%) (Figure 33).[7] Between 2000 and 2010, the proportion of deaths from malaria has decreased from 23% to 19%. The proportion of deaths from pneumonia and diarrhoea has also declined slightly (Figure 34). Child deaths from measles reduced from 6% to 1% between 2005 and 2010. Mozambique has a high rate of preterm births with 16 babies born too soon out of every 100 births.[26]

Figure 33: Causes of mortality 2010
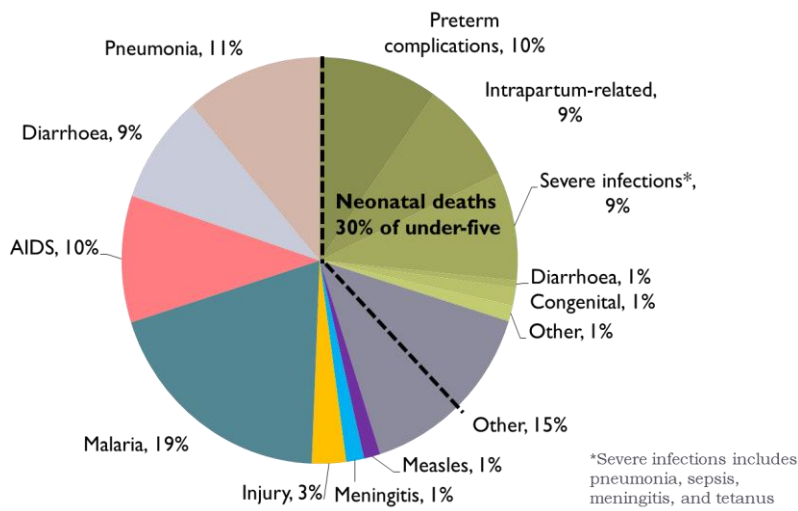
Figure 34: Trend from 2000 to 2010 in causes of mortality
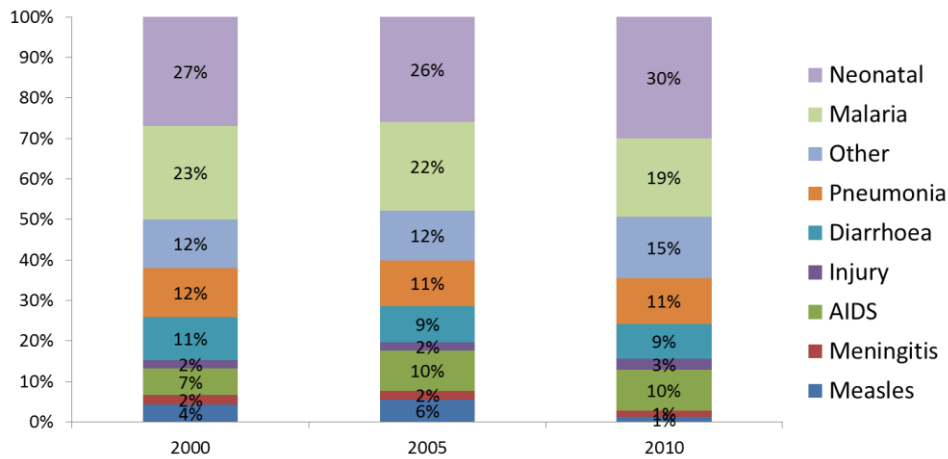
Data source: Liu et al, Lancet 2012.[7]

5.3.2 Lives saved results

This section documents the extent to which changes in child mortality could be attributed to increases in intervention coverage by presenting the number of child lives saved by intervention considering three phases: pre-IHSS programme implementation, Phase I and Phase II of IHSS programme implementation. The results from the LiST analyses are presented by time period: 2000-2007 (pre-IHSS), 2007-2010 (Phase I of IHSS), and 2010-2013 (scenario for Phase II with iCCM interventions increasing 15 percentage points, other IHSS interventions increasing 5 percentage points, and all other interventions holding constant from 2011 DHS).

Pre-IHSS programme implementation (2000-2007)

Prior to the start of the IHSS programme implementation, changes in intervention coverage accounted for 12% of deaths averted in 2007. According to the modelled results, approximately 99,100 deaths of children under five were averted between 2000 and 2007 before the implementation of the IHSS programme in Mozambique with a predicted average annual rate change in under-five mortality of -1.0% per year (Table 6). Since these numbers are annually calculated based on deaths averted as compared to the baseline mortality rate, the cumulative number should be interpreted with caution. According to survey mortality data between 1997 and 2008, the average annual rate change in under-five mortality was -4.2% per year indicating that the model could not account for child mortality reductions and other factors played a role in the decline of mortality. In 2007, over one-third of deaths were averted with reductions in wasting (4,600 [19%]) and stunting (3,500 [14%]) reflecting possible changes in population-level risk factors (i.e., food availability, household food security, agricultural productivity, roads and market access, WASH interventions). Care seeking for suspected pneumonia nearly doubled in coverage over this time and resulted in averting 2900 child deaths (12%) in 2007. Improvement in care at the time of birth, including labour and delivery, antenatal corticosteroids, neonatal resuscitation, among others, together accounted for a quarter of deaths averted (Figure 35). The results that vitamin A supplementation averted 6% of deaths, or more than 1450 lives saved in 2007, are perhaps a results of early IHSS programme efforts to increase this intervention through Child Health Weeks in 2008 .

Table 6: Results from Lives Saved analysis for Mozambique pre-IHSS

Pre IHSS	2001	2002	2003	2004	2005	2006	2007	Cumulative deaths prevented
Proportion of under-five deaths averted	2%	4%	6%	6%	9%	10%	12%	
Additional under-five deaths prevented per year	3,700	7,400	11,600	12,900	18,600	20,900	24,000	99,100
Predicted under-five mortality rate	207	205	203	202	199	198	196	
Annual under-five mortality rate change	-1.1	-1.0	-1.3	0.2	-2.0	-0.6	-1.1	*Average -1.0*

Phase I (from 2007: start of the IHSS programme up to 2010: beginning of iCCM implementation)

For the Phase I analysis with the implementation of the IHSS programme from 2007, baseline mortality for children under five of 141 per 1,000 live births (from MICS 2008) was used. The LiST model predicted a higher mortality, 129 per 1000 live births in 2010, than the national household survey, DHS 2011, that reported mortality at 97 [CI 89, 104]. When comparing average annual rate of change in under-five mortality between 2008 and 2011, national household survey data showed a much faster rate of decline (-11.8% per year) as opposed to the LiST model (-3.1% per year). The modelled results indicate that approximately 20500 deaths of children under five were averted between 2007 and 2010 (9% of deaths in 2010) (Table 7). Since these numbers are annually calculated based on deaths averted as compared to the baseline mortality rate, the cumulative number should be interpreted with caution. Across each year, IHSS programme-focus interventions came across as leading interventions averting the greatest proportion of deaths indicating the scale up of these interventions has potential to save lives (cumulatively 16,100 deaths averted or 82% of total). Given the model applies national mortality and coverage estimates, these deaths averted cannot be attribute solely to the IHSS programme. In 2010, the scale up of ownership of insecticide treated nets (ITNs) prevented almost a quarter of deaths (2,700 lives saved [24%]) (Figure 35). Hib vaccine also prevented more than one in four deaths (3,000 [27%]). ORS for diarrhoea and malaria treatment (ACTs) together saved a quarter of child lives (1,200 [11%] and 1,600 [14%)], respectively). Decreases in rates of care seeking for pneumonia resulted in approximately 1,400 *additional* deaths in 2010 compared to 2007.

Table 7: Results from Lives Saved analysis for Mozambique Phase I

PHASE I	2008	2009	2010	Cumulative deaths prevented
Proportion of under five deaths averted	1%	7%	9%	-
Additional under-five deaths prevented per year	1,100	8,300	11,100	20,500
Predicted under-five mortality rate	140	132	129	-
Annual under-five mortality rate change	-1.1	-5.7	-2.4	*Average -3.1*
Number (%) of deaths averted due to interventions to which the IHSS contributed^	700 (65%)	6,700 (80%)	9,500 (85%)	16,100 (82%)

^As per page 5 of Schedule A of the Grant Agreement and the tailored Mozambique programme implementation, in this context "IHSS interventions" in LiST are assumed to include maternal tetanus vaccination; exclusive breastfeeding; complementary feeding; ITN use and IPT in pregnancy; DPT Hib and measles vaccines; vitamin A supplementation; vitamin A for measles treatment (vitamin A supplementation used as proxy for coverage); ACTs for malaria; ORS for diarrhoea; zinc for diarrhoea; and case management of pneumonia (care-seeking used as proxy for coverage). PMTCT interventions are not included in this result.

This result considers the deaths averted due to the overall coverage change in these interventions which is a reflection of multi-factorial inputs within the health system and otherwise, not just those of the IHSS programme. Additionally, this LiST analysis does not reveal the implementation strength of IHSS in relation to specific interventions, nor does it assign weights to different levels of service provision (e.g. community).

Phase II (from 2010: start of iCCM to 2013)

For Phase II with the implementation of iCCM through the revitalisation of the APE programme, a scenario approach was applied to generate estimates of lives saved to account for the lack of endline coverage data with a 15 percentage point increase in iCCM interventions and 5 percentage point increase in other IHSS interventions assumed. Under-five baseline mortality of 97 per 1000 live births in 2010 (data from DHS 2011) was assumed. Applying these assumptions, the LiST model predicted a mortality of 89 per 1000 live births – saving approximately 19,000 lives of children under five between 2011 and 2013 (12% deaths averted in 2013) (Table 8). The estimated increases in malaria treatment (ACTs), care-seeking for pneumonia, and ORS and zinc for diarrhoea accounted for an estimated 5,900 lives saved in 2013 (47% deaths averted in 2013) (Figure 35). The proportion of deaths averted due to IHSS programme interventions is not provided in these results given the scenario applied.

Table 8: Results from Lives Saved analysis for Mozambique Phase II scenario

Phase II	2011	2012	2013	Cumulative deaths prevented
Proportion of under-five deaths averted	2%	7%	12%	-
Additional under-five deaths prevented per year	1,500	6,500	11,100	19,000
Predicted under-five mortality rate	99	94	89	-
Annual under-five mortality rate change	-1.5	-5.5	-5.4	*Average -4.1*

Figure 35: Proportions of deaths averted by intervention for Mozambique
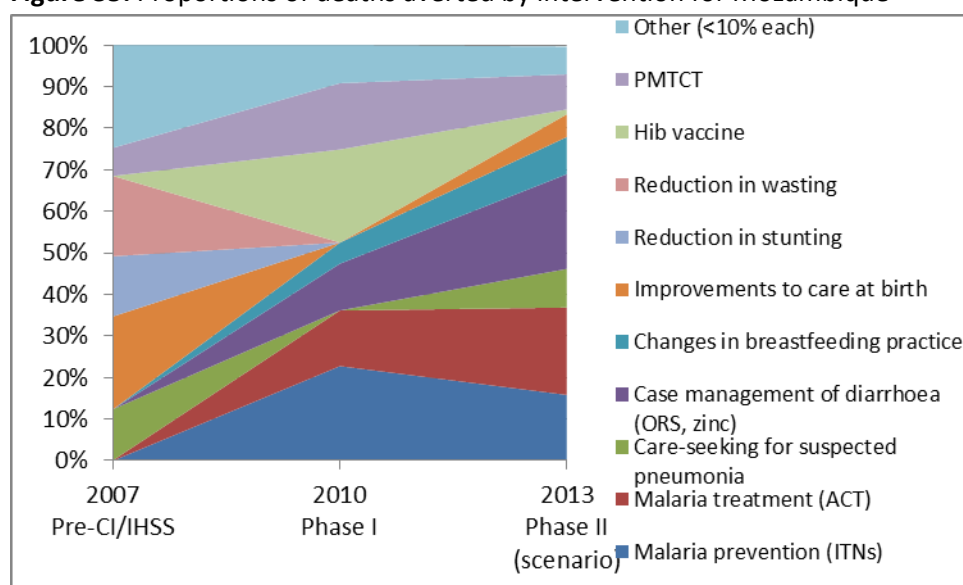
Note: Improvements to care at birth include: labour and delivery management, antenatal corticosteroids for preterm labour, neonatal resuscitation, and clean birth practices. WASH indicators are included in "other" since these interventions all resulted in less than 10% deaths averted.

The comparison in reductions in under-five mortality in the pre-IHSS Phase and Phase I and Phase II must consider that there were fewer potential additional lives to save over time. Reductions in stunting and wasting accounted for a large proportion of lives saved before the start of the IHSS programme and are a result of changes in population-level risk factors. With increased focus on the IHSS interventions in 2008 and coverage gains experienced, it is plausible that a proportion of the lives saved presented are from the IHSS programme. In Phase I, the increases in lives saved from malaria prevention and treatment, case management of diarrhoea, and PMTCT, and promotion of breastfeeding could partly reflect the start of the IHSS programme in 2008 and other similar programmes. The scenario approach applied for Phase II aims to reflect what possible changes in coverage may have occurred given the programme scale up. However, results should be interpreted with caution since they are not based on any data provided from national sources.

5.4   Sustainability

5.4.1   Costing

The costing analysis focuses on the implementation of iCCM for children under five and specifically the curative interventions by APEs for malaria, diarrhoea and pneumonia. Results reflect **additional costs** incurred by the introduction of iCCM for children under five in order to answer the following questions:

- What is the additional cost per treatment for each of the 3 conditions?
- What is the cost of increased utilisation?
- What is the financial sustainability of iCCM?

Thus, this costing exercise does not reflect the actual expenditure on iCCM (although unit costs were extracted from programme expenditure data). It reflects expected costs if the programme is implemented according to protocol: a normative approach which determines the cost of treatments as per the clinical protocol, and the costs of support services (supervision etc.) as per the prescribed plans, e.g., it assumes that quarterly supervision takes place as required. Detailed costing tables are included in Appendix D.

5.4.1.1 Current cost per treatment

This costing analysis is limited to the DFATD support for the 905 APEs trained in iCCM in 2012. These APEs were deployed in the districts covered by the IHSS programme. Thus, the costing analysis does not include other organisations funded by DFATD nor does it include the contribution of other sources of funding support to iCCM in districts other than those in which UNICEF worked.

APEs are engaged in health promotion and prevention activities as well as offering curative services to children under five, older children, and adults. According to policy, APEs should spend 80% of their time on promotion/prevention and 20% on curative activities. However from the evaluation team's interviews with a range of stakeholders it appears that APEs spend the largest part of their time on curative activities. In the absence of specific quantification on the share of time between activities, it was assumed that 2/3 of time (66%) is spent on curative services. In 2012-2013, an average of 142 iCCM treatments per APE per year was reported. Of these 70% (99 treatments) were delivered to children under five. Overall, iCCM for children under five accounts for 46% (66% x 70%) of APEs

activities and costs (excluding training). At the current level of utilisation, APEs spent on average 2.6 hours per week on iCCM under five activities. This calculation combines time spent on home visits, meetings, kit replenishment, and travel. Additional annualised fixed costs per APE stand at $751.77. Management and supervision accounts for 38% and APE subsidy for 29% (the total subsidy per APE is $40 a month or$480 a year). Translated into cost per treatment, fixed costs per treatment amount to $7.56 (Table 9).

Table 9: Additional annualised fixed costs per APE for iCCM for under-fives

Additional Annualised Fixed Cost by APE for iCCM for under-fives in $	Fixed Cost/APE/Year CCM for under-fives	Share of costs	# MDP treatments for under-fives /year per APE	Fixed Cost per Treatment
Training	133.73	17.8%		
Subsidy	221.76	29.5%		
Equipment	74.67	9.9%		
Management & Supervision	285.81	38.0%		
Other Overheads 5%	35.80	4.8%		
Total Additional fixed cost	751.77	100.0%	99.40	7.56

MDP=Malaria, Diarrhoea, Pneumonia

The total cost of a malaria treatment, including RDT and drugs, as per protocol, is $9.04 ($1.48 for drugs and RDT tests). Diarrhoea treatment with ORS and zinc costs $7.86 ($0.30 for drugs), and pneumonia treatment $7.89 ($0.33 for drugs). The cost driver is fixed costs per treatment accounting for 84% of malaria treatment costs, and 96% for diarrhoea and pneumonia. Given the relative share of these conditions the average drug cost per treatment is $0.77 or 9% of the total cost per treatment (Table 10).

Table 10: Cost per treatment

Medicine & Diagnostic test / Treatment	Medicine & Diagnostic test	% Treatments
Malaria, incl RDT	1.48	40%
Diarrhea	0.30	29%
Pneumonia	0.33	31%
Average cost per Treatment	0.77	100%

Cost per treatment 2012-13 $	Fixed Cost	Drug/ Diagnostic	Total	% Fixed Cost
Malaria, incl RDT	7.56	1.48	9.04	84%
Diarrhea	7.56	0.30	7.86	96%
Pneumonia	7.56	0.33	7.89	96%
Average cost per Treatment	7.56	0.77	8.34	91%

Fixed costs per APE are incurred independently of the number of treatments per APE. Since fixed costs per APE are divided by the number of treatments to establish fixed cost per treatment, the smaller the number of treatments per APE per year, the higher the fixed cost per treatment will be, and the higher the number of treatments the smaller the fixed cost per treatment will be. This raises the issue of the time feasibility and cost impact of increasing the number of treatments for children under five per APE.

5.4.1.2 Scenarios for increased iCCM service utilisation

Two scenarios were modeled: (1) 15% increase in the number of treatments for under-fives and (2) 30% increase in treatments.

If the number of treatments per APE per year increases by 15%, the time spent by an APE on iCCM for under-fives would increase from the current 2.6 hours a week to 2.9 hours a week, and to 3.2 hours for a 30% increase in treatments. The marginal increase in required time is due to the fact that there would be no increase in the length of meetings and time required to collect new kits.

Costs do not increase in the same proportion as activity, due to the share of fixed costs. With an additional 15% in treatments per existing APE, the fixed costs per treatment would decrease from $7.56 to $6.58 and to $5.82 for a 30% increase in treatments (Table 11).

Table 11: Cost impact of increased treatments per APE

Increased Efficiency by APE	By APE for Under 5s		
	2012	With 15% increase in treatmts / APE	With 30% increase in treatmts / APE
Number Treatments Under 5 / Year / APE	99	114	129
Hours on CCM program / Week	2.6	2.9	3.2
Fixed Cost per Treatment	7.56	6.58	5.82
Average Drug/Test cost per Treatment	0.77	0.77	0.77
Total Cost per Treatment	8.34	7.35	6.59

The cost of the iCCM activities for under-fives by the 905 APEs stands at $357,116 for the current level of activity, at $367,563 with 15% increase in treatments and at $378,010 for a 30% increase (Table 12).

Recognizing that implementation of iCCM requires strengthening of supporting structures, an additional 15% is added to the iCCM for under-fives annualised costs. This 15% is likely to be higher at the beginning of implementation in new districts but reduces drastically over the years. This value is based on estimated costs of health system strengthening inputs but will vary over time and between regions depending on the existing capacity before introduction of iCCM and on the maturity of iCCM implementation. This scenario is called iCCM+ for under-fives.

Table 12: Total Cost for iCCM for under-fives and iCCM+ for under-fives

	2012	With 15% increase in treatmts / APE	With 30% increase in treatmts / APE
CCM<5			
Number APEs	905	905	905
Total cost per Year $	749 999	760 446	770 894
CCM+ <5			
Number APEs	905	905	905
Total cost per Year $	862 499	874 513	886 528

5.4.1.3 Financial Sustainability

Financial sustainability of the programme is assessed a) for the iCCM under-fives component only, and b) for the APE programme recognizing that iCCM could not take place if the APE programme was not in place. In addition projections are made for an extension of the programme to new areas according to the target defined for 2015.

a) iCCM for under-fives

Additional expenditure on iCCM for under-fives for 2012 was compared to the total annual public health expenditure (government and donors), and to the government health expenditure in 2011. Government covers 30.7% of public health expenditure and donors 69.3% (WHO-National Health Accounts). In order for this assessment of sustainability to be meaningful, costs of iCCM for under-fives are presented using the total number of APEs working currently on the programme across the country rather than only using the 905 current UNICEF APEs, assuming that the cost per APE and level of activity is the same across all areas as that presented above. In 2012, there were 2,000 trained and deployed APEs in the country with a projected increase to 3,809 in 2015, remaining at that level up to the projection line of 2017.

With the 2,000 APEs, iCCM+ for under-fives would represent 0.54% of the total public health expenditure and 1.77% of the government's health expenditure. If iCCM+ was extended to be delivered by 3,809 APEs, the total impact would be 1.03% of the total public health expenditure and 3.36% of the government's health expenditure (Table 13).

Table 13: iCCM+ for under-fives as proportion of public health and government health expenditure

	Total 2011 ($)	Government	Donors
Public Health expenditure	100.00%	30.7%	69.3%
	351 580 253	107 935 138	243 645 115

Current number of APEs:	2 000		
	2012	With 15% increase in treatmts / APE	With 30% increase in treatmts / APE
Cost ICCM+<5	1 906 075	1 932 626	1 959 177
ICCM <5 as % Public Health Expenditure	0.54%	0.55%	0.56%
ICCM <5 as % of Government own Expenditure	1.77%	1.79%	1.82%
Scale-up: increasing the number of APEs	3 809		
Cost ICCM+<5	3 630 120	3 680 686	3 731 253
ICCM <5 as % Public Health Expenditure	1.03%	1.05%	1.06%
ICCM <5 as % of Government own Expenditure	3.36%	3.41%	3.46%

b) The APE programme

The assessment above only reflect cost of iCCM+ for under-fives. Continuation of this programme requires the maintenance of the APE programme. Cost of the APE programme is calculated by extrapolation from the iCCM for under-fives representing 46% of the total programme. As such this extrapolation gives an order of magnitude rather than an exact costing. The annualised cost of the APE programme would stand at about $2,144 per APE. For the existing 2,000 APEs the estimated cost of the APE programme would represent 1.2% of the public health expenditure and 3.9% of the government's own expenditure. For the target 3,809 APES, cost of the APE programme would

represent 2.3% of public health expenditure and 7.5% of the government's own expenditure (Table 14).

Table 14 : Estimated cost of APE Programme

Annualised Cost of APE Program per APE	$
Training	289.46
Subsidy	480.00
Equipment	161.61
Management & Supervision	618.64
Other Overheads 5%	77.49
Consumables	237.97
Sub-total	1 865.18
Systems Strengthening (+15%)	279.78
Total per APE	2 144.95

APE Program	2012	2015
Number of APEs:	2 000	3 809
Cost ICCM+<5	4 289 903	8 170 120
ICCM <5 as % Public Health Expenditure	1.22%	2.32%
ICCM <5 as % of Government own Expenditure	3.97%	7.57%

Discussions with MISAU, UNICEF, and other donors showed that the main concern about sustainability is the capacity of the government to carry the subsidy for APEs as donors had indicated their willingness to pay for training, kits and drugs if the government covered the subsidies. Full APE subsidies, at $480 a year per APE, would amount currently to 0.89% of the government's own expenditure on health and to 1.69% with scale-up (Table 15).

Table 15: Impact of APE subsidies on Government Health expenditure

	Number APEs in the country	Cost	% Public Expenditure	% Government Expenditure
Current	2 000	960 000	0.27%	0.89%
Scale-Up	3 809	1 828 320	0.52%	1.69%

The level of utilisation of iCCM for under-fives is high in Mozambique compared to other countries assessed, pointing to the fact that delivery of curative services at community level responds to a real need. This is evidenced by the fact that policy places curative services at 20% of the APE activities whilst this proportion is clearly much higher as indicated in other parts of this report. This investment in iCCM seems well justified even if it is too early to quantify the health impact. However, some aspects of programme delivery could decrease the expenditure on the programme. The calculated cost of drugs by treatment is lower than the current expenditure. This is due to the fact that drugs and tests costs are calculated as per protocol per treatment. However, the current use of pre-packed drug kits with standard quantities means that in many cases only a fraction of the drugs are used for their purpose, and there are no systematic plans to recycle surplus drugs. The actual drugs expenditure is, thus, much higher than presented here. Management and supervision represent a significant 34% of the cost per treatment. Allowances for supervisors account for 87% of management and supervision costs. Bicycles are part of the standard kit of APEs. However, this expenditure is not justified in sandy areas where bicycles cannot be used. Transport allowances may be more appropriate and likely cheaper in these circumstances. The team could not find published information on average cost per visit at a health centre to compare with the cost of an iCCM treatment.

The sustainability of iCCM depends centrally on the sustainability of the APE programme as a whole. The estimated cost of the full APE programme represents 1.2% of public health expenditure but nearly 4% of the government's own expenditure. However, a much smaller commitment from the government could secure the sustainability of the programme. If the government paid for the APE subsidies, committing 0.9% of its own health expenditure, donors have indicated that they would support other aspects of the programme.

5.4.2 Qualitative findings related to sustainability

The APE programme is widely perceived as important and critical to the GRM health goals:

> *"For their community role, we are all clear that they are very important to reduce maternal and child mortality."* [Planning- MISAU]

The Strategic Health Plan for 2013-2017 envisions that APEs will extend the reach of the health system to a further 20% of the total population, bringing overall coverage close to 80%. Sustainability of the APE activities is, thus, central to the national plan.

There are two critical issues to consider around the funding of the APEs: subsidies and the recurring costs of drugs.

> *"The iCCM programme jumped on an existing system of the old APE programme, where many APEs were still functional to some degree and got kits through the facility. If support now from UNICEF is discontinued, it is unclear if the system will continue as it had in the past because two integral elements were changed: 1) Now the APEs get a monthly subsidy and 2) The medicine kit has been expanded to include many more drugs."* [UNICEF informant]

Most informants believe the programme would collapse without the subsidies but are committed to finding methods to sustain the programme.

> *"We understand that the APE programme is in the community participation strategy and provides the link between the community and facilities. This is why we need to find ways to sustain the programme."* [MISAU informant]

Furthermore, there are competing priorities for incremental funds even within the health sector.

> *"Government does not have funds to pay for their public servants. The common basket is paying for over 5,800 (new) health workers who are outside of the government (payroll) system. If MISAU does not provide the salaries or subsidies for the APE we do not have any guarantees that this initiative will continue, even if we provide them with the kits."* [MISAU informant]

The common basket fund was created for integrated development processes but these funds have been progressively decreasing, just as obligations to PHC have increased, including the entire APE programme. However, some partners feel the near total donor financial support to this programme breeds dependency:

> *"They (GRM) is prioritizing other programmes. If we continue to show our commitment to support the programme, they will continue to lag behind. The most important aspect of the programme is its sustainability."* [International partner]

There is a concerted push from the post war rehabilitation side to have government take on the support of the programme. However, while GRM has shown that it is willing to strengthen their commitment to the programme on paper, the funds have not yet been forthcoming.

Though many APEs do not meet the minimum requirement in education or age to be incorporated into the government payroll, some observers pointed out that exceptions have been made in other government sectors.

The largest cost driver of the programme is the recurring cost of medicines and supplies, presently purchased exclusively by the donors. These costs are currently seven to eight times the cost of subsidies. A dramatic reassessment of the products and quantities supplied would seem necessary to bring these costs into line with likely government resources. In the short to medium term it is likely that donors would be willing to continue paying these costs especially if GRM assumes responsibilities for APE stipends.

The future of the APE programme seems to hang in the balance while there is indecision at the Ministry of Health over the payment of subsidies, including setting up appropriate systems for paying APEs. The integration of the programme at the community, district, and provincial levels is because of a significant amount of implementation work on the part of UNICEF. Keeping the programme running at an operational level is critical if the investment so far is to show results convincing enough to secure the full commitment of MISAU. While UNICEF's advocacy and technical role is what is most expected by partners, their work in implementing the scale-up of the APE programme has possibly been the most crucial to date.

The APE programme is a source of pride to the GRM and plans to continue expansion to reach 3,450 APEs are in place. While donors are likely to be willing to help with initial training and commodity supply for some time, ultimate viability depends on the contentious issue of subsidies. To incur further obligations while this issue is unresolved seems unwise.

Challenges with basic resources

APEs are expected to work out of their homes, visiting households spread over great distances carrying needed supplies, health education materials, and large registers with them. Additionally they must visit health facilities, invariably many kilometers distant, to submit reports, obtain drug kits, and receive supervisory guidance. Thus, transportation needs are a critical infrastructural challenge for APEs, for which the provided bicycles are usually not adequate. Additionally, visits of supervisors to the APEs are subject to irregular vehicle availability. APEs often procure replacement batteries for torches and respiratory timers from already limited stipends along with payment for cell phone use.

A transport subsidy to enable collection of drug kits and their transport, repair of cycles (where they are used at all), and reliable regular transport for supervision from health facilities and districts out to the homes of APEs should be considered, along with reimbursement for legitimate out of pocket expenses (cell phones, batteries). Redesign of registers will make them more portable and easy to use. Any improvements in performance of APEs is vitally dependent upon more regular and structured supervision coupled with continuing monthly education for APEs, which should be designed by a dedicated unit in MISAU.

6.   Conclusions

6.1   Relevance

Policy environment

Implementation of the IHSS programme required flexibility to ensure smooth implementation across multiple donor demands

The policy environment for maternal and child health in Mozambique has progressed over the past decade in support of PHC and greater community outreach. Continued commitment has been made in the formal health strategy for the next five years (2013-2017). However, heavy dependency of MOH on external funding places many programmes in jeopardy, especially as donor support to the common fund, Prosaude, has been declining. One of the major obstacles to funding is donor coordination. Findings in this report make it clear that donor coordination in the health sector is difficult, though substantial efforts have been made on both sides to assure regular communication and achieve uniform agreements on procedures and implementation.

Working groups involving all partners have participated fully in determining the details of each programme component: job details, training curriculum, supplies, information content and flow, and supervision norms. However, instances of donor pressures to change policies or procedures have at times disrupted smooth implementation. In such instances UNICEF has provided flexibility in activities and funding enabling continuity where disruptions or delays from donors occur.

IHSS programme contributed to a strengthened health systems capacity across the PHC system in rural areas

The IHSS programme has strengthened the PHC capacity in rural areas through a series of programme design and support, first at district level (through RED), then in Level I facilities (through IMCI), and in outreach to rural communities distant from health facilities (through RED, Child Health Weeks with immunisations, vitamin A, LLINs, and nutrition promotion). The revival of the APE programme through the IHSS programme has been well designed and piloted prior to roll-out and is now covering up to a million of under-fives (or 25% of the 3.9 million under-fives) with health education and iCCM services and increasing access by 50% of the under-five population that previously had no access to basic PHC services. APEs are chosen by the communities they serve and most seem highly motivated and articulate a sense of service and important contribution to their communities. APE training is well designed and the standard curriculum appropriate. The knowledge and skills of APEs interviewed was found to be generally quite good. However, continuing education of APEs is generally lacking and further training is frequently requested by APEs. The equipment provided to each APE is adequate, though in many cases bicycles are not used or are broken; they are probably not an appropriate conveyance in rural areas with bad roads.

Women's participation and gender equality

Gender equality in the APE programme continues to be a challenge. While recruitment of women to serve as APEs is emphasized, in many areas men are predominantly recruited as women are less educated and cultural barriers inhibit their movement out of their immediate home environment. Also, younger men are more likely to find alternative work and, thus, leave the programme early.

6.2   Effectiveness

6.2.1   Assessment of the contribution of the IHSS programme to health system strengthening

Medicines supply and commodities

IHSS enabled the procurement, supply, and distribution of medicines and commodities at the community level though improved monitoring is needed to ensure accountability and recording of surplus stock

Medicine and expendable supplies are reliably provided monthly in standard kits, most of which are delivered to the nearest health facility from where APEs must collect and transport them home. However, the content list of the kit needs study and revision with an effort to reduce recurring costs of these supplies. The APE register and monthly report of curative activities is well designed and generally used, though closer scrutiny and instruction by supervisors is needed to improve data quality. Also, APE reports do not appear to be used to generate indicators of performance nor to measure effectiveness of APE work. Referral slips, which are used to send patients to health facilities for care, are honored by providing a fast track to be seen at the health facility and generally provide feedback to APEs by being returned with the patient. It would be useful to track the percentage of referrals receiving feedback to gauge the uptake of referrals.

There is a discrepancy between the number of drugs provided and the number of reported iCCM iCCM treated. It is not clear what is happening to this likely surplus medication. While the national protocol is for APEs to return surplus stock to the health facility to be re-absorbed into the facility stock, it was not clear if this was done. Accountability and recording of surplus stock returns does not appear to be occurring and methods to improve monitoring are needed.

Supervision

Supervision of APEs occurs mostly during their monthly visits to the health facility to submit reports and to collect medicine kits and stipends. These are often brief and may not include use of the well-designed supervision checklist. Many supervisors reported making use of monthly reporting forms to check for completeness of APE activity. More importantly, supervision of APEs in their villages is dependent upon transport, usually provided by districts, and therefore occurs less frequently (in many cases quarterly). These visits are often brief but helpful in managing supplies, reviewing cases seen, and encouraging health promotion activities.

Supervision procedures are in need of refinement and improvement, both by training supervisors, insisting that checklists be used and used properly, and by supervision from higher levels. Local monthly supervision is carried out by facility nurses, who themselves need extra training around

monitoring and supervising APEs. Enforcing use of the supervisory checklists would be beneficial to ensure consistent monitoring and help with identifying weaknesses and gaps in APE service delivery. More effort to identify training needs and provide in-service training at each supervision visit is needed.

APE skills and community impact

Early signs of increased utilisation of the community level services supported by the IHSS programme point to likely improvements in coverage of key child health indicators

Our qualitative findings and those of evaluations carried out by Save the Children and the Malaria Consortium show that communities served by APEs report improved health behaviours and understanding of determinants of health and appear to seek care earlier and in greater numbers. Furthermore, community committees are active. They support and reinforce the work of APEs. The APEs are highly appreciated and motivated by this support. Attrition is not yet a problem with fewer than 5% loss in the first year of service. However, continued retention is vitally dependent upon reliable payment of the stipend. Also, there is no career path for APEs; the only possible advancement is to gain more skills. A long tradition of volunteers in various health activities persists but is not well organised, and it is highly variable between areas and may be jeopardized by the role of paid APEs in the villages (in contrast to unpaid volunteers). Further, there appears to be little inter-sectoral collaboration between APEs and other volunteers in the community, except in notable pilot areas run by NGOs.

Overall, considering the brief time since the initiation of the APE programme and the many challenges that have been met in scaling up this cadre of workers, the results are highly commendable and promising. A measurable increase in coverage of key child health indicators seems likely by the time of the next objective evaluation by DHS or similar national survey.

6.2.2 Assessment of the contribution of the IHSS programme to coverage changes

Over the period of the IHSS programme, average annual rates of coverage change for tetanus toxoid vaccination of pregnant women and care seeking for suspected pneumonia both declined among rural populations. The average annual rate of coverage change for vitamin A showed a marked increase between 2003-2008, which could very well be due to the NCHW although baseline data for this is only available from 2003. Modest annual coverage change was maintained through the rest of the programme implementation period. Mozambique is amongst the countries that have successfully eliminated maternal and neonatal tetanus, and as a result it is likely that coverage declines are reflective of an increase in lifetime tetanus protection overall. It is unclear why care seeking for suspected pneumonia would have declined during this period, although with the recent definition change for the diagnosis of suspected pneumonia (addition of difficulty breathing, evidenced by chest in-drawing), it is likely that fewer cases would be diagnosed but the implications of this definition change for care seeking coverage are unclear. Large increases in coverage are noted for early initiation of breastfeeding and the provision of ORS, with notable changes in immunisation coverage of measles during the IHSS programme funding period. Rates for ITN usage in under-fives also show many a fold increase from programme baseline to endline.

When comparing care seeking behaviour for all three diseases in under-fives prior to the IHSS programme and once the APE programme was revitalised, there is an increase to 4% of care being sought from a community health worker among rural populations. In light of the fact that this care seeking data is obtained from the 2011 DHS, with the APE programme in its infancy, only covering 8 districts (5% of total districts), this shift towards APEs for first level care of iCCM illness is very positive. Furthermore, there are overall increases in care seeking in the public sector, with care seeking being redirected away from other sources of care which may include private pharmacies, drug vendors/stores, shops, or traditional healers. Furthermore, in the early infancy of the programme implementing partners have demonstrated, through localised controlled studies, a clear shift towards care seeking from APEs for iCCM diseases.[14, 15]

The IHSS programme contributed to an increase in equity in terms of access to services through NCWH and RED strategy and the APE programme

There are notable examples of the contribution of the IHSS programme to improving equity in access to services including to services delivered through NCHWs and the RED strategy. By 2011, there was a clear narrowing in the gap between the richest and poorest populations with regards to care seeking behaviours. The poorest quintile demonstrated an increase of 8% in care seeking between 2003 and 2011, with no change in care seeking behaviour to the public sector among the richest quintile. Furthermore, by 2011, 6% of the poorest quintile reported care seeking at the community level, whereas 1% of the richest quintile sought care in the community.

With regards to health care seeking practices specifically for children with fever, more is needed to improve health care seeking amongst the poorest population, which maintained pre-IHSS levels but did not improve significantly during the programme. However, when comparing treatment with antimalarials between the richest and poorest quintiles, there are very similar coverage rates from 2003 to 2008; however, by 2011, treatment with antimalarials amongst the poorest quintile surpasses that of the richest. Though reasons for this are unclear, it is plausible the efforts to increase access to the poorest have been successful. With regards to the provision of ORS for diarrhoea, while the gap between the richest and poorest quintiles narrowed between 1997 and 2008, the gap begins to widen again in 2011, despite an increase in coverage among both population groups. Furthermore, with respect to immunisation coverage, there has been a steady and significant increase in the average annual rate of coverage change for measles vaccination after 2008 as well as an acceleration in equity amongst the poorest quintile as immunisation coverage among the richest remained relatively steady over the same time period.

The coverage data around care seeking demonstrates early but optimistic evidence for the utility of the APE programme, especially among the poorer population in Mozambique. According to estimates of utilisation for the period between 2012 and 2013, APEs provided treatment at the community to approximately 142 patients per year for the three diseases, 70% of which were delivered to under-fives. While this number amounts to approximately eight to ten children under five per month, it is important to note that 75%-80% of the APE time is dedicated to preventive activities including home visits and health promotion activities. Furthermore, at the time of analysis, the APE programme had still not gone to scale, with training and placements of more APEs still underway. It is very likely, as a result, that this trend in utilisation would increase over time.

6.3 Impact

6.3.1 Assessment of the contribution of the IHSS programme to mortality changes

The main causes of under-five deaths in Mozambique in 2010 included malaria, pneumonia, AIDS, diarrhoea and complications from prematurity.[7] The LiST analysis estimated higher mortality rates than those of the DHSs in both the pre-IHSS period and IHSS programme period, indicating that the coverage changes cannot account for all factors relating to child mortality reductions, or that the model is not accurately capturing the mortality impact of the coverage changes. During Phase I of the IHSS programme (2007-2010), the LiST-modelled analysis indicated that an additional 20,500 lives were saved, with 82% of these lives saved due to increases in coverage of interventions also supported by the IHSS programme (16,100 deaths averted over three years). Since these numbers are annually calculated based on deaths averted as compared to the baseline mortality rate, the cumulative number should be interpreted with caution. Across each year, IHSS programme-focus interventions came across as leading interventions averting the greatest proportion of deaths indicating the scale up of these interventions has potential to save lives. Without endline data for Phase II, assumptions were applied for coverage of IHSS interventions with similar results as Phase II. Until higher coverage of APEs is achieved and their work pattern more settled, it is difficult to attribute lives saved to the IHSS programme.

6.4 Sustainability

6.4.1 Programme costs

Costed according to the national protocol, iCCM treatments for malaria, diarrhoea and pneumonia have a weighted average cost per treatment of $9.04 for malaria treatment, $7.86 for diarrhoea treatment, and $7.89 for pneumonia treatment. Drugs and diagnosis tests represent 10% of the cost of iCCM treatment, with the main cost driver (90% of total costs) being represented by fixed costs. Fixed costs reflect the annualised expenditures incurred for each APE: cost of training, subsidy, kits, and supervision. The impact of fixed costs on the total cost per treatment is, thus, a function of the number of treatments per APE per year. The lower the number of treatments, the higher the fixed cost per treatment will be.

At present, there are 2,000 iCCM-trained APEs across the country. Under similar cost inputs as those APEs trained under the IHSS programme, iCCM services delivered to under-fives would amount to 0.54% of the total public health expenditure and 1.77% of the government's health expenditure, while iCCM+ (which includes an additional 15% for systems strengthening) represents 0.55% and 1.79 %, respectively. If the plans underway to train and equip 3,809 APEs are to be achieved in Mozambique, the cost on the health system would amount to 1.03% of the total public health expenditure and 3.36% of the government's health expenditure. For iCCM+, these percentages would stand at 1.05% and 3.41%, respectively.

The APE programme in Mozambique is unique in that the community health workers do not exclusively provide treatment to children under five. A large amount of their time is also spent on prevention which is equally critical to the health outcomes of children under the age five and to older children. Interviews with key stakeholders invested in the APE programme, including the Ministry of Health and critical partners, consistently reiterated that the main concern about the sustainability of

this programme is the capacity of the government to take on the responsibility for the subsidies for APEs. Thus, as an interim transition measure, some donors have indicated their willingness to continue to pay costs of the training, kits, and drugs for the programme if the government commits to paying the APE subsidies. The subsidies, amounting to $480 a year per APE, would equate to 0.89% of the government's own expenditure on health. If the numbers of APEs are to be scaled up to 3,809, as planned, the government's expenditure would increase to 1.69%.   With the prospect of significant economic growth (export of coal and the discovery of oil in the country), it is possible that government allocations to the health sector could increase, making payment of APEs' subsidies by the government still more affordable. However, support of the government for the programme has not translated yet into a commitment to pay for subsidies. Should this commitment not materialise, it is likely that in the medium term the programme would be threatened.

6.4.2   Likelihood of sustainability

On the whole, the IHSS programme has indeed strengthened the capacity of the MOH in numerous critical areas: policy dialogue and formulation, ability to plan especially at the district level, training design, and decentralised training capacity, supervision at all levels, supply purchasing and logistics, design and use of routine information systems, and design and implementation of field research and evaluation techniques. This contributed to strengthening the capacity to deliver key health interventions at the community level through frontline health workers. There is capacity to sustain the system, but a greater need exists for a practical plan for financial sustainability.

7. Strengths and limitations of the evaluation

7.1 Strengths and limitations of the quantitative component

A statistical trend analysis was performed on all available data points corresponding to the years between 1997 and 2011, using a combination of DHS and MICS surveys. The DHS and MICS data files were combined to recalculate coverage indicators over time, and care was taken to use standard indicator definitions and appropriate sampling weights. The use of both these data sets was guided by two main reasons. Both are major programs that generate household-level survey data needed to measure coverage for maternal and child health in low- and middle-income countries and both collaborate closely with interagency processes to ensure that their survey tools are harmonized and comparable as far as it is possible. Additionally, both surveys adhere to the fundamentals of scientific sampling that included updating sampling frames and preparation of appropriate sample documentation.

However, an important difference between MICS and DHS surveys is in the collection of information on children under five. MICS surveys collect information on the children from mothers or primary caregivers in the household, making it possible to collect information on all children, including orphans and foster children, regardless of whether their biological mothers are in the same household. On the other hand, in DHS surveys most information is collected from the biological mothers in the Woman's Questionnaire. There are also a number of differences in the population covered and the reference periods used to measure coverage, where MICS usually uses births within 0-2 years of the survey, and DHS uses 0-5 years, the latter potentially resulting in recall problems. These differences between DHS and MICS surveys may affect coverage estimates and need to be considered when comparing estimates over time.

These differences may explain the anomalies in the observed trends. In most cases, coverage estimates using one data source, for example DHS, clearly show either upward or downward trends. However, when coverage estimates from MICS are combined, the trends are heavily distorted resulting in non-linear trends. This may be a true reflection of the coverage estimates or a reflection of differing population and reference coverage inherent in the two surveys.

The IHSS programme was not confined to one geographical area in Mozambique resulting in the absence of a comparison group. Though national coverage rates were compared to rural rates, this cannot serve as a plausible counterfactual scenario. Furthermore, plausible attribution to changes in coverage on selected indicators is not possible due to the wide number of contributing partners and programmes targeting MNCH interventions in the country, though some possible assumptions have been proposed.

The analysis was envisioned to cover three time periods corresponding to pre-IHSS, Phase I, and Phase II of the IHSS programme. Where necessary, indicator definitions were adjusted to ensure valid comparisons over time. For most indicators we used 2008 as the baseline for the beginning of the IHSS programme, as interventions would not have largely been rolled out to be reflective in the 2008 MICS, with the exception of vitamin A supplementation and measles vaccination that formed a large part of the first National Child Health Week that ran in March of 2008. For these indicators we used 2003 as a baseline. However, the use of a baseline 5 years before a programme starts does not provide an accurate picture of real changes achieved by the interventions and can be viewed as a limitation.

Due to the late start of the APE programme in Mozambique, which only began in late 2010, the coverage trend analysis is limited by the lack of endline data. Furthermore, it is unlikely that even DHS 2011 data could have picked up effects of the APE programme, as the 2010 period was largely taken up with preparatory work and training for activities. Thus, the DHS in 2011 cannot be expected to provide any reflection of iCCM activities provided by APEs and their impact on the communities they serve.

7.2   Strengths and limitations of the LiST analysis

The analysis for Mozambique benefited from multiple household surveys. However, the lack of endline data prevented a complete assessment of Phase II. The survey indicator definitions do not perfectly match LiST indicators in all cases. Additionally, the national surveys used in this analysis do not capture many of the facility-based interventions included in LiST. These interventions are often high impact for children, e.g., Kangaroo Mother Care, and might have changed during the period under consideration. LiST automatically calculates some of these indicators based on coverage of a contact point, such as antenatal care, or facility birth, e.g., antenatal corticosteroids or case management of severe neonatal infection. LiST does not allow skilled birth attendance to be lower than facility birth; yet in Mozambique, survey data reports this to be the case across some time points. Due to the limitation in LiST, skilled birth attendance was set at the level of facility birth even though it was reported have lower coverage.

The causes of death used to calculate lives saved are those modelled at national level by the Child Health Epidemiology Reference Group and do not take into consideration regional differences. PMTCT coverage is based on assumptions from the AIM module in Spectrum, and coverage was set to reflect the Countdown to 2015 report.[27]

Given the recall period of the household surveys, the model years do not necessarily align with the coverage figures used. Data points between the household survey years were interpolated linearly, not necessarily reflecting true coverage patterns, especially for campaign-based interventions.

The LiST model did not accurately predict measured mortality change within a confidence range for either phase under consideration, resulting in an inability to directly link measured mortality reduction with coverage change. For this reason and those mentioned above, the results of the LiST analysis should be treated with caution. The number and proportion of total deaths averted as well as deaths averted due to interventions to which the IHSS programme contributed may not reflect the true result and should be used exclusively for illustrative purposes.

The same is true for the hypothetical scenario applied in the last phase of the programme given the lack of endline mortality and coverage data.

7.3   Strengths and limitations of the costing exercise

Two approaches have shaped the costing exercise, each with their strengths and limitations:

- The *normative costing approach* used in this evaluation has the benefit to reflect costs as per programme design and to make it comparable to other CCM costing exercises (current multi-country evaluation and MSH).   However, the limitation of this approach is that it does not reflect the variations in actual implementation (stock-outs, uneven supervision) with its impact on effectiveness of programme. As a consequence, it also does not reflect actual use of donor funds of which a significant proportion was spent on initial design, set-up, and systems strengthening.

- The *additional costs approach* benefit is that it recognises existing structures and systems and avoids double-counting, e.g., CHO supervisors' salaries already covered in existing government budgets. However, the additional cost approach does not reflect all the costs by excluding those already funded as part of the existing system.

Some elements of the total additional cost of the iCCM programme are excluded (the cost of design, policy development, and broad capacity development) as these costs are 'once-off' costs which will not recur with expansion of iCCM.

It is also important to note that costing a set of iCCM (curative) activities for the three key diseases in isolation is limited as in practice APEs deliver both preventive and curative services, one strengthening the other.

7.4   Strengths and limitations of the qualitative component

This country visit was conducted by a mixed methods team with expertise in quantitative, qualitative, and economic evaluation methods, allowing for inter-researcher triangulation from different methodological perspectives. All of the researchers who visited Mozambique are experienced in health systems research. The key strength of this evaluation was that this group of researchers are not in the direct employ of UNICEF and, therefore, are able to objectively assess the impact, outcomes, and experiences of the implementation of the IHSS programme and to see and experience for themselves how the IHSS programme was implemented. The field visits were helpful to the team in understanding the cultural and political context in which the IHSS programme took place, something that could not have been achieved by merely conducting a desk-based evaluation.

While in Mozambique, the team spoke to a wide range of stakeholders. These included participants at national, provincial, district, facility, and village levels.

Although the team was able to gain snapshots of iCCM implementation during the ten day visit, it couldn't completely ground itself in the context. The large number of interviews in this short time also meant issues could not be examined in-depth. Furthermore, due to travel and time constraints, the team was only able to visit the southern regions of the country, which overall have better infrastructural, health, and economic profiles than the central and northern regions.

Selection of participants for interviews may have been biased towards those more favourable to the programme, partly because the team was dependent on the UNICEF office to assist with selecting appropriate people to interview. The team was able, though, to gather a wide range of perspectives

during the visit and via document reviews. Although the team was able to explain to high level participants that it was separate and not employed by UNICEF, it may have been harder for community level participants to make the distinction. This may have influenced how they related their experiences.

During the interviews the team had to rely on translators for interpretation of both the questions and the participants' responses. The translators were recruited independently of UNICEF (for Portuguese translations) as well as with the assistance of UNICEF (for Shangaan translations). The interviews with the Ministry of Health representatives only required translation from Portuguese to English. Community level interviews often required a third translation to Shangaan, i.e., the English speaking researcher would ask the question, which would be translated into Portuguese by the first translator and then further translated from Portuguese to Shangaan by the second translator, and then this process would again occur in reverse order. This is very likely to have resulted in some of the communication being lost in translation, and it has also raised difficulties for direct transcription of the interviews. In addition, the Shangaan component of the translation was often carried out by district supervisors so as to facilitate the focus group discussions with mothers. The supervisor's presence may have biased the discussions.

8.   Lessons learned and recommendations

8.1   Lessons learned

Relevance

- The IHSS programme has strengthened the PHC capacity in rural areas through a series of programme design and support, first at district level (RED), then in Level I facilities (IMCI), and in outreach to rural communities distant from health facilities (RED, Child Health Weeks with immunisations, vitamin A, LLINs, and nutrition promotion). The revival of the APE programme through the IHSS programme has been well designed and piloted prior to roll-out and is now covering up to a million under-fives (or 25% of the 3.9 million under-fives) with health education and iCCM services and increasing access by 50% for the under-five population that previously had no access to basic PHC services.

Effectiveness

- At the moment, supervision is very limited and may threaten the quality of care and morale of APEs.

Impact

- Mozambique has achieved notable progress in reducing under-five mortality and is nearly on track to meet the target for Millennium Development Goal 4 for child survival. The IHSS support focused heavily on improving childhood vitamin A and immunisation coverage through the NCWH and RED approach, in addition to national distribution of bed nets and an emphasis on facility-based IMNCI. These interventions are all likely to have played a major role in the modelled deaths averted.
- Due to the specific parameters of the LiST modelling (e.g., not attributing lives saved to specific health service levels), and the parameters of the costing analysis (calculating additional, not full costs, of delivering iCCM), the evaluation did not calculate cost-per-life saved.

Sustainability

- Diminishing donor support leaves many health programmes in the country uncertain – as the Prosaude funds shrink it jeopardizes many PHC activities.

8.2   Recommendations

Relevance

- Various mechanisms to ensure donor and NGO coordination and adherence to norms for the programme need to be explored in order to ensure systematic implementation, while allowing flexibility to explore alternative approaches to improvements (such as in the RaCE project). Clear mechanisms to evaluate, and report on, the results of trials such as the RaCE project are needed.

- The expansion of the role of experienced APEs should be explored with only incremental addition of tasks as APEs demonstrate competence and interest in taking on more services: family planning, TB DOTS, and first aid seem high priority among the community. These should be piloted and carefully evaluated on a small scale as important operational research.

Effectiveness

- Barriers faced by the Government of Mozambique to regularise the APE workforce need to be overcome. This will require negotiations with MoF and revisions of HR requirements in the country. The World Bank is apparently working on a justification for the use of APEs by the MOH.   APE subsidies are seen as critical to the sustainability of the programme, and constraints to regularize this cadre (age, minimum educational requirements) are not absolute as evidenced by payments by other ministries to village level workers.

- The sale of items other than iCCM drugs needs to be considered at set costs and APEs would repurchase drugs from health facility. As this may not reduce overall costs substantially as the major recurring cost is for malaria diagnosis and treatment, pilot trials on cost recovery need to be conducted. This mechanism is being implemented in other countries implementing iCCM.

- Recognition of the large curative role APEs play may require revision of APE time allocation to allow fixed time to see patients, even if service delivery at health posts, rather than outreach home visits, is still discouraged, as this is a strong and consistent demand of communities.

- Activities to generate increased demand for use of APEs should also be designed and implemented.

- Supervision needs to become regular, even if only at health facility during APE monthly visit with use of checklists and written suggestions to APEs. Different models for this can be explored, e.g., Save the Children and Malaria Consortium in the RaCE project are piloting specific APE supervisory tools. Supervision activities need to be reported and sent upwards to different levels of care to enable monitoring of supervision at each level.

- Continued education should be factored in at the monthly health facility visits using set the materials provided by the MISAU training unit. Quarterly refresher training of 1-2 days can reinforce old, and introduce new, skills.

- A four-month continuous training model should be compared with episodic incremental training of one month every quarter for four rounds, or some other modification to allow field application of knowledge and skills between education sessions.

- APEs need training and monthly supervision on proper use of registers and reports. Register redesign should consider removing the large space for address, which is seldom used, insist on quantities dispensed in the treatment columns, and print every other line in grey to enable tracing across the page break. A smaller number of pages will encourage carrying registers to the field as current size is too large and heavy to carry on home visits, and often the APEs carry a small notebook to write down notes from health visits, which are then rewritten into the register, increasing the chances of errors.

- A feedback mechanism from province to districts and health facilities on APE activities and supervision should be designed and prepared quarterly by each province and sent to all lower levels and to the national.

- Experienced and well-functioning APEs could be "promoted" to a supervisory or mentoring role for surrounding APEs thereby providing an internal career path and incentive for good work, in which case a modest increase in stipend would be needed. This model has been utilised in other places, such as Malawi.

Impact

- Use LQAS surveys once every couple years to validate the routine data but also to use for annual planning, identification of priority districts and sub-district areas, bottleneck analysis, and monitoring interventions not captured by the HMIS (e.g. BF, ITNs, etc.).

- In order to measure the effectiveness in preventive activities to help set targets for APE work, a set of indicators (3-4) should be developed. Potential indicators could include: % women using family planning, % under-twos fully immunised; % exclusive BF under 6 months; % under-fives sleeping under bed nets; % referral slips returned from the health facility. However, it must be emphasised that targets for treatment must NOT be set, as this will drive curative activities at the expense of other things.

- Plausible contribution of the IHSS programme to lives saved has been assessed through modelling. It is acknowledged that other interventions not included in the IHSS programme package, such as improved care at birth, may have played a role in child survival, and that the modelled estimates reflect changes in coverage at all levels of the health system, and not only the community level. It is recommended that future evaluations strive to collect data at the level at which impact is expected to be seen, e.g., the health post level.

- Plausible contribution for mortality changes is difficult to ascertain for a discrete set of health interventions such as iCCM, given the contribution of a wide range of health services and non-health factors and the long implementation time required for interventions to change population level health outcomes. It is recommended that future evaluations of UNICEF interventions broaden the outcome parameters to be measured so as to take these complexities into account.

Sustainability

- MISAU need to find alternative means of sustained funding for its APE programme, in the interim, at least for recurring costs (stipends, drugs, supervision).

- Discussions should be held jointly with Ministry of Finance and Ministry of Health to emphasise the limited burden APEs subsidies would have on government funding, in order to facilitate government commitment to take on this responsibility and signal to donors goodwill to share costs for other aspects of the APE delivery platform.

- In the short term it is essential that donor funding for this programme is maintained as alternative sources are explored to ensure continuity of services.

- Attempts must be made to obtain longer-term commitment from donors to support the essential components of the APE programme and a similar mechanism of common funding pool that will allow MoH to allocate funds to essential services where shortfalls occur. UNICEF has provided a stop gap measure in many instances to date. It will also be important to consider the possibility of establishing a common fund dedicated only to supporting the APE programme.

- At this critical juncture, the World Bank and Global Fund should be encouraged to support the APEs as a mechanism to deliver integrated PHC at community level in hard to reach and vulnerable communities. This would align with the Bank's desire to support RBF/PBF and the Global Fund's desire to move away from support to vertical programs. There will be opportunities in 2014 to propose such moves through the CCM of the Global Fund and the World Bank Focal Points.

- Many of the above issues are amenable to field operational research, which should be the priority over the next year or two to determine the best way forward. Further issues to explore through operational research include:

  o Explore APE impact on health utilisation and coverage of essential services – are more people receiving services or just shifting provider from health facility to APE?

  o Administrative challenges need to be evaluated, and options to regularize the system and solve problems in the field should be explored in order to reduce dependence on partners for finance, supplies, information flow

  o Role and functions of community committees and volunteers at village level should be evaluated to explore opportunities for collaboration

- The expansion of APE numbers in the country should be put on hold until the above issues are resolved. It is more important to improve the existing system quality and resolve apparent problems than to forge ahead with greater numbers of APEs, support of which could well jeopardise sustainability.

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10. Appendices

Appendix A: Policy and implementation timeline

Policies

1989: MOH suspended old APE program though MoH continued to supply APEs with medicines through the kit system adopted in the 1980s

1998: MoH adopted the health package "Integrated Management of Childhood Illnesses" (IMCI) backed by WHO, UNICEF, USAID and NGOs

2002: MoH signs *Declaration of Millenium Development Goals*

2003: The PROSAUDE health common fund is established

2004: National Strategy for Community Involvement emphasizes that the APEs role includes treatment of illness at the community level, among other responsibilities

2004: Adoption of ACT.
Cost of ACTs remained a concern and use was not scaled up until the introduction of rapid diagnostic tests that permitted accurate diagnosis.

2006 July: Government has progressively implemented the policy of removal of user fees for childcare, antenatal care, caesarean section operations and family planning.

2007: MOH adopts RED policy

2008: MOH finalised a comprehensive five-year Communication and Social Mobilisation Plan for the promotion, protection and support of breastfeeding.

2010: strategic plan for the revitalization of the Community Health Worker (APE) programme approved by the MOH, with CCM for malaria, pneumonia and diarrhea, and payment of subsidies to APE as two major innovations

2011 Jan: Drug and logistic kit contents for APEs finalised

2011 Jan: Approved Ammoxicillan for APEs in place of Pennicilin

Timeline: 1989-2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012-3

Implementation: Training & Supply

2006: 130 out of 140 districts were implementing IMCI- was based entirely in health facilities and the only role of CHWs (APEs, TBAs, and activists) was to encourage families to seek care in health facilities when needed

2008: Implemetation of RED in 33 Districts

2008: Initiation of first National Child Health Week (March/ October)

2009: RED operational in 66 districts resulting in 700 Health zones equipped with micro plan for implementation of integrated MCH package using fixed, outreach and mobile teams.

2009 August: 1 year national breastfeeding campaign launched

2010 March: APE pilot program starts with 4 month training of first cohort of APEs initiated in 8 districts.

2011: tools for operationalizing APE program produced

2011: Second cohort of APEs (1050) initiated in additional 42 districts

2011: Indoor residual spraying delayed due to SWAP crisis

2011: RED adopted as national platform for integrated planning and implementation of activities

2012: 50 districts implementing APE programme

Appendix B: Country Logic Model

Programme title	IHSS Program
Country	MOZAMBIQUE

ULTIMATE OUTCOME

Reduction in under 5 mortality. Nationally under 5 mortality decreased from 130/1000 in 2008 to 103 /1000 in 2011

↑

INTERMEDIATE OUTCOMES

Increases in care seeking for pneumonia, diarrhea and fever, especially among poorer and rural populations, with early signs of increased care seeking at community level. Immunization coverage (DPT3 and measles increased nationally, and especially among poorest quintile. Increases in Vitamin A coverage noted. Small increases in exclusive breastfeeding.

↑

IMMEDIATE OUTCOMES

CATALYTIC EFFECTS:
Strengthened capacity front-line health workers (Agente Polyvalente Elementares) to deliver iCCM interventions, with early signs of increased utilization. Challenges with capacity in government to supervise them. Strengthened health systems (planning, implementation, monitoring and evaluation) as a result of the RED initiative, but financial challenges exist.

↑

OUTPUTS

- Supportive policies for activities developed by government (ICCM)-Revitalization of APE programme
- Improved knowledge and skills of front line health workers to deliver iCCM
- Increased availability of iCCM commodities
- Improved quality of community based services

- Improved access to treatment for childhood illnesses (25 APEs per district)-not always equitable distribution according to population
- Improved family health practices-big focus of programme on promotion and prevention
- Improved care seeking practices by families for all three diseases

↑

DELIVERY STRATEGIES

Community based preventive and promotional services – Agente Polyvalente Elementares
Behavior change
Outreach services through national child health weeks and RED

Community based clinical and curative services – Health professionals (RED approach) and Agente Polyvalente Elementares
Some weakening in clinical IMCI due to redirected focus on community based care

↑

ACTIVITIES

Supportive
Supply chain support
Training
Supervision systems (weak)
Payment of subsidies to Agente Polyvalente Elementares
Provision of kits (medical and practical)

Preventive and promotive
Reaching Every District (RED) Approach;
Integrated Management of Neonatal and Childhood Illnesses (IMNCI) including activities for Community Case Management (CCM) of common childhood diseases;
Vitamin A Supplementation;
Distribution of long lasting insecticidal nets (LLINs); and
Promotion of Breast Feeding
Deworming
Immunization
Nutritional screening
Information and education on major causes of death in children

Treatment
ICCM of pneumonia (antibiotics), diarrhea (ORS and zinc) and malaria (anti-malarials)

Appendix C: Table of indicators included in the coverage and LiST analyses

Packages	Coverage indicators*	Interventions in LiST	Indicator definition in LiST	Data source used for LiST analysis	IHSS basic	IHSS-iCCM	Non-IHSS
Periconceptual	Contraception use (1.3.2.17) (1.3.2.18)	Contraception use	Proportion of women currently married or in union aged 15-49 years of age who are using (or whose partner is using) a contraceptive method (either modern or traditional) Proportion of women that are currently married or in union 15-49 years of age that have an unmet need for contraception	Household surveys			X
		Folic acid supplementation or fortification	Proportion of married women receiving folic acid supplementation tablet or fortification at conception	No national level data available. Set at 0 for baseline			X
Expanded Antenatal Care Package	Antenatal care (1.3.2.19) (1.3.2.20)	Antenatal care (4 visits)	Proportion of women who were attended at least 4 times during pregnancy by any provider (skilled or unskilled)	Household surveys			X
	Tetanus toxoid vaccination** (1.3.2.14)	Tetanus toxoid vaccination	Proportion of women with a live birth in the last 2 years who received at least 2 doses of tetanus toxoid vaccine during the last pregnancy	Household surveys	X		
	IPTp** (1.3.2.13) ITNs (1.3.2.8)	IPTp	Proportion pregnant women living in malaria endemic areas and receiving IPT for malaria (at least two doses of SP) or sleeping under an ITN during their last pregnancy	Household surveys	X		
		Syphilis detection and treatment	Proportion of pregnant women screened for syphilis with the rapid plasma reagent	Calculation in LiST based on antenatal care 4 visits			X

					X		
			test and treated with 2.4 miu benzathin penicillin, if needed				
		PMTCT – prevention of mother to child transmission of HIV	Proportion of HIV+ pregnant women receiving prenatal prophylaxis – single dose Nevirapine, dual ARV, HAART	National country programme data, UNAIDS/PEPFAR	X		
Childbirth & Immediate Newborn Care		Facility based births	Proportion of infants delivered in a facility	Household surveys			X
	Skilled birth attendance (1.3.2.21)	Skilled birth attendance	Proportion of births attended by skilled health personnel (doctor, nurse, midwife, auxiliary midwife)	Household surveys			X
		Essential care for all women and immediate essential newborn care		Calculation in LiST based on facility delivery			
		Basic emergency obstetric care (clinic)		Calculation in LiST based on facility delivery			
		Comprehensive emergency obstetric care		Calculation in LiST based on facility delivery			
		Clean birth practices	Proportion of neonates delivered with appropriate clean birth practices	Calculation in LiST based on facility delivery			
		Immediate assessment and stimulation	Proportion of neonates with appropriate drying and stimulation immediately after birth	Calculation in LiST based on facility delivery			
		Labour and delivery management		Calculation in LiST based on facility delivery			
		Neonatal resuscitation	Proportion of newborns with access to detection of breathing problems and resuscitation	Calculation in LiST based on facility delivery			
		Antenatal corticosteroids for preterm labour	Intramuscular injection of betamethasone sodium phosphate to women with suspected premature labor	Calculation in LiST based on facility delivery			

Category	Indicator	Sub-indicator	Definition	Data source			
		Antibiotics for PRoM	Administration of oral erythromycin to women with premature rupture of membranes who are not in labor to prevent PROM	Calculation in LiST based on facility delivery			
Breastfeeding	Breastfeeding initiation** (1.3.2.23)	Breastfeeding initiation	Proportion of newborns put to the breast within one hour of birth	Household surveys	X		
	Exclusive breastfeeding prevalence (0-5 months)** (1.3.2.24)	Exclusive breastfeeding prevalence (0-5 months)	Proportion of infants aged 0-5 months of age who are exclusively breastfed: 0-<1 month, 1-5 months	Household surveys	X		
	Complementary feeding (1.3.2.25)	Complementary feeding	Proportion of infants aged 6-8 months of age who are breastfed and receive complementary food	Household surveys	X		
Preventive care	Preventive postnatal care - includes thermal care and clean postnatal practices (1.3.2.26)	Preventive postnatal care - includes thermal care and clean postnatal practices	Proportion of mothers who received a postnatal care visit within two days of birth	Household surveys			X
	Vitamin A supplementation** (1.3.2.5.1)	Vitamin A supplementation	Proportion of children 6-59 months who received at least one high dose Vitamin A supplement in the last 6 months	Household surveys	X		
		Zinc supplementation	Proportion of children 6-59 months receiving full coverage with zinc	Household surveys			X
	Improved water source (1.3.2.28)	Improved water source	Proportion of the population using improved drinking water sources	Household surveys			X

		Improved sanitation – utilization of latrines or toilets	Proportion of homes with access to an improved latrine or flush toilet	Household surveys			X
		Hand washing with soap	Proportion of mothers washing their hands with soap appropriately	No national level data available. Set at 17% (global average)			X
		Hygienic disposal of children's stool	Proportion of children whose fecal matter is adequately contained	Household surveys			X
	ITN ownership** (1.3.2.9)	ITN ownership	Proportion of children under 5 years of age sleeping under an insecticide treated net the previous night	Household surveys	X		
Vaccines		BCG	Proportion of children 12-23 months of age who received 1 dose of BCG vaccine	Household surveys			X
		Polio	Proportion of children 12-23 months of age who received 3 doses of polio vaccine	Household surveys			X
	DPT3** (1.3.2.7)	DPT3	Proportion of children 12-23 months of age who received the third dose of DPT or Pentavalent vaccine	Household surveys	X		
		Hib	Proportion of children 12-23 months of age who received the third dose of Haemophilis influenza type B (Hib) vaccine	Household surveys			X
		HepB	Proportion of children 12-23 months of age who received the third dose of Hepatitis B vaccine	Household surveys			X
		Pneumococcal	Proportion of infants having received three doses of pneumococcal vaccine	No national level data available. Set at 0 for baseline			X
		Rotavirus	Proportion of infants having received three doses of rotavirus vaccine	No national level data available.			X

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				Set at 0 for baseline			
	Measles** (1.3.2.6)	Measles	Proportion of children 12-23 months of age who received measles vaccine	Household surveys	X		
Curative care		Kangaroo mother care	Proportion of low birth weight infants with access to kangaroo mother care	No national level data available. Set at 0 for baseline			X
		Oral antibiotics: case management of severe neonatal infection	Proportion of neonates with suspected pneumonia, sepsis or ARI in the two weeks preceding the surveys treated with antibiotics	No national level data available. Set at 0 for baseline			X
		Injectable antibiotics: case management of severe neonatal infection	Proportion of neonates with suspected pneumonia, sepsis or ARI in the 2 weeks preceding the surveys treated with antibiotics	No national level data available. Set at 0 for baseline			X
		Full supportive care: case management of severe neonatal infection	Proportion of neonates with serious infection with facility based care	Data not available – LiST uses same proportion as facility deliveries			X
	Diarrhoea** (1.3.2.12.4) (1.3.2.12.5) (1.3.2.12.6)	Oral rehydration solution	Proportion of children under five years of age with diarrhoea in the last two weeks who received ORS	Household surveys	X	X	
		Zinc for treatment of diarrhoea	Proportion of children under five years of age with diarrhoea in the last two weeks who received zinc	Household surveys		X	
		Antibiotics for treatment of dysentery	Proportion of children with dysentery treated with antibiotics	Household surveys, if available, otherwise set at 50% of ORS			X
	Pneumonia** (1.3.2.11.2) (1.3.2.11.3)	Case management of pneumonia in children	Proportion of children under five years of age with ARI symptoms in the last two weeks whose mothers/caregivers sought care	Household surveys		X	

	Intervention	Indicator	Data source			
	Vitamin A for treatment of measles	Proportion of measles cases treated with vitamin A.	Set at level of vitamin A supplementation Household surveys			X
Malaria** (1.3.2.10.3)	Malaria	Proportion of children under five years of age with fever in the last two weeks who received appropriate treatment (as per national policy)	Household surveys		X	
	Therapeutic feeding for severe wasting	Proportion of wasted children receiving therapeutic feeding	No data available – set at 0		X	
	HIV treatment	Cotrimoxazole ART	Country programme data, UNAIDS/PEPFAR			X

Appendix D: Detailed costing tables

Treatments APE per Year:	Total # Treatments all APEs	Total number APEs	# Treatment per Year /APE	% Treatments for under 5	# Treatments <5 per Year /APE	Share
Malaria	51 044		56.4		39.5	40%
Diarrhea	37 183		41.1		28.8	29%
Pneumonia	40 231		44.5		31.1	31%
Autres conditions			-		-	0%
Total	128 458	905	142	70%	99.4	100%

Treatment Protocol	Medicine & Tests	Quantity per Treatment	Proportion cases	Unit Cost US$	Cost per treatment
Malaria, incl RDT	ACT		50%	0.62	0.31
			50%	1.1	0.55
	ACT average				0.86
	RDT	1	150%	0.41	0.62
	Average Malaria				1.48
Diarrhea	ORS sachet	2	100%	0.076	0.15
	Zinc	10	100%	0.015	0.15
	Average Diarrhea				0.30
Pneumonia	Amoxycillin 125mg	15	20%	0.017	0.05
	Amoxycillin 250mg	15	80%	0.023	0.28
	Average Pneumonia				0.33

Fixed Cost per APE for CCM <5

Training	Days	Cost per Training	Life Years	Annualised Cost (A)	Attrition Rate	Annualised Cost (B)
Initial ICCM Training	23	628.3				
Training Materials		16.2				
Refresher						
Total per APE		644.5	5	128.9	3.75%	133.73

	Month	Year	Annual for CCM<5
Subsidy/ APE	40	480	221.76

Equipment Cost per APE	Unit Cost	Life Years	Annualised Cost
Kit excl medicines	72.996	3.0	24.33
Registers, stationary			17.00
Bicycle	100	3.0	33.33
Total			74.67

Supervision and Management

Number APEs per District	25

Training of Supervisors & Co-ordinnators	Days	Cost per District	Life Years	Annualised Cost	Attrition Rate	Annualised Cost (B)	Annualised Cost per APE
Orientation and Supervision for 25 APEs		4 598.2	5	919.6	3.0%	947.23	37.9
Facilitators		9.6	5	1.9	3.0%	1.98	0.1
Total							38.0

Allowances for supervision			
Per Diem + Transport	Annualised Cost per District	Annualised Cost per APE	Annualised Cost per APE CCM <5
District Co-ordinnator	12 000.0	480.0	221.8
Provincial Co-ordinator	1 400.0	56.0	25.9
National Co-ordinators	416.7	0.5	0.2
Total		536.5	247.8

Time on CCM under 5 per APE				
Current number of treatments	Per Home Visit	Per Month	Per Year	Per Week
Average Time per home visit in hrs	0.5		49.7	
Average travel Time per home visit in hrs	0.5		49.7	
Other (meetings, transport patient)		3	36.0	
Total			135.40	2.60

Meetings: supervision and collection drugs, part refresher training

Time for meetings assumes that only a portion of these meetings is for ICCM

Increased Efficiency by APE	By APE for Under 5s		
	2012	With 15% increase in treatmts / APE	With 30% increase in treatmts / APE
Number Treatments Under 5 / Year / APE	99	114	129
Hours on CCM program / Week	2.6	2.9	3.2

	2007	2008	2009	2010	2011
Total Health Expenditure per capita in current US$	21.96	24.35	26.62	24.82	35.43
Public Health Expenditure : Gvt own + External					
as % Total Health Expenditure	58.97	52.92	44.62	52.84	41.47
as % of Government Expenditure	12.78	10.50	8.57	10.37	7.75
as % of GDP	3.52	2.91	2.79	3.32	2.75
Per capita (current US$)	12.95	12.88	11.88	13.12	14.69
% Government own funding	47.20	33.51	37.71	38.05	30.66
% External (Donors)	52.80	66.49	62.29	61.95	69.34

Appendix E: List of APE tasks

Health Promotion:

Explain why mothers should go to the clinic for antenatal care and childbirth;

Describe the potential consequences of the lack of ANC and childbirth at home;

Describe the main methods of preventing transmission of HIV infection, with emphasis on vertical transmission;

Explain the importance of proper immunisation of children and pregnant women;

Describe the benefits for mothers and their children breastfeeding, good weaning practices and nutrition;

Explain how to prepare nutritionally adequate foods during weaning based on ingredients available in their communities;

Explain the benefits for mothers and children the proper spacing between pregnancies, highlighting the various methods of family planning available for this purpose;

Explain the importance of monitoring the evolution of weight and growth in child health;

Use the materials provided to educate community members about the precautions to take during pregnancy, breastfeeding, child nutrition , immunization, prevention of HIV transmission (during pregnancy) and the spacing of children;

Knowing how to record activities performed in the community and use the existing forms for this purpose, must know how to prepare activity reports as required;

Objectives of health promotion and health education, Importance of repeating and reinforcing the need for behavior change, and importance of praise and recognize the progress made in the community;

Signs and symptoms that require urgent transfer to a pregnant woman facility of reference;

Explain the importance of hand washing and personal hygiene in preventing some common diseases in the community;

Explain the importance of sanitation in preventing some diseases common in the community;

Explain the importance of preserving water quality suitable for consumption in the prevention of common diseases;

Describe, in general terms, the causes and mechanisms of transmission of malaria, diarrhoeal diseases, tuberculosis and other respiratory infections, and of sexually transmitted infections, including HIV infection;

Describe the main methods of preventing the transmission of malaria, TB, diarrhoeal diseases, HIV infection and other sexually transmitted diseases;

Using the materials provided during the course (posters, etc.) To educate community members on the prevention of malaria and diarrhoea, tuberculosis, HIV and other sexually transmitted diseases, and the importance of proper handling of household waste (from the perspective family and communal).

Treatment:

Managing cases of uncomplicated malaria using rapid testing and first-line treatment;

To handle the non-complicated cases of diarrhoea using oral rehydration salts;

Identify cases of cholera in the community and transfer to medical units

Guide patients on the need for a hydration and other appropriate hygienic care not to spread the disease in community

To handle the non-complicated cases of acute respiratory infection (ARI) in children under five years of age using oral antibiotics;

Handling cases that require basic first aid / basic observing good biosecurity practices;

Identify suspected cases of tuberculosis, leprosy, HIV infection and other sexually transmitted infections and transferring knowledge to health unit reference;

Use correct protocols for transferring cases of serious illness or they are outside its scope of knowledge and skills;

Develop a referral note from a patient and know the importance of transferring patients in a timely manner

Appendix F: APE kit contents

<u>Kit 1</u>

Ferrous salt 60mg iron tabs/PAC-1000	1
Paracetamol 500mg tabs/PAC-1000	1
Mebendazole 500mg chewable tabs/PAC-100	1
New formula Oral reh.salts,1L s/BOX-100	2
Benzyl benzoate 25% lotion /BOT-1000ml	1
Tetracycline eye ointment 1%/TBE-5g	25
Chlorhexidine conc. sol. 5%/BOT-1000ml	1
Tape,adhesive,Z.O.,2.5cmx5m	3
Cotton wool,500g,roll,non-ster	2
Compress,gauze,10x10cm,ster/PAC-5	1
Bandage,gauze,8cmx4m,roll	20
Sachet,tablet,plastic,10x16cm/PAC-100	5
Zinc 20mg tablets/PAC-100	4
Amoxicillin 250mg disp.tab/PAC-100	3
Gloves, exam, latex, medium, disp/BOX-100	5
Pharmaceuticals & micronutrients	1
Pharmaceuticals & micronutrients	1
Condom, male/PAC-144	1
Soap,toilet,bar,approx.100-110g,wrapped	3
Safety box f.used syrgs/ndls 5lt/BOX-25	0.04
Safety box f.used syrgs/ndls 5lt	0.04
Condom, male/PAC-144	1

Amoxicillin 125mg disp.tab/PAC-90	1
Paracetamol 250mg disp. tabs/PAC-100	5
Gloves, exam, latex, pwdfree, medium/BOX-100	5
Safety box f.used syrgs/ndls 5lt	1

*Separate Malaria Kit also provided containing RDTs and ACTs

Appendix G: National and provincial coverage profiles

Mozambique National Profile

DEMOGRAPHICS[1]

Total population	23,050,000	Annual births	927,000
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	32,000	Maternal deaths	3,800
Under-five mortality rate (per 1000 live births)	97	Total fertility rate	5.9
Under-five deaths	113,000		

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

- Demand for family planning… 29
- Antenatal care (1+ visit) 90
- Skilled attendant at delivery 54
- Postnatal care* 12
- Exclusive breastfeeding* 43
- Measles vaccine 82

Antenatal care

ANC1+   ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	65	84	88	92	90
ANC 4+	37	53	56		51

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	44	47	58	58	55
Skilled attendant	44	48		55	54
C-section rate	2	2			5

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 12 — No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
	1	1	74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		5	2	15.4
antimalarial drugs		20	23	30
ITN	15	7	23	36

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
appropriate provider	39	55	65	50
antibiotics			22	12

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
appropriate provider	35	49	38	56
ORS	42	49		55

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are severly stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
underweight	24	24	18	15
stunted	42	41	44	43
severly stunted				

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
breastfed within 1 hour	81	65	63	77
<6 months exclusively breastfed	28	30	37	43
6-9 months introduced to food	83	79	64	70

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.

Cabo Delgado

DEMOGRAPHICS[1]

Total population	1,764,000	Annual births	75,000
Neonatal mortality rate (per 1000 live births)	31	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	2,000	Maternal deaths	300
Under-five mortality rate (per 1000 live births)	116	Total fertility rate	6.6
Under-five deaths	8,700		*Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family… 20
Antenatal care (1+ visit) 96
Skilled attendant at delivery 35
Postnatal care 11
Exclusive breastfeeding* 51
Measles vaccine 80

Percent

Antenatal care
■ ANC1+ ■ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	78	89		98	96
ANC 4+	28	55	49		56

Care during childbirth
■ Facility deliveries ■ Skilled attendant ■ C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	31	30	32	45	36
Skilled attendant	32	32		46	35
C-section rate	1	1			2

Postnatal care
Percent of women who received postnatal care within two days of childbirth (all births)

2003: 11   No Data

CHILD HEALTH

Immunization
■ Percent of children fully immunized against measles
■ Percent of children fully immunized with DPT3
■ Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	40	80	84	80
DPT3	29	69	88	68
Hib3*			74	76

Malaria prevention and treatment
■ Percent of children with fever receiving ACT
■ Percent of children with fever receiving antimalarial drugs
■ Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		6	7	10
Antimalarial drugs		13	32	13
ITN	13	7	33	50

Pneumonia treatment
■ Percent of children taken to appropriate provider
■ Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	15	64	78	Too few cases
Antibiotics			13	

Diarrhoea treatment
■ Percent of children taken to appropriate provider
■ Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	14	57		30
ORS	34	50	33	24

NUTRITION

Underweight and stunting prevalence
■ Percent of children <5 years who are underweight
■ Percent of children <5 years who are stunted
■ Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	45	34	23	21
Stunted	60	56	56	53
Sev stunted	36	37	22	27

Infant feeding practices
■ Percent of infants breastfed within 1 hour of birth
■ Percent of infants <6 months exclusivey breastfed
■ Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	63	56	39	69
Exclusively breastfed	35	40	18	51
Introduced to food*	74	71	63	

Gaza

DEMOGRAPHICS[1]

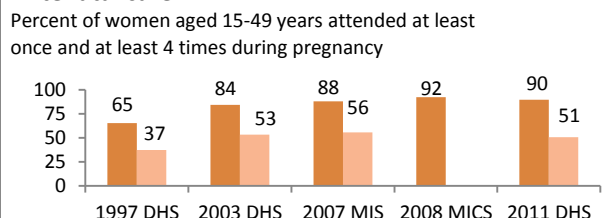|			
Total population	1,321,000	Annual births	56,000
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	1,900	Maternal deaths	230
Under-five mortality rate (per 1000 live births)	110	Total fertility rate	5.3
Under-five deaths	6,100	*Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family planning… 34
Antenatal care (1+ visit) 97
Skilled attendant at delivery 71
Postnatal care 34
Exclusive breastfeeding* 60
Measles vaccine 86

Antenatal care

ANC1+   ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	70	96	98	100	92
ANC 4+	42	66	69		61

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	66	63	73	69	71
Skilled attendant	66	60		67	71
C-section rate	2	2			4

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 34   No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	64	92	83	86
DPT3	85	90	89	89
Hib3*			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		11		12
Antimalarial drugs	17	27	22	24
ITN		2	10	10

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Taken to appropriate provider	43	60	56	Too few cases
Receiving antibiotics			23	

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Taken to appropriate provider	61	53		70
Receiving ORS	64	68	48	70

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	11	23	7	6
Stunted	36	34	34	27
Sev stunted	16	16	9	9

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	76	51	41	71
Exclusively breastfed	82	48	45	60
Introduced to food*	78	80	65	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.
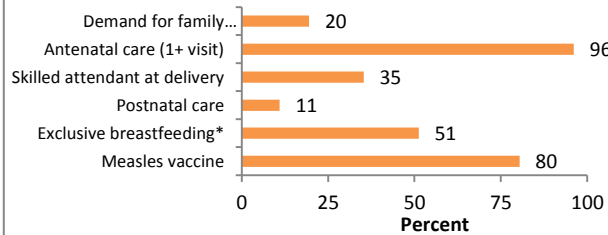
Inhambane

DEMOGRAPHICS[1]

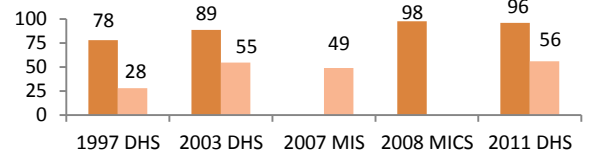|			
Total population	1,402,000	Annual births	51,000
Neonatal mortality rate (per 1000 live births)	16	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	800	Maternal deaths	210
Under-five mortality rate (per 1000 live births)	58	Total fertility rate	4.9
Under-five deaths	3,000		*Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH
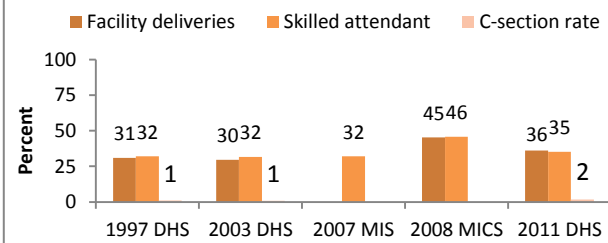
Coverage along the continuum of care

Demand for family planning... 26
Antenatal care (1+ visit) 96
Skilled attendant at delivery 59
Postnatal care 10
Exclusive breastfeeding* 32
Measles vaccine 86

(Percent)

Antenatal care

ANC1+ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	93	93	62	99	96
ANC 4+	59	56			55

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	56	50		62	58
Skilled attendant	55	49	60	59	59
C-section rate	1	1			7

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 10   No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	81	93	87	86
DPT3	83	94	91	82
Hib3			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2010 MC	2011 DHS	2012 MC
ACT			2	29	14	26
Antimalarial drugs	17	34	29	32	34	29
ITN	5	3	22		24	

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2010 MC	2011 DHS	2010 MC
Appropriate provider	56	55	70	30	Too few cases	26
Antibiotics			5			

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	45	41	30	59
ORS	55	46		57

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	14	13	12	7
Stunted	29	33	35	36
Sev stunted	13	15	13	16

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	80	60	36	77
Exclusively breastfed	81	44	42	32
Introduced to food	63	55	32	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.
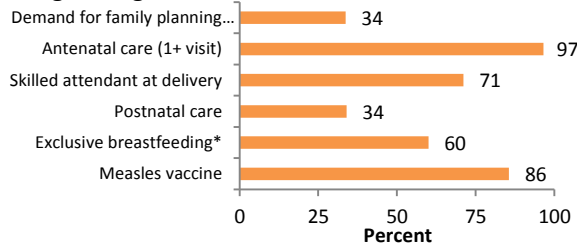
Manica

DEMOGRAPHICS[1]

Total population	1,672,000	Annual births	77,000
Neonatal mortality rate (per 1000 live births)	23	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	1,800	Maternal deaths	310
Under-five mortality rate (per 1000 live births)	114	Total fertility rate	5.8
Under-five deaths	8,800		*Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH
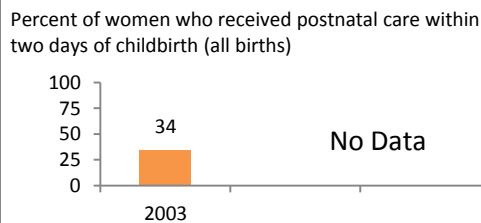
Coverage along the continuum of care

Demand for family planning… 31
Antenatal care (1+ visit) 99
Skilled attendant at delivery 74
Postnatal care 24
Exclusive breastfeeding* 29
Measles vaccine 80

(Percent)

Antenatal care

ANC1+ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	76	90	62	91	99
ANC 4+	49	63			76

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	43	56	63	57	75
Skilled attendant	44	56		53	74
C-section rate	3	0			3

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 24
No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	67	82	69	80
DPT3	63	74	75	77
Hib3*			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		6	1	10
Antimalarial drugs	14	46	29	40
ITN	7	13	15	38

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	50	80	74	Too few cases
Antibiotics			42	

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	15	60	40	49
ORS	31	31		74

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	31	23	19	11
Stunted	48	39	48	42
Sev stunted	25	22	16	18

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	93	85	62	52
Exclusively breastfed	14		34	29
Introduced to food*	92	86	63	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.
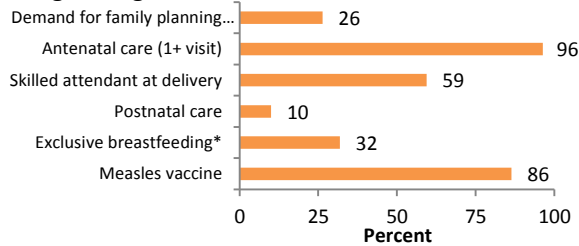
Maputo

DEMOGRAPHICS[1]

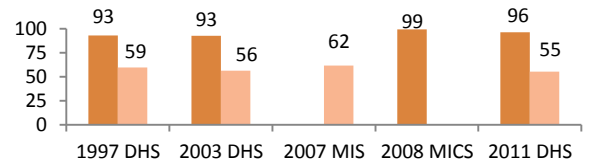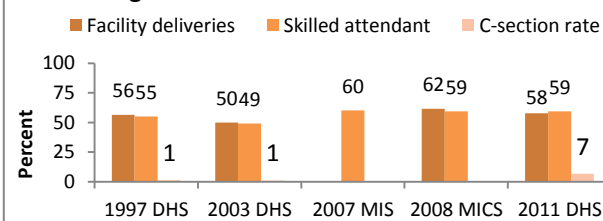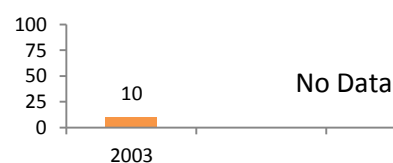|			
Total population	1,445,000	Annual births	49,000
Neonatal mortality rate (per 1000 live births)	37	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	1,800	Maternal deaths	200
Under-five mortality rate (per 1000 live births)	96	Total fertility rate	4.1
Under-five deaths	4,700	*Refers to national data, not region-specific	

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family planning… 52
Antenatal care (1+ visit) 99
Skilled attendant at delivery 84
Postnatal care 72
Exclusive breastfeeding* 51
Measles vaccine 98

Antenatal care

ANC1+   ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	93	100	77	99	99
ANC 4+	52	77			63

Care during childbirth

■ Facility deliveries ■ Skilled attendant ■ C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	76	85		75	88
Skilled attendant	76	85	84	76	84
C-section rate	8	7			10

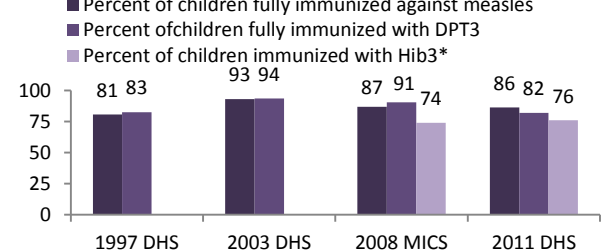### Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 72   No Data

CHILD HEALTH

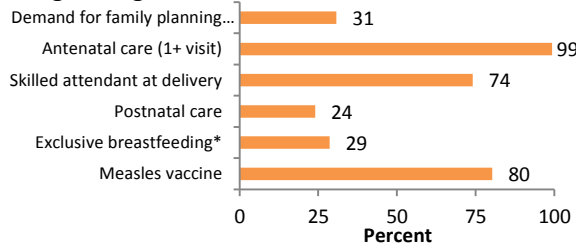### Immunization

■ Percent of children fully immunized against measles
■ Percent of children fully immunized with DPT3
■ Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	80	95	87	98
DPT3	74	98	87	97
Hib3			74	76

Malaria prevention and treatment

■ Percent of children with fever receiving ACT
■ Percent of children with fever receiving antimalarial drugs
■ Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		9	1	0
antimalarial drugs	14	13	10	3
ITN	10	0	9	22

Pneumonia treatment

■ Percent of children taken to appropriate provider
■ Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
appropriate provider	34	55	71	Too few cases
antibiotics			7	

Diarrhoea treatment

■ Percent of children taken to appropriate provider
■ Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
appropriate provider	79	52	30	47
ORS	81	73		47

NUTRITION

Underweight and stunting prevalence

■ Percent of children <5 years who are underweight
■ Percent of children <5 years who are stunted
■ Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
underweight	7	9	8	7
stunted	21	24	28	23
sev stunted	4	6	8	6

Infant feeding practices

■ Percent of infants breastfed within 1 hour of birth
■ Percent of infants <6 months exclusivey breastfed
■ Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
breastfed within 1 hour	65	67	61	59
<6 months exclusively breastfed	33	23	37	51
6-9 months introduced to food	63	86	59	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.

Maputo Cidade
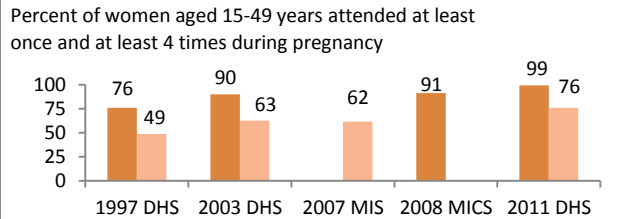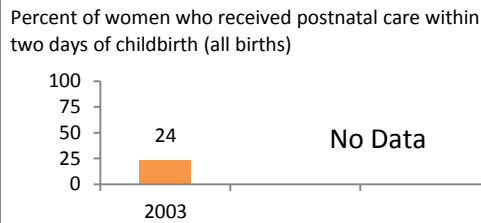
DEMOGRAPHICS[1]

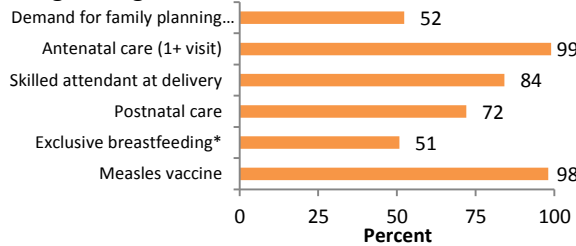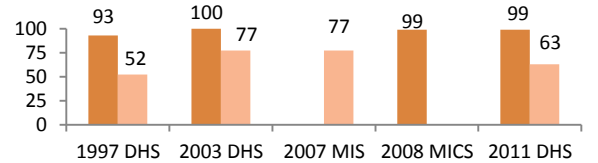|			
Total population	1,178,000	Annual births	36,000
Neonatal mortality rate (per 1000 live births)	33	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	1,200	Maternal deaths	150
Under-five mortality rate (per 1000 live births)	80	Total fertility rate	3.1
Under-five deaths	2,800	*Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

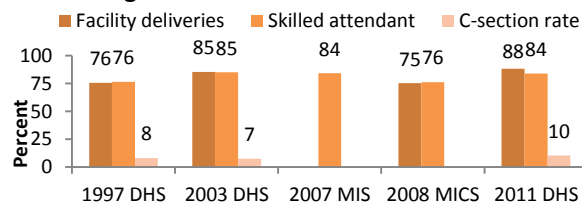### Coverage along the continuum of care

Demand for family planning… 36
Antenatal care (1+ visit) 97
Skilled attendant at delivery 91
Postnatal care 75
Exclusive breastfeeding* 44
Measles vaccine 95

Percent

Antenatal care

ANC1+   ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	99	100		100	97
ANC 4+	67	75	73		69

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	87	90	90	93	92
Skilled attendant	87	89		92	91
C-section rate	5	11			13

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 75

No Data

CHILD HEALTH

Immunization

Percent of children fully immunized against measles
Percent of children fully immunized with DPT3
Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	91	97	93	95
DPT3	88	97	90	90
Hib3*			74	76

Malaria prevention and treatment

Percent of children with fever receiving ACT
Percent of children with fever receiving antimalarial drugs
Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		0	0	7
Antimalarial drugs	12	10	7	7
ITN	18	5	16	31

Pneumonia treatment

Percent of children taken to appropriate provider
Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	66	55	47	Too few cases
Antibiotics			13	

Diarrhoea treatment

Percent of children taken to appropriate provider
Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	51	48	30	64
ORS	82	67		67

NUTRITIO

Underweight and stunting prevalence

Percent of children <5 years who are underweight
Percent of children <5 years who are stunted
Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	7	8	7	5
Stunted	29	21	25	23
Sev stunted	12	9	7	7

Infant feeding practices

Percent of infants breastfed within 1 hour of birth
Percent of infants <6 months exclusivey breastfed
Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	81	26	58	69
Exclusively breastfed	20	18	33	44
Introduced to food*	77	67	66	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.
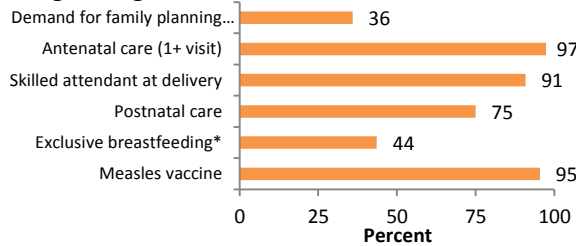
Nampula

DEMOGRAPHICS[1]

Total population	4,530,000	Annual births	193,000
Neonatal mortality rate (per 1000 live births)	15	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	2,900	Maternal deaths	800
Under-five mortality rate (per 1000 live births)	67	Total fertility rate	6.1
Under-five deaths	13,000		*Refers to national data, not region-specific*

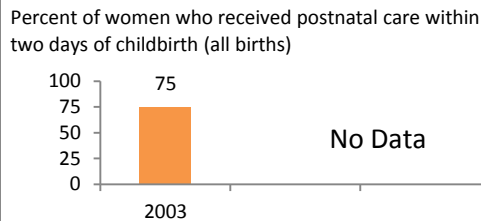## MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family planning... 5
Antenatal care (1+ visit) 93
Skilled attendant at delivery 55
Postnatal care 8
Exclusive breastfeeding* 42
Measles vaccine 83

Antenatal care

ANC1+ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	69	86		94	93
ANC 4+	36	48	28		37

Care during childbirth

Facility deliveries Skilled attendant C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	29	37		62	53
Skilled attendant	29	38	45	63	55
C-section rate	1	3			4

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 8   No Data

CHILD HEALTH

Immunization

Percent of children fully immunized against measles
Percent of children fully immunized with DPT3
Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	44	69	67	83
DPT3	47	62	64	75
Hib3*			74	76

Malaria prevention and treatment

Percent of children with fever receiving ACT
Percent of children with fever receiving antimalarial drugs
Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS	2012 SC
ACT			4	27	70
Antimalarial drugs	15	5	42	43	
ITN	5	31	34	51	72
		3			

Pneumonia treatment

Percent of children taken to appropriate provider
Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS	2013 SC
Appropriate provider	16	49	71	Too few cases	69
Antibiotics			36		43

Diarrhoea treatment

Percent of children taken to appropriate provider
Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS	2013 SC
Appropriate provider	40	58	39	74	61
ORS	30	56		63	59

NUTRITION

Underweight and stunting prevalence

Percent of children <5 years who are underweight
Percent of children <5 years who are stunted
Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	27	28	28	16
Stunted	45	42	51	55
Sev stunted	28	24	30	30

Infant feeding practices

Percent of infants breastfed within 1 hour of birth
Percent of infants <6 months exclusivey breastfed
Percent of children 6-9 months introduced to food*

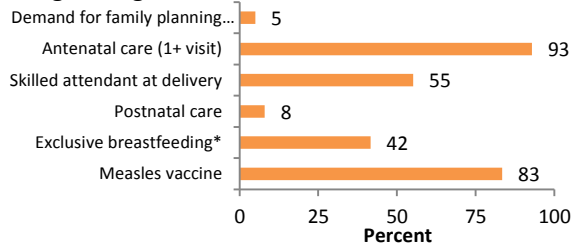|	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	77	70	67	89
Exclusively breastfed	2	7	40	42
Introduced to food*	88	83	62	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.

Niassa

DEMOGRAPHICS[1]

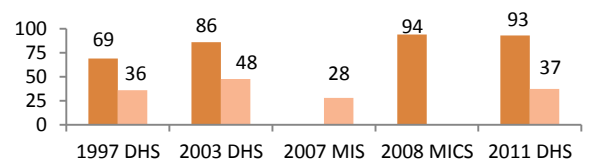|			
Total population	1,415,000	Annual births	60,000
Neonatal mortality rate (per 1000 live births)	28	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	1,700	Maternal deaths	250
Under-five mortality rate (per 1000 live births)	101	Total fertility rate	7.1
Under-five deaths	6,100	*Refers to national data, not region-specific	

MATERNAL AND NEWBORN HEALTH
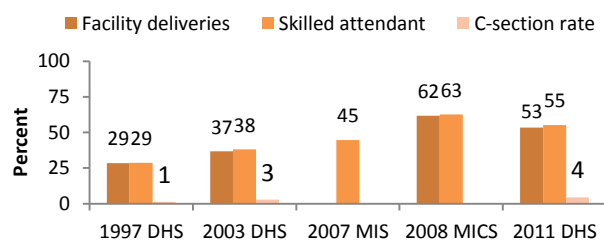
Coverage along the continuum of care

Demand for family planning… 12
Antenatal care (1+ visit) 90
Skilled attendant at delivery 61
Postnatal care 6
Exclusive breastfeeding* 27
Measles vaccine 88

Percent

Antenatal care

ANC1+   ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	68	81		97	90
ANC 4+	45	58	51		37

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

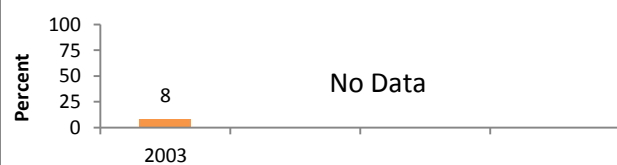|	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	44	46		75	61
Skilled attendant	46	47	69	66	61
C-section rate	3	1			2

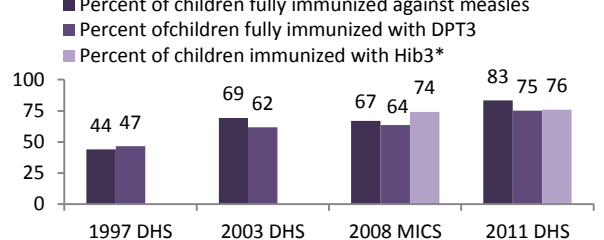### Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 6

No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	59	52	75	88
DPT3	59	55	75	83
Hib3*			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		1	0	33
antimalarial	8	20	15	44
ITN	10	9	17	39

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
provider	84	45	Too few cases	

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
provider	50	31		62
ORS	56	43	54	86

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
underweight	37	25	19	18
stunted	60	47	46	47
sev stunted	35	27	19	24

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

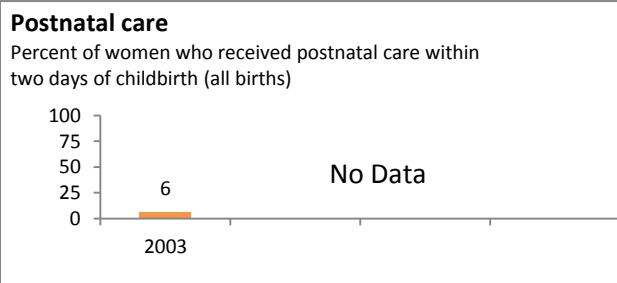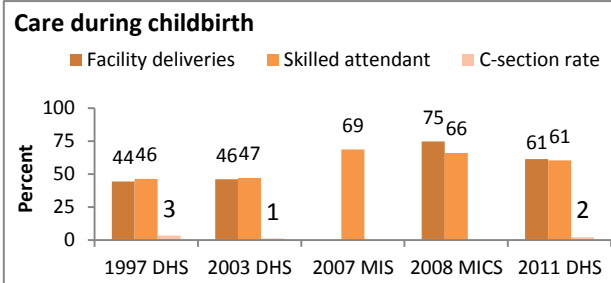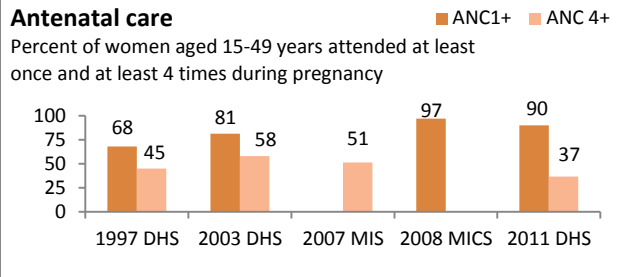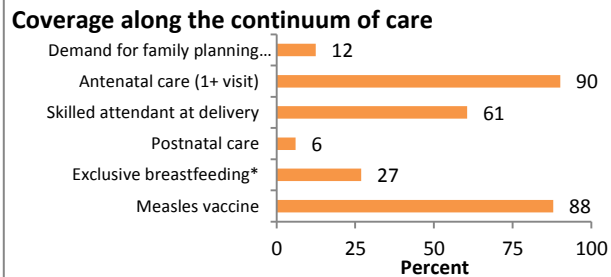|	1997 DHS	2003 DHS	2008 MICS	2011 DHS
breastfed within 1 hour	96	86	77	95
exclusively breastfed	32		53	27
introduced to food*	93	95	70	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.
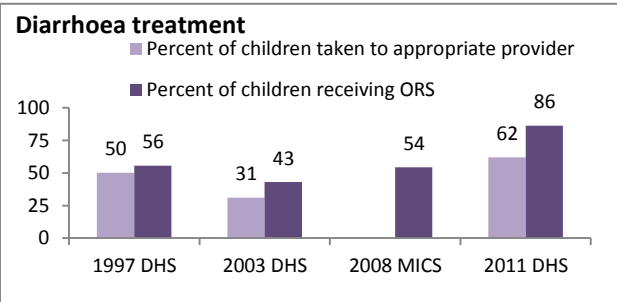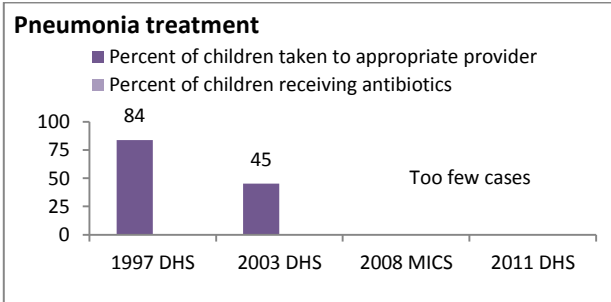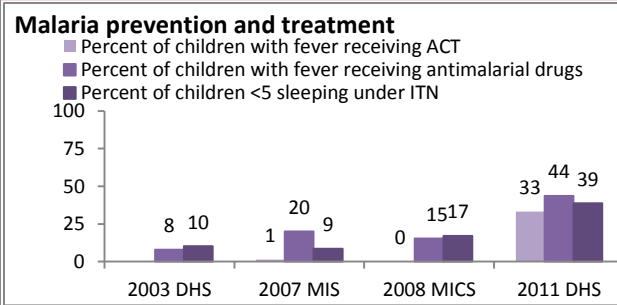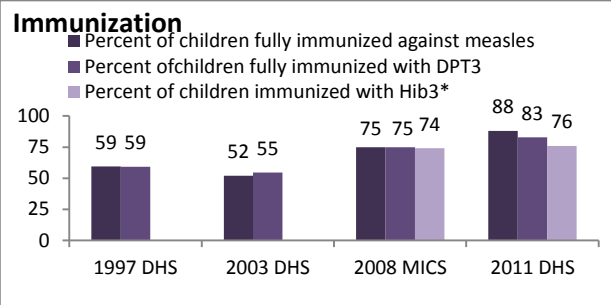
Sofala

DEMOGRAPHICS[1]

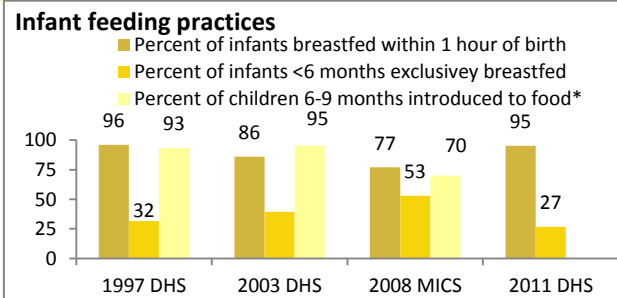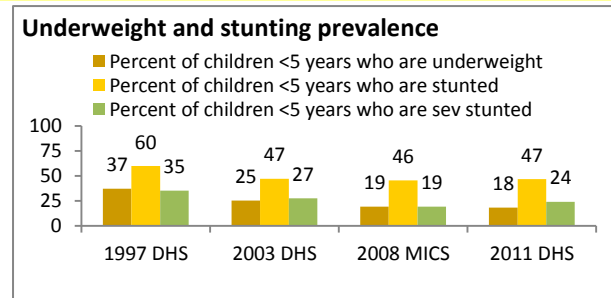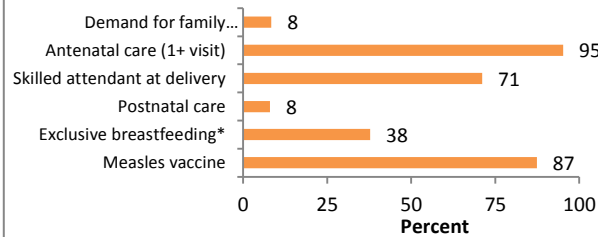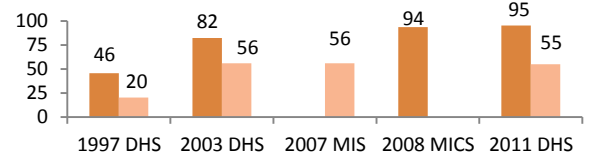|			
Total population	1,858,000	Annual births	80,000
Neonatal mortality rate (per 1000 live births)	41	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	3,300	Maternal deaths	350
Under-five mortality rate (per 1000 live births)	105	Total fertility rate	6.1
Under-five deaths	8,400	*Refers to national data, not region-specific	

MATERNAL AND NEWBORN HEALTH
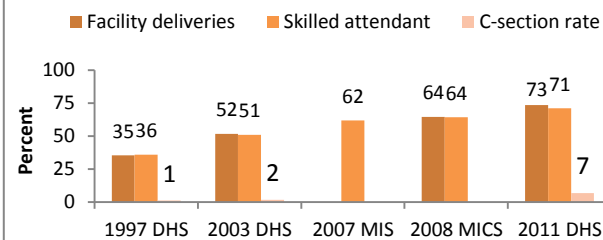
Coverage along the continuum of care

- Demand for family... 8
- Antenatal care (1+ visit) 95
- Skilled attendant at delivery 71
- Postnatal care 8
- Exclusive breastfeeding* 38
- Measles vaccine 87

Antenatal care

ANC1+ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	46	82		94	95
ANC 4+	20	56	56		55

Care during childbirth

Facility deliveries Skilled attendant C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	35	52	62	64	73
Skilled attendant	36	51		64	71
C-section rate	1	2			7

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 8

No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	61	75	83	87
DPT3	65	77	81	85
Hib3			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT			1	26
Antimalarial drugs	13	9	13	33
ITN	4	28	30	40
		12		

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Taken to provider	40	59	59	Too few cases
Antibiotics			34	

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Taken to provider	22	44		71
ORS	30	38	53	74

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	24	26	16	11
Stunted	46	42	41	36
Sev stunted	21	22	14	15

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	94	66	92	88
Exclusively breastfed	31	54	43	38
Introduced to food	97	67	69	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 and numbers applied to 2011 births from census.

Tete

DEMOGRAPHICS[1]

Total population	2,138,000	Annual births	101,000
Neonatal mortality rate (per 1000 live births)	48	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	4,900	Maternal deaths	400
Under-five mortality rate (per 1000 live births)	129	Total fertility rate	6.8
Under-five deaths	13,100	*Refers to national data, not region-specific	

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family planning... 15
Antenatal care (1+ visit) 90
Skilled attendant at delivery 52
Postnatal care 11
Exclusive breastfeeding* 40
Measles vaccine 76

Percent

Antenatal care

ANC1+ ANC 4+

Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	84	86	62	86	90
ANC 4+	43	51			44

Care during childbirth

Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	41	47	60	49	51
Skilled attendant	39	47		33	52
C-section rate	1	1			5

Postnatal care

Percent of women who received postnatal care within two days of childbirth (all births)

2003: 11   No Data

CHILD HEALTH

Immunization

- Percent of children fully immunized against measles
- Percent of children fully immunized with DPT3
- Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	65	72	60	76
DPT3	63	64	56	80
Hib3*			74	76

Malaria prevention and treatment

- Percent of children with fever receiving ACT
- Percent of children with fever receiving antimalarial drugs
- Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		3	1	12
Antimalarial drugs	27	30	26	17
ITN	12	3	15	32

Pneumonia treatment

- Percent of children taken to appropriate provider
- Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	67	62	45	Too few cases
Antibiotics			33	

Diarrhoea treatment

- Percent of children taken to appropriate provider
- Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	58	39	40	36
ORS	71	42		37

NUTRITION

Underweight and stunting prevalence

- Percent of children <5 years who are underweight
- Percent of children <5 years who are stunted
- Percent of children <5 years who are sev stunted

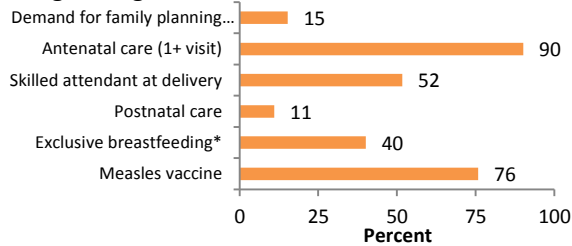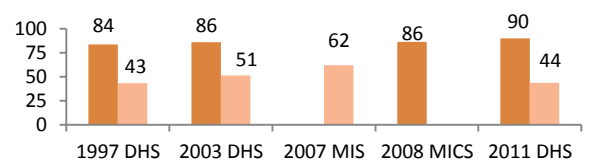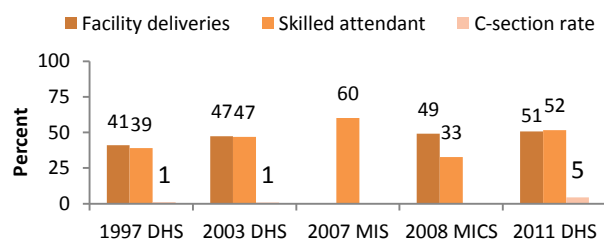|	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	43	25	19	17
Stunted	51	46	48	44
Sev stunted	27	25	19	19

Infant feeding practices

- Percent of infants breastfed within 1 hour of birth
- Percent of infants <6 months exclusivey breastfed
- Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	81	61	68	79
Exclusively breastfed	18		14	40
Introduced to food*	99	92	77	

Zambézia

DEMOGRAPHICS[1]

Total population	4,327,000	Annual births	153,000
Neonatal mortality rate (per 1000 live births)	37	Maternal mortality ratio* (per 100,000 live births)	408
Neonatal deaths	5,700	Maternal deaths	600
Under-five mortality rate (per 1000 live births)	142	Total fertility rate	6.8
Under-five deaths	21,700		*Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

Demand for family... 5
Antenatal care (1+ visit) 74
Skilled attendant at delivery 26
Postnatal care 5
Exclusive breastfeeding* 36
Measles vaccine 72

(Percent)

Antenatal care
ANC1+   ANC 4+
Percent of women aged 15-49 years attended at least once and at least 4 times during pregnancy

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ANC1+	48	58		81	74
ANC 4+	19	29	48		43

Care during childbirth
Facility deliveries   Skilled attendant   C-section rate

	1997 DHS	2003 DHS	2007 MIS	2008 MICS	2011 DHS
Facility deliveries	24	33	49	40	28
Skilled attendant	26	32		38	26
C-section rate	2	1			1

Postnatal care
Percent of women who received postnatal care within two days of childbirth (all births)

2003: 5
No Data

CHILD HEALTH

Immunization
Percent of children fully immunized against measles
Percent of children fully immunized with DPT3
Percent of children immunized with Hib3*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Measles	31	63	62	72
DPT3	30	53	62	60
Hib3*			74	76

Malaria prevention and treatment
Percent of children with fever receiving ACT
Percent of children with fever receiving antimalarial drugs
Percent of children <5 sleeping under ITN

	2003 DHS	2007 MIS	2008 MICS	2011 DHS
ACT		0	0	10
Antimalarial drugs	15	16	11	35
ITN	14	14	23	32

Pneumonia treatment
Percent of children taken to appropriate provider
Percent of children receiving antibiotics

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	30	43	Too few cases	

Diarrhoea treatment
Percent of children taken to appropriate provider
Percent of children receiving ORS

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Appropriate provider	21	27	25	52
ORS	33	23		39

NUTRITION

Underweight and stunting prevalence
Percent of children <5 years who are underweight
Percent of children <5 years who are stunted
Percent of children <5 years who are sev stunted

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Underweight	30	27	21	21
Stunted	48	47	46	45
Sev stunted	24	31	18	21

Infant feeding practices
Percent of infants breastfed within 1 hour of birth
Percent of infants <6 months exclusivey breastfed
Percent of children 6-9 months introduced to food*

	1997 DHS	2003 DHS	2008 MICS	2011 DHS
Breastfed within 1 hour	77	66	66	76
<6 months exclusively breastfed	2	34	47	36
6-9 months introduced to food*	76	72	62	

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[1] Population, births, maternal mortality data collected from Mozambique's 2007 Census projected data for 2011. Neonatal and under-five mortality rates as well as total fertility rate are collected from Mozambique DHS 2011 an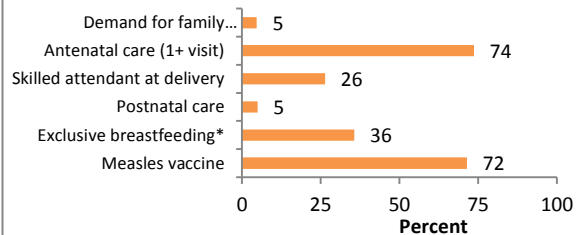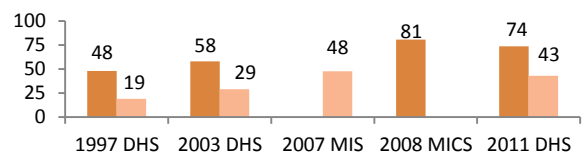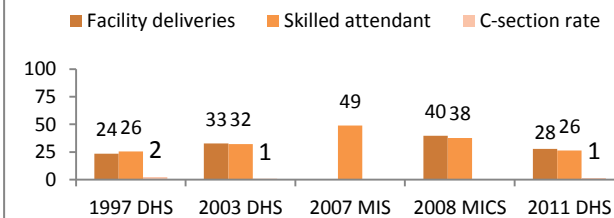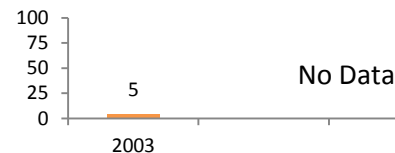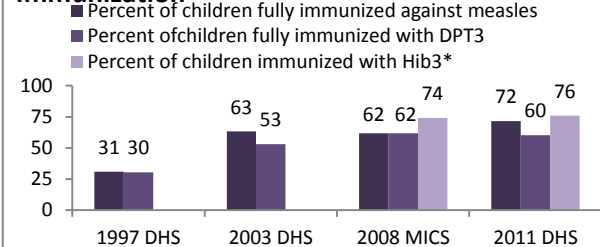d numbers applied to 2011 births from census.