

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

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Children



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ACRONYMS

ACSD	Accelerated Child Survival and Development
ACT	Artemisinin-based combination therapy
ANC	Antenatal care
CI	Catalytic initiative
CHAM	Christian Health Association of Malawi
CHO	Community Health Outreach
CHW	Community Health Worker
DFATD	Department of Foreign Affairs, Trade, and Development
DHS	Demographic and Health Survey
DTP	Diphtheria, Tetanus, Pertussis vaccine
EBF	Exclusive breastfeeding
EHP	Essential Health Package
EPI	Expanded Program of Immunisation
FGD	Focus group discussion
GAVI	Global Alliance on Vaccines and Immunisation
GDP	Gross domestic product
GoM	Government of Malawi
HCT	HIV Counselling and Testing
HII	High Impact Interventions
HIPCI	Highly Indebted Poor Countries Initiative
HMIS	Health Management Information System
HSA	Health surveillance assistant
iCCM	Integrated community case management of common childhood illnesses
IMCI	Integrated Management of Childhood Illnesses
IHSS	Integrated health systems strengthening
IP	Implementing partner
IPTp	Intermittent preventive treatment of malaria in pregnant women
IRS	Indoor residual spraying
ITN	Insecticide treated net
JHU	Johns Hopkins University
LDC	Least Developed Countries
LiST	Lives saved tool
LLIN	Long-lasting insecticidal net
LQAS	Lot Quality Assurance Survey
MDGs	Millennium Development Goals
MDP	Malaria, Diarrhoea, Pneumonia
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
M&E	Monitoring and evaluation
MCWH	Maternal, child and women's health
NMR	Neonatal mortality rate
ORS	Oral rehydration salts
PCV	Pneumococcal vaccine
PHC	Primary health care
PMNCH	Partnership for Maternal, Newborn and Child Health
PNC	Postnatal care
PRSP	Poverty Reduction Strategy Paper
RED	Reach Every District
RDT	Rapid Diagnostic Test

RHU	Reproductive Health Unit
SP	Sulfadoxine-pyrimethamine
SWAp	Sector Wide Approach
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VHC	Village Health Committee
WASH	Water, sanitation and hygiene interventions
WHO	World Health Organization

EXECUTIVE SUMMARY

Background

Malawi is a landlocked country in southeast Africa and one of the least-developed countries (LDCs) in the world which received 90% debt relief under the Highly Indebted Poor Countries Initiative (HIPCI) in 1999. While the government provides administrative control and leadership to the Malawi health system, much of the financing comes from donors. The Government of Malawi (GoM) contributes less than 50% of the total expenditure on health, with development partners contributing about 52%¹. However, external donors' current contribution to the total health expenditure has been severely reduced from 97% in 2009² and reflects a decrease in the country's dependence on external resources for financing health care. Furthermore, the Ministry of Health's commitment to improving the health system of the country is shown in the increases in government expenditure observed in recent years². From 2002 to 2011, the per capita total expenditure on health increased from \$27.2 to \$77.0, and per capita government expenditure on health increased from \$16.4 to \$56.5². UNICEF contributes 10% to the health budget, while the Canadian International Development Agency (DFATD) contributes 1%³.

The Integrated Health Systems Strengthening (IHSS) programme was established in Malawi in 2007 with support and funding from DFATD and UNICEF. The programme built on the Essential Health Package (EHP) programme led by the GoM, which sought to prioritise and strengthen community participation and the delivery of free community health services through increasing access to high impact interventions (HII) targeting maternal and child mortality. The IHSS programme aimed to strengthen the Malawi health system's capacity to reduce maternal and child mortality through several mechanisms including: task-shifting essential maternal and child oriented health care services to community health workers (CHWs) called Health Surveillance Assistants (HSAs) who operate from 'village clinics' and who are trained to manage and treat common childhood illnesses, supporting distribution of vaccinations, vitamin A supplementation and long-lasting insecticide treated nets (LLINs) through Child Health Days and campaigns, and training clinicians and nurses in Integrated Management of Childhood Illnesses (IMCI). IHSS programme funds from UNICEF/DFATD were used to prioritise the HSA programme in 10 districts which contain 48% of the total Malawi population and which have hard-to-reach areas with poor indicators of infant, child and maternal health.

HSAs are government salaried workers who are deployed to the 28 districts of Malawi to deliver integrated community case management of common childhood illnesses (iCCM) interventions and other outreach services. Malawi has a long history of using CHWs to deliver community health services. Before iCCM was adopted as policy and HSAs trained in curative care, HSAs were employed as environmental health assistants, serving a preventive role conducting community outreach programmes related to water, sanitation and health promotion. With the advent of iCCM, the curative role was added to their responsibilities.

In the 10 IHSS programme districts HSAs receive general training over a 12 week period followed by 6 days of specific training on iCCM. They are required to have 12 years of schooling in order to apply to be trained as an HSA. HSAs split their working week between the health post or village clinic and community based outreach work. HSAs are regarded as the backbone of the health system in Malawi.

Since the implementation of the IHSS programme in 2007, UNICEF, through IHSS programme funds, has made a significant contribution, financial and technical, to ensuring the training of many HSAs and facility-based staff in iCCM. Of the 1,796 HSAs operating in the 10 IHSS programme districts, 1,645 received basic training, through IHSS programme funding. This is 92% of all HSAs deployed to hard to reach areas in the 10 IHSS programme districts and 16% of all 10,451 HSAs in Malawi. The IHSS programme funded iCCM training for 1,018 (56%) of HSAs in hard to reach areas of the 10 IHSS programme districts and 48% of all HSAs (3,722) trained in iCCM in Malawi. In addition, 3,946 nurses/clinicians received IMCI training through IHSS programme funding. The IHSS programme also supported procurement of medicines and supplies including insecticide treated nets (ITNs), oral rehydration salts (ORS), zinc, cotrimoxazole, Fansidar, Artemisinin-based combination therapy drugs (ACTs), drug box supplies and bicycles.

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 System⁴.

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”⁵. As the IHSS programme has come to an end, this external evaluation is intended to fulfill this requirement and is pursuant to the terms the terms of the document “Request for Proposal of Services” (the terms of reference for the external evaluation) signed by DFATD and UNICEF⁶.

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 Malawi.
- To inform programme and policy decisions in Malawi 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 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 hard to reach areas in ten districts of Malawi. Similar programmes are, however, operating through the Government of Malawi in all 28 districts. 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 MOH of Malawi, 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^{7,8} in that quantitative, qualitative and economic evaluation methods were utilised. Data sources for the coverage and LiST analyses included the Malawi Demographic and Health Survey (DHS) 2000, the Malawi Multiple Indicator Cluster Survey (MICS) 2006, the DHS 2010 and the 2012/13 Lot Quality Assurance Survey (LQAS). The endline data source for the 10 IHSS programme districts was the 2012/13 LQAS household survey. Coverage data for all 10 IHSS programme regions was only available from 2006 onwards. In the DHS 2000, survey data for 4 of the 6 IHSS programme districts were available in the Central and Northern regions with no data for the 4 Southern region IHSS programme districts. For analysis of coverage, trend analysis was performed using a non-parametric test of trend across years and wealth quintiles for all available household surveys.

Data to assess implementation strength, utilisation and quality of care were taken from routine programme data collected by UNICEF as well as a Johns Hopkins survey in Balaka district and a quality of care survey in 6 of the 10 IHSS programme districts. The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework⁹.

Using household survey data as indicated above, 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 over three time periods: pre-IHSS, and phase I and phase II of the IHSS programme.

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 curative interventions by HSAs for the treatment of malaria, diarrhoea and pneumonia in children under 5. It also assessed the

financial sustainability of the programme in relation to current utilisation and anticipated increased future levels of utilisation. Costs are expressed in US\$ 2012.

A cost per life saved was not calculated, for several reasons. 1. The methodology for assessing lives saved using 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 programme 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 intervention. Not being able to quantify the total cost of health system strengthening, in particular at health post 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. Contextual data to support the quantitative coverage data were collected during key informant interviews and focus group discussions which were held with national stakeholders, key district personnel, HSAs, their supervisors, beneficiaries and community based structures involved in supervision (senior HSAs). The team visited two districts for field work, Kasungu and Mzimba, in addition to spending three days in Lilongwe.

Each set of data, i.e household survey, qualitative, costing and LiST, was analysed and reported on independently. The analyses and their separate findings are brought together and synthesised in this report.

Findings

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?

The Government of Malawi, through the Ministry of Health (MOH), has created a policy environment that is conducive to implementing programmes such as the IHSS programme. Particular policy strengths of the MOH include a strong commitment to community level health care, as demonstrated in the way it has embraced iCCM and integrated it into the health system, and a long history of CHW-led services. Thus, the IHSS programme has built upon a stable health system that prioritises free primary level care and integration.

The MOH has also played a leadership and coordinating role in terms of partners and donor agencies which fund and support its health system, and this has ensured that IHSS programme activities are aligned with the national priorities.

Gender inequality remains a challenge, with female workforce in the HSA programme remaining at a low 28% for the 2011-2012 reporting period. More efforts are, thus, needed to address and reduce barriers to female participation. The IHSS programme has included a gender equality focus by delivering interventions known to be effective for addressing gender dynamics, such as making services more accessible to carers of children, interventions promoting accessing households directly through home visits and seeking to mobilize and engage communities for improving child health and nutrition outcomes.¹⁰

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?

More than a third (36%) of the 10,451 HSAs operating in Malawi's 28 districts have been trained in iCCM. IHSS programme funds were used to provide basic training to 1,645 HSAs and training in iCCM to 1,018 HSAs who were deployed to the 10 IHSS programme districts. The training fell slightly short of the target (1,470 HSAs trained in iCCM). However, in addition to the training of HSAs, the IHSS programme also funded the training of 3,946 nurses/clinicians in IMCI. Our qualitative data show that HSAs recognise and value the role that they play in reducing maternal and child mortality. Communities in turn appreciate the difference that has been made by the programme in the management of childhood illnesses since the implementation of iCCM.

However, there are several areas of the programme that need to be addressed. HSA selection and deployment, where it concerns the posting of HSAs outside their catchment areas, presents a major threat to the availability and accessibility of HSAs, mainly due to the lack of housing for HSAs. A planned solution to this problem is for the government to construct new houses for HSAs in the communities they are deployed to.

Furthermore, the HSA to population ratio in many districts remains far below the official ratio of 1:1000, with HSAs serving populations of 1500 to 2000. These ratios may result in lower overall utilisation if families have to travel longer distances and the risk that hard to reach/vulnerable families might be missed. Supervision frequency is also a major concern with many HSAs receiving one-on-one supervision on iCCM about once every three months. The most recent routine data (ending May 2013) shows low levels of HSAs supervised in iCCM in the last three months (53%), similarly low numbers

supervised by a supervisor trained in iCCM in the last three months (53%), and even fewer HSAs who had been observed in case management as part of iCCM supervision in the last three months (48%). This has, however, improved since 2009 when a quality of care survey, undertaken in 6 of the 10 IHSS programme districts, found that only 38% of HSAs received supervision from an iCCM trained supervisor in the previous 3 months.¹¹ Issues related to transport, clarity of supervision roles, and workload are some of the challenges preventing senior HSAs tasked with supervising HSAs from carrying out their duties.

UNICEF, through IHSS programme funds, has played a significant role in ensuring the provision and replenishment of supplies for iCCM. This was especially the case during the economic crisis period 2010-2011, where there were many stock-outs, as a result of fuel and currency shortages, and lack of funds from the MOH. However, supply chain issues and stock-outs continue to be a challenge in Malawi. Innovations in supply chain management such as 'cStock', a mobile phone platform, present promising opportunities for improving the management and supply of medicines and supplies.

This evaluation has found low utilisation of HSAs which should be interpreted in light of the fact that the programme had only been at scale for 11 months at the time of the endline survey. In 2013, in the IHSS programme districts only 9% of children with malaria, pneumonia and diarrhoea received care from an HSA whilst 52% received care from a health centre, despite 70% of mothers reporting that they could walk to the nearest village clinic. The LQAS survey revealed that only 36% of villages had an HSA living there, and this could be a major reason for the low utilisation since the vast majority of villages have HSAs who travel in to hold their village clinics, thus reducing their availability.

Improvements in the IHSS programme period in the 10 IHSS programme districts were found with regard to rates of early initiation of breastfeeding, coverage of intermittent preventive treatment of malaria in pregnant women (IPTp), care-seeking for fever, measles immunisation and oral rehydration salt (ORS) use, where the average annual rates of increase in coverage were significantly higher in the IHSS programme period, in comparison to the pre-IHSS period. Measles and diphtheria/tetanus/pertussis (DTP3) immunisation coverage was maintained at a high level throughout the period of assessment, at rates over 80%, which required significant efforts through successful partnerships to ensure vaccination coverage rates did not decrease despite the financial and fuel crisis experienced in the country. The average annual rates of coverage change between the pre-IHSS and IHSS programme periods for the 10 IHSS programme districts were not significantly different with regard to care-seeking of suspected pneumonia, use of ITNs and DTP3 immunisation. For Vitamin A coverage, declines of around 1 percent per year occurred in the pre-IHSS period, which worsened to -3% per year during the IHSS programme period. While annual rates of change with regard to care seeking for pneumonia were comparable between the pre-IHSS and IHSS programme periods, both periods reflected large annual rates of increase of approximately 4%. Annual rates of coverage change decreased during the IHSS programme period for exclusive breastfeeding (EBF), tetanus toxoid and postnatal care. This slowdown in coverage change, with respect to tetanus toxoid, during the IHSS programme period is to be expected, as Malawi achieved tetanus toxoid elimination in 2004. Coverage of any antimalarials increased significantly, from 24% in 2006 to 56% in 2012. Data on ACT treatment was not available in the 2000 survey since the treatment was only introduced in 2007. However, after its introduction the average annual rate of increase was 9%, with coverage rising to 53% by 2012.

With regard to impact on equity, a narrowing of the gap between the richest and poorest wealth quintiles was noted with regard to postnatal care (PNC), IPTp coverage, and rates of early breastfeeding. It is plausible that the IHSS programme contributed to this improvement in equity through the deployment of HSAs to hard to reach areas and the increased availability of medicines. There was consistently better coverage for ITN and exclusive breastfeeding amongst the richest, while nearly equal access was observed throughout for tetanus toxoid, care seeking for fever, antimalarials/ACT, vitamin A and immunizations against DPT and measles.

In light of the nascent nature of iCCM, with only 11 months at scale when the endline survey was conducted, the achievements made in changes in coverage to date are impressive and show promise for the future, as the iCCM component matures and strengthens.

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 Malawi in 2010 included malaria, HIV, pneumonia and diarrhoea.¹² Changes in intervention coverage during the pre-IHSS period (2000-2006, given the IHSS programme was introduced in 2007) accounted for an estimated, cumulative 14,700 lives saved over the 6 years of the analysis, equivalent to an average of 2,450 lives saved per year. During Phase I of the IHSS programme (2007-2010), the model indicated an additional 9,791 lives were saved from IHSS programme focused interventions (72% of total deaths averted), and in Phase II (2010-2013) another 6,382 lives saved (48% of total deaths averted) due to the scale up of these interventions. When considering all changes in coverage levels across all interventions, the modelled annual rate of mortality reduction was faster in the IHSS programme period than the years preceding the IHSS programme. The interventions contributing most to lives saved during the pre-IHSS period were Hib vaccine (25%, 1013 lives saved in 2006) and ITNs (22%, 863 lives saved in 2006). During Phase I, malaria prevention (ITNs) and treatment (ACTs) and improvements to care at birth, through increases in facility deliveries, had the greatest impact on lives saved. In the iCCM period (Phase II), the introduction of the pneumococcal (PCV) vaccine contributed to 41% of deaths averted (2729 lives saved in 2013), followed by ITNs (24%, 1595 lives saved in 2013), and the case management interventions for pneumonia, diarrhoea (zinc only) and malaria together averted 20% (1,269) of deaths. With increased focus on the IHSS programme interventions and coverage gains experienced, it is plausible that IHSS programme contributed to the lives saved during phase I and II of the programme. At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time would be an underestimate of their expected number in a more mature programme.

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?

This costing focusses on additional costs, excluding costs already covered by the health services such as salaries. The additional cost of a malaria treatment, including rapid diagnostic tests (RDTs) and drugs stands at \$2.36, diarrhoea treatment with ORS and zinc costs \$0.70, and pneumonia treatment \$0.23.

By 2012, a total of 1,018 iCCM trained HSAs were deployed in the 10 IHSS programme districts (Note comment on data limitation in Methodology). Each of them provided an average of 546 malaria, diarrhoea and pneumonia (MDP) iCCM treatments between June 2012 and May 2013. The share of HSA fixed costs, training, kits, supervision and management, represents an average of 7% of the cost per treatment. With an average of 11.4 MDP treatments a week, the combined consultations and meeting time spent amounted to 9 hours a week per HSA. An increase of 30% in utilisation, due to increased demand and increased population, would translate to 11 hours a week for 19 MDP treatments. The current number of HSAs could respond to this increase.

In 2011, donors' share of public health expenditure stood at 71%. Additional costs of iCCM account for 0.9% of total public health expenditure and 3% of government health expenditure. For iCCM+ (iCCM + 15% cost for additional support to the health system) these percentages would stand at 1% of total public health expenditure and 3.5% of the government's own health expenditure. With 30% increase in treatments iCCM+, totalling US\$4,540,215, would represent 1.2% of total public health expenditure and 4.4% of the government's own health expenditure.

On the basis of available data it appears that the programme runs efficiently. Representing 3.5% of the government's own health expenditure, the current programme could continue after the end of the IHSS programme. However, it is unlikely that it could develop without support from donors, especially if it includes the government stated objective of construction of new houses for HSAs in the communities they cover in order to increase their availability. The New Funding Model by the Global Fund could go a long way in ensuring financial sustainability. We suggest that besides the inputs which have been costed, consideration be given to supporting transport. Replacing bicycles of HSAs and their supervisors, given initially upon completion of training but not replaced, every 3 years would cost \$136,473 a year, increasing the programme cost by 4%. Such expenditure could strengthen the quality of the programme as well as other programmes covered by the HSAs and their supervisors.

At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time would likely be an underestimate of their actual number in a more mature programme. The cost per life saved at this point is, thus, much higher than it would be if evaluated at a later stage, and as such the information could be potentially misleading for policy makers. Cost per life saved is, therefore, not presented.

Qualitative findings show that there is no clear plan for sustaining the programme beyond the IHSS programme period, and without other external funding and support, even though key informants at the MOH believe that the government's commitment to the programme will ensure its sustainability should external support be withdrawn. Infrastructural challenges present a real threat to sustaining the gains that have been made in the programme. Specific challenges relate to the transportation and housing of HSAs who live outside their catchment areas and transportation of HSA supervisors who need to conduct supervision in the field.

Conclusions

Relevance

The health systems strengthening approach of IHSS programme was well aligned with the health policies of the Malawi government

One of the key factors that explain the gains that have been made through IHSS programme in Malawi is the investment made in strengthening the health system through capacity building of both front line HSAs as well as facility-based staff. What was also highlighted during the evaluation is that policies, Reach Every District (RED) and Accelerated Child Survival and Development (ACSD) and health system decentralisation, which pre-dated IHSS, contributed a strong foundation upon which iCCM could be implemented. The Malawi MOH has demonstrated commitment to, and ownership of, iCCM, and the approach has been embraced and integrated into the national health system.

MOH leadership and co-ordination was an important factor in the success of the IHSS programme

A factor that was repeatedly cited as being influential to the success of the IHSS programme is the strong collaborative relationship between the MOH and international agencies and partners in Malawi. The qualitative data show UNICEF, through the IHSS programme), and other partners as having played a predominantly supporting role in health systems strengthening, and indeed in the success of iCCM in Malawi. By all accounts the MOH is seen as having played an agenda-setting and coordinating role. Given the plethora of international organisations and partners in the health field alone in Malawi, this is no small feat.

Women's participation and gender equality

Achieving gender balance at HSA level remains a problem in Malawi. At the root of this problem seems to be a lack of deliberate planning and prioritisation of female participation in community-based service delivery. However, the data also highlighted other reasons, such as cultural issues around females following their husbands, which are outside the control of MOH and which have contributed to hindering progress in achieving gender equality. Furthermore, the decision to not recruit HSAs from within the villages they will serve has immense consequences financially and with regard to gender equality and utilisation. Recruiting women to move to an assigned area and commute, with the consequent housing and transport challenges, may well be hampering the gender balance.

Literature points to the leading role of gender dynamics in health service user outcomes, including influences on child health and nutrition outcomes and service utilisation and the importance of developing interventions that address gender dynamics. The IHSS programme has captured many of the components found to be effective in addressing gender dynamics, including making services more accessible to carers of children, promoting the access of households to care through home visits and seeking to mobilise and engage communities.¹³

Effectiveness

The IHSS programme contributed to the expansion of community-based health-care for pregnant women and children through deployment of HSAs but their availability needs to be increased

The districts where iCCM is implemented by HSAs had communities who not only valued the HSAs but directly attributed the reduction in child mortality to their services. Communities were able to appreciate the importance of, and the difference made by, having HSAs who were available to treat their children, saving them time and money. However, the challenges resulting from the deployment of HSAs outside their catchment areas were many, and they were confirmed by both the qualitative and quantitative data. Having HSAs work in areas that they do not reside in is one of the few threats facing iCCM in Malawi, as it undermines the very objective of using HSAs to bring essential services to the people through ensuring their accessibility and availability to sick children 24 hours a day. A few studies have reported similar findings regarding HSAs who are deployed outside their catchment areas^{29,44}. Similar to our findings, the results of one of the studies revealed a high number of HSAs who are deployed outside the areas they live in, and, as with our findings, this was associated with reduced or minimal visits to the community and shorter working hours. The authors further point out that this approach does not adhere to WHO guidelines which emphasise the importance of having CHWs operate within the areas they live in¹⁴. Since this was a national policy it was not possible for the IHSS programme to influence or change this.

The IHSS programme strengthened the health system through training of HSAs and facility-based staff

UNICEF, through IHSS programme funds has made a significant contribution, financial and technical, to ensuring the training of many HSAs and facility-based staff in iCCM.

Of the 1,796 HSAs operating in the 10 IHSS programme districts, 1,645 received basic training, through IHSS programme funding. This is 92% of all HSAs deployed to hard to reach areas in the 10 IHSS programme districts and 16% of all 10,451 HSAs in Malawi. The IHSS programme funded iCCM training for 1,018 (56%) of HSAs in hard to reach areas of the 10 IHSS programme districts and 48% of all HSAs (3,722) trained in iCCM in Malawi. In addition, 3,946 nurses/clinicians received IMCI training through IHSS programme funding.

The IHSS programme strengthened the health system through strengthening supervision of HSAs

While field observations and discussions suggest that a significant amount of indirect supervision of HSAs might be taking place in health facilities, the infrequency of specific one-on-one supervision sessions, confirmed by both the qualitative and quantitative data, paints a different picture. In late 2009 an assessment of the quality of HSA-led iCCM provision¹⁵ reported that less than 40% of HSAs had received supervision by an iCCM trained supervisor in the last 3 months, and only 16% had clinical observation of case management by a supervisor¹⁶. However, the situation has improved since 2009 and routine UNICEF data for periods 5 and 6 (June 2011 to May 2013) shows improvement in supervision by a trained supervisor, which increased to 53%, and supervision with case management, which increased to 48%. Therefore, it seems plausible that the IHSS programme contributed to this improvement in supervision. While more improvement is needed, this is a commendable achievement.

The IHSS programme enabled the procurement, supply and distribution of medicines and commodities during a financial crisis but more systems strengthening is required

Challenges related to supply chain and stock-outs of medicines and supplies were identified as an important threat facing iCCM. One publication warns that “these disruptions [in stock] will, in the long run, undermine the credibility of the HSAs and the likelihood that families will seek care promptly when children show signs of illness”¹⁶. IHSS programme funding was critical to maintaining stock levels and transporting of supplies during the funding crisis period, which was an important contribution of the support. Recent innovations such as the ‘cStock’ mobile platform hold a lot of promise in terms of improving supply chain management but need to be augmented with other efforts.

Assessment of the contribution of the IHSS programme to coverage changes

There were significant improvements over the IHSS programme period in the 10 IHSS programme districts in rates of early initiation of breastfeeding, coverage of IPTp in pregnant women during antenatal care, care-seeking for fever, measles immunisation and ORS coverage. Despite the fuel and financial crisis between 2010 and 2011, the country has made remarkable progress in sustaining very high levels of vaccination coverage, largely attributed to intersectoral collaboration and the efforts of the HSAs. Furthermore, care seeking for pneumonia continued to rise over the past decade, with annual rates of increase of approximately 4%. With the introduction of ACTs in 2007, the country was able to rapidly scale up availability and utilization, with coverage rates having increased to over 50% by 2012.

Evidence of increased access to care can be noted in the IHSS programme districts, where the proportion of children under 5 who sought care for fever, suspected pneumonia and diarrhoea at public health facilities increased from 11% to 52% between 2000 and 2012. There is further evidence of increased access at the community level to care provided by the HSAs, with care seeking having increased from <1% in 2000, before the IHSS programme support, to 9% in 2012. This is largely attributed to the construction of village clinics and the scale up of HSAs in the country. Overall, the proportion of the population who did not access care at all for the three major childhood diseases decreased from 56%, in 2000, to 18%, in 2012. It is plausible that the IHSS programme support for training, equipping and deploying HSAs has contributed to the increases seen in care-seeking and treatment for diarrhoea, malaria and pneumonia.

Impact

During Phase I of IHSS programme (2007-2010), the model indicated an additional 9791 lives were saved as a result of IHSS programme focus interventions, and in Phase II (2010-2013) another cumulative 6382 lives saved due to the scale up of these interventions. It is plausible that the IHSS programme contributed to these additional lives saved. Considering all interventions, the modelled annual rate of mortality reduction is faster in the IHSS programme period than the years preceding the IHSS programme. The interventions contributing most to lives saved during the pre-IHSS period were Hib vaccine (25%, 1013 lives saved in 2006) and ITNs (22%, 863 lives saved in 2006). During Phase I, malaria prevention (ITNs) and treatment (ACTs) and improvements to care at birth through increases in facility deliveries had the greatest impact on lives saved. In the iCCM period (Phase II), the introduction of the pneumococcal vaccine (PCV) contributed to 41% (2729 in 2013) lives saved followed by ITNs (24%, 1595 lives saved in 2013), and the case management interventions for pneumonia, diarrhoea (zinc only) and malaria together averted 20% (1269 in 2013) of deaths. At the

time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a more mature programme.

Sustainability

The additional cost per treatment of malaria stands at \$2.33, treatment of diarrhoea at \$0.70, and treatment of pneumonia at \$0.23. The weighted average cost per treatment amounted to \$1.44. If utilisation per HSA increased by 30%, due to increased coverage and increased population, the cost per treatment would decrease only very marginally, but the costs across the programme would increase by 26%, showing that there is little economy of scale to be gained. The time implications of the increased workload could be absorbed by the existing HSAs.

If DFATD's/UNICEF's involvement ends, the additional costs of implementing iCCM for the three conditions, including the attached health system support necessary for iCCM implementation, would represent 3.5% of the government's own health expenditure. With an additional 30% treatments per HSA, this share would increase to 4.4%, and the current number of HSAs would be adequate. As such the programme could continue to function if no additional areas are added. However, the government plan to build houses in the community for the HSAs could not be funded.

As stated above, at the time of the evaluation, iCCM in Malawi had been at scale for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a more mature programme. The cost per life saved at this point would, thus, be much higher than if evaluated at a later stage, and as such the information would potentially mislead policy makers. Cost per life saved is, therefore, not reported.

While assessing the additional cost to the health service of iCCM, it is important to note that this delivery strategy is likely to save money at higher levels of the health service. Increase in care seeking at community level covers both previously unmet demand and demand made at health centres. As such this demand diverted to community level translates into lower cost in health centres. In addition, by preventing the occurrence of serious malaria, diarrhoea or pneumonia, the programme is likely to decrease the number of hospital admissions for these conditions.

Likelihood of sustainability post-IHSS

Qualitative findings on the likelihood of sustainability of iCCM in the post-IHSS period, and without external support, suggest that there is no concrete plan for the MOH to fund and sustain this delivery strategy if external partners withdraw their support. However, key informants in the MOH expressed confidence in the government's capacity to carry iCCM forward in the event that external support ends. This belief is bolstered by the commitment and leadership the Ministry of Health has already showed in integrating iCCM into the health system. Nevertheless, it is doubtful that the Government of Malawi on its own would be able to sustain implementation of iCCM given the severely limited fiscal space it has to maintain a strategy of this magnitude. As it is, even the HSA salaries that come from the government are financed through the SWAp, which itself is funded by development partners. As reported in other sections of this evaluation report, UNICEF and other partners have had to come in and provide crisis funding to limit the stock-outs that occurred during the financial crisis of 2010/2011, and indeed such crisis support has continued intermittently since then, and is likely to be called upon in the future.

Lessons learnt

Relevance

- In Malawi, iCCM has been implemented within a robust and well organised health system with an established decentralised structure which has enabled strong links between different levels of care. The MOH has also played a leadership and coordinating role in terms of partners and donor agencies which fund and support its health system, and this has ensured that IHSS programme activities are aligned to national priorities.
- Gender equality remains an issue for community-based service delivery as only 28% of the HSAs are women. Women's participation is, however, seen at higher levels of government in country level Ministry leadership.

Effectiveness

- While it is understood that the MOH changed the selection of HSAs from the community level to the national level, as a result of concerns about nepotism and fairness, it is clear that this has led to the deployment of HSAs outside their catchment areas, and this evaluation and several other publications have documented the challenges that result from posting HSAs to areas they do not reside in.
- The presence of Village Health Committees (VHCs) augments the impact of HSAs as they conduct promotive and preventive work and encourage care-seeking for the iCCM conditions. VHCs also facilitate community entry and the acceptance of HSAs, especially when an HSA is deployed to areas they do not reside in.
- The evaluation has highlighted that roughly half of HSAs don't receive quarterly supervision and even fewer receive supervision entailing observation of case management.
- The supply chain is a critical determinant of utilisation of, and trust in, the system by communities. The evaluation has found that the national supply chain system is weak, and while parallel supply chain systems are expedient in the short term, they undermine health systems strengthening. Stock-outs were identified as a major challenge facing iCCM. Routine data has revealed that roughly two thirds of HSAs had experienced stock outs of ORS and co-trimoxazole in the last three months and over half for ACTs.
- Increases in coverage were achieved for several indicators over the period of the IHSS programme. More efforts are needed with regard to postnatal care, exclusive breastfeeding and vitamin A supplementation

Impact

- The modelled annual rate of mortality reduction was faster in the IHSS programme period than the years preceding the IHSS programme.
- At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a more mature programme.
- 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, ie. calculating additional, and not full costs, of delivering iCCM, the evaluation did not calculate cost-per-life saved.

Sustainability

- If utilisation per HSA increased by 30%, with increased coverage and increased population, the cost per treatment would decrease only very marginally, but the costs across the programme would increase by 26%, showing that there is little economy of scale to be gained. The time implications of the increased workload could be absorbed by the existing HSAs.

Recommendations

Relevance

- While the MOH has been widely commended on its leadership and coordination of partners working on iCCM in Malawi, there are opportunities for more streamlined planning and tracking of who is providing what and where. There also needs to be greater harmonisation with regard to strengthening systems, especially supply chain, rather than bypassing and undermining government systems.
- One of the reasons key informants gave for the low participation rates of women in the HSA workforce was low literacy levels. During the iCCM Symposium in Accra in March 2014, one country presented an innovative approach to increasing female CHW participation rates. This approach involves the training of illiterate women with visual training materials. This strategy could be used in Malawi, and the current requirement for 12 years of schooling could be lowered to fewer years.

Effectiveness

- We recommend that the task of recruiting HSAs should either be given back to communities or at the very least be devolved to the regional or district level, where the likelihood of matching HSAs to their own areas can be increased. If this is not possible, then more efforts and resources need to be put into the erection of proper and sturdy village clinics with HSA quarters attached to them. The current reliance on communities to provide housing for HSAs with very few resources is unrealistic.
- The frequency of one-on-one supervision, including case management observation, needs to be increased. This increase will depend on addressing current challenges related to the transportation of HSA supervisors to the field and adjusting their workload to ensure that there is time to conduct proper supervision. One suggestion would be to use a simple supervision checklist that is completed during supervision and could serve as evidence of a supervision visit having taken place.
- The supply chain and stock-outs of essential commodities and supplies need to be improved, and harmonising donor support around strengthening the national systems for procurement and supply chain are critical. In this regard the roll-out of the mobile phone-based 'cStock' initiative needs to be expanded to other districts, and the knowledge and capacity of health officials responsible for supply chain management, at higher levels of the chain, need to be improved.
- Future budgeting for iCCM should include a line-item for upkeep and maintenance of HSA bicycles since these require regular parts and repairs.

Impact

- 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 presence of skilled birth attendants, have also 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 we expect to see impact, 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.
- The underlying reasons for decline in coverage of important preventive interventions (vitamin A) deserve closer scrutiny.

Sustainability

- Recognising that care-seeking patterns take time to change significantly, a new sustainability study should be undertaken when the programme has reached higher maturity. Patterns of utilisation at health centres and community level would have stabilised, and the additional costs of the programme could then be better evaluated in light of other savings in the health system.
- Given the lack of a concrete plan for the MOH to take over funding and support of the programme at the end of the IHSS programme period, such a plan should be devised before withdrawal of support, and even then it should be recognised that the fiscal reality of Malawi means that the GoM is unlikely to fund and support programmes of this magnitude on its own, and therefore some form of continued funding and support will be needed. The Global Fund's New Funding Model could go a long way in ensuring financial sustainability.

1. Background

1.1 Country context

Malawi is a landlocked country, formerly known as Nyasaland, in southeast Africa. The country has high population growth and is home to 16.7 million people, of which 2.71 million are under five. Malawi has a democratic, multi-party government led by the first female president in the country and in Southern Africa. It is also one of the least-developed countries (LDCs) in the world, and one of the countries which received 90% debt relief under the Highly Indebted Poor Countries Initiative (HIPC) in 1999. The per capita GDP declined from \$359 in 2010 to \$268 in 2012.¹⁷

Food insecurity and malnutrition are some of the serious challenges facing the people of Malawi. The Malawian economy is largely agrarian with a large rural population (84%).¹⁸ It is heavily dependent on external aid to meet its development needs although this has been decreasing since 2000.¹⁷ The period 2010-2011 plunged Malawi into an economic crisis, largely a result of the withdrawal of donor funding by several bilateral and multilateral development partners, as well as the general global crisis that had started in 2008. The impact of that crisis was especially felt in fuel and currency shortages. Since then Malawi has seen some recovery, especially in the availability of fuel and currency, but the effects of the crisis linger on.

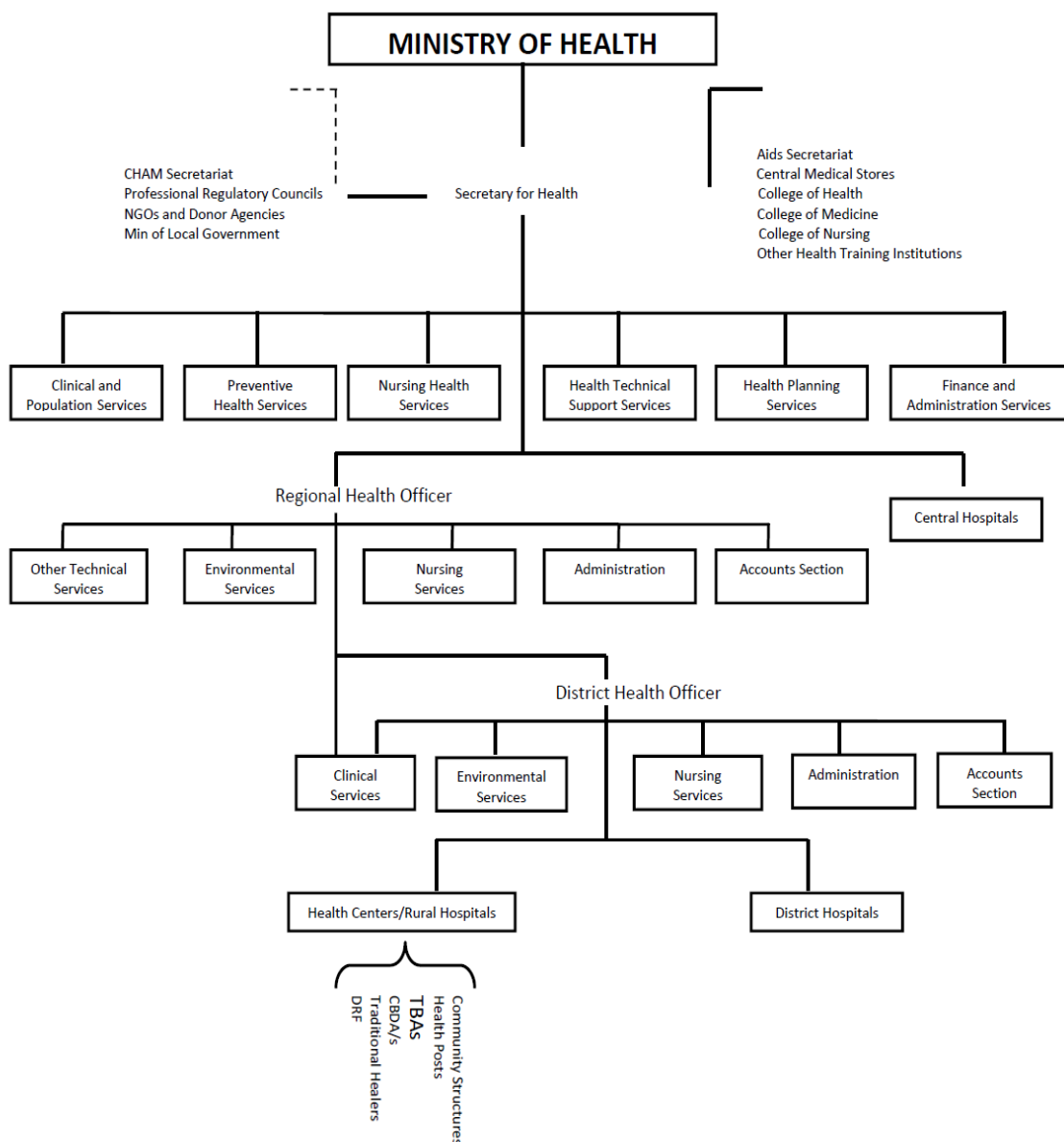
1.2 Malawi's Health system

Malawi's Ministry of Health is responsible for healthcare in Malawi. While 62% of health services are provided by the government, 37% are provided by the Christian Health Association of Malawi (CHAM).¹⁹ Even though user fees were abolished in 2009 in Malawi and health services became free overall, there is a significant presence of non-governmental organisations that, along with private practitioners, provide services and medicines, sometimes, for a small fee. The health system in Malawi has three tiers: primary, secondary, and tertiary care. A system of referrals links these three tiers. However, even though it has the three tier system, Malawi has a policy of decentralising health services in order to strengthen district level delivery of the essential health package. Administration of health services is decentralised to district assemblies (local governance structure) with direct budget allocations to districts. The District Health Management Team is accountable to district assemblies. Figure 1 illustrates the organisational structure of the MOH.

Malawi's health system is largely reliant on primary level care, "where the bulk of health care actually happens in Malawi"²⁰, and this consists of community-based outreach, health posts or 'village clinics', and health centres. Health Surveillance Assistants (HSAs) are community health workers who are the first point of care for sick patients. HSAs provide basic treatment and care at the village clinic level as well as outreach service, and cases which require higher level care are referred to health centres, of which there are 484 in the country. Health centres provide services ranging from outpatient care, including HIV Counselling and Testing, and antenatal and maternity care. They have holding beds, postnatal beds, holding wards and outpatient, antenatal and maternity services²⁰. At the health centre level, cases which are thought to be too critical for management in these facilities are referred to the next level of the healthcare system which consists of rural/community hospitals and district hospitals, of which there are 42 and 24, respectively, in the country. Top tier hospitals are found in major urban areas where specialized services are provided. There are four central hospitals in the country.

While the government provides administrative control and leadership to the Malawi health system, much of the financing comes from donors. The GoM contributes less than 50% of the total expenditure on health, with development partners contributing about 53%.¹⁷ However, external donors' current contribution to total health expenditure has been severely reduced from 2009's 97%², and reflects a decrease in the country's dependence on external resources for financing health care. Furthermore, the MOH's commitment to improving the health system of the country is shown in the increases in government expenditure observed in recent years². From 2002 to 2011, the per capita total expenditure on health increased from \$27.2 to \$77.0, and per capita government expenditure on health increased from \$16.4 to \$56.5. From 2002 to 2011, the percentage of total government expenditure allocated to health increased from 13% to 18.5%². UNICEF contributes 10% to the health budget, while DFATD contributes 1%³.

Figure 1: Organisation of Malawi's Ministry of Health



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

HSAs have formed part of the backbone of the Malawi health system for decades. Initially introduced in the 1960's as temporary 'Smallpox Vaccinators' and then as 'Cholera Assistants' in the 1970s¹⁶, they have now become entrenched in the health system as frontline health workers at the community level where they deliver all health services that have a community component. However, it was only in 1995 that HSAs became formally established within the civil service system in the MOH²¹. HSAs are formally recruited and salaried by the MOH and are required to have 12 years of schooling to qualify for this position. There are currently 10,451 HSAs who are each expected to cover populations of 1000 per area, including hard-to reach areas >8km from nearest health centre. Remuneration of HSAs has been reported to be 44 000 Malawi Kwacha (US\$110) per month, with senior HSAs who are supervisors earning slightly more at 48 000 Kwacha (US\$120) per month (personal communication, Malawi Ministry of Health 2014). Sector Wide Approach (SWAp) funds finance HSA salaries. SWAp is a process in which all significant funding for the sector - whether internal or external - supports a single policy and expenditure programme under government leadership, with common approaches across the sector. It is accompanied by progressive reliance on government procedures to disburse and account for all funds.

The role of HSAs started to gain prominence in Malawi's health system in 2004 with the introduction of the Essential Health Package (EHP), a policy of the Government of Malawi established to prioritise and strengthen community participation and the delivery of free community health services²². The EHP emerged from a national policy called the Poverty Reduction Strategy Paper (PRSP) and used WHO's 2002 evidence on the most significant burdens of disease in Malawi to identify the eleven health issues affecting the poor, which the policy would seek to combat²². Child-specific conditions targeted in the EHP include malaria, diarrhoea, pneumonia, and eye infections, amongst other conditions. The EHP strategy operated within the SWAp Framework developed in 2000 to fund EHP activities.

In many ways, in Malawi the EHP has been the foundational rock upon which child-orientated health policies, including iCCM, have been built. However, before EHP, Malawi already had a child health focused policy in the form of the Integrated Management of Childhood Illness (IMCI) strategy adopted in 1998, which focused on the management and treatment of diarrhoea, malaria, and pneumonia at the facility level, with a specific component (the third component) focusing on the involvement of households and communities in child health. The other two components of the strategy were: 1) improving the technical skills of health providers, and 2) improving health systems. Even though the IMCI strategy was established in 1999, it was only in 2006 that policy guidelines for its implementation were developed. As a result, until 2006, district level coordination of IMCI activities was very limited. However, IMCI is acknowledged to be one of the key national health strategies in the Malawi National Health Plan of 1999-2004, and the strategy continues to "be a critical area in following health plans and strategies" in Malawi²¹. Currently, the aim is to have two IMCI trained health workers in each of the 484 health centres in the country.

In 2005 Malawi adopted the RED approach in 8 initial districts as a strategy to increase access to high impact interventions. In 2006 UNICEF funded the expansion of RED to an additional 8 districts. The RED approach was replaced by the ACSD strategy in 2007 with similar approaches to target high impact interventions.

2. Object of Evaluation: The IHSS programme

The IHSS programme was established by UNICEF with joint funding from DFATD in late 2007 with the main aim of assisting low and middle-income countries in Central, West and Southern Africa with high maternal and child mortality rates to scale up efforts to achieve UN MDGs 4 and 5, child mortality and maternal mortality, respectively, by 2015.²³ The CI programme has a strong health systems strengthening focus and provides funding and support to governments to enable them to deliver integrated and evidence-based maternal and child health oriented high impact interventions at the community level.²⁴ As such, the programme supports the training and equipping of community health workers who are the conduits of the main intervention package, iCCM of malaria, pneumonia and diarrhoea. The key principles of the programme are integration and alignment with existing national processes and plans and monitoring and evaluation frameworks.²⁵ Malawi was one of the countries in which the CI programme was implemented after it became clear that, despite the adoption of IMCI and EHP policies, the country was unlikely to reach its MDGs 4 and 5 targets, as it continued to experience high levels of child mortality and maternal mortality in the years 1999-2006.

In 2007 UNICEF used funds from DFATD, as part of the Catalytic Initiative, to support the IHSS programme in Malawi with a focus on child survival. While the initial plan for the DFATD CI funds was to only support activities at the national and district level, the development of two strategies, namely: the ACSO Strategic Plan, as well as the Partnership for Maternal, Newborn and Child Health (PMNCH), led to a decision to support maternal, newborn and child health activities in 10 districts, which contain approximately 48% of the total Malawi population. These districts, which have hard-to-reach areas, were selected for their poor indicators of infant, child and maternal health²⁶, as well as geographic representation of the 3 regions of Malawi (Figure 2). Forty-five percent of the total HSAs operate in the 10 DFATD districts. HSAs receive general initial training for multiple responsibilities, with later training on iCCM. Senior HSAs provide supervision in a ratio of 1 senior HSA to 10 HSAs, and other oversight/supervision is provided by professional cadres of health workers.

In the first year of the IHSS programme, the programme supported activities in four main areas: health systems strengthening, immunisations (child health days), EPI, and community strategy²⁷ (Table 1).

Table 1: IHSS programme and UNICEF interventions in Malawi

IHSS programme focused interventions	Activities supported by DFATD funding for the IHSS programme	Activities supported by UNICEF matching fund
Correct classification and treatment of suspected pneumonia, diarrhoea, and malaria	Communication and social mobilisation on iCCM (through job aids), recruitment, selection and training of HSAs in 10 IHSS programme districts, supervision (quarterly mentorship and review meetings on CCM) and M&E (support to M&E officer at IMCI unit, finalisation of Implementation Strength indicators). Review of health surveillance curricula to include new competencies. Renovation of three training centers. Purchase of ORS sachets and Zinc tablets, cotrimoxazole, ACTs	Basic training of 1645 HSAs in some of the IHSS programme districts Drug box supplies, bicycles for HSAs and motorcycles for supervisors, technical and financial support for development and implementation of ACSD policy and strategic plan.
Immunisations	Child health days: Vitamin A supplementation, de-worming. EPI support	Training on and expansion of the RED strategy to increase EPI coverage
Long lasting insecticide treated bednets (LLIN) for pregnant women and children under 5	Re-treatment of mosquito nets Procurement of ITN/LLIN Procurement of packs of ACTS for the treatment of 1.9 million cases of malaria	Procurement of ITN/LLIN
Nutrition: Breastfeeding Promotion and counselling	Promotion, by the HSAs, of early initiation and exclusive breastfeeding for 6 months	Capacity building for the promotion of early initiation of breastfeeding and EBF
Hygiene and education		Water and sanitation

With regards to iCCM, it was a combination of issues which led to the decision to adopt a more aggressive community level strategy to improve these indicators. First, results from a 2004 survey showed that a lot of child deaths were taking place within the community, and the lack of improvement in MDGs 4 and 5 put pressure on the MOH, as it became clear that Malawi would likely not meet these MDGs. Second, the human resource crisis in the form of health worker shortage²⁸, as well the limited availability of health services and access issues, especially for people in rural or hard-

to-reach areas, prompted the need for task-shifting services to the community to HSAs who were already part of the primary care system²¹. The policy development process for iCCM in Malawi started with a series of meetings in 2006-2007, which culminated in a multi-sectoral, holistic and integrated approach for accelerated child survival and development (ACSD) called the Strategic Plan for Child Survival²⁷, adopted in 2007 at the time when UNICEF/DFATD support for the IHSS programme began. The strategy aimed to reduce childhood morbidity and mortality by two thirds between 2000 and 2015, and it focused on the scaling up of high impact interventions (HII) identified in the EHP for the prevention and treatment of illnesses affecting children under 5. The following interventions form part of the ACSD strategy:

- Antenatal Care
- IPTp
- Skilled birth attendants
- Postnatal care within 2 days
- Early Breastfeeding initiation
- Exclusive Breast Feeding
- ITNs
- Vitamin A
- Immunisation
- CCM of pneumonia, malaria, diarrhoea
- Water and sanitation

The ACSD policy is multi-sectoral and also encompasses extension workers or community volunteers from other sectors to complement the work of HSAs, with 6177 extension workers across the 28 districts also having been trained on ACSD, especially in the areas of water and sanitation, but also help with spreading health promotion messages and providing support during health campaigns such as Child Health Days.

The roll out of iCCM in Malawi started in 2009. iCCM's main objective is to manage and treat children suffering from common childhood illnesses such as diarrhoea, malaria, pneumonia, eye infections, and newborn sepsis¹, using HSAs operating from their communities (village clinics) who would be accessible 24 hours a day. The implementation of iCCM is taking place in all 28 districts in hard-to-reach areas. Cumulatively, 73% of HSAs work in hard-to-reach areas, although the number of HSAs in these areas varies by district.

The MOH is credited with having led the process for developing and implementing iCCM. The implementation of iCCM is coordinated by the MOH via District Health Offices and implemented through partners who also manage the funds²⁹. Various research reports indicate that during the iCCM policy development process there was wide-spread consultation and communication at all levels, including the community level, in an effort to gain buy-in from all key stakeholders. Resistance from some quarters, particularly the regulatory bodies, who were uncomfortable with the idea of HSAs dispensing medication (antibiotics) to ill children and who were concerned about the non-regulation of HSAs by the Medical Council, was initially reported²¹. The MOH resolved such concerns by engaging the medical fraternity through a series of workshops and meetings to explain the rationale and

¹Newborn care, including the treatment of newborn sepsis, is still not fully operational in Malawi

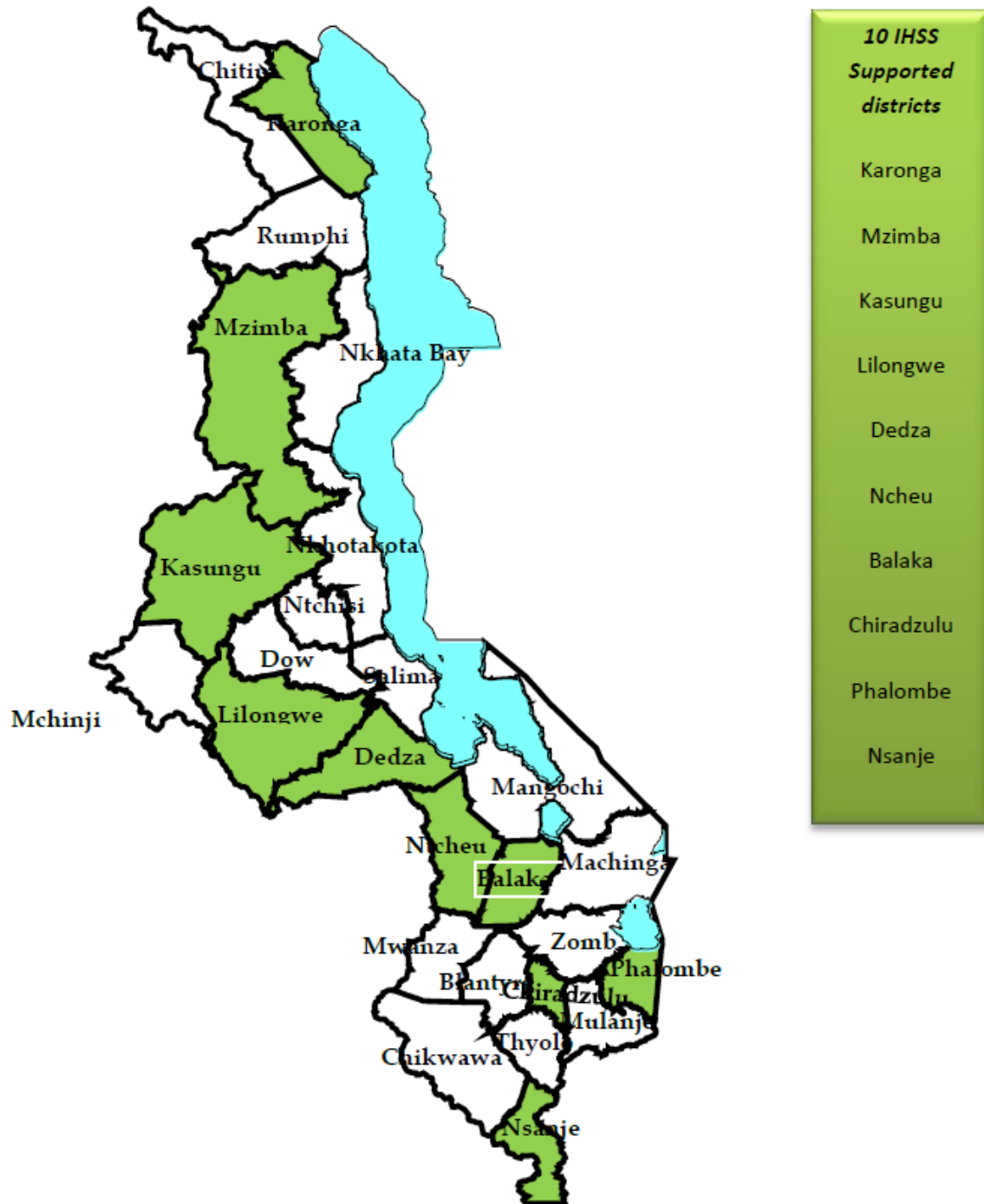
usefulness of the HSA strategy and eventually gained their support². However, the problem of regulating HSAs remains as the Medical Council has still not agreed to formally recognise and regulate them because of concerns about the short period of training that they receive.

Development partners, particularly USAID-funded organisations, such as Save the Children and PSI, UNICEF and WHO have been critical to the implementation of iCCM, providing technical and financial assistance from the beginning of the programme.

Challenges to iCCM in the initial phase were reported to include the deployment and retention of HSAs, supply chain management (stock-outs), gender inequality, the lack of targeted communication to increase awareness and utilisation of CCM services, and supervision³⁰.

² From field interviews

Figure 2: Map of Malawi showing UNICEF IHSS programme supported regions (in green)



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”⁵. As the IHSS programme has come to an end, this external evaluation is intended to fulfill this requirement and is pursuant to the terms the terms of the document “Request for Proposal of Services” (the terms of reference for the external evaluation) signed by DFATD and UNICEF⁶.

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 Malawi.
2. To inform programme and policy decisions in Malawi 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/ governance³¹
- 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 IHSS 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”³². 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 hard to reach areas in ten districts of Malawi. However, it is worth noting that similar programmes are operating through the Government of Malawi in all twenty eight districts.

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, known as Phase I of the programme, and the period 2010 to March 2013, known as 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 System⁴.

3.5 Intended Audience

The intended audience of this external evaluation includes the MOH of Malawi, 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

A mixed method approach to this evaluation was used^{7,8} in that quantitative, qualitative and economic evaluation methods were utilised. 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 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 were collected during key informant interviews with national stakeholders, key district personnel, HSAs, their supervisors, beneficiaries, and, where relevant, community based structures involved in supervision.

Collection of qualitative contextual data occurred at national and district levels. Each set of data, household survey, qualitative, costing and LiST, was analysed and reported independently. The analyses and their separate findings are brought together and synthesised 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 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 Malawi country evaluation framework was based on a preliminary country logic model, Appendix B, which was developed following a desk review. The review highlighted several issues for exploration during the country visit, which may not have previously been explored in-depth and which would make a unique contribution to documenting lessons learnt from this programme. Malawi has seen impressive reductions in under-five mortality rates, and this evaluation provided an opportunity to examine the factors that have contributed to this remarkable outcome, especially as far as this relates to the role of external support, including UNICEF/DFATD, and the role of the government, i.e. political will. Along with this, the evaluation explored the sustainability of the achieved outcomes in terms of HSA retention and deployment, and supply chain funding and management.

4.1 Quantitative data sources and analysis

4.1.1 Coverage trend analysis

A full list of all indicators collected for coverage and LiST analysis can be found in Appendix C. Data sources for the coverage and LiST analyses included the Malawi Demographic and Health Survey (DHS) 2000, the Malawi Multiple Indicator Cluster Survey (MICS) 2006, the DHS 2010 and the 2012/13 Lot Quality Assurance Survey (LQAS). The endline data source for the 10 IHSS programme districts was the 2012/13 LQAS household survey. Coverage data for all 10 IHSS programme regions was only available from 2006 onwards. In the DHS 2000, survey data for 4 of the 6 IHSS programme districts was available in the Central and Northern regions, with no data for the 4 Southern region IHSS programme districts.

For the anthropometric data, the 2000 and 2006 z-scores were re-calculated using the 2006 WHO growth reference standards to be comparable with the 2010 DHS.

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. In the wealth equity assessments, trend over time was tested within the poorest quintile to determine if there was significant trend in coverage within this target population. Trend analysis was performed on data for the 10 IHSS programme districts, corresponding to the areas of implementation of iCCM through UNICEF/DFATD support. National estimates are also provided for comparison purposes.

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;
- the age range for vitamin A supplementation in DHS and MICS has been restricted to 12-23 months to align with the LQAS;
- intake of ORS has been allowed in exclusive breastfeeding;
- pharmacy has been excluded from care-seeking providers for fever and suspected pneumonia in both DHS and MICS data

Some differences remained for the IPT/Fansidar, early breastfeeding and tetanus toxoid during pregnancy indicators in the LQAS survey, due to the restrictive data collection method used as data for these indicators was collected from mothers of 0-5 month old infants, yet in the other surveys all mothers with a live birth in the past two years were considered. It was not possible to create a consistent definition across surveys because of lack of infant age within the MICS data file providing data on these three indicators from interviewed mothers/primary caregivers.

Graphical presentations of the derived results in the form of line graphs and bar charts with confidence limits were generated in Excel. In order to assess the plausible contribution of the IHSS programme to changes in coverage, if such were observed, coverage levels in the implementation areas (10 IHSS programme districts) were compared with the national coverage levels over the period of implementation for which data were available, i.e. 2000 to 2013. Furthermore, we assessed whether there was a significant difference in the average annual rate of change in coverage of pertinent indicators when comparing 95% Confidence Intervals from the trend over time, in addition to a comparison of the annual rate of change between the pre-IHSS period (2000-2006) and during IHSS programme implementation (2006-2013). We assumed a linear rate of change, which we simply calculated by subtracting the endline point estimate from the 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, we calculated these 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.

We also considered contextual factors such as implementation strength, i.e. extent of drug stock outs and supervision, and relevant data from qualitative interviews. Where the contribution of the IHSS programme is not clear this has been stated.

Data to assess implementation strength, utilisation and quality of care were taken from routine programme data collected by UNICEF as well as a Johns Hopkins survey in Balaka and a quality of care survey in 6 of the 10 IHSS programme districts.

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:

- Prior to the start of the programme (secular trend): Under-five lives saved from the year 2000 to the start of IHSS programme implementation (roughly 2000-2006)
- Phase I: Under-five lives saved from the start of IHSS programme implementation up to the early period of iCCM implementation (roughly 2007-2010)
- Phase II: Under-five lives saved from the start of iCCM implementation to present (roughly 2010-2013)

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 wasting³³. 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 published including discussion of the limitations, which are particularly related to the lack of coverage data for many of the specific interventions³⁴⁻³⁶. The analysis was done with Spectrum version 5.04.

For the first time period, we used 2000 as the baseline year with the first year of intervention in 2000 and projected forward to 2006, using all available data on changes in intervention coverage and nutritional status. For Phase I, we used 2007 as the baseline year and the first year of intervention as 2007 and projected forward to 2010, using all available data on changes in intervention coverage and nutritional status. For Phase II, we used 2010 as the baseline year, using mortality data from DHS 2010 and first year of intervention and projected forward to 2013, using all available data on changes in intervention coverage and nutritional status. 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.

The LiST analysis for the 10 IHSS programme districts combined population data and used an average of mortality, fertility and coverage data. Table 2 shows the data sources used for the baseline characteristics - population, fertility, mortality rates, causes of death and nutrition – for the Malawi LiST analyses. These were modified when necessary to best reflect the annual population and births in the 10 IHSS programme regions. All data was extracted from official national, regional and district-level sources, as well as UNICEF and partner databases, and compiled into a pre-formatted excel spread sheet. 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 immunizations was not available from national surveys, e.g., for Hib, Hep B, and pneumococcal conjugate vaccine, WHO/UNICEF coverage estimates were used.³⁷

Table 2: Additional data used to create LiST projections

Indicator	Source
Population served	National Statistics Office Malawi
Total fertility rate	DHS 2000 and 2010 and MICS 2006
Stunting, wasting rates	DHS 2000 and 2010 and MICS 2006
Cause of death	CHERG trend analysis
Mortality (under-5, infant, neonatal)	DHS 2000 and 2010 and MICS 2006

4.1.3 Costing

The costing component, for the purpose of this evaluation, addresses the following question: *What are the additional costs incurred by the health services, including donor funding, due to the introduction of the curative interventions by HSAs for the treatment of malaria, diarrhoea and pneumonia in children under 5?*

iCCM for the purpose of the costing will refer to iCCM in children under 5 for the three conditions: Malaria, Diarrhoea and Pneumonia (MDP).

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 they are not included in the costing because they will not be incurred again, and as such they would artificially inflate the cost of scaling up the programme and distort calculations on 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 with pre-existing funding. 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).

Table 3: Costs included and excluded in this costing exercise

Costs NOT Included	Costs Included
Initial one-off design costs for iCCM	iCCM training for HSAs
Salaries of HSAs and supervisors	iCCM training for HSA supervisors
Basic training of HSAs and supervisors	Mentorship training for health facilities mentors
Bicycles for HSAs and Motorbikes for supervisors	HSA kit for ICCM
	Drugs for iCCM
	Overheads : distribution costs, admin

Costs were collected and analysed in the following way:

Fixed Costs per HSA: independent from the number of treatments

These costs are annualised to assist with future planning and sustainability analysis. Training and replacement of equipment needs to take place over time if the programme is to be institutionalized and last beyond the time of the IHSS programme. These costs will take place in different years across the country. Annualizing costs, thus, allows assessing the average financial implications across the years.

- iCCM training cost per HSA. Initial training has been allocated 10 life years, to reflect the role of mentorship sessions. An annual attrition rate of 3.75% was applied.
- HSAs equipment. Different numbers of life years apply to different pieces of equipment.
- Supervision and management. These costs included training for HSAs' supervisors and mentorship training for mentors in health facilities. As for HSAs, an annual attrition rate of 3.75% was applied. Training was allocated 5 life years in the absence of refresher training
- Overheads Five percent (5%) of the annualised costs, to cover administration and distribution costs.

The annualised fixed costs per HSA are then divided by the number of treatments per HSA in 2012. Data from year 2012/13 was chosen because it represented the highest level of activity and the highest number of HSAs trained.

Variable Costs: dependent on the number of iCCM treatments

- Drug and tests (Rapid Diagnostic Tests, RDTs) costs for each of the three treatment conditions. For malaria, the number of RDTs per treatment is weighted by the positivity rate in Malawi, which stands at 50%.

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 * number of treatments in 2012

Two costing outcomes will be presented.

1. Additional cost of iCCM (Basic) - the minimum costs associated with the introduction of iCCM.
2. Additional cost of iCCM Plus (iCCM+) - this factors in a portion of the costs associated with those required by the health systems strengthening interventions necessary to allow for the implementation of iCCM, e.g., some IMCI training for facility staff, some logistics set-up. An average 15% increase in iCCM costs was modelled to give the cost of iCCM+. This percentage is clearly much higher at the beginning of the programme but decreases annually over the implementation of the programme.

In order to assess whether a higher number of treatments per HSA was possible, the time spent on iCCM was calculated with the following assumptions:

- The length of a visit at the village clinic stands at 30 minutes, time extracted from Costing of Integrated Community Case Management in Malawi by Management Sciences for Health³⁸.
- Besides the number of treatments, an additional 30% of visits were made, reflecting visits which did not end up in treatment, such as negative RDT results. Such an assumption will need to be tested with additional research.
- 5 hours a month was allocated for the iCCM share of supervision and going to the health centre for refilling of kits and mentoring meetings. These 5 hours do not represent all the time on meetings but rather the share attributable to the curative component of the HSAs' work.
- An HSA worked an average of 46 weeks per year.

Increase in the number of treatments per existing HSA per year: increases of 15% and 30% were modelled to assess the impact of increased utilisation and population growth.

Cost of the country-wide programme was calculated by applying utilisation per HSA and cost per treatment to the country number of iCCM trained HSAs.

Financial sustainability of the programme:

- Country wide iCCM basic 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 were extracted from the World Databank.
- These calculations are made for a 15% and 30% increase in utilisation.

The number of HSAs deployed and number of children treated per HSA were extracted from UNICEF 2013 CI Report Main Tables (Master) (July 2013). Treatment protocols, and test and drugs unit costs, were extracted from the 2012 Quantification and Supply Planning Exercise Final Draft Report, May 5, 2012. Training costs were provided by the UNICEF Malawi Country Office.

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 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 programme 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 health post 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, i.e. government and donor costs combined, of delivering iCCM.

Data Limitations:

UNICEF reports indicate that 1,018 HSAs in the 10 IHSS programme districts have been trained in iCCM, resulting in an average of 546 MDP treatments per HSA for the final year of the DFATD grant, i.e. June 2012 to May 2013. Information collected during the evaluation visit to Malawi puts the number of iCCM trained HSAs in the 10 IHSS programme districts at 1,796. It is possible that these additional 798 HSAs were trained in iCCM by other partners. If the same number of total treatments in the IHSS programme districts applies, the average number of MDP treatments per HSA per year would stand at 309. In the absence of additional information UNICEF reported data was used.

4.2 Qualitative data sources and analysis

The country visit to Malawi took place in August 2013. Individual interviews and focus group discussions were held with UNICEF staff and other partners, Malawi Ministry of Health staff, HSA supervisors, nurses in health facilities, HSAs and mothers. The team visited three districts for field work, Lilongwe, Kasungu and Mzimba. The list of potential interviewees was discussed in advance with the UNICEF country team, who assisted with pre-scheduling appointments. In compiling this list consideration was given to gaining as wide a range of opinion as possible so as to ensure a fair representation of how IHSS programme was experienced in Malawi. Each interview was conducted by one or more members of the country field team. Where necessary, i.e. in interviews with mothers, HSAs and HSA supervisors, the services of an interpreter were used. Although the interpreters were provided by the Ministry of Health, several of the interviewees understood English well enough to check the accuracy of the translation. All interviews took place either at the offices of the interviewees, at a district office or health centre, or in the communities. Interviews were audio recorded and the researchers took field notes.

The analysis of interview data from the country visit was based on the typed interview notes or audiotape transcriptions, observations from the field and reflections from the MOH and district annual reports gathered during the visit. This analysis was conducted both deductively and inductively. Deductively, we 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, we tried to understand what new information and insights could be gleaned from the interviews and our observations. Based on this analysis, and using the logic framework as a guide (Appendix B), 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 introduction of the IHSS programme in Malawi happened within a context of an integrated and strong health system, where there was already country ownership and political will. When the IHSS programme came into being, the MOH had already established the goals and objectives of the Ministry, and as stated in the introduction, policy frameworks and policies around integrated health systems strengthening were already in place, thus the IHSS programme's alignment with the policy environment was achieved with relative ease. Further, key respondents reported that districts in which the IHSS programme was implemented were not known by their IHSS programme or UNICEF association, instead the districts, and the various interventions delivered therein, were known as MOH districts, running and delivering MOH interventions. The policy environment in Malawi has allowed the IHSS programme and indeed iCCM to be embraced and integrated into the national health system (box 1).

Box 1:

"There is a framework to allow interventions to be delivered. And of course when I say the communities, I mean they are not in isolation, they are linked to the traditional health system –health centres, district level, zonal level up to Minister of Health. So they have really used that framework and structure very effectively in order to ensure that services are delivered, where they are needed (Senior Official)"

"I think my first experience is country ownership...." (International partner)

"that's very true, when you go there you don't hear[people] mostly saying this is a UNICEF district, what you hear is MOH...the appreciation of the districts to enable them to say this is their own programme" (Senior official)

"because they look at what their problems are, make rational decisions and take action, and they are conscious of issues of equity, so they not dealing with a small area, like a small village in a district no, when they say this intervention is good for the health of our people, they make sure it goes to everyone. So these are the decisions they make and act on that they take, I mean, they own the thing. It's not like someone has thrown to them to start discussing, do you want it or not. Yes, I think there is a strong sense of ownership, when there is decision making and action taking" (International partner)

Malawi was one of the first countries that UNICEF used to pilot iCCM in 2008, and this led to its implementation in 2009. In field interviews, many of the successes that have been observed in child health outcomes, particularly the decline in infant and under-5 mortality, which have placed Malawi on track to meet the 2015 MDGs, are attributed to the MOH's commitment to, and ownership of, iCCM.

While there was initial resistance towards HSAs by health professionals and experts, especially where this involved treating of children and dispensing of drugs, the government engaged them in discussions and training until this cadre of professionals was won over and embraced the programme. In the words of an informant:

“The relationship between health facility staff and HSAs is very, very supportive; right now things are very good. Initially when we were trying to establish and introduce community case management, we overlooked the involvement and the orientation of health centre staff such that there was like no support and linkage between the HSA and the health staff. We realized along the implementation lines, we needed to orient and train health centre staff, buy their support because the HSA does not exist in isolation, but rather he requires the very support from the health centre staff to enable them to get the supply and do the mentorship and all that. That we addressed in 2008, 2009 and 2010.”

5.1.2 Multi-sectoral collaboration and alignment

Even though none of the interviews specifically identified the IHSS programme as contributing to multi-sectoral collaboration and alignment, in several interviews it was reported that there are strong collaborative relationships between the MOH and international agencies and partners. Multi-sectoral collaboration has played a key role in the success of the HSA platform in Malawi. When iCCM was first implemented in 2008, a core group comprising the three UN agencies, UNICEF, UNFPA and WHO, and the Ministry of Health with members from Reproductive Health Unit (RHU) and the IMCI unit was formed to set up the package in the country.

Partners and other respondents credit the MOH with coordinating partners to ensure that the support they provide is aligned with the ministry’s goals and objectives. This is especially remarkable given the MOH’s financial dependence on donors.

“When donors come to Malawi they are coordinated, I mean the Minister of Health takes the lead to coordinate, to direct them where they should provide their support...”(Senior official)

“co-ordination and leadership does not come from the partner world. No partner will go to a district to implement without MOH support”. (International partner)

Informants also report a good working relationship between partners, USAID, UNICEF and WHO, who work with the MOH in delivering iCCM services.

“So the issues of conflict between donors, antagonism between donors is not seen in Malawi; there is more synergy rather than conflict. So there are quite a number of donors but they all work very harmoniously because they are very well coordinated by the Minister of Health so on that one I see as a very big advantage” (International partner).

5.1.3 Women’s participation and gender equality

Gender equality remains an issue in Malawi’s HSA programme where an overwhelming number of HSAs are men. For the reporting period 2011 to 2012 females only made up 28% of the HSA workforce. While a commitment to addressing gender inequality has been made by UNICEF the IHSS programme and the MOH, achieving this goal remains a challenge. Specifically, UNICEF is said to have tried to address the issue of the low participation of women by advocating for higher numbers of women to

be trained as HSAs, but based on observations/interviews from the field this has not resulted in any real change.

One of the indicators affected by the low number of female HSAs in Malawi is infant feeding. One of the key informants voiced concerns that male HSAs provided inadequate support for breastfeeding mothers, as the HSAs could not identify with such mothers.

“I think for some, those are the gender issues that in nutrition maybe the HSA may not effectively support the woman who breastfeeds” (International partner)

Some of the challenges relating to the recruitment and retention of female HSAs include low education levels among women in Malawi. School dropout rates among young girls are said to be very high³⁹. Also, since the process of recruiting HSAs is centralised, as described in the section on selection and deployment, it is harder for females to take up an HSA post if they are deployed to areas they do not live in because they cannot leave their husbands and children behind to go and live and work in a different community far from home. Some informants expressed the belief that at government level no deliberate effort was made to ensure gender balance since the centralized recruitment process takes whoever applies without taking a particular gender ratio into consideration. During fieldwork, and at the iCCM Symposium held in Ghana recently³, when a senior level MOH official was asked to expand on the reasons for the centralized recruitment process, the response was that this was because the government believed this was a more equitable process as there were reports that community-led recruitment had led to nepotism.

Furthermore, it can be speculated that since the nature of the work of HSAs requires a lot of walking/cycling and doing traditionally masculine activities such as those found in water and sanitation interventions, i.e. building latrines, fixing pumps etc., being an HSA may be more attractive to men. Other factors such as when young women get married and move away from their catchment areas also play a role. In Malawi there is a tradition of women following their husbands in what seem to be generally very mobile communities, thus women are never tied to a place, but are rather tied to their husbands.

“when you have female HSAs and they get married, they have to move in order to follow the husband either in the other area or indeed in the other districts”

In terms of women’s participation in country-level programme design and higher levels of government, Malawi has a female president, and within the health system a significant number of women participate at various levels, but their participation is mainly seen in the nursing and midwifery profession.

The role of gender dynamics is important in influencing key health service user outcomes, including child health, nutrition and service utilisation. Furthermore, women’s ability to bargain and to have access to, and control over, resources is often limited, and in turn this impacts on their health care seeking behaviour and access to education and economic opportunities. Thus, there is a call for the development of interventions that address these dynamics¹⁰. Interventions that have been shown to work, especially in the areas of child health and nutrition, are those addressing barriers associated with accessing facilities, with service delivery that prioritises community engagement and

³ iCCM Symposium, 2014 Accra, Ghana 3-6 March 2014

mobilization, and access to services for carers of children,⁴⁰ all of which were part of the IHSS programme's approach.

5.2 Effectiveness

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

5.2.1.1 Human resources: Health Surveillance Assistants (HSAs)

There are 10,451 HSAs operating in Malawi's 28 districts. 3722 (36%) are situated in hard-to-reach areas, with 1796 (48%) concentrated in the 10 IHSS programme districts. The IHSS programme funded basic training for 1645 of these HSAs and funded iCCM training for 1018 HSAs, and thus did not meet its target of funding 1470 HSAs trained in iCCM.

One international partner noted that the decision on which 10 districts to select was guided by a need to target areas with the most challenges.

"Where to go was a decision; among the where to go there are some districts amongst the 10 that might need a little bit of more support. There are big distances, the size is big. The population might be not very big, but access is a big issue" (International partner)

Thus, the 10 IHSS programme districts were chosen because they had the largest number of hard-to-reach areas, which, until very recently, were defined as <8km radius from the nearest health centre, but the definition was recently changed to <5km from nearest health centre. One senior official reported plans to reduce the distance even further, to about <2km radius. From field observations there were health centres that were very close to the district hospital in terms of kilometres, but very far in terms of the logistical difficulty in getting there. Patients have to walk along dirt roads and contend with frequent flooding and washed away roads with no public transport. The ratio of HSA to population is supposed to be 1:1000, but in reality informants report this to be anywhere between 1:1500 and 1:2000 overall across the country.

Below is a box illustrating the typical work week for an HSA. As can be seen, HSAs spend much of their time on outreach visits and health education. The average time spent in a village clinic is about two days a week.

Box 2: A typical week for an HSA

Monday – village clinic morning till noon, afternoon home visits
Tuesday – assist with immunization outreach from health facility (mobilizing people). The nurse uses bicycles or motorbikes to reach them. Afternoon: registers and tallying.
Wednesday – community feedback meetings, health education
Thursday – village clinic, afternoon community public inspection (water, sanitation, schools, market places)
Friday – community public inspection

Village Health Committees

In Malawi, there is another cadre of volunteer community workers known as Village Health Committees (VHCs) who support HSAs operating in village clinics. VHCs are selected by chiefs, with help from HSAs, in each community where there is a village clinic⁴¹. From our interviews with key informants the strength of the VHCs is in their ability to facilitate community participation, governance and ownership. Elsewhere, VHCs are described as “the bridge between the people in the village, the HSAs and the hospitals [health centres]”⁴¹. Their involvement in community health work dates back to the 1990s when HSAs were working in communities as environmental health officers, where the MOH established VHCs to promote primary health care activities such as planning for environmental health services such as water and sanitation and disseminating preventive health messages to their communities⁴². This historical involvement may have made a significant contribution to the acceptance of HSAs and their relatively smooth transition from working as environmental health officers to their current role as community health workers. Indeed, the history and evolution of the VHC enabled iCCM to have strong links with community structures. In present day Malawi, VHCs continue to play an important role in community work, and in the context of iCCM, this role takes on the form of combining oversight of HSAs and promotion of their work, as well community outreach and health promotion, through for instance helping with immunisation campaigns (Child Health Days) and encouraging and helping communities to dig pit latrines and use mosquito nets. As one committee member described:

“[we hold] meetings with the communities at least, maybe 3 or 4 times a month.... We discuss some issues like the importance of going to under 5 clinics with the children who are under 5. We discuss about the importance of going to the antenatal clinics for the pregnant mothers. We discuss about the use of a protected source of water in the communities to prevent other diseases” (Village Health Committee member)

During the country visit, the team found VHC members in many of the visited village clinics and learnt that this was common practice. The presence of VHC members in clinics likely bolsters community confidence in HSAs and the work that they do, and it also keeps HSAs accountable.

“the village health committee is strong because they are all ten members; they come and they assist the issues here at the clinic....the committee has ten [members], 5 are women, 5 are men. Normally they divide [visits to the village clinics] amongst themselves, two people come. For the week, two members of the community, the other week another two members, because they want to make sure that the HSA is around....[the VHC member] first he makes sure during the clinic day that they [VHC members] are there to see how the HSA is doingand interact with the community to tell them the goodness of taking their [HSA advice]” (VHC member)

Additionally, the VHC play an important role in the management of medicines dispensed by HSAs in the village clinic. Each HSA providing iCCM services is given a wooden drug box with medicine supplies, and as a safety measure the wooden drug box has 2 keys to two different locks, and one of these keys is kept by a member of the VHC who has to be summoned each time there is a sick child who needs treatment after hours. This is to protect HSAs from possible attacks as well as to prevent abuse or mismanagement

“ [they are] also making sure that the drugs are available at the [village] clinic” (Community member)

In other areas, some VHCs have taken on responsibility for resupplying family planning commodities, and others are trained as DOTS supporters for TB patients. They have many roles that effectively extend the HSA influence further.

HAS Selection and deployment

Interviews with senior officials revealed that the formal policy for recruiting HSAs starts with a selection process of HSAs at the national level, where HSA posts are advertised, and a process of recruitment is followed where potential candidates submit their curriculum vitae and those who have at least 12 years of schooling are shortlisted, culminating in their employment. Conflicting reports about who selects HSAs in Malawi may be a result of the change in the recruitment process. One official stated that until five years ago, HSAs used to be selected by the communities they came from, but this changed when the MOH felt that allowing communities to select their own HSAs sometimes led to perceptions of bias.

“... the trend has changed, previously they [HSAs] would be coming from their catchment areas so they can serve the people better. Five years ago I think there were these issues to do with human rights where government put in measures to say let us explore opportunities for everybody other than just limiting people to be picked from where ever they want to choose. With that pressure you know the MOH was pressed enough to abandon the previous system of deploying or recruiting people from their catchment area” (Senior official, MOH)

This government-led selection process is partly responsible for the deployment of HSAs to areas they do not come from. As one senior official stated:

“Now these things are advertised at national level and in one way or the other also affects the way we are deploying and keeping these people in their respective catchment areas, because people from one district would be recruited and employed in another district.” (Senior Official, MOH)

Another reason for the deployment of HSAs outside their catchment areas is the difficulty in finding candidates who meet the selection requirements, especially the requirement concerning education levels, i.e. minimum Grade 12. Data from the 2012/2013 LQAS household survey reveals that only 36% of villages in the 10 IHSS programme districts had an HSA living there, with a range from 22% in Nsanje to 66% in Karonga. The proportion of districts with HSAs who visit to hold village clinics was higher at 84%. Approximately a third (68%) of mothers interviewed reported that they knew where the nearest village clinic is, and for the majority (70%) the walk to the nearest village clinic is less than an hour.

Having HSAs who work in areas where they do not reside presents many challenges and affects service provision in these areas. Some of the challenges cited in interviews include the inability of HSAs to be available to see sick children at all times. For such children the caregiver is left with the problem of having to find a way to take their child to a health centre, often miles away from where they live. This defeats the original purpose of placing HSAs in hard-to-reach areas, i.e. to bring services to the people, to relieve caregivers of the burden of travelling to distant health centres to seek care, and to ensure children are seen within a 24 hour period after reporting ill. Another difficulty presented by the problem of living outside the catchment area is transport. HSAs who live outside the areas they serve have to travel long distances, every day and often on foot, to reach the communities they work in. As one HSA reported:

“the problem as I have already said I’m not staying within the community; I am living a little bit far from here so for me, I don’t have means of transport.... sometimes I walk...that’s why I have said [the bicycle] it’s unreliable, ja, I’ve got it but most of the times I come here on foot” (HSA).

Provision of housing for HSAs who are not from the catchment areas they serve is a challenge that was often cited in interviews. What is apparent from the interviews is that it is mainly left to communities to provide housing for HSAs. As one senior official stated:

“What we have done through the district councils, the district assemblies, they did the district management team to ensure mobilization of communities to at least construct some housing for accommodation for the HSA” (MOH Senior Official)

But these poverty-stricken hard-to-reach areas do not have the resources to provide proper accommodation, and thus these houses are not being built in most catchment areas, compelling HSAs to relocate to trading centers where they can have other economic activities to sustain their livelihood. In a few communities, attempts are made to erect makeshift structures, usually attached to a ramshackle village clinic built by community members with iron sheets and some cement from the District Council.

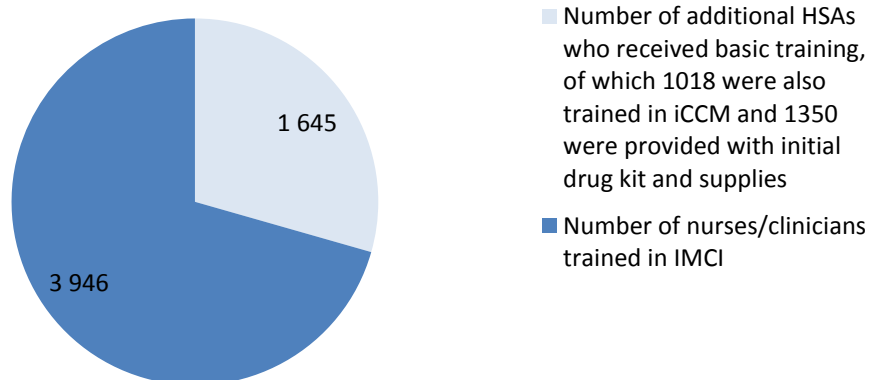
“...support is given from what we call the Local Development Fund from the District Council, especially iron sheets because those are the most expensive things....[and also] some cement is provided. These are basically smaller makeshift housing within the same house, one side is an attachment what we call the village clinic, so you have in each clinic one side would be the clinic and the other side would be the HSA residing inside the house” (MOH senior official)

HSAs who are provided this kind of housing by the community are required to pay rent at the end of each month, and this money is given to the Village Health Committee (VHC) to support other district initiatives. To our knowledge the amount of rent differs from village clinic to village clinic, thus no specific figure was given for rent.

HSA Training

Of the 1796 HSAs operating in the 10 IHSS programme districts, 1645 received basic training and 1018 iCCM training through the IHSS programme. Additionally, 3946 nurses/clinicians received IMCI training (Figure 3). IHSS programme funds supported all of this training.

Figure 3: Training of front line health workers by UNICEF with IHSS programme funds



The training of HSAs involves a basic Health Surveillance 12 week programme (previously 8-10 weeks), which includes some aspects of iCCM. For HSAs selected to implement iCCM in hard-to-reach areas there is a further 6 day training that they attend. In addition, 4-6 weeks after the iCCM training, there is a further 3 day supervision training and 3 day mentorship training for senior HSAs. HSAs are supposed to report to the nearest health centre on a quarterly basis for supervision, which includes observation of case management. However, in reality many HSAs spend some time each week assisting in health centres where informal supervision may be occurring.

There are 3 training centers that were built with funding from WHO for primary health care training, and these centers have been used to train HSAs. However, as recruitment of HSAs increased dramatically in 2007, during the implementation of iCCM, these centers proved to be insufficient for training all the HSAs, and thus a train-the-trainer approach was taken. Trainers included environmental health officers, community health nurses, clinical officers and midwife assistants, while others came on an adhoc basis.

The cost of training HSAs is 1,300 USD, which includes the allowances for the HSA during training and accommodation, food, etc.

Some HSAs believe that more HSAs need to be trained in CCM. As one respondent stated that there was a shortage of HSAs trained in CCM.

“I think if we can train more HSAs; it would be more important...because we are running short of HSAs that have been trained” (HSA supervisor)

The perception that more HSAs need to be trained in iCCM is given more credence by the point made earlier about how the IHSS programme did not meet its target of training 1470 HSAs in the 10 IHSS programme districts. Furthermore, the failure to meet this target may be one of the reasons for the low HSA to population ratio.

A key training need that remains, and that was mentioned by both senior informants and HSAs, is refresher training. The problem with conducting regular refresher trainings is budgetary constraints.

“We have always wanted to have refresher training, but financial constraints have been a problem.” (Senior official)

“[the ICCM training is enough] but maybe only for maybe a refresher.” (HSA)

During a recent iCCM symposium hosted by UNICEF in Accra, it was reported that there are plans to increase the training duration of HSAs to one full academic year. These plans seem to be partly influenced by the Malawi Medical Council’s reluctance to recognize and manage HSAs without at least one year’s training. How the extension of the training period will be operationalized or funded and when it will take effect remains unclear. The iCCM symposium pointed out the importance of achieving the recommended community health worker to population ratio, as high utilization is a cost driver, and creating more barriers for HSAs to participate will only make matters worse.

Training on newborn care

The 2013 CI/IHSS Annual Report to DFATD asserts that despite lobbying by UNICEF/the IHSS programme, HSAs “have not been allowed to treat newborn children within the CCM programme due to the lack of a policy”³. However, the report further states that UNICEF/IHSS programme efforts resulted in HSAs being allowed to provide pre-referral treatment to newborns. Postnatal follow-up is being implemented in 17 districts by different partners, and they focus mostly on follow-up and not treatment, since this is still not allowed.

However, it is clear that the inclusion of newborn care into the iCCM package of interventions in 2011 has not been without contention. From the document review, it is reported that there has been resistance to allowing HSAs to treat newborns for common neonatal conditions such as sepsis. The main reason for this resistance stems from concerns similar to those initially expressed when HSAs were allowed to treat children with antibiotics at the beginning of the CCM programme; fears are specifically around the fact that newborn sepsis requires injectable antibiotics, which HSAs would have to administer.

In field interviews, HSAs and HSA supervisors did not seem to provide newborn care services. Furthermore, HSAs and HSA supervisors specifically stated that they were not trained in newborn care. As one HSA explained:

“I have just heard about the newborn care. I have never been trained.” (HSA)

From the interviews the procedure that is followed with newborns seems to be educating mothers about the importance of going to a health facility after delivery. HSAs only get involved after the first 2-4 weeks. One HSA supervisor reported:

“...for postnatal checkups we are there; it is what we discuss in the communities, when the mother has delivered they must go back to the health facility too, for the checkups..... after delivery I think it is less than 2 months, 2 to 4 weeks they should come for postnatal checkups and after 6 weeks they should start immunization [not within the first 48hrs]...: I think no one [sees newborns in the first 48hrs], because I am sure no HSAs have been trained on that” (HSA supervisor)

Training innovations

There have been some innovations in training to ensure the widespread use and knowledge of IMCI at all levels of care. To this end a new training technology has been developed called E-CATT, and it is provided in all health training institutions.

“it is IMCI computerized adaptation and training tools (E-CATT). Now in the period of one year Malawi has adopted the initiative and has covered all the schools in the country. They are applying IMCI...[E-CATT training is provided to] nurses, doctors, medical assistants, everyone, all the schools, because there are different types of Health Training Institutions” (Partner)

HSA Attrition

From the interviews it was difficult to gauge the level of attrition in the HSA programme. From observational notes it seems that attrition is currently minimal, and when it does occur it is mostly due to death. This is said to be due to the upgrading of the job grade of HSAs, a rarity for low cadres of workers. As one respondent reported

“[the HSAs are] the only group of the lowest cadres receiving top up allowances -by nature of their work”

The period of 2012 is cited as having been one where a significant level of attrition of HSAs was experienced in Malawi. This is mainly attributed to the devaluation of the Malawian currency in 2012, where it depreciated by 50% as a result of budgets that were negotiated by the ministries. The devaluation meant that the amounts requested by the ministries were insufficient to cover their annual plans. The salaries of staff were not adjusted to take into account the devaluation of currency, and this resulted in major attrition of staff including HSAs.

However, both senior level officials, partners and HSA supervisors acknowledged some degree of HSA mobility occurring.

“sometimes we have some difficulties with the HSAs. They do leave their areas maybe without any notice....” (HSA supervisor)

“Human Resources [is an issue] because people are very mobile, sometimes they move from one place to another” (International partner)

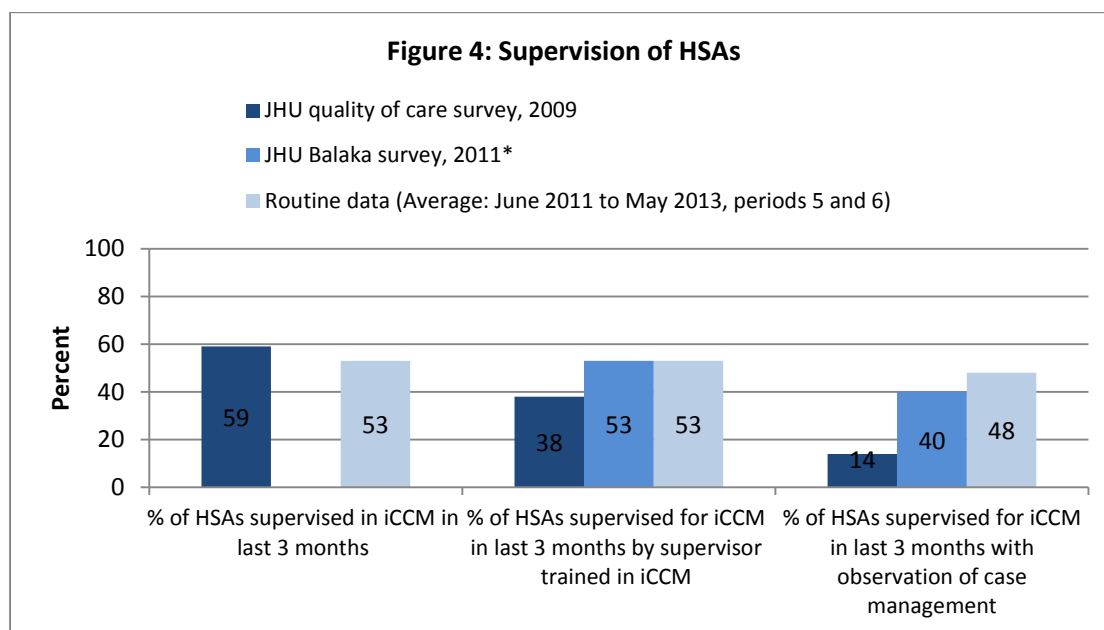
Even though the fact that HSAs are government salaried workers is often said to be a huge factor that sets the HSA programme apart from other CHW programmes in low and middle income countries, and is said to contribute to HSAs feeling recognized and valued⁴⁶, the low level salaries likely influence attrition. And while attempts to raise the salaries of HSAs have been made through the system of topping up their government salaries, the take home amount is still very low at around \$50 per month.

Supervision

In the 2010/2011 reporting period IHSS programme funds were used to train supervisors as part of a group of 315 HSAs trained with the same funds⁴³. HSAs are supervised by senior HSAs who are mainly based in health centres. In addition to the 12 week training on general HSA work and 6 day training on iCCM, HSA supervisors get 3 days training on supervision. Supervisors also join a mentorship programme where they are mentored in health facilities by medical assistants. The mentorship programme is said to have improved quality of care. The tasks of HSA supervisors are not limited to supervision but include all the other HSA tasks, as well as facility based activities such as HIV counseling and testing (HCT), and any other activities where extra hands are needed. Each senior HSA supervises about 12 HSAs. Data from the interviews with HSA supervisors indicate possible work overload and lack of clarity on the supervisors' roles/job description.

“.....on top of supervising my fellow HSAs I also do other activities like I do counseling on HCT, I’m also doing growth monitoring or bringing organization to their children, I also do community assessments in the villages giving the health information to the communities..... I do also take the roles of an HSA, I also do the work on top of the supervision that I’m doing.....”
(HSA supervisor)

In terms of the supervision itself, there seems to be infrequent one-on-one contact between supervisors and their HSAs (Figure 4). Routine UNICEF data shows that half of HSAs received supervision in iCCM in the previous 3 months with a similar proportion that included observation of case management. Survey data from earlier years reveals lower levels of supervision. A Johns Hopkins University (JHU) Quality of Care survey undertaken in 2009 in 6 of the 10 IHSS programme districts, whilst reporting slightly higher levels of any supervision, reported lower levels of supervision by an iCCM trained supervisor (38%) and even lower levels of supervision that included observation of case management (14%)⁴⁴. A further survey undertaken in Balaka district¹¹ in 2011 found that 40% of HSAs had supervision which included observation of case management in the previous 3 months (Figure 4). It is encouraging that supervision with an iCCM trained supervisor and supervision which includes observation of case management appear to have improved over time.



* clinical supervision included observation of case management, practicing case scenarios or mentoring at a health facility

While the figure above reveals low frequency of HSA supervision, observational notes show that there are several opportunities for HSAs to receive indirect supervision when they visit the health centres to help out with service provision. On such visits HSAs are observed by medical assistants and other health care professionals as they conduct case management on sick children, and there is an opportunity to correct and advise and mentor them as they work.

Qualitative data supports the finding on poor supervision. One senior HSA reported meeting with his HSAs only once every quarter for individual supervision. More regular supervision seems to occur during monthly group meetings where HSAs share challenges experienced in the field. Another opportunity for supervision occurs during the process of handing over written reports which are submitted monthly. Supervisors struggle to visit HSAs in their catchment areas where the actual work

is taking place. This is largely a result of transport issues. While all supervisors are equipped with motorbikes to do their supervision visits and other community outreach activities, the stipend given for fuel is so small that it is not enough for regular visits. As one supervisor explained:

“the DHO gave me a motorbike so for this facility....the DHO give us fuel though it is not enough because they only give me 2000 kwacha (approx. 5US\$) per month..... so sometimes, I use the little fuel that I buy from that 2000 to make some activities to go in the field” (HSA supervisor)

The financial crisis that gripped the government in 2010/2011, as a result of cutbacks in donor funding, is also said to have affected supervision because there was no money to provide fuel for field visits, and later there were fuel shortages as well, which exacerbated this problem. UNICEF/the IHSS programme provided financial support to alleviate fuel shortages during the financial crisis.

Supervision tasks include checking of HSA registers and reports, coordinating HSA activities and work plans, and observing HSAs when they conduct iCCM to ensure that they do it correctly. As one HSA supervisor explained:

“Mainly I do go to their communities. Firstly, I will look on the specific maybe activity that is cut out, or what they are doing that day also. If that HSA may be conducting a CCM is trained on CCM, I do also even supervise during the clinic so I can see maybe how he is conducting a case management on the child or even if the treatment is the right treatment he is giving to the child. Sometimes I do also see the register if it is well recorded” (senior HSA supervisor)

Supervisors also lobby their own supervisors for support on issues affecting their HSAs such as uniforms and bicycles. From observational notes the CCM supervision checklist includes 7 modules: assess case management skills, review records, check supplies including the timer, check that there are enough medicines, check expiration, liaise with village health committee to see if they are providing support to CCM HSAs.

5.2.1.2 Supply of Medicines/Commodities and stockouts

Supply chain management remains weak in Malawi, and essential commodities are often out of stock at the point of use. Even though it is important to reiterate that IHSS programme funding was critical to maintaining stock levels in Malawi during the funding crisis period alluded to earlier, during fieldwork, in nearly all the interviews with partners and senior officials, supplies and stockouts were mentioned as one of the key challenges to the delivery of community-based interventions such as iCCM in Malawi. From the perspective of HSAs and community members the problem lies in the fact that they rely on health centres in their districts for supplies, and those health centres battle to maintain their own stocks, even without the added responsibility of supplying village clinics/HSAs (Box 3).

Box 3:

“Because we rely on the supply which comes at the health centre so they share with us some of the supplies which come at the health centre. So when they have received maybe insufficient supplies it’s difficult for them to share with us few supplies” (HSA)

“...the other challenge with the HSA is that most of the time there are no drugs. So drugs are also running out of stock....” (Community member)

“Before they start off to do that they normally send, or communicate to make sure the health centre have the stocks because sometimes our health centres do not have supplies to give out to HSAs, so once that information is sent you will be told you can come now or come after 3 days because we are getting our supplies today or tomorrow.” (Senior official)

However, senior officials and partner agencies paint a much more complex and chaotic picture of the supply chain. First, the problem of supplies was compounded by the 2010/2011 donor/financial crisis, where donor contribution to SWAP estimated at 89% of funds was stopped. This led to a major cut back of funding for operational costs which had a negative impact on all the activities associated with iCCM (outreach, supervision) and especially the procurement of commodities. Even though Emergency PHC funds and UNICEF/IHSS programme funds tried to address the shortages of medicines and supplies, the problem remained.

Further contributing to the problem is a supply chain system that flows from central to regional to district level. Drugs are often not available in stores because of delays in tendering processes and lack of technical competence in stores handling supplies, and problems in stock control, from central to regional to district levels. There was also poor management of supplies at the central medical depot. Central medical stores were not fully operational, with less than 50% stock of drugs, and this is what resulted in many partners providing drugs directly to health centers, but these supplies were not always sufficient and did not have the full spectrum of drugs. As one official pointed out:

“the period of financial crisis led to lots of bypassing and establishing of parallel supply chains”
(International partner)

However, central medical stores have also undergone reform and have been turned into a trust. The status of central stores changed because people felt there was too much corruption and interference from the government. Under the new reform central medical stores are more independent of the government as the trust is accountable to a board of trustees.

Another measure which has been implemented to improve the supply chain is the C-stock initiative, which is a mobile phone platform. The C-stock intervention was developed to improve supply chain data visibility, to support problem-solving, and to enhance the quality of decision making in the supply chain.

In this new initiative HSAs send a text message in their stock orders (to the facility level) if they are short during the month, and the facility keeps pre-packed stock to be available for collection by HSAs. The C-stock web-based technology keeps a record of stock coming in and out as well as stock levels, and this data gets viewed by central stakeholders in charge of supply chain management and district staff who use the information for decision making and reporting³². HSAs have been working with

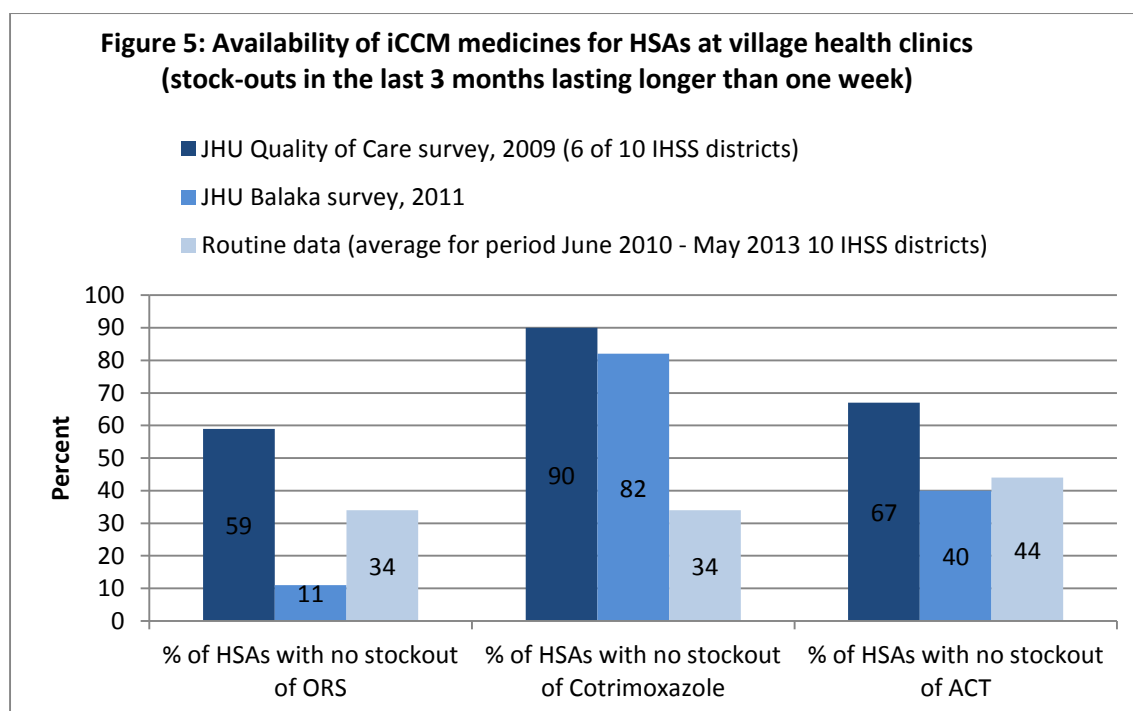
cStock in 2 districts to ensure that supply moves according to cStock data. As one respondent explained:

“When cStock and distribution of drugs are linked the situation is improved, and HSAs are motivated to report on drug stock” (Key informant)

With the new initiative the stock is not left at health centers because when this was done previously, stock was often consumed at the health centre and would not reach HSAs. With the introduction of cStock they now keep a small buffer of stock at health centers and district hospitals to be able to respond to HSA drug shortages. The main advantage of the cStock system is that it is not linked to central procurement, and this facilitates the flow of information from HSA to health center and districts. Staff at the national level has access to the information, but it is not linked to the procurement process itself. Thus, the cStock system is for community stock and compliments the MOH system to monitor supply chain that stops at the health facility level. During fieldwork cStock was being piloted in 6 districts, with 2 of the districts operating under Save the Children.

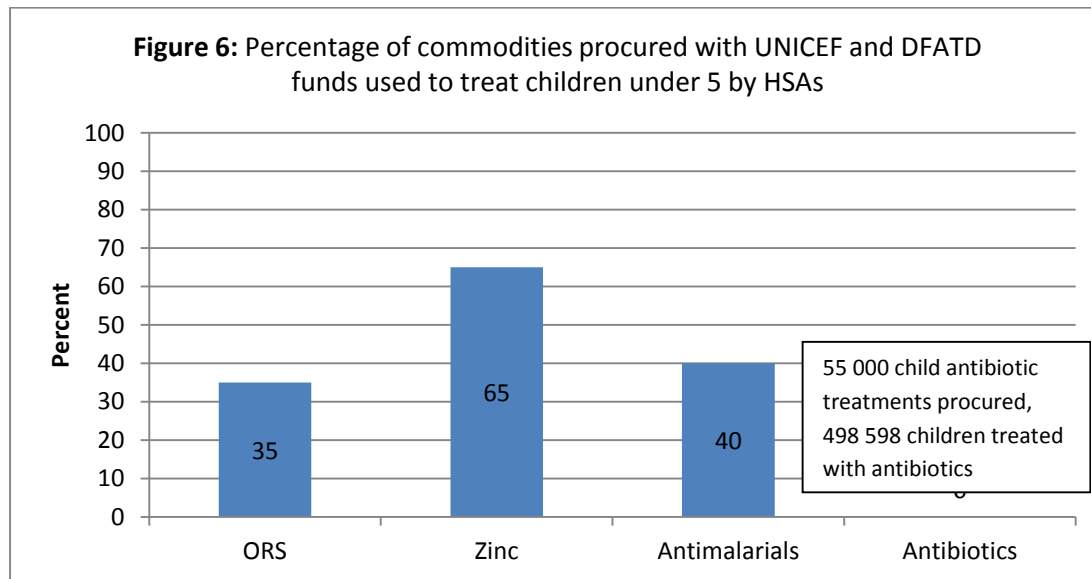
HSAs are each supplied with a wooden ‘drug box’ which has the following contents: ORS and Zinc, ACTs, paracetamol, antibiotic eye ointment, and cotrimoxazole.

Routine UNICEF data and survey data support the qualitative findings that stock-outs are a major challenge facing HSAs. The availability of ORS, cotrimoxazole and ACTs appears to have declined since the JHU survey in 2009, most notably for cotrimoxazole. In the most recent reporting period, routine data shows that less than 45% of HSAs reported no stock-outs of the three main drugs in the previous three months (Figure 5).



With regard to utilisation of commodities purchased during the IHSS programme period to treat children under five, approximately two thirds of the zinc tablets were utilised, 40% of antimalarials and one third of ORS sachets (Figure 6). Many more children were treated with antibiotics than the supply procured, and therefore approximately 443,598 children were treated with antibiotics

procured through another source. The reason for stock-outs at village clinics, and therefore low utilisation of supplies, could be due to transport difficulties in getting supplies from central or regional stores to health centres and difficulties for HSAs to collect supplies from health centres.



5.2.2 Utilisation, M&E and quality of care

Utilisation

There seems to be a high demand for HSAs in their communities. As one international partner stated:

“There is a huge demand for iCCM services at community level....people actually trust the HSAs, they have confidence in the HSAs.”(International partner)

The IHSS programme has plausibly effected utilisation through the training and deployment of HSAs, and the support the programme has provided in commodities and supervision. Thus, HSAs seem to be well received in communities. All the beneficiaries that were interviewed felt that the presence of HSAs had brought a lot of change to their communities and the management of sick children. One group of women specifically attributed the reduction of under 5 mortality to iCCM. The mothers said:

“ It is really true that under 5 [deaths] have been really reduced..... We believe under 5 deaths have been reduced in our society because of many interventions we have been getting, one of the interventions is the care we get when children are sick, the care we are getting from these villages...”(Focus group discussion with mothers)

Others were appreciative of the fact that the presence of HSAs in their communities saved them from travelling long distances to health centers to seek care for their children. Community members reported that HSAs went out of their way to help, often agreeing to see and treat their children after hours and outside the scheduled clinic days. From field observations mothers were extremely happy with the work of the HSAs, and they directly attributed this to UNICEF. At one health centre the field team was treated to an elated performance of a song all about the good work that UNICEF had been doing (box 4).

Box 4:

"...they [father/beneficiary] say the HSA works with them better because they come in time..... There used to be challenges because when their kids were sick they had to travel long distances but now at this day there is a difference because they come here" (Beneficiary)

".. she is saying...when they come here he is able to refill here when the tablets are up. Even if sometimes it's not in the middle of the day, when they meet him, they still come here, he does assist them, so to her this is a good side [of the programme] because sometimes even if it is not a clinic day, when they meet him they come here...." (Beneficiary)

"She is saying when you come here the man comes and is able to explain to you how to get the drugs. That is when the drug is there, they are able to explain how you get this medicine 3, 4 times and are given the right dosage; that's what's she is saying" (Beneficiary)

It must be noted though that at another health centre, when mothers were asked when last they had experienced a baby dying no one had had this experience since 2000. This is telling because while on the one hand the mothers are praising UNICEF, on the other hand their experience suggests that the success in saving babies and children began long before this programme. This is an important methodological "occurrence" with qualitative research because people conflate experiences across time and can't always make time specific attributions.

One of the main factors that was reported to have affected the utilisation of the HSA programme was the frequent stock-outs of supplies and drugs. When community members went to the village clinic to seek help with a sick child and found no drugs they had to find a way to the nearest health centre.

"She says the services are good but the problems are sometimes when they come, the clinic do not have one of the drugs or sometimes [they do not have] both so they, so they just refer them to another facility, but sometimes when they also come they receive treatment... but sometimes the drugs is out of stock and then they get referred" (Beneficiary)

However, in the case of stock-outs community members appreciated getting referred to health centres by HSAs because it meant they would be given priority at the centre and not have to queue for long.

"...and sometimes they also able to refer them to a facility because they are given a referral letter, there they are given priority..." (Beneficiary)

The success of outreach programmes like immunisations was credited to the HSA programme:

"because HSAs come from the communities, the communities trust them, and people bring their children to them to get immunized"(Senior official)

There is little quantitative data on workload of HSAs. Routine UNICEF data shows that the 1018 HSAs trained in iCCM using DFATD funds treated a total of 1 474 568 children under five between June 2009 and May 2013, which crudely translates to 470 children per year over a four year period, or 39 children per month per HSA. The Balaka survey¹¹ did measure HSA workload, but the sample size was only 35 HSAs who had treated sick children in the previous 7 days. The survey found that the median number of children treated in the previous 7 days was 1 and the median number of village clinics held in the

previous 7 days was 1. It should also be noted that this survey was conducted in 2011, the period when HSAs were affected.

Monitoring and evaluation (M&E)

During the field visits M&E activities and documents were observed and discussed during interviews. Malawi has a well developed Health Management Information System (HMIS), which includes community level activities of HSAs. HSAs have registers and a monthly report form for recording of their activities, including iCCM.

One respondent, an international partner, talked about M&E activities that occurred at the start of iCCM implementation, where the MOH and development partners jointly conducted some M&E activities to assess how iCCM was being implemented:

“The follow up was done by means of joint monitoring and supervision visits, so UNICEF, WHO, UNFPA, and Minister of Health would come together and then go to follow up and supervise the activities to ensure that it is effective and appreciated because people are working very hard. So if you don’t go there you will think they are not working; you have to go there and see. You also have to understand their problems, and we also have review meetings.”
(International partner)

One interview showed that monitoring activities had helped to identify iCCM as a key strategy in Malawi.

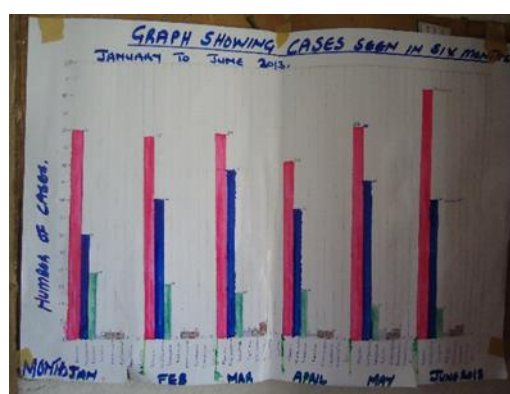
“Their overall objective was to reduce the under 5 mortality by 25%, so the focus now with iCCM it ensures equality access and increased utilisation appear to be the key intervention, and then it happens along the way in the process of evaluation it happen to be like the landmark, [so] the whole partnership is focusing on the reduction of the under 5 mortality.”
(International partner)

The HSAs in the field did speak about community level monitoring activities during the health post tours. All HSAs visited had a map of their community with key features. All HSAs also had updated graphs posted with tallies of monthly sick child cases (Figures 7 and 8). They seemed to understand and use this data. One example of this was an HSA had seen an increase in malaria cases during the dry season and set out to determine the cause of this increase. He did household visits to determine that bednets were still available and in use and then spoke with community members and clients. He determined that his case load had increased that month because clients were coming from outside his catchment area as he had stock of supplies and a good reputation for quality of care. This shows understanding of the use of data for programme monitoring and quality improvement.

Figure 7: An HSA with his clinic register



Figure 8: Graph of sick child cases seen



This local use of data for programme management was also reported in a review conducted by IIP/JHU/Save in two districts in Malawi⁴⁵. This same report noted a “well-defined structure for reporting” with high completeness of HSA reporting forms (89%).

Beyond the health post use, HSAs had a register where they recorded client encounters and produced monthly reports for their supervisors. These reports were tallied by supervisors and aggregated at the district level. During the field visit, tallies of HSA data were indeed noted at the Health Centres. Use of data above district level was not evaluated in this review. The implementation of iCCM/IHSS programme and accompanying M&E activities to monitor implementation has increased available community data on childhood illness and treatment thereof, and such data can be used for district planning.

Quality of care

From field interviews there was a general sense that community members had confidence in the work that HSAs do and the skills they exhibit when they carry out their iCCM tasks. Community members were able to describe the education and knowledge they had gained from HSAs regarding the management of childhood illnesses; others were able to describe treatment schedules that they had been given by their HSAs:

“when you come here the man [HSA] comes and is able to explain to you how to [use] the drugs, that is when the drug is there, they are able to explain how you [use] this medicine 3, 4 times and are given the right dosage....” (Community member)

“He [HSA] does talk with them in their villages about hygiene and sanitation.....he does advise them about the hand washing facility at the toilet when he visits them at their households” (Mother)

HSAs themselves were able to articulate the knowledge and skills needed to carry out iCCM work and were able to describe their responses to a range of childhood illnesses they had encountered during their time as HSAs. They described management of illnesses, treatment schedules, how they make a diagnosis for certain illnesses, etc.

“like the CCM we treat children for malaria... now 6 months to 3 years, we give them, one tablet in the morning 1 tablet in the afternoon, so for 3 days it is 6 [tablets]. So we say 1 x 6 yes and 2 x 6 that means children above 3. So that is why we do receive only 1 x 6 packets

which is 180 packets so you share that, you divide that by 90 + 90 so the other children are receiving too. That means the 2 x 6 drugs will be finishing before the 1 x 6 drug” (HSA)

“the schedule, morning, evening, morning, for 3 days..... [we] just teach them how to use this and how important is the net, especially to the under 5s because one of groups who are at risk are the under 5s and pregnant woman”(HSA)

“it starts there, one sachet tea mixed with one litre of water and demonstrate and then through the same way they take some of the suggested home” (HSA describing ORS treatment)

One HSA gave an example of a case where he was able to correctly identify a condition related to malnutrition in a child:

“ one case was a boy, the under 5 child, the legs, both legs were swelling, and the lady, I mean the mother, the mother and the other ladies are saying that the child has been bewitched. So one of the village committee members came to say that you may come and look. When I went there I noticed [he was] nutritionally impaired” (HSA)

Likewise he knew when he was dealing with a condition beyond his knowledge and skills:

“another time a certain child was sick but it was a case that I could not manage because it was like, at the hospital they recognized it as meningitis.....” (HSA)

They also demonstrated a pride in their work and understood how it contributed to overall health outcomes in Malawi:

“I am contributing to MDG4” (HSA)

Gilroy et. al evaluated the quality of care of sick children by HSAs in Malawi⁴⁴. The evaluation assessed care by 131 HSAs as compared to a ‘gold standard’ clinician assessment. They found correct treatment in 79% of cases with antimalarials for fever, 69% of cases with ORS for diarrhoea, 52% of children presenting with antibiotics for suspected pneumonia, and correctly referred 55% of children with danger signs. This suggests variable quality of care depending on the presenting condition. Another review by Save the Children⁴⁶ noted that only 24% of children with cough had respirations counted. Sub-optimal performance for assessment and treatment of suspected pneumonia has been described in iCCM-implementing programmes. However, these problems are not particular to CHWs and have also been reported for IMCI trained health professionals in primary care facilities and hospitals.^{47, 48}

So while there is community demand and confidence in the skills of HSAs in Malawi, there is room for improvement in skills, particularly with regard to diagnosis and treatment of pneumonia. Gilroy et.al. recommend “reinforcement of physical exam skills through training and more frequent, clinically-focused supervision could improve the quality of treatment provided to sick children (by HSAs) in the community⁴⁴.”

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 2000 to 2012/13. Descriptions include changes at the national level, within the ten IHSS programme districts, and in the richest and poorest wealth quintiles of the 10 IHSS programme districts. The LQAS did not collect data to construct wealth quintiles, hence we were unable to analyse changes in equity up to 2012. All figures included in this section are for the ten IHSS programme districts combined, except for 2000 which did not have data for all ten districts. Statistically significant trends are indicated in figures with**. Only figures for indicators included in the coverage trend analysis are included in this section. National and regional coverage profile figures which include indicators not part of the trend analysis can be found in Appendix E. 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 coverage in the main IHSS programme intervention indicators in the ten IHSS programme districts. Significantly higher average annual rates of coverage change during the IHSS programme period are noted in early initiation of breastfeeding, coverage of IPTp, care-seeking for fever, measles immunisation, and ORS, suggesting a positive contribution on the part of IHSS programme. No significant differences in the average annual rates of coverage change between the pre-IHSS and IHSS programme periods were observed for vitamin A supplementation, care-seeking for suspected pneumonia, use of ITNs, and DPT3 immunisation. Annual rates of change in coverage decreased during the IHSS programme period for EBF, tetanus toxoid and postnatal care. However, for EBF and tetanus toxoid this reflects a slowing of the annual coverage change with the coverage estimates being similar in 2012 to the 2006 levels. With regard to postnatal care, the coverage was significantly lower in 2012. Data on ACT treatment were not available in the 2000 survey since the treatment was only introduced in 2007. However, after its introduction the average annual rate of increase was 9%, with coverage rising to 53% by 2012.

Table 4: Summary of coverage trend indicators

Indicator	Malawi (10 IHSS districts)			Average annual rate of change pre IHSS (2000-2006). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2006-2012). Data shown as % per year with confidence intervals
	DHS 2000 (pre IHSS) % (95%CI)	MICS 2006 (baseline) % (95%CI)	LQAS 2012/ 2013 (endline) % (95%CI)		
Tetanus toxoid vaccination of pregnant women (at least 2 doses)	58 (56-61)	72 (70-74)	72 (69-75)	2.3 (2.1-2.6)	0.0 (-0.4 – 0.4)
IPTp	28 (26-31)	48 (46-51)	84 (82-87)	3.3 (3.1- 3.6)	6.0 (5.7-6.3)
*Postnatal care for the mother	3 (2-3)	14 (13-16)	5 (3-7)	1.8 (1.7-2.0)	-1.5 [-1.7-(-1.3)]
Early breastfeeding	68 (66-71)	53 (51-56)	75 (72-79)	-2.5 [-2.7-(-2.2)]	3.7 (3.3-4.1)
Exclusive breastfeeding	38 (33-43)	55 (50-60)	61 (57-64)	2.8 (2.3-3.4)	1.0 (0.7-1.7)
Vitamin A supplementation#	79 (76-82)	75 (71-78)	56 (52-59)	-0.7 [-0.9-(-0.5)]	-3.2 [-3.6-(-2.7)]
Measles immunisation	80 (77-84)	81 (78-84)	87 (84-89)	0.2 (-0.2-0.5)	1.0 (0.7-1.3)
DPT3 immunisation	82 (79-85)	86 (83-88)	88 (86-91)	0.7 (0.4-1.0)	0.3 (0.0-0.7)
Care-seeking for suspected pneumonia	26 (23-29)	52 (46-58)	78 (75-81)	4.3 (3.8-4.8)	4.3 (3.8-4.9)
Care-seeking for fever	36 (33-38)	43 (40-46)	74 (69-79)	1.2 (0.8-1.5)	5.2 (4.7-5.5)
ACT	None	0.08 (-0.01-0.17)	53 (49-56)	NA	8.8 (8.4-9.3)
ITN	2 (2-3)	25 (23-26)	46 (42-49)	3.8 (3.7-3.9)	3.5 (3.1-4.0)
ORS coverage	47 (42-52)	50 (46-53)	61 (57-64)	0.5 (0.0-1.0)	1.8 (1.3-2.3)

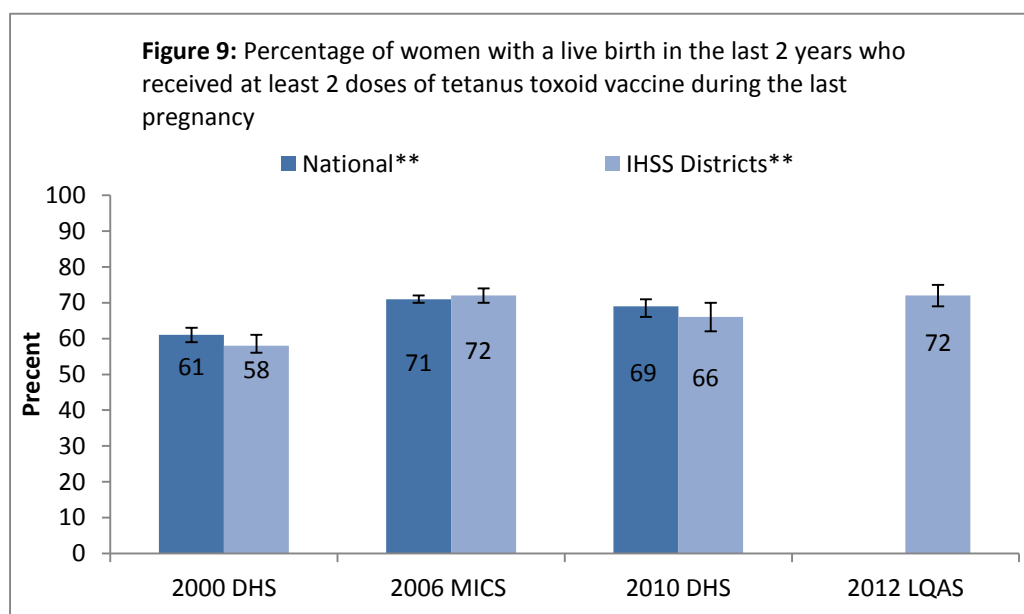
*IPTp = intermittent preventive treatment of malaria for pregnant women; ITNs = Insecticide Treated Nets; DPT = diphtheria, pertussis and tetanus; *results not fully comparable due to data inconsistencies between surveys #amongst children aged 12-23 months to align with LQAS*

	Decrease in annual rate of change between pre-IHSS and IHSS programme period
	Stable annual rate of change between pre-IHSS and IHSS programme period
	Increase in annual rate of change between pre-IHSS and IHSS programme period

5.2.3.1 Antenatal care

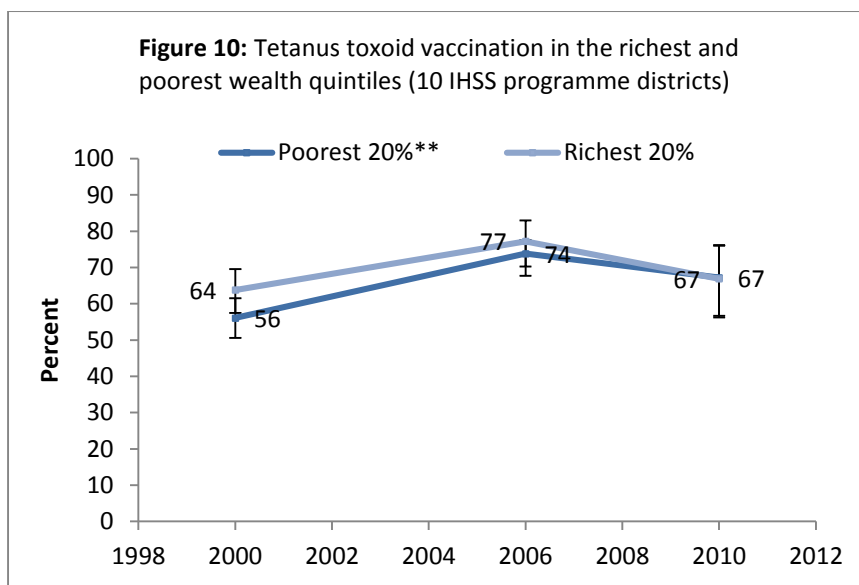
Tetanus Toxoid vaccination of pregnant women

The proportion of pregnant women nationally having received at least two doses of tetanus toxoid (TT2+) to prevent neonatal tetanus in their previous pregnancy increased significantly between 2000 and 2010 (61% to 69%), with the largest change occurring in the pre-IHSS period between 2000 and 2006 ($p < 0.05$). This trend is similar both at a national level and in the IHSS programme districts, which saw a significant increase in TT2+ coverage from 58% to 72% between 2000 and 2006, an average annual increase of 2.3%. Coverage was maintained at 72% in 2012 (Figure 9). Malawi was certified for elimination of maternal and neonatal tetanus in 2004⁴⁹, hence coverage is unlikely to increase further due to the higher levels of lifetime tetanus protection in the population. This is further reflected in the annual rate of coverage change which was higher in the pre-IHSS period of approximately 2% per year, with no annual change in coverage during the IHSS programme period. It is plausible that the IHSS programme contributed to the maintenance of the TT2+ coverage during the IHSS programme period through support given to routine EPI services.



**Denominator is mothers with infants 0-5 months old.*

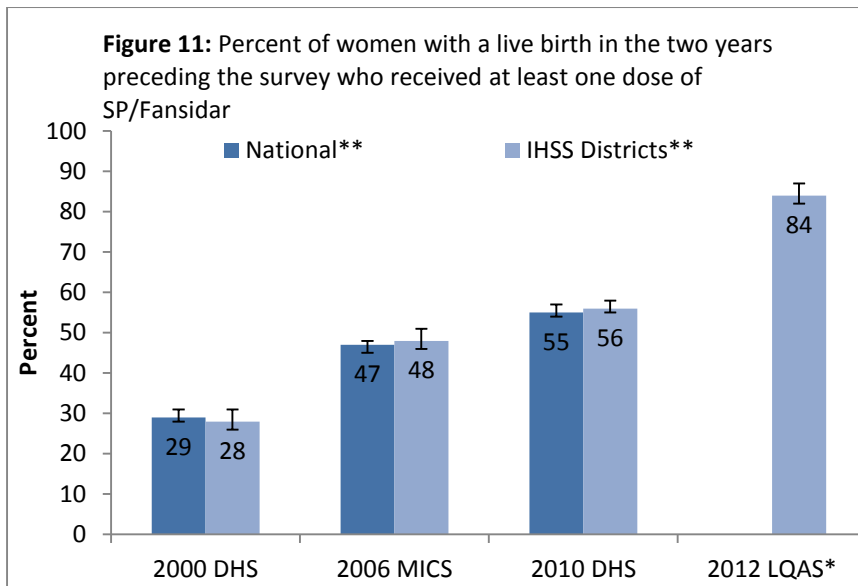
Equity in coverage between the richest and poorest quintiles with regard to tetanus toxoid vaccination was maintained with no significant difference between these quintiles noted from 2000 to 2010. Both the richest and poorest wealth quintiles experienced increases in coverage of tetanus toxoid vaccination between 2000 and 2006, and the increase in the poorest wealth quintile was significant ($p < 0.05$). The apparent drop in coverage among both wealth quintiles between 2006 and 2010 was insignificant when taking into account the overlapping confidence intervals. Consequently, there has been no change in coverage comparing wealth quintiles over the evaluation period. However, there was a significant increase in tetanus toxoid coverage amongst the poorest between 2000 and 2006 (Figure 10). It is plausible that the IHSS programme contributed to the maintenance of the coverage levels in the poorest wealth quintile between 2006 and 2010.



Malaria prevention in pregnancy

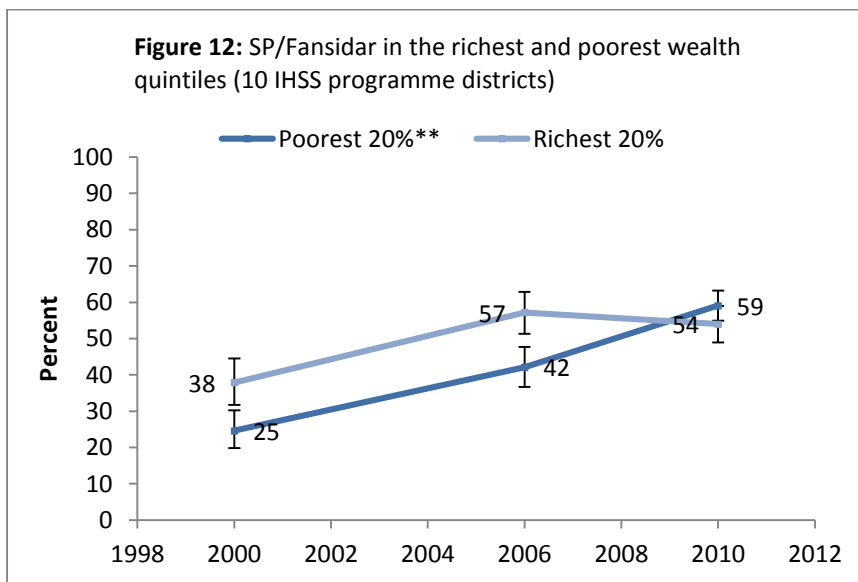
Malawi was the first African country to implement IPTp with sulfadoxine-pyrimethamine (SP) as a national policy in 1993⁵⁰. This is reflected in the significant and steady increase in coverage nationally, rising from 29% in 2000 to 55% in 2010. In the IHSS programme districts a similar trend was observed over the same time period (28% to 56%), with a further large increase to 84% in 2012 (Figure 11). However, the different recall periods in the MICS/DHS and LQAS should be taken into account when interpreting these estimates. The longer recall periods in the DHS and MICS of up to two years could potentially bias coverage estimates downwards; the LQAS has a shorter recall period of up to five months. The average annual rate of coverage change was higher in the IHSS programme period (6%) compared to the pre-IHSS period (3%).

The IHSS programme could plausibly have contributed to the increasing trend in coverage of IPTp through the promotion of antenatal care by HSAs and the village health committees, as well as the purchase, with UNICEF and DFATD funds, of Fansidar tablets. The lack of significant difference between the IHSS programme districts estimate and national estimate between 2006 and 2010 suggests that other interventions and support in the remaining districts led to similar improvements as seen in the IHSS programme districts.



*Denominator is mothers with infants 0-5 months old.

Equity with regard to Fansidar coverage among pregnant women in the IHSS programme districts has improved, with a narrowing gap in coverage between the richest and poorest wealth quintiles between 2000 and 2010. Coverage in the poorest wealth quintile increased, from 25% in 2000 to 59% in 2010 ($p < 0.05$), while the richest quintile experienced a coverage change from 38% to 54% over the same period. By 2010, the difference in coverage between the richest and poorest wealth quintiles was no longer significant, with overlapping confidence intervals (Figure 12). It is plausible that IHSS programme contributed to this improved equity through the deployment of HSAs in rural and hard to reach areas and their promotion of antenatal care attendance.

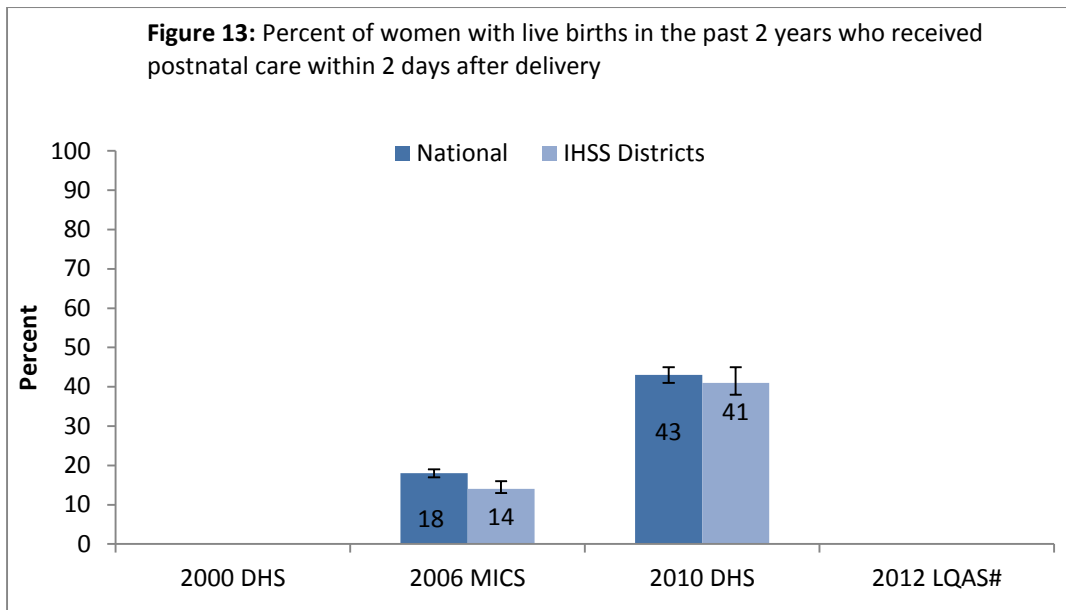


5.2.3.2 Postnatal care

The percentage of women who received postnatal care within 2 days after delivery started at very low levels at both the national and IHSS programme district levels. However, the low estimate in 2000 is based on home-births alone and, hence, is not comparable in the trend analyses (shown in Table 4). The 2012 LQAS survey also reported very low coverage of postnatal care in the IHSS programme districts (5%, shown in Table 4). However, the different recall periods in the MICS/DHS and LQAS should be taken into account when interpreting these estimates. The longer recall periods in the DHS and MICS of up to two years could potentially bias coverage estimates downwards, whereas the LQAS has a shorter recall period of up to five months. Furthermore, it is important to consider the unresolvable differences that exist between the MICS and DHS survey questionnaires with regard to collection of postnatal care information for the mother. MICS 2006 does not distinguish between home and facility deliveries, whilst DHS 2010 clearly gathers this information from facility and home-based deliveries separately. In the latter case, however, the issue of recall could be applicable in that the estimate remained the same when the 5-year period was aligned with the 2-year MICS interval or disaggregated to yearly intervals in the preceding 2-5 years. In the LQAS, information on postnatal care for the mother was not provided for facility births before the mother was discharged, which further made it non-comparable in the trend analysis. Even though we show that during the pre-IHSS period the average annual rate of coverage change was 1.8% per year, whilst during the IHSS programme period it was -1.5% due to the decline noted in the LQAS, these changes are not meaningful for the reasons stated above and should be interpreted with caution.

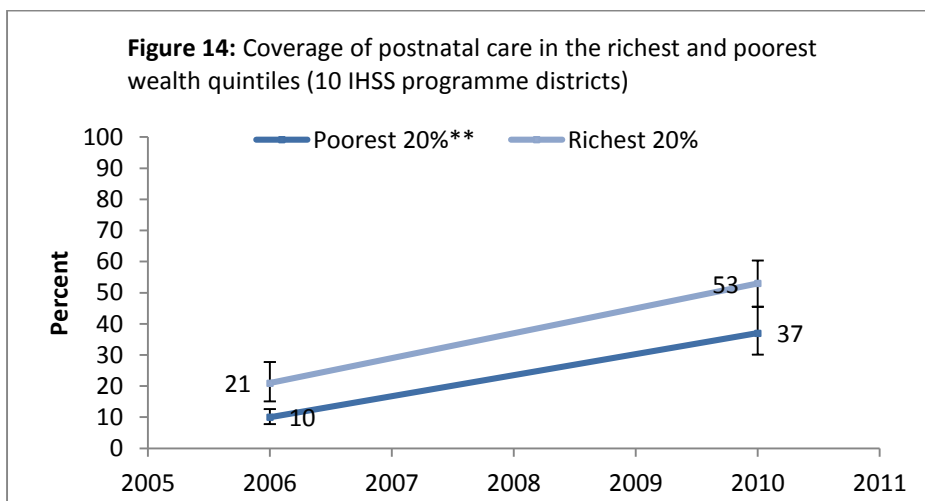
However, there appeared to be a large increase from 2006 to 2010, rising from 18% to 43% nationally, and from 14% to 41% in the IHSS programme districts, when considering all postnatal mothers, regardless of place of delivery (Figure 13). This increase could be attributed to the increase in facility-based deliveries nationally from 54% in 2006 to 73% in 2010. Indeed, according to discussions in country, traditional birth attendants are being fined for out of facility deliveries in an effort to discourage mothers and TBAs from delivering at home. It is also plausible that IHSS programme contributed to this increase in PNC through home visits by HSAs and health education to encourage facility-based deliveries.

Regardless of the gains in facility births reflected in the postnatal care indicators, the 2012 LQAS PNC estimate of 5% (Table 4) clearly shows that women delivering at home are not receiving postnatal care within 48 hours.



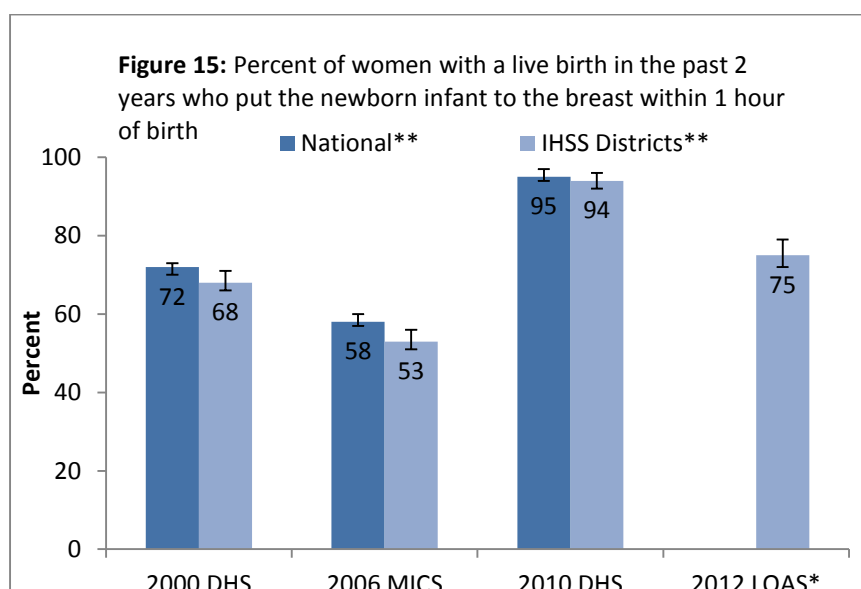
*data based on home births alone; # data from facility births not collected

Both the richest and poorest wealth quintiles experienced significant increases in postnatal coverage between 2006 and 2010. The proportion of women who received postnatal care within 2 days of delivery increased from 10% in 2006 to 37% by 2010 amongst the poorest quintile, while coverage in the richest quintile increased from 21% to 53% over the same period (Figure 14). By 2010, the confidence intervals around the coverage estimates between the richest and poorest quintiles just slightly overlapped, indicating that coverage estimates between the richest and poorest populations were no longer significantly different. It is plausible that IHSS programme contributed to this improved equity in coverage of postnatal care through the training and deployment of HSAs in hard to reach and rural areas, their health promotion regarding facility-based deliveries, and actual service provision through home visits.



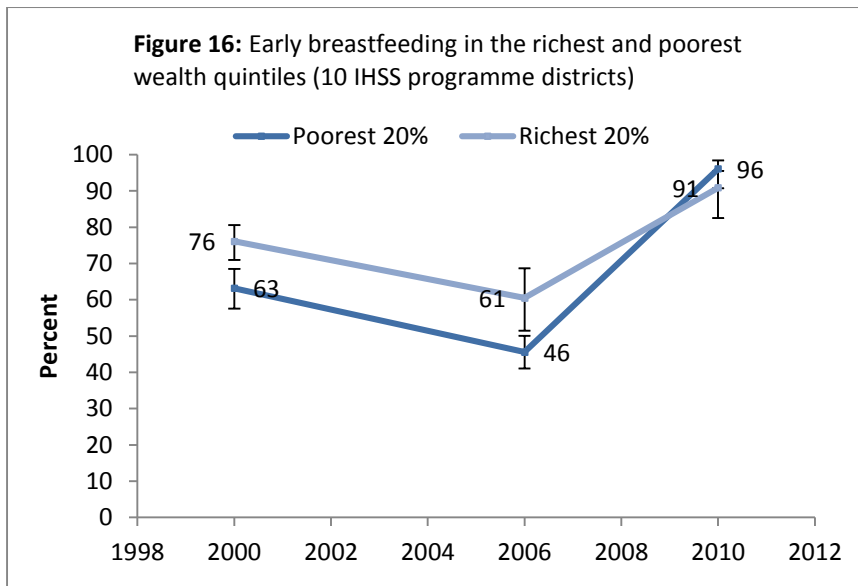
5.2.3.3 Early initiation of breastfeeding and Exclusive Breastfeeding (EBF)

Nationally, the percentage of infants who were breastfed within an hour of birth decreased significantly from 72% in 2000 to 58% in 2006, with a subsequent large and significant increase to 95% in 2010. The IHSS programme districts followed a similar trend; however, a significant decline is noted in the 2012 LQAS to 75% (Figure 15). Importantly, the different recall periods in the MICS/DHS and LQAS should be taken into account when interpreting these estimates. The longer recall periods in the DHS and MICS of up to two years could potentially bias coverage estimates downwards, whereas the LQAS has a shorter recall period of up to five months. The average annual rate of coverage change in the IHSS programme districts during the pre-IHSS period was -2.5% per year, whilst during the IHSS programme period there was a positive coverage change of 3.7% per year as the declines in the pre-IHSS programme period were reversed. It is plausible that IHSS programme contributed to the increase in coverage of early breastfeeding through the awareness raising and promotive role of the HSAs in encouraging facility-based deliveries and undertaking postnatal home visits themselves.

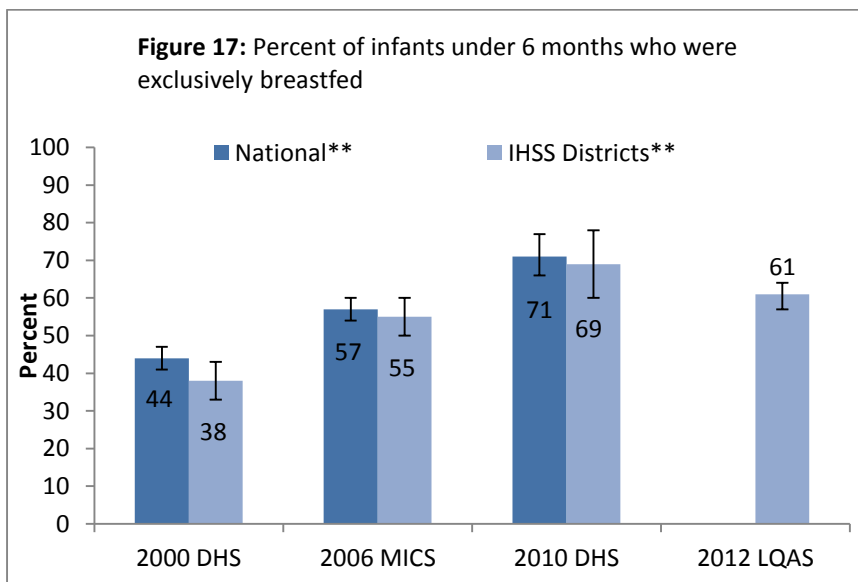


*Denominator is mothers with infants 0-5 months old.

Despite a significant drop in rates of early breastfeeding in both the richest and poorest wealth quintiles between 2000 and 2006, from 76% to 61% and 63% to 46%, respectively, rates rose significantly to 91% and 96% among the richest and poorest wealth quintiles by 2010 (Figure 16). Consequently, equity in coverage increased, with comparable rates of early breastfeeding by 2010 between the richest and poorest wealth populations, despite the richest wealth quintile having higher initial breastfeeding rates both in 2000 and 2006. It is plausible that IHSS programme contributed to this improved equity in coverage of early breastfeeding through the training and deployment of HSAs in hard to reach and rural areas and their health promotion regarding infant feeding practices.

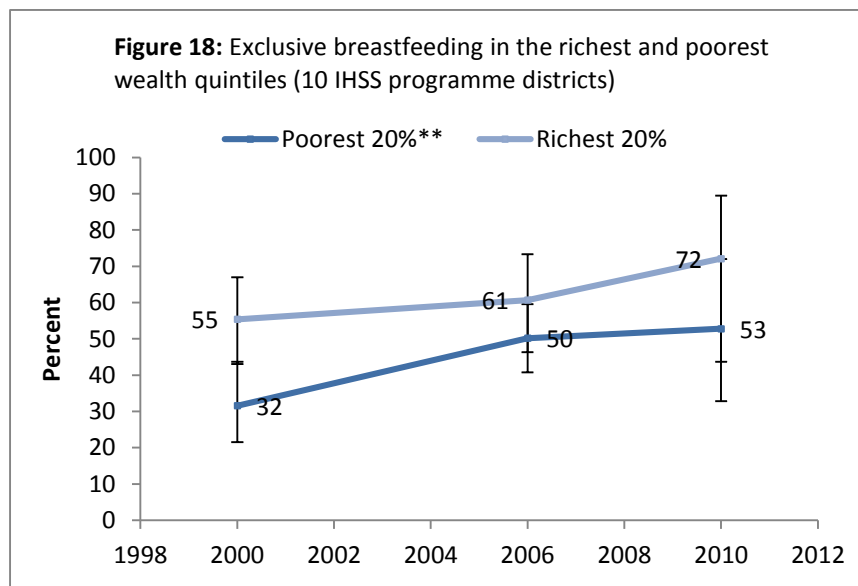


Nationally, the percentage of infants below the age of 6 months who were exclusively breastfed rapidly increased from 44% in 2000 to 71% in 2010. The coverage change between 2000 and 2006 and 2006 and 2010 was similar, with coverage significantly increasing during both time periods. In the IHSS programme districts a similar improvement was seen between 2000 and 2010, with the largest coverage change occurring between 2000 and 2006. Between 2006 and 2010 coverage rates were maintained, hence the average annual rate of coverage change during the pre-IHSS period was 2.8% per year whilst during the programme IHSS period it was 1% per year, as the biggest improvements had already occurred and efforts were needed to maintain relatively high exclusive breastfeeding rates (Figure 17). It is plausible that the programme IHSS contributed to the maintenance of high EBF coverage during the IHSS programme period through the breastfeeding counselling messages of HSAs.



Due to the extremely small sample sizes of children between the ages of 0-6 months, when restricting to the poorest and richest wealth quintiles of the 10 IHSS programme districts, the confidence intervals around the estimates for exclusive breastfeeding were quite large. Consequently, the surveys showed no significant difference in equity both during the pre-IHSS period (2000-2006) and in the IHSS

programme period (2006-2012), despite seemingly large differences between the point estimates around the coverage of exclusive breastfeeding (Figure 18). As a result, equity in coverage appears to have remained stable throughout the period of analysis, where the gap in coverage between the richest and poorest wealth quintiles did not change. Furthermore, despite almost 20 percentage point increases in coverage between 2000 and 2010 in both the poorest ($p < 0.05$) and richest wealth quintiles, the rise in rates of exclusive breastfeeding in each quintile was not significant due to overlapping confidence intervals between time periods.

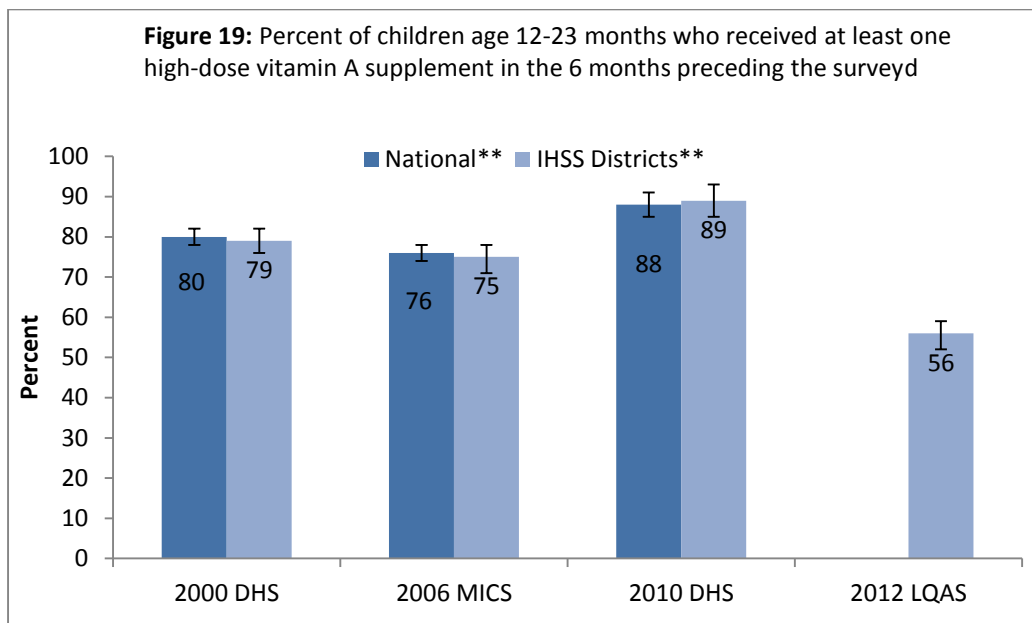


5.2.3.4 Preventive care

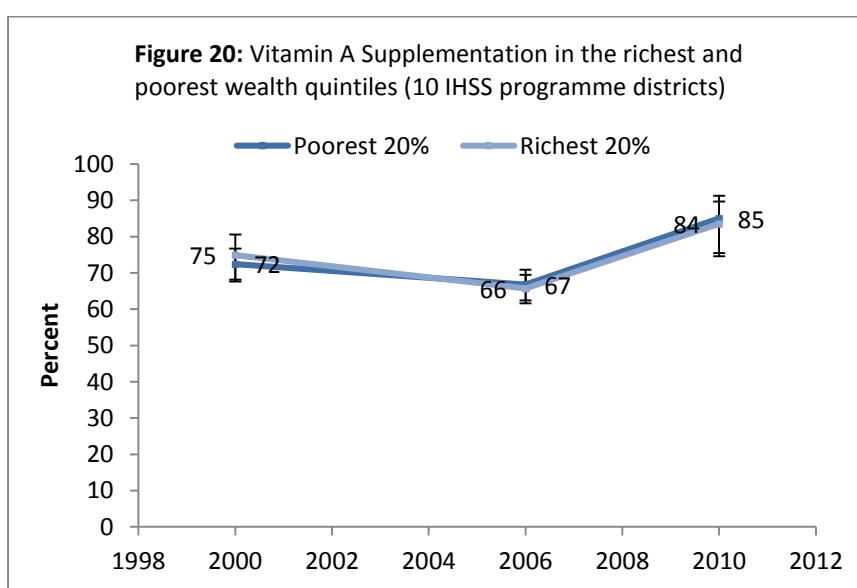
Vitamin A supplementation

Nationally, 80% of children aged 12-23 months received vitamin A supplementation in 2000. Six years later, coverage was not significantly different at 76%. However, the most recent national estimate (2010) shows a sharp significant increase to 88% coverage.

In the IHSS programme districts, coverage was similar in 2000 and 2006, 79 and 75%, respectively. However, as with the national trend, coverage in the 10 IHSS programme districts increased significantly between 2006 and 2010 to reach 89% (Figure 19). Between 2010 and 2012, there was a large significant decline in coverage to 56%, and thus, between 2000 and 2012 in the IHSS programme districts, there was an overall negative trend. A possible explanation for the decline in coverage between 2010 and 2012 is the timing of the survey relative to the timing of the Child Health Weeks campaigns, since the timing of the survey relative to the campaign can drastically affect coverage estimates. However, this does not appear to be a major factor since data from the campaign tally sheets for Feb-April 2013 indicates 63% coverage, which is similar to what the LQAS survey estimates, suggesting that this is a true decline. Assessing annual rates of coverage change shows a negative average annual rate of change during the pre-IHSS period of -0.7% per year, which worsened to -3.2% during the IHSS programme period. It is plausible that IHSS programme contributed to the increase in vitamin A coverage between 2006 and 2010 through the support to Child Health Week campaigns.

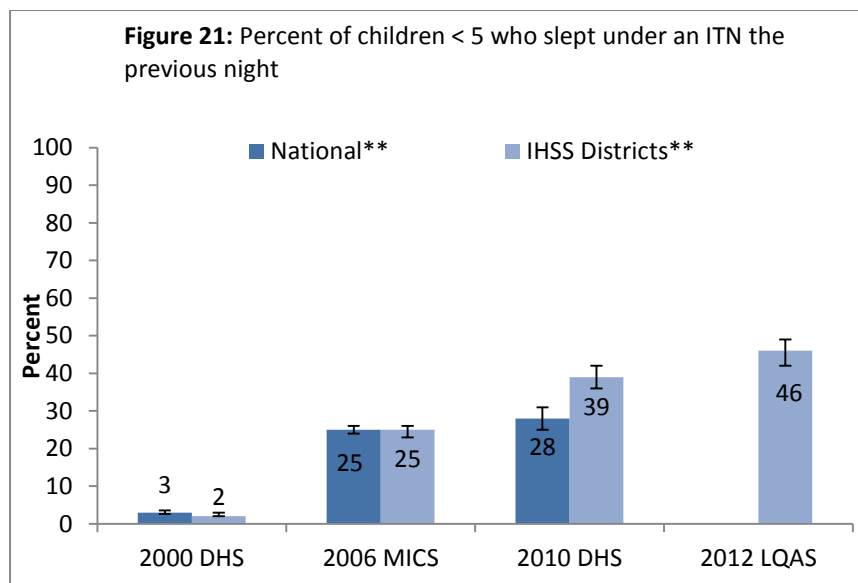


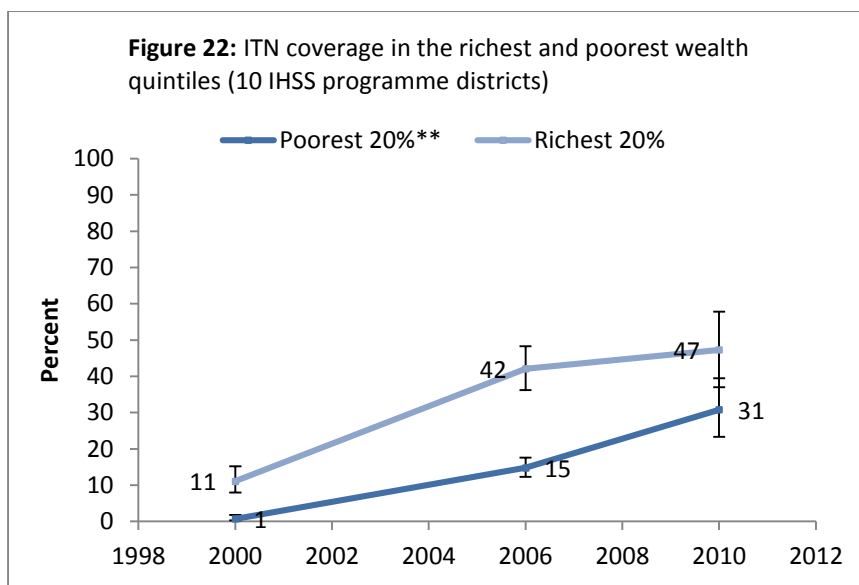
Coverage of vitamin A supplementation, both in the richest and poorest wealth quintiles experienced a non-significant drop between 2000 and 2006, from 75% to 66% and 72% to 67%, respectively. Thereafter, both quintiles experienced a similar significant rise in coverage to 84-85% by 2010 (Figure 20). There was no inequity between the richest and poorest populations, with virtually identical coverage reported throughout the period of analysis in the IHSS programme districts. Due to the fluctuations in Vitamin A coverage in the poorest wealth quintile, trend was not significant ($p=0.2$). It is plausible that IHSS programme contributed to the significant increase in coverage of vitamin A in the poorest quintile between 2006 and 2010 through the support to Child Health Week campaigns, which reach hard to reach areas, and through the mobilizing role of HSAs encouraging mothers to attend the campaign outreach posts.



Children under 5 sleeping under ITNs

The proportion of children under the age of 5 sleeping under treated nets increased nationally from 3% in 2000 to 25% in 2006, with no change thereafter in 2010 (28%). For the IHSS programme districts a dramatic increase in coverage was observed during the pre-IHSS phase (2000 to 2006), rising from 2% to 25%. A further significant rise occurred during the IHSS programme phase (2006-2010) where coverage reached 39% (Figure 21). Thereafter, coverage was maintained with a small but non-significant increase to 46% reported in 2012. While there was no significant difference between the average annual rate of coverage change in the pre-IHSS and IHSS programme periods (3.8% versus 3.5% per year, respectively) in the IHSS programme districts, the continued rise in coverage of ITNs during the IHSS programme period could plausibly be due to the inputs from the programme. Two million three hundred and fifty thousand (2,350,000) were procured ITNs with DFATD funds, and an additional 500 000 with UNICEF funds, and these were distributed by HSAs at village clinics. Nets in Malawi are largely distributed when women attend ANC care as well as through national campaigns. In 2010, the IHSS programme districts had significantly higher coverage of 39% than the national estimate of 28%.



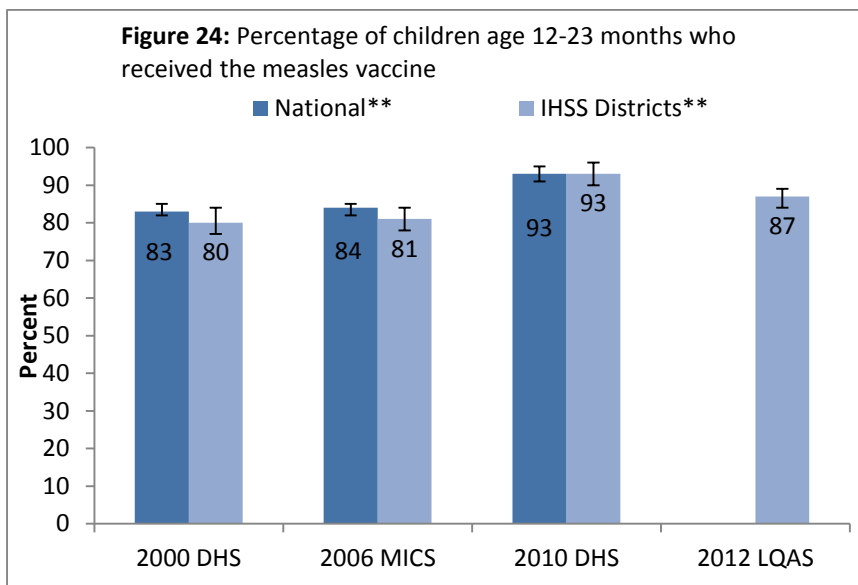
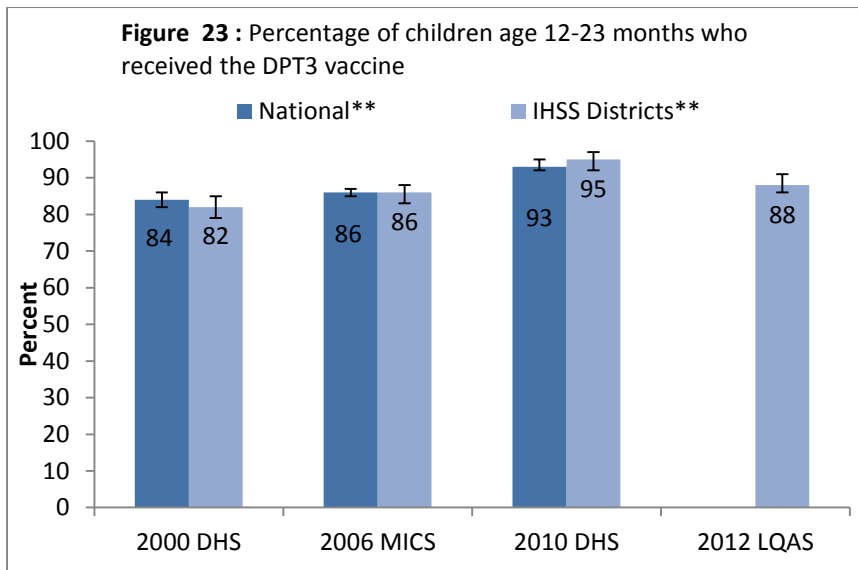


Equity with respect to coverage of children sleeping under ITNs improved between 2000 and 2010, with the gap in coverage between the richest and poorest wealth quintiles decreasing over time. The proportions of children in the poorest wealth quintile sleeping under a net was virtually non-existent in 2000 with coverage of less than 1%, rising to 15% in 2006 and reaching 31% coverage by 2010 ($p < 0.05$). The annual rate of increase of coverage in the richest quintile was starker in the pre-IHSS period, with coverage rising from 11% to 42% between 2000 and 2006 (Figure 22). However, this plateaus between 2006 and 2010 as the richest quintile did not experience a significant increase in coverage, while coverage in the poorest quintile doubled. The IHSS programme plausibly contributed to the improvement in equity in ITN coverage as it procured over 2 million ITNs and focused distribution on the poorest, hard to reach populations.

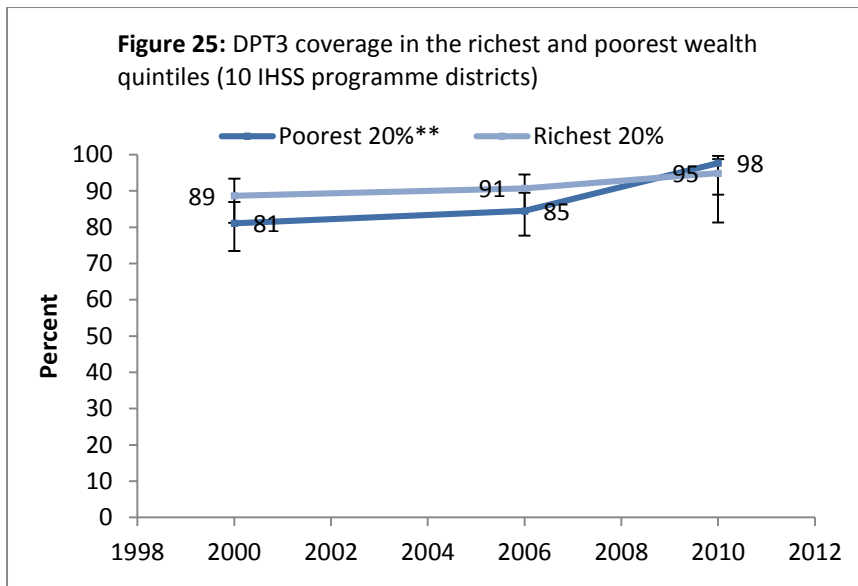
Vaccinations: Measles and DPT3

Malawi has achieved impressive immunisation coverage over the past 14 years. In 2000, 84% and 83% of children had received the required 3 doses of the Diphtheria, Pertussis and Tetanus (DPT) and measles vaccination respectively nationally. Coverage remained similarly high (over 80%) across all the time periods, peaking at 93% in 2010 for both vaccines (Figures 23 and 24). Coverage in the IHSS programme districts was similar to national coverage with equally high rates reported. During the IHSS programme period coverage increased from 86% for DPT3 and 81% for measles in 2006 to 95% and 93% in 2010, respectively. This dropped significantly to 88% and 87%, respectively in 2012. The average annual rate of coverage change was similar during both periods for DPT3, whilst for measles it was higher during the IHSS programme period (1% per year) compared to the pre-IHSS period (0.2% per year).

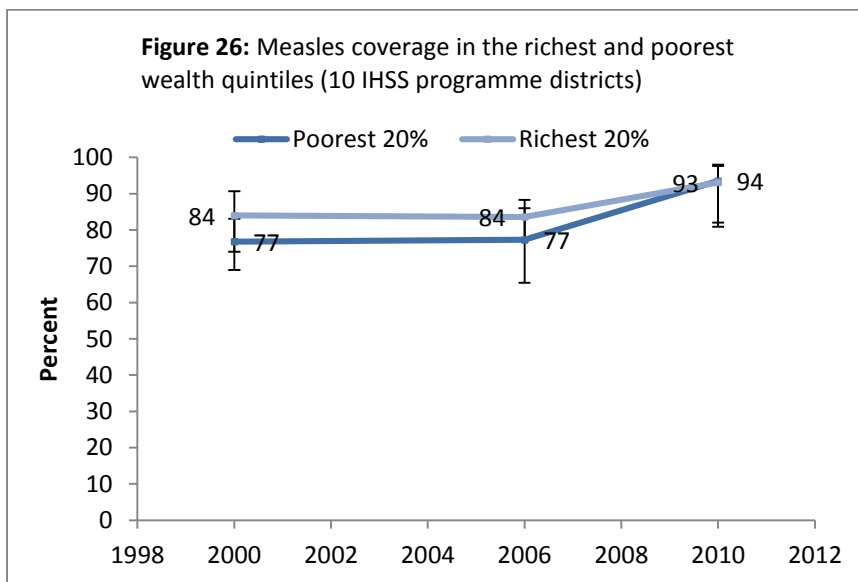
Despite the fuel shortages and financial crisis of 2010/11, coverage levels were maintained at a high level in 2012 which could plausibly be due to the support provided through the IHSS programme for routine vaccination and campaigns. Such support included vaccine supply chains, transport, purchasing of fridges and the frontline administration of vaccines by HSAs.



Equity in DPT3 coverage remained stable between 2000 and 2010, with no significant difference between coverage estimates comparing the richest and poorest wealth quintiles. However, the poorest wealth quintile did experience a significant increase in DPT3 coverage estimates when comparing 2000 and 2010, where coverage rose from 81% to 98% (Figure 25). Increases in DPT3 coverage were less prominent in the richest wealth quintile; the confidence intervals around the coverage estimates between 2000 and 2010 just slightly overlap, indicating a non-significant increase over time amongst the richest quintile. The IHSS programme could have plausibly contributed to the maintenance of high coverage in the poorest quintile between 2006 and 2010 through the support for routine EPI and the mobilizing role of the HSAs in encouraging mothers to receive immunization services.



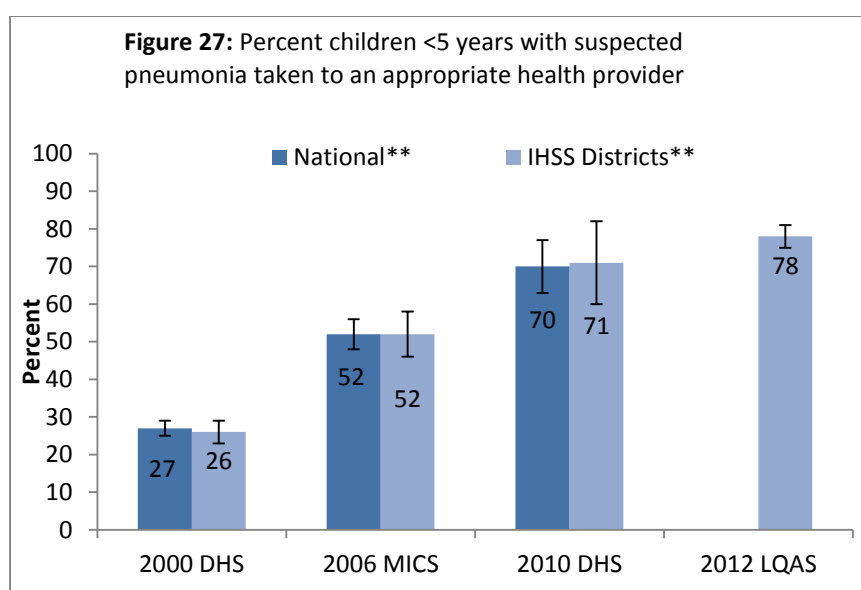
There were no changes in equity with regard to measles vaccination coverage, with the gap between the richest and poorest wealth quintiles remaining consistent between 2000 and 2010. Furthermore, coverage changes within the poorest and richest wealth quintiles remained stable over time, with non-significant increases from 77% to 94% in the poorest quintile between 2000 and 2010 ($p=0.05$), and 84% to 93% in the richest wealth quintile (Figure 26). It is important to note that initial coverage estimates for measles were already high, and significant efforts are required to maintain them over time. The IHSS programme could have plausibly contributed to the maintenance of high coverage in the poorest quintile between 2006 and 2010 through the support for routine EPI and campaigns and the mobilizing role of the HSAs in encouraging mothers to receive immunization services.



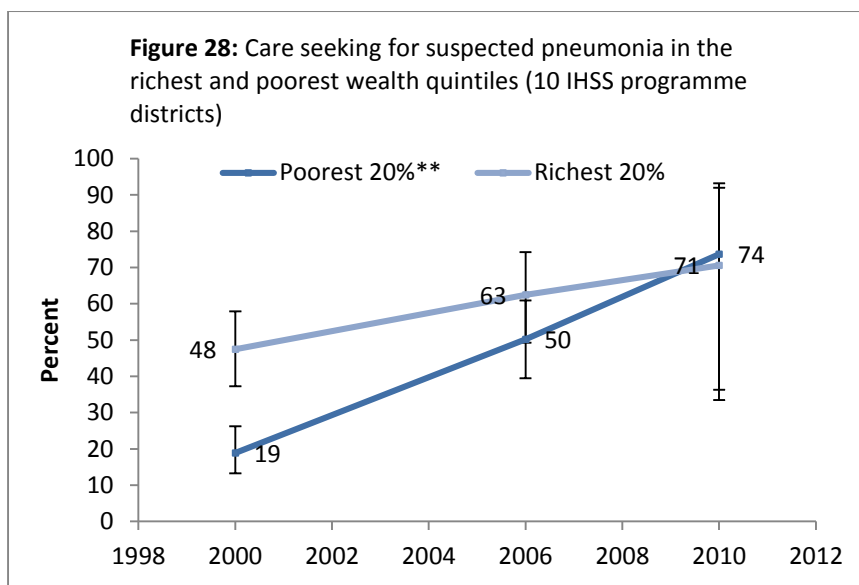
5.2.3.5 Curative care for malaria, suspected pneumonia and diarrhoea

Care-seeking for suspected pneumonia

Nationally, care seeking for suspected pneumonia from appropriate providers increased from 27% in 2000 to 52% in 2006 and to an impressive 70% in 2010. The trend for care-seeking is almost identical in the IHSS programme districts during the same period (Figure 27). In the IHSS programme districts the high coverage of care-seeking from appropriate providers was maintained between 2010 and 2012. The average annual rate of coverage change was identical during the pre-IHSS and IHSS programme periods (4.3% per year) reflecting a steady positive upward trend. The IHSS programme could have plausibly contributed to the significant increase in care-seeking between 2006 and 2012, due to the increased availability of treatment for suspected pneumonia at health post level and the training and deployment of HSAs to provide such treatment.

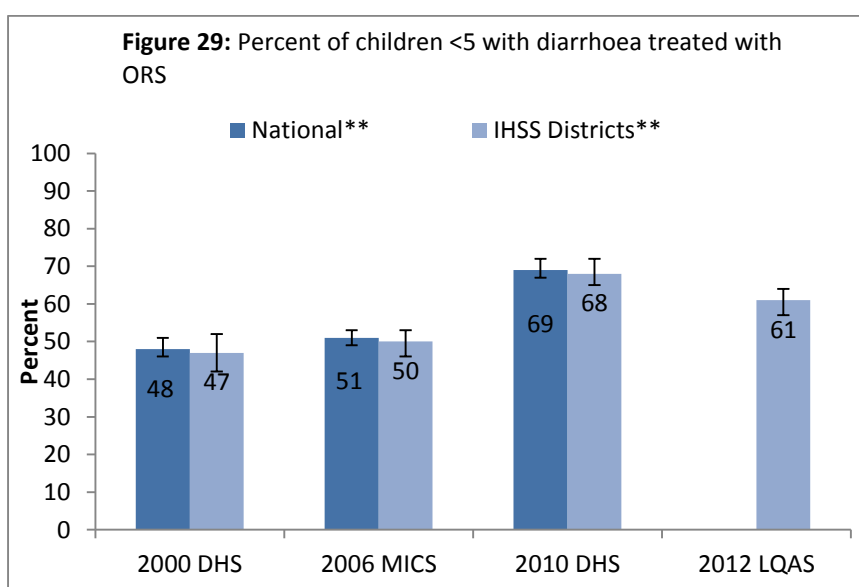


Equity with regard to care seeking for suspected pneumonia improved, with a narrowing gap between the richest and poorest wealth quintiles over the reported time period. Coverage in the poorest quintile began at a significantly lower level of 19% in 2000, compared to 48% in the richest quintile. By 2006, the gap had disappeared, with coverage estimates rising to 50% in the poorest quintile ($p < 0.05$) and 63% in the richest quintile (Figure 28) with overlapping confidence intervals. This trend continued in 2010. However, coverage changes within the richest quintile, from 63% in 2006 to 71% in 2010, and the corresponding increase from 50% to 74% in the poorest quintile, were not significant. The confidence intervals for both quintiles in 2010 are extremely wide, most likely due to the narrowing definition of suspected pneumonia and consequently smaller sample size. It is plausible that the IHSS programme contributed to the non-significant increase in care-seeking for suspected pneumonia in the poorest quintile between 2006 and 2010 through the training and deployment of HSAs to hard to reach areas with consequent increases in access to treatment at health post level.

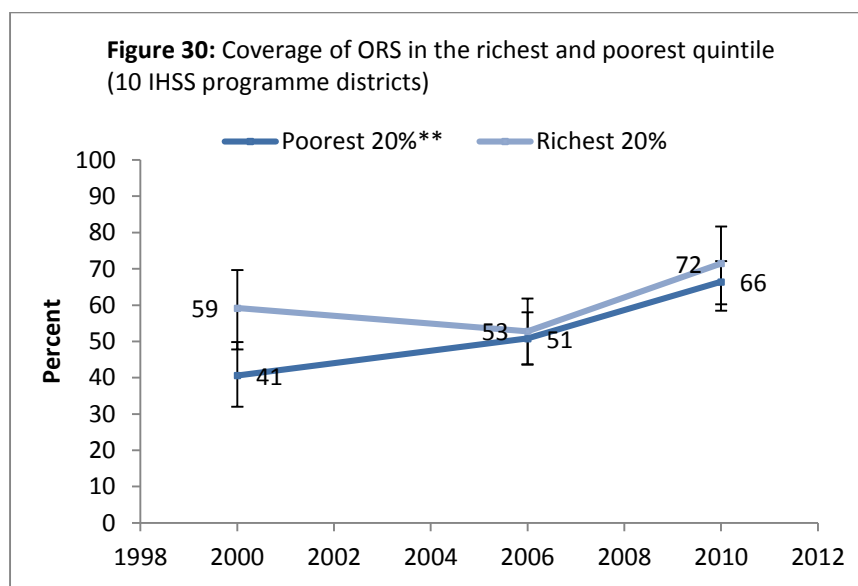


Treatment of diarrhoea

Coverage of ORS treatment for children with diarrhoea was similar when comparing the years 2000 and 2006 at both the national and IHSS programme district levels (Figure 29). Thereafter, coverage increased significantly (by 18 pts) at both levels by 2010. However, by 2012 there was a small but significant decline to 61% in the IHSS programme districts. The average annual rate of coverage change increased from 0.5% per year pre-IHSS to 1.8% per year during the IHSS programme period. This could plausibly be due to the IHSS programme support for ORS supplies (1.6 million sachets), and the scale up of HSAs available in the country. The lack of significant difference between the IHSS programme districts estimate and national estimate in 2010 suggests that other interventions and support in the remaining districts led to similar improvements as seen in the IHSS programme districts. The small decline between 2010 and 2012 could possibly have been due to the funding crisis and fuel shortages which affected distribution of supplies; however, the decline could have been much worse had the additional support through the IHSS programme not been present.

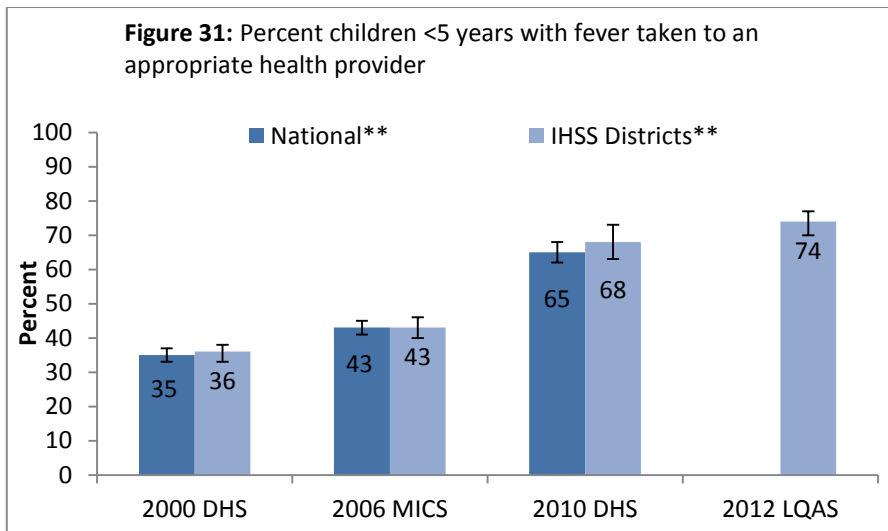


Equity with regard to coverage of ORS amongst children with diarrhoea improved, with the gap in coverage between the richest and poorest wealth quintiles narrowing over time. In 2000, the poorest wealth quintile reported 41% ORS coverage, while the richest quintile reported 20% higher coverage. By 2006, the decrease in coverage within the richest quintile to 53%, and the increase in coverage within the poorest quintile to 51%, were not significant in comparison to 2000 estimates, but the equity gap does appear to have reduced. Subsequent increases in coverage in the poorest quintile to 66% by 2010 were, however, significant ($p < 0.05$) although increases in coverage in the richest were not (Figure 30). It is plausible that the IHSS programme contributed to the significant increase in ORS coverage in the poorest quintile between 2006 and 2010 through the training and deployment of HSAs to hard to reach areas with consequent increases in access to ORS treatment at health post level.

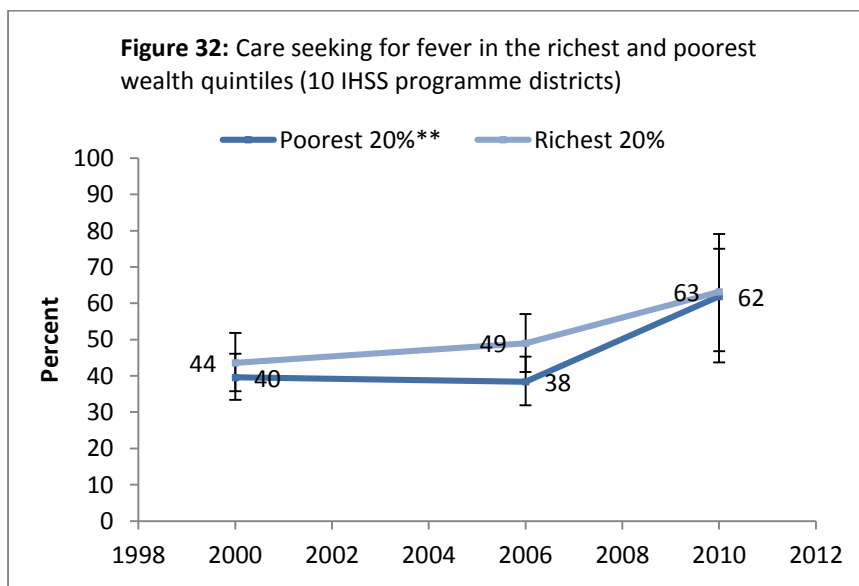


Care-seeking and treatment of children with fever (suspected malaria)

Care seeking for children with fever increased at a similar rate between 2000 and 2006, with the biggest change occurring between 2006 and 2010, where coverage reached 65% and 68% nationally and in the IHSS programme districts, respectively (Figure 31). By 2012 there was a further small but non-significant increase to 74% in the IHSS programme districts. Consequently, the average annual rate of increase in the IHSS programme period was approximately 5% per year in comparison to 1% per year in the pre-IHSS period. The increased coverage of care-seeking for fever during the IHSS programme period could plausibly be due to the scale up of trained HSAs in the country and availability of health service points, in addition to the increased availability of antimalarials with almost 2 million ACTs purchased with DFATD funding. The lack of significant difference between the estimate for the IHSS programme districts and the national estimate in 2010 suggests that other interventions and support in the remaining districts led to similar improvements as seen in the IHSS programme districts.

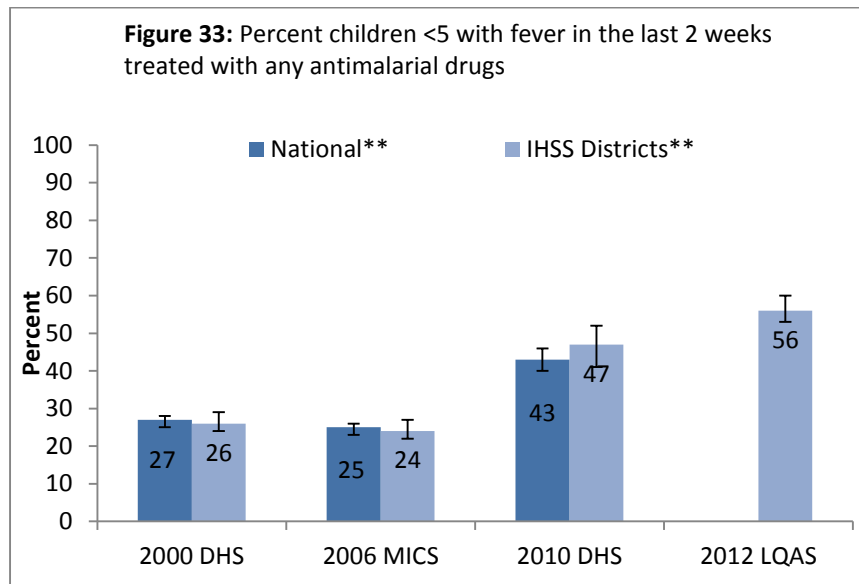


From 2000 to 2010, there was no significant difference, with regard to care seeking for fever, between the richest and poorest quintiles. Although care seeking amongst the poorest wealth quintile remained the same at approximately 40% between 2000 and 2006, it rose significantly to 62% by 2010 ($p < 0.05$). Similarly, the richest quintile did not experience any significant changes in coverage between 2000 and 2010, with overlapping confidence intervals (Figure 32). It is plausible that the IHSS programme contributed to the significant increase in care-seeking for fever in the poorest quintile between 2006 and 2010 through the training and deployment of HSAs to hard to reach areas with consequent increases in access to malaria treatment at health post level.

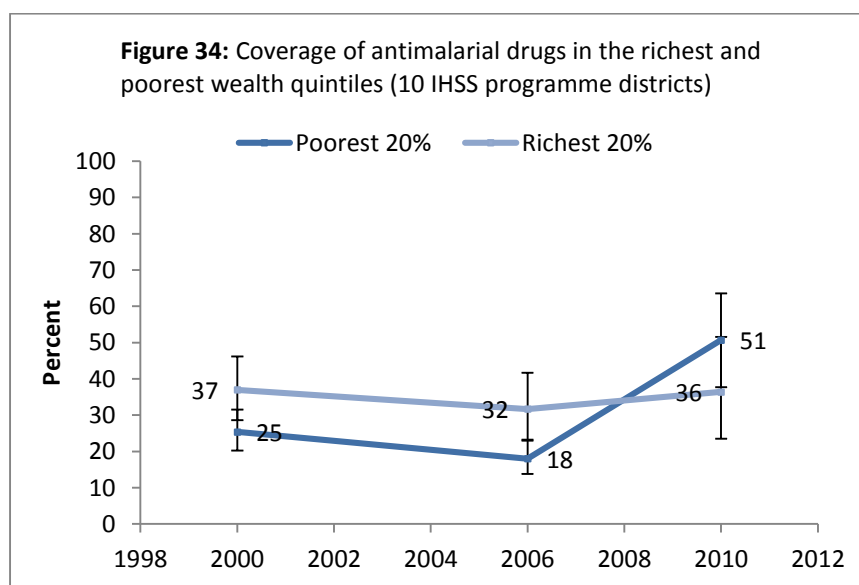


The treatment of fever for suspected malaria using any antimalarial remained low and virtually unchanged in the pre-IHSS period, both nationally and in the IHSS programme districts. An increase in coverage from 25% to 43% was observed between 2006 and 2010 at the national level. In the IHSS programme districts coverage changed from 24% to 47% in 2010, with a further significant increase to 56% in 2012 (Figure 33). The increase in coverage of antimalarial drugs in the IHSS programme

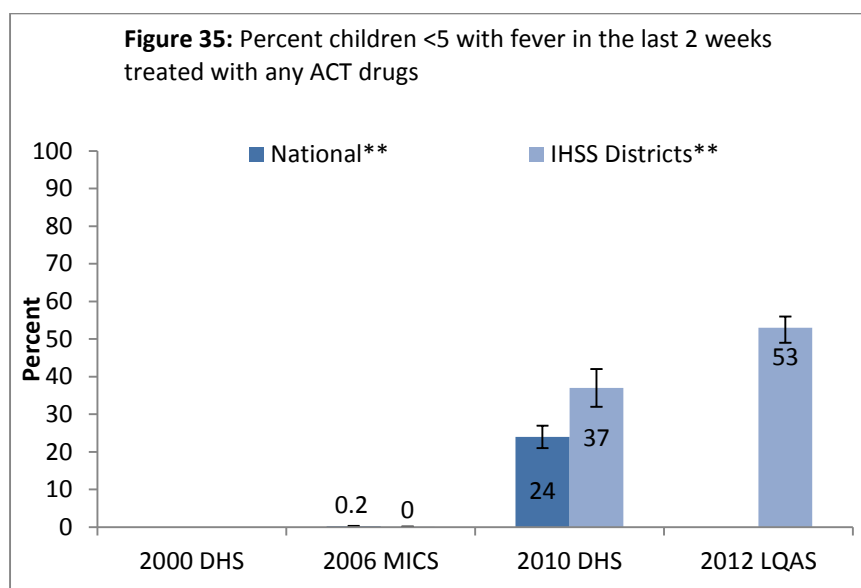
districts could plausibly have been due to the inputs of the IHSS programme including the increased availability of antimalarials, with almost 2 million ACTs purchased with DFATD funding, training and deployment of HSAs and facility-based staff. The lack of significant difference between the estimate for the IHSS programme districts and the national estimate in 2010 suggests that other interventions and support in the remaining districts led to similar improvements as seen in the IHSS programme districts.



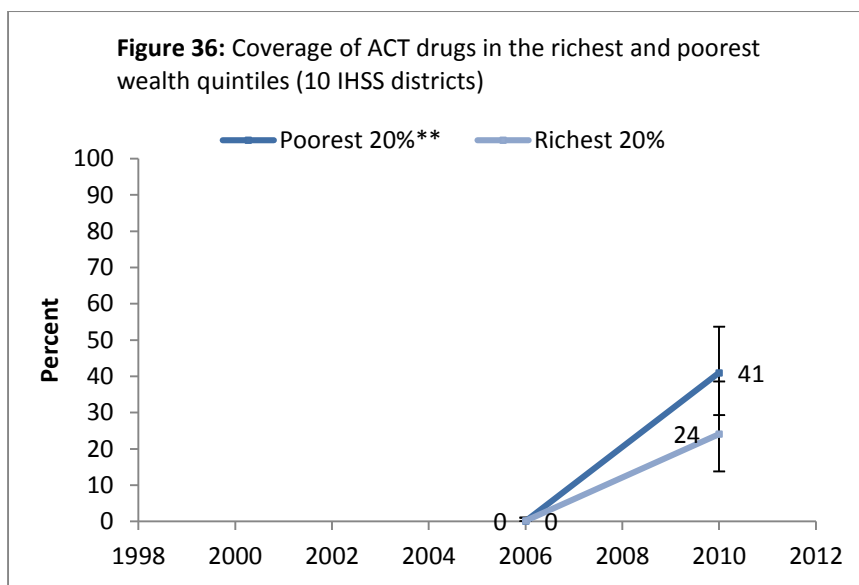
Equity with regard to coverage with antimalarials for children with fever did not change over time, although the degree of overlap in coverage between the richest and poorest wealth quintiles was much less marked by 2006, in comparison to 2000 and 2010 estimates. It is important to note, however, that while coverage in the richest quintile did not change significantly between 2000 and 2010, coverage in the poorest quintile doubled from 25% to 51%. The increases were not significant for trend however ($p=0.1$) (Figure 34).



Malawi's malaria treatment policy was revised in December 2007 to include Artemisinin-based combination therapy (ACT) as first line treatment. Specific use of ACT increased from 0.2% in 2006 nationally. In the IHSS programme districts coverage of ACT treatment reached 37% in 2010, and increased significantly to 53% in 2012 (Figure 35). Due to its introduction and rapid scale up in the country, the average annual rate of coverage change of ACTs was approximately 9% per year over the IHSS programme period. During this period, UNICEF, through DFATD funding, procured packs of ACTs for the treatment of 1.9 million cases of malaria, and this contribution could plausibly explain the increase in coverage observed between 2010 and 2012 as well as the higher coverage in the IHSS programme districts compared to national estimates in 2010.

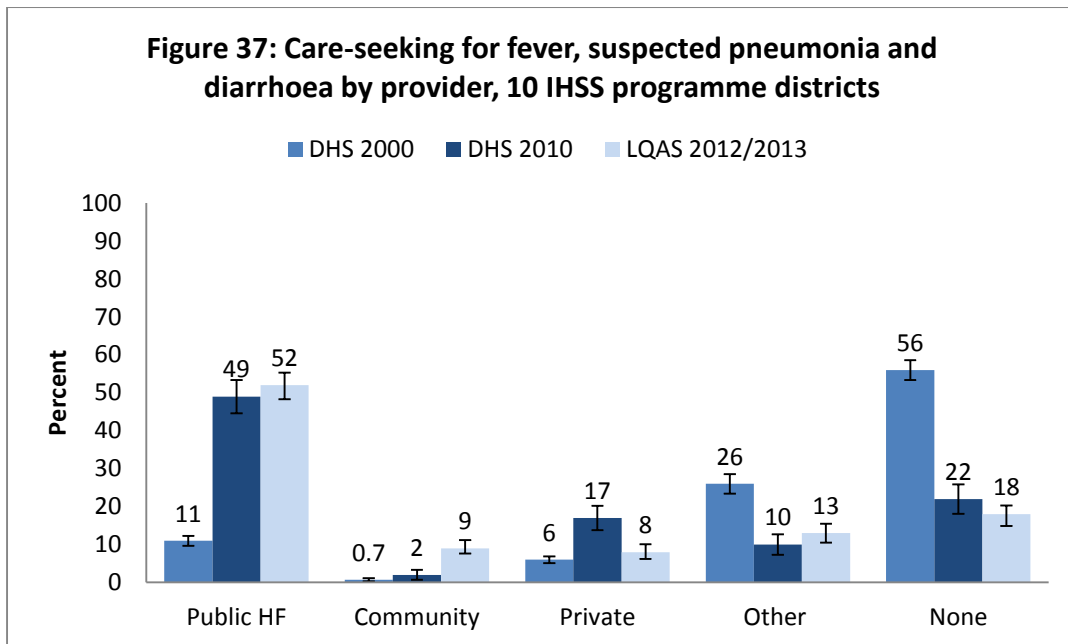


Equity with regard to ACT coverage did not change significantly over time, although both the richest and poorest wealth quintiles experienced significant increases in coverage between 2006 and 2010. This is to be expected, since the ACT policy came into place only in 2007. However, it is important to note the rapid rate of scale up in provision of ACT over a 3-year time span, increasing coverage in the poorest quintile to 24% ($p < 0.05$) and 41% in the richest quintiles. Due to the small sample sizes, the confidence intervals are large and overlapping between the wealth quintiles in 2010, despite large variations in the point estimates around ACT coverage (Figure 36). It is plausible that the IHSS programme contributed to the increase in coverage of ACT drugs in the poorest quintile between 2006 and 2010 through the training and deployment of HSAs to hard to reach areas with consequent increases in access to first line malaria treatment at health post level.

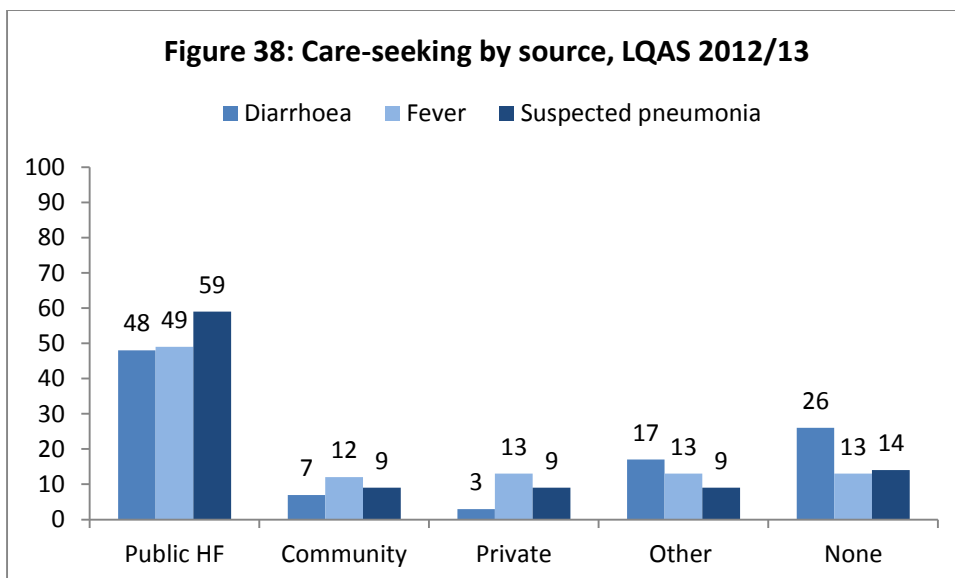


5.2.3.6 Care-seeking for fever, suspected pneumonia and diarrhoea by provider

In the IHSS programme districts, the proportion of children under 5 who sought care for fever, suspected pneumonia and diarrhoea at public health facilities increased from 11% to 52% between 2000 and 2012. Care-seeking at community level, through the HSAs, also increased from <1% in 2000 before iCCM, to 9% in 2012 (Figure 37). UNICEF, through IHSS programme funding, was a major provider of support for the training, supplying and supervision of new HSAs in the 10 IHSS programme districts. Furthermore, the construction of village clinics, largely through district level support or community investment, out of which the HSAs could provide care, strengthened a new layer of service delivery more accessible to remote populations. It is encouraging to see that proportions of those who did not seek care from HSAs for the three conditions declined from 56% in 2000 to 18% in 2012. Additionally, since a decrease in those seeking care from private facilities was noticed, it is plausible that much of the new care-seeking is now occurring at the community level where the largest increases in care-seeking have occurred. It is plausible that the IHSS programme has made a major contribution to this shift through the training, supplying and supervision of new HSAs.



Data from the recent LQAS household survey show that approximately half of children with diarrhoea and fever sought care from a public health facility, roughly a quarter of children with diarrhoea were not taken for care, and the most common condition for care to be sought from private providers was fever. At community level, fever was the most commonly treated condition (12%) (Figure 38).



5.2.3.7 Additional maternal and child health indicators not included in the statistical trend analysis

The indicators below were not the primary targets for 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 the IHSS programme implementation. Figures for these indicators can be found in appendix E.

Antenatal care

ANC visits

Utilization of antenatal care services at least once during pregnancy remained steadily high at the national level over the 2000 to 2010 period. An average of at least 91% of pregnant women attended antenatal care at least once, during each of the four survey years reaching a peak of 95% in 2010. All of the IHSS programme districts achieved over 90% coverage of at least one antenatal care visit in 2010 with the highest being Karonga (99%).

However, the proportion of women attending at least four ANC visits has declined nationally from 56% in 2000 to 35% in 2010. The reasons for this are unclear. A similar pattern is seen across all IHSS programme districts with the lowest coverage in 2010 in Chiradzulu (28%) (see Appendix E).

Childbirth and newborn care

Skilled attendance

There was no change between 2000 and 2006 in the national proportion of pregnant women having been seen by a skilled birth attendant during delivery. The biggest shift in coverage occurred between 2006 and 2010 (IHSS programme period) with a 17 percentage point change from 54% to 71%. Amongst the IHSS programme districts, the lowest coverage in 2010 was in Kasungu district (60%), whilst the highest coverage was in Mzimba (81%). The HSAs could plausibly have contributed to the increases in skilled attendance seen between 2006 and 2010 through the promotion of facility deliveries. Furthermore, as revealed earlier, home-based deliveries are discouraged by the fining of traditional birth attendants should they deliver children at home (see Appendix E).

Infant and Young Child Feeding

Complementary feeding

The proportion of children 6-8 months who were breastfed and received complementary foods declined from 93% in 2004 to 70% in 2006 nationally. It is important to note that the 2004 DHS only collected data in 10 of the 27 districts. In 2010 this proportion increased to 87% (see Appendix E).

Vaccinations

BCG

Coverage of the BCG vaccine is high in Malawi and has been above 90% since 2000, reaching coverage of 97% in 2010 with all districts reaching over 90% coverage. Two non-IHSS programme districts, Mulanje and Mwanza, were reported to have 100% coverage in the 2010 DHS.

Polio

Coverage of polio vaccine is not as high as for BCG but it has risen from 80% in 2000 to 86% in 2010. The lowest coverage in 2010 was in Lilongwe district (74%) and the highest in Mwanza district (98%).

HepB and Hib

In January 2002 Malawi introduced the pentavalent vaccine (DPT-HepB- Hib) with support from the Global Alliance on Vaccines and Immunisations (GAVI). Coverage estimates for Hib and HepB are incorporated into the estimates for DPT3 since this is a pentavalent vaccine. The country reached 93% national coverage of DPT-HepB- Hib in 2010.

It is plausible that the IHSS programme contributed to these improvements in immunisation coverage through support to the routine EPI services.

Nutrition indicators: Stunting and underweight

The national profile for malnourished children under the age of 5 showed little change in rates of stunting between 2000 and 2010 (49% versus 47%). The lack of change in stunting rates over a ten year period is concerning and is perhaps a missed opportunity for community-based nutrition support, through the HSAs and the even larger of TBAs and other community volunteers. Amongst the IHSS programme districts five experienced increases in stunting between 2006 and 2010 (Balaka, Chiradzulu, Karonga, Mzimba, Phalombe), three showed no change (Kasungu, Lilongwe, Nsanje) and only two achieved declines (Dedza, Ntcheu).

The proportion of underweight children declined from 25% in 2000 to 13% in 2010. Declines were seen in all 10 IHSS programme districts with the largest decline of 13 percentage points between 2006 and 2010 in Dedza (see Appendix E). It is plausible that the IHSS programme could have contributed to this decline through increased access to treatment for common conditions contributing to under nutrition (malaria, pneumonia and diarrhoea), increased immunization coverage, and improvements in early initiation of breastfeeding.

5.3 Impact

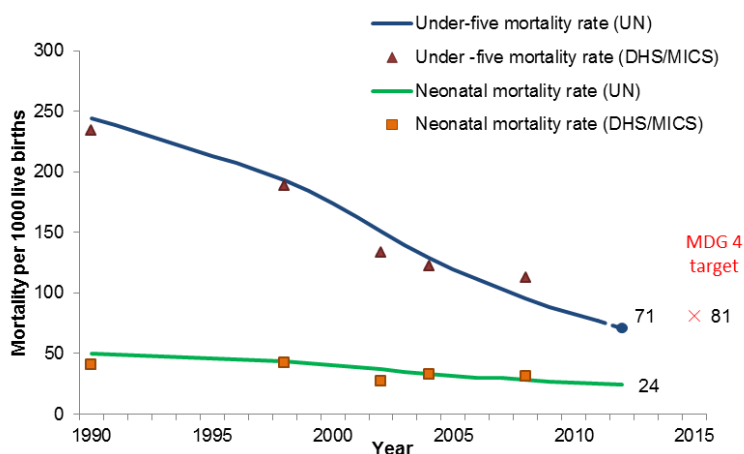
5.3.1 Change in child mortality

Malawi is one of the few countries in Sub-Saharan Africa on track for MDG 4 for child survival. This is a remarkable achievement given major national challenges including a high population growth rate (2.8%), fertility rate (5.7 births per woman), HIV prevalence (10%), low gross national income (US\$340 per capita) and health worker density (<3 per 10,000 population).

In 2012, an estimated 43,000 children under the age of five died in Malawi.⁵¹ According to the UN Inter-Agency Group for Child Mortality Estimation, under-five mortality has decreased 71% from 244 deaths per 1,000 live births in 1990 to 71 in 2012 (Figure 39).⁵¹ The average rate of reduction is 5.6% per year, which is substantially greater than the sub-Saharan African regional average (2.7%).

Figure 39: Millennium Development Goal progress

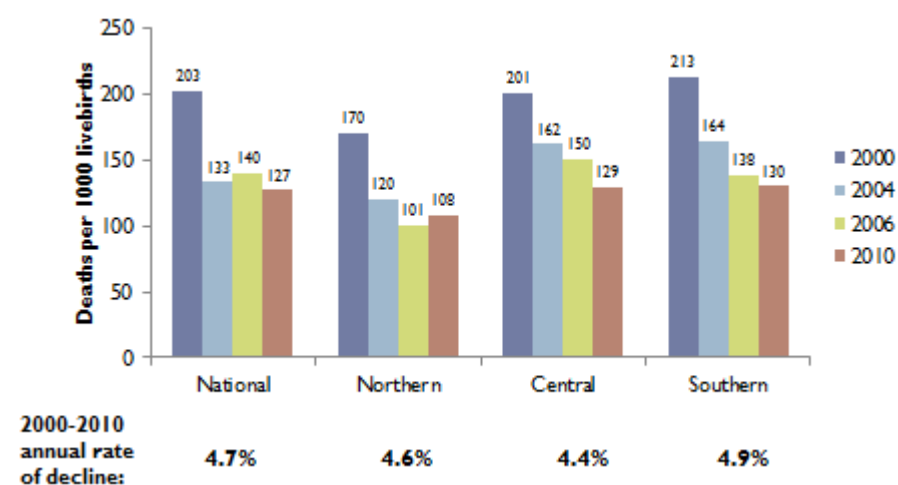
Data sources: IGME 2013 mortality estimates (www.childmortality.org), 1992, 2000, 2004, 2010 Malawi DHS; 2006 Malawi MICS.



National survey data reported U5MR for the 10-year period preceding the surveys at 203 deaths per 1000 in 2000, 133 per 1000 in 2004, 140 in 2006, and 127 per 1000 in 2010, with an average reduction of 4.7% per year.⁵²⁻⁵⁵ There was little regional variation with the Southern Region having consistently slightly higher mortality rates and slower average rate reduction than the Northern (Figure 40).

Figure 40: National and regional Under-five mortality rates since 2000

Data source: 2000, 2004, 2010 Malawi DHS; 2006 Malawi MICS. Note: Regional USMR for the 10-year period preceding the survey.



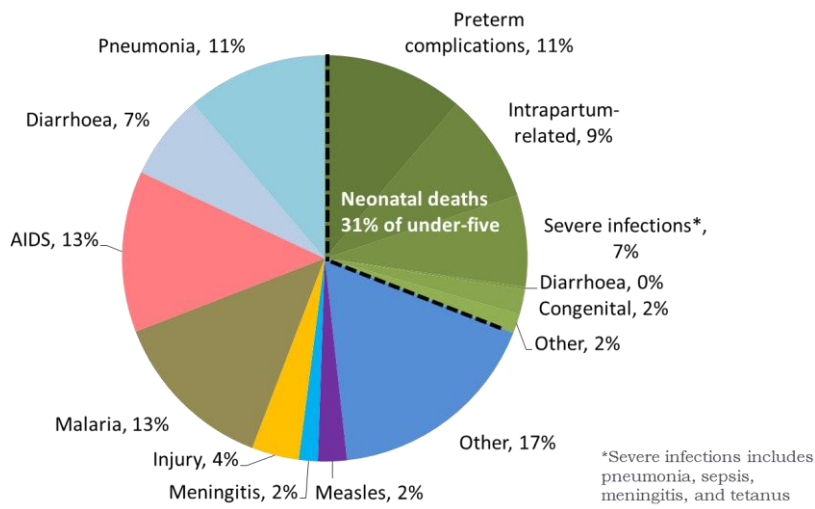
Nearly a third of child deaths occur in the first month of life (neonatal period), and this is an increasing proportion given that neonatal mortality rate (NMR) is reducing slower than post-neonatal mortality rate. The average rate of reduction of newborn mortality since 1990 was 3.2% per year according to UN estimates.⁵¹ National survey data report around the same level of national progress (3.3% per year) but with wide variations across regions. For example, the Northern region had experienced little progress towards reducing NMR (0.5%), whereas the Southern region saw rapid declines with 4.6% reduction per year.

The main causes of under-five deaths in Malawi are: malaria (13%), AIDS (13%), pneumonia (11%), complications from prematurity (11%), intrapartum-related (birth asphyxia) (9%), and diarrhoea (7%) (Figure 41a).¹² According to modelled estimates, between 2000 and 2010, the proportion of deaths from malaria reduced 5 percentage points from 18% to 13%, pneumonia reduced from 13-11%, and diarrhoea from 10-7% (Figure 41b). Malawi has the highest rate globally of preterm births with 18 babies born too soon out of every 100 births.⁵⁶

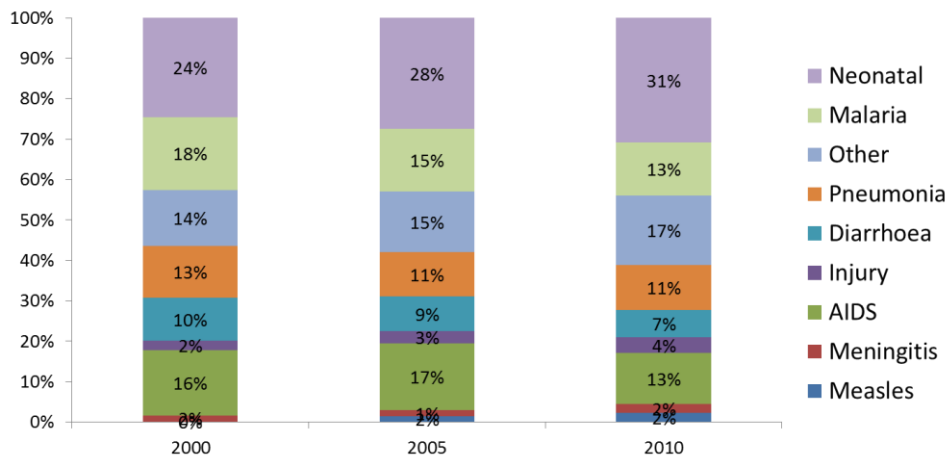
Figure 41: Causes of under-five deaths in Malawi

Data source: Liu et al, Lancet 2012¹²

(a) 2010



(b) Trend from 2000 to 2010



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 implementation, phase I and phase II of the IHSS programme. The results from the LiST analyses are presented by time period: 2000-2006 (pre-IHSS), 2007-2010 (Phase I of the IHSS programme), and 2010-2013 (Phase II of the IHSS programme with iCCM interventions).

Pre-IHSS implementation (2000 to 2006)

Prior to the start of the IHSS programme, changes in intervention coverage accounted for 9% of deaths averted in 2006. According to the modelled results, approximately 14,700 deaths of children under five were averted between 2000 and 2006 with a predicted under-five mortality of 165 deaths per 1,000 live births and an average annual mortality rate change of -1.6% per year (Table 5). The results differ from mortality data reported in national household surveys of 146 in 2006 with an average annual mortality rate change of -3.7% per year. Over this time period, Hib vaccine averted a quarter of child deaths (25%, 1,013 lives saved in 2006) since it was introduced in 2002 and scaled up rapidly (Figure 42). The scale up of ownership of insecticide treated nets (ITNs) prevented 863 child deaths in 2006 (22%). Case management of diarrhoea and care seeking for suspected pneumonia both accounted for approximately 20% of lives saved (857 and 782 in 2006 respectively).

Table 5: Results from Lives Saved analysis for Malawi pre-IHSS

Pre IHSS PHASE	2001	2002	2003	2004	2005	2006	Cumulative deaths prevented
Proportion of under five deaths averted	1%	5%	6%	7%	8%	9%	-
Additional under five deaths prevented per year	409	1,705	2,402	2,874	3,347	4,000	14,737
Predicted under 5 mortality rate	180	175	172	170	168	165	-
Annual under 5 mortality rate change	-0.9	-3.2	-1.6	-1.0	-1.1	-1.8	<i>Average -1.6</i>

Phase I (2007 to 2010)

For the Phase I analysis, we used the baseline mortality for children under five years from MICS 2006 (146 per 1,000 live births). In this phase, the LiST model predicted a slightly lower mortality (121 per 1,000 live births) than the 2010 national household survey (128 per 1000 live births) but it is likely that the confidence intervals overlap. When comparing average annual rate of change in under-five mortality between 2006 and 2010, national household survey data showed a much slower rate of decline (-3.3% per year) as opposed to the LiST model (-6.4% per year). The modelled results indicate that 13,679 deaths of children under five were cumulatively averted between 2007 and 2010 (17% of deaths in 2010) (Table 6), with 72% of these deaths averted by interventions that were a focus of the IHSS programme. By 2010, malaria treatment (ACT) accounted for 21% of deaths averted (1411 lives saved in 2010). The dramatic coverage increase for skilled birth attendance and facility deliveries over this time averted 15% of deaths (1006) in 2010, most in the neonatal period. Likewise the promotion of breastfeeding prevented 836 deaths (12%) in 2010. Care-seeking for suspected pneumonia also saved 804 lives (12% of total deaths averted) in 2010 (Figure 42).

Table 6: Results from Lives Saved analysis for Malawi Phase I of the IHSS programme

PHASE I	2008	2009	2010	Cumulative deaths prevented
Proportion of under five deaths averted	6%	12%	17%	
Additional under five deaths prevented per year	2,297	4,674	6,708	13,679
Predicted under 5 mortality rate	137	129	121	
Annual under 5 mortality rate change	-6.6	-6.5	-6.0	-6.4 <i>average</i>
Number (%) of deaths averted due to interventions to which the IHSS contributed	1,621 (72%)	3,319 (71%)	4,851 (72%)	9,791 (72%)

^As per page 5 of Schedule A of the Grant Agreement and the tailored Malawi programme implementation, in this context, "IHSS programme 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 the IHSS programme in relation to specific interventions, nor does it assign weights to different levels of service provision (e.g., community).

Phase II (2010 to 2013)

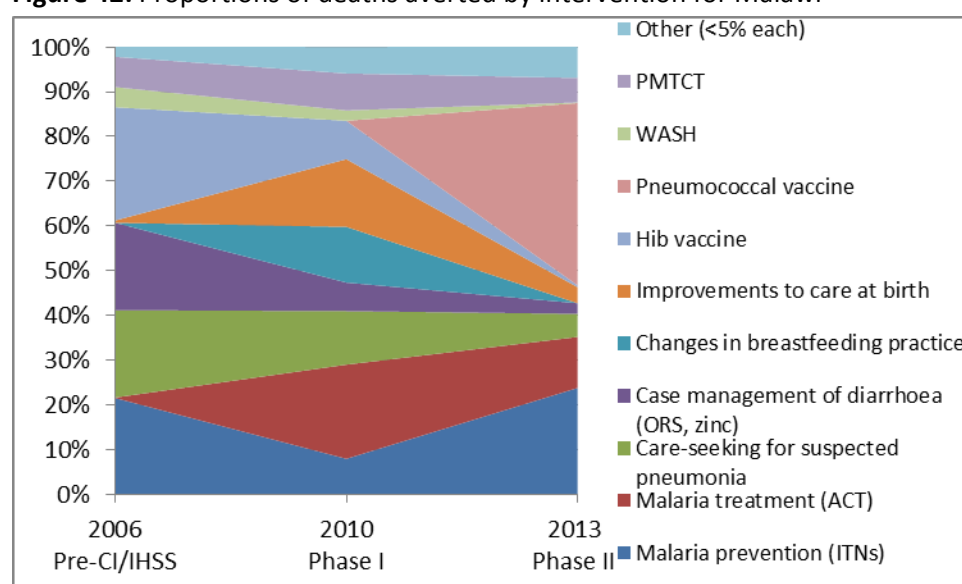
For Phase II with the implementation of iCCM in 2009, we applied the first year of implementation as 2010 using the baseline under five mortality rate of 128 per 1000 live births (data from DHS 2010). The LiST model predicted a mortality of 105 per 1000 live births – saving approximately 13,172 lives of children under-five years between 2010 and 2013 (17% deaths averted in 2013) (Table 7), with 48% of these deaths averted by interventions that were a focus of the IHSS programme. Given the LQAS does not provide mortality data, we cannot compare results from what the LiST model predicted. The intervention with the greatest cumulative lives saved was the pneumococcal vaccine (2729 lives saved in 2013; 41%). This vaccine was introduced in 2011, and by 2012 the WHO immunisation database³⁷ estimated universal coverage (99%). The scale up of ownership of insecticide treated nets (ITNs) prevented almost a quarter of deaths (1595 lives saved in 2013; 24%) (Figure 42). The estimated increases in malaria treatment (ACTs), care-seeking for pneumonia and zinc for treatment of diarrhoea together accounted for an estimated 1,269 lives saved in 2013 (a total of 20% deaths averted). Coverage decreases in ORS and some vaccines (measles, DPT and Hib) resulted in additional deaths in 2013 compared to 2010.

Table 7: Results from Lives Saved analysis for Malawi Phase II scenario

Phase II	2011	2012	2013	Cumulative deaths prevented
Proportion of under five deaths averted	3%	14%	17%	
Additional under five deaths prevented per year	1,031	5,441	6,700	13,172
Predicted under 5 mortality rate	123	108	105	
Annual under 5 mortality rate change	-3.5	-12.8	-3.1	-6.5 <i>average</i>
Number (%) of deaths averted due to IHSS interventions [^]	882 (86%)	2,232 (41%)	3,267 (49%)	6,382 (48%)

[^]see note under Table 6.

Figure 42: Proportions of deaths averted by intervention for Malawi



Note: Improvements to care at birth include: labour and delivery management, antenatal corticosteroids for preterm labour, neonatal resuscitation, and clean birth practices. WASH indicators include improved water and sanitation and access to water connection in the home.

The comparison in reductions in under-five mortality in the pre-IHSS Phase then in Phase 1 and subsequently Phase II of the IHSS programme indicates that mortality began to decline more rapidly after the implementation of the IHSS programme. With increased focus on the IHSS programme interventions and coverage gains experienced, it is plausible that the IHSS programme contributed to the proportion of the lives saved by the focus interventions (10, 710 in Phase I and 6,989 in Phase II). In Phase I, the increases in lives saved from malaria prevention and treatment, improvement in care at birth, 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. With the continued increase of these interventions in Phase II of the IHSS programme, and particularly the introduction of the pneumococcal vaccine, mortality declines continued.

At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in ICCM, for 11 months only. Thus, the number of lives saved over such a short time would be an underestimate of their actual number over a longer implementation period.

5.4 Sustainability

5.4.1 Costing

Findings from this costing analysis aim to answer the following questions:

- What is the additional cost per treatment for each of the 3 conditions?
- What would be the cost of increased utilisation?
- What is the financial sustainability of this programme? (What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends?: Are committed financial and human resources sufficient to maintain benefits and results?)

The results below do not reflect the actual expenditure on iCCM. They reflect expected costs if the strategy 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. Appendix D shows details of protocols, unit costs and calculations.

In 2012, a total of 1,018 iCCM trained HSAs were deployed in the 10 IHSS programme districts (Note comment on data limitation in Methodology). According to routine UNICEF data each of them provided an average of 546 malaria, diarrhoea and pneumonia (MDP) iCCM treatments between June 2012 and May 2013.

Malaria treatments represented 54% of MDP treatments, diarrhoea 13% and pneumonia 33%.

5.4.1.1 Current cost per treatment

Additional annualised fixed cost per HSA is \$55, and additional annualized fixed cost by HAS per treatment is \$0.10 per treatment, as shown in Table 8 below. The cost of a malaria treatment, including rapid diagnostic tests (RDTs) and drugs (Coartem and Paracetamol) is \$2.36, whereas diarrhoea treatment with ORS and zinc costs \$0.70, and pneumonia treatment (Cotrimoxazole) \$0.23. Share of HSA fixed costs represent an average of 7% of the cost per treatment (Table 9). This proportion is lower when consumable costs are higher (malaria) and higher when consumable costs are lower (diarrhoea, pneumonia).

Table 8: Additional annualised costs per HSA for 2012

Additional Annualised Fixed Cost by HSA in \$	Fixed Cost/HSA/Year	# MDP treatments under 5 /year	HSA Cost per Treatment
Training	12.26		
Subsidy	-		
Equipment	33.68		
Management & Supervision	6.54		
Other Overheads 5%	2.62		
Total Additional HSA cost	55.10	546	0.10

Table 9: HSAs Fixed cost and variable costs per iCCM treatment for 2012

Cost per treatment 2012-13 - US\$	HSA Cost	Drug/ Diagnostic	Total	% HSA Cost
Malaria, incl RDT	0.10	2.26	2.36	4%
Diarrhea	0.10	0.59	0.70	15%
Pneumonia	0.10	0.13	0.23	44%
Weighted Average	0.10	1.34	1.44	7%

The 546 MDP treatments per HSA over the one year period June 2012 to May 2013 translates to 11.4 treatments a week. Assuming that an additional 30% of visits were made which did not end up in treatment (e.g., negative RDT results), the combined consultations and meetings time spent on iCCM for the MDPs amounted to an average of 9 hours a week per HSA, out of the 2 days a week allocated to iCCM.

5.4.1.2 Scenario for increased iCCM service utilisation

If the number of treatments per HSA per year increases by 15%, amounting to 13 treatments (17 visits) a week, the time spent by an HSA on MDP treatments for children under 5 would increase from the current 9 hours a week to 10 hours a week, and to 11.3 hours for a 30% increase in treatments representing 15 treatments (19 visits) a week. Required time increases by a smaller ratio than the increase in number of visits because the time spent on meetings does not increase.

Due to the fact that 93% of additional treatment costs are due to drugs and diagnosis, the cost per treatment would only change very marginally, but the costs across the programme would increase by 13% with 15% more treatments, and by 26% with 30% more treatments (Table 10).

Table 10: Impact on time and costs of increased number of treatments by HSA

Increased Utilisation by H.S.A/Year	2012	With 15% increase in treatments	With 30% increase in treatments
Increase rate		15%	30%
Number Treatments / Year / HSA	546	628	710
Number Treatments / Week	11.4	13.1	14.8
Number Visits / Week	14.8	17.0	19.2
Hours on visits/meetings / Week	9.0	10.2	11.3
HSA Cost per Treatment	0.10	0.09	0.08
Average Cost per Treatment	1.54	1.51	1.49

Program Cost CI Districts	856 519	968 168	1 079 817
% increase in cost		13.0%	26.1%

There are 3,722 iCCM trained HSAs across the country. If the patterns observed in the IHSS programme districts were similar in other districts, the additional annualised costs of iCCM would stand at \$3.1 million. With 30% more treatments per HSA, the cost would be \$3.95 million. This costing has assumed that health workers were already trained in iCCM, HSAs had already received basic training, drugs/tests were available at the village clinics, and that treatments were given as per protocol. In practice additional funds were used as part of the IHSS programme to provide the conditions to enable iCCM to be delivered. To reflect this wider platform, we defined iCCM+ as iCCM costs plus an arbitrary additional 15% added to the iCCM basic costs. We recognize that this additional 15% underestimates these additional costs at the beginning of implementation of iCCM but will

overestimate them as iCCM continues to be delivered. The additional costs of the iCCM+ would stand at \$3.6 million. With 30% more treatments per HSA, the cost would be \$4.5 million (Table 11).

Table 11: iCCM cost for the Country

Additional iCCM Cost for the Country	2012	With 15% increase in treatments	With 30% increase in treatments
iCCM basic	3 131 594	3 539 804	3 948 013
iCCM + (+15% for system strengthening)	3 601 333	4 070 774	4 540 215

Utilisation of MDP services at village clinics stands at an average of 0.86 treatments per child under 5 per year, a higher proportion than observed in a number of other countries studied. The high number of treatments per HSA makes it efficient while the workload allows it to remain within the time allocated for iCCM.

5.4.1.3 Financial Sustainability

To assess the financial sustainability of iCCM, the 2012 additional expenditure on iCCM for MDPs was compared to the total annual public health expenditure (government and donors), and to the government health expenditure in 2011. In 2011, government expenditure stood at 28.6% of public health expenditure. With the current number of HSAs and current number of treatments per HSA, additional costs of iCCM basic accounts for 0.9% of total public health expenditure and 3% of government health expenditure. For iCCM+ these percentages would stand at 1% of total public health expenditure and 3.5% of government health expenditure. With 30% increase in treatments iCCM+ would represent 1.3 % of total public health expenditure and 4.4% of the government's own health expenditure (Table 12). The budget impact of the iCCM is in fact likely to be smaller since a part of the treatments delivered by HSAs were previously provided and budgeted for in health centres.

Table 12: iCCM impact on Malawi health expenditure

	Total 2011 (\$)	Government	Donors
Public Health expenditure	100.0%	28.6%	71.4%
	360 848 346	103 202 627	257 645 719
Current number of iCCM trained HSAs across the country	3 722		
Current # of ASCs current # of Treatments	% Public Health Exp.	% Government Own Health Exp.	
iCCM as % Public Health Expenditure	0.87%	3.03%	
iCCM + as % Public Health Expenditure	1.00%	3.49%	
Current # of ASCs, +30% Treatments			
iCCM as % Public Health Expenditure	1.09%	3.83%	
iCCM + as % Public Health Expenditure	1.26%	4.40%	

The high rate of utilisation demonstrates that this programme responds to an existing need, and does it in a way which is accessible. On the basis of data available, the programme runs efficiently. The decision of the government to increase the proportion of HSAs living in the community they are responsible for is likely to increase utilisation further with HSAs being in the community for longer time. An increase of 30% has been modeled. Whilst the additional costs of the programme represent a small proportion of the total health expenditure or even government own expenditure, it is unlikely

the programme can be developed further, including the construction of new houses for HSAs in the community they cover, without support from donors.

We suggest that besides the inputs which have been costed, consideration should be given to support transport. Newly trained HSAs and their supervisors were given bicycles, through IHSS programme funds, at the onset of their employment. However, bicycles require repair and eventually must be replaced. Bicycles provided at the start of the IHSS programme broke down over time. Dysfunctional bicycles have been a constant complaint affecting supervision visits and HSAs' work including the visits to the health centres for further supervision. Assuming the purchase cost of a bicycle at \$100 and the life of a bicycle to be 3 years, the annualised cost of bicycles for the 3,722 HSAs country-wide, and their 372 supervisors, would amount to \$136,473, increasing the programme cost by 4%. Such an expenditure could strengthen the programme as well as other programmes covered by the HSAs and their supervisors.

In summary, the additional cost per treatment of malaria stands at \$2.33, treatment of diarrhoea at \$0.70, and treatment of pneumonia at \$0.23. The weighted average cost per treatment amounted to \$1.44. If utilisation per HSA increased by 30%, with increased coverage and increased population, the cost per treatment would decrease only very marginally, but the costs across the programme would increase by 26%, showing that there is little economy of scale to be gained. The time implications of the increased workload could be absorbed by the existing HSAs.

What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends? Are committed financial and human resources sufficient to maintain benefits and results? If DFATD/UNICEF's involvement ends, the additional costs of iCCM for the three conditions, including the attached health system support necessary for iCCM to take place, would represent 3.5% of the government's own health expenditure. With an additional 30% treatments per HSA, this share would increase to 4.4%, and the current number of HSAs would be adequate. As such the programme could continue to function if no additional areas are added. However, the government plan to build houses in the community for the HSAs could not be funded.

At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time would be an underestimate of their actual number in a more mature programme. The cost per life saved at this point would, thus, be much higher than if evaluated at a later stage, and as such the information could be potentially misleading and misinform policy makers. Cost per death averted could not be calculated. Additional costing tables are provided in Appendix D.

5.4.2 Qualitative findings related to Sustainability

As would be expected, the sustainability of large donor-funded national programmes is often a concern. However, in the case of iCCM, informants were confident that sustainability was less of a threat in Malawi because of the solid foundation it has built for the maintenance of iCCM as a core feature of the health system (box 5).

Box 5:

“We have allowed the embracement of iCCM through level that are operating and coordinating the district levels. There isn’t a district in the country that does not know about Community Case Management. We have oriented and trained all district health team members to own the establishment and introduction of iCCM. In any district you may visit in Malawi.....health centres , staff, the District Health Management Team after being oriented they are providing leadership and coordination on district level. Besides that, when we have conveyed these messages, orienting and training them they regard iCCM as having been established, it is part and parcel of the District Health System” (Senior official)

“There is a commitment from government side to sustain the programme” (International partner)

“What we have done, as I have said we have established and introduced iCCM within an existing structural MOH system in the country. [If the iCCM programme is not sustained it would mean]the collapse of the Ministry of Health; it just means the overall collapse of the health system in the country. We have, as I said, not allowed, you know, coordination and leadership to come from the partner world.....rather we have allowed the introduction and establishment of iCCM and indeed and other programmes with the MOH, to be run and coordinated by MOH and the district teams...” (Senior official)

Some informants believed that donor support would continue and help to sustain the programme because of the gains that have been achieved in a relatively short period of time.

“When donors see results they want to keep supporting” (International partner)

Infrastructural challenges

All rural, hard-to-reach areas in Malawi are severely underdeveloped with many infrastructural challenges. Many of these challenges relate to long distances, lack of proper transportation, sanitation, water and adequate housing. The lack of these services not only affects the community at large, but also directly impacts on the work of HSAs in iCCM. During field interviews, HSAs who live outside their catchment areas complained about having to walk long distances every day. Even HSAs with established village clinics reported a similar challenge each time they had to fetch supplies from the closest health centre or when they had to conduct their community outreach programmes. Further, HSA supervisors were impeded in their duty of supervising HSAs because of transportation problems. Even though HSAs are given bicycles on recruitment, these are rarely replaced, and the cost of maintaining them falls on HSAs who simply do not have the amount of money required for the upkeep of a bicycle that is used on hard dirt roads. This could be considered a failure in the IHSS programme support since it is a critical aspect of programme implementation.

“and the other problem is on transport because HSAs they receive the bicycles. I think some in 2008, some in 2007, so most of them are not in good condition, so these are some of the problems. I talk to the supervisor maybe, she will look into it..... the issue of the bikes up till

now is not sorted out because they say when they do give the bikes which go to the HSAs, so the HSAs are responsible to maintain the bicycle for at least for 2yrs” (Senior HSA)

Adequate housing for HSAs living outside their catchment areas is a problem that was repeatedly cited by both HSAs and senior officials. The lack of housing contributes to HSA attrition, and restricts the ability of HSAs to be available to their client base 24 hours as originally intended. One HSA explained the problem encountered by patients who cannot easily access him because of distance:

“...because some patients do come to me in the night so they are easily assisted, but to move from here to find me is a long distance, so if I can just be within [easy reach] it would be very nice” (HSA)

The village clinics that do exist are often in a poor condition in flimsy debilitated housing structures. As one HSA mentioned:

“The health post is not in a good condition...” (HSA)

Another infrastructural challenge in rural Malawi is poor sanitation. While some respondents reported improvements in the number of households with toilets, these are home-made pit latrines with no concrete slabs. As such they require constant rebuilding as they disintegrate often.

“...people are using latrines and there are about 200 latrines where the houses are about 316 so since I came this was my baseline data so we have improved...”

The responsibility of HSAs where sanitation is concerned is to encourage community members to dig their own latrines, and sometimes HSAs will even help out with the erection of these structures. Survey data shows that coverage levels for improved sanitation in the 10 IHSS programme districts are low and have not changed much (12% in 2010 DHS and 14% in 2013 LQAS).

6 Conclusions

6.1 Relevance

The health systems strengthening approach of the IHSS programme was well aligned with the health policies of the Malawi government

One of the key factors that explain the gains that have been made through the IHSS programme in Malawi is the investment made in strengthening the health system through capacity building of both front line HSAs as well as facility-based staff. What was also highlighted during the evaluation is that policies (RED and ACSD) and health system decentralisation, which pre-dated the IHSS programme, contributed a strong foundation upon which iCCM could be implemented. The Malawi MOH has demonstrated commitment to, and ownership of, iCCM and the approach has been embraced and integrated into the national health system.

The qualitative interviews conducted as part of this evaluation highlight the strength of the other community structures, such as the Village Health Committee which provides oversight and community ownership, which have also contributed to the success of iCCM. Even though by many standards HSAs earn little, qualitative findings and field observations show that they value and understand the important role that they play in child survival, and the communities they work in also hold them in high regard.

MOH leadership and co-ordination was an important factor in the success of the IHSS programme

A factor that was repeatedly cited as being influential to the success of the IHSS programme is the strong collaborative relationship between the MOH and international agencies and partners in Malawi. The qualitative data show UNICEF, through the IHSS programme, and other partners as having played a predominantly supporting role in health systems strengthening and indeed in the success of iCCM in Malawi. By all accounts the MOH is seen as having played an agenda-setting and coordinating role. Given the plethora of international organisations and partners in the health field alone in Malawi, this is no small feat.

Women's participation and gender equality

Achieving gender balance at HSA level remains a problem in Malawi. At the root of this problem seems to be a lack of deliberate planning and prioritisation of female participation in community-based service delivery. However, the data also highlighted other reasons, such as cultural issues around females following their husbands, which are outside the control of MOH and which have contributed to hindering progress in achieving gender equality. Furthermore, the decision to not recruit HSAs from within the villages they will serve has immense consequences financially and with regard to gender equality and utilisation. Recruiting women to move to an assigned area and commute, with the consequent housing and transport challenges, may well be hampering the gender balance.

Literature points to the leading role of gender dynamics in health service user outcomes, including influences on child health and nutrition outcomes and service utilisation and the importance of developing interventions that address gender dynamics. The IHSS programme has captured many of the components found to be effective in addressing gender dynamics, including making services more

accessible to carers of children, promoting the access of households to care through home visits, and seeking to mobilise and engage communities.¹³

6.2 Effectiveness

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

The IHSS programme contributed to the expansion of community-based health care for pregnant women and children through deployment of HSAs but their availability needs to be increased

The districts where iCCM is implemented by HSAs in Malawi had communities who not only valued the HSAs but directly attributed the reduction in child mortality to their services. Communities were able to appreciate the importance of, and the difference made by, having HSAs who were available to treat their children, and save them time and money. However, the challenges resulting from the deployment of HSAs outside their catchment areas were many, and they were confirmed by both the qualitative and quantitative data. Having HSAs work in areas that they do not reside in is one of the few threats facing iCCM in Malawi as it undermines the very objective of using HSAs to bring essential services to the people through ensuring their accessibility and availability to sick children 24 hours a day. A few studies have reported similar findings regarding HSAs who are deployed outside their catchment areas^{29,44}. Similar to our findings, the results of one of the studies revealed a high number of HSAs who are deployed outside the areas they live in, and, as with our findings, this was associated with reduced or minimal visits to the community and shorter working hours. The authors further point out that this approach does not adhere to WHO guidelines, which emphasise the importance of having CHWs operate within the areas where they reside¹⁴. Since this was a national policy it was not possible for the IHSS programme to influence or change this.

Another key challenge that needs to be addressed is the HSA to population ratio. From our findings HSAs are in reality covering a far bigger population than the 1000 per HSA that is in policy guidelines. Other studies confirm these findings, with one study reporting HSAs to be covering 2 to 5 times the population they are supposed to cover, thus 2000-5000 per HSA.¹⁴

The IHSS programme strengthened the health system through training of HSAs and facility-based staff

UNICEF, through IHSS programme funds, has made a significant contribution, financial and technical, to ensuring the training of many HSAs and facility-based staff in iCCM. Of the 1,796 HSAs operating in the 10 IHSS programme districts, 1,645 received basic training and 1,018 iCCM training through IHSS programme funding. This is 92% of all HSAs deployed to hard to reach areas in the 10 IHSS programme districts and 16% of all 10,451 HSAs in Malawi. The IHSS programme funded iCCM training for 1,018 (56%) of HSAs in hard to reach areas of the 10 IHSS programme districts and 48% of all HSAs (3,722) trained in iCCM in Malawi. In addition, 3,946 nurses/clinicians received IMCI training through IHSS programme funding.

The skills gained by HSAs and clinicians through training need to be maintained through refresher training, as cited by both HSAs and senior officials in the qualitative interviews. Another issue that needs addressing is training on newborn care both at the level of policy, where guidelines need to be written and published, and the HSA level, where training on this additional task needs to be

conducted. The findings show that IHSS programme support has led advocacy efforts to train HSAs on newborn care and to provide this service to children in their communities. However, findings also suggest that there is resistance to allowing HSAs to administer sepsis treatment, and this is delaying and thwarting the operationalization of newborn care, particularly treatment, at the community level.

The IHSS programme strengthened the health system through strengthening supervision of HSAs

While field observations and discussions suggest that a significant amount of indirect supervision of HSAs might be taking place in health facilities, the infrequency of specific one-on-one supervision sessions confirmed by both the qualitative and quantitative data paints a different picture. Similar findings have been reported elsewhere^{14, 16}. In the Phuka et al. study, supervision of HSAs was found to be uncoordinated and senior HSAs tasked with supervising HSAs did not have a clear and specific job description on how to carry out their supervision duties. Instead, as was also found in this evaluation, HSA supervisors performed similar tasks to HSAs. In late 2009 an assessment of the quality of HSA-led iCCM provision¹⁵ reported that less than 40% of HSAs had received supervision by an iCCM trained supervisor in the last 3 months, and only 16% had clinical observation of case management by a supervisor¹⁶. However, the situation has improved since 2009 and routine UNICEF data for periods 5 and 6 (June 2011 to May 2013) shows improvement in supervision by a trained supervisor, which increased to 53% and supervision with case management, which increased to 48%. Therefore, it seems plausible that IHSS contributed to this improvement in supervision. While more improvement is needed, this is a commendable achievement.

The IHSS programme enabled the procurement, supply and distribution of medicines and commodities during a financial crisis but more systems strengthening is required

Challenges related to supply chain and stock-outs of medicines and supplies were identified as an important threat facing iCCM. One publication warns that “*these disruptions [in stock] will, in the long run, undermine the credibility of the HSAs and the likelihood that families will seek care promptly when children show signs of illness*”¹⁶. IHSS programme funding was critical to maintaining stock levels and transporting of supplies during the funding crisis period which was an important contribution of the support. Recent innovations such as the ‘cStock’ mobile platform hold a lot of promise in terms of improving supply chain management but need to be augmented with other efforts.

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

There were significant improvements over the IHSS programme period in the 10 IHSS programme districts in rates of early initiation of breastfeeding, coverage of IPTp in pregnant women during antenatal care, care-seeking for fever, measles immunisation, and ORS coverage. Despite the fuel and financial crisis between 2010 and 2011, the country has made remarkable progress in sustaining very high levels of vaccination coverage, largely attributed to intersectoral collaboration and the efforts of the HSAs. Furthermore, care seeking for pneumonia continued to rise over the past decade, with annual rates of increase of approximately 4%. With the introduction of ACTs in 2007, the country was able to rapidly scale up its availability and utilization, with coverage rates having increased to over 50% by 2012.

Evidence of increased access to care can be noted in the IHSS programme districts, where the proportion of children under 5 who sought care for fever, suspected pneumonia and diarrhoea at public health facilities increased from 11% to 52% between 2000 and 2012. There is further evidence

of increased access at the community level provided by the HSAs, with care seeking having increased from <1% in 2000, before the IHSS programme support, to 9% in 2012. This is largely attributed to the construction of village clinics and the scale up of HSAs in the country. Overall, the proportion of the population who did not access care at all for the three major childhood diseases decreased from 56% in 2000 to 18% in 2012. It is plausible that the IHSS programme support for training, equipping and deploying HSAs has contributed to the increases seen in care-seeking and treatment for diarrhoea, malaria, and pneumonia.

Impact on equity

Improvements in equity in Malawi during the IHSS programme implementation period, related to increases in coverage amongst the poorest populations, and a narrowing of the gap between the country's poorest and richest wealth quintiles have been noted for ORS, PNC, and IPTp coverage, care seeking for pneumonia, and rates of early breastfeeding. On the other hand, equity gaps remained unchanged for the remaining indicators, including tetanus toxoid vaccination, Vitamin A supplementation, exclusive breastfeeding, care seeking for fever, and coverage of antimalarials, including ACT, as well as DPT3 and measles vaccination coverage rates, though these remained equally high. It is important to note that the poorest wealth quintile did, nonetheless, experience significant increases in antimalarial coverage, including ACT coverage, in addition to having sustained high levels of immunization rates. The IHSS programme plausibly contributed to these improvements in equity through the coverage gains amongst the poorest quintile.

6.3 Impact

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

Malawi is well on track to achieve the Millennium Development Goal (MDG 4) of reducing child mortality, having achieved notable declines in infant and under-five mortality rates. Under-five mortality has decreased from 244 in 1990 to 71 deaths per 1,000 live births in 2012⁵⁷, an impressive 71% reduction. The average rate of reduction in Malawi is double that of other sub-Saharan African countries, at approximately 5.6% per year. Such achievements are impressive in light of the country's challenges including high population growth rates of 2.8%, coupled with fertility rates of 5.7, a low gross national income (US\$340 per capita), as well as the recent economic crisis and food insecurity.

The main causes of under-five deaths in Malawi include malaria, HIV, pneumonia and diarrhoea. The pre-IHSS period (2000-2006, given the IHSS programme was introduced in 2007) accounted for an estimated, cumulative 14,700 lives saved over the 6 years of the analysis. During Phase I of the IHSS programme (2007-2010), the model indicated an additional 9,791 lives were saved as a result of the IHSS programme's focus interventions, and in Phase II of the IHSS programme (2010-2013) another 6,382 lives were saved due to the scale up of these interventions. It is plausible that the IHSS programme contributed to these additional lives saved. Considering all interventions, the modelled annual rate of mortality reduction is faster in the IHSS programme period than the years preceding the IHSS programme. The interventions contributing most to lives saved during the pre-IHSS period were Hib vaccine (totaling 4768 lives saved between 2000 and 2006) and ITNs (totaling 2740 lives saved). During Phase I of the IHSS programme, malaria prevention (ITNs) and treatment (ACTs) and improvements to care at birth through increases in facility deliveries had the greatest impact on lives saved. In the iCCM period (Phase II of the IHSS programme), the introduction of the pneumococcal

(PCV) vaccine contributed to a total of 5403 lives saved from 2010 to 2013 followed by ITNs (totaling 3051 lives saved), and the case management interventions for pneumonia, diarrhoea (zinc only) and malaria together averted (2571 of deaths. At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a more mature programme.

6.4 Sustainability

6.4.1 Costing

The costing study aimed at answering the following questions, focussing on the additional costs to the health service due to the implementation of iCCM:

1. What is the additional cost per treatment for each of the 3 iCCM conditions?
2. What is the cost of increased utilisation?
3. What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends: Are committed financial and human resources sufficient to maintain benefits and results?

The additional cost per treatment of malaria stands at \$2.33, treatment of diarrhoea at \$0.70, and treatment of pneumonia at \$0.23. The weighted average cost per treatment amounted to \$1.44. If utilisation per HSA increased by 30%, with increased coverage and increased population, the cost per treatment would decrease only very marginally, but the costs across the programme would increase by 26%, showing that there is little economy of scale to be gained. The time implications of the increased workload could be absorbed by the existing HSAs.

If DFATD/UNICEF's involvement ends the additional costs of iCCM for the 3 conditions, including the attached health system support necessary for iCCM to take place, would represent 3.5% of the government own health expenditure. With an additional 30% treatments per HSA, this share would increase to 4.4%, and the current number of HSAs would be adequate. As such the programme could continue to function if no additional areas are added. However, the government's plan to build houses in the community for the HSAs could not be funded.

As stated above, at the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a more mature programme. The cost per life saved at this point would, thus, be much higher than if evaluated at a later stage, and as such the information would potentially mislead policy makers. Cost per life saved is, therefore, not reported.

While assessing the additional cost to the health service of iCCM, it is important to note that this programme is likely to save money at higher levels of the health service. Increase in care seeking at community level covers both, the previously unmet demand and the demand previously met at health centres. As such this demand diverted to community level translates into lower cost in health centres. In addition, by preventing the occurrence of serious malaria, diarrhoea or pneumonia, the programme is likely to decrease the number of hospital admissions for these conditions.

6.4.2 Likelihood of sustainability post-IHSS

Qualitative findings on the likelihood of sustainability of the programme in the post-IHSS period and without external support suggest that there is no concrete plan for the MOH to fund and sustain the programme if external partners withdraw their support. However, key informants in the MOH expressed confidence in the government's capacity to carry the programme forward in the event that external support ends. This belief is bolstered by the commitment and leadership the Ministry of Health has already showed in integrating iCCM into the health system. Nevertheless, it is doubtful that the Government of Malawi on its own would be able to sustain the programme given the severely limited fiscal space it has to maintain a programme of this magnitude. As it is, even the HSA salaries that come from the government are financed through the SWAp, which itself is funded by development partners. As reported in other sections of this evaluation, UNICEF and other partners have had to come in and provide crisis funding to limit the stock-outs that occurred during the financial crisis of 2010/2011, and indeed such crisis support has continued intermittently since then, and is likely to be called upon in the future.

The external environment as far as this relates to infrastructural challenges in Malawi presents a real challenge to implementing community level packages of interventions, such as iCCM, which require the functional infrastructure to be in place. The challenges related to the transportation and housing of HSAs directly affect the programme's ability to meet its stated objectives of improving availability and access to HSAs providing case management of childhood illnesses.

7 Strengths and limitations of the evaluation

7.1 Strengths and limitations of the quantitative component

A strength of the Malawi evaluation is that the 10 IHSS programme districts are geographically dispersed across all three regions (2 in Northern, 4 in Central and 4 in Southern) of the country, thus, limiting regional biases to service provision and evaluation. Adequate survey data from all 10 districts were available for analysis from the time of implementation of the IHSS programme (2006), during the IHSS programme period (sampling in 2010) as well as at end-point (2012/2013). A statistical trend analysis was performed on all available IHSS programme district data points over four time periods corresponding to pre-IHSS, the IHSS program period and end-point of the programme. Where possible, indicator definitions were adjusted to ensure valid comparisons over time between survey types.

There were two main limitations. First, the unavailability of pre-IHSS survey data from all four Southern districts and two Central districts. Although the data were aggregated across all 10 districts, there could be regional biases from the pre-IHSS estimates. The second limitation of this evaluation is the lack of a comparison group or counterfactual. For this evaluation comparison areas were not possible since all districts are implementing the same basic package of interventions, including iCCM. National estimates have been presented in the figures but this is not a true comparison of the IHSS programme areas for the reasons given.

The focus on IHSS programme districts alone, although it could have improved programme implementation, limited our ability to assess differences in impact between rural and urban settings. The selected districts are largely rural, and most of them, such as Dedza, have less than 6% urban dwellers recruited for the 2010 DHS survey. The urban sample sizes were, therefore, too small to perform reasonable analyses, hence, we did not disaggregate any of the results by rural/urban type of residence.

A limitation in using different types of surveys to measure coverage over time arises from different definitions (questions asked in different ways or to different samples) of indicators. We have combined DHS and MICS data files to recalculate coverage indicators over time, and care was taken to use standard indicator definitions and appropriate sampling weights. The use of these sets of data was guided by two main reasons: DHS and MICS are major programmes that generate household-level survey data needed to measure coverage for maternal and child health in low- and middle-income countries, and they collaborate closely with interagency processes to ensure that their survey tools are harmonized and comparable as far as it is possible. The latter point, therefore, makes combining these logical. 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 under-five children. 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, using the Woman's Questionnaire. There are also a number of differences in the population covered and the reference periods used to measure coverage. MICS usually uses births within 0-2 years of the survey,

and DHS uses 0-5 years; the latter potentially resulting into recall problems. These differences between DHS and MICS surveys may affect coverage estimates and need to be considered when comparing estimates over time.

There are also differences between the LQAS and DHS/MICS indicators which need to be taken into account when interpreting trends. The LQAS survey collects data on women and infant health (Tetanus toxoid, IPTp, PNC, early breastfeeding) from mothers of 0-5 month old infants (as opposed to all women with a live birth in the past two years); therefore, these denominators are different. The restriction to current 0-5 month old mothers, however, is likely to result in a higher level of recall in comparison to recalling information from as far back as two years. It was not possible to create a consistent definition across surveys for these four indicators because of lack of infant age within the MICS data file providing these indicators from interviewed mothers/primary caregivers.

Data on vitamin A coverage in the LQAS uses the denominator of children 12-23 months whilst the MICS and DHS surveys use 6-59 months. For this analysis we restricted the DHS and MICS to reflect the age bracket for the LQAS survey (12-23 months) in order to align the definition for vitamin A supplementation. Postnatal care for mothers was also not explicitly asked about for health facility deliveries, hence the low end-point estimate could underestimate the true coverage.

Generally, although the inter-survey differences do affect data accuracy in certain cases, the selected districts for study implementation were a good country-wide representative sample. This is evidenced by the similarity in overall trends to the national trend patterns for all assessed indicators. Although the national estimates are not accurate comparative points, the similarity in trend patterns indirectly reflects that the aggregated analyses of the IHSS programme districts provides a non-regionally biased result which can be used for country-level decision making for future service delivery. We, however, are unable to provide regional level trend patterns due to sample size limitations from the pre-IHSS period. Therefore, contextual regional/district parameters will still need to be considered along with the trend data presented here.

7.2 Strengths and limitations of the LiST analysis

The analysis for Malawi benefited from multiple household surveys including the LQAS which provided endline data. 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, case management of severe neonatal infection). LiST does not allow skilled birth attendance to be lower than facility birth; yet in Malawi, survey data reports this to be the case across many time points. Due to the limitation in LiST, we set skilled birth attendance at the level of facility birth even though it was reported as lower coverage.

The time references for coverage estimates and mortality estimates are different, as mortality estimates reflect a 10 year period prior to the survey whilst coverage reflects a different time reference for each indicator, e.g., from 24 hours for breastfeeding to the previous two years for antenatal care. 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. Given the

lack of district PMTCT data, coverage was not changed beyond what is already included in the Spectrum projection.

The LiST model predicted, within a margin, the measured mortality change in Phase I; yet all factors must be applied when directly linking 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 also supported by the IHSS programme, may not reflect the true result and should be used exclusively for illustrative purposes.

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 of reflecting costs as per programme design, and to make it comparable to other iCCM 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 iCCM. 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 benefit of the additional costs approach 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 iCCM 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 3 key diseases in isolation is limited as in practice HSAs 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 Malawi are experienced in health systems research. The key strength of this evaluation was that these researchers are not in the direct employ of UNICEF and, therefore, were able to objectively assess the impact, outcomes and experiences of the implementation of IHSS and to see, and experience for themselves, how the IHSS was implemented. The field visits also helped in understanding the cultural and political context in which the intervention took place, something that could not have been achieved by merely conducting a desk based evaluation.

While in Malawi the team spoke to a wide range of stakeholders. These included participants at national, regional, district, facility and village level. The team was, therefore, able to gain a composite picture on which to base the evaluation. Interviews with HSAs and beneficiaries were limited due to

short time in the field. Only three groups of HSAs were interviewed and three individual HSAs, three groups of women, and one group of men who were also village committee members.

Although the team was able to gain snapshots of iCCM implementation during the 7 day visit, it couldn't completely ground itself in the context. The large number of interviews in this short time also meant the evaluators were not able to investigate issues in great depth.

Selection of participants for interviews may have been biased towards those more favourable towards 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 evaluators were able to explain to high level participants that they were separate and not employed by UNICEF, it may have been harder for community level participants to make the distinction. This was especially so when the team arrived in UNICEF vehicles, with UNICEF staff. Thus, the communities' inability to make the distinction may have influenced how they related their experiences. When interviewing these community level participants, the team also had to rely on translators who were found by UNICEF. This meant that the team was reliant on the translators' interpretation of both the questions and the participants' responses.

8 Lessons learned and Recommendations

8.1 Lessons learned

Relevance

- In Malawi, iCCM has been implemented within a robust and well organised health system with an established decentralised structure which has enabled strong links between different levels of care. The MOH has also played a leadership and coordinating role in terms of partners and donor agencies which fund and support its health system, and this has ensured that IHSS programme activities are aligned to national priorities.
- Gender equality remains an issue for community-based service delivery as only 28% of the HSAs are women. Women's participation is, however, seen at higher levels of the government in country level Ministry leadership.

Effectiveness

- While it is understood that the MOH changed the selection of HSAs from the community level to the national level as a result of concerns about nepotism and fairness, it is clear that this has led to the deployment of HSAs outside their catchment areas, and this evaluation and several other publications, have documented the challenges that result from posting HSAs to areas they do not reside in.
- The presence of VHCs augments the impact of HSAs as they conduct promotive and preventive work and encourage care-seeking for the iCCM conditions. VHCs also facilitate community entry and the acceptance of HSAs, especially when an HSA is deployed to areas they do not reside in.
- The evaluation has highlighted that roughly half of HSAs don't receive quarterly supervision and even fewer receive supervision entailing observation of case management.
- The supply chain is a critical determinant of utilisation of, and trust in, the system by communities. The evaluation has found that the national supply chain system is weak and while parallel supply chain systems are expedient in the short term, they undermine health systems strengthening. Stock outs were identified as a major challenge facing iCCM. Routine data has revealed that roughly two thirds of HSAs had experienced stock outs of ORS and Co-trimoxazole in the last three months and over half for ACTs.
- Increases in coverage were achieved for several indicators over the period of the IHSS programme grant. More efforts are needed with regard to postnatal care, exclusive breastfeeding and vitamin A supplementation

Impact

- The modelled annual rate of mortality reduction was faster in the IHSS programme period than the years preceding the IHSS programme.
- At the time of the evaluation, iCCM in Malawi had been at scale, with over 80% of HSAs trained in iCCM, for 11 months only. Thus, the number of lives saved over such a short time is likely to be an underestimate of their actual number in a setting with a longer implementation period.

- 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, i.e., calculating additional, not full costs of delivering iCCM, the evaluation did not calculate cost-per-life saved.

Sustainability

- If utilisation per HSA increased by 30%, with increased coverage and increased population, the cost per treatment would decrease only very marginally, but the costs across the programme would increase by 26%, showing that there is little economy of scale to be gained. The time implications of the increased workload could be absorbed by the existing HSAs.

8.2 Recommendations

Relevance

- While the MOH has been widely commended on its leadership and coordination of partners working on iCCM in Malawi, there are opportunities for more streamlined planning and tracking of who is providing what and where. There also needs to be greater harmonisation with regard to strengthening systems, especially supply chain, rather than bypassing and undermining government systems.
- One of the reasons key informants gave for the low participation rates of women in the HSA workforce was low literacy levels. During the iCCM Symposium in Accra in March 2014, one country presented an innovative approach to increasing female CHW participation rates. This approach involves the training of illiterate women with visual training materials. This strategy could be used in Malawi, and the current requirement for 12 years of schooling could be lowered to fewer years.

Effectiveness

- We recommend that the task of recruiting HSAs should either be given back to communities or at the very least be devolved to the regional or district level where the likelihood of matching HSAs to their own areas can be increased. If this is not possible, then more efforts and resources need to be put into the erection of proper and sturdy village clinics with HSA quarters attached to them. The current reliance on communities to provide housing for HSAs with very few resources is unrealistic.
- The frequency of one-on-one supervision, including case management observation, needs to be increased. This increase will depend on addressing current challenges related to the transportation of HSA supervisors to the field and adjusting their workload to ensure that there is time to conduct proper supervision. One suggestion would be to use a simple supervision checklist that is completed during supervision and could serve as evidence of a supervision visit having taken place.
- The supply chain and stock-outs of essential commodities and supplies need to be improved, and harmonising donor support around strengthening national systems for procurement and supply chain is critical. In this regard the roll-out of the mobile phone-based 'C-stock' initiative needs to be expanded to other districts, and the knowledge and capacity of higher level health officials responsible for supply chain management need to be improved.

- Future budgeting for iCCM should include a line-item for upkeep and maintenance of HSA bicycles since these require regular repairs.
- The underlying reasons for decline in coverage of important preventive interventions (vitamin A) deserve closer scrutiny.

Impact

- 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, have also played a role in child survival, for example, presence of skilled birth attendants during deliveries, 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 we expect to see impact, i.e., 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

- Recognising that care-seeking patterns take time to change significantly, a new sustainability study should be undertaken when the programme has reached higher maturity. Patterns of utilisation at health centres and community level would have stabilised, and the additional costs of the programme could then be better evaluated in light of other savings in the health system.
- Given the lack of a concrete plan for the MOH to take over funding and support of the programme at the end of the IHSS programme period, such a plan should be devised before withdrawal of support. Even then it should be recognised that the fiscal reality of Malawi means that the GoM is unlikely to fund and support programmes of this magnitude on its own, and therefore some form of continued funding and support will be needed. The New Funding Model of the Global Fund could go a long way in ensuring financial sustainability.

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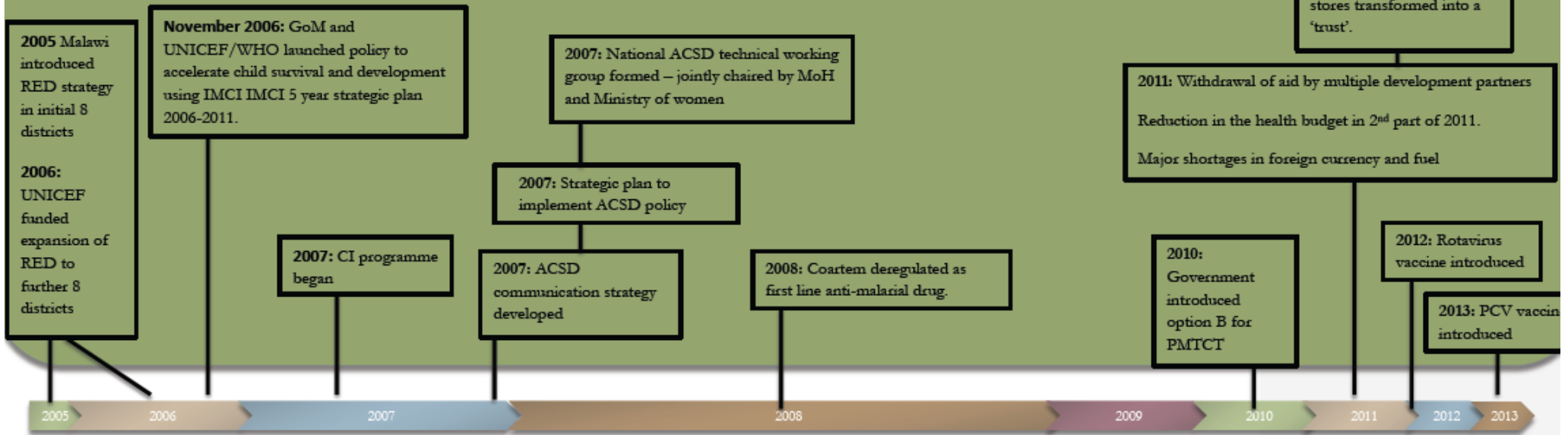
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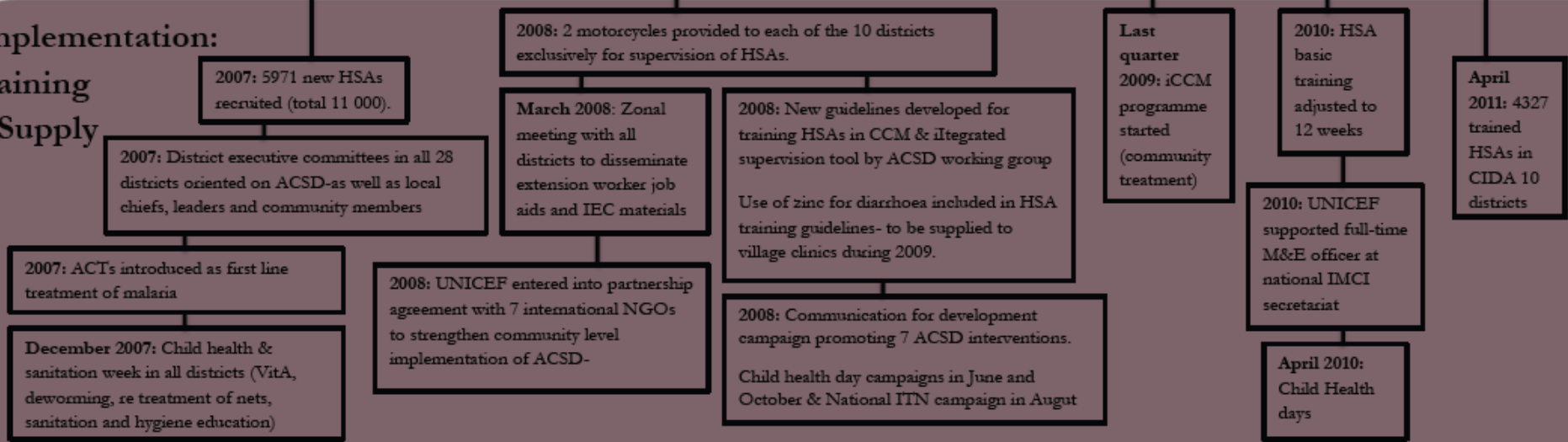
10 Appendices

Appendix A: Malawi - Policy and implementation timeline

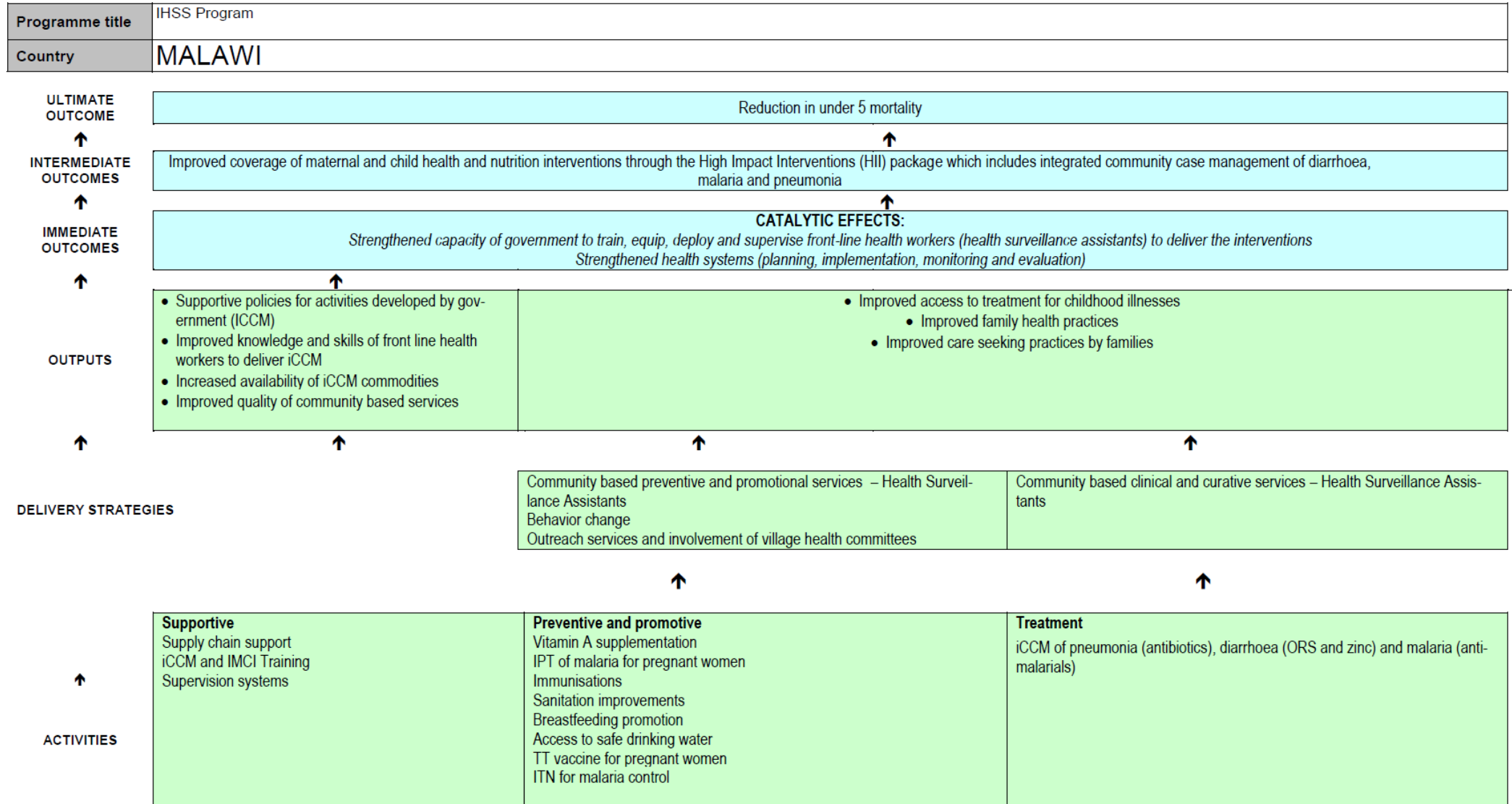
Policies



Implementation: Training & Supply



Appendix B: Country logic model



Appendix C: Table of indicators included in the evaluation

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)	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
	(1.3.2.18)						
		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)	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
	(1.3.2.20)						
	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 of 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	Calculation in LiST based on antenatal care 4 visits			X

		plasma reagent test and treated with 2.4 miubenzathin 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 program 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 labour	Calculation in LiST based on facility delivery		

		Antibiotics for PROM	Administration of oral erythromycin to women with premature rupture of membranes who are not in labour 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 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 3 doses of pneumococcal vaccine	No national level data available. Set at 0 for baseline			X
		Rotavirus	Proportion of infants having received 3 doses of rotavirus vaccine	No national level data available. Set at 0 for baseline			X
	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 2 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)	Oral rehydration solution	Proportion of children under 5 years of age with diarrhoea in the last 2 weeks who received ORS	Household surveys	X	X	
	(1.3.2.12.5) (1.3.2.12.6)	Zinc for treatment of diarrhoea	Proportion of children under 5 years of age with diarrhoea in the last 2 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 5 years of age with ARI symptoms in the last 2 weeks whose mothers/caregivers sought care	Household surveys		X	
		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 5 years of age with fever in the last 2 weeks who	Household surveys		X	

		received appropriate treatment (as per national policy)				
	Therapeutic feeding for severe wasting	Proportion of wasted children receiving therapeutic feeding	No data available – set at 0		X	
	HIV treatment	Cotrimoxazole ART	Country program data, UNAIDS/PEPFAR			X

Appendix D: Detailed costing tables

Additional costing tables

Table 13: HSA Equipment

Equipment	Unit Cost	Life Years	Annualised Costs
Registers Total Cost	7.98	0.5	4.0
Referral stationary	4.0	0.5	2.0
Thermometer			0.0
Minuter	3.8	3	11.4
Scale			0.0
MUAC tape	0.5	3	1.5
Measuring cup	3.2	3	9.5
Tea spoon	1.8	3	5.3
Total	21.2		33.7

Table 14: Tests and Drug Protocols

	Medicine & Tests	Units/Treatment	Proportion cases	Unit Cost US\$	Cost per treatment
Malaria, incl RDT	Coartem 1*6	6	20%	0.15383	0.185
	coartem 2*6	12	80%	0.03683	0.354
	Paracetamol 500 mg.	3	20%	0.00467	0.003
	Paracetamol 500 mg.	6	80%	0.00467	0.022
	RDT	1	200%	0.85	1.700
	Average Malaria				2.263
Diarrhea	ORS sachet	4	100%		0.198
	Zinc	6	3%	0.0402	0.007
	Zinc	10	17%	0.0402	0.068
	Zinc	10	80%	0.0402	0.322
	Average Diarrhea				0.595
Pneumonia	Cotrimixazole tab 480	5	20%	0.0141	0.014
	Cotrimixazole tab 480	10	80%	0.0141	0.113
	Average Pneumonia				0.127

Source: Malawi 2012 Quantification and Supply Planning Exercise

Table 15: HSA Training Cost

Training	Days	Cost per Training	Life Years	Annualised Cost (A)	Attrition Rate	Annualised Cost (B)
Training per H.S.A	6	118.2	10	11.8	3.75%	12.26

Table 16: Supervisors training costs

Supervision and Management	
Number H.S.As per	
Supervisor	10
Health Facility Mentor	10

Training of Supervisors & Managers	Days	Cost per Training	Life Years	Annualised Cost	Attrition Rate	Annualised Cost (B) per Supervisor	Annualised Supervisor Cost per HSA
Supervisors initial train	6	118.18	5	23.64	3.75%	24.52	2.45
Training on supervisor	3	59.09	5	11.82	3.75%	12.26	1.23
Mentorship training*	5	137.88	5	27.58	3.75%	28.61	2.86
Total						65.4	6.5

HSA cost per training day increased by 40% to reflect higher allowances

Table 17: Past trends in health expenditure

	2007	2008	2009	2010	2011
Health expenditure per capita (current \$)	17.9	25.6	29	28.5	30.9
Share Public Health expenditure per capita	66%	73%	74%	74%	73%
Public Health expenditure per capita (current \$)	11.85	18.61	21.55	21.15	22.68
as % of Government Expenditure	13.3	19.9	18.5	18.5	18.5
Population					15 910 000

Appendix E: National and regional coverage profiles (see separate pdf)

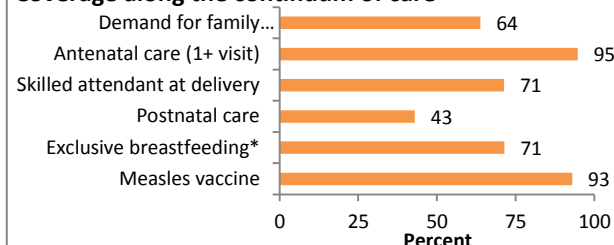
Malawi National Profile

DEMOGRAPHICS¹

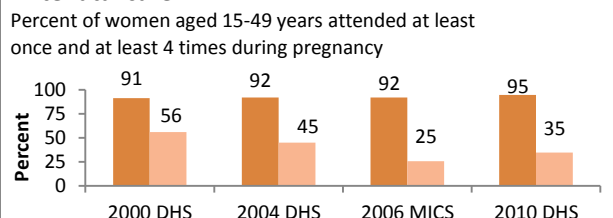
Total population	15,528,000	Annual births	686,000
Neonatal mortality rate (per 1000 live births)	33	Maternal mortality ratio (per 100,000 live births)	675
Neonatal deaths	22,600	Maternal deaths	4,600
Under-five mortality rate (per 1000 live births)	127	Total fertility rate	5.7
Under-five deaths	87,100		

MATERNAL AND NEWBORN HEALTH

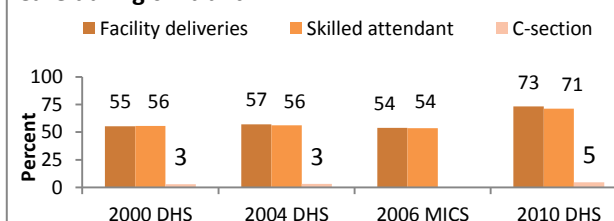
Coverage along the continuum of care



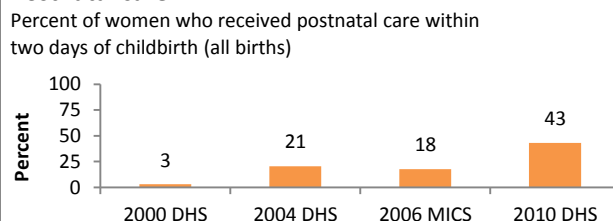
Antenatal care



Care during childbirth

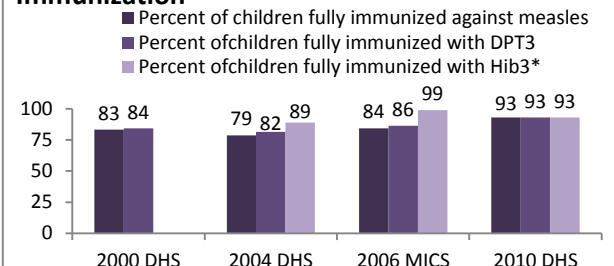


Postnatal care

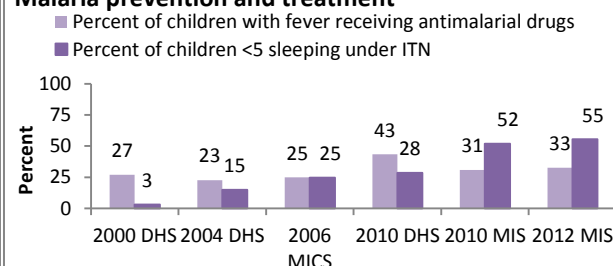


CHILD HEALTH

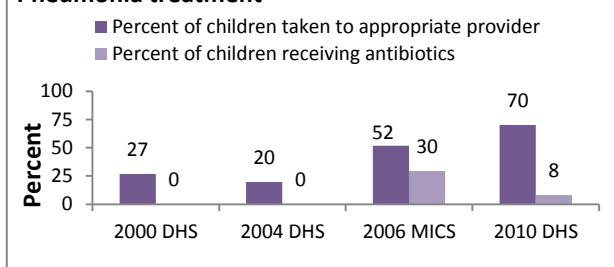
Immunization



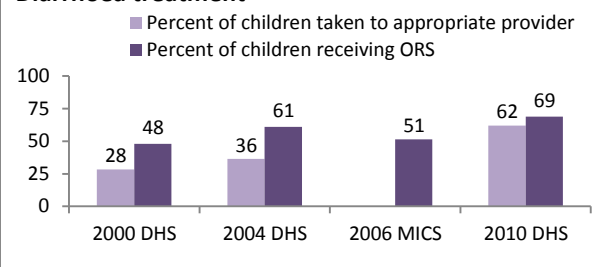
Malaria prevention and treatment



Pneumonia treatment

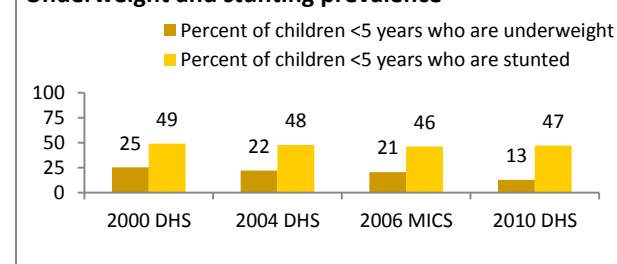


Diarrhoea treatment

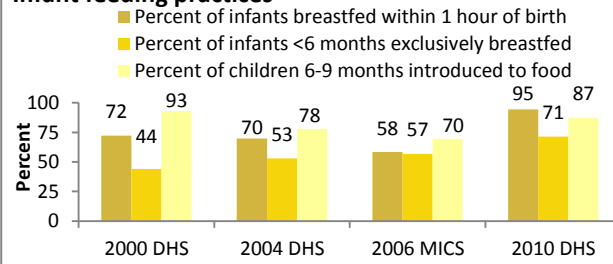


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

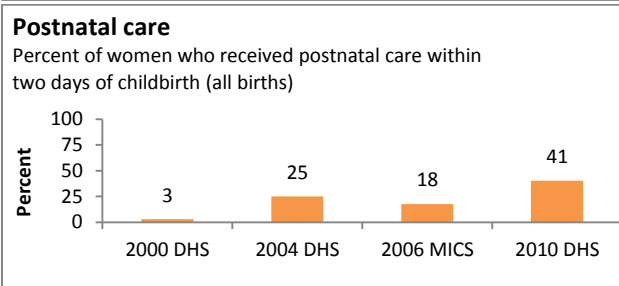
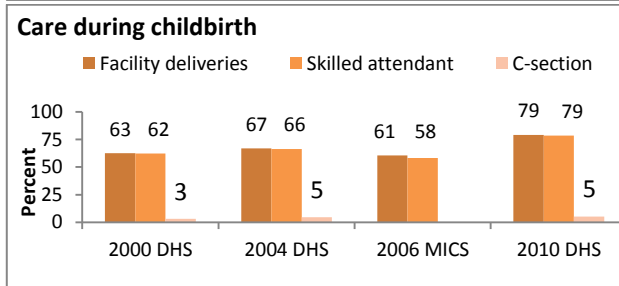
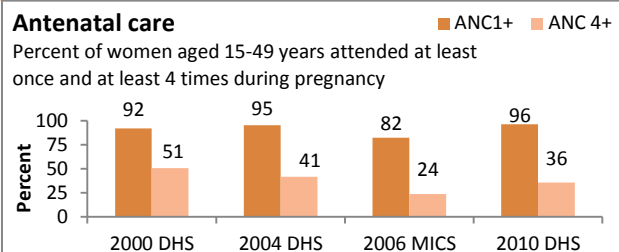
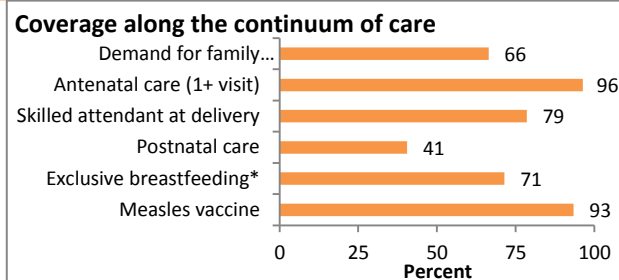
Northern Region

DEMOGRAPHICS¹

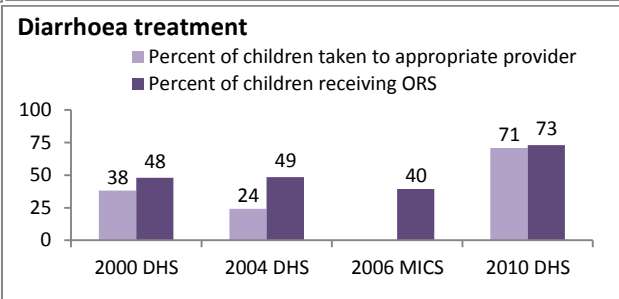
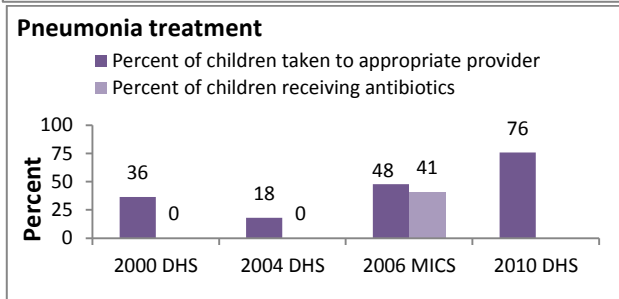
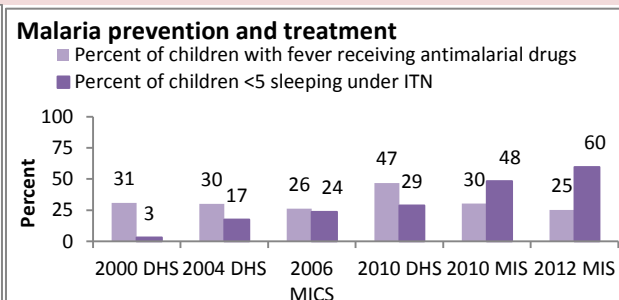
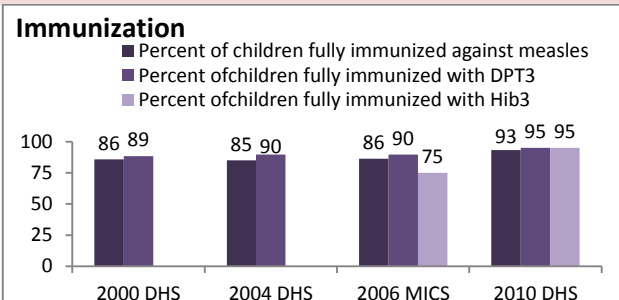
Total population	1,780,000	Annual births	73,000
Neonatal mortality rate (per 1000 live births)	39	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	2,800	Maternal deaths	500
Under-five mortality rate (per 1000 live births)	108	Total fertility rate	5.7
Under-five deaths	7,900		

** Refers to national data for 2004, not region-specific*

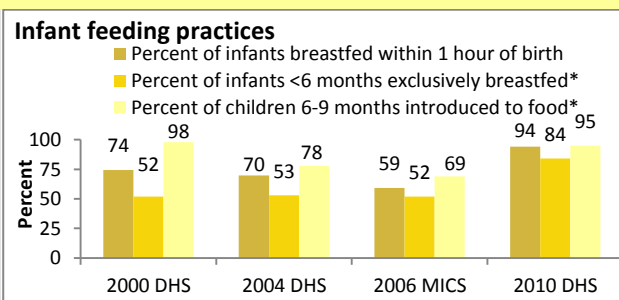
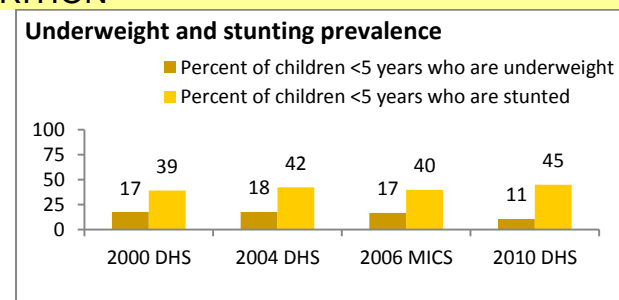
MATERNAL AND NEWBORN HEALTH



CHILD HEALTH



NUTRITION



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Central Region

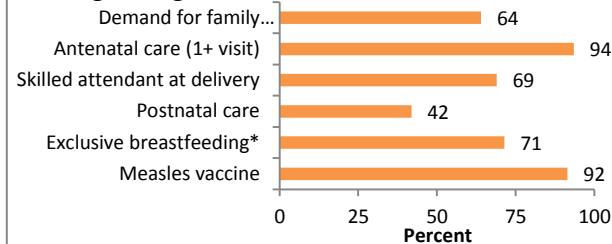
DEMOGRAPHICS¹

Total population	6,660,000	Annual births	315,000
Neonatal mortality rate (per 1000 live births)	33	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	10,400	Maternal deaths	2,100
Under-five mortality rate (per 1000 live births)	129	Total fertility rate	5.8
Under-five deaths	40,600		

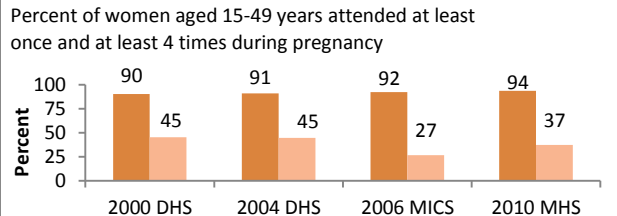
** Refers to national data for 2004, not region-specific*

MATERNAL AND NEWBORN HEALTH

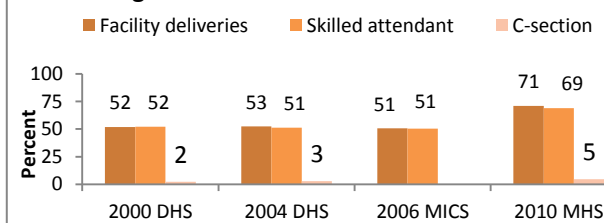
Coverage along the continuum of care



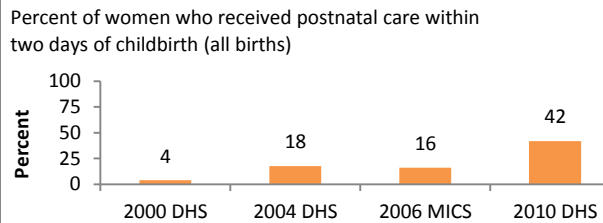
Antenatal care



Care during childbirth

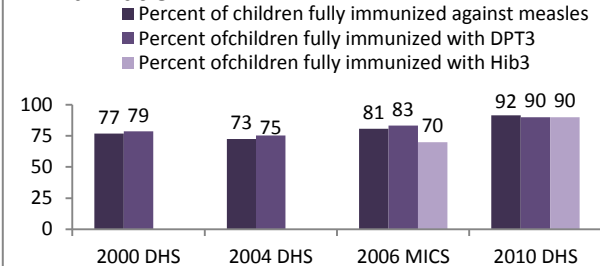


Postnatal care

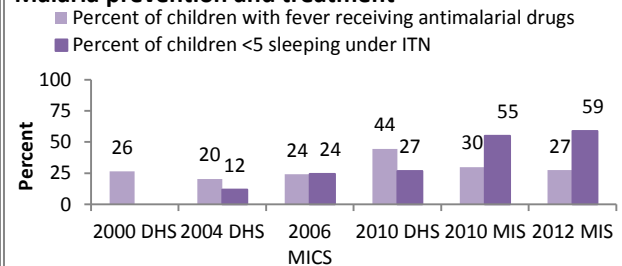


CHILD HEALTH

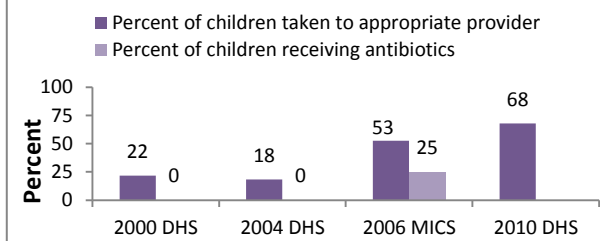
Immunization



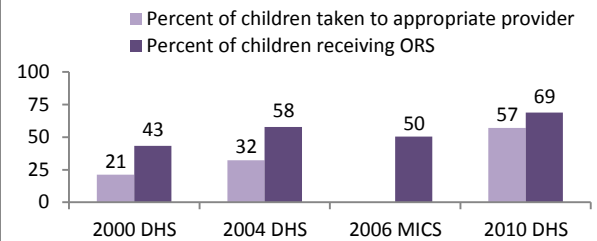
Malaria prevention and treatment



Pneumonia treatment

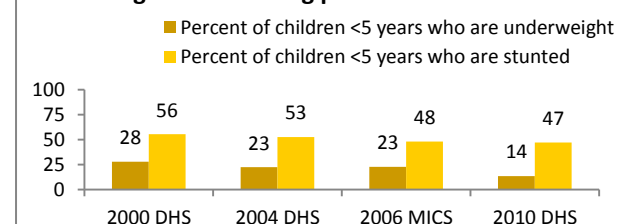


Diarrhoea treatment

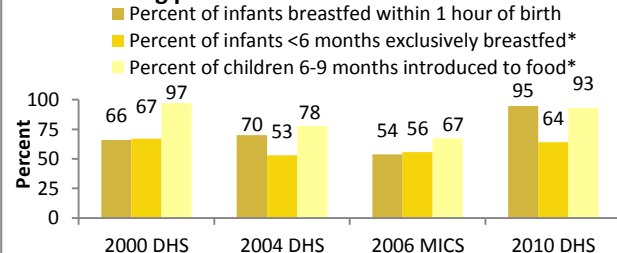


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Southern Region

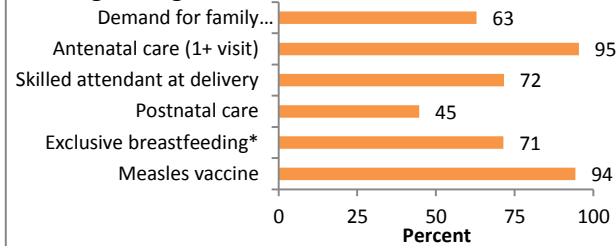
DEMOGRAPHICS¹

Total population	7,140,000	Annual births	300,000
Neonatal mortality rate (per 1000 live births)	32	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	9,600	Maternal deaths	2,000
Under-five mortality rate (per 1000 live births)	130	Total fertility rate	5.6
Under-five deaths	38,900		

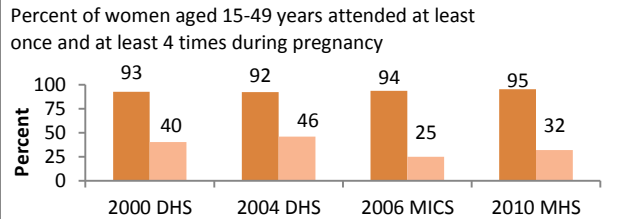
** Refers to national data for 2004, not region-specific*

MATERNAL AND NEWBORN HEALTH

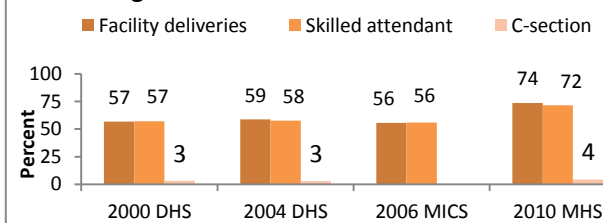
Coverage along the continuum of care



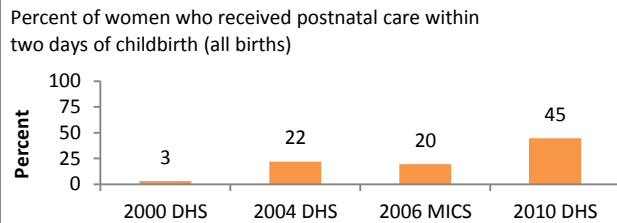
Antenatal care



Care during childbirth

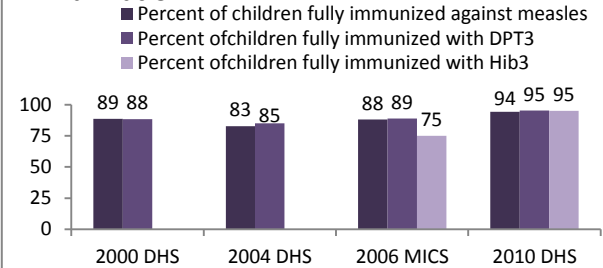


Postnatal care

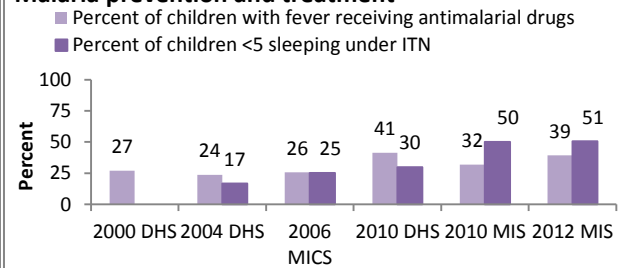


CHILD HEALTH

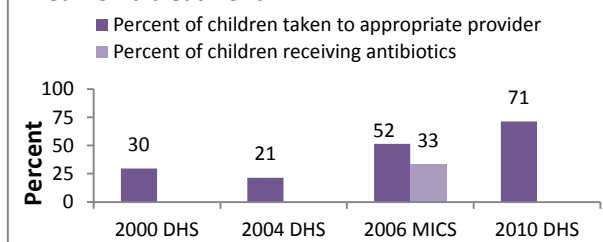
Immunization



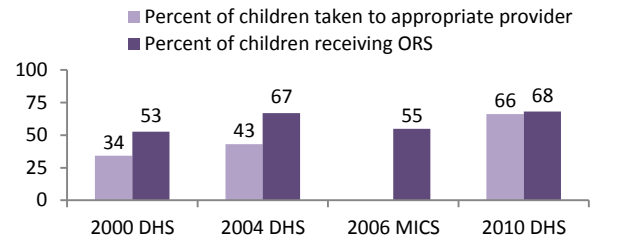
Malaria prevention and treatment



Pneumonia treatment

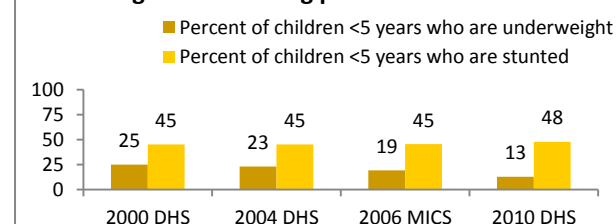


Diarrhoea treatment

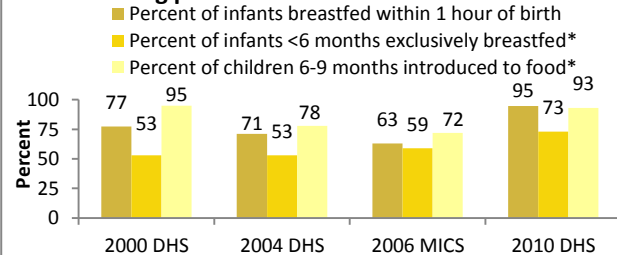


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Balaka District

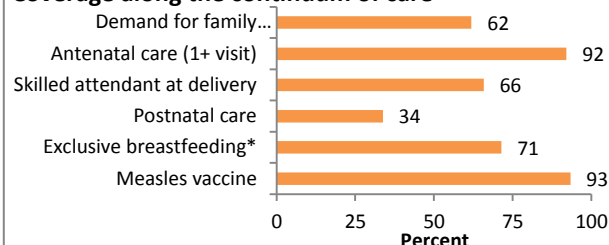
DEMOGRAPHICS¹

Total population	381,500	Annual births	17,000
Neonatal mortality rate (per 1000 live births)	31	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	500	Maternal deaths	100
Under-five mortality rate (per 1000 live births)	125	Total fertility rate	6.0
Under-five deaths	2,200		

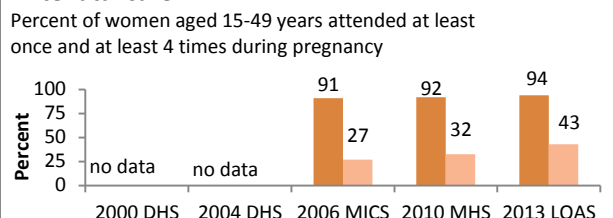
* Refers to national data, not region-specific

MATERNAL AND NEWBORN HEALTH

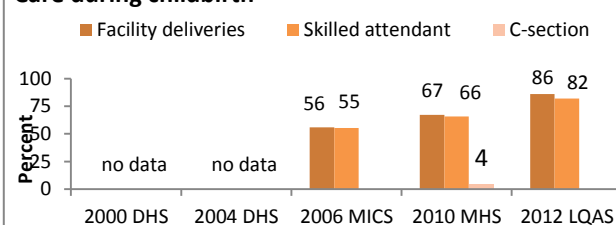
Coverage along the continuum of care



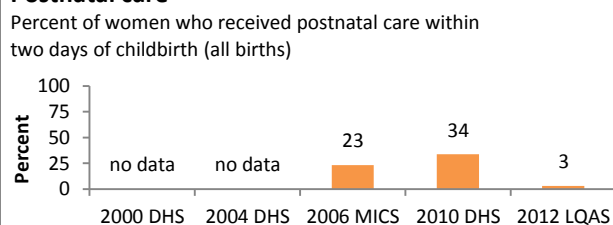
Antenatal care



Care during childbirth

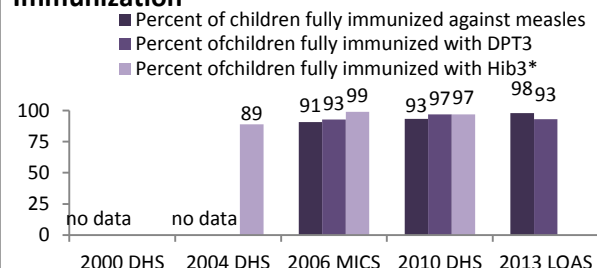


Postnatal care

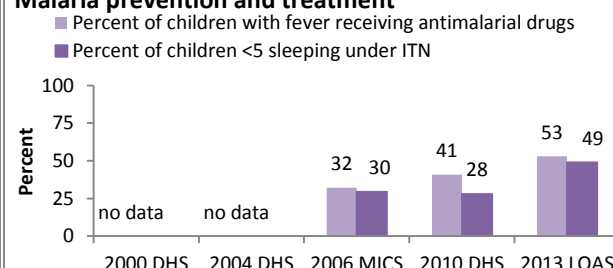


CHILD HEALTH

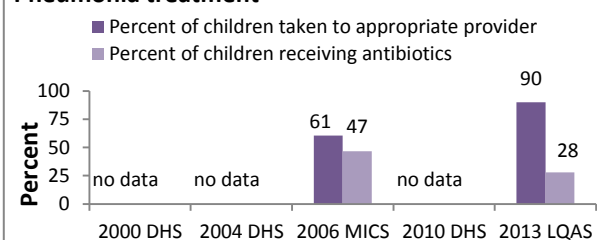
Immunization



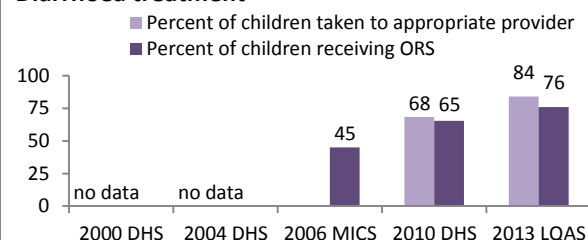
Malaria prevention and treatment



Pneumonia treatment

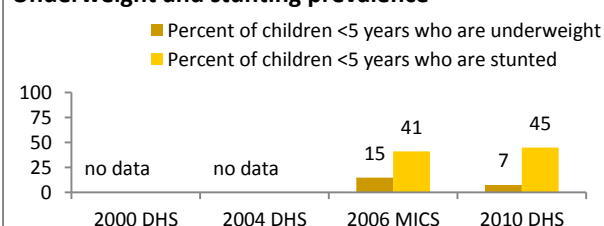


Diarrhoea treatment

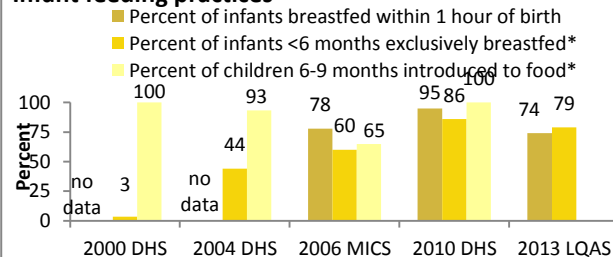


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Chiradzulu District

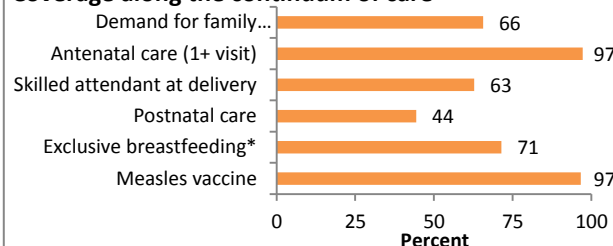
DEMOGRAPHICS¹

Total population	349,000	Annual births	15,000
Neonatal mortality rate (per 1000 live births)	44	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	700	Maternal deaths	100
Under-five mortality rate (per 1000 live births)	136	Total fertility rate	4.6
Under-five deaths	1,800		

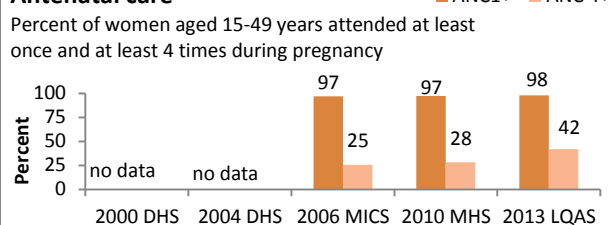
* Refers to national data, not region-specific

MATERNAL AND NEWBORN HEALTH

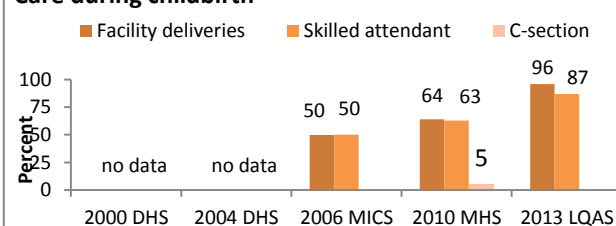
Coverage along the continuum of care



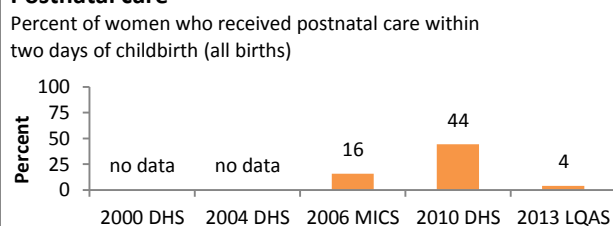
Antenatal care



Care during childbirth

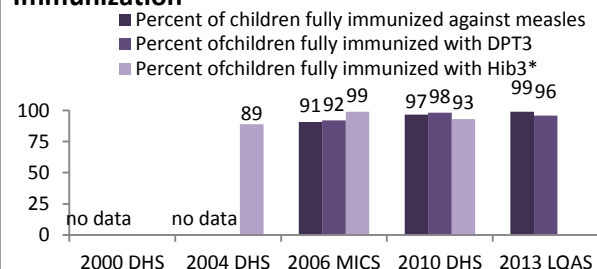


Postnatal care

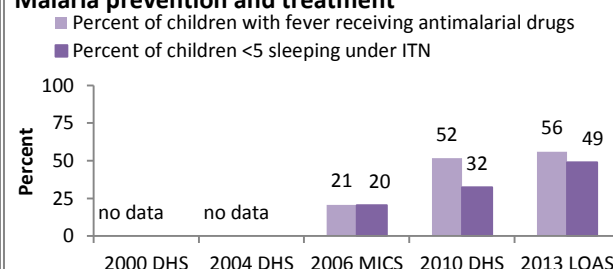


CHILD HEALTH

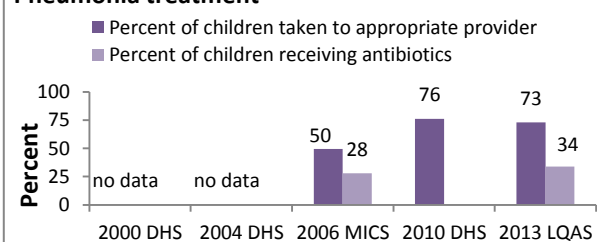
Immunization



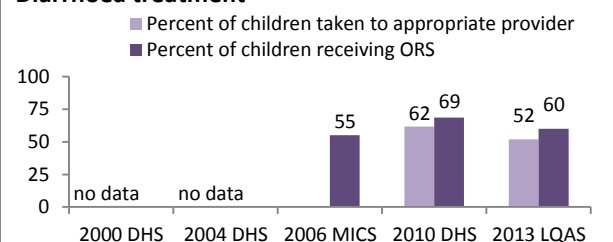
Malaria prevention and treatment



Pneumonia treatment

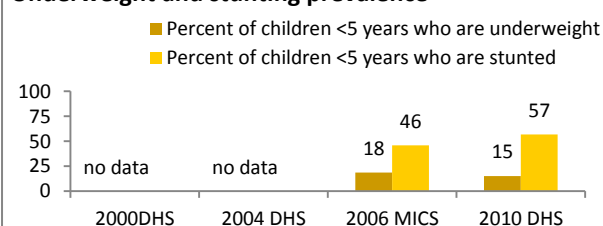


Diarrhoea treatment

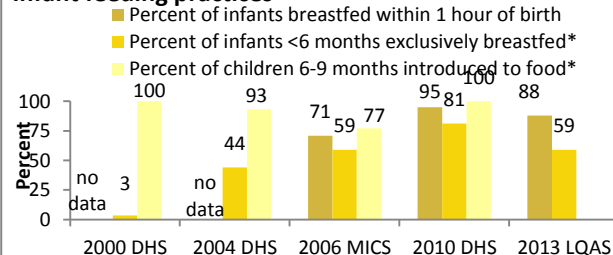


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Dedza District

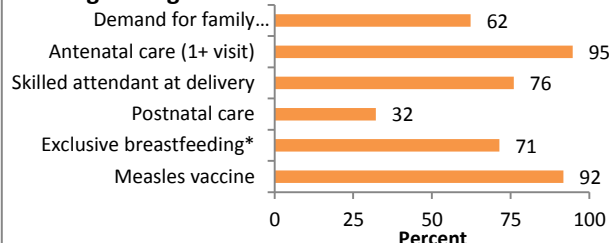
DEMOGRAPHICS¹

Total population	772,000	Annual births	38,000
Neonatal mortality rate (per 1000 live births)	27	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	1,000	Maternal deaths	300
Under-five mortality rate (per 1000 live births)	140	Total fertility rate	5.8
Under-five deaths	5,300		

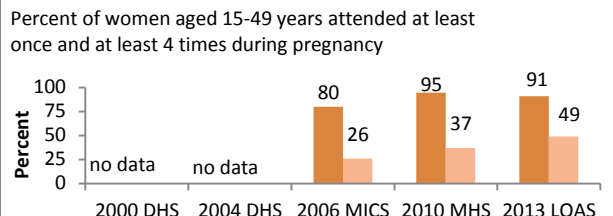
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

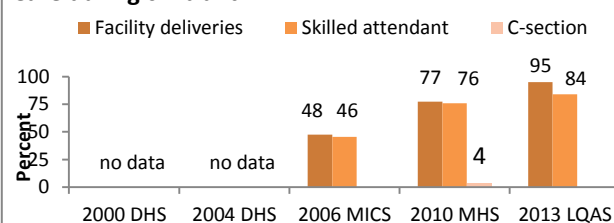
Coverage along the continuum of care



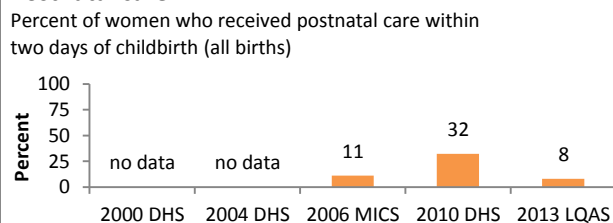
Antenatal care



Care during childbirth

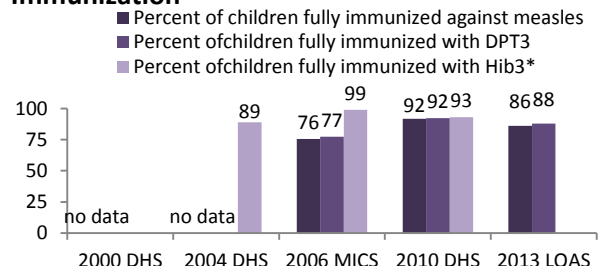


Postnatal care

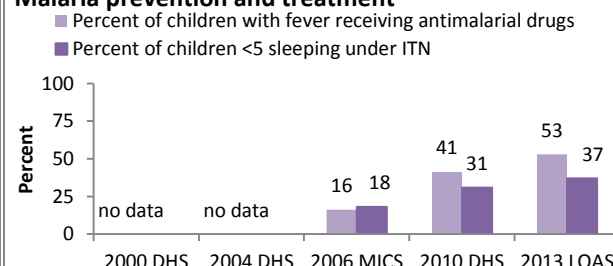


CHILD HEALTH

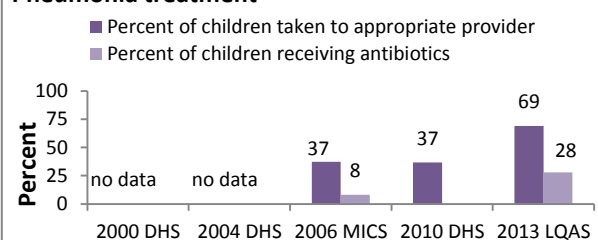
Immunization



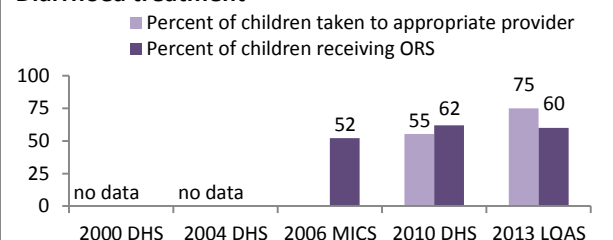
Malaria prevention and treatment



Pneumonia treatment

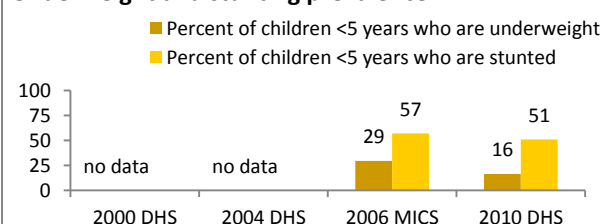


Diarrhoea treatment

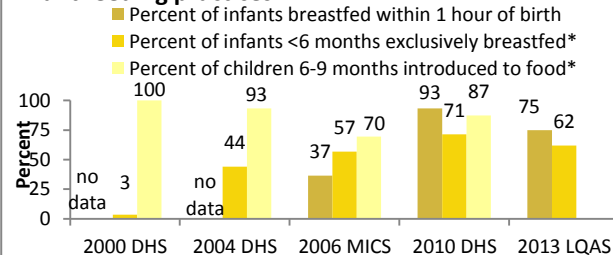


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Karonga District

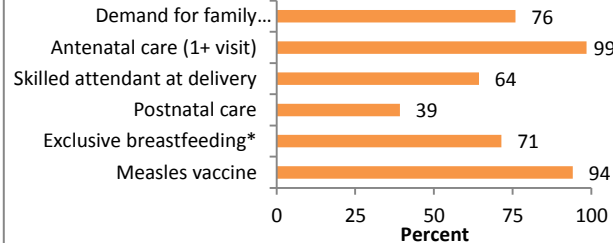
DEMOGRAPHICS¹

Total population	289,000	Annual births	14,000
Neonatal mortality rate (per 1000 live births)	23	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	300	Maternal deaths	100
Under-five mortality rate (per 1000 live births)	75	Total fertility rate	6
Under-five deaths	1,000		

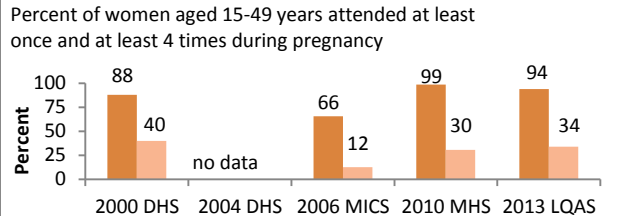
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

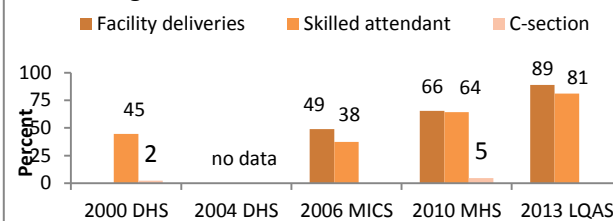
Coverage along the continuum of care



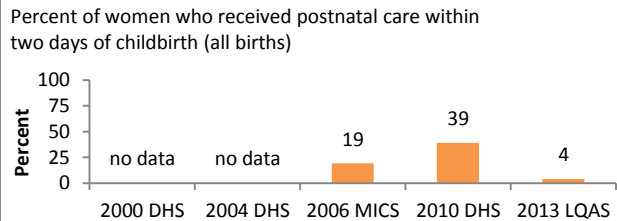
Antenatal care



Care during childbirth

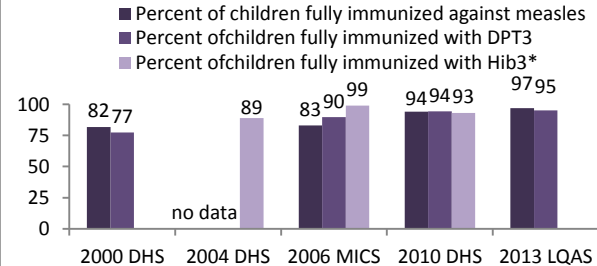


Postnatal care

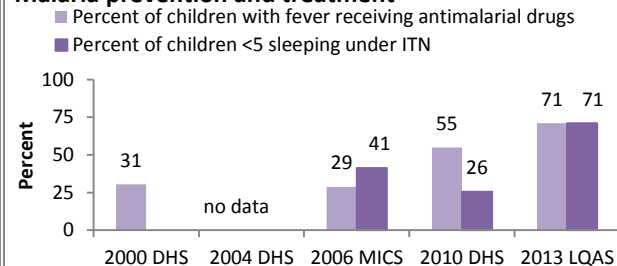


CHILD HEALTH

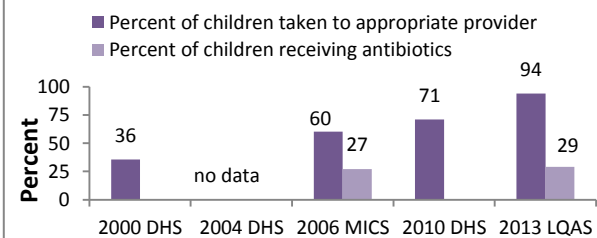
Immunization



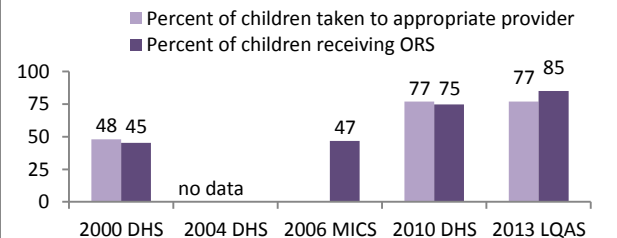
Malaria prevention and treatment



Pneumonia treatment

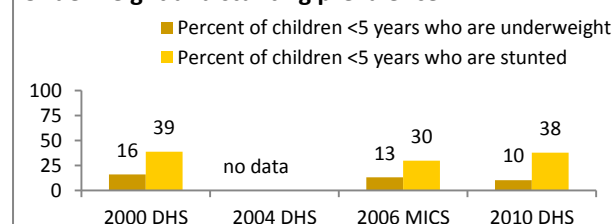


Diarrhoea treatment

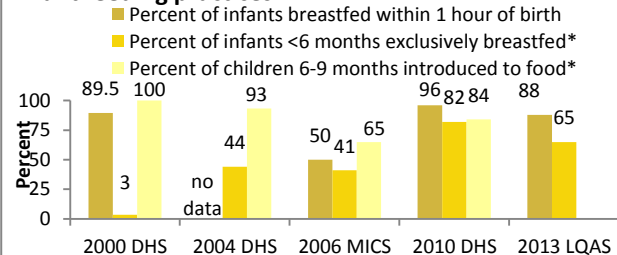


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Kasungu District

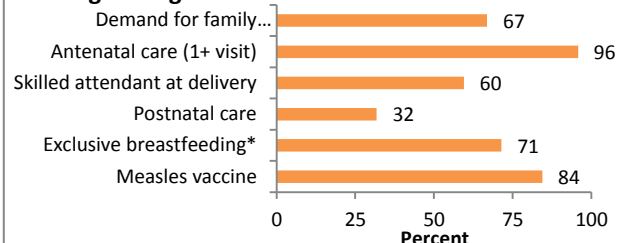
DEMOGRAPHICS¹

Total population	761,000	Annual births	36,000
Neonatal mortality rate (per 1000 live births)	37	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	1,300	Maternal deaths	300
Under-five mortality rate (per 1000 live births)	133	Total fertility rate	6.4
Under-five deaths	4,800		

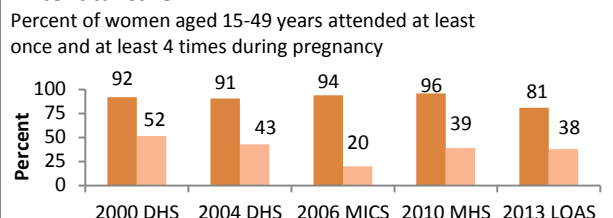
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

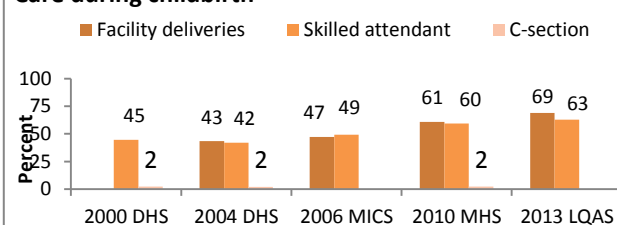
Coverage along the continuum of care



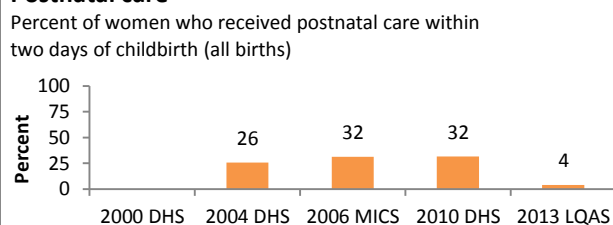
Antenatal care



Care during childbirth

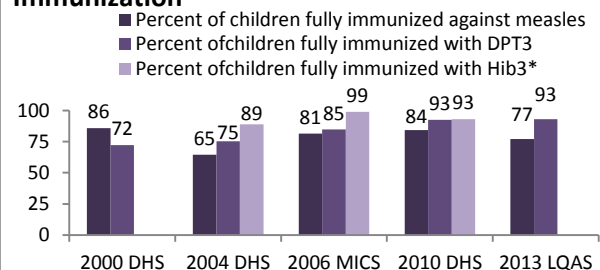


Postnatal care

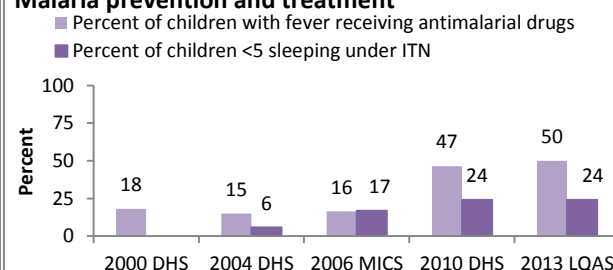


CHILD HEALTH

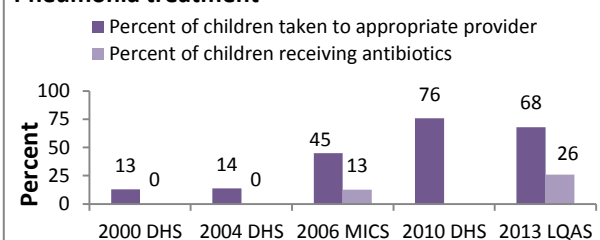
Immunization



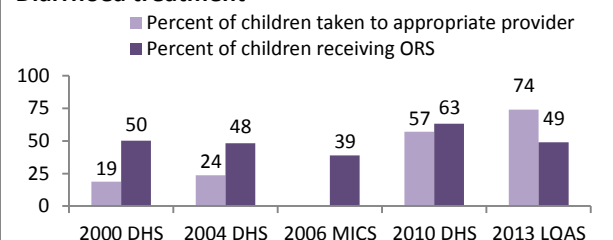
Malaria prevention and treatment



Pneumonia treatment

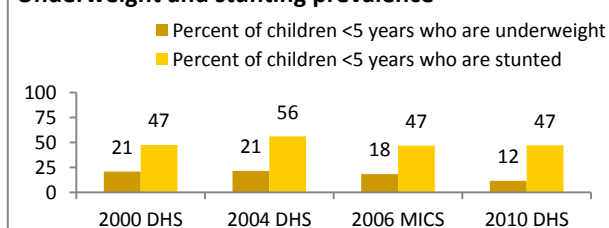


Diarrhoea treatment

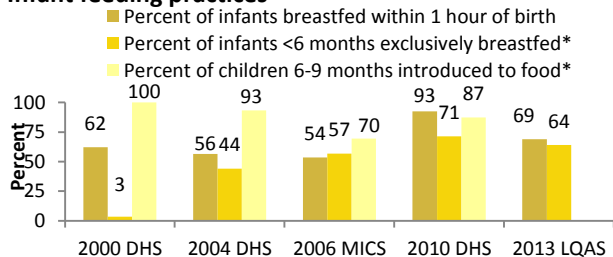


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Lilongwe District

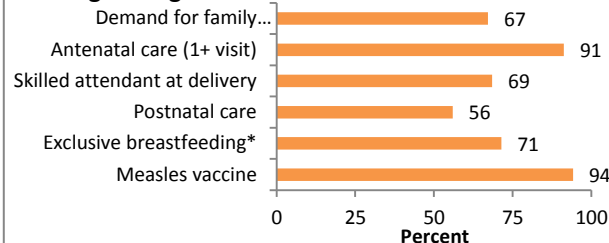
DEMOGRAPHICS¹

Total population	2,385,000	Annual births	111,000
Neonatal mortality rate (per 1000 live births)	35	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	3,900	Maternal deaths	800
Under-five mortality rate (per 1000 live births)	132	Total fertility rate	5.4
Under-five deaths	14,700		

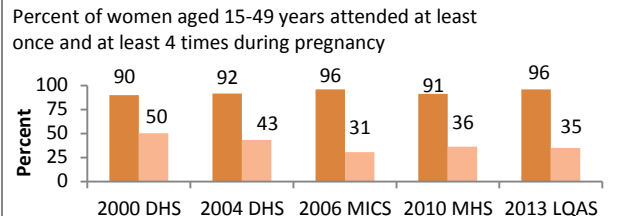
* Refers to national data, not region-specific

MATERNAL AND NEWBORN HEALTH

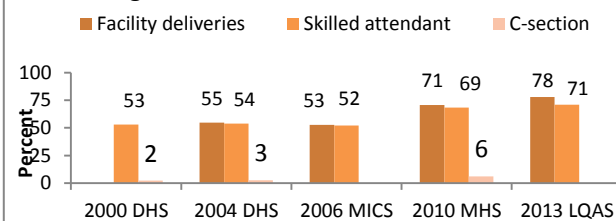
Coverage along the continuum of care



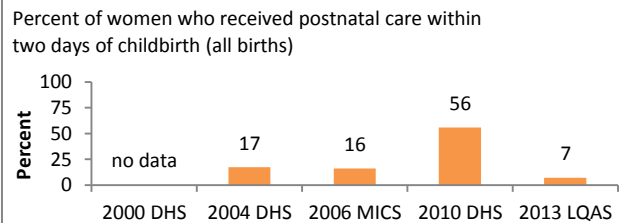
Antenatal care



Care during childbirth

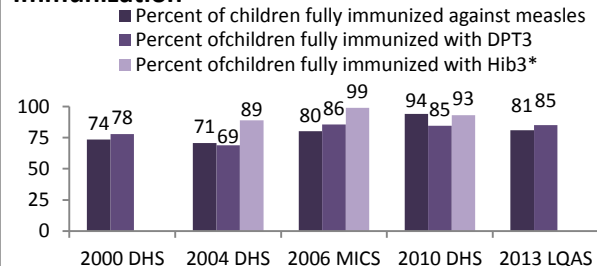


Postnatal care

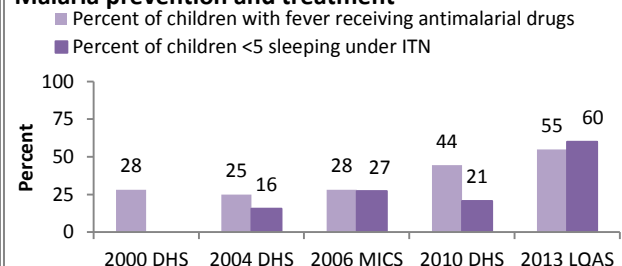


CHILD HEALTH

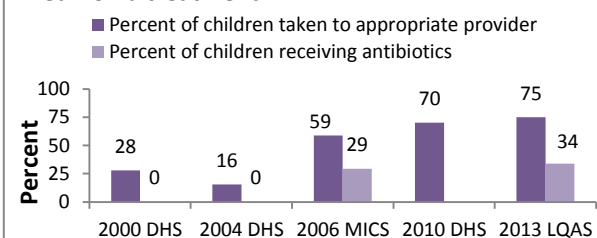
Immunization



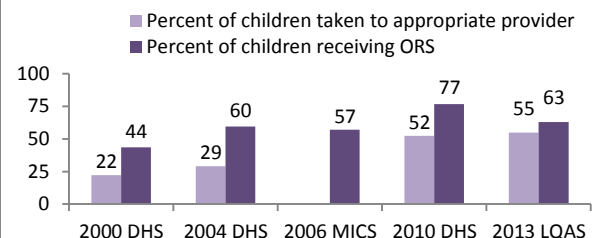
Malaria prevention and treatment



Pneumonia treatment

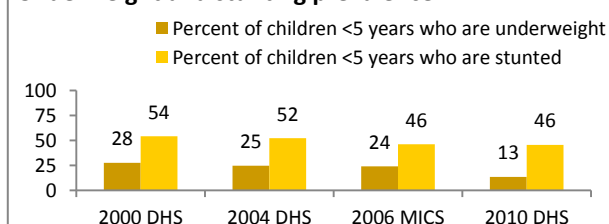


Diarrhoea treatment

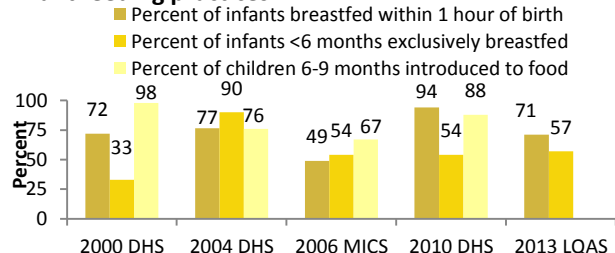


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Mzimba District

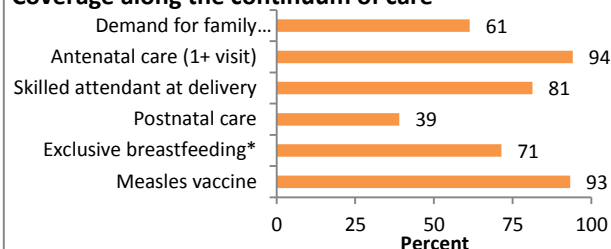
DEMOGRAPHICS¹

Total population	696,000	Annual births	27,000
Neonatal mortality rate (per 1000 live births)	49	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	1,300	Maternal deaths	200
Under-five mortality rate (per 1000 live births)	131	Total fertility rate	5.8
Under-five deaths	3,600		

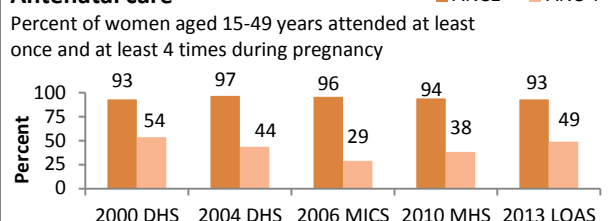
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

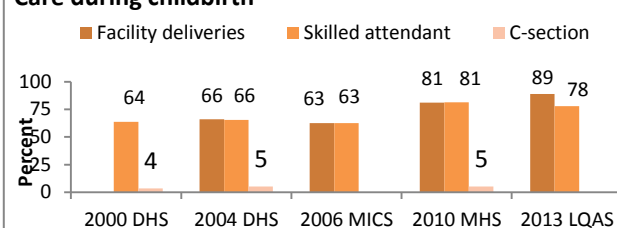
Coverage along the continuum of care



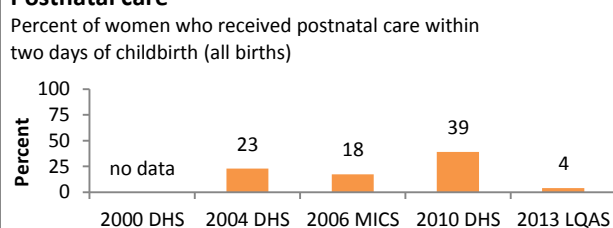
Antenatal care



Care during childbirth

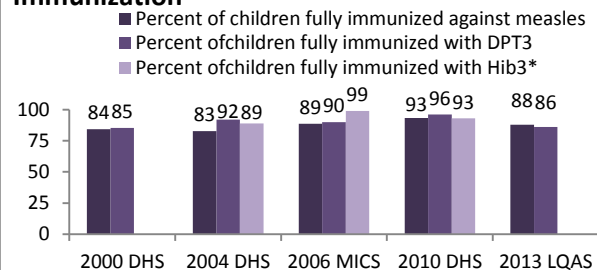


Postnatal care

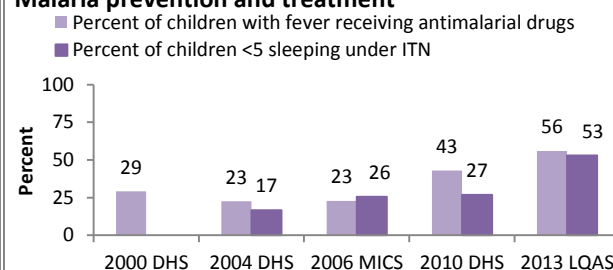


CHILD HEALTH

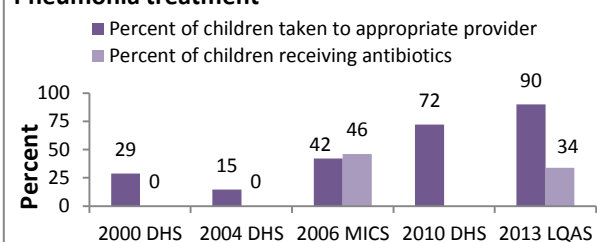
Immunization



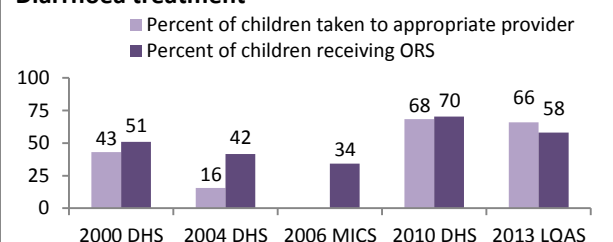
Malaria prevention and treatment



Pneumonia treatment

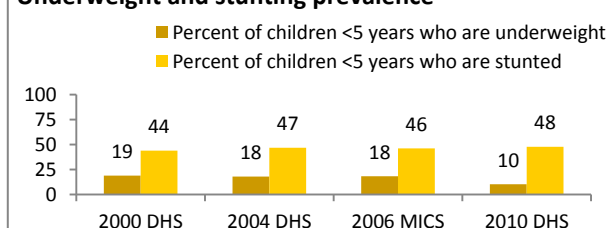


Diarrhoea treatment

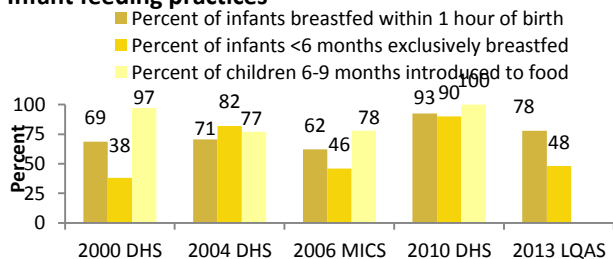


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Nsanje District

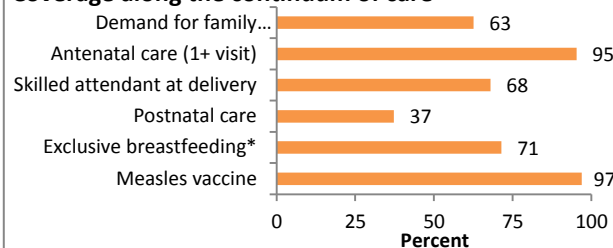
DEMOGRAPHICS¹

Total population	272,000	Annual births	13,000
Neonatal mortality rate (per 1000 live births)	37	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	500	Maternal deaths	100
Under-five mortality rate (per 1000 live births)	134	Total fertility rate	6.2
Under-five deaths	2,500		

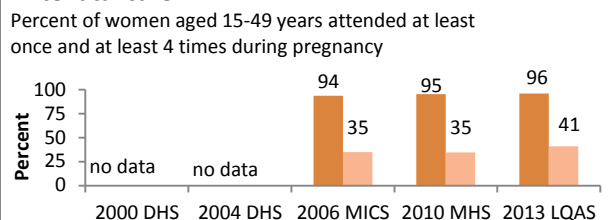
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

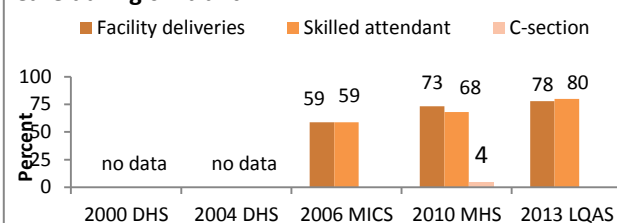
Coverage along the continuum of care



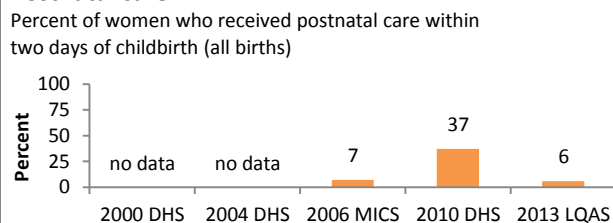
Antenatal care



Care during childbirth

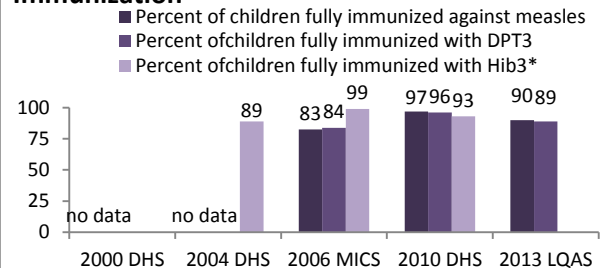


Postnatal care

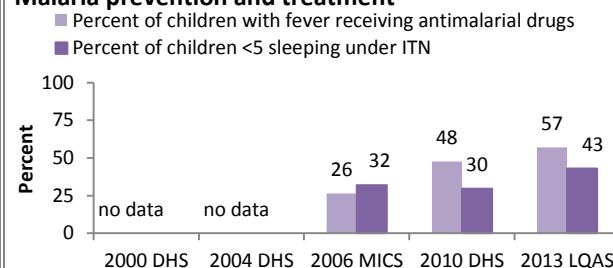


CHILD HEALTH

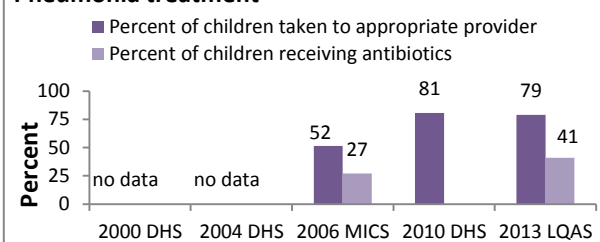
Immunization



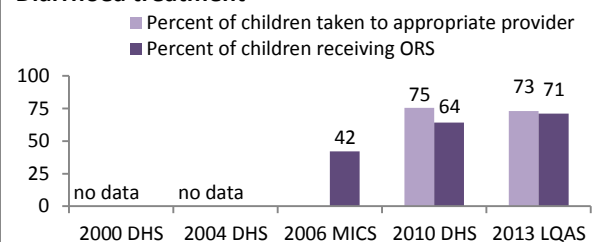
Malaria prevention and treatment



Pneumonia treatment

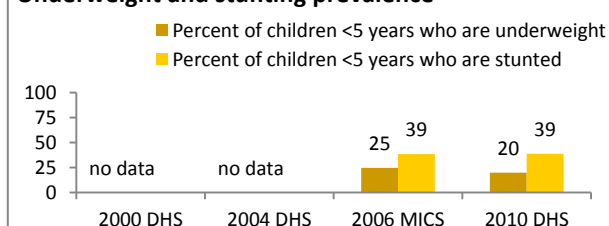


Diarrhoea treatment

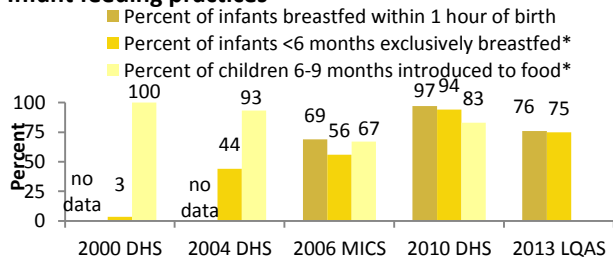


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Ntcheu District

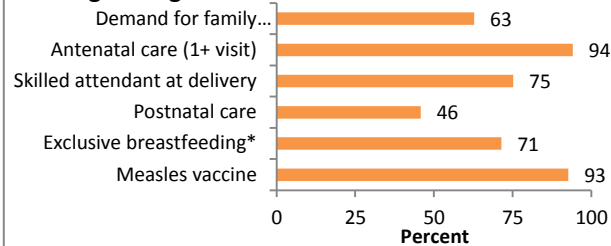
DEMOGRAPHICS¹

Total population	590,000	Annual births	28,000
Neonatal mortality rate (per 1000 live births)	33	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	900	Maternal deaths	200
Under-five mortality rate (per 1000 live births)	125	Total fertility rate	5.3
Under-five deaths	3,500		

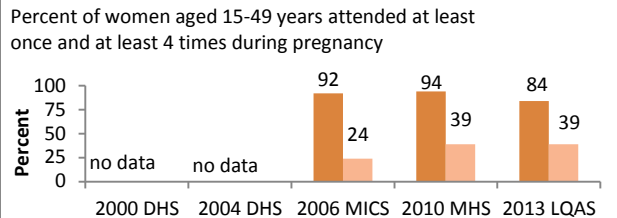
** Refers to national data, not region-specific*

MATERNAL AND NEWBORN HEALTH

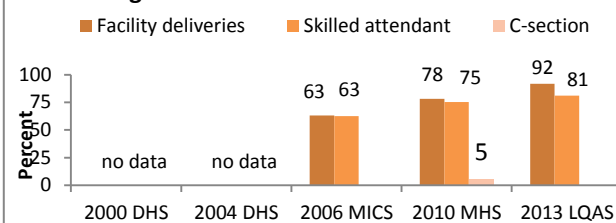
Coverage along the continuum of care



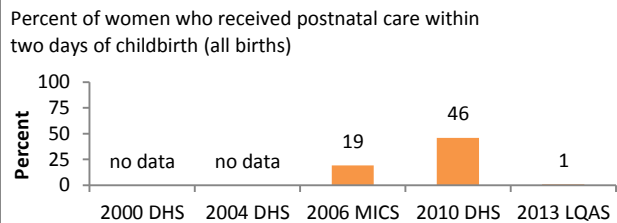
Antenatal care



Care during childbirth

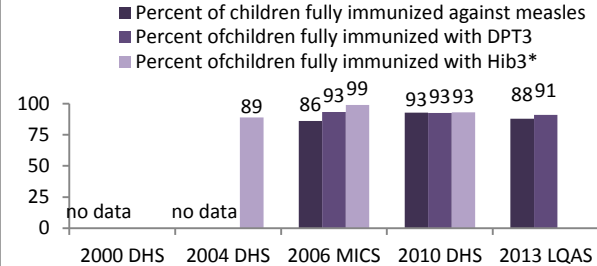


Postnatal care

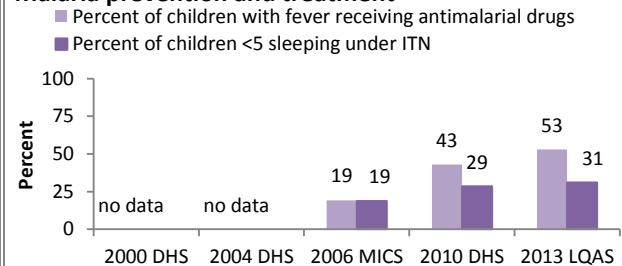


CHILD HEALTH

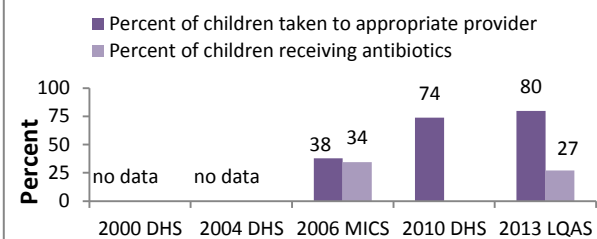
Immunization



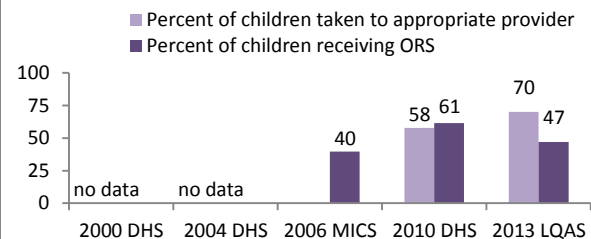
Malaria prevention and treatment



Pneumonia treatment

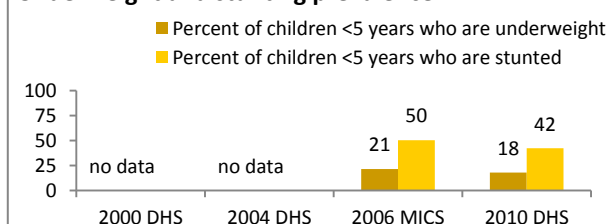


Diarrhoea treatment

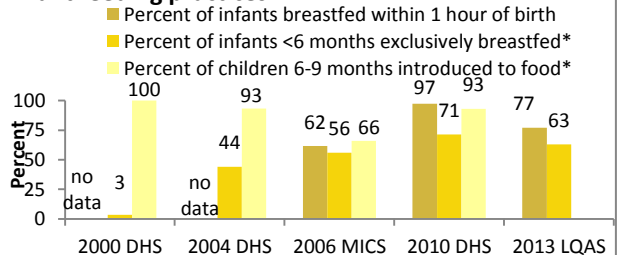


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



¹ Population, births, maternal mortality data collected from Malawi's 2008 Census and projected to 2012. Neonatal and under-five mortality rates as well as total fertility rate are collected from Malawi DHS 2010 and numbers applied to 2012 births from census.

Phalombe District

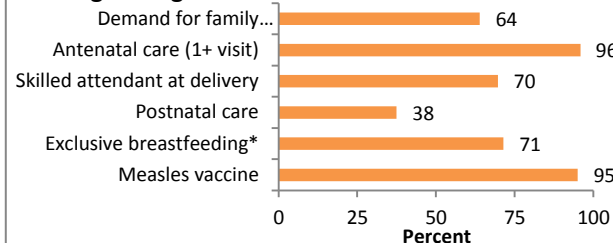
DEMOGRAPHICS¹

Total population	370,000	Annual births	17,000
Neonatal mortality rate (per 1000 live births)	31	Maternal mortality ratio (per 100,000 live births)*	675
Neonatal deaths	500	Maternal deaths	100
Under-five mortality rate (per 1000 live births)	144	Total fertility rate	4.7
Under-five deaths	2,500		

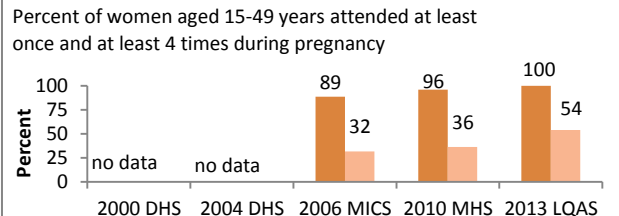
* Refers to national data, not region-specific

MATERNAL AND NEWBORN HEALTH

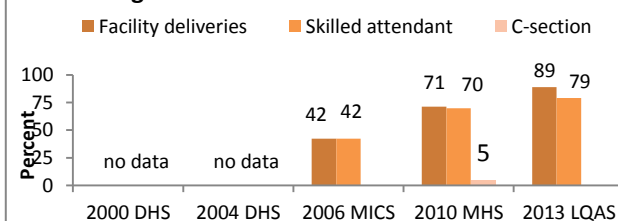
Coverage along the continuum of care



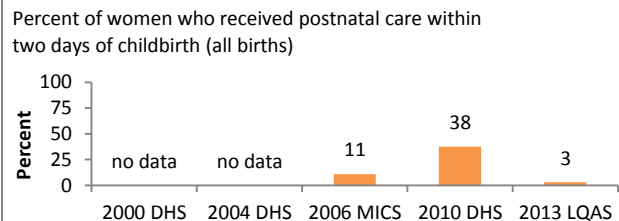
Antenatal care



Care during childbirth

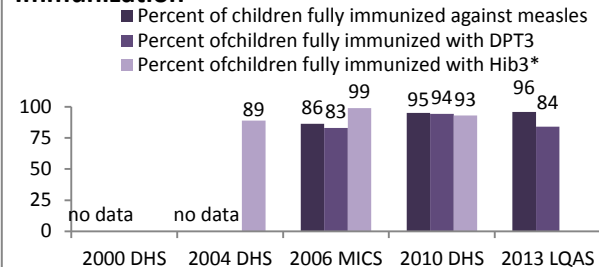


Postnatal care

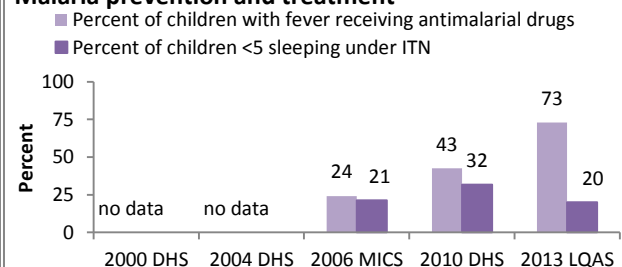


CHILD HEALTH

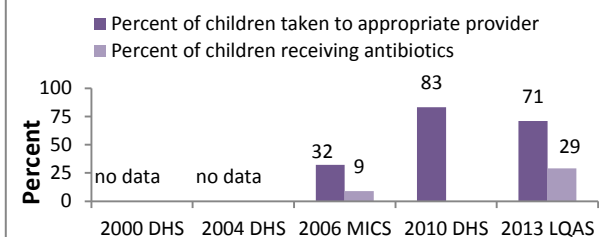
Immunization



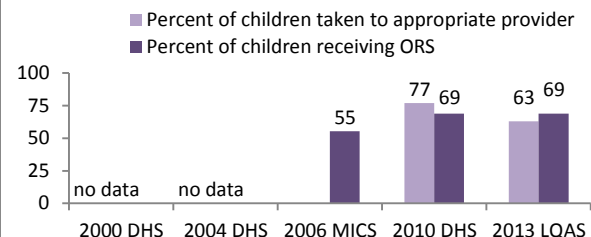
Malaria prevention and treatment



Pneumonia treatment

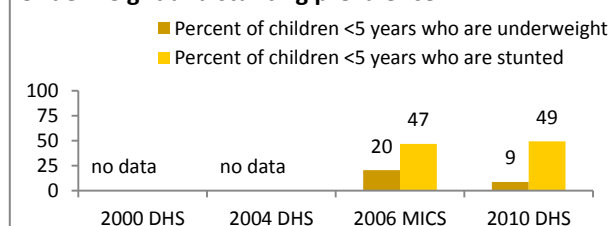


Diarrhoea treatment

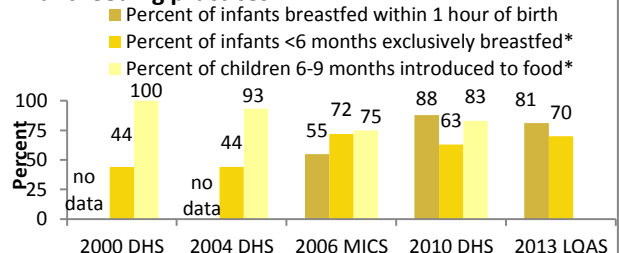


NUTRITION

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