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

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

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ACRONYMS

ACSD	Accelerated Child Survival and Development
ACT	Artemisinin-based combination therapy
BFHI	Baby Friendly Hospital Initiative
CBA	Community-based agent
CCM	Community Case Management
CHO	Community Health Officer
CHNs	Community Health Nurses
CHPS	Community Health Posts
CI	Catalytic initiative
DFATD	Department of Foreign Affairs, Trade, and Development
CMAM	Community Management of Acute Malnutrition
CMS	Central Medical Stores
DANIDA	Danish International Development Agency
DFID	Department for International Development
DHS	Demographic Health Survey
DRG	Diagnostic Related Groups
DTP	Diphtheria, Tetanus, Pertussis vaccine
EBF	Exclusive breastfeeding
EU	European Union
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization of the United Nations
FGD	Focus group discussion
GAVI	Global Alliance on Vaccines and Immunisation
GDP	Gross domestic product
GHS	Ghana Health Services
GoG	Government of Ghana
HIRD	High impact rapid delivery
iCCM	Integrated community case management of common childhood illnesses
IHSS	Integrated health systems strengthening
IP	Implementing partner
IPTp	Intermittent preventive treatment of malaria in pregnant women
IRS	Indoor residual spraying
JICA	Japan International Cooperation Agency
ITN	Insecticide treated net
LiST	Lives saved tool
LLIN	Long-lasting insecticide treatednet
LQAS	Lot Quality Assurance Survey
MDGs	Millennium Development Goals
M&E	Monitoring and evaluation
MICS	Multiple Indicator Cluster Survey
NHIS	National Health Insurance Scheme
NIDs	National Immunisation Days
NMCP	National Malaria Control Programme
NMR	Neonatal mortality rate
ORS	Oral rehydration salts
PHN	Public Health Nurse
PMTCT	Prevention of Mother to Child Transmission of HIV
PNC	Postnatal Care
RDT	Rapid Diagnostic Test

RUTF	Ready to Use Therapeutic Food
SP	Sulfadoxine-pyrimethamine
U5MR	Under Five Mortality Rate
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
VAT	Value Added Tax
WASH	Water, sanitation and hygiene interventions
WHO	World Health Organization
WPF	World Food Programme

EXECUTIVE SUMMARY

Background

The Integrated Health Systems Strengthening (IHSS) support through the Canadian International Development Agency (DFATD) and UNICEF began in January 2008 and continued until 31 May 2013. The aim of the programme was to support the High Impact Rapid Delivery (HIRD) strategy of the Government of Ghana, which began in 2007 and aimed to increase access to evidence-based high impact interventions to reduce maternal and child mortality. UNICEF/DFATD support was focussed on the Northern, Upper West and Upper East regions of the country, the most disadvantaged regions in terms of maternal and child health outcomes. There was also some support for CBA training and deployment in the Central Region.

The main focus of the IHSS programme was to strengthen the health system to prevent, and provide effective treatment for the main causes of, child deaths especially at community level. Community based workers are referred to as community based agents (CBAs) in Ghana and they are deployed mainly in the three Northern Regions and the Central Region. They are volunteers who do not receive any government salary but do charge a small token incentive from beneficiaries for medicines dispensed. CBAs deliver services in homes and are not based within the community-based health posts (CHPS). CBAs are endorsed in the Child Health Policy and Child Health Strategy but not covered by the National Health Insurance Scheme (NHIS).

During phase one of the IHSS programme the focus was on providing support for strengthening immunisations, vitamin A supplementation, infant and young child feeding, procuring and distributing ITNs, training and quality improvement. In 2009 the Child Health Policy and Child Health Strategy were revised to include treatment with Amoxicillin and zinc by trained CBAs. This paved the way for implementation of the full iCCM package. Implementation of iCCM of diarrhoea, malaria and pneumonia started in late 2010.

Evaluability

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

Evaluation Rationale

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

Purpose and objectives

The purpose of this external evaluation was two-fold:

- To evaluate the effect of the IHSS programme on coverage of a limited package of proven, high impact, and low cost maternal and child health interventions in Ghana.
- To inform programme and policy decisions in Ghana 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 WHO building blocks of the health system and the capacity of government and/or civil society organizations to train, equip, deploy, and supervise front-line health workers to deliver a limited package of proven, high impact and low cost health interventions.
- Impact: Effect on coverage of selected maternal, newborn and child health and nutrition interventions, particularly integrated Community Case Management (iCCM), which were supported by the IHSS programme; as well as the effect on the number of additional lives saved by the IHSS programme calculated using the Lives Saved Tool (LiST) disaggregated by groups of interventions, e.g., iCCM, and by individual interventions according to the phases of the programme.
- Sustainability: The cost of implementing iCCM and the organisational and financial sustainability of this programme.

Scope of the Evaluation

The scope of the external evaluation was focused on estimating the plausible effect of the IHSS programme on coverage of interventions funded by the IHSS programme, and estimating the additional lives saved by the programme (together with other relevant interventions), using LiST. The evaluation scope was limited to assessing the plausible contribution of the IHSS programme to observed changes in coverage of selected indicators due to the lack of true comparison areas, as similar programmes were being implemented across the country, and the lack of feasibility of a randomized intervention/control design. Geographically the scope of the external evaluation included the three Northern regions and all districts therein. 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 Ghana Health Service, DFATD, UNICEF, other UN agencies, and governmental and civil society partners at national, regional, and global levels.

Methodology

A mixed method approach to this evaluation was used[4, 5] in that quantitative, qualitative and economic evaluation methods were utilised. For analysis of coverage, trend analysis was performed using a non-parametric test of trend across years and wealth quintiles for all available surveys. Data to assess implementation strength, utilisation, and quality of care were taken from routine programme data collected by UNICEF as well as the 2012 CHO/CHN survey. The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework[6].

Using household survey data, we used LiST to investigate the extent to which changes in child mortality could be attributed to increases in intervention coverage. On the basis of measured baseline mortality values and changes in coverage, we forecasted child mortality over three time periods (pre-IHSS, phase I and phase II) and compared cumulative lives saved and annual rates of reduction for each period.

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 CBAs for the treatment of malaria, diarrhoea and pneumonia in children under five. It also assessed the financial sustainability of the programme in relation to current utilisation and anticipated increased future levels of utilisation.

A cost per life saved was not calculated, for several reasons. 1. The methodology for assessing lives saved using the Lives Saved Tool (LiST) is based on modelled estimates, not measured outcomes linked to specific interventions 2. The lives saved analysis reflects inputs across the health system resulting in coverage change which include, but are not limited to, IHSS 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 rapid socioeconomic progress, policy changes, epidemiological changes and complementary and competing interventions by other donors and government, were described using data from document reviews and relevant databases. Contextual data to support the quantitative coverage data was collected during key informant interviews and focus group discussions with national stakeholders, key district personnel, CBAs, their supervisors, beneficiaries and community-based leaders/structures involved in supervision (zonal co-ordinators).

The team visited three districts in the Northern region for field work (Saboba, Tolon and Savelugu) in addition to three days spent in Accra.

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 IHSS programme in the three Northern regions of Ghana was well received at both government, national and regional, and community levels. This was facilitated by the fact that the change in the Child Health Policy to allow CBAs to administer antibiotics and zinc coincided with the early phase of implementation of the programme, thereby enabling iCCM to take place. However, the sentiment was also expressed that more needs to be done in order to strengthen the Community Health Posts (CHPS), the level just above the CBAs at which nurses work. UNICEF, through the IHSS programme, has made a major contribution to capacity building having trained the second largest number of front line workers of all the CI countries. A total of 16,812 CBAs were trained in iCCM in the Northern and Central regions with a good gender balance (48% female). Eighty four percent (84%) of the trained CBAs received their initial drug kit and supplies. A considerable number of nurses/clinicians were also trained in iCCM (666) and a few in IMCI (238).

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?

As stated above, the IHSS programme made a considerable contribution in terms of training and equipping CBAs to implement iCCM. However, the levels of utilisation of CBAs appear to be low, with an average of 9 treatments per CBA/year between June 2009 and May 2013, and this is most likely due to two reasons, i.e., the lack of inclusion of CBAs in the NHIS scheme and the token system which requires clients to pay a small amount to receive drugs from the CBAs. Stock outs of drugs could also have contributed to the low utilisation of CBAs.

Despite the fact that this programme was funded and supported by UNICEF, who attempted to work with government to resolve bottlenecks, implementation was plagued by difficulties around supplies and logistics, and stock outs were a major problem. This problem was caused both by the lack of availability of stocks in the facilities as well as the CBAs' lack of transport to fetch the drugs from the facilities when they were available.

With regard to trends in coverage indicators, improvements are noted in early initiation of breastfeeding, coverage of ITNs, intermittent preventive treatment of malaria in pregnancy (IPTp), ORS, care-seeking and treatment of fever and care-seeking for pneumonia. Coverage levels were maintained for exclusive breastfeeding, measles vaccination, DPT3 and vitamin A supplementation.

In terms of the contribution of the IHSS programme to improving equity in access to services, a mixed picture is presented. For several indicators (IPTp, vitamin A, care-seeking for fever), coverage increased significantly in the poorest quintile, and the gap between the richest and the poorest wealth quintiles narrowed significantly for DPT3, whilst for other interventions (anti-malarial drugs, tetanus toxoid, care-seeking for pneumonia, ORS) there was no improvement in coverage amongst the poorest. Coverage of ITNs and postnatal care was significantly pro-poor since coverage was higher amongst the poorest quintile in 2011, although in the case of postnatal care this reflects a decline in the richest quintiles and no change in the poorest.

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 Ghana in 2010 included malaria, pneumonia, and neonatal causes, i.e., complications from prematurity and intrapartum-related.[7] Changes in intervention coverage during the pre-IHSS period (2000-2007) accounted for an estimated, cumulative 11,400 lives saved over the seven years of the analysis across the three regions, equivalent to an average of 1,600 lives saved per year. During Phase I of the IHSS programme (2007-2010), the model indicated an additional 1,900 lives were saved across the three regions, with 66% of these deaths averted being from IHSS programme focused interventions. In Phase II (2010-2013), another 1,900 lives were saved with an average of 60% of deaths averted due to the scale up of IHSS programme interventions.

In the years before the implementation of IHSS programme, the main interventions contributing to the prevention of child deaths included vaccines, i.e., measles and Hib, and ITNs for malaria prevention. Phase I interventions, which contributed to the vast majority of deaths averted in Northern region and Upper East, included ITNs for malaria prevention, antimalarials (ACT) and care-seeking for suspected pneumonia, used as a proxy for appropriate treatment for pneumonia, and ORS and zinc for treatment of diarrhoea. ITNs for malaria and improvements to care at birth had the most impact in Upper West. In Phase I, ITNs for malaria prevention was a leading intervention saving lives across the three regions, coinciding with the IHSS programme's support for the 'hang-up' campaign. CBAs, through IHSS programme support, were involved in social mobilisation and distribution of these nets to households. There were regional variations in prominent interventions that saved the most lives in Phase II. Case management interventions (case management of malaria, pneumonia and diarrhoea) were prominent in the lives saved results across the three regions. In Upper East, these interventions averted nearly 484 child deaths between 2010 and 2013 (45% deaths averted); in Upper West, care seeking for suspected pneumonia averted 23% of total deaths while ORS and zinc for diarrhoea treatment averted 10% of deaths; in Northern, 38% of deaths averted (208 lives saved) were a result of case management interventions. Improvements to care at birth consistently saved a large proportion of lives across regions and time periods. 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 IHSS programme. 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.

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?

Costing of the program according to the country iCCM guidelines showed that a malaria treatment stood at $13.7, diarrhoea treatment at $12.5 and pneumonia at $12.4. An average of 94% of these costs are fixed CBA-related costs, such as training, kit, management and supervision, and an average of only 6% reflects drug costs. The number of treatments (malaria, diarrhoea and pneumonia) per CBA was 10 in 2012, the year on which this costing analysis was based. An increase in the demand, and thus number of treatments per CBA, would decrease significantly the cost per treatment by spreading CBA costs amongst a higher number of treatments.

The impact on the program costs of increased demand would be marginal: +0.9% if the number of treatments per CBA were 15% higher, and +1.7% if the number of treatments increased by 30%. Reducing the number of CBAs from the current 2 to 1 per community would decrease the cost per treatment by 47%. Currently the iCCM program in the Northern region represents 24% of the region's expenditure on district health services, and 5% of its total health expenditure. In order to assess the sustainability of an iCCM program extended to the whole country, Northern Region iCCM costs were extrapolated based on population, with the assumption that there would be only 1 CBA per community. The required number of CBAs for the country would be 25,415, and the iCCM basic cost would stand at $3.58 million, representing 0.34% of the country's public health expenditure and 0.46% of the government's own health expenditure. Adding 15% to iCCM basic cost to include related systems strengthening activities, would put the cost of iCCM at $4.11 million, representing 0.4% of the country's public health expenditure and 0.5% of the government's own health expenditure.

Conclusions

Relevance

It was clear during this evaluation that the IHSS programme was well received at both government and community levels in the three Northern regions of Ghana. The qualitative findings show that the government was supportive of the roll out of iCCM in the three Northern regions, CBAs were generally satisfied to be the frontline workers implementing it, and community members expressed gratification in having a treatment point for their children in close proximity to where they lived. The data also shows that the IHSS programme made a substantial contribution in terms of training CBAs and equipping them. Through the IHSS programme a platform for community-based service delivery has been established in Northern Ghana, the most disadvantaged region in the country in terms of maternal and child health indicators.

Effectiveness

The Phase I support, primarily for preventive interventions, resulted in substantial increases in early initiation of breastfeeding, ITNs, maintenance of exclusive breastfeeding, and immunisation coverage. In Phase II, coverage increases are noted in care-seeking for all three case management conditions.

The volunteer model of CBAs, who are not included in the NHIS, has possibly limited the effectiveness of the case management component as seen in the low levels of utilisation of CBAs. Care-seeking for suspected pneumonia did increase considerably between 2007 and 2012, and it is plausible that the health promotion activities of CBAs could have led to this increase in care-seeking at government health facilities.

Impact

The lives saved modelling results found that during Phase I of the IHSS programme, an additional 1,900 lives were saved across the three regions, with 66% of these deaths averted being from IHSS programme focused interventions. In Phase II (2010-2013), another 1,900 lives were saved with an average of 60% of deaths averted due to the scale up of IHSS programme interventions.

Case management, of malaria, pneumonia and diarrhoea, interventions were prominent in the lives saved results across the three regions. Improvements to care at birth consistently saved a large proportion of lives across regions and time periods. With increased focus on the IHSS programme interventions and coverage gains experienced, it is plausible the IHSS programme contributed to the lives saved during Phase I and II of the IHSS programme. 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.

Sustainability

Cost per treatment ranging from $12.4 to $13.6 is high for a treatment delivered by a volunteer who often is not literate. The reason for this high price is the low number of treatments per CBA, due to both supply of, and demand for, these services. In the Northern Region, it was standard practice to have 2 CBAs per village, each covering an average of 72 children under 5. This is very low in comparison to other countries with similar programmes (377 children under 5 per CHW in Ethiopia and 300 in Mali). In volunteer-based programmes, as is the case in Ghana, fixed costs per CHW are often under-estimated and optimising the use of the volunteers not seen as a necessity. In this programme CBAs-related cost accounted for 93% of treatment cost.

There appear to be missed opportunities, such as CBAs not undertaking early postnatal visits, promoting timely antenatal care, skilled delivery and more attention to promoting exclusive breastfeeding in conjunction with mother-to-mother support groups.

Financial sustainability of the program, if expanded across the country, does not appear to be a significant barrier, as a country-wide iCCM scale up with additional systems strengthening support (+15% in costs) but with an average of 1 CBA only per community would represent 0.4% of the country public health expenditure and 0.5% of the government own health expenditure. The level of demand is the crucial element which will impact on health status improvement and costs, and hence justify the maintenance and extension of the program.

Lessons learnt

Relevance

- The IHSS programme was well received at both government and community levels in the three Northern regions of Ghana. This was facilitated by the fact that the change in the Child Health Policy to allow CBAs to administer antibiotics and zinc, coincided with the early phase of implementation of the programme, thereby allowing for iCCM to take place.
- The support was provided to the three Northern regions which are the most disadvantaged in terms of maternal and child health indicators.
- It is encouraging that the focus of UNICEF in the three Northern regions now includes community-based newborn care since the three Northern regions have increasing neonatal mortality rates and a negative annual rate of decline. It will be critical to reverse this trend and lower neonatal mortality in order for the under-5 mortality decline to increase.

Effectiveness

- Lack of inclusion of CBAs in the NHIS and lack of compensation hinders their ability to function as a part of the health workforce.
- Implementation of iCCM was plagued by difficulties around supplies and logistics and stock outs were a major problem.

Impact

- At the time of the evaluation, iCCM in Ghana had been at scale, with over 80% of CBAs trained in iCCM in the three Northern Regions, for approximately one year. 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, i.e., calculating additional and not full costs of delivering iCCM, the evaluation did not calculate cost-per-life saved.

Sustainability

- Costed according to protocol, community case management (CCM) treatments for malaria, diarrhoea and pneumonia have a weighted average cost per treatment of $13.21: $13.81 for malaria treatment, $12.7 for diarrhoea and $12.63 for pneumonia. This is a high cost given that the treatment is delivered by, often illiterate, volunteers.
- In volunteer-based programmes, fixed costs per CHW are often under-estimated and optimising the use of the volunteers is often not seen as a necessity. If the number of CBAs per village was reduced to one, the average cost per CCM treatment would be reduced from $13.2 to $7, and the CBA would spend an average of 1.6 hours a week on the CCM programme.

Recommendations

Relevance

- Implementation of the Catalytic Initiative was challenges by the fact that the services of CBAs are not covered under the NHIS. This appears to have impacted on the demand for CBA services. Strategies to encourage demand for CBA services are needed together with a formal process to include CBA services within the NHIS. This would be essential if CBAs are to continue with their curative functions.
- Given the poor socio-economic indicators in the three Northern regions, the CBAs could be used to implement total community-led sanitation.

Effectiveness

- Improved monitoring of the utilisation of iCCM is needed through community-based HMIS systems and periodic LQAS surveys.
- The increases in both early initiation and maintenance of high levels of exclusive breastfeeding are encouraging. The Northern regions of Ghana could serve as a role model for other countries in achieving high rates of breastfeeding and these lessons learnt should be shared within the country. Furthermore the CBAs' functions could be extended to include community-based nutrition as part of the SUN (scaling up nutrition) initiative.
- The increasing trend in no care-seeking between 2008 and 2012 is concerning and should be assessed more closely to determine barriers to lack of care-seeking. Further research is needed to determine whether NHIS requirements could be detrimentally affecting care-seeking.
- A study of CHPS as a level of care is recommended, analysing both utilisation and costs compared to CBA services and facility-levels above CHPS, in order to understand to what extent they have the capacity to increase, in a sustainable way, access to care.
- Stock-outs have been a severe problem for CBAs as well as CHPS in the three Northern regions of Ghana. Efforts are needed to improve the reliability of drugs and supplies, which ought to increase the confidence of communities in CBA and CHPS services. Improvements are also needed in real-time monitoring of supply chain, possibly through the use of information technology.
- Whilst ITNs appear to have been the most successful intervention during the IHSS programme period in terms of coverage increases, as well as targeting the most poor, they are dependent on donor funding and campaign style delivery. Longer term strategies should be considered to sustain this high level of coverage.

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 improved care at birth, 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 impact is expected to be seen, e.g., the CBA/ CHPS 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

- Although iCCM was being implemented, through IHSS programme support, in the three Northern Regions and the Central region, it was not implemented anywhere else in the country. This reflects a lack of national government buy-in for the approach. National support and scale-up is critical to the sustainability of iCCM.
- As current costs per CBA are high due to treatments per CBA being low. To improve sustainability, one of the two following options is recommended:

  1) reduce the total number of CBAs, focus support on these and thereby increase the treatments per CBA (while they still conduct preventive and promotional interventions)

  2) reduce the number of CBAs providing iCCM so as to reduce cost per CBA and increase treatment rates per CBA (i.e. get more value from each CBA) while the balance of CBAs only conduct preventive and promotional interventions.

1. Background

1.1 Country context

Ghana is a middle income country located in West Africa. It is bordered by Côte d'Ivoire to the west, Burkina Faso to the north, Togo to the east, and the Gulf of Guinea to the south. The total population is estimated to be 24.9 million, of which 3.5 million are under 5. It has a GDP of US$ 39.2 billion. With a stable, democratic government, Ghana has made significant strides towards poverty reduction in recent years; however, inequities exist between regions, most notably the north, especially with coverage of care for high impact interventions.

In 2011 Ghana experienced high economic growth (13-14%) following the discovery of oil at the end of 2010 and subsequent investment in the oil industry. In the following years the average annual growth rate reduced to around 8%.

1.2 Ghana Health system

In 2003, in an attempt to replace a system of user fees for health care, Ghana introduced a National Health Insurance Scheme (NHIS) through a legislative Act of Parliament (The NHIS Act). Scale up of the system began in 2004, and it reached full operation nationally in 2006. The NHIS is largely funded through an NHI levy, which is an additional 2.5% value added tax (VAT), while the remainder is gathered through pay-roll deduction and premium and registration fee payment. All children under 18 years are exempt from premium payments, and NHIS registration is free for children under 5 and pregnant women and those over 65 years of age. For working people in formal employment the fee is deducted at source.

The NHIS covers inpatient and outpatient services, essential drugs, maternity care, and emergency care. Preventive services, such as immunisations or family planning, are not included in the NHIS although the Ghana Health Services (GHS) is a GAVI recipient. In 2012 a decision was made to provide family planning free of charge, but this is yet to be implemented. The government pays all staff costs in all public institutions, which amounts to more than 80% of total health expenditure, so the cost recovery is for services using the diagnostic related groups (DRG) fee structure. Currently curative services provided by community based workers, referred to as community based agents (CBAs), who are not included in the NHIS scheme, and clients, therefore, have to pay a token amount for medicines received from CBAs. Attempts have been made by UNICEF to lobby for abolishing those fees.

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

Between 2002 and 2004, UNICEF together with DFATD and the Government of Ghana piloted the Accelerated Child Survival and Development model (ACSD) in six districts in the Upper East Region[8]. The objective of this model was to fast track progress towards the achievement of Millennium Development Goals (MDGs) 4 and 5. The ACSD programme included the training of CBAs who were providing malaria treatment (Chloroquine) and diarrhoea treatment with ORS only at community level. Children with pneumonia were referred to the nearest health facility as the policy did not allow for the use of antibiotics and zinc by non-formal health workers. The ACSD programme served as a model for Ghana's High Impact Rapid Delivery (HIRD) strategy which was established in a programme of work of the Ministry of Health 2007-2011.

Community-based health services in Ghana are provided through the Community-based Health Planning and Services (CHPS). The CHPS initiative was started in 2001. The goal was to improve access to services, efficiency and responsiveness to client needs and to develop inter-sectoral collaboration. Under this scheme communities are divided into CHPS zones comprising 3000-4500 people. A CHPS compound/health post should be constructed in each zone with the help of communities. These compounds are the most peripheral units of the formal health sector, where they mainly focus on preventive health services. A Community Health Nurse (CHNs) or Community Health Officer (CHOs) is allocated to live and work in a CHPS compound. A CHO is a CHN who has undertaken further training on clinical management of common diseases and health problems, family planning and community organisation and mobilisation. In reality, many CHPS zones do not have compounds, and the CHOs/CHNs travel to their zones to deliver services. Attrition amongst CHNs and CHOs is reported to be high as they return to urban areas to further their studies. The CHOs/CHNs are supported by the network of CBAs who assist with their outreach activities.

2. Object of Evaluation: The IHSS programme

The Integrated Health Systems Strengthening (IHSS) support through DFATD/UNICEF began in January 2008 and continued until 31 May 2013. The aim of this programme was to support the HIRD strategy of the Government of Ghana, which began in 2007 and aimed to increase access to evidence-based high impact interventions to reduce maternal and child mortality. UNICEF/DFATD support was focussed on the Northern, Upper West and Upper East regions of the country (Figure 1), the most disadvantaged regions in terms of maternal and child health outcomes. There was also some support for CBA training and deployment in the Central Region. The Northern region makes up one third of the total land mass of Ghana and is sparsely populated, with roughly 30 people per square kilometre, and it has poor road infrastructure. It is, thus, a very difficult situation for rendering services. Ghana's predominant religion is Islam.

Figure 1: Map of Ghana showing UNICEF-supported regions (in red)

The main focus of the IHSS programme was to strengthen the health system to prevent and provide effective treatment for the main causes of child deaths especially at community level. CBAs are deployed mainly in the 3 Northern Regions and the Central Region. There are CBAs employed outside of these three regions who support implementation of partial iCCM. CBAs deliver services in homes and are not based within health posts (CHPS). CBAs are endorsed in the Child Health Policy and Child Health Strategy, however they are not covered by the NHIS. There are approximately 72 under-fives per CBA (14 CBAs per 1000 under-fives in the regions supported by the IHSS programme) and two CBAs per community (one male and one female).

During Phase I of the IHSS programme, the focus was on providing support for strengthening immunisations, vitamin A supplementation, infant and young child feeding, procuring and distributing ITNs, training and quality improvement (Table 1).

Implementation of integrated community case management (iCCM) of diarrhoea, malaria and pneumonia started in late 2010. Prior to this, scale up of non-iCCM interventions and partial iCCM (diarrhoea and malaria) was undertaken from 2008. In 2009 the child health policy and child health strategy were revised to include treatment with Amoxicillin and zinc by trained CBAs. This paved the

way for implementation of the full iCCM package. The start-up phase of the IHSS programme was completed by late 2010 with the full iCCM package in place. In 2010 the National Malaria Control programme (NMCP) requested UNICEF to stop procuring Artemisinin-based combination therapy drugs (ACTs), and this was taken over by the Global Fund. Instead, UNICEF focussed on procurement of ORS, zinc and Amoxicillin. As of May 2013, all districts in the three Northern regions had CBAs and all were implementing the full iCCM package. The total population in the targeted regions is 6,055,499, and the total number of under-fives is 1,210,691. For a full timeline of policy and implementation events refer to Appendix A.

The period from 2011 focussed on increasing coverage and quality in the three Northern regions through active implementation of iCCM. UNICEF-funded activities included refresher training of CBAs, some commodity procurements, supervision, field monitoring and programme reviews. The iCCM training lasts three days. Training of CBAs was also cascaded so that CHOs and CHNs could serve as trainers and supervisors. Zonal coordinators, volunteers previously used for Guinea worm surveillance, also assist with supervision. During this Phase, support for other interventions (immunisations, vitamin A supplementation, ITNs and infant and young child feeding) was maintained. The 'Hang-Up' campaign occurred during this phase, and CBAs were involved in distributing nets during the campaign.

There was no funding allocated to demand creation, and this activity was initiated late in the programme. In the 2012-2013 annual report to DFATD, demand creation activities through community sensitisation/ durbars is listed as a future plan for the programme.

Table 1: IHSS and UNICEF interventions in Ghana

IHSS programme interventions	Activities supported by DFATD IHSS programme funds	Activities supported by UNICEF matching fund
Correct classification and treatment of suspected pneumonia, diarrhoeal disease and malaria	Identification and training of frontline workers; procurement of essential supplies for CBAs; Strengthening M&E, strengthening supervision	Procurement of kits of basic supplies for CBAs; Facilitation of supervision and monitoring of CBAs
The use of Long lasting Insecticide Treated nets (LLIN) to prevent malaria in children under five and pregnant women	Purchase and distribution of LLINs in 3 IHSS programme regions as part of Integrated Maternal and Child Health Campaign	With funding from DFID, UNICEF assisted GHS with distribution of 4.6 million LLINs free of charge in four regions ('Hang-up' campaign); supported communication for development activities aimed at proper use of nets and (?) purchased nets with matched funding.
Administration of Vitamin A supplements to children under five and postpartum women	Capacity building for Vitamin A supplementation in all 18 districts of the Northern region; trainings and orientation sessions for health and community volunteers; social mobilization and logistics support for Vitamin A supplementation	UNICEF has been supporting the nutrition program including Vitamin A supplementation and community management of acute malnutrition (CMAM) in four focus regions through provision of Vitamin A capsules and ready-to-use food (RUTF). DFATD supported CMAM interventions in the three Northern regions.
Promotion of antenatal visits with the administration of tetanus toxoid vaccine and intermittent preventive therapy for the prevention of malaria	Clinical IMCI training; 42 Public health Nurses were trained in improving the quality of data for the recording of tetanus toxoid vaccination status in mothers.	Purchase of Fansidar tablets.
Protection, promotion and support of exclusive breastfeeding, infant and young child feeding	Promotion of breastfeeding in all 18 districts of the Northern region; trainings conducted in lactation management, orientation sessions for Mother-to-Mother Support Groups on exclusive breastfeeding and complimentary feeding practices; expansion of Baby Friendly program to another 30 hospitals in this region	Support towards behavior change communication activities; support to the government in Baby Friendly Health Facility Initiative (BFHFI) certification of hospitals; support of various capacity development activities on appropriate complementary feeding; CMAM was scaled up to over 300 health facilities in 31 districts, and a total of 1,800 health care providers were trained in the management of severe acute malnutrition (including provision of RUTF). UNICEF supports GHS in the management of severe acute malnutrition in collaboration with Food and Nutrition Technical Assistance II (FANTA II), a USAID funded project.

The Prevention of Mother to Child Transmission of HIV (PMTCT)	Contribution to establishment of PMTCT sites; Training on infant feeding for HIV exposed infants	Scaling up PMTCT services by increasing the number of sites offering PMTCT; Infant diagnosis, prophylaxis and treatment boosted by the introduction of newer technology such as the use of Dried Blood Smears and DNA Polymerase Chain Reaction machines for timely infant diagnosis.
Strengthening of EPI		Training at the national level; procurement of cold chain equipment (solar refrigerators) and funds to conduct outreach service delivery in focus regions; assisted in cold chain expansion and training of health workers to manage new pneumococcal and rota-virus vaccines.

The full iCCM package is only implemented in the Northern regions. In the rest of the country, the Global Fund supports CCM of malaria only, and the programme is known as home-based care. Treatment of diarrhoea and suspected pneumonia are not included. Since 2012 the CBAs in 14 districts in the North have also been implementing community level activities to improve newborn care including postnatal home visits through IHSS programme support. Since 2012, UNICEF's support to the Ghana Health Services has focussed on the implementation of an exit strategy to enable GHS to continue implementation of iCCM beyond May 2013 when the IHSS programme funding ended.

3. Evaluation Rationale, Purpose and Objectives

3.1 Evaluation Rationale

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

3.2 Purpose and Objectives

Purpose

The purpose of the external evaluation was two-fold:

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

Objectives

<u>To assess the effect of the IHSS programme on the following:</u>

Relevance:

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

Effectiveness:

- Strengthening the health system, including all six health system building blocks, namely health workforce, service delivery, information, supplies, financing and leadership/ governance[9]
- 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"[10]. As defined by the OECD-DAC attribution represents "the extent to which an observed development effect can be attributed to a specific intervention or to the performance of one or more partners taking account of other interventions, (anticipated or unanticipated) confounding factors, or external shocks". In assessing plausibility of attribution, the external evaluation attempted to "rule out external factors [factors outside of the programme] which might have caused the observed effects".

The scope of the evaluation was limited to plausible contribution due to the presence of one or more of the following conditions in each of the targeted countries:

- non-existence of true comparison areas due to the national scale of the programme; and
- the infeasibility of a randomized intervention/control design due to political and ethical considerations.

Geographically the scope of the external evaluation includes the following areas:

- Ghana – the three Northern regions and all districts therein

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 System[1].

3.5 Intended Audience

The intended audience of this external evaluation includes the Ghana Health Service, 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

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

Data collection occurred at national, regional and district levels. Thereafter, each set of data was analysed and reported on independently. The analyses and their separate findings are brought together and synthesised at the level of interpretation in this report. The evaluation approach aims to provide data which can be used for future decision-making. It also provides recommendations for improvements to the programmes as they scale up as well as 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 Ghana country evaluation framework was based on a preliminary Country Logic Model (Appendix B), which was developed following a desk review and attempted to outline the implied logic of the program. The Country Logic Model outlines the intended outcomes of the IHSS programme and the pathways by which these outcomes were intended to be achieved.

The desk review highlighted several issues for exploration during the country visit which may not have previously been explored in-depth and which were expected to make a unique contribution to documenting lessons learnt from this programme. The evaluation explored the effect of a national health insurance scheme on community case management which is unique amongst the IHSS programme countries funded by DFATD/UNICEF.

4.1 Quantitative data sources and analysis

4.1.1 Coverage trend analysis

A full list of all indicators collected for coverage and Lives Saved Tool (LiST) analysis can be found in Appendix C. Data sources for the coverage and LiST analyses included the Ghana Demographic and Health Survey (DHS) 1998, 2003, 2007 DHS special Maternal Health Survey, and 2008 survey, the Ghana Multiple Indicator Cluster Survey (MICS) 2006, the Supplementary MICS 2007 survey, 2011 MICS surveys and the 2012 Lot Quality Assurance Survey (LQAS). The endline data source for the three Northern regions (Northern, Upper East and Upper West) was the 2012 LQAS household survey. For the anthropometric data, the 1998, 2003 and 2006 z scores were re-calculated using the 2006 WHO growth reference standards to be comparable with the 2008 DHS and 2011 MICS.

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 with a significance level of $p<0.05$ used to determine whether changes actually took place. Trend analysis was performed on data for the three Northern regions, corresponding to the areas of implementation of iCCM through UNICEF/DFATDthe IHSS programme. National estimates are also provided for comparison purposes. Due to small sample sizes of children to efficiently estimate coverage for fever, diarrhoea and suspected pneumonia in the richest 5th quintile in the three Northern regions, the 4th and 5th quintiles have been combined. Thus, the equity analyses are based on a comparison of the poorest quintile with the 4th and 5th quintiles combined to increase the precision of the estimates.

The complex sampling design of these DHS/MICS surveys such as regional and rural/urban stratification, clustering at enumeration areas, and sampling weights (due to non-proportional sampling) were taken into account.

Some adjustments were made to indicators from DHS surveys in order to align them with definitions used in MICS surveys. The following changes were made: the denominator and numerator for tetanus vaccination, IPT/Fansidar during pregnancy, early breastfeeding and postnatal care, which had been calculated over a 5-year period in DHS have been restricted to live births in the two years preceding the survey to correspond with MICS surveys; pharmacy has been excluded from care-seeking providers in both DHS and MICS data for fever and suspected pneumonia. Regarding the LQAS survey, data related to tetanus toxoid, IPTp, postnatal care (PNC), early breastfeeding and exclusive breastfeeding (EBF) were collected from mothers of 0-5 month old infants (as opposed to all women with a live birth in the last 2 years). Therefore, the denominator differs between the LQAS and the DHS and MICS estimates. Furthermore, 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.

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 (3 Northern regions) were compared with the national coverage levels over the period of implementation for which data was available (2007 to 2012). Furthermore, we assessed whether there was a significant difference in the average annual rate of change in coverage of pertinent indicators between the 3 Northern regions and the national level estimates, in addition to a comparison of the annual rate of change between the pre-IHSS period (2003-2007) and during implementation of the IHSS programme (2007-2012). We assume linear rates of change, which we simply calculated by subtracting the endline point estimate from baseline point estimate, divided by the total number of years within the time period of analysis. Using the statistical formulae for variance and confidence intervals for proportions, 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 (extent of drug stock outs, 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 the 2012 CHO/CHN survey. The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework[6]

4.1.2 Lives Saved analysis

Using household survey data, as described above, we used LiST to investigate the extent to which changes in child mortality could be attributed to increases in intervention coverage in the IHSS programme regions. The use of the terminology "lives saved" refers to deaths averted. On the basis of measured baseline mortality values and changes in coverage, we forecasted child mortality over three time periods:

- Prior to the start of the IHSS program (secular trend): Neonatal, infant and under-five lives saved from the year 2000 to the start of IHSS programme implementation (roughly 2000-2007)
- Phase I: Neonatal, infant and under-five lives saved from the start of IHSS programme implementation up to the early period of iCCM implementation (roughly 2007-2010)
- Phase II: Neonatal, infant and 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 wasting[11]. 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 interventions[12-14]. The analysis was done with Spectrum version 4.62.

Key indicators, representing the scope of the IHSS programme as well as broader health system indicators, were collected for the analysis. Coverage data was extracted from all of the available household surveys and other datasets for each time point available and entered into the projections. If there was discrepancy in coverage data between the Supplementary MICS 2007 survey and the DHS 2008 survey, we used data from the MICS 2007 since it specifically targeted indicators for the High Impact Rapid Delivery programme across the three Northern regions (and Central). When coverage data for immunizations was not available from national surveys, we used WHO/UNICEF coverage estimates for Ghana. All data was extracted from official national, regional and district-level sources, and UNICEF and partner databases and compiled into a pre-formatted excel spread sheet.

For the first time period, we used 1998 as the baseline year with the first year of intervention in 2000 and projected forward to 2007 using all available data on changes in intervention coverage and nutritional status. For Phase I, 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 2011, 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 under-five lives saved for each period with the per annum under-five lives saved, annual rate of reduction and cumulative under-five lives saved.

Table 2 shows the data sources used for the baseline characteristics - population, fertility, mortality rates, causes of death and nutrition – for the Ghana LiST analyses. These were modified when necessary to best reflect the annual population and births in the three Northern regions.

Table 2: Additional data used to create LiST projections

Indicator	Source
Population served	Ghana 2010 Population and Housing Census
Total fertility rate	DHS and MICS (sub-national) all years
Stunting, wasting rates	DHS 1998, 2008 and 2011 (sub-national)
Cause of death	CHERG trend analysis (national)
Mortality (under5, infant, neonatal)	DHS 1998 and 2011 and MICS 2007 special (sub-national)

4.1.3 Costing

The costing component 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 CBAs for the treatment of malaria, diarrhoea and pneumonia for children under five years of age?*

iCCM for the purpose of the costing will refer to iCCM in children under five years of age.

Costs are incurred in 2 phases, at times overlapping:

- Design phase. This phase covers formative research, meetings and workshops for the design of the intervention, design of the training curriculum, and design of materials. This phase is a 'one-off', not repeated as the programme is rolled out to new districts. These costs can be very significant, but they are not included in the costing as they will not be incurred again, and including them 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 (Table3).

Table 3: Costs included and excluded in this costing exercise

Costs NOT Included	Costs Included
Initial one-off design costs for iCCM programme	iCCM training of CBAs (initial + refreshers)
Salaries of nurse supervisors (CHOs)	iCCM training of zonal co-coordinators
Basic training of nurse supervisors	iCCM training of CHOs supervisors & district co-ordinators
Motorbikes and petrol for supervisors	CBA kit for CCM
	Drugs for iCCM
	Overheads : distribution costs, admin

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

Fixed Costs: (independent from the number of treatments)

- iCCM training cost per CBA. Initial training has been allocated 10 life years and refresher training 2 life years, as these refresher trainings are expected to take place every two year. If no refresher training were taking place the life years of training would have been set at 5 years. An annual attrition rate of 8% was applied.
- CBAs kit: bag, equipment, including bicycles (and excluding consumables) were expected to need replacement after 3 years (3 life years).
    1. Supervision and management. These costs included: iCCM initial and refresher training for zonal coordinators, CHOs and district coordinators. An annual attrition rate of 30% was applied (UNICEF Ghana annual report to DFATD 2013). Initial training has been allocated 10 life years and refresher training 2.
- Overheads (5% of the annualised costs) to cover administration and distribution costs.

All fixed costs are annualised, according to the number of life years, and calculated per CBA. These fixed costs are then calculated by treatment by dividing the annualised fixed costs per CBA by the number of treatments per CBA in 2012. Data from year 2012/13 was chosen because it represented the highest level of activity, and the highest number of CBAs trained. Clients pay contributions for drugs to the CBAs, and these contributions are taken into consideration in the costing.

Variable Costs (dependent on the number of iCCM treatments)

- Drug costs for each of the three treatment conditions. Clients pay some contribution for drugs. Half of this amount is given back to the CBA as an incentive and half is kept by the health services. Health services costs (Purchase cost – clients' contributions + CBAs incentives) are used in the calculations.

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 the iCCM programme
2. Additional cost of iCCM Plus (iCCM+) – this factors in a portion of the costs associated with those required health systems strengthening interventions necessary to allow for the implementation of iCCM, e.g. IMNCI training, logistics set-up, demand creation/social mobilisation. An average 15% increase in iCCM costs was modelled to arrive at the cost of iCCM+. This value is based on estimated costs of health system strengthening inputs but will vary over time and between regions depending on the existing capacity before introduction of iCCM and on the maturity of the iCCM program.

In order to assess whether a higher number of treatments per volunteer CBA was possible, the time spent on the iCCM programme was calculated, assuming the length of the home visit at 30 minutes and the travel time (return) per home visit as an additional 15 minutes. Travel time was assessed from communication with the UNICEF staff. In addition 3 hours a month was allocated for the iCCM share of supervision meetings, refilling of kits at the same meeting and transport of patients to CHP (health post)/health centre when required. These 3 hours do not represent all the time spent on meetings but rather the share attributable to the curative component of the CBAs work.

Scenarios for increase in coverage:

- Increase in the number of treatments per existing CBAs per year: increases of 15% and 30% were modelled to assess the impact of efficiency gains
- Increases in the number of districts covered by iCCM: the model projects an extension of iCCM to the whole country.

Financial sustainability of the programme:

- 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 WHO National Health Accounts Database
- Similar calculations are made for each scenario.
- Costs of the program are compared to costs without clients' contributions for drugs to assess the potential impact of making this service free to clients.

All unit costs were provided by UNICEF Ghana Country Office. The number of CBAs deployed and number of children treated per CBA were extracted from UNICEF 2013 CI Report Main Tables (Master) (July 2013).

This evaluation has quantified both the additional cost incurred by the health system, and the estimated under-five lives saved due to changes in coverage of healthcare interventions. A cost per life saved was not calculated, for several reasons. 1. The methodology for assessing lives saved using the Lives Saved Tool (LiST) is based on modelled estimates, not measured outcomes linked to specific interventions 2. The lives saved analysis reflects inputs across the health system resulting in coverage change which include, but are not limited to, IHSS 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 (government and donor costs combined) of delivering iCCM.

4.2 Qualitative data sources and analysis

The country visit to Ghana took place in May 2013. Individual interviews and focus group discussions were held with UNICEF staff and other partners, GHS staff, CBA supervisors, Nurses in health facilities, CBAs and mothers. The team visited the Northern region for field work. The list of potential interviewees was discussed in advance with the UNICEF country team, who assisted the team 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 the IHSS programme was experienced in Ghana. Each interview was conducted by one or more members of the country field team. Where necessary (in interviews with mothers, CBAs and CBA supervisors), the services of an interpreter were used. Although the interpreters were provided by the GHS, 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 conducted by two members of the country field team. It was based on the typed interview notes, observations from the field and reflections from the annual reports and other reports gathered during the visit. This analysis was conducted both deductively and inductively. Deductively, the team sought to find answers to predefined questions (e.g., *How did this intervention fit within the policy environment?* or, *What evidence was there of health systems strengthening on the ground?*). Inductively, the team tried to understand what new information and insights could be gleaned from the interviews and observations. Based on this analysis, and using the logic framework as a guide (Appendix B), the data was 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

Economic context

Against a backdrop of political stability, the economic context of Ghana appeared to be contradictory. In 2007, oil was discovered off the shores of Ghana[15], and this boost to the economy contributed to the country being classified as a lower middle income country in 2010 [16], moving from its status as a low income country. However, it has been argued that "*Improved macroeconomic management and enduring political stability have not significantly transformed the structure of Ghana's economy over time"*[16]. During the course of interviewing Government of Ghana (GoG) staff, it was clear that the economic prosperity experienced in the private sector had not trickled into the public health system. A senior official in the Ghana Health Services explained that although the investment in capital expenditure and the oil industry in 2011 had resulted in exceptional growth rates (13-14%), these had since dropped (to 8%). He argued that sustained growth would be needed in order for the health and social services sectors to benefit. During the interview the senior official suggested that the Ministry of Health struggled to afford to pay for its public health system. He argued that 80% of government public health expenditure was on staff cost, with the rest going to capital and recurrent expenses. Thus, Ghana continues to rely on donor funding to support its health system. Some of this funding comes directly to the Ghana Health Service (one of 9 agencies within the Ministry of Health), while other funding goes to the Ministry of Health, before being disbursed to the agencies, some of which is earmarked for specific activities such as GAVI funding. An interview with one multi-lateral European donor revealed that some donors, USAID being an example, by-pass government altogether and fund activities directly in districts. However, as UNICEF staff explained, the change in economic status has resulted in Ghana being at a *"very important crossroads"* in which *"traditional donors have been looking at exit strategies*" while newer donors such as Brazil, India and China are playing a greater role.

In other interviews with senior GoG staff, the precarious nature of health care funding, and in particular the possibility of the Catalytic Initiative coming to an end, was responded to with much anxiety, especially since UNICEF was perceived as being the biggest contributor to treatment, at community level, for children under five years old. One senior staff member in the Northern region explained that UNICEF was the largest contributor to that region, and that *"it is because of UNICEF that this district isn't the worst"*. Two national GoG directors both expressed concern about government being weaned off UNICEF funding support for this programme, suggesting that *"weaning is going to be a big problem"*, and that *"development partners have to be patient"*. When asked what they would do when funding comes to an end, one district director argued that the *"Ghana Health Service will support home based care, since this is part of the child health policy"*, but he also suggested that they would seek funds from other donors and nongovernmental organisations. Some participants both outside of government and outside of UNICEF, were, however, critical of the government's dependency on, and approach to, donor funding. One outside participant suggested that *"Government is very slow. It is difficult to get consensus from government. There should be strong leadership, ownership"*. Another outside participant further suggested that the government could be

encouraged to focus on programmes that donors encourage, even if they didn't necessarily want it because of the need for funding. She argued *"It's a very complex phenomena. And you have a system that is underfunded. So people need money, so finally they just go for the money"*.

Delivering iCCM within the context of the NHIS

The Ghana Government has tried to generate an income for the public health system from within Ghana. In 2004, the National Health Insurance Scheme (NHIS) was introduced both for its potential to generate revenue internal to Ghana and as an attempt to achieve universal financial protection [17]. Essentially this scheme generates income through a combination of taxes and insurance premiums from registered members, with exemptions for children, the aged and the indigent [17]. Registration and premium payment occurs at district level, thereby generating funds to be used by that district. The premiums are meant to be structured on the basis of members' ability to pay, but due to logistical difficulties many districts charge a flat rate [17]. There are, however, great difficulties with the implementation of this scheme in general. These difficulties are detailed in the literature[18-21] and were also spoken of during our interviews. Both at a regional level and at a district level, UNICEF staff and Ghana Health Services employees expressed concern that the NHIS was in severe financial trouble and not financially sustainable. It was suggested that there was a huge increase in utilisation by NHIS members, but that the levy charged did not cover the scheme's costs. UNICEF staff members indicated that the NHIS implementation is facing challenges including escalating cost, delays in reimbursement to service providers, and exclusion of some services. An interviewee from a partner organisation shared the following observation: "*Reimbursement to facilities by the NHIS is very poor. Some facilities stop providing services or start charging for services when they are not reimbursed*".

A specific problem for the Catalytic Initiative, however, is that the services of CBAs are not covered by the NHIS. The annual reports to DFATD document UNICEF's yearly attempts at lobbying the national government to include CBAs in the NHIS, but up to the time of the country visit (May 2013), these attempts had still been unsuccessful. UNICEF staff explained that there was a fear that the inclusion of CBAs would be *"too much too handle"*. They argued that although treatment at the lower levels is easier and cheaper, that it was at these lower levels where resource constraints were experienced (due to lack of support). One partner questioned the point of community members being insured, since even with NHIS registration, they had to travel all the way to the health centre for free treatment. She furthermore suggested that there was a need for a costing study comparing the costs of CBA services versus the costs of going to a health centre with NHIS registration. The NHIS exclusion, suggested two health facility staff, acted as a deterrent in some cases to the use of CBAs. They felt that mothers who were enrolled in the scheme would bypass the CBAs opting instead to go directly to the health facilities, where their enrolment entitled them to free service, as compared to having to pay a token fee for services or treatment received from the CBAs. They claimed *"mothers with health insurance don't want to use them [CBAs] because they have to pay"*. Many other interviewees, including mothers, CBAs, facility staff, zonal coordinators, and GoG staff, however, suggested that the payment of the token and the exclusion from the NHIS did not act as a barrier. There were suggestions, both by UNICEF staff and by regional and district level GoG staff, that there was some flexibility in the translation of NHIS policy with regards to CBAs. This flexibility resulted in some conflicting narratives as to what was happening on the ground. For example, while staff at one health centre suggested that *"people insured on NHIS don't pay the CBA, the CBA brings their card to the health centre"*, and they would then have their token payments reimbursed. Other interviewees,

including mothers and CBAs, suggested a different system in which a token payment was made to the CBAs who then paid this over to the health centre after which they were reimbursed in part (50%). A partner explained that districts found their own ways to motivate the CBAs by facilitating their reimbursement through the NHIS: "*In the Upper East they keep petty cash to pay the CBAs while waiting for reimbursement from the NHIS*."

Whatever system was employed, however, the payment of the token was not seen by either mothers or CBAs as being a deterrent, as the CBAs would treat the children even when the parents didn't have the money, allowing them to pay later when they were able to do so. This willingness to pay for treatment was attributed by one group of CBAs to a perception that this level of care was cheap in comparison to seeking care from other levels.

Fitting in with government plans

This synergy of the IHSS programme with government policy and plans was clear during the team's field visit. Staff at the UNICEF country office asserted that they were not *"running ahead of government";* instead they aimed to *"move with government"* and to *"take government along"*. During visits to the regional and district offices of the Ghana Health Service, it was also very evident that a familiar and cordial relationship existed between the UNICEF regional staff and the GoG staff at all levels.

In order for the IHSS programme to be rolled out fully, however, required a shift in government policy to allow CBAs to deliver treatment. This shift did indeed take place in late 2009. UNICEF national staff reported that changing the policy was not difficult. They claimed that the Pharmacy Council had to deregulate the drugs required so that they could be used by CBAs, and that zinc was included in the Essential Medicines List. UNICEF played a key role of a catalyst for this policy change. A staff member in UNICEF explained their role as follows:

> "*The place of UNICEF has been to play a catalytic role. We increased the speed of implementation and provided financial and technical support*".

5.1.2 Multi-sectoral collaboration and alignment

The annual reports by the Ghana UNICEF country office suggest that collaboration was considered to be a desirable aspect of the Catalytic Initiative. For example, the extent of collaboration had to be reported on as part of the indicators. These annual reports sometimes referred to connections with JICA, DFID, FAO, WFP, WHO, USAID, Red Cross Mothers to Mothers, and other unnamed development partners. The main collaborator for the CI, possibly due to the nature of the regional focus of the initiative in the North, was the Government of Ghana Ministry of Health. UNICEF staff mentioned the biannual review meetings with the government and the health sector working group, which UNICEF would lead from July 2013. This was considered to be a strong group with representation from the government and partners such as DANIDA, EU, DFID, JICA and UNICEF which met monthly.

The review meetings tried to resolve bottlenecks and also evaluated the core delivery indicators. They were attended by district directors, public health nurses, nutrition officers and data validation teams and CBAs as well as by UNICEF staff. One participant from a group of development partners expressed that monthly meetings between partners were held, but that these meetings discussed *"issues"* rather than programmes. One of the development partners interviewed who worked in the area of family

planning suggested that the Family Health Division of the Ghana Health Services was central to coordinating donors, but that there were no regular meetings between any of them. Most of the meetings occurred when needed because of targets such as MDG. The overall impression by the end of the country field visit was that development partners and government seemed to divide the work up by regions, and so different partners took on different projects in each region, but did not seem to be working with each other within those regions.

5.1.3 Women's participation and gender equality

One of the explicit intentions of the Catalytic Initiative was the empowerment of women, particularly through training women to deliver community based health care. This was reflected in both the annual reports and in practice that the selection of CBAs was split between men and women (see Figure 2 with proportion of male and female CBAs trained). As stated in the May 2009 annual report: "*Each officially designated community, or minimum of 500 persons, is assigned 2 CBAs, preferably a male and a female*". Through interviews it was clear that CBAs were supervised by zonal coordinators, who were all men.

The decision to select both men and women as CBAs in the current IHSS programme was widely accepted as appropriate. They felt that both men and women were needed since their roles were complementary. UNICEF staff reported that male CBAs tended to engage in the outdoor, physical and outreach tasks, such as carrying benches for outreach and mobilising people, since they could move around the vicinity more easily, while the women did more of the tasks around home based care and breastfeeding. While female volunteers were seen as more reliable and transparent, the males helped the Community Health Officers (CHOs) to go out on motorbikes and assisted them when they had breakdowns. In one focus group, mothers expressed that it didn't matter to them if the CBA was a man or a woman. They said that during a community meeting they had chosen the male CBA because he was literate and the female because she was calm. In a focus group of CBAs, it was explained that male and female CBAs carried out the same tasks. They claimed that both male and female CBAs were, for example, engaging in breastfeeding counselling. This was, however, contradicted in an interview in another district where it was said that all CBAs selected were women, and that they were chosen for cultural reasons, such as men not being allowed to see the baby until the umbilical cord falls off. During this same interview, the team was told that female CBAs could relate to other women because they had experienced pregnancy, and they, therefore, *"understand women's suffering"*. There was, however, some concern about the safety of women CBAs. A village chief shared that women CBAs needed transport because they had to travel far to get to meetings. One CBA said that she was widowed, and she was, therefore, concerned about community members coming to her door during the course of the night when seeking treatment.

In contrast to the gender balance amongst CBAs, according to UNICEF staff two-thirds (70%) of the CHOs, who were the next level up and worked at the health posts, were female. It was gleaned during interviews that career progression was facilitated for this level of health care staff through career pathing with several training opportunities enabling progression. Thus, conversely, it would seem career pathing for these mostly female CHOs was empowering to them because it allowed them to progress, but it negatively impacted on the programme because it resulted in high staff turnover.

Although as described above, the IHSS programme in Ghana did not seem on the ground to be purposefully addressing gender issues amongst CBAs, from our observations it was clear that the

programme was making an impact on women as mothers. Repeatedly, it was expressed that before the CBAs or during stock-outs, mothers had difficulties in accessing treatment. The introduction of CBAs, by implication, therefore, reduced the burden on women as mothers and by further implication reduced the opportunity costs these women would have incurred by having to tend to sick children, particularly when seeking treatment far from the village.

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 dynamics[22]. 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 mobilization, and access to services for carers of children,[23] 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 Health Facilities: CHPS

Informants spoke about the CHPS compounds as posing some problems mainly due to the scarcity of these facilities which are the lowest level of health services. CHOs and CHNs work at the CHPS level and do outreach to communities. An informant in the GHS told us that the CHPS concept came out of the work undertaken at Navrongo in the early 90s. The push behind this was that "*People wanted clinics and clinical services*." (GHS) However challenges have arisen with the scale-up of this approach and many CHPS zones do not have compounds with functioning facilities or resident CHO staff (Box 1). Community members therefore have to travel to hospitals outside of the monthly outreach visits.

Box 1: Challenges with CHPS service provision

"*People became obsessed with this idea of building a CHPS compound, and then the CHPS compound became a stumbling block because it is quite expensive, so if you were to have a CHPS compound you can't have a nurse. The community would think "Ah we are getting a big hospital". And they would go and get a parcel of land in the middle of nowhere, and the CHPS compound would be put up there, it is so isolated nobody wants to work there. So CHPS has had problems with scale up, it's a national policy, but it has had problems with scale up."* (University Researcher)

"There is supposed to be one CHPS compound for every zone. Where there is no compound the CHOs can't live there because there is no accommodation. They have to travel in and out." (Zonal Co-ordinator)

"In the Northern region there are 325 CHPS zones – most zones have no compounds. CHOs move from the centre to their zones to deliver services." (Regional director)

"At CHPS level money for service delivery is dwindling. The districts receive $300 per quarter for services. There is huge potential for corruption with cash being collected at facility level. Districts have to buy their own vehicles and pay monthly instalments on them."

"The health facility (CHPS) should be stocked properly. The hospital in this area is too far away. We want to give birth at the CHPS but it is not equipped." (Mother)

5.2.1.2 Human Resources

Community Based Agents

CBAs in Ghana appeared to be selected based on certain personal characteristics rather than education level as one village chief explained:

> *"We selected the CBAs based on certain factors; the one woman is the wife of an elder, she is hard working."*

As a CBA explained:

> *"Two [CBAs] are selected for each community. They need to have a spirit of volunteerism"*.

Another CBA described how she was selected:

> *"They called a community gathering, and the community selected me. They think I am hard working. I am a mother, and I have 7 children. I had 8 deliveries but one died. Before becoming a CBA I was doing petty trading".*

A UNICEF informant explained that

> *"CBAs are chosen by the community, some may be illiterate. Over 70% of CBAs are reported to be illiterate. Some use school children to help them complete their registers."*

It was clear from the interviews that volunteerism is very strong in Ghana (Box 2). CBAs are one category amongst several types of volunteers present in communities. Many informants spoke of the need for volunteers to be recognised in some way and informants, especially district staff, spoke of using their own initiative and paying out of their own pocket as a token of appreciation. It was also stated that the lack of recognition of CBAs could affect demand for their services.

Box 2: The realities of volunteerism- "*When I have something in my bag I give them".*

"Use of volunteers is everywhere in Ghana" (UNICEF informant).

However, many informants spoke about the need for volunteers, especially CBAs, to be recognised in some way: *"Volunteers are everywhere but they are not being recognized. They have no official place in the GHS."* (UNICEF informant)

"Volunteerism is in every part of the country, though the type varies. There is no activity that won't link volunteers to the community. The GHS is linked to the community through volunteers. But there is nothing to acknowledge and recognise these volunteers." (UNICEF informant)

"There are also TBAs in communities. Many providers are working at community level – all volunteers. There are Red Cross mother-to-mother support groups in most communities in the Northern regions.

They are volunteers who support breastfeeding. They also have growth promoters – a different group of volunteers but some are also CBAs or TBAs." (District director)

"When a woman is in labour the TBAs goes and assesses them and then arranges transport to hospital. The TBAs also do cord care. They were given supplies by the hospital." (Mother)

"CBAs are complaining about needing to be paid. There is no refund to the CBAs when they use their own phones. When I have something in my bag I give them." (District director)

"People may not trust them because they are not paid." (Village chief)

"*People don't value things that are free. CBAs want recognition most of all. Everyone needs to understand that we must recognize and motivate them."* (Deputy director, Northern region)

"Sometimes CBAs become dormant if they don't get any incentives. During the farming season they go to their fields and they are not available. They may go and live on their farms for several weeks." (UNICEF informant)

The roles of the CBAs have also expanded over several years to include several tasks as one district director explained:

> *"CBAs started off with guinea worm surveillance. Then we added AFP surveillance, measles, birth and death registration. Then they helped with mass campaigns (polio, measles, vit A) then CMAM (2010), CIMCI and lastly newborn care"* (District director).

An informant from UNICEF confirmed this as a concern:

> *"We're adding more without sitting down to think about what they're doing and how to reward them. It needs to be sustainable."* (UNICEF informant)

Interviews with facility-based staff revealed that they value the work of the CBAs, especially in supporting facility outreach activities (Box 3). All of the CBAs interviewed did other work to earn a living. In one focus group of eight CBAs (5 females, 3 males), one was a petty trader and the rest were farmers.

Box 3: Roles of CBAs – *"They are people saving their own people"*

"The CBAs are a real help. They mobilize mothers for activities. They identify critical cases and refer. They are there at every outreach." (Public Health Nurse, PHN) Another nurse shared how CBAs are helping their communities but described how it took time for communities to trust their skills: *"They provide a good quality service. They are saving mothers from having to travel. Mothers didn't know enough about CBAs and didn't trust their skills. They did the last refresher training in the community so people could see them and see their training. They are people saving their own people"* (Nurse).

"CBAs assist with mobilising people for child welfare outreach clinics, [National Immunization Days] NIDs as well as [Community Management of Acute Malnutrition] CMAM. CBAs are usually given a small token (money) when they help with campaigns." (UNICEF informant)

"We have come to help them. When I have stock I will go around and tell people. Sometimes people come and call me. Outreach from the CHPS comes monthly. The day before the nurse sends a message to me, and I go around telling people to wait for the outreach." (CBA)

One CBA described a typical day: *"Between 4:30- 6:00 am I clean the house, take care of household chores, from 6:00- 12:30 I do home visits and treatment, from 12:30pm onwards I conduct my own trading."* (CBA)

There was also the impression amongst partners that CBAs were underutilised:

> *"The number of cases they treat is very small. An active CBA will only see 10-15 cases per month."* (Development partner)

This was confirmed in the routinely collected M&E data where the average number of cases per year seen by CBAs during the period of the IHSS programme was 9.

The difficulty with availability of CBAs due to the lack of salary was highlighted by UNICEF. A district director stated that the lack of incentive impacted on attrition of CBAs. He stated:

> *"There is a high attrition rate amongst CBAs. They get their relatives to continue the work."* (District director)

CBAs earn a small incentive from the sale of medicines when they treat children with diarrhoea, malaria or pneumonia. As a UNICEF informant explained: *"They have a cash and carry method of working. They record this in their registers. At the end of the month they submit this money to the CHPS, and they give 30% back to the CBA."* This system, however, appears to differ from district to district as one CBA explained:

> *"One half of what we get is for the drugs which goes to the facility, the other half is for our own motivation."*

A CBA explained what happens when people can't afford to pay for the medicines:

> *"Sometimes people can't pay but I still treat them. Then they pay me later. Payment is not a barrier. I take my money to the facility, and they give back 50% to me (+- 15 cedi a month)."*

Despite the problems of lack of a salary and minimal supplies to do their work, CBAs also expressed an appreciation for the training they had received: *"I am so happy, and our communities are so happy with the change in health. Before the training we only boiled herbs and massaged children."*

Mothers appreciated the presence of CBAs in their communities: *"CBAs are very affordable, instead of carrying a child to Saboba and spending more money there - we have to eat, have to buy food for the child."* Another mother explained that:

> *"If a child is sick we take him or her to the CBAs house."*

Mothers also appreciated the proximity of the CBAs *"The CBAs live in the village so we see them every day. They make a follow up visit the day after they have given treatment."*

CBAs were also assisting communities with health promotion activities as one mother explained:

> *"The CBAs have been lobbying around clean water. Now we are taking water from the dam. Also having better toilets. This community uses the public toilets at the school."*

A UNICEF informant confirmed this health promotion role of CBAs:

> *"If you look at the three Northern regions, you will see that they have the worst sanitation rates yet cholera is limited due to the work of the CBAs."*

A mother described the huge needs in her community for improvement in basic infrastructure:

> *"We need mosquito nets, drinking water- there is no stand pump here. We get water from rivers. We boil it and then put it in water pots. We are waiting for an NGO to bring us a stand pump. The CBA can't help with that. We practice open defecation. There is food insecurity at certain times of the year."*

At the national level there was some scepticism expressed regarding the sustainability of the CBA programme as well as its relevance. Some informants felt that greater focus should be spent on training more community health nurses instead of CBAs. As one informant from Ghana Health Services explained

> *"If we had more CHNs and they worked well, then we would need less CBAs."*

A researcher from the University of Ghana shared this sentiment and expressed his opinion of CBAs needing to be formally linked to the health services:

> *"We're glad we had an interim measure; the community also saw it as an interim measure. Now our idea was that these village health workers are progressively upgraded, because what we want are trained nurses, we want trained nurses. We understand what you are saying about primary health care, but our needs don't end there. If we have an emergency in this community, our problem has always been that despite your village health worker, I will probably die. There should be some link between the village health worker and higher levels of services."*

CBAs in Ghana were community health workers in the true sense in that they were chosen from, and remained living in, the communities in which they worked. Although they may not have been the most sophisticated of health workers, with some having very low levels of literacy, through their spirit of volunteerism, they provided a service at the very frontline that was regarded by participants as being much needed. The findings from the evaluation interviews indicated that CBAs were engaged in a range of activities that included treatment, health promotion and health activism on behalf of their communities. The interviewed CBAs expressed great appreciation for being allowed to be a part of the programme. Yet, what was also clear was that if this service were not valued in a tangible way, such as through a financial incentive, then CBAs could withdraw from the programme. As it was, CBAs split their time between programme activities and other income generating activities such as farming and petty trading. While there was great appreciation for the work of CBAs, there was also some scepticism around the sustainability of this programme in comparison to an investment in higher level formal health workers.

Facility-based staff

At the health facility level services are provided by public health nurses (PHNs), community health nurses (CHNs), and community health officers (CHOs). The biggest challenge reported by interviewees was attrition amongst CHOs and CHNs, especially in the Northern regions. CHOs are mainly female but the male ratio is increasing. The difficulty in retention appears to be related to ongoing training desires of the CHOs (Box 4).

Box 4: Challenges of retaining skilled health workers in rural areas

"There is great difficulty in retaining CHOs after they have qualified – they want to return to school to study further. Always around September; every three years there is a complete new cohort." (UNICEF informant)

"70% of CHOs should remain in the region where they were trained but retention is very difficult in the North." (UNICEF informant)

"*Because the urban people who had been recruited to community nurse training, the rural culture was alien to them, they had cultural shock; they just didn't want to stay there, whereas for these people it was not an alien culture. So we actually proposed that can you invest money in a different type of community health nurses training where the school is in the rural community, where the community has a say in picking the entrants to the school. You still apply academic grades, but you look at the quality of the rural schools and if necessary you lower the bar, factoring the quality into it. Because if people are bright, I remember one of them, he topped the post test, and he was coming from this rural village, you could see this was a highly intelligent person. So balance a pure academic selection with consideration for all these complex contextual issues, with consideration of the person's likelihood to stay in this village. Also don't move them out of the village for two, three years, because once you move them out of the village for two, three years, they develop roots in an urban area, [and] they begin to find it harder, despite the fact that they were living there.*" (Public health researcher, University of Ghana)

Retention of doctors was also raised as a concern facing the Northern region as one deputy director described:

> *"For three consecutive years doctors posted to the region haven't arrived."* (Deputy director, Northern region)

However, illiteracy amongst CBAs was raised as a concern by health workers:

"*Some of them are good. They are doing well, but illiteracy is a problem. Education would help them a lot."* (PHN)

There were differing opinions amongst health workers regarding utilisation of CBAs. One CHO expressed that the lack of inclusion of CBAs in the NHIS was a deterrent to their utilisation:

> *"There is low demand for them – and lack of motivation amongst them. Mothers with health insurance don't want to use them because they have to pay."*

Whilst another felt that the token charged by CBAs for medicines was not a deterrent to their use:

> *"The token isn't a deterrent for people. NHIS refused to reimburse CBAs so they stopped getting reimbursed in 2010".* (Registered Nurse)

Training

UNICEF, through the IHSS programme has made a major contribution to capacity building. UNICEF Ghana has trained the second largest number of front line workers of all the CI countries (Figure 2). As one UNICEF informant shared:

> *"All trainings for CCM were paid for by UNICEF at all levels (regional, district, midlevel workers, CBAs)."*

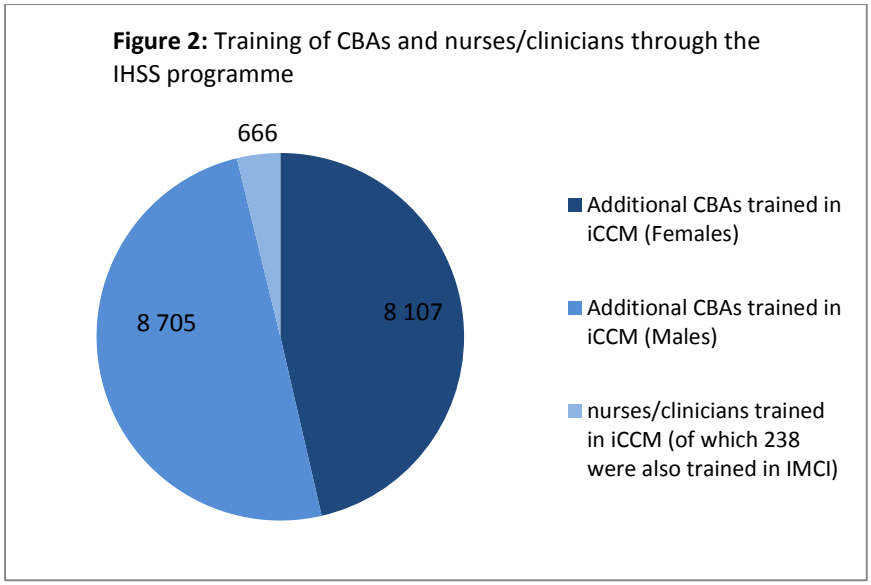


Figure 2: Training of CBAs and nurses/clinicians through the IHSS programme

A total of 16812 CBAs were trained in iCCM in the Northern and Central regions with a good gender balance (48% female). Eighty four percent (84%) of the trained CBAs received their initial drug kit and supplies. A considerable number (616) of nurses/clinicians were also trained in iCCM and a few (238) in IMCI (Figure 2). Data from the LQAS survey shows that there are still gaps in the training of CHOs/CHNs in iCCM. In two of the regions (Northern and Upper West) only half of the sampled CHOs/CHNs had received iCCM training. This was considerably higher in the Northern region where 83% of sampled CHOs/CHNs had been trained in iCCM.

Despite the focus on initial training, the LQAS survey has revealed deficiencies in refresher training, with less than 60% of CBAs reported to have received refresher training in the last 12 months (range 42% in Northern to 74% in Upper East).

The sustainability of this level of capacity is concerning since currently iCCM is not in the pre-service training curriculum for CHOs. UNICEF has been conducting this training as an additional training for these health workers. There are attempts to have iCCM training included in the pre-service training of certain levels of facility-based health workers.

Supervision

CBAs are supervised by a volunteer cadre known as zonal co-ordinators comprised of CBAs who were promoted to a higher level. Zonal co-ordinators are all male. They were previously known as community surveillance officers whose main role was guinea worm surveillance. When guinea worm was eradicated from Ghana in 2010 their role changed to supervising CBAs. Their remuneration also changed as an informant from UNICEF described:

> *"The zonal co-ordinators used to get allowances (20 cedi a month) when they were doing guinea worm surveillance. Now they don't really get anything regularly."*

Since the end of guinea worm the zonal co-ordinators get piece-meal incentives irregularly such as a bar of soap at the end of the month. A District director described how zonal co-ordinators are incentivized in his district:

> *"Quarterly meetings are a motivation for zonal coordinators. They receive 20 Ghana cedi for lunch, in cash, which they can use for whatever they like (not necessarily to buy lunch with).*

When there are other programmes then they are involved in the campaigns and get paid for that."

Unlike the CBAs, these co-ordinators don't have any other jobs. They are allocated to health zones. Each co-ordinator has between 20 and 40 CBAs to supervise.

Findings from interviews with the zonal co-ordinators indicate their desire to help their communities. One zonal co-ordinator explained:

"*If you treat a child and they get better you are happy."*

The eradication of guinea worm had a major influence on the motivation of individuals to help their communities as one interviewee described:

"The more rural the more the spirit of volunteerism. People were committed because they were able to see the eradication of Guinea Worm." (Regional deputy director)

One zonal co-ordinator described his role:

"*During mass campaigns we get allowances. We help with re supplying CBAs with drugs. Stock outs are rare*."

A CBA described her interaction with a zonal co-ordinator supervising her:

"My supervisor is a support worker at the health centre and also a zonal co-ordinator. He sees me monthly during outreach. He comes and collects my register information monthly. But if I run out of stock I take in my register to the facility earlier. I call the health facility when I need help. I borrow a phone to do this."

Two zonal co-ordinators expressed their needs, especially in relation to transport and other requirements necessary to carry out their tasks:

"We need motivation – allowances, motorbikes, uniforms, identification badges, baskets to carry drugs in (wooden boxes are too heavy for the bicycles), rain coats and boots for the rainy season."

"At the end of each month we gather at the health centre. We were given bicycles to use. All of them are now broken. We now use our own personal bicycles."

A District director confirmed these needs and the lack funds to meet them:

"We also need boots, rain coats, torch and bicycles for the zonal coordinators. These have only been given once in 2007 when the programme started."

In addition to the zonal co-ordinators, for their clinical supervision CBAs are supervised by CHOs/CHNs, who are trained in iCCM. Observation of CBA case management is supposed to be carried out once or twice a year. UNICEF developed the tools for this supervision. However, the high annual turnover (up to 30-40%) of CHO/CHNs was reported to be a big problem for CBA supervision.

The LQAS survey found that more than half of the CBAs had received supervision in the last three months by a CHO/CHN. However, as has been shown previously, many of these health workers have not received iCCM training. Supervision which includes observation of case management was very low (6%). Furthermore, amongst CHOs/CHNs sampled who were trained in iCCM, less than half reported supervising CBAs during the past month (Figure 3).

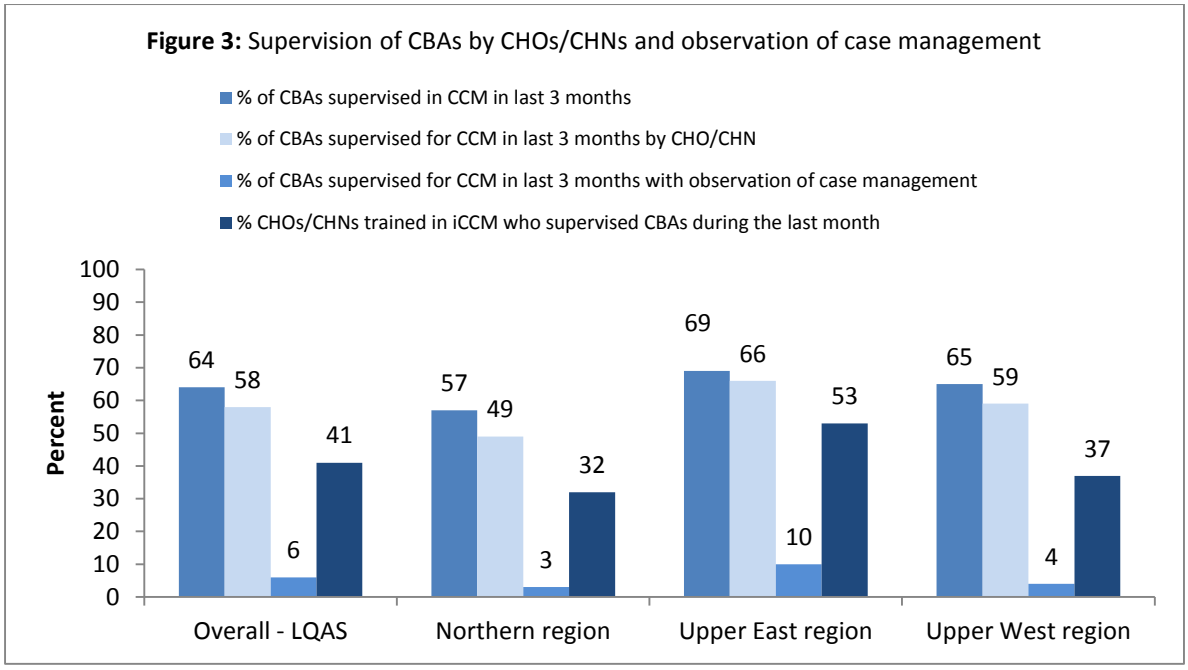


Figure 3: Supervision of CBAs by CHOs/CHNs and observation of case management

5.2.1.3 Supply of Medicines/Commodities and stockouts

UNICEF has played a major role in ensuring drug supplies for iCCM. UNICEF supported all iCCM drugs at the start of the programme and all ACTs in 2010/11. Since then the ACT supply has been taken over by the Global Fund, through the National Malaria Control Programme. ACT stocks are stored at the Central Medical Stores (in Accra), which allocates them to the Regions and requests the Regions to collect and distribute them accordingly. The same distribution system applies to dispersible zinc which is supplied by GHS. A senior official in GHS shared that:

> "*The supply (of ACT) is erratic, procurement is a problem*", and she felt that this was due to a lack of commitment to iCCM by the Ministry of Health.

When the IHSS programme ended UNICEF was only procuring Amoxicillin. There have been major bottlenecks with the supply of medicines which UNICEF has been assisting with through procurement. UNICEF delivers the iCCM supplies (ORS and Amoxicillin) to the Regional Medical Stores (RMS) and the Regions distribute them to the Districts through different arrangements: In Northern Region and Upper West Region, the Region allocates the items to the districts and requests the districts to collect them from the RMS. In Upper East Region, through the scheduled delivery system, the Region does door to door deliveries of the items directly to the health facilities including (some of) the CHPS compounds.

Drug stock-outs were reported to be a major problem by all levels of informants:

> *"ACTs are currently out of stock for one and a half months. 80% of districts are out of stock of ACTs currently."* (Registered Nurse at a Health Facility – May 2013)

> "*I hardly ever run out of stock but today I have only 3 doses of ACTs left. 2 weeks ago I got new stock of ACTs but now I have only 3 doses left. I have no ORS sachets. I ran out a week ago. I get supplies from the health centre. A man in the community calls the health centre. They will send the supplies with someone to me. I don't pay the man to use his phone*." (CBA)

"If the CBA runs out of drugs we go to the health centre- it is 2 hours away and we walk." (Mother)

"The biggest problem is stock-outs, mostly for malaria tablets." (another mother)

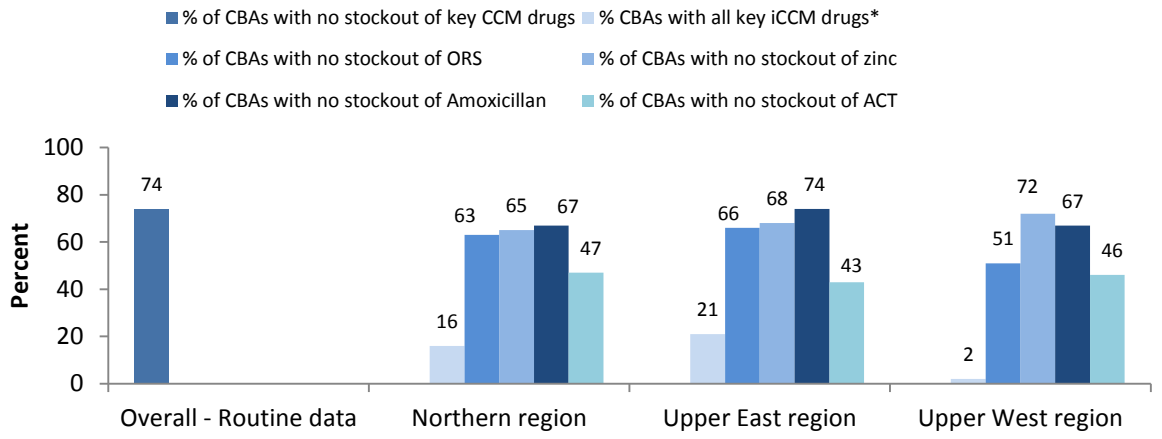
Drug stock outs are so common that the CBAs inform their community when they have stocks as one mother described:

"The CBAs tell us when they have medicine in stock. Before the CBAs were working we used to go straight to the hospital."

A village chief explained how CBAs need transport to assist them with collecting drugs from the health facility:

"When the CBA runs out of stock they have to travel far to get stock on foot. CBAs were given bicycles, not good quality, now they are broken down. They need cars or motorbikes." (Village chief)

Figure 4: Availability of iCCM medicines for CBAs (stockouts lasting longer than 1 week in the last 3 months), 2012 LQAS



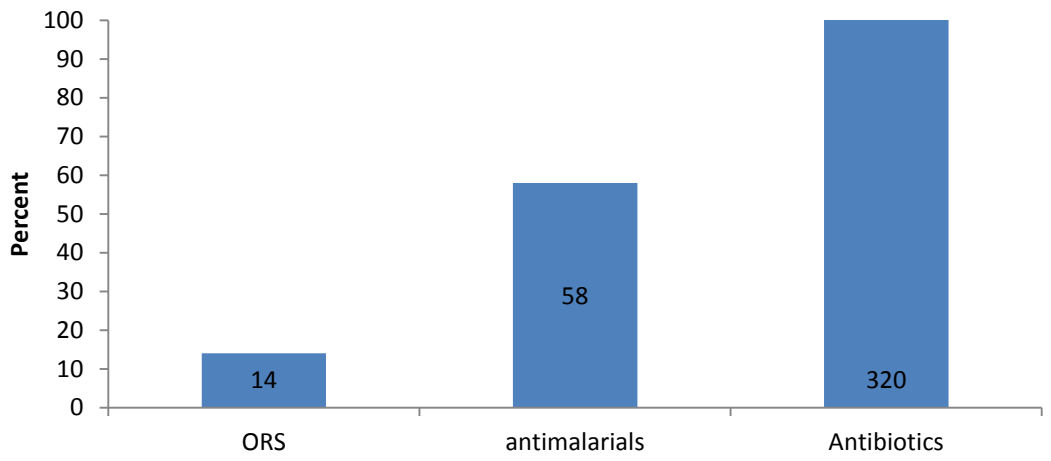
** on the day of the survey*

Figure 4 above confirms the qualitative findings from the key informant interviews. It is clear that routine programme data under-estimates the problem of drug stock outs. The LQAS survey revealed that very few CBAs had all key iCCM drugs on the day of the survey (ranging from 21% in Upper East to only 2% in Upper West). As highlighted in the interviews, stock-outs of ACTs appear to be the most common with less than 50% of CBAs in all three regions having no stock out longer than 7 days in the last three months.

With regard to utilisation of UNICEF/DFATD procured commodities during the IHSS programme the routine data reveals a mixed picture. Figure 5 shows low utilisation of ORS by CBAs to treat children with diarrhoea as well as low utilisation of ACT (only half of those procured) supplies. It was noted that many more children were treated with antibiotics for suspected pneumonia than numbers of antibiotics procured even after taking the number of tablets per treatment into account. UNICEF Ghana staff explained that transport to get supplies from regional medical stores to lower levels (facilities and CHPS) is a problem. There was also reported to be lack of clarity between the Central Medical Stores (CMS) Managers and the Regions on which items are to be collected from the CMS free

of charge (donated items e.g. ACTs, Amoxicillin, ORS) versus the items they have to pay for. The very low level of utilisation of CBAs is likely to have contributed to the under-utilisation of ORS and ACT. The reason for the high reported usage of antibiotics is unclear. It is possible that the number of cases treated has been under-reported.

Figure 5: Percentage of commodities used to treat children under 5 by CBAs



At the community level certain drugs are available from licensed chemical sellers. These are recognized by the pharmacy council. These sellers are mostly men and supervision of them is reported to be sporadic. They are selling ACTs, Amoxicillin and cough syrups amongst other things. They are entirely private and for profit and not linked to the NHIS. They mainly operate in hard to reach areas where there is no CHPS. There is little control over the quality of the drugs they sell. An informant in UNICEF, as well as a mother, described the role of the licensed chemical sellers:

> *"The first point of call for people when they are sick is the licensed chemical suppliers. They have marketing skills. There are perceptions that their quality is better."* (UNICEF informant)
>
> *"If the CBA is unavailable and the child has diarrhoea we go and buy ORS from the drug seller who comes on his motorbike. If there is no ORS we boil water and add sugar and salt. We also give rice water. 1 sachet of ORS costs 20 pesewas. The CBA sells zinc tablets plus 3 sachets of ORS for 70 pesewas. We earn between 50 pesewas and 1 cedi a day from farming."* (Mother)

Costs of drugs available from CBAs are shown in box 5.

Box 5: Costs of drugs provided by CBAs (cost to mothers)

ACTs – 50 pesewas

3 sachets ORS- 50 pesewas

Zinc – 20 pesewas (usually given with the ORS for 70 pesewas)

Amoxicillin – 1 cedi (approximately 50 US cents)

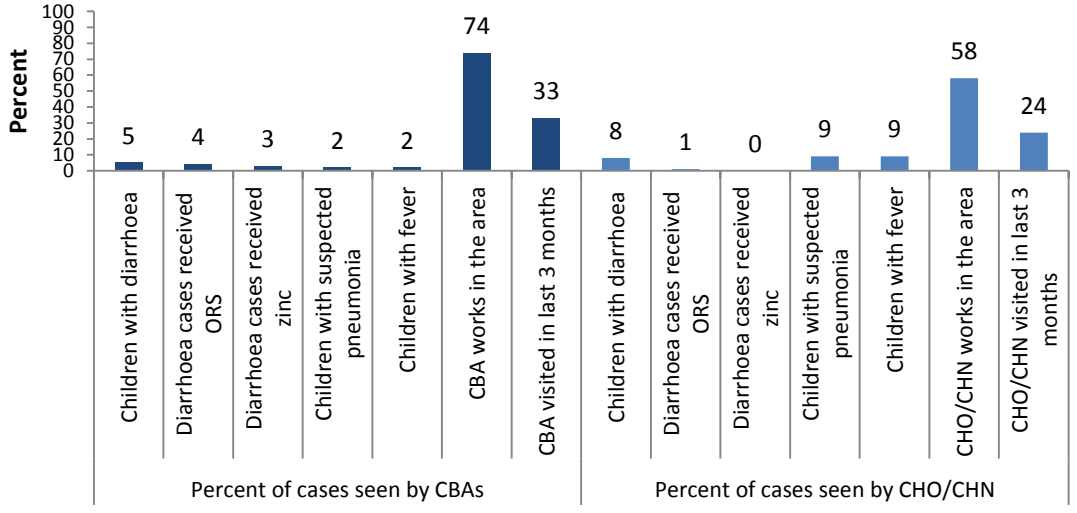
5.2.2 Utilisation, M&E and quality of care

Utilisation

Data from both the routine HMIS and the LQAS survey reveals low utilisation of both CBAs and CHOs/CHNs for case management conditions. Despite the active presence of CBAs reported by roughly three quarters of mothers, few caregivers reported seeking care or receiving treatment from CBAs or CHOs/CHNs (Figure 6). Care seeking to all appropriate providers was, however, reported to be high in the LQAS with 72% and 65% of mothers reporting to have taken their child with suspected pneumonia and diarrhoea, respectively, to an appropriate provider. Care seeking was lower for fever with only 25% of mothers reporting to have sought care from an appropriate provider. Only a third and a quarter of mothers had received a visit by a CBA and a CHO/CHN, respectively, in the past 3 months.

Routine data collected by the UNICEF office also reflects low utilisation of CBAs. Amongst the 16812 CBAs who received iCCM training during the IHSS programme grant period, a total of 700 464 treatments (excluding zinc) were given to children under 5 which translates to an average of 9 treatments per CBA per year, the lowest of all the CI countries. Most treatments given by CBAs were for suspected malaria (62%), followed by ORS for diarrhoea (27%). Treatment for pneumonia constituted 11% of all CBA treatments given.

Figure 6: Utilisation of CBAs and CHOs/CHNs for case management in the previous two weeks, 3 Northern Regions 2012 LQAS



A survey undertaken in 2013 amongst 503 CBAs in the three Northern regions supports findings from the LQAS and routine UNICEF data. CBAs were asked how many children they had treated for malaria, suspected pneumonia and diarrhoea in the previous month, and this was verified by review of their registers. The majority of the CBAs had seen no children for these three conditions in the previous

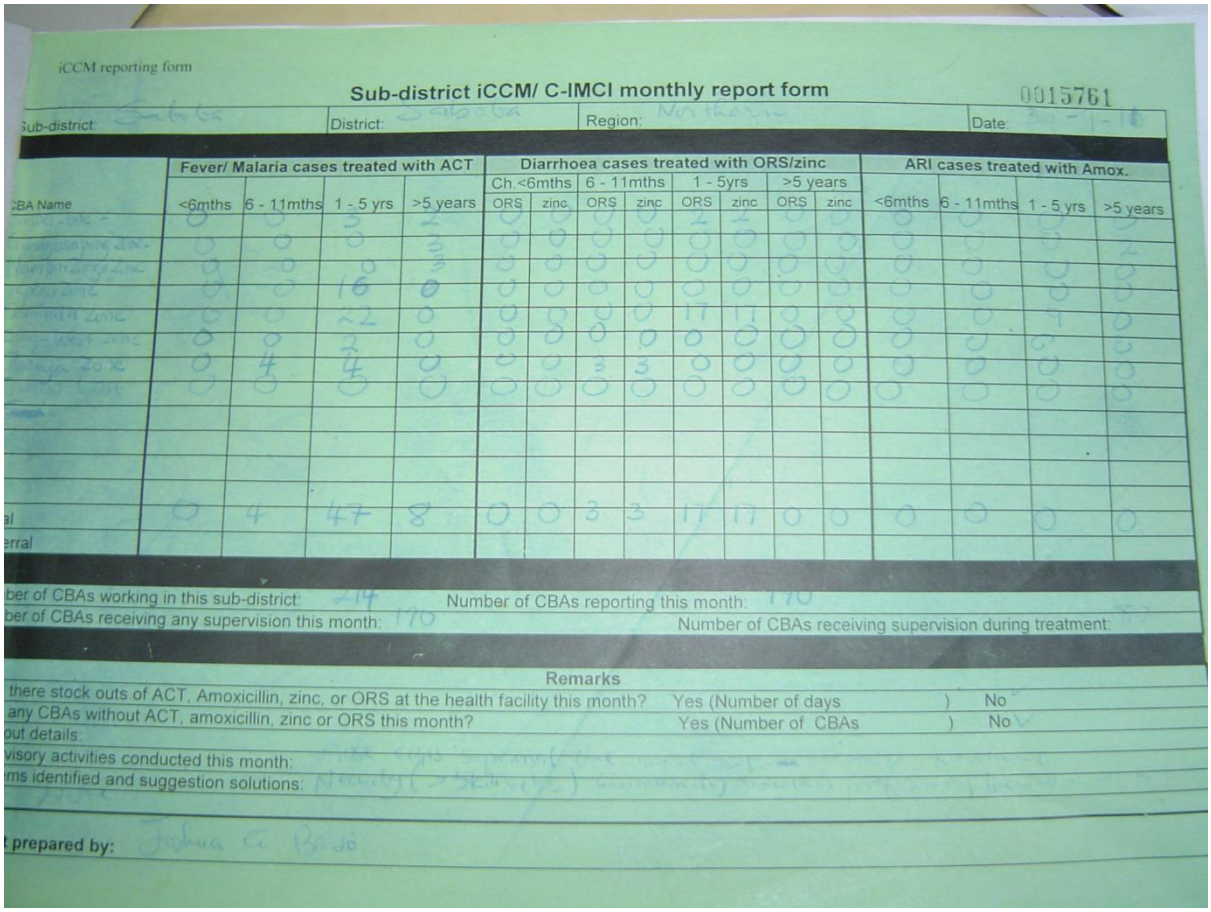
month; 76%, 88% and 74% of CBAs had seen no children with malaria, suspected pneumonia and diarrhoea, respectively, in the previous month with the median number of cases seen for all three conditions being zero.

Monitoring and evaluation

The Ghana Health Services prioritises monitoring and evaluation through twice yearly programme planning and review meetings. The reviews are attended by the district director for each of the districts, public health nurses, nutrition officer and data validation teams. At the annual review meeting there is also a bottleneck analysis. The reviews are also attended by partners and critical stakeholders.

With regard to the flow of data on community level service provision, the zonal coordinators collect information from the CBA registers and complete a monthly report form (see Figure 7 below), which is passed on to the district and region. Observations in the field revealed that only the curative component of the CBA register was completed. The preventive part was left blank although the CBAs reported undertaking health promotion activities.

Figure 7: Example of a sub-district iCCM monthly report form.



iCCM reporting form

Sub-district iCCM/ C-IMCI monthly report form

0015761

Sub-district: Sabota | District: Saibota | Region: Northern | Date: 30-1-16

CBA Name	Fever/ Malaria cases treated with ACT				Diarrhoea cases treated with ORS/zinc								ARI cases treated with Amox.			
					Ch.<6mths		6 - 11mths		1 - 5yrs		>5 years					
	<6mths	6 - 11mths	1 - 5 yrs	>5 years	ORS	zinc	ORS	zinc	ORS	zinc	ORS	zinc	<6mths	6 - 11mths	1 - 5 yrs	>5 years
[illegible]	0	0	3	2	0	0	0	0	2	2	0	0	0	0	0	0
[illegible]	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	2
[illegible]	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	22	0	0	0	0	0	17	17	0	0	0	0	9	0
[illegible]	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	4	4	0	0	0	3	3	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
al	0	4	47	8	0	0	3	3	17	17	0	0	0	0	0	0
erral																

ber of CBAs working in this sub-district: 214 Number of CBAs reporting this month: 170

ber of CBAs receiving any supervision this month: 170 Number of CBAs receiving supervision during treatment:

Remarks

there stock outs of ACT, Amoxicillin, zinc, or ORS at the health facility this month? Yes (Number of days) No

any CBAs without ACT, amoxicillin, zinc or ORS this month? Yes (Number of CBAs) No

out details:

visory activities conducted this month:

ms identified and suggestion solutions:

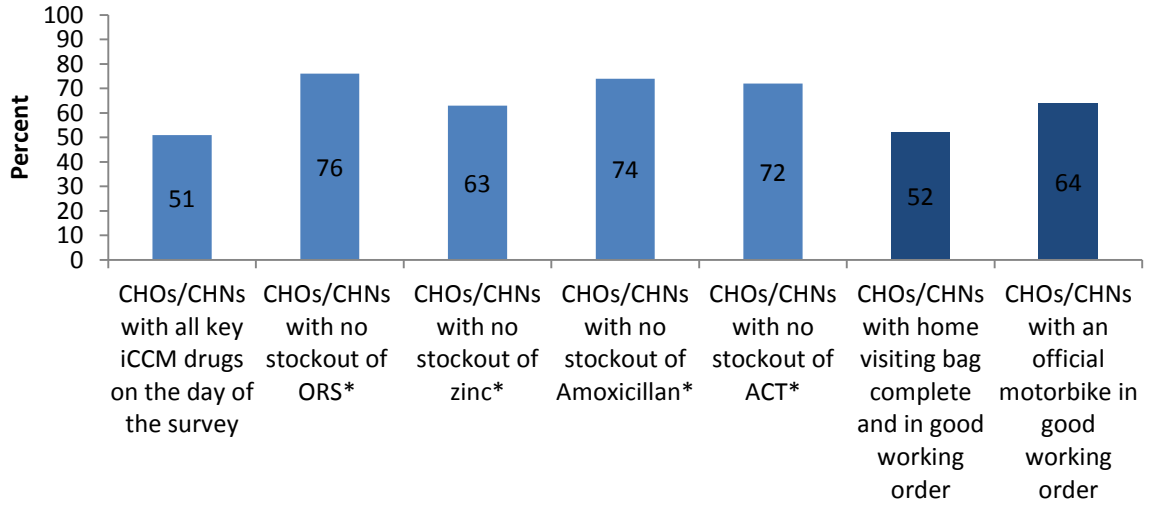
t prepared by: Joshua G. Bojo

Quality of care

There was a sense at the national level that greater attention should be given to strengthening facility-based health care delivery. One Ghana Health Services manager explained: *"CHPS are a stop gap measure"* (GHS informant)

The LQAS survey has revealed deficiencies in availability of basic medicines and supplies at the CHPS level (Figure 8). The extent of stock-outs is not as bad as amongst CBAs; however only 51% had all key iCCM drugs on the day of the survey. Furthermore only about half of CHOs/CHNs had a complete home visiting bag which is concerning given that community outreach is one of their main responsibilities. As with CBAs, transport is also a key barrier for health care workers which impacts on their outreach responsibilities.

Figure 8: Availability of drugs and supplies at CHPS level, 3 Northern regions 2012 LQAS



**Lasting longer than one week in the last 3 months*

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 1998 to 2012. Descriptions include changes at the national level, within the three Northern regions and in the richest and poorest wealth quintiles of the three Northern regions. 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. Statistically significant trends are indicated in figures with **.

Table 4 below provides a summary of changes in the main IHSS programme indicators in the three Northern regions. Improvements are noted between the pre-IHSS period and the IHSS programme period for early initiation of breastfeeding, coverage of ITNs and care-seeking for pneumonia, and more modest improvements are noted in exclusive breastfeeding and coverage of IPTp and ORS, suggesting the IHSS programme plausibly contributed to increases in these interventions. Declines in coverage occurred for tetanus toxoid and measles vaccination and to a lesser extent for DPT3 and vitamin A supplementation.

Table 4: Summary of coverage trend indicators

Indicator	Ghana Northern regions			Average annual rate of change pre IHSS (2003-2007). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2007-2012). Data shown as % per year with confidence intervals
	DHS 2003 (pre IHSS) % (95%CI)	MICS 2007 (special)# (baseline) %	LQAS 2012 (endline) % (95%CI)		
Tetanus toxoid vaccination of pregnant women (at least 2 doses)	47 (41-52)	64	17 (15-19)	4 (3-6)	-9[-10-(-9)]
IPT	1 (0.3-2.2)	59	68 (66-70)	15(14-15)	2(1-3)
Postnatal care for the mother	15 (11-20)	Not collected	44 (42-46)	-	-
Early breastfeeding	58 (52-64)	45	55 (53-57)	-3[-5-(-2)]	2 (1-3)
Exclusive breastfeeding	53 (44-63)	71	69 (67-71)	4 (2-7)	-0.3 (-1.5-0.9)
Vitamin A supplementation	74 (70-79)	50	45 (45-46)	-6[-7-(-5)]	-1[-1.7-(-0.5)]
Measles immunisation	80 (73-86)	92	90 (89- 90)	3(2-5)	-0.7 [-1- (-0.1)]
DPT3 immunisation	70 (61-77)	91	90 (89-92)	5(4-7)	-0.1 (-0.7-0.5)
Care-seeking of suspected pneumonia	49 (38-60)	43	64 (62-66)	-2(-5-2)	4 (2- 6)
Care-seeking for fever	50 (41-58)	Not collected	69 (67-71)	-	-
ACT	Not collected	13	37 (35-39)	-	5 (4-5)
ITN	11 (8-16)	60	75 (73-77)	12 (11-13)	3(2-4)
ORS coverage	40 (32-48)	32	41 (39-44)	-2[-4-(-0.1)]	2(1-3)

IPTp = intermittent preventive treatment of malaria for pregnant women; ITNs = Insecticide Treated Nets; DPT = diphtheria, pertussis and tetanus

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

Stable coverage rate between pre-IHSS and IHSS programme period

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

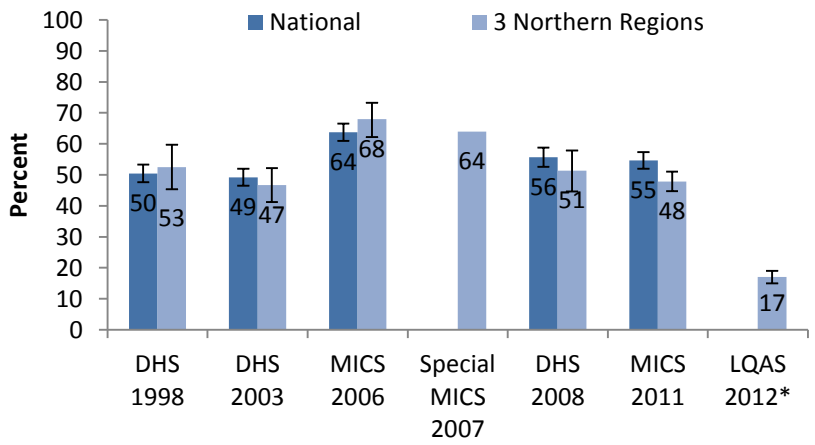
5.2.3.1 Antenatal care

Tetanus Toxoid vaccination of pregnant women

Nationally the proportion of women who received at least 2 doses of tetanus toxoid injection during their last pregnancy fluctuated between 50% in 1998 and 55% in 2011 with a peak at 64% in 2006. All three Northern regions showed a decline in tetanus toxoid coverage between the 2007 supplemental MICS and the 2012 LQAS. Combining the coverage for the three Northern regions shows a 47% decline between 2007 and 2012, with no significant upwards trend across survey years (p=0.08) (Figure 9), although the decline began between 2007 and 2008 which is prior to the IHSS programme period. It should further be noted that the LQAS denominator for tetanus toxoid vaccination is mothers with infants aged 0-5 months as opposed to women with a live birth in the last two years, which is the denominator for the other surveys. The average annual rate of coverage change in the pre-IHSS period was 4% per year compared to -9% per year during the IHSS programme period.

Ghana achieved elimination of maternal and neonatal tetanus in 2011 (unicef.org/media/media_60763.html), therefore the decline seen in coverage of two doses of tetanus toxoid vaccination during pregnancy may be due to the higher levels of lifetime tetanus protection in the population since women with multiple pregnancies might have received more than three or four doses and were not eligible for two doses of tetanus toxoid during their last pregnancy.

Figure 9: Percentage of women with a live birth in the last 2 years who received at least 2 doses of tetanus toxoid vaccine during last pregnancy



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

The gap in tetanus toxoid coverage between the poorest 20% and the richest 40% was 11% in 1998 and 19% in 2011. The confidence intervals overlap in all years except 2011 (which may be due to a larger sample size in the MICS survey), therefore, it appears as if there were no major changes in equity in access to tetanus toxoid vaccination (Figure 10).

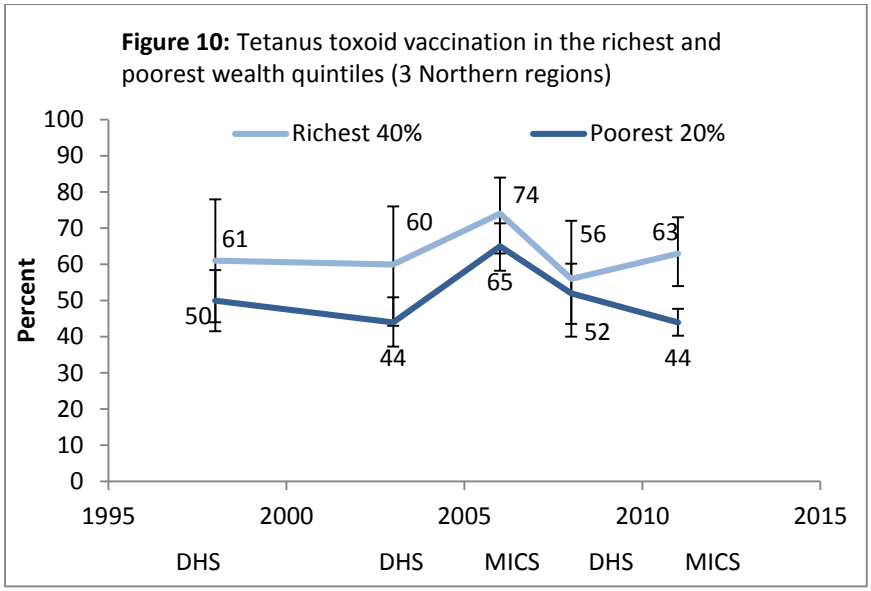


Figure 10: Tetanus toxoid vaccination in the richest and poorest wealth quintiles (3 Northern regions)

Malaria prevention in pregnancy

Ghana adopted IPTp using sulfadoxine-pyrimethamine (SP) as a national policy in 2003, in which SP is reserved for IPTp only[24]. An upward increase followed the adoption of the national policy from 2006 where close to half of pregnant women received the necessary 2 doses; this rose to at least 83% of women 2011. In the three Northern regions coverage increased considerably from 1% in 2003 to 59% in 2007, with a further increase to 68% during the IHSS programme period up to 2012 (p=0.00 for trend) (Figure 11). The IHSS programme could plausibly have contributed to the increasing trend in coverage of IPTp through the promotion of antenatal care by CBAs and the purchase (with UNICEF funds) of Fansidar tablets. During the pre-IHSS period the average annual rate of coverage change was 15% per year which slowed to 2% per year during the IHSS programme period as the biggest improvements had already occurred and efforts were needed to maintain coverage.

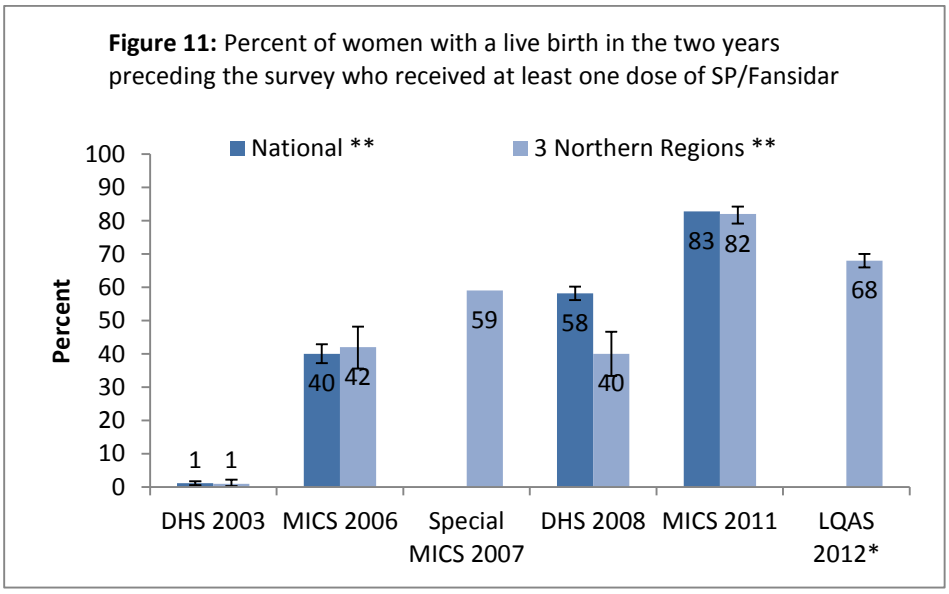


Figure 11: Percent of women with a live birth in the two years preceding the survey who received at least one dose of SP/Fansidar

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

IPTp coverage in the poorest and richest wealth quintiles have increased significantly between 2003 and 2011. In 2011 the confidence intervals of the richest 40% and the poorest 20% overlap with a small gap in coverage between quintiles (Figure 12).

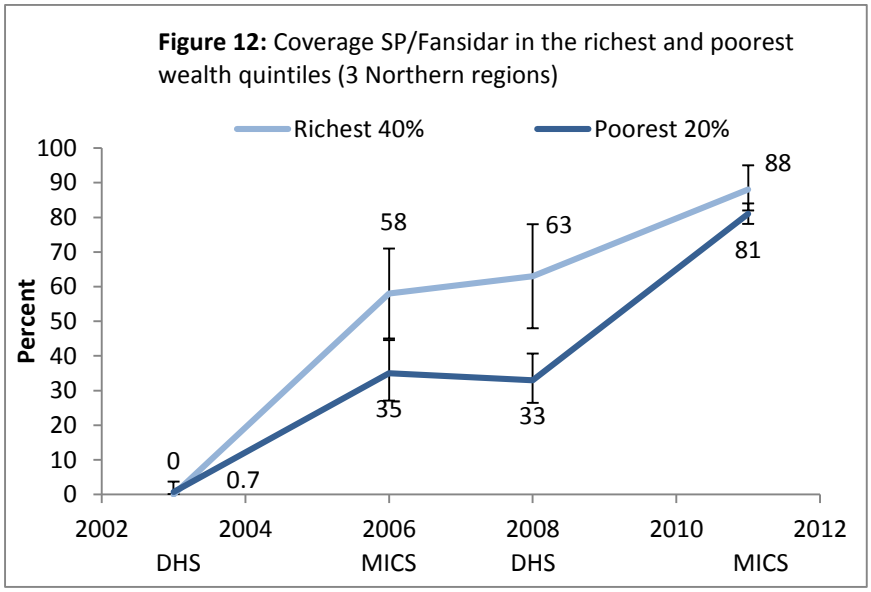


Figure 12: Coverage SP/Fansidar in the richest and poorest wealth quintiles (3 Northern regions)

5.2.3.2 Postnatal care

The proportion of women who received postnatal care within two days of child birth has decreased nationally from 31% in 1998 to 14% in 2003 and further to 6% in 2008 where it remained at a similar level in 2011. Overall the Northern regions have seen an increase in postnatal care from 26% in 1998 to 44% in 2012 (p value for trend 0.00) with much lower coverage reported in the intervening years (Figure 13). The combined estimate for the 3 Northern regions in 2012 (44%) masks large regional variation. Northern region had the lowest coverage of the three Northern regions at 17% whilst Upper East achieved 68% and Upper West 47% coverage. When discussing this with the Tamale field office they explained that it is difficult for nurses to do outreach in the Northern region as there are long distances between CHPS. In contrast, Upper West and Upper East are more compact with less distance between communities and CHPS. Data from the 2012 LQAS shows that 70% of postnatal care is received from nurses or midwives and 13% from a community health nurse. The increase in postnatal care coverage between 2011 and 2012 in the Northern regions could therefore reflect improved access to facility-based care. The recent training of CBAs in community-based newborn care will hopefully contribute to maintaining the higher coverage in the 3 Northern regions.

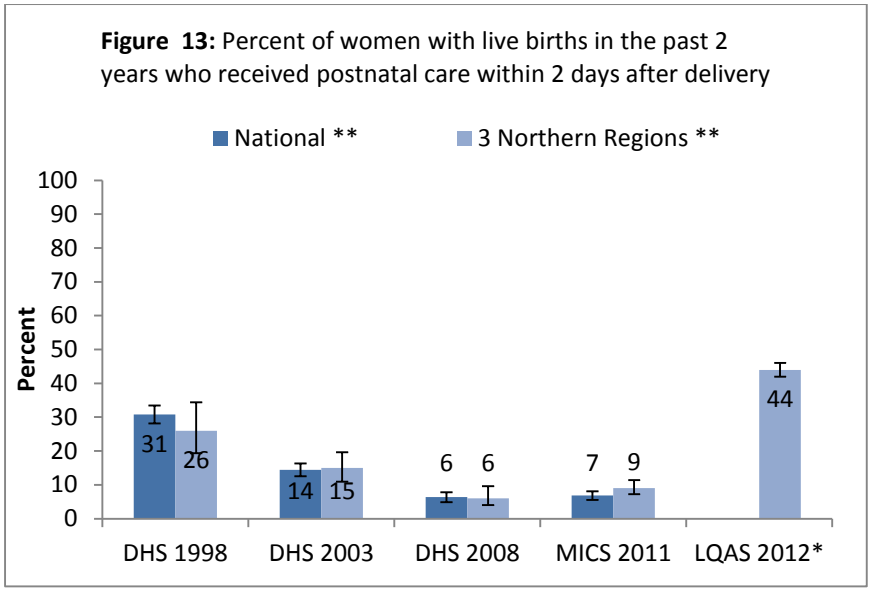


Figure 13: Percent of women with live births in the past 2 years who received postnatal care within 2 days after delivery

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

Coverage of postnatal care in the poorest wealth quintile has remained fairly stable between 1998 and 2011 whilst coverage in the richest quintile appears to have declined and in 2011 coverage in the poorest quintile was significantly higher than the wealthiest (Figure 14).

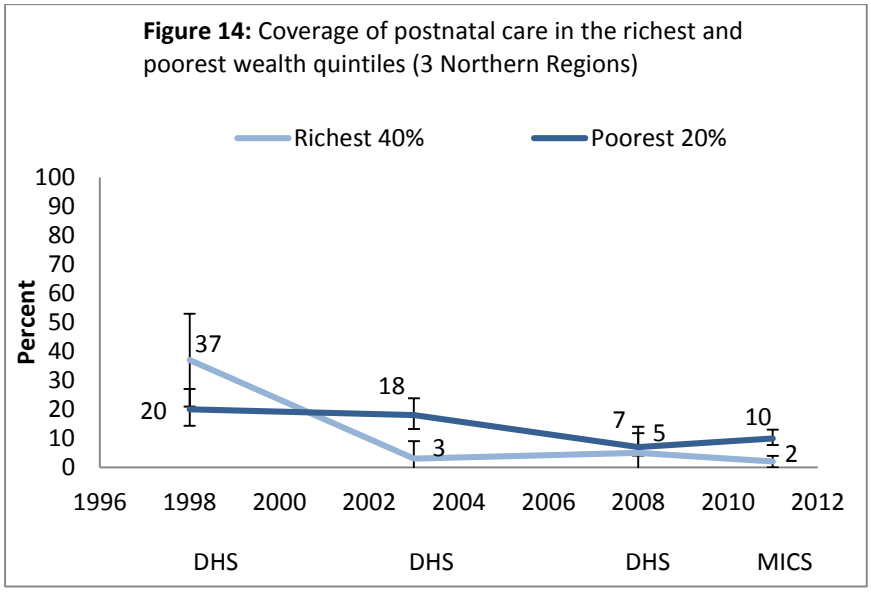


Figure 14: Coverage of postnatal care in the richest and poorest wealth quintiles (3 Northern Regions)

5.2.3.3 Early initiation of breastfeeding

Nationally the percentage of infants who were breastfed within an hour of birth increased from 26% in 1998 to 53% in 2008 with a significant decline to 46% in 2011. In the 3 Northern regions the proportion fluctuated from 2003 to 2012 with overall maintenance of the same coverage level (Figure 15). The average annual rate of coverage change during the pre-IHSS period was -3% per year whilst during the IHSS programme period there was a positive coverage change of 2% per year as the declines in the pre-IHSS period were reversed.

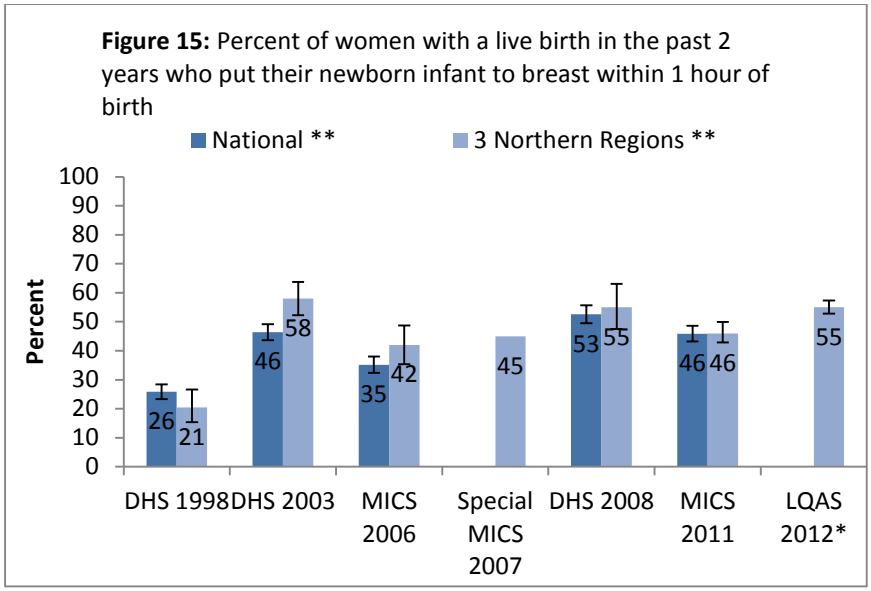


Figure 15: Percent of women with a live birth in the past 2 years who put their newborn infant to breast within 1 hour of birth

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

5.2.3.4 Exclusive Breastfeeding (EBF)

Nationally, the percentage of infants below the age of 6 months who were exclusively breastfed rapidly increased from 32% in 1998 to 52% in 2003 followed by a slower increase to 63% in 2008. It dropped by close to a third in 2011(42%). The three Northern regions achieved higher EBF rates compared to the national coverage from 2006 onwards. The biggest increase occurred between 1998 and 2006, after which time the rate remained the same until a significant decline was reported in the 2011 MICS (Figure 16). The reduction in EBF rates reported by the MICS 2011 raises questions regarding the validity of the survey data collected. Another possibility for this decline, given by staff at the UNICEF country office, could be that there are many more working women. The staff further indicated that *"We lost focus on EBF. There are fewer BFHI accredited hospitals and formula is more accessible. Ghana is a big market for formula companies".* The maintenance of the EBF levels between 2007 and 2012 in the three Northern regions could plausibly be due to the efforts of the CBAs and mothers support groups to promote breastfeeding.

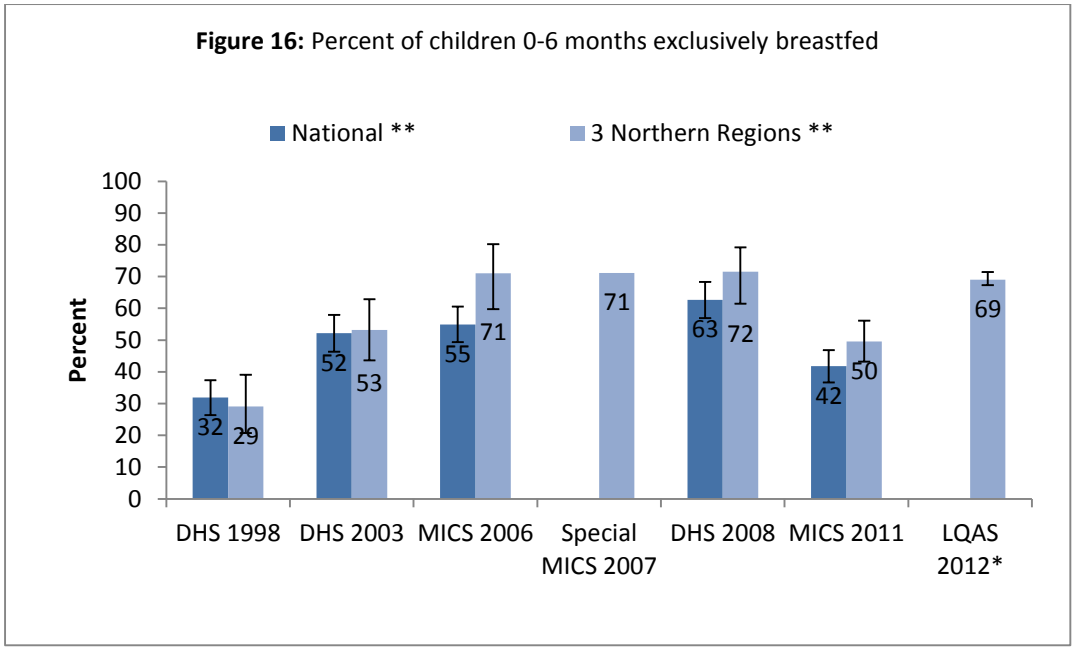


Figure 16: Percent of children 0-6 months exclusively breastfed

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

5.2.3.5 Preventive care

Vitamin A supplementation

Nationally, only a quarter of children aged 6-59 months received vitamin A supplementation in 1998. A rapid increase followed thereafter to 72% in 2003 preceding a decline to 53% in 2008. The most recent estimate is 72% (2011). Coverage nationally and in the 3 Northern regions was similar across all time periods.

In the three Northern regions coverage increased from 44% in 1998 to 75% in 2003 with a decline to 46% in 2008 (Figure 17). Between 2007 and 2012 in these regions coverage was maintained. The 2011 MICS reported much higher coverage for these regions at over 70%. It should be noted that MICS reports on children 6-59 months who have received two doses, the most recent dose in the last six months, whilst the LQAS reports on children 12-23 months who received a dose of vitamin A in the last six months; hence MICS coverage is expected to be higher. Furthermore, there were no National Immunization Days (NIDs) in 2012, which is most commonly where children over 23 months receive vitamin A. Assessing annual rates of coverage changes shows a negative average annual rate of change during the pre-IHSS period of -6% per year whilst during the IHSS programme period the annual rate of change improved to -1% per year.

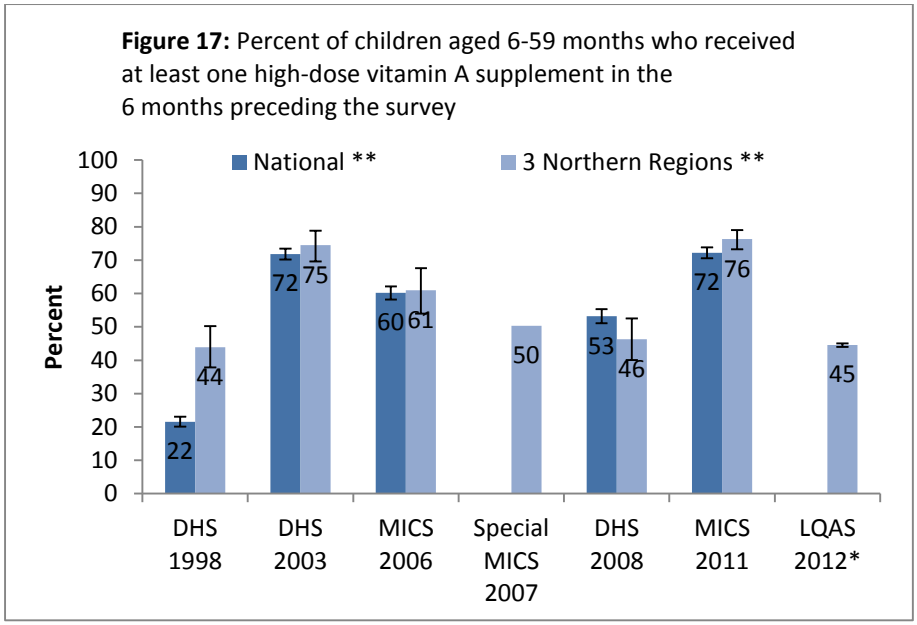


Figure 17: Percent of children aged 6-59 months who received at least one high-dose vitamin A supplement in the 6 months preceding the survey

**Denominator for LQAS is children 12-23 months*

Assessing vitamin A coverage by wealth quintile shows a fluctuating but overall increase in the poorest quintile from 42% in 1998 to 75% in 2011. The confidence intervals in the richest and poorest wealth quintiles overlap in all except one year, and the gap in 2011 was only 6 percentage points. The IHSS programme support for vitamin A supplementation through NIDs could plausibly have contributed to the improved coverage and especially amongst the poorest (Figure 18).

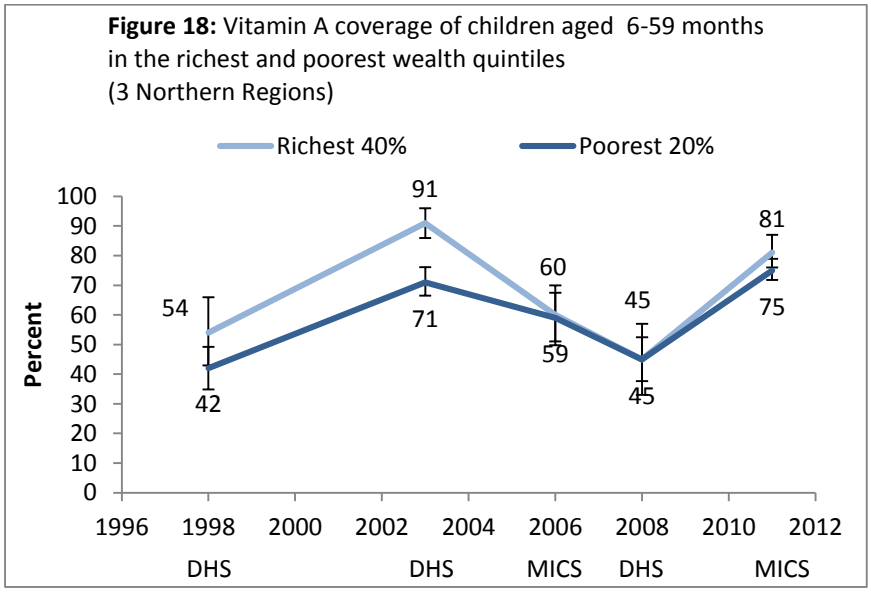
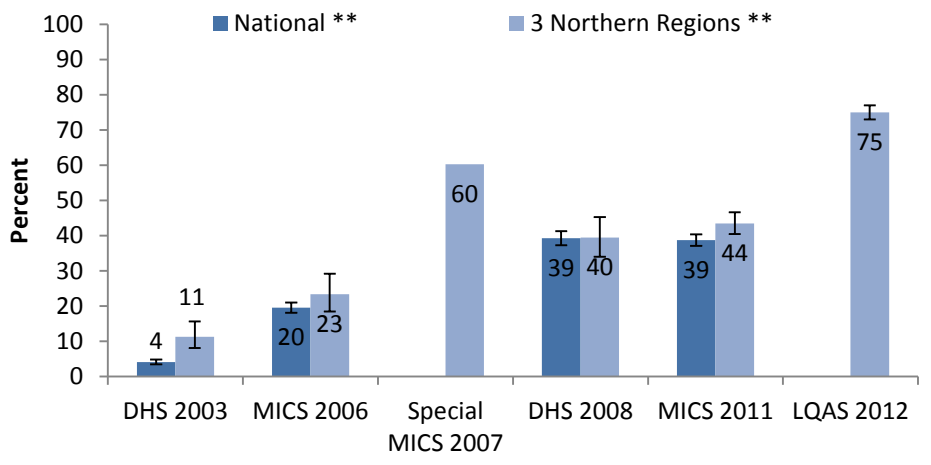


Figure 18: Vitamin A coverage of children aged 6-59 months in the richest and poorest wealth quintiles (3 Northern Regions)

Malaria: ITNs

The proportion of children under the age of five sleeping under treated nets increased nationally from 4% in 2003 to 39% in 2008 and was maintained at the same level in 2011. The national "Hang-up" campaign occurred after the 2011 MICS survey in 2012. National ITN coverage was similar to coverage in the three Northern regions in 2006 and 2008 and was higher (borderline significant) in 2011. For the three Northern regions coverage increased from 11%, in 2003, to 60%, in 2007, and 75%, in 2012, after the campaign (p value for trend = 0.00) (Figure 19). The average annual rate of coverage change was 12% per year in the pre-IHSS period where the largest increases in coverage occurred, and 3% per year during the IHSS programme period when coverage continued to increase but a lower rate. The IHSS programme contributed almost 2 million ITNs, and the CBAs were involved in net distribution, and this could plausibly be responsible for the continued increase in high coverage levels during the IHSS programme period.

Figure 19: Percent of children < 5 who slept under an ITN the previous night



Coverage of ITNs in the poorest wealth quintile increased from 11% in 2003 to 46% in 2011. The confidence intervals in the poorest and richest quintiles overlapped in all years except 2011. During the IHSS programme period between 2008 and 2011 coverage in the poorest exceeded that in the richest quintiles (31%) (Figure 20) possibly due to increased access to nets in hard to reach areas through CBA distribution.

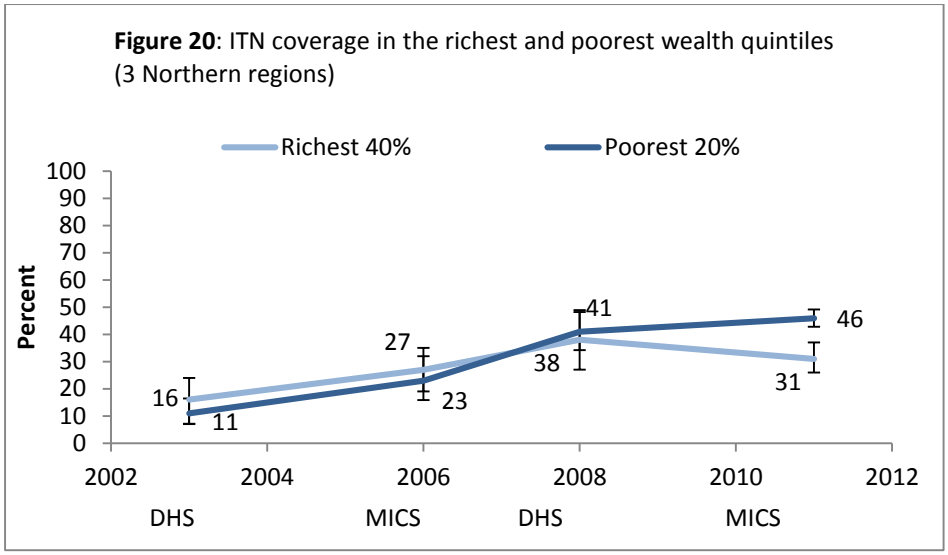


Figure 20: ITN coverage in the richest and poorest wealth quintiles (3 Northern regions)

Vaccinations: Measles and DTP3

An early awareness of the importance of vaccination against measles and DPT was very apparent countrywide. Nationally, in 1998, 72% and 73% of children received the required 3 doses of the Diphtheria, Pertussis and Tetanus (DPT) and measles vaccination, respectively. The three Northern regions had a marginally, but not statistically significant, lower coverage of 66% and 70%, respectively. National coverage increased gradually reaching over 90% for both vaccines in 2011. In the Northern regions coverage of both DPT3 and measles increased to over 90% in 2007 and was maintained at a similar level in 2012 (Figures 21 and 22). For both vaccines the average annual rate of coverage change was significantly lower in the IHSS programme period compared to the pre-IHSS period. This is due to the fact that the major increases in coverage occurred pre-IHSS between 1998 and 2007, and the IHSS programme support enabled the high coverage to be maintained between 2008 and 2012.

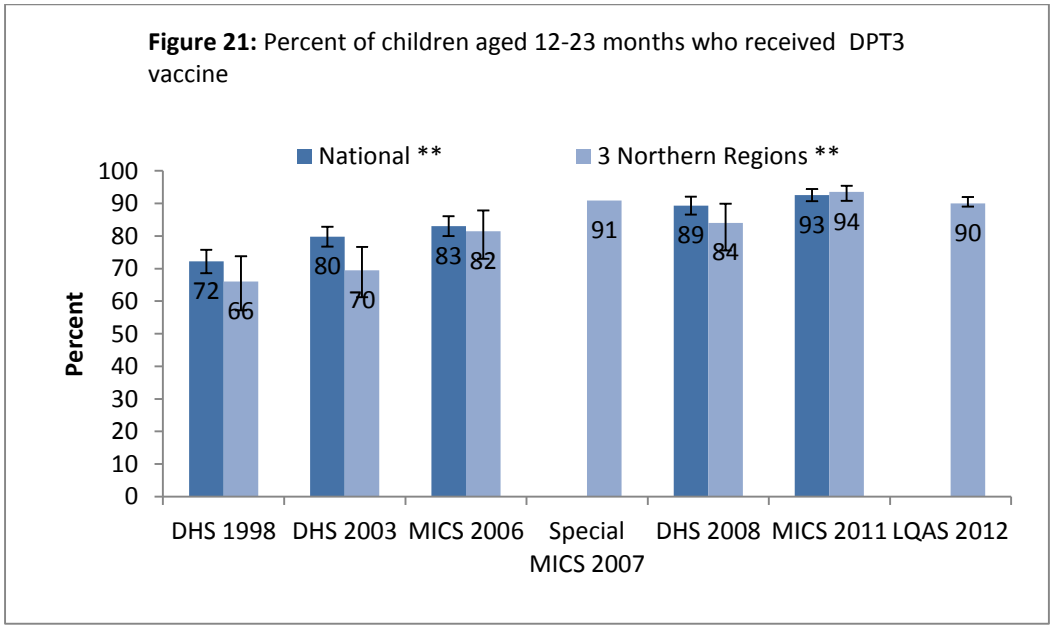
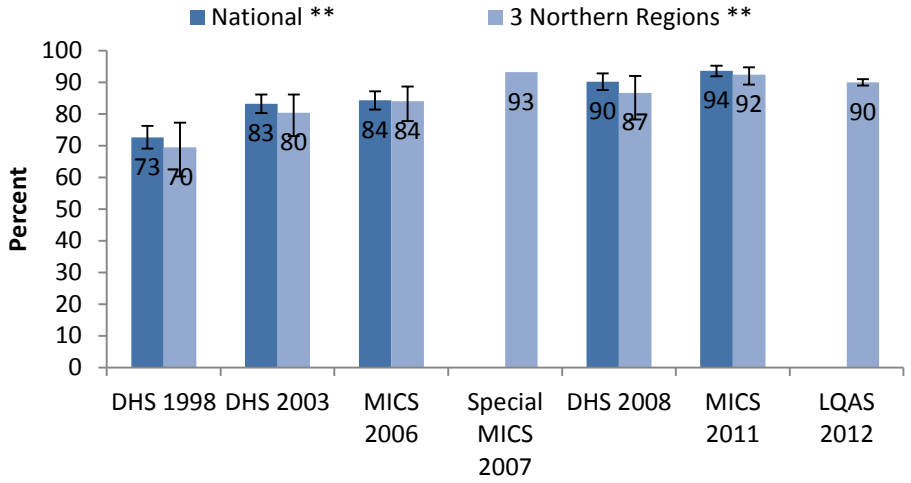


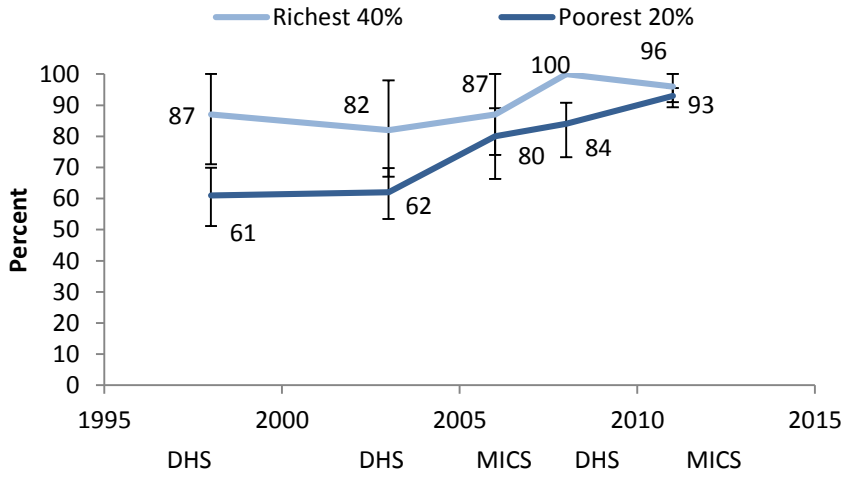
Figure 21: Percent of children aged 12-23 months who received DPT3 vaccine

Figure 22: Percentage of children aged 12-23 months who received measles vaccine



Coverage of DPT3 vaccination increased significantly in the poorest quintile from 61% in 1998 to 93% in 2011, where there was only a 3 percentage point difference between the poorest and richest wealth quintiles (Figure 23). Measles vaccination coverage in the poorest quintile increased to the same level as the richest quintile in 2006, and between 2006 and 2011 there was very little difference between the quintiles as both continued to increase at the same rate (Figure 24).

Figure 23: DPT3 coverage of children aged 12-23 months in the richest and poorest wealth quintiles (3 Northern regions)



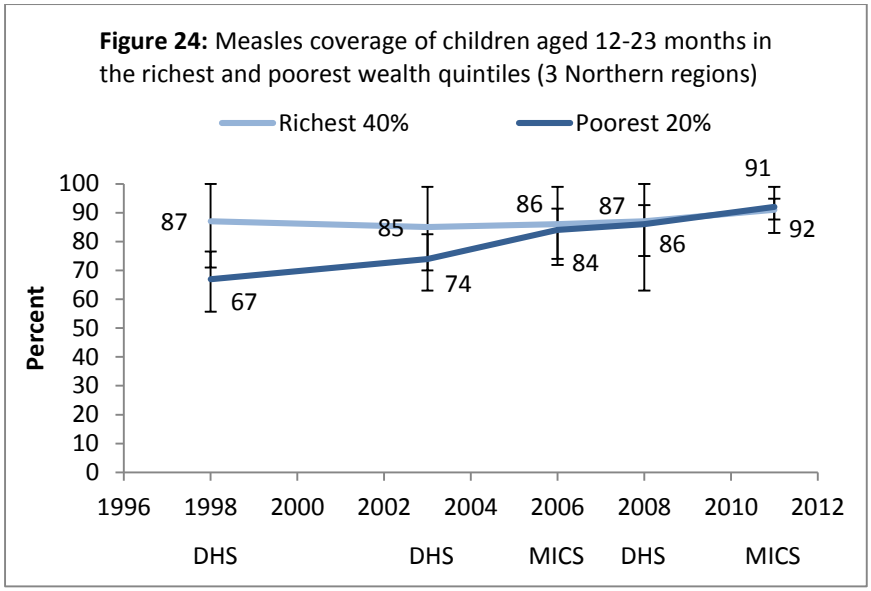


Figure 24: Measles coverage of children aged 12-23 months in the richest and poorest wealth quintiles (3 Northern regions)

5.2.3.6 Curative care for malaria, suspected pneumonia and diarrhoea

Care seeking and treatment of suspected pneumonia

Survey data from 1998 through to 2011 indicate poor utilization of health care services for the treatment of suspected pneumonia in children under five nationally. Between 1998 and 2011, care seeking increased from 26% to 41% with fluctuations between survey years. Care seeking for suspected pneumonia increased considerably in the Northern regions (Figure 25), with a 21 percentage point improvement between 2007 and 2012 (p value for trend = 0.02). The average annual rate of coverage change was negative during the pre-IHSS period (-2% per year) and changed to a positive 4% annual average increase during the IHSS programme period. Despite the low utilization of CBAs for treatment of pneumonia, it is plausible that their presence in communities in the three Northern regions could have contributed to improved care-seeking at government health facilities. Furthermore nationally there was a negative, but non-significant, downward trend in care-seeking for suspected pneumonia between 2008 and 2011, whilst in the three Northern regions coverage was kept stable between 2008 and 2011 and significantly increased between 2011 and 2012, which could plausibly be indicative of the protective effect of the IHSS programme support.

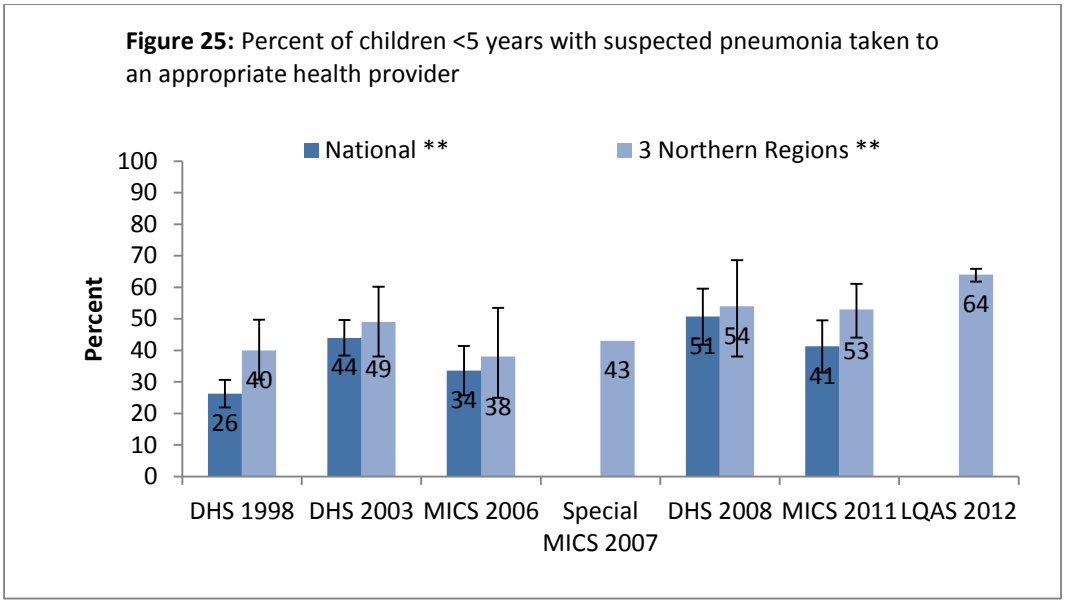


Figure 25: Percent of children <5 years with suspected pneumonia taken to an appropriate health provider

Coverage of care-seeking in the richest and poorest wealth quintiles have fluctuated with an overall slow increasing, but non-significant, trend in the poorest wealth quintile. The numbers of children with reported symptoms of pneumonia in the previous two weeks in the richest quintiles was small, hence the confidence intervals are wide and overlap with the poorest quintile (Figure 26).

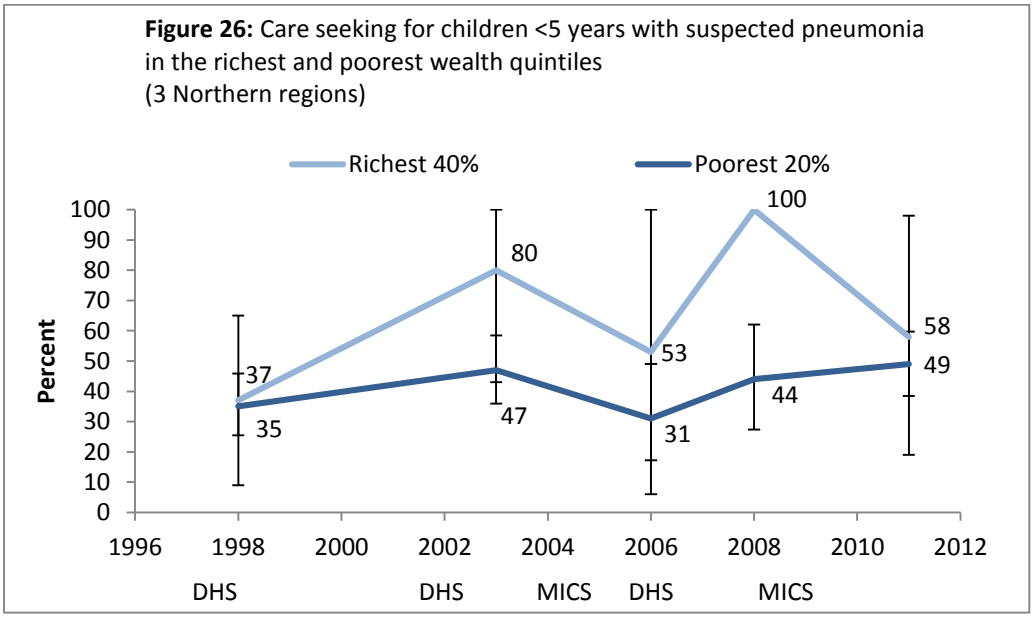


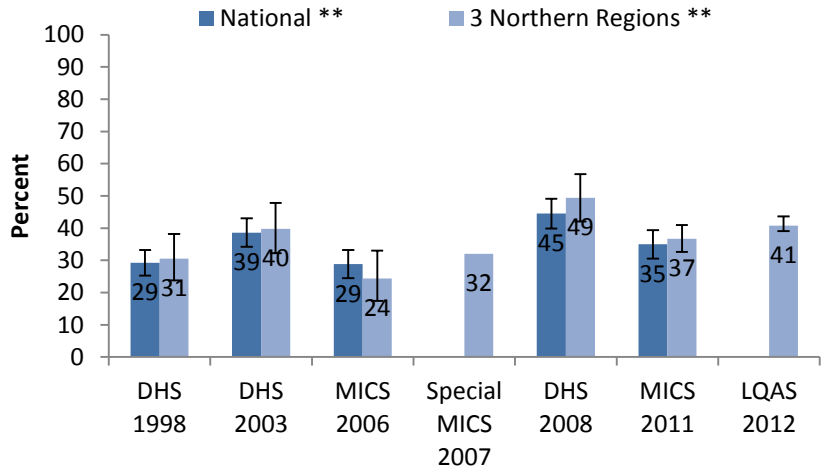
Figure 26: Care seeking for children <5 years with suspected pneumonia in the richest and poorest wealth quintiles (3 Northern regions)

Care seeking and treatment of diarrhoea

Seeking treatment for children under the age of five suffering from diarrhoea was poor during earlier survey years at a national level. Coverage increased from 29% in 1998 to 45% in 2008. Nationally, use of ORS did not increase with time but rather fluctuated, and there was no significant difference between national coverage and coverage in the three Northern regions. The proportion observed at

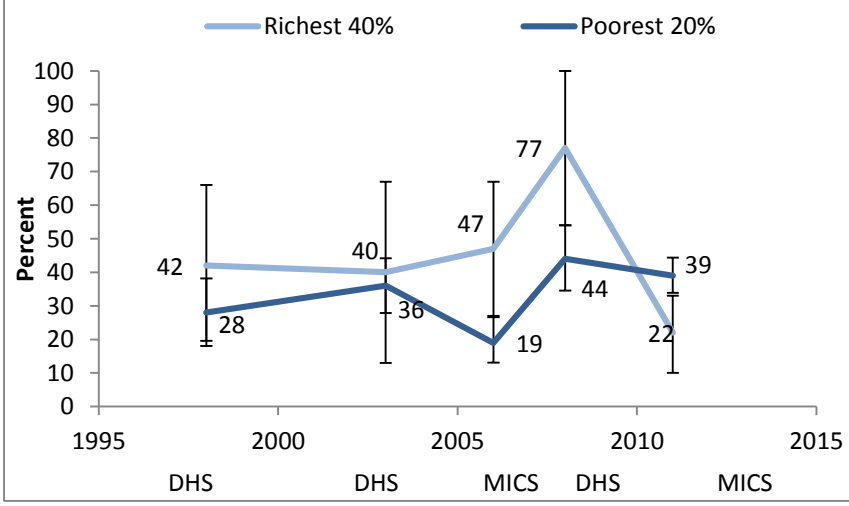
the final survey point in 2011 was not significantly different to that observed in 1998. In the Northern regions coverage of ORS increased from 32% in 2007 to 41% in 2012 (Figure 27), although there are no confidence intervals to assess whether this was a significant change. The average annual rate of coverage change was negative in the pre-IHSS period (-2%) but positive during the IHSS programme period (2%). During the IHSS programme period, UNICEF, mainly through DFATD funding, procured almost 2 million ORS sachets, and this increased availability at lower levels of care could plausibly have contributed to the overall increase during the 2007 to 2012 period, i.e., pre-IHSS to the IHSS programme period.

Figure 27: Percent of children <5 with diarrhoea treated with ORS



Coverage of ORS in the poorest wealth quintile fluctuated with an overall increasing, but non-significant, trend from 28% in 1998 to 39% in 2011. The confidence intervals in the richest quintiles are wide due to small numbers of children with diarrhea in the previous two weeks, hence the confidence intervals of the quintiles overlap (Figure 28).

Figure 28: Use of ORS for children <5 with diarrhoea in the richest and poorest wealth quintiles (3 Northern regions)



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

Nationally, care seeking for children with fever increased slightly from 40% in 1998 to 50% in 2011, with the biggest change occurring between 2006 and 2008. In the three Northern regions care seeking for fever increased from 45% in 1998 to 59% in 2008 and increased, although not significantly, to 69% in 2012 (Figure 29).

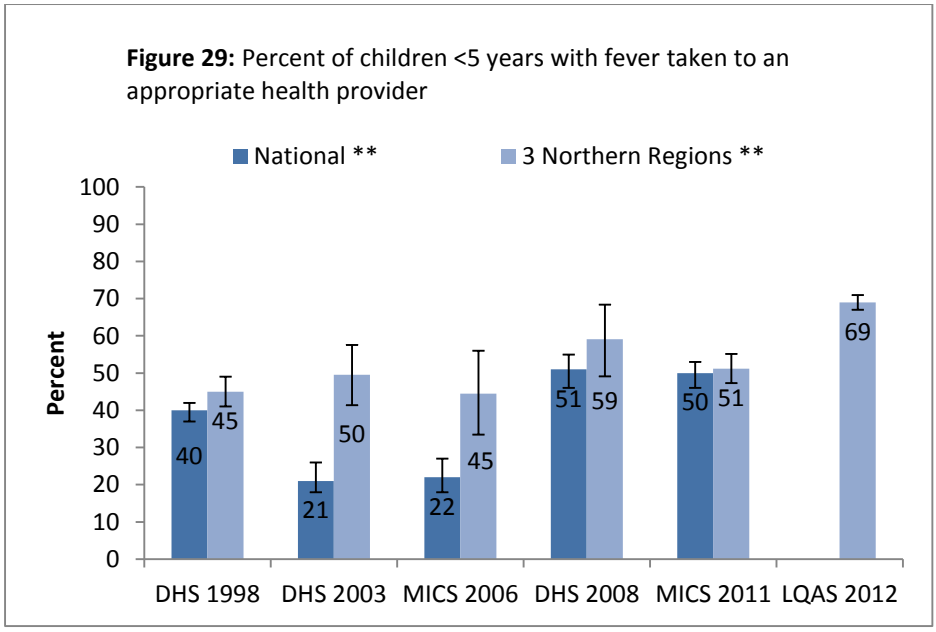


Figure 29: Percent of children <5 years with fever taken to an appropriate health provider

The treatment of fever for suspected malaria using any antimalarial treatment declined from 63% to 53% between 2003 and 2011 at the national level. At the regional level, fluctuations in the use of any antimalarial treatment were observed across the years, but with mostly minimal variations between survey points. In most years, around half of the children suffering from fever were given some antimalarial drug. In the Northern regions coverage of antimalarial drugs remained fairly similar between 1998 and 2011. Between 2008 and 2012 there is a significant increase in antimalarial treatment in the 3 Northern regions from 43% to 65%, a reversal of the declining trend observed between 2006 and 2008. It is plausible that the significant increase in antimalarial treatment between 2008 and 2012 in the three Northern regions could be due to the increased availability of treatment through the IHSS programme's support (Figure 30).

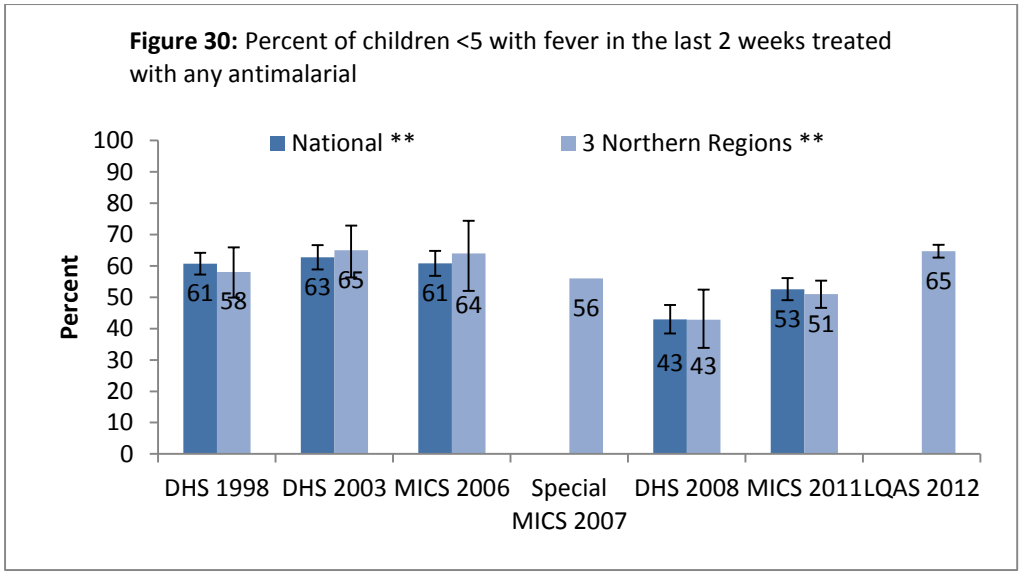


Figure 30: Percent of children <5 with fever in the last 2 weeks treated with any antimalarial

Specific use of Artemesinin-based combination therapy (ACT) was less common but increased from 4% in 2006 to 18% in 2011 nationally. In the three Northern regions coverage of ACT treatment reached 37% in 2012, an increase from 13% in 2007. This could plausibly be due to the IHSS programme's support as during the period of the IHSS programme grant, UNICEF, with DFATD funding, procured 750 000 ACT blister pack treatments.

Coverage of care seeking for fever in the poorest Northern regions quintile increased substantially between 1998 and 2003 but has not improved overall between 2003 and 2011 with fluctuations in the intervening years (Figure 31).

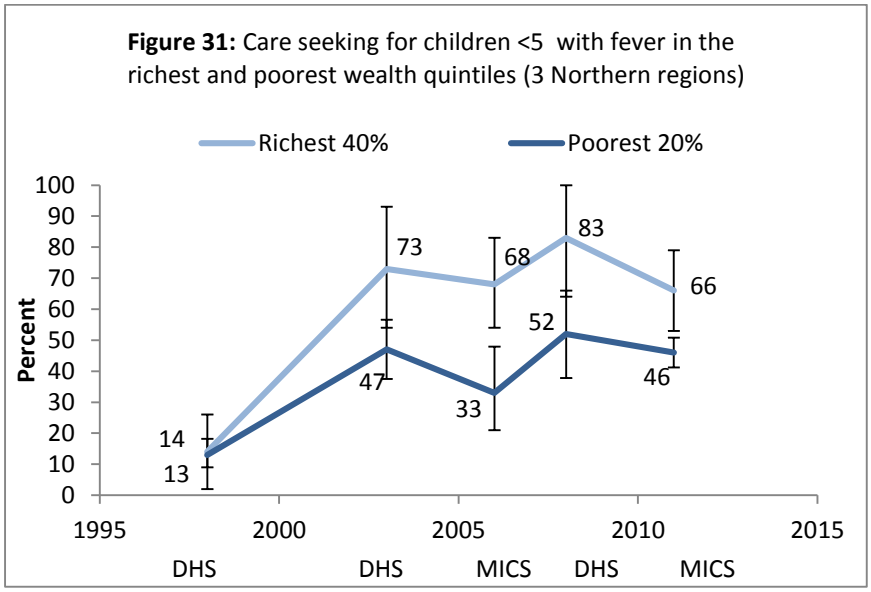


Figure 31: Care seeking for children <5 with fever in the richest and poorest wealth quintiles (3 Northern regions)

Coverage of antimalarials in the poorest wealth quintile has fluctuated between 1998 and 2011 with no overall improvement in coverage, except between 2008 and 2011. The gap between richest and poorest wealth quintiles has remained fairly constant, and in 2011 the confidence intervals of the quintiles did not overlap (Figure 32).

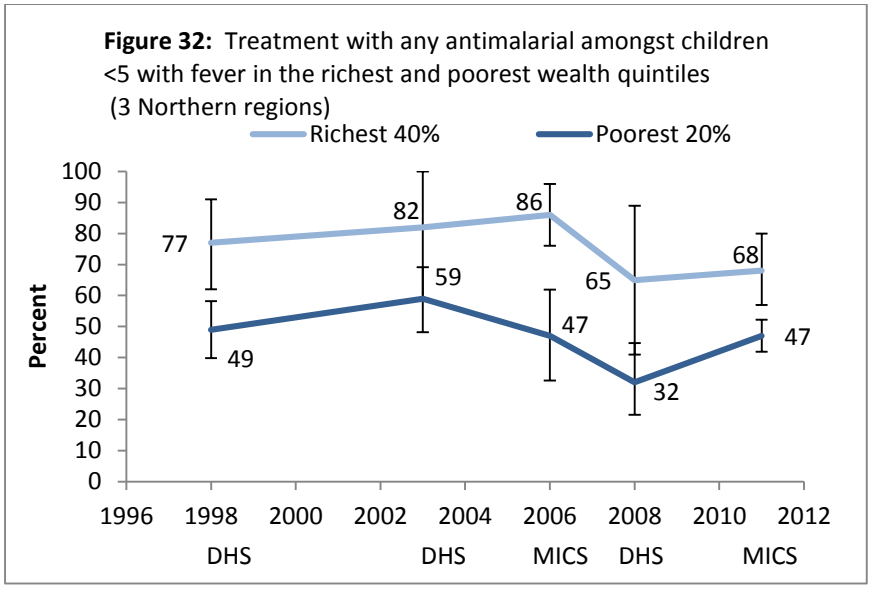


Figure 32: Treatment with any antimalarial amongst children <5 with fever in the richest and poorest wealth quintiles (3 Northern regions)

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

In the Northern regions, the proportion of children under five who sought care for fever, suspected pneumonia and diarrhoea at public health facilities increased between 2006 and 2008 and then declined in 2011 and 2012. Care-seeking at community level (CBA) also increased from 1% in 2006 to 7% in 2011 but dropped to 4% in 2012. UNICEF, through DFATD funding, was the primary provider of support for CBAs in the three Northern regions. Overall the majority of caregivers do not seek care (over half in 2011 and 2012), and this non care-seeking trend has increased since 2008 (Figure 33).

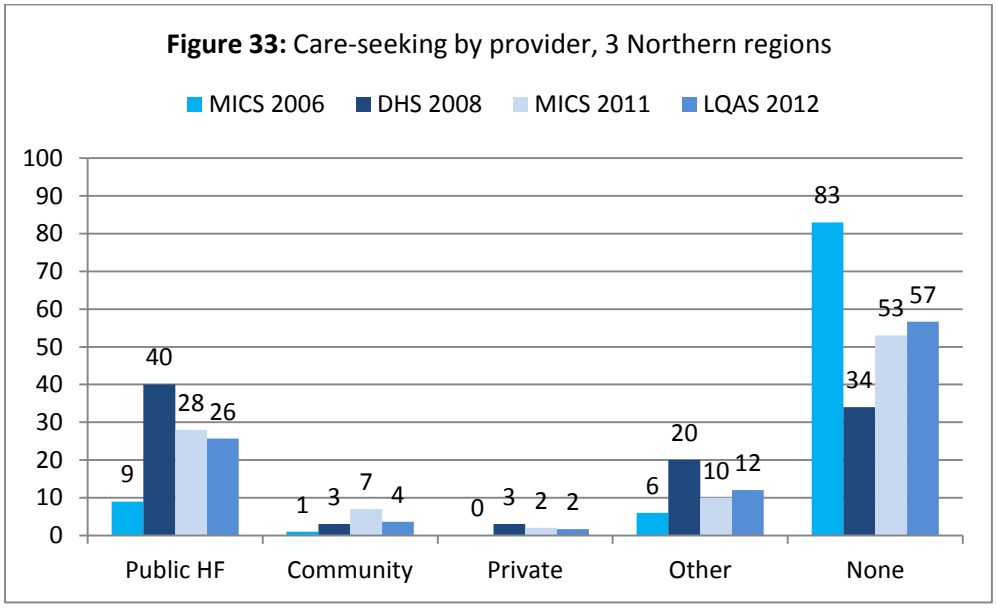


Figure 33: Care-seeking by provider, 3 Northern regions

Data from the most recent LQAS in the three Northern regions shows that care seeking from CBAs was marginally higher for diarrhoea but less than 5% for all three conditions. Care-seeking at CHPS level was also low at less than 10% for all three conditions (Figure 34).

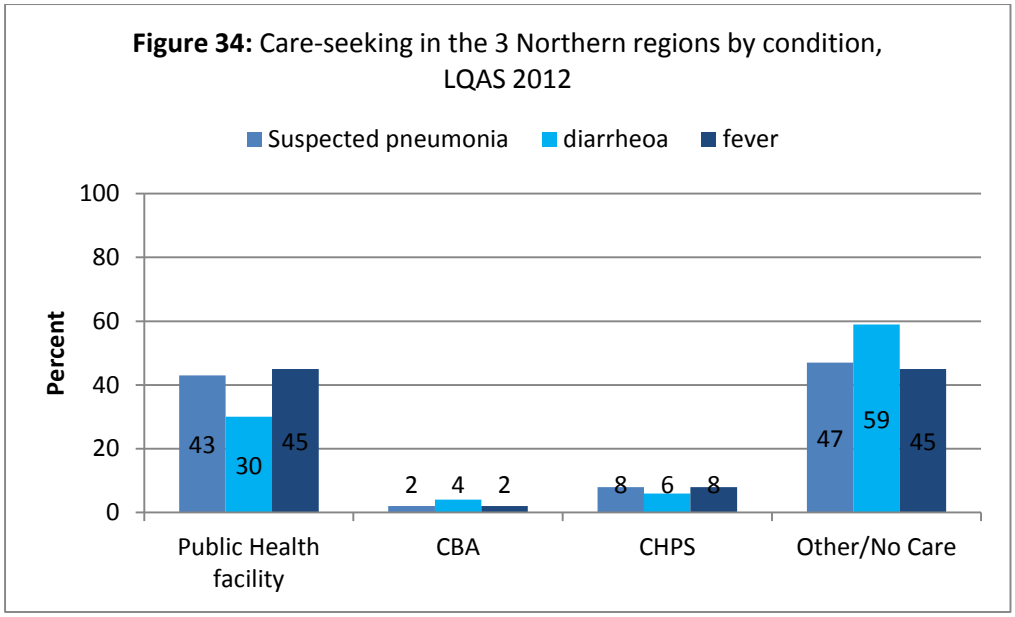


Figure 34: Care-seeking in the 3 Northern regions by condition, LQAS 2012

Across all time periods no one seeking care at community level was in the 4th or 5th wealth quintile. Care-seeking at community level has increased in the poorest, second and middle quintiles between 2006 and 2011 suggesting that community-based services are becoming increasingly pro-poor over time. The majority of children who received care at community level in 2011 were in the poorest wealth quintile (Figure 35).

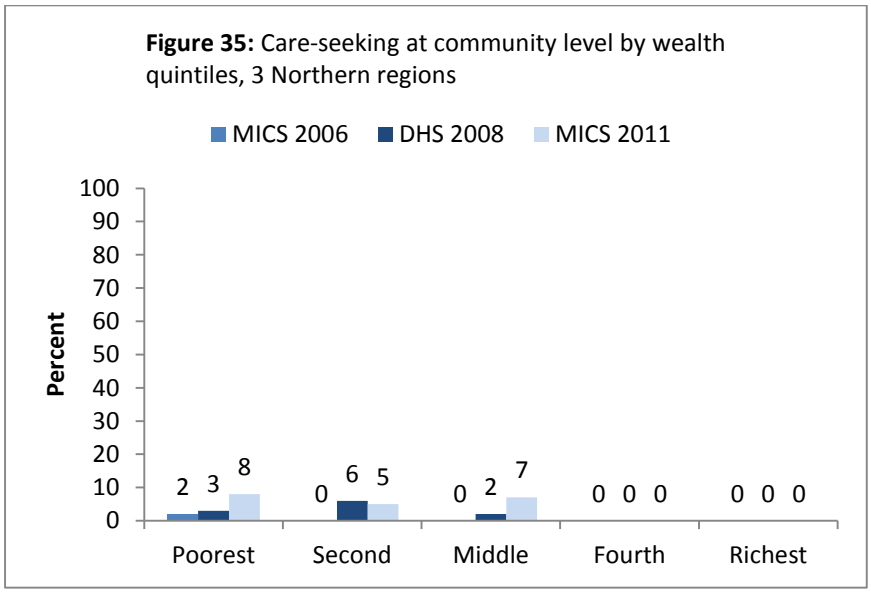


Figure 35: Care-seeking at community level by wealth quintiles, 3 Northern regions

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

These indicators were not the primary targets for the IHSS programme but are included here to provide a complete picture of the state of maternal and child health services in the country over the period of implementation of the IHSS programme. 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 1998 to 2011 period. An average of at least 87% of pregnant women attended antenatal care at least once, during each of the six survey years. There were some fluctuations with antenatal attendance, with a 98% peak attendance in 2006 and the least attendance in 2008 (87%). A steeper trend was observed for the three Northern regions, all of which achieved almost universal coverage (99%) in 2012. The proportion of women attending at least 4 ANC visits gradually increased from 62% in 1998 to 87% in 2011. Similar upward trends were observed across regions with the exception of the Upper West, which showed fluctuations in both the attendance for antenatal care at least once and at least four times, which fluctuated from 78% in 2007 to 90% in 2011 and then back to 79% in 2012 (see Appendix E). Health promotion messages of the CBAs and CHNs/CHOs, encouraging antenatal care attendance could plausibly have contributed to the improvements seen in these two indicators in the three Northern regions.

Childbirth and newborn care

Skilled attendance

There was a gradual increase from 44% to 55%, between 1998 and 2008, in the national proportion of pregnant women having been seen by a skilled birth attendant during delivery. The biggest shift in coverage occurred between 2008 and 2011, with a 12 percentage point change. The greatest increases in coverage during this period were seen in the Upper East and Upper West regions, which rose from 17% in 1998 to 81% in 2012 and 22% in 1998 to 59% in 2012, respectively, with the most rapid improvement taking place between 2008 and 2012 in both regions. The Northern region remained poorly serviced during the entire evaluation period with very little change in access to skilled birth attendance and coverage of 30% reported for 2012. The highest proportions reached were 38% and 37% in 2006 and 2011. In the Northern region a higher proportion of women gave birth in a facility (34%) than those birthing with a skilled attendant (30%). This is because some women give birth in a CHPS but are assisted by a CHO who are not considered skilled attendants in the MICS and LQAS surveys only in DHS surveys (see Appendix E).

Infant and Young child Feeding

Complementary feeding

Nationally, around 90% of children 6-8 months old were breastfed and received complementary foods. Upper West region had the lowest proportion in 2011 of 88% (see Appendix E).

Immunisations

BCG

Coverage of the BCG vaccine is high amongst the Ghanaian population. The minimum proportion of children receiving a dose of BCG vaccine in any year was 84% in the earlier years rising to nearly 100% in 2008, both regionally and nationally. Central region and Greater Accra had 100% coverage in 2008 and 2011, respectively. The Volta region was the exception, with a BCG coverage of 78% in 1998, which, however, rapidly increased to 91% by 2003. In the three Northern regions coverage decreased between 2007 and 2012, especially in the Northern region from 95 to 72%, whilst in the other two regions despite decreases in 2012, coverage still remained above 90%.

Polio

The proportion of children receiving 3 doses of the Polio vaccine increased over time from 71% in 1998 to 91% in 2011. Similar upward trends were observed across all regions with the exception of Greater Accra, where high proportions were maintained throughout, with an 85% coverage in 1998. Although it decreased slightly to 77% in 2003, the coverage rose consistently thereafter to 84% in 2011. The Central region had the lowest proportion of children covered with a 57% proportion in 1998, followed by a very steep rise to 89% in 2003. In the Northern regions, polio coverage between 2007 and 2012 remained high (>90%) in Upper East and Upper West but declined in the Northern region from 81 to 66%.

HepB and Hib

At least 80% of children were vaccinated against HepB and Hib in 2008 in all surveyed regions nationally except the Northern region where coverage was 76%. Vaccination against HepB and Hib was not yet introduced in all regions during 2007, hence data were not available for the Ashanti district and also not adequate to infer national level estimates. In 2011 coverage of HepB and Hib increased further to 93% nationally, following the introduction in 2007 of the combined pentavalent vaccine (Hepatitis B, DPT and Hib).

Nutrition indicators: Stunting and underweight

The national profile for malnourished children under the age of five showed no change in rates of stunting between 1998 and 2011 (25% versus 23%). The lack of change in stunting rates over a 13 year period is concerning and is perhaps a missed opportunity for community-based nutrition support through the CBAs, particularly given the gains in early breastfeeding and maintenance of EBF coverage. The proportion of underweight children declined from 25% in 1998 to 13% in 2011. Most regional estimates did not show marked differences from the national estimates. The Northern region had the worst child nutrition profile; the proportions of stunted/underweight children were 37% and 24% in 2011.

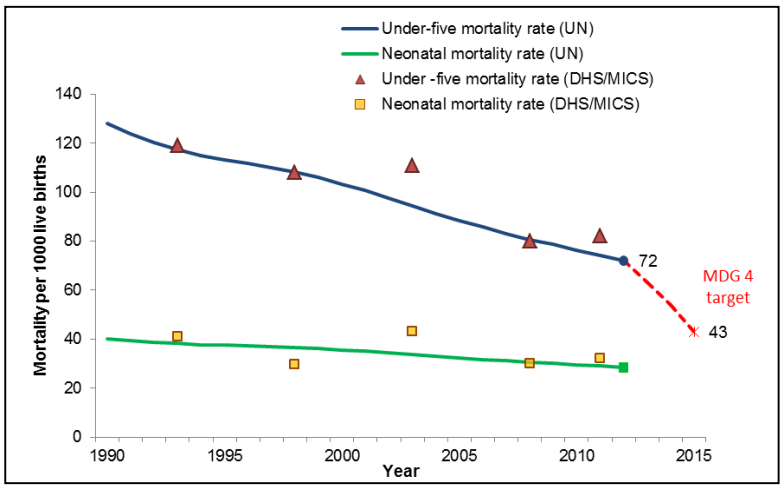
5.3 Impact

5.3.1 Change in child mortality

In 2012, 55,900 children under the age of five years died in Ghana. Despite major steps towards reducing its under-five mortality rate (U5MR), the decline has not been enough to achieve the target for MDG 4 for child survival. According to UN Inter-Agency Group for Child Mortality Estimation, under-five mortality has reduced 44% from 128 in 1990 to 72 deaths per 1,000 live births in 2013 (Figure 36).

Figure 36: Millennium Development Goal progress

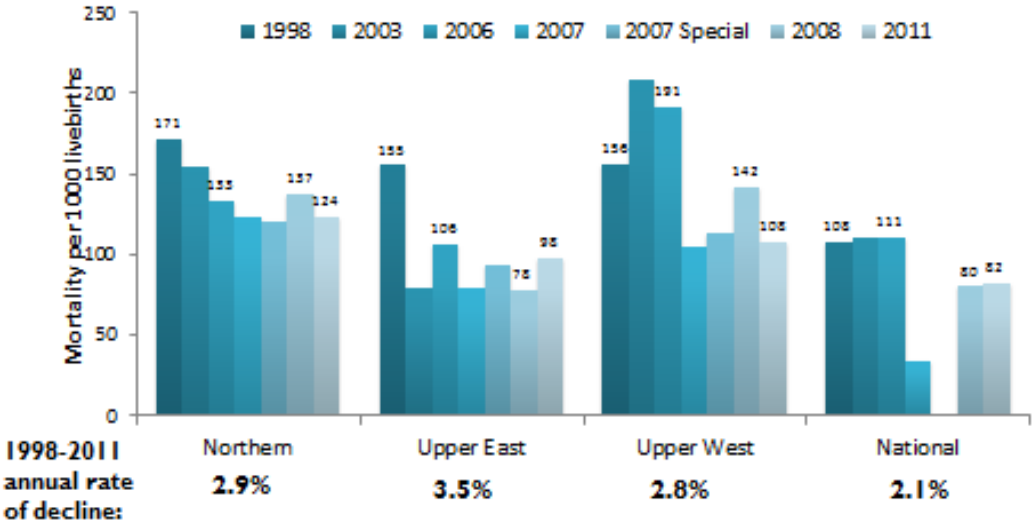
Data sources: IGME 2013 mortality estimates (www.childmortality.org), 1993, 1998, 2003, and 2008 Ghana DHS; 2011 Ghana MICS.



The national average rate of reduction is 2.6% per year, which is similar to the regional average (2.7%).[25] National survey data reported U5MR at 119 deaths per 1000 in 1993[26], 80 per 1000 in 2008[26] and 82 per 1000 for 2011[27], which is an average reduction of 2.1% per year. Northern and Upper West regions have consistently had the highest U5MR in the country with 124 and 108 deaths per 1000 live births in 2011, respectively[27] (Figure 37). The average annual rate of reduction in mortality in the three Northern regions was faster than the national average rate (2.1%).

Figure 37: Under-five mortality rates for the Northern regions and country since 1998, Ghana

Data source: 1998, 2003, 2007 and 2008 Ghana DHS; 2006, 2007, 2011 Ghana MICS. Note: Regional U5MR for the 10-year period preceding the survey. National U5MR for the 5-year period preceding the survey.



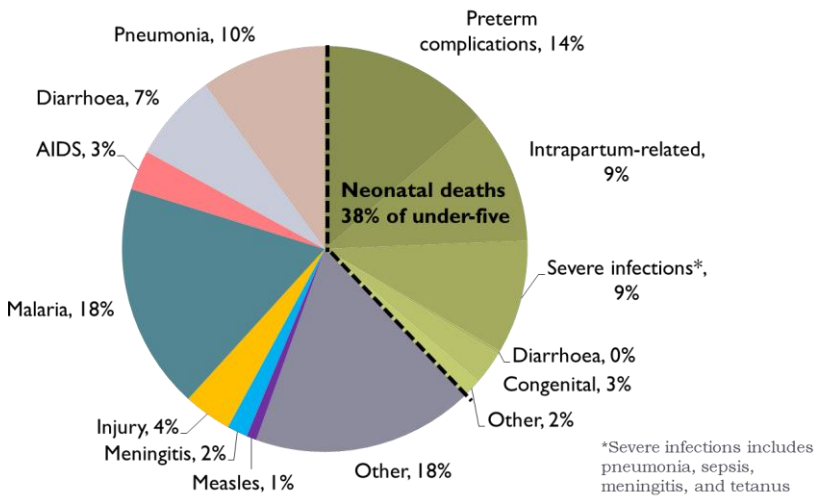
More than a third of child deaths occur in the first month of life (neonatal period), and this is an increasing proportion given that neonatal mortality rate (NMR) is reducing slower than post-neonatal mortality rates. The average rate of reduction since 1990 was 1.6% according to UN estimates. National survey data reports even less progress with NMR, at 41 in 1993 and 32 in 2011, and even increases in NMR in the three Northern regions (Northern, Upper East, Upper West). These same regions have all reported above the national average for NMR and U5MR.

The main causes of under-five deaths in Ghana are: malaria (18%), pneumonia (10%), complications from prematurity (14%), intrapartum-related (birth asphyxia) (9%), severe neonatal infection (9%) (Figure 38a).[7] According to modelled estimates, between 2000 and 2010, the proportion of deaths from malaria, pneumonia and diarrhoea has not had significant change (Figure 38b). Child deaths from measles reduced dramatically from 12% to 1% between 2000 and 2005. Ghana has a high rate of preterm births with 14 babies born too soon out of every 100 births.[28]

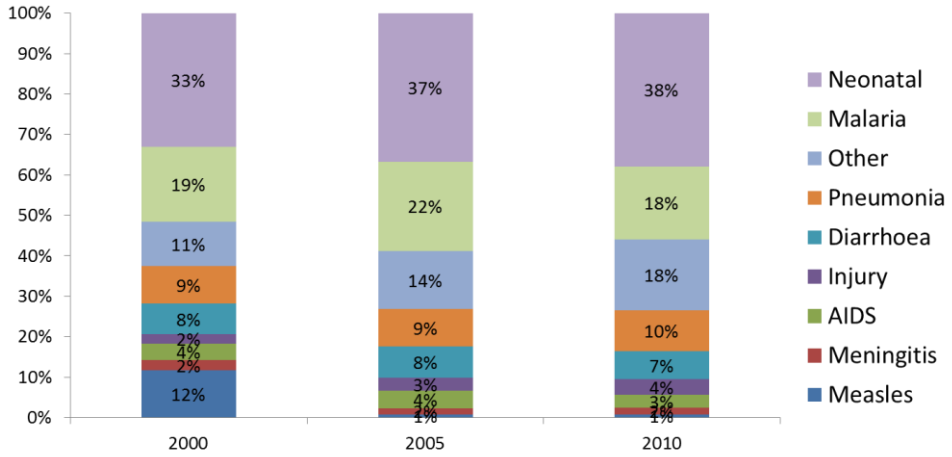
Figure 38: Causes of under-five deaths in Ghana

Data source: Liu et al, Lancet 2012.[7]

(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 lives saved by intervention considering three phases: 2000-2007 (pre-IHSS), 2007-2010 (Phase I IHSS of the programme), and 2010-2013 (Phase II of the IHSS programme with case management interventions). The proportion of child lives saved by intervention was calculated using the LiST-estimated number of child lives saved for each year in each phase (relative to the situation in 2000, 2007 and 2010, respectively) as a denominator. The results are presented by phase for each region. The proportion of deaths averted are provided by intervention, by phase in regional graphs (Figure 39).

Pre-IHSS implementation (2000-2007)

Before the implementation of the IHSS programme and during the ACSD pilot phase, more than 11,380 deaths of children under five were averted between 2000 and 2007 in the three Northern regions (Table 5). The main interventions contributing to the prevention of these deaths included: measles and Hib vaccines and ITNs for malaria prevention (Figure 39). The greatest proportion of deaths averted occurred in Upper West in 2007 (22%); yet the greatest number occurred in Northern region, which also had the highest number of births and deaths. The results from Upper East indicated a sharp increase in deaths averted in 2003 followed by a decrease given the coverage changes in measles vaccination increasing from 75% in 1998 to 91% in 2003 and then declining to 88% in 2006 and increasing again to 95% in 2008. Using the baseline regional U5MR from DHS 1998 and applying intervention coverage change from 2000, LiST predicted higher U5MR in 2007 than the MICS 2007 and DHS 2008, indicating that the model did not fully capture all of the health interventions affecting under-five mortality or factors outside of the health sector which played a role in the mortality decline.

Table 5: Results from Lives Saved analysis for three regions in Ghana for pre-IHSS implementation

	2001	2002	2003	2004	2005	2006	2007	Cumulative
Northern								
Proportion of under five deaths averted	3%	8%	9%	11%	13%	15%	17%	
Additional under five deaths prevented per year	251	711	889	1058	1236	1487	1648	**7,280**
Predicted under-five mortality rate	159	151	148	146	143	139	137	
Annual under-five mortality rate reduction	2.6	4.9	1.8	1.7	1.8	2.7	1.7	Average 2.5
Upper East								
Proportion of under five deaths averted	2%	3%	8%	8%	8%	9%	10%	
Additional under five deaths prevented per year	64	130	299	300	333	351	400	**1,877**
Predicted under-five mortality rate	149	147	141	141	140	139	137	
Annual under-five mortality rate reduction	1.4	1.5	4.3	0.0	0.9	0.6	1.5	Average 1.5
Upper West								
Proportion of under five deaths averted	3%	6%	11%	13%	16%	18%	22%	
Additional under five deaths prevented per year	65	146	269	331	399	465	548	**2,223**
Predicted under-five mortality rate	145	141	134	130	126	123	118	
Annual under-five mortality rate reduction	2.5	3.1	5.1	2.5	2.9	2.9	3.7	Average 3.4

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

Between 2007 and 2010, with the implementation of the IHSS programme and trained CBAs, approximately 1,900 deaths of children under five were averted in the Northern regions cumulatively, with the percentage of deaths averted ranging between 5% and 19% in 2010 (Table 6). Since this is over a shorter time period, the cumulative number of deaths is smaller, and as U5MR declines, it becomes increasingly hard to save additional lives without further gains in quality coverage of high impact interventions. The interventions accounting for the greatest contribution of deaths averted differed between the regions (Figure 39). ITNs for malaria prevention, antimalarials (ACT) and care-seeking for suspected pneumonia (used as a proxy for appropriate treatment for pneumonia), and ORS and zinc for treatment of diarrhoea contributed to 74% of deaths averted in Northern region. In Upper East, these same interventions together prevented 59% of child deaths; and improved care at birth also accounted for 28% of deaths averted. In Upper West, 17% of deaths were averted from ITNs for malaria and 36% of deaths were averted from improved care at birth. Interventions supported by the IHSS programme contributed to an average of 66% of all deaths averted, ranging from 50% in Upper West to 82% in Northern. Using the baseline regional U5MR from MICS 2007 and applying intervention coverage change from 2007, LiST predicted lower U5MR in 2010 than the MICS 2011 in every region.

Table 6: Results from Lives Saved analysis for the three Northern regions in Ghana for Phase I

	2008	2009	2010	Cumulative deaths prevented
Northern				
Proportion of under five deaths averted	2%	3%	5%	
Additional under five deaths prevented per year	135	240	345	**720**
Predicted under-five mortality rate	118	116	115	
Annual under-five mortality rate reduction	1.8	1.3	1.5	Average 1.4
Number (%) of deaths averted due interventions to which the IHSS contributed^	117 (88%)	204 (86%)	288 (83%)	598 (85%)
Upper East				
Proportion of under five deaths averted	4%	13%	19%	
Additional under five deaths prevented per year	114	325	470	**909**
Predicted under-5 mortality rate	89	81	75	
Annual under-5 mortality rate reduction	4.8	8.7	7.8	Average 8.3
Number (%) of deaths averted due to interventions to which the IHSS contributed^	77 (66%)	154 (48%)	292 (63%)	516 (58%)
Upper West				
Proportion of under five deaths averted	1%	4%	9%	
Additional under five deaths prevented per year	21	74	167	**262**
Predicted under-five mortality rate	112	109	103	
Annual under-five mortality rate reduction	1.2	2.8	4.9	Average 3.9
Number (%) of deaths averted due to interventions to which the IHSS contributed^	10 (52%)	55 (56%)	81 (49%)	134 (50%)

^As per page 5 of Schedule A of the Grant Agreement and the tailored Ghana programme implementation, in this context "IHSS programme interventions" in LiST are assumed to include maternal tetanus vaccination; PMTCT; exclusive breastfeeding; complementary feeding; ITN use and IPT in pregnancy; DPT, Hib, pneumococcal, 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).

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)

In Phase II with the implementation of iCCM, approximately 1,900 lives of children under five were saved in the three Northern regions cumulatively between 2007 and 2010 (Table 7), with regional variations from 18% of deaths averted in Upper East compared to 3% of deaths averted in Northern. ITNs for malaria prevention remained a leading intervention across the regions (Figure 39), coinciding with the IHSS programme support for the 'Hang-up' campaign. CBAs, through IHSS programme support, were involved in social mobilisation and distribution of these nets to households. The case management interventions (case management of malaria, pneumonia and diarrhoea) in Upper East averted nearly 484 child deaths (45% deaths averted) between 2010 and 2013, the majority of these resulting from case management of malaria with ACTs. For Upper West region, care seeking of suspected pneumonia resulted in averting 23% of total deaths, while ORS and zinc for diarrhoea treatment averted 10% of deaths. Interventions relating to care at birth continued to highly contribute to lives saved in Upper West (27% of deaths averted). In the Northern region, 38% of deaths averted (208 lives saved) were a result of case management interventions, case management of malaria with ACTs (12%), care seeking of suspected pneumonia (20%), and ORS for treatment of diarrhoea (4% of total); however, the majority of lives saved were a result of improvements to care at birth (31%).

The result that fewer lives were saved during Phase II reflects the fact that as mortality declines, it is more difficult to prevent deaths. In addition, the findings of this LiST analysis and the trend analysis indicate that coverage decreased for vitamin A and remained constant or declined for exclusive breastfeeding and immunisations (DPT3 and measles) resulting in more than 50 additional deaths in Phase I and over 100 additional deaths in Phase II (most additional deaths took place in Northern region). This finding underlines the importance of maintaining high coverage of interventions.

Table 7: Results from Lives Saved analysis for the three Northern regions in Ghana for Phase II

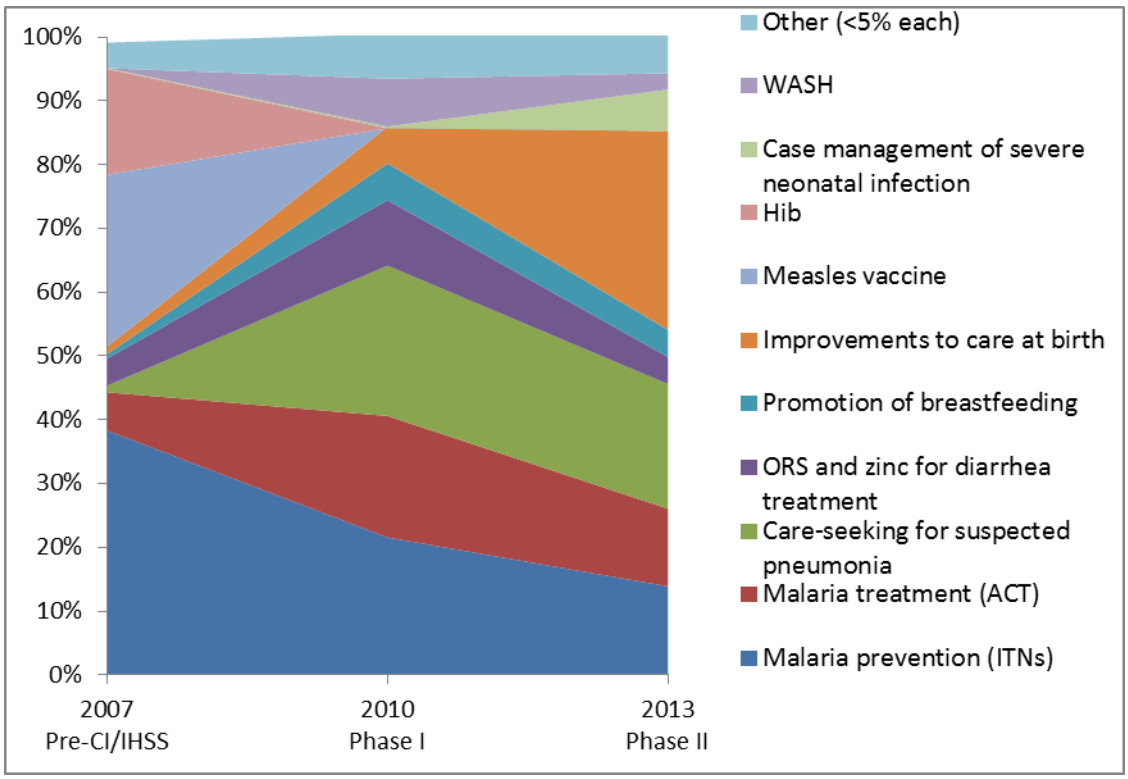
	2011	2012	2013	Cumulative deaths prevented
Northern				
Proportion of under five deaths averted	1%	3%	3%	
Additional under five deaths prevented per year	99	246	212	**557**
Predicted under-five mortality	122	120	121	
Annual under-five mortality rate reduction	1.2	1.8	-0.4	Average -0.7
Number (%) of deaths averted due to interventions to which the IHSS contributed^	76 (77%)	142 (58%)	120 (56%)	326 (60%)

Upper East				
Proportion of under five deaths averted	8%	18%	18%	
Additional under five deaths prevented per year	209	443	437	**1,089**
Predicted under-five mortality	90	81	80	
Annual under-five mortality rate reduction	8.4	10.7	0.4	Average 5.5
Number (%) of deaths averted due to interventions to which the IHSS contributed^	140 (67%)	264 (60%)	253 (58%)	657 (60%)
Upper West				
Proportion of under five deaths averted	3%	5%	6%	
Additional under five deaths prevented per year	59	96	120	**275**
Predicted under-five mortality	105	103	101	
Annual under-five mortality rate reduction	3.1	1.9	1.3	Average 1.6
Number (%) of deaths averted due to interventions to which the IHSS contributed^	33 (56%)	56 (60%)	79 (66%)	168 (62%)

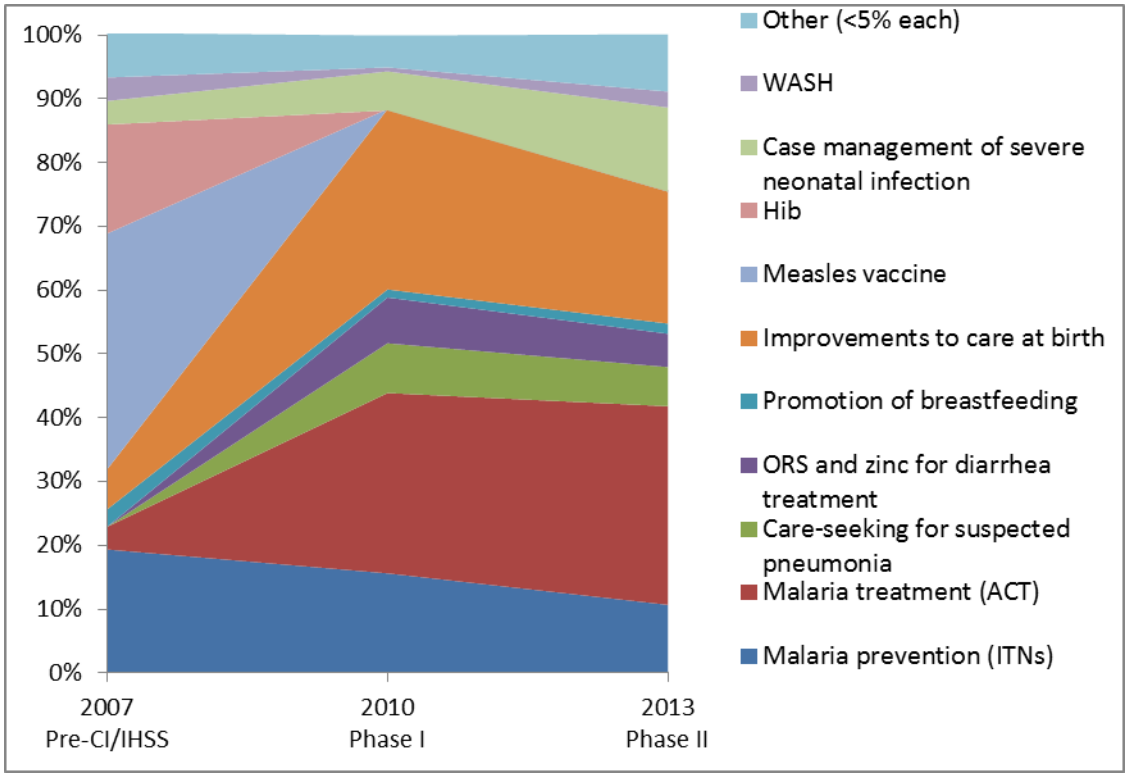
^ same details as noted in Table 6

Figure 39: Proportion of deaths averted by intervention for each of the three Northern regions

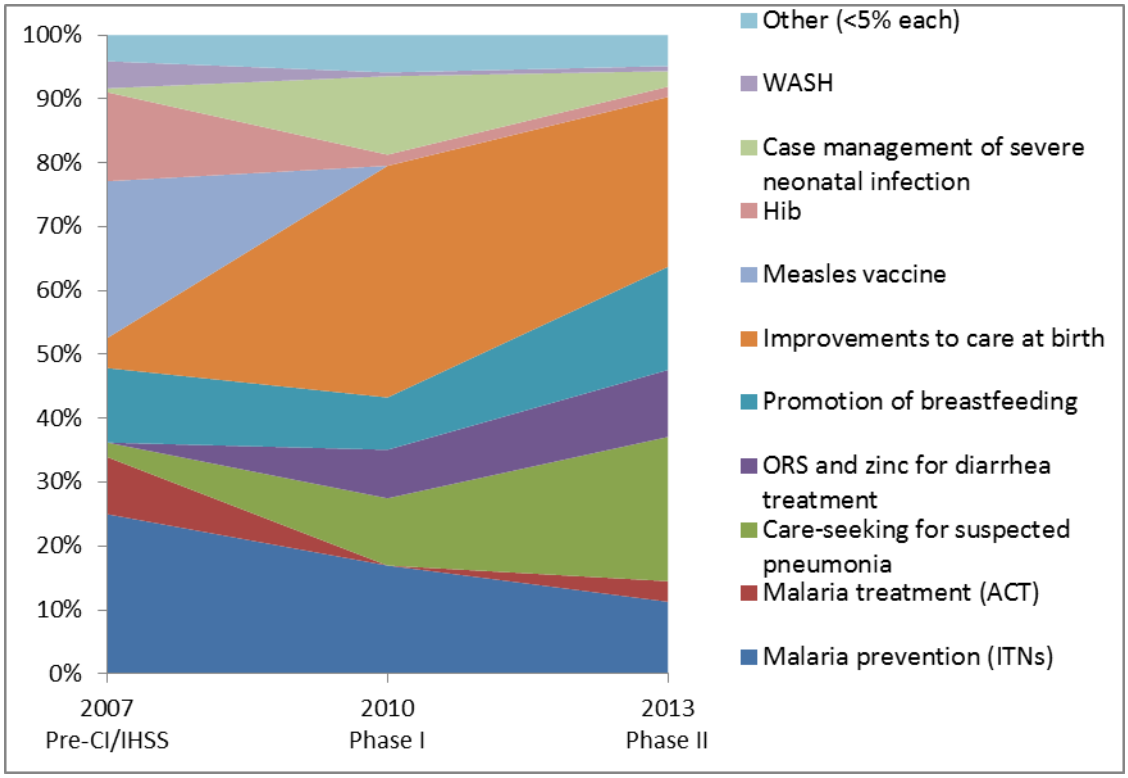
a) Northern region lives saved results



b) Upper East region lives saved results



c) Upper West lives saved results



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

The comparison of reductions in under-five mortality in the pre-IHSS Phase with Phase I and subsequently Phase II of the IHSS programme must consider that there were fewer potential additional lives to save over time. Reductions in stunting and wasting accounted for a large proportion of lives saved before the start of IHSS programme and are a result of changes in population-level risk factors. With increased focus on the IHSS programme interventions in 2007 and coverage gains experienced, it is plausible that a proportion of the lives saved presented are from the IHSS programme. In Phase I and II, the increases in lives saved from malaria prevention and treatment, case management of diarrhoea and pneumonia, and promotion of breastfeeding could partly reflect the start of the IHSS programme in these regions. Improvements to care at birth also resulted in a large portion of deaths averted after 2007 due to increases in facility deliveries and access to skilled care at birth.

The average annual rate of under-five mortality decline varied across the three phases assessed ranging from 0% to 5.1% over the 7 years pre-IHSS, with wider variation in progress between regions during Phase I (1.2% to 8.7%) and Phase II (-0.4% to 10.7%). 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 regional rate of under-five mortality decline seen in the Ghana between 1998 and 2011 using the DHS and MICS was faster than that predicted by LiST in Northern and Upper East. LiST predicted a faster mortality decline in Upper West region (Table 8).

Table 8: Mortality rate in 2011 and reduction from 1998 to 2011, MICS and LiST comparison

	Northern	Upper East	Upper West
Under-five mortality rate measured in MICS 2011	124	98	108
Average annual rate of mortality reduction (1998-2011)	2.49%	3.54%	2.81%
Under-five mortality rate predicted in LiST for 2011	134	106	103
Average annual rate of mortality reduction (1998-2011)	1.80%	2.91%	3.17%

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, by CBAs, for each of the 3 (Malaria, Diarrhoea and Pneumonia) conditions?
- What is the cost of increased utilisation?
- What is the financial sustainability of this programme?

The results below do not reflect the actual expenditure on the iCCM, although unit costs were extracted from expenditure data. They reflect expected costs if the intervention 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.

In 2012, a total of 16 812 iCCM trained CBAs were deployed. Each of them delivered an average of 10 iCCM treatments in that year. The average time per week on the iCCM programme (curative home visits for iCCM, share of meetings for supervision, planning or other purposes, kit replenishment and travel combined) amounted to under 1 hour a week.

5.4.1.1 Current cost per treatment

Additional annualised fixed costs per CBA stand at $125.65 per CBA, or divided by the number of treatments per CBA, at $12.3 per treatment (see Table 9 below), an average of 94% of total treatment cost, with drugs and tests accounting for the remaining 6%. The total cost of a malaria treatment, including fixed cost, rapid diagnostic test (RDT) and drugs as per protocol, stands at $13.68, diarrhoea treatment with ORS and zinc costs $12.45 and pneumonia treatment $12.41. Detailed costing tables are included in Appendix D.

Table 9: Additional annualised costs per CBA and per treatment for 2012

Additional Annualised Fixed Cost by CBA	Total	# MDP treat/year /CBA	Fixed Cost per Treatment
Training	22.02		
Equipment	57.50		
Management & Supervision	40.14		
Other Overheads 5%	5.98		
Total Additional fixed cost	125.65	10.23	12.28

Drug/ Diagnostic	Total Cost	Paid by Patients	Paid back to CBA	Government Cost
Malaria	1.52	0.25	0.13	1.40
Diarrhea	0.35	0.35	0.18	0.17
Pneumonia	0.38	0.50	0.25	0.13

Cost per treatment 2012-13	Fixed Cost	Government Drug/ Diagnostic Cost	Total	Fixed costs as % Total
Malaria	12.28	1.40	13.68	90%
Diarrhea	12.28	0.17	12.45	99%
Pneumonia	12.28	0.13	12.41	99%
Weighted Average Cost per Treatment	12.28	0.76	13.04	94%

MDP=malaria, pneumonia, diarrhoea

5.4.1.2 Scenario for increased iCCM service utilisation

If the annual number of treatments per CBA increases by 15%, the fixed costs per treatment would decrease from $12.28 to $10.68 and to $9.45 if the number of treatments increased by 30%. The total additional cost of treatments which amounts to $2.24 million in 2012 would be only 0.9% higher with an increase of 15% in treatments, and 1.7% higher with an increase of 30% in treatments (Table10).

Table 10: Country level cost of increasing iCCM treatments by 15% and 30%

	2012	With 15% increase in treatments	With 30% increase in treatments
Fixed Cost per Treatment	12.28	10.68	9.45

Cost per treatment varying coverage	2012	With 15% increase in treatments	With 30% increase in treatments
Malaria	13.68	12.08	10.85
Diarrhea	12.45	10.85	9.62
Pneumonia	12.41	10.81	9.57
Weighted Average Cost per Treatment	13.04	11.44	10.21

Annual Cost for the country	Actual Treatments	With 15% increase in treatments	% Cost Increase	With 30% increase in treatments	% Cost Increase
Malaria	1 142 051	1 159 447		1 176 970	
Diarrhea	695 927	697 268		698 693	
Pneumonia	405 155	405 732		406 359	
ICCM basic	2 243 133	2 262 447	0.9%	2 282 022	1.7%

Recognising that implementation of iCCM also requires strengthening of supporting structures, an additional 15% was added to the total iCCM costs in the analysis of sustainability (iCCM+). The annual costs for the country of iCCM+ would stand at $2.58 million for the current number of treatments, $2.60 million if the number of treatments increases by 15% and $2.62 million if the number of treatments increases by 30%.

The costs above are annualised to assist with future planning and sustainability analysis. Because a large part of training and equipment expenditure takes place at the beginning of the programme, actual expenditure per initial year is higher than annualised costs. However, annualised costs represent the average costs with the maturing of the programme in some regions and the initiation of the programme in others.

To assess whether this investment is justifiable in financial terms, the average cost per iCCM treatment was compared to the cost of a visit at PHC level. In the absence of information on cost per visit at CHPs and cost per visit at health centres, average cost of an ANC visit in a health centre is used as a proxy. At $13.04 per treatment, iCCM cost is high compared to the average cost of an ANC visit with a nurse in a health centre which stood in 2010 at $18, or $17.4 for recurrent costs.[29] However, the purpose of the iCCM program is to increase accessibility and create new demand. The low number of treatments per CBA per year raises the question of whether in its current form the program is able to increase access to services. In turn, if the number of treatments increases the cost per treatment will decrease as seen earlier, making the program both effective in terms of its objectives but also more justifiable financially.

The low number of treatments per CBA is a function of a variety of factors:

a) Drug stock-outs may have resulted in CBAs being unable to satisfy existing demand for treatment services. A repetition of this situation may lead to demand no longer being expressed.
b) Fees for drugs: financial barriers are the most common main reason for a low level of demand for iCCM treatments. This is accentuated in Ghana by the fact that patients enrolled in the NHIS would not pay any fees in CHPS or health centres. If drugs were free, government in collaboration with partners, would pay the total costs of the drugs plus the incentives to CBAs, as currently the CBAs incentive is paid from the patients' contributions. The impact on the health services would be an increase in costs of iCCM by 2.5% ($56 753) for the current number of treatments, by 2.9% ($65 265) if the number of treatments increases by 15% and by 3.2% ($73 778) if the number of treatments increases by 30% (Table 11).

Table 11: Additional costs if drugs are free for patients

	Actual Number of Treatments	With 15% increase in treatments	With 30% increase in treatments
Malaria	20 868	23 998	27 129
Diarrhea	19 561	22 495	25 429
Pneumonia	16 324	18 772	21 221
Total	56 753	65 265	73 778
% of ICCM costs	2.5%	2.9%	3.2%

c) Acceptability of the training level of CBAs. The CBAs have very low levels of education, if any and many are illiterate. This fact may affect the level of trust in their skills and impact on

demand level. However, if higher skilled staff were recruited it is likely that the level of incentives which would have to be paid may have to increase significantly, in turn increasing costs but potentially increasing the level of demand.

d) The under-five catchment population per CBA is low, with an average of 72 children per CBA, substantially lower than Ethiopia's 377 and Mali's 300. This small catchment population explains in part the low level of treatment per CBA per year. Currently there are two CBAs per community. If this number was reduced to one, each CBA would have an average catchment population of under fives of 150, and would provide 1.6 treatments a month, still only 20 a year. The cost per treatment would reduce by an average of 47%, and would stand for the current level of utilisation at $6.90, down from $13.04, and compared to the average of $18 for an ANC visit with a nurse in a health centre.

Halving the average number of CBAs per community could make maintaining this program more justifiable financially. However, better understanding and actions on the factors which influence the current low level of demand would fully justify an investment which reaches its objectives in terms of increased access and health status.

5.4.1.3 Financial Sustainability

iCCM under IHSS programme support was implemented in the three Northern regions of Ghana. To assess the financial sustainability of iCCM, the additional expenditure on iCCM in the Northern Regions was compared to the total annual public health expenditure (government and donors) of this region, where breakdown of health services expenditure per level of care was available for 2011. Of the Northern Region public health services expenditure 21.1% ($2 837 635) was spent on District Health Services. With 5 083 CBAs and 10.2 treatments per CBA per year, the calculated iCCM cost would be $678 113, representing 24% of District Health Services expenditure and 5% of the region's public health services expenditure. The Northern Region represents 10% of the total population of Ghana.

In order to assess the sustainability of iCCM if it was extended to the whole country, Northern Region iCCM costs were extrapolated to the country from the share of Northern Region population. However, it was assumed that there would be only one CBA per community. The required number of CBAs for the country would stand at 25 415 and at 20.4 treatments per CBA per year, the iCCM basic cost would stand at $3.58 million, representing 0.34% of the country's public health expenditure and 0.46% of the government's own health expenditure. Adding 15% to iCCM basic cost to include related systems strengthening activities, would put the cost of iCCM+ at $4.11 million, representing 0.39% of the country's public health expenditure and 0.52% of the government's own health expenditure. Increasing the number of treatments per CBA by 15% and 30% would increase the share of government expenditure only very marginally, moving from 0.52% to 0.53% and 0.54%, respectively (Table 12).

Table 12: iCCM as a proportion of public health sector funding

	Total 2011 ($)	Government own	Donors
Public Health expenditure	100.00%	74.8%	25.2%
	1 050 563 052	785 325 088	265 237 964

If 1 CBA/Community	Current	With 15% increase in treatments	With 30% increase in treatments
Number country CBAs	25 415	25 415	25 415
Number Treatments	518 466	596 236	674 006
ICCM basic			
Cost ($)	3 577 299	3 635 909	3 694 912
% Public Health Expenditure	0.34%	0.35%	0.35%
% Government own Expenditure	0.46%	0.46%	0.47%
ICCM+ (+15%)			
Cost ($)	4 113 893	4 181 295	4 249 148
% Public Health Expenditure	0.39%	0.40%	0.40%
% Government own Expenditure	0.52%	0.53%	0.54%

However, the maintenance of the current level of public health expenditure is unclear. Public health expenditure has decreased steadily from 15% of the government's expenditure in 2007 to 12% in 2011, and from 3.7% of GDP in 2007 to 2.7% in 2011. Many informants emphasized that additional funding will not come from the government, and that donors are indicating their plans to progressively decrease their financial participation as Ghana is getting richer through its mineral resources. In fact the significant increase in GDP in 2010 has not been maintained, and the government health budget has to respond to many urgent demands: increasing the number of NHI beneficiaries, as well as catching up with the refund backlog to districts/facilities for expenditure on NHI beneficiaries.

iCCM was set-up to respond to a real need of lack of access to services, in particular for the poorest and most vulnerable in the population. This has highlighted issues affecting both demand and supply sides affecting both impact on health status but also impact on cost and sustainability of iCCM. If demand increased significantly, it is likely that health impact would improve. Given the slow roll out of CHPS, extending iCCM modified with the lessons from the IHSS pogramme may be a justifiable stop gap measure. With the increase in the number of CHPS, the relative roles and functions of these two levels of care will need to be evaluated.

5.4.2 Qualitative findings related to Sustainability

In many of the interviews informants expressed a great fear of how iCCM would continue once the IHSS programme funding ended. This was particularly concerning due to the fact that iCCM only operates as an integrated intervention treating all three conditions in the Northern regions, and it is, therefore, not implemented on a wide scale by the Ghana Health Service. A development partner informant described the broader level issues regarding health care funding:

> *"The Ministry of Finance doesn't want to invest more in health because health facilities can generate their own funds (through the NHIS)."*

There is also the awareness that Ghana is a middle income country and the implications of this for donor funding:

> *"Ghana is now a middle income country. Some donors are making exit plans"* (Partner).

It was widely acknowledged that UNICEF has been the driving force behind the successful implementation of iCCM in the Northern regions of Ghana:

> *"UNICEF has made a large contribution to iCCM in the Northern Regions. They funded development of training materials, printing, M&E, registers, bicycles, kits, flash lights, medicines, counselling cards, boots."* (GHS staff)

An informant from a development partner described the importance of government ownership to the sustainability of iCCM:

> *"There should be some level of ownership by government for sustainability. This is one of the key challenges. Government is very slow. It is difficult to get consensus from government. There should be strong leadership, ownership."*

The UNICEF staff have been acutely aware of the need to ensure sustainability of iCCM as one staff member explained:

> *"Since 2012 UNICEF has been implementing an exit strategy – ACTs have been taken over by national malaria control programme, zinc is part of the essential drug kits (procured by government), ORS is part of GHS. Only amoxicillin is still being support by UNICEF."*

In order to ensure that iCCM has a chance of continuing, the UNICEF office has committed to still support refresher trainings with other funds when DFATD funds end. UNICEF has also been appealing to the District Health Services to take over incentives for CBAs (when they come for meetings) as one way to continue motivating them. A District director also described his attempts to fund iCCM beyond 2013:

> *"We have approached other NGOs to take over when UNICEF/DFATD funding ends."*

In addition to iCCM, UNICEF also plays a major role in supporting nutrition programmes in the Northern regions. There were attempts a few years go to produce Plumpy Nut locally. They tried to start up but the price was no less than importing from Nutriset through UNICEF, so it was abandoned. DFATD, through UNICEF, is the biggest funder for nutrition and health in the three Northern regions contributing 85% of expenditure in the region.

The lack of inclusion of CBAs in the NHIS was described as a factor that could impact on the sustainability of iCCM given that IHSS programme funding has come to an end:

"It is still a struggle to get CBAs to be included in the NHIS. There has been lots of advocacy by UNICEF with the regional NHIS schemes. In some districts CBAs are included in the NHIS but it is very unofficial. CBAs must take the clients NHIS card to the local CHPS to claim there as if the child was treated at the CHPS. It sometimes takes days for CBA to get the card to the CHPS. In places where the CBAs are getting reimbursed by the NHIS they are very enthusiastic. In one district the district director gave the CBAs petty cash while they wait for the reimbursement from the NHIS (in Upper East region)." (Partner)

"iCCM sustainability is threatened if it is not included in the NHIS." (another Partner)

Challenges with basic resources

Overall from what the evaluation team was exposed to it found that rural Ghana has poor infrastructure. In the places visited access to sanitation, electricity, tarred roads, transport and equipment were largely missing. CBAs offered their services from their homes or from the homes of their clients, working with nothing but the rudimentary medical kits supplied by UNICEF, and often having to conduct their services on foot because the bicycles they had been supplied with years ago were by now in serious disrepair. Although they expressed joy in their task, these infrastructural challenges were not unnoticed. As one CBA stated:

"Mothers in the community appreciate my work. It would help if we had a constant supply of medicines. The biggest challenge is transport. I also need a cell phone. My bicycle is broken. A motorbike would be a big help."

Another CBA described the lack of supplies to help them do their work:

"Once the community is aware that you have the treatment then they'll wake you. We're woken up in the night when it's raining and we have no raincoat, no boots, and the bicycles are spoiled (broken)."

Another CBA explained:

"We work at night with no lamps. We use fire light and people come to the house."

Another CBA mentioned the desire to have a uniform:

"We want a form of identification (uniform). This will make us unique and people will know what we are doing."

Transport emerged as a major challenge for the CBAs. Although they were given bicycles when the programme started in 2007 most of these were now in disrepair as one CBA explained:

"I can't help a woman with a child get to hospital with no bicycle. It is a 3 hour walk to the facility. There is no CHPS close to us" (CBA)

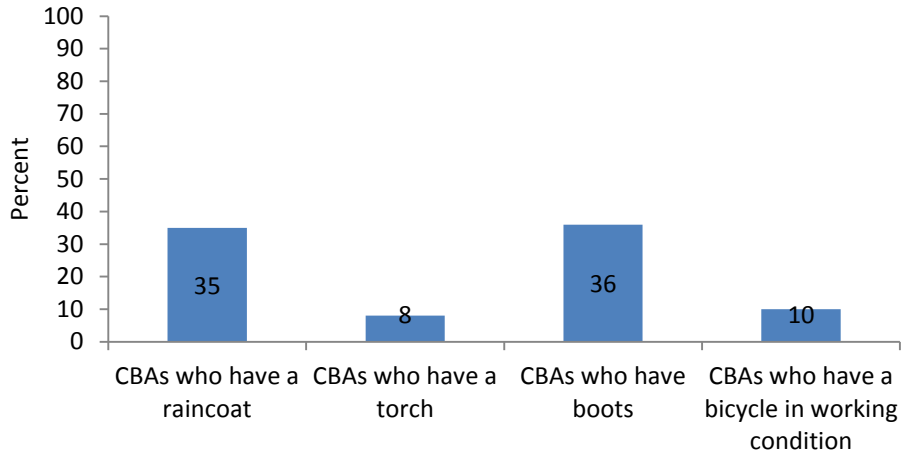
But the problem of transport was not limited to CBAs. CHOs are facility-based but do outreach four times a month to a public place in the communities. CBAs assist with this outreach. The CHOs communicate with CBAs through clients (coming to the clinic) who live near the CBAs. Transport for outreach services and supervision of CBAs was raised as a problem by facility staff:

"Transport is a problem – we need strong motorbikes. We mostly travel on motorbikes. We got one vehicle for the district from UNICEF for supervision." (Nurse)

The lack of transport posed a serious threat to the sustainable delivery of services, because without a means of reaching clients, or of CHOs reaching CBAs, services cannot be delivered and medicines cannot be collected.

Data from the LQAS survey confirms these reports of lack of equipment amongst CBAs. Figure 40 shows that less than 20% of CBAs across all three regions had a torch or a bicycle in working order and less than half had a raincoat or boots.

Figure 40: Availability of basic equipment for CBAs, 3 Northern Regions 2012 LQAS



6 Conclusions

6.1 Relevance

It was clear during this evaluation that the CI/IHSS programme was well received at both government and community levels in the three Northern regions of Ghana. This was facilitated by the fact that the change in the Child Health Policy to allow CBAs to administer antibiotics and zinc coincided with the early phase of implementation of the programme, thereby allowing for iCCM to take place. As the qualitative findings show, government was supportive of the roll out of iCCM with UNICEF/DFATD funding, CBAs were generally satisfied to be the frontline workers implementing it, and community members expressed gratification in having a treatment point for their children in close proximity to where they lived. The data also show that the CI/IHSS made a huge contribution in terms of training CBAs and equipping them. Through the IHSS programme a platform for community-based service delivery has been established in Northern Ghana. There are several aspects that require strengthening in order for the programme to reach higher levels of utilisation and effectiveness.

Lack of ownership and integration by government

Although this programme fitted within national policy, and although the government was involved in aspects of its implementation, particularly at a regional level (such as conducting the training), the evaluation team's experiences in the field suggest that there was very little government ownership of the programme. Instead, it seemed clear that GHS officials facilitated UNICEF's ability to implement the programme, and they did as much as they could to not stand in the way of the programme, but it never became theirs. Although, one participant suggested that the government was not committed to iCCM, this was not obvious from any of the other interviews, or from our observations. Still, it was also not clear as to why GHS was interacting with the IHSS programme as a UNICEF programme, rather than as a GHS programme. In fact, the lack of ownership only became clearer as the team visited other countries in which iCCM was being implemented and, thus, was able to compare the different governmental approaches to iCCM. Without ownership, iCCM seemed to operate alongside of the public health service rather than within it. What was equally interesting, however, was that while there may not have been a strong sense of ownership by government, there certainly was a sense of government dependency on UNICEF to continue with iCCM implementation. This sense of dependency was accompanied by a sense of anxiety as to what would happen should UNICEF withdraw. As an expenditure analysis of the free maternal care programme of the Ghana National Health Insurance Scheme[20] has shown, this sense of anxiety is not unfounded. Ankrah Odame and colleagues [20] showed through their analysis that although there was an initial grant by the British government to start iCCM, that the recurrent high expenditure costs, after start up, were not sustainable by government. Furthermore, these authors argue for the need to have a sustainability plan – such a plan was never mentioned in any of our interviews.

6.2 Effectiveness

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

Focus on informal rather than formal salaried health workers

Further evidence that IHSS programme occurred alongside, rather than within the public health service, was the fact that the main human resources implementing iCCM are voluntary CBAs rather than formal government-paid health care staff. All of the training and supply of kits, drugs and other equipment was focused on the CBAs. Yet, these CBAs are unpaid volunteers, who only receive a token for their services from clients, are not formally accountable to the government, and hold a tenuous and unpredictable position in the system. Although the evaluation team saw clear evidence of their commitment, and even clearer evidence of the commitment of the zonal coordinators who supervised them without any financial incentive, the CBAs could withdraw their services at any point, without government recourse to make them stay. Although the team was told by CBAs that they worked several hours each day, this response probably reflects a social desirability bias since the team was also told that CBAs would leave their villages for long periods (weeks) at a time to attend to their other livelihood supporting activities, such as farming. The 2013 CBA survey data shows that the median number of hours worked by CBAs in a day was 3 (IQR 2-4), and the median number of days worked per week was 2 (IQR 2-3). Despite several expressions of altruism, it was not clear that the CBAs would for example continue to do health promotion should their drug supply come to an end, thus ending their ability to gain an income from the tokens received from selling drugs. The weaknesses in using voluntary CBAs to deliver community-based services was raised in the evaluation of the ACSD programme[8], however was not addressed prior to the scale up of the approach through IHSS programme.

Furthermore, there was no evidence of demand creation strategies which may have increased the utilisation and time spent by CBAs, although, demand creation in the absence of an incentive system may not be very effective.

The data (both qualitative and quantitative) from this evaluation showed very little evidence of the inclusion of the CHOs and CHNs in the programme. These CHOs and CHNs were two levels above the CBAs (with zonal coordinators in between), and were the first level of formal health workers. They were also expected, in conjunction with the zonal coordinators, to supervise the CBAs. Yet as the data showed, not all of the CHOs and CHNs were trained in iCCM either as part of the programme or as part of their pre-service curriculum. This lack of training raises concerns about the quality of their capacity to supervise CBAs implementing CCM. The qualitative interviews suggested that there was some anxiety about the cost of training this group since it was believed that it was hard to retain them in the rural areas, and as a consequence high attrition and turn over were a big problem[30]. This anxiety about CHO and CHN retention, as compared with CBAs who lived in the villages in which they worked, may have inadvertently contributed to the lack of focus on this level. However, this does raise questions for the long term sustainability of the programme since CHOs and CHNs are a fixed component of the public health system, while CBAs come and go with programmes. It was interesting that some facility based staff raised questions about the education of CBAs, while they were the ones who lacked training in iCCM.

Exclusion from the NHIS

As a consequence of CBAs not being included in the formal health system, payment for their services was also excluded from the NHIS. This exclusion had two consequences. Firstly, it meant that CBAs had to charge for their curative services, by asking community members seeking treatment to pay a token for the medication received. Secondly, this token may have resulted in caregivers who were registered with NHIS, bypassing CBAs in favour of facility visits where they could receive treatment for free. However, survey data showing an increase in no care-seeking between 2008 and 2011 is worrying since it coincides with the introduction of the NHIS. Further research is needed to determine whether NHIS requirements could be having a detrimental effect on care-seeking.

Although findings from interviews indicate that various arrangements were being made on the ground in order to informally include the token in the NHIS reimbursement, officially CBAs were not part of the NHIS, and the quantitative data suggests low utilisation of their services. This NHIS exclusion was expressed as a continued problem by UNICEF country staff who remained unsuccessful in their attempts to lobby the government to change this policy. Given that both the qualitative interviews and previous research[17-21] have indicated that the NHIS is already oversubscribed and overburdened, it is unlikely that CBA services will be easily incorporated.

Logistical and supply difficulties

Despite the fact that the IHSS programme was funded and supported by UNICEF, who attempted to work with government to resolve bottlenecks, implementation was plagued by difficulties around supplies and logistics. As described in the findings above, stock-outs were a major problem. This problem was caused both by the lack of availability of stocks in the facilities as well as the CBAs' lack of transport to fetch the drugs from the facilities when they were available. Commodity data shows that sufficient quantities of drugs were purchased but the systems for moving these drugs from central or regional medical stores led to stock-outs at lower levels. At present most of the drugs (except ACTs) are procured through donor funding, including large support from UNICEF. It is unclear how the government will sustain the drug supply in the absence of UNICEF support.

The lack of transport caused multiple problems, not limited to the CBAs' difficulty in collecting drugs. Although UNICEF initially supplied bicycles to CBAs and zonal coordinators, these bicycles were now in disrepair and were not being replaced or repaired. This meant that all of their work had to occur on foot including household visits and supervisory visits. Given that the CHOs and CHNs were also frequently without transport, having neither working bicycles nor working motorbikes, they too could not reach either the CBAs or their communities, which meant limited outreach work and limited supervisory visits.

In almost all community level interviews, whether with the village chief, mothers or CBAs, the lack of supplies and equipment, was lamented. Concerns were raised around the lack of replenishment of the kits (not limited to drugs), raincoats, flashlights, boots, uniforms, etc. All of these requests related to the CBAs' ability to carry out their tasks effectively and move around their communities with ease. If supply of these goods proved to be so problematic with UNICEF's involvement, it raises serious questions around the government's ability to reequip CBAs in the absence of UNICEF support, especially given the argument that government is ill prepared to afford recurrent programme costs[20].

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

With regard to trends in coverage indicators, improvements are noted in early initiation of breastfeeding, coverage of ITNs, IPTp, ORS, care-seeking and treatment of fever and care-seeking for pneumonia. Coverage levels were maintained for exclusive breastfeeding, measles vaccination, DPT3 and vitamin A supplementation. The increase in care-seeking for pneumonia is a very positive finding; even if the majority of care-seeking was not at the level of the CBAs or CHOs/CHNs, analysis of wealth data reveals that they were reaching the poorest children. The LQAS survey shows that 2% of children with suspected pneumonia were treated by CBAs and 8% by CHOs/CHNs.

In terms of the contribution of IHSS programme to improving equity in access to services, a mixed picture is presented. For several indicators coverage increased significantly in the poorest quintile (IPTp, vitamin A, care-seeking for fever), and the gap between the richest and the poorest wealth quintiles narrowed significantly for DPT3, whilst for other interventions there was no improvement in coverage amongst the poorest (e.g. anti-malarial drugs, tetanus toxoid, care-seeking for pneumonia, ORS). Coverage of ITNs and postnatal care was significantly pro-poor since coverage was higher amongst the poorest quintile in 2011, although in the case of postnatal care this reflects a decline in the richest quintiles and no change in the poorest.

With regard to iCCM, utilisation data suggest that there is little contribution of CBAs to the treatment of malaria, pneumonia and diarrhoea. Routine data shows that CBAs were treating on average only 9 children per year during the period of the IHSS programme. Data from the recent LQAS survey confirm this as it shows that an average of 4% of children who sought care for malaria, pneumonia or diarrhoea were seen by a CBA. The survey amongst CBAs confirms the reports by mothers in the household survey showing that the median number of cases of diarrhoea, malaria and pneumonia seen by CBAs in the previous month was zero. There could be several reasons for this; the exclusion of CBAs from the NHIS, improvements in geographic access to facility-based care, lack of attention and funding to demand creation strategies, stock-outs of drugs affecting trust in CBA services, and the fact that the CBAs are voluntary and spend little of their time on iCCM. Most of these CBAs are in the Northern Region of Ghana, which has the largest landmass of all regions in Ghana, low population density, with isolated, sparsely distributed communities that are grossly underserved. Assessing trends in care-seeking in the three Northern regions has revealed that care-seeking to government health facilities and other sources of care (drug vendors, shops etc.) has decreased between 2008 and 2012, whilst care-seeking at community level and no care-seeking has increased. Therefore, community-based service delivery does appear to have replaced some of the previous care-seeking at public health facilities and shops; however, the increase in no care-seeking is concerning.

6.3 Impact

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

Although Ghana has achieved some reduction in under-five mortality, it is not enough to achieve the target for MDG 4 for child survival. During the IHSS programme period, increases in coverage occurred for infant feeding (early breastfeeding) and for care-seeking for suspected pneumonia and fever, ORS and coverage of ACTs. The ACSD evaluation also found a significant increase in early initiation of breastfeeding[8] which has been maintained at a similar level since 2003. This is likely due to the continued increases in skilled attendance at birth.

With increased focus on the preventive interventions during Phase I and subsequent coverage gains in care-seeking, it is plausible that the IHSS programme contributed to under-five lives saved. In Phase I, ITNs for malaria prevention was a leading intervention saving lives across the three regions, coinciding with the IHSS programme's support for the 'Hang-up' campaign. CBAs, through IHSS programme support, were involved in social mobilisation and distribution of these nets to households. There were regional variations in prominent interventions that saved the most lives in Phase II. Case management (of malaria, pneumonia and diarrhoea) interventions were prominent in the lives saved results across the three regions. Improvements to care at birth consistently saved a large proportion of lives across regions and time periods. 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.

6.4 Sustainability

6.4.1 Programme Costs

Costed according to protocol, iCCM treatments for malaria, diarrhoea and pneumonia have a weighted average cost per treatment of $13.21: $13.81 for malaria treatment, $12.7 for diarrhoea treatment, and $12.63 for pneumonia treatment. This is a high cost given that the treatment is delivered by volunteers who often are iliterate.

Drugs only represent 7% of the cost of iCCM treatment, with the main cost driver (93% of total costs) being the fixed costs. Fixed costs reflect the annualised expenditures incurred for each CBA: cost of training, kits and supervision. As volunteers, CBAs do not receive a salary. The impact of fixed costs on the total cost per treatment is, thus, a function of the number of treatments per CBA per year. The lower the number of treatments, the higher the fixed cost per treatment.

On average, each CBA provides 9 iCCM treatments a year, and there are 2 CBAs per village, each covering an average of 72 children under the age of five. This is very low in comparison to CHWs delivering the same programme in Mali, where they cover an average of 300 children. In volunteer-based programmes, fixed costs per CHW are often under-estimated and optimising the use of the volunteers is often not seen as a necessity. If the number of CBAs per village was reduced to one, the average cost per iCCM treatment would be reduced from $13.2 to $7, and the CBA would spend an average of 1.6 hours a week on iCCM.

6.4.2 Likelihood of sustainability

During our interviews, regional and districts managers indicated that they will be able to cover the costs of medicines (with the help of the Global Fund for malaria medicines), but will not be able to cover the cost of refresher training or replacement of kits (in particular bicycles). This threatens the sustainability and quality of iCCM delivery, even if it is volunteer-based. Currently iCCM costs (fixed costs and supplies) in the 3 Northern regions represent 0.22% of the country's public health expenditure (government and donors) and 0.29% of the government's own health expenditure. If the number of CBAs was halved, and the same total number of iCCM treatments maintained, these proportions would stand at 0.12% and 0.16%, respectively. If iCCM was rolled out to hard to reach areas throughout the country the costs would likely hover around 1% of 2011 public expenditure if the number of CBA would be kept at one per village. Only on this condition would iCCM be sustainable,

despite the numerous demands on the health sector funding. The proposal for incentives for CBAs would need to be costed to assess its affordability.

However, if the number of beneficiaries of the NHIS increases, as is the objective of the government, the level of utilisation of iCCM services may decrease as payments are not required in facilities staffed by CHOs. The cost of iCCM would then be high compared to its benefits, even if higher cost may be justified to secure increased access.

No costing or information on utilisation of CHPs services could be found. It is unclear whether in a situation of low utilisation of iCCM services, an investment in strengthening CHP level of care would bring more benefit, or not, than the current iCCM approach.

It is our understanding that UNICEF Ghana intends in the future to shift iCCM services from CBAs to CHNs and CHOs at the CHPS (health post) level, with the exception of hard to reach areas where CBAs will continue their treatment functions. This is a reasonable shift given the context in which CBAs are not included in the NHIS and do not receive any government salary. Furthermore, currently most care-seeking at community level is to CHOs/CHNs, and thus it would be wise to strengthen this level of care. There has also been a shift within UNICEF Ghana to a focus on home-based newborn care for which training began in 2013. Furthermore GHS in the Northern region with the support of UNICEF has drafted a community volunteers' incentive package which is being considered by the National Ministry of Health.

7 Strengths and limitations of the evaluation

7.1 Strengths and limitations of the quantitative component

The strength of the Ghana evaluation is the large amount of survey data available for analysis. Regarding household survey data, a statistical trend analysis was performed on all available data points over five time periods corresponding to pre-IHSS, Phase I and Phase II of the IHSS programme. Where necessary, indicator definitions were adjusted to ensure valid comparisons over time between survey types. A limitation of this evaluation is the lack of a comparison group or counterfactual. National estimates have been presented in the figures but this is not a true comparison as various forms of iCCM (with and without pneumonia treatment) are occurring in other parts of the country.

The programme in Ghana operated in the three Northern regions and this limited sub-group analysis such as by wealth quintiles where the 4th and 5th quintile were combined to increase the sample of children with iCCM conditions in the previous two weeks. This has still resulted in wide confidence intervals and a possible inability to detect significant trends where they might exist.

DHS and MICS surveys may dilute the effect of community-based mechanisms as data is aggregated to regional level since exposure to CBAs is localised so the effect is only expected for the villages in which they work. By aggregating to regional level that effect becomes diluted. It would be ideal to repeat an LQAS survey in the same areas of the three Northern regions in order to determine changes in care-seeking at community level.

DHS and MICS data files have been combined to recalculate coverage indicators over time, and care was taken to use standard indicator definitions and appropriate sampling weights. The use of this data was guided by two main factors: DHS and MICS are two major programs 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 possible. The latter point, therefore, makes combining these data 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 in the Woman's Questionnaire. There are also a number of differences in the population covered and the reference periods used to measure coverage, where MICS usually uses births within 0-2 years of the survey, DHS uses 0-5 years; the latter potentially resulting in recall problems. These differences between DHS and MICS surveys may affect coverage estimates and need to be considered when comparing estimates over time.

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 and EBF) from mothers of 0-5 month old infants (as opposed to all women with a live birth in the past two years), and, therefore, these denominators are different. Furthermore 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. This is likely to explain the difference between the 2011 MICS and 2012 LQAS coverage for vitamin A.

These differences may explain the anomalies in the observed trends. In most cases, coverage estimates using one data source, e.g., DHS, clearly show either upwards or downwards trends. However, when coverage estimates from MICS, DHS and LQAS are combined, the trends are heavily distorted resulting in non-linear trends. This may be a true reflection of the coverage estimates or a reflection of differing population and reference coverage inherent in the three survey types.

7.2 Strengths and limitations of the LiST analysis

The analysis for Ghana benefited from multiple household surveys including the LQAS which provided endline data. However, trends in coverage and mortality did not always align between surveys conducted over a similar time period e.g. DHS 2008 and MICS special 2007. In addition, many data points were missing particularly for the earlier years in the analyses.

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 Ghana, 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 lower coverage.

While coverage indicators have been calculated to reflect the two years prior to the survey (except for LQAS), regional mortality data in DHS reflect the 10 year period prior to the survey. 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 regional data, coverage was not changed beyond what is already included in the Spectrum projection (0% in 2000 to 30% in 2013).

The LiST model did not accurately predict measured mortality change across the pre-IHSS phase and Phase I in all regions, resulting in an inability to directly link measured mortality reduction with coverage change. For this reason and those mentioned above, the results of the LiST analysis should be treated with caution. The number and proportion of total lives saved as well as lives saved 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 being 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 programme. As a consequence, it also does not reflect actual use of donor funds of which a significant proportion was spent on initial design, set-up, and systems strengthening.
- The additional costs approach benefit is that it recognises existing structures and systems and avoids double-counting (e.g. CHO supervisors' salaries already covered in existing government budgets). However, the additional cost approach, does not reflect all the costs by excluding those already funded as part of the existing system.

Some elements of the total additional cost of iCCM are excluded (the cost of design, policy development and broad capacity development) as these costs are 'one-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 CBAs 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 Ghana are experienced in health systems research. The key strength of this evaluation was that this group of researchers is not in the direct employ of UNICEF, and, therefore, are able to objectively assess the impact, outcomes and experiences of the implementation of the IHSS programme and to see and experience for themselves how the IHSS programme was implemented. The field visits also helped the team to understand the cultural and political context in which the interventions took place, something that could not have been achieved by merely conducting a desk based evaluation.

While in Ghana 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.

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

Selection of participants for interviews may have been biased towards those more favourable towards the IHSS programme, partly because the team was dependent on the UNICEF office to assist with selecting appropriate people to interview. The team was able, though, to gather a wide range of perspectives during the visit and via document reviews. Although the team was able to explain to high level participants that it was separate from, 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 community members' inability to make the distinction may have influenced how they related their experiences. When interviewing these community level participants the evaluators also had to rely on translators who were sought by UNICEF and the GHS. 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

- The IHSS programme was well received at both government and community levels in the three Northern regions of Ghana. This was facilitated by the fact that the change in the Child Health Policy to allow CBAs to administer antibiotics and zinc, coincided with the early phase of implementation of the programme, thereby allowing for iCCM to take place.
- The support was provided to the three Northern regions which are the most disadvantaged in terms of maternal and child health indicators.
- It is encouraging that the focus of UNICEF in the three Northern regions now includes community-based newborn care since the three Northern regions have increasing neonatal mortality rates and a negative annual rate of decline. It will be critical to reverse this trend and lower neonatal mortality in order for the under-5 mortality decline to increase.

Effectiveness

- Lack of inclusion of CBAs in the NHIS and lack of compensation hinders their ability to function as a part of the health workforce.
- Implementation of iCCM was plagued by difficulties around supplies and logistics, and stock-outs were a major problem.

Impact

- At the time of the evaluation, iCCM in Ghana had been at scale (over 80% of CBAs trained in iCCM in the three Northern Regions) for approximately one year. 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 (calculating additional, not full costs of delivering iCCM), the evaluation did not calculate cost-per-life saved.

Sustainability

- Costed according to protocol, iCCM treatments for malaria, diarrhoea and pneumonia have a weighted average cost per treatment of $13.21: $13.81 for malaria treatment, $12.7 for diarrhoea treatment, and $12.63 for pneumonia treatment. This is a high cost given that the treatment is delivered by volunteers who often are iliterate.
- With volunteer-based strategies, fixed costs per CHW are often under-estimated, and optimising the use of the volunteers is often not seen as a necessity. If the number of CBAs per village was reduced to one, the average cost per CCM treatment would be reduced from $13.2 to $7, and the CBA would spend an average of 1.6 hours a week on iCCM.

8.2 Recommendations

Relevance

- A specific problem for the Catalytic Initiative implementation in Ghana was that the services of CBAs are not covered under the NHIS. This appears to have impacted on demand for CBA services. Strategies to encourage demand for CBA services are needed together with a formal process to include CBA services within the NHIS. This would be essential if CBAs are to continue with their curative functions.
- Given the poor socio-economic indicators in the three Northern regions, the CBAs could be used to implement total community-led sanitation.

Effectiveness

- Improved monitoring of the utilisation of iCCM is needed through community-based HMIS systems and periodic LQAS surveys.
- The increases in both early initiation and maintenance of high levels of exclusive breastfeeding are encouraging. The Northern regions of Ghana could serve as a role model for other countries in achieving high rates of breastfeeding and these lessons learnt should be shared within the country. Furthermore the CBAs' functions could be extended to include community-based nutrition as part of the SUN (scaling up nutrition) initiative.
- The increasing trend in no care-seeking between 2008 and 2012 is concerning and should be assessed more closely to determine barriers to lack of care-seeking. Further research is needed to determine whether NHIS requirements could be having detrimental effect on care-seeking.
- A study of CHPS as a level of care is recommended, analysing both utilisation and costs compared to CBA services and facility-levels above CHPS, in order to understand to what extent they have the capacity to increase, in a sustainable way, access to care.
- Stock-outs have been a severe problem for CBAs as well as CHPS in the three Northern regions of Ghana. Efforts are needed to improve the reliability of drugs and supplies which would hopefully also increase the confidence of communities in CBA and CHPS services. Improvements are also needed in real-time monitoring of supply chain possibly through the use of information technology.
- Whilst ITNs appear to have been the most successful intervention during the IHSS programme period in terms of coverage increases as well as targeting the most poor, they are dependent on donor funding and campaign style delivery. Longer term strategies should be considered to sustain this high level of coverage.

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 such as improved care at birth, 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 CBA/ CHPS 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

- Although iCCM was being implemented, through IHSS programme support, in the three Northern Regions and the Central region, it was not implemented anywhere else in the country. This reflects a lack of national government buy-in for the approach. National support and scale-up is critical to the sustainability of iCCM.
- As current costs per CBA are high due to treatments per CBA being low. To improve sustainability, one of the two following options is recommended:
    - 1) reduce the total number of CBAs, focus support on these and thereby increase the treatments per CBA (while they still conduct preventive and promotional interventions)
    - 2) reduce the number of CBAs providing iCCM so as to reduce cost per CBA and increase treatment rates per CBA (i.e. get more value from each CBA) while the balance of CBAs only conduct preventive and promotional interventions.

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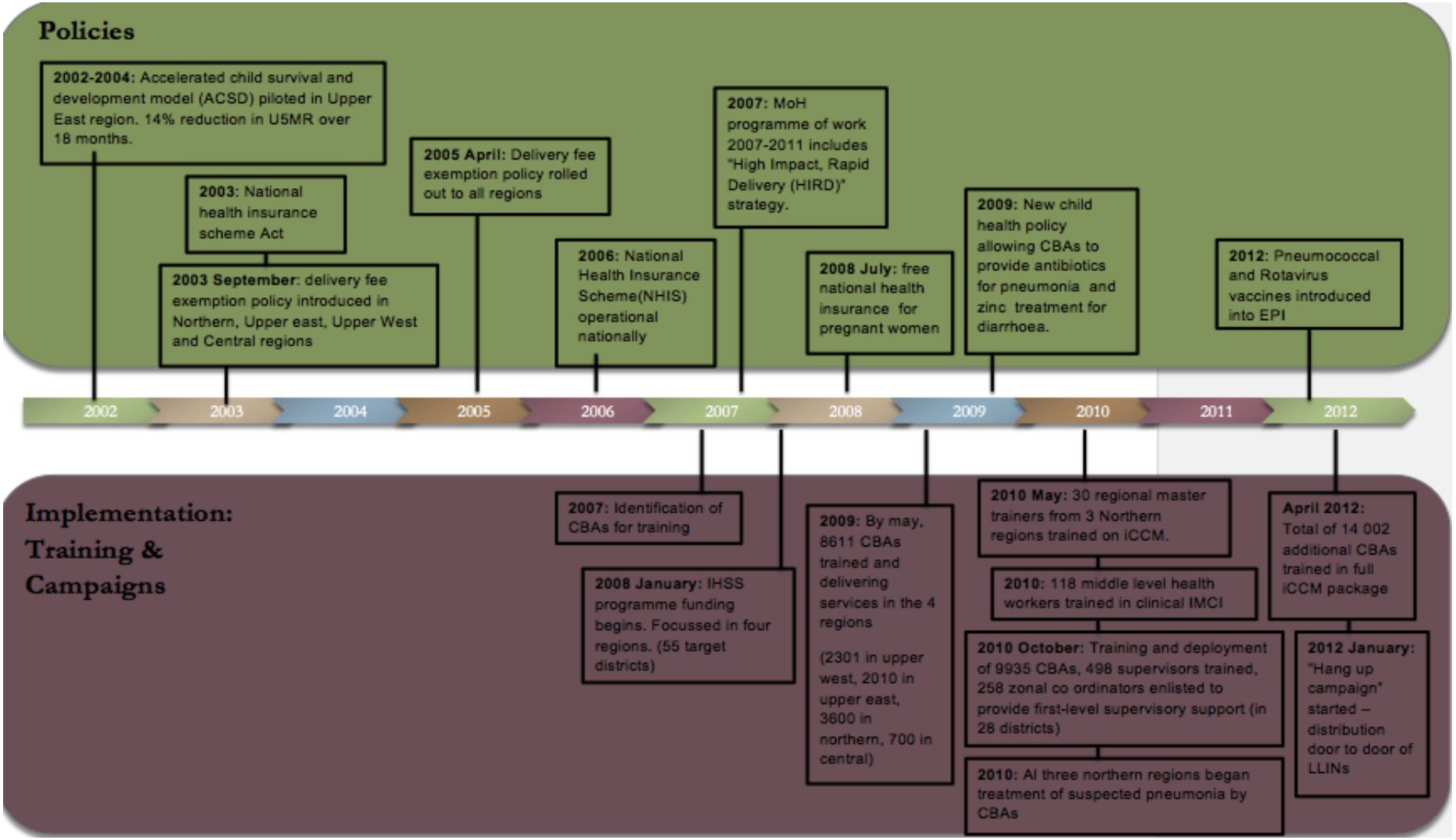
10 Appendices

Appendix A: Policy and implementation timeline



Appendix B: Country logic model

Programme title	IHSS Program
Country	GHANA

ULTIMATE OUTCOME

Slow rate of reduction in under 5 mortality. Nationally under 5 mortality increased from 80/1000 in 2008 to 82/1000 in 2011. IGME estimates <5 mortality rate of 72 in 2013.

↑

INTERMEDIATE OUTCOMES

Positive coverage change for the 3 Northern regions. Some improvements (care seeking for pneumonia, IPTp, early breastfeeding, ORS, ACT and ITNs) and some stable coverage (EBF, measles and DPT3)

↑

IMMEDIATE OUTCOMES

CATALYTIC EFFECTS:

Strengthened capacity of front-line health workers (community based agents and nurses) in the Northern regions to deliver iCCM interventions but low utilisation

Strengthened health systems (planning, implementation, monitoring and evaluation) but weak supply chain.

↑

OUTPUTS

- Improved knowledge and skills of front line health workers to deliver iCCM in the 3 Northern regions (CBAs and CHOs/CHNs)
- Increased availability of iCCM commodities to CBAs in the Northern regions
- Improved quality of community based services

- Improved access to treatment for childhood illnesses (2 CBAs per community)
- Improved care seeking practices by families (care seeking for suspected pneumonia, diarrhoea and fever)
- Maintenance of EBF and immunization coverage
- Increase in ITN coverage

↑

DELIVERY STRATEGIES

High Impact Rapid Delivery (HIRD) strategy of Government

Community based preventive and promotional services – CBA's Outreach services from CHPS by CHOs	Community based curative services – CBA's (Northern regions only). Not included in NHIS. Clients pay a token amount for drugs.

↑

ACTIVITIES

Supportive	**Preventive and promotive**	**Treatment**
Refresher training of CBAs Supervision, Field monitoring Commodity procurement (Zinc, amoxicillin, ORS) Programme reviews	Long lasting-insecticide treated nets Vitamin A supplementation IPT of malaria for pregnant women Immunisations PMTCT (nevirapine) TT for pregnant women Breastfeeding promotion	ICCM of pneumonia (antibiotics), diarrhea (ORS and zinc) and malaria (antimalarials)

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) (1.3.2.18)	Contraception use	Proportion of women currently married or in union aged 15-49 years of age who are using (or whose partner is using) a contraceptive method (either modern or traditional) Proportion of women that are currently married or in union 15-49 years of age that have an unmet need for contraception	Household surveys			X
		Folic acid supplementation or fortification	Proportion of married women receiving folic acid supplementation tablet or fortification at conception	No national level data available. Set at 0 for baseline			X
Expanded Antenatal Care Package	Antenatal care (1.3.2.19) (1.3.2.20)	Antenatal care (4 visits)	Proportion of women who were attended at least 4 times during pregnancy by any provider (skilled or unskilled)	Household surveys			X
	Tetanus toxoid vaccination** (1.3.2.14)	Tetanus toxoid vaccination	Proportion of women with a live birth in the last 2 years who received at least 2 doses of tetanus toxoid vaccine during the last pregnancy	Household surveys	X		
	IPTp** (1.3.2.13) ITNs (1.3.2.8)	IPTp	Proportion pregnant women living in malaria endemic areas and receiving IPT for malaria (at least two doses of SP) or sleeping under an ITN during their last pregnancy	Household surveys	X		
		Syphilis detection and treatment	Proportion of pregnant women screened for syphilis with the rapid plasma reagent test and treated with 2.4 miu benzathin penicillin, if needed	Calculation in LiST based on antenatal care 4 visits			X
		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		
		Facility based births	Proportion of infants delivered in a facility	Household surveys			X

Childbirth & Immediate Newborn Care	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			
		Labor 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 labor	Intramuscular injection of betamethasone sodium phosphate to women with suspected premature labor	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 labor to prevent PROM	Calculation in LiST based on facility delivery			
Breastfeeding	Breastfeeding initiation** (1.3.2.23)	Breastfeeding initiation	Proportion of newborns put to the breast within one hour of birth	Household surveys	X		
	Exclusive breastfeeding prevalence (0-5 months)** (1.3.2.24)	Exclusive breastfeeding prevalence (0-5 months)	Proportion of infants aged 0-5 months of age who are exclusively breastfed: 0-<1 month, 1-5 months	Household surveys	X		

	Complementary feeding (1.3.2.25)	Complementary feeding	Proportion of infants aged 6-8 months of age who are breastfed and receive complementary food	Household surveys	X		
Preventive care	Preventive postnatal care - includes thermal care and clean postnatal practices (1.3.2.26)	Preventive postnatal care - includes thermal care and clean postnatal practices	Proportion of mothers who received a postnatal care visit within two days of birth	Household surveys			X
	Vitamin A supplementation** (1.3.2.5.1)	Vitamin A supplementation	Proportion of children 6-59 months who received at least one high dose Vitamin A supplement in the last 6 months	Household surveys	X		
		Zinc supplementation	Proportion of children 6-59 months receiving full coverage with zinc	Household surveys			X
	Improved water source (1.3.2.28)	Improved water source	Proportion of the population using improved drinking water sources	Household surveys			X
		Improved sanitation – utilization of latrines or toilets	Proportion of homes with access to an improved latrine or flush toilet	Household surveys			X
		Hand washing with soap	Proportion of mothers washing their hands with soap appropriately	No national level data available. Set at 17% (global average)			X
		Hygienic disposal of children's stool	Proportion of children whose fecal matter is adequately contained	Household surveys			X
	ITN ownership** (1.3.2.9)	ITN ownership	Proportion of children under 5 years of age sleeping under an insecticide treated net the previous night	Household surveys	X		
Vaccines		BCG	Proportion of children 12-23 months of age who received 1 dose of BCG vaccine	Household surveys			X
		Polio	Proportion of children 12-23 months of age who received 3 doses of polio vaccine	Household surveys			X
	DPT3** (1.3.2.7)	DPT3	Proportion of children 12-23 months of age who received the third dose of DPT or Pentavalent vaccine	Household surveys	X		

		Hib	Proportion of children 12-23 months of age who received the third dose of Haemophilis influenza type B (Hib) vaccine	Household surveys			X
		HepB	Proportion of children 12-23 months of age who received the third dose of Hepatitis B vaccine	Household surveys			X
		Pneumococcal	Proportion of infants having received 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 received appropriate treatment (as per national policy)	Household surveys		X	
		Therapeutic feeding for severe wasting	Proportion of wasted children receiving therapeutic feeding	No data available – set at 0		X	
		HIV treatment	Cotrimoxazole ART	Country program data, UNAIDS/PEPFAR			X

Appendix D: Detailed costing tables

Number CHWs/CBAs deployed in 2012	16 812
Pop under 5	1 210 691
Number under 5 per CBA	72

Number CHWs/CBAs per	
Zonal Co-ordinnator	30
CHPs Supervisors	30
Sub-district co-ordinnators	127
District Co-ordinators	382

Annual Attrition Rate	
CBA	8%
Zonal-Coordinnator	8%
CHO	30%

Utilisation per CHW/CBA per Year:	Total for the year	Number per CHW/CBA	Share by condition
Malaria	83 473	4.97	49%
Diarrhea	55 888	3.32	32%
Pneumonia	32 647	1.94	19%
Total	172 008	10.23	100%

Fixed Cost per CHW/CBA

CBA Training	Days	Cost per CHW/CBA	Life Years	Annualised Cost (A)
Initial Training incl materials	3	95.2	10	9.52
Refresher training	2	25.0	2	12.50
Total per CBA				22.02

Equipment Cost : Kits excl Meds	Quantity	Unit Cost	Life Years	Annualised Cost
New kit bag	1	2.90	3.0	0.97
ARI Timer	1	3.80	3.0	1.27
Measuring cup	1	3.17	3.0	1.06
Tea spoon	1	1.76	3.0	0.59
Scissors	1	3.87	3.0	1.29
Towel	1	1.50	1.0	1.50
Soap	1	1.50	0.3	5.00
Register	1	7.98	3.0	2.66
Torch	1	4.20	3.0	1.40
Wellington boots	1	14.40	3.0	4.80
Raincoat	1	10.91	3.0	3.64
Bicycle	1	100.00	3.0	33.33
Total				57.50

Supervision and Management

CCM Training	Days	Cost per Training	Life Years	Annualised Cost	Attrition Rate	Annualised Cost (B)	Annualised Cost per CBA
Initial Training							
Zonal Co-ordinnator	3	100.3	10	10.0	10%	11.0	0.4
Health Worker	5	393.0	10	39.3	30%	51.1	1.7
Sub-district co-ordinnators	5	393.0	10	39.3	30%	51.1	0.4
District Co-ordinators	5	393.0	10	39.3	30%	51.1	0.1
Refresher Training							
Zonal Co-ordinnator	2	25.0	2	12.5	10%	13.8	0.5
Health Worker	2	184.0	2	92.0	10%	101.2	3.4
Initial Training	2	25.0	2	12.5	10%	13.8	0.1
Zonal Co-ordinnator	2	184.0	2	92.0	10%	101.2	0.3
Total							6.8

Public Health expenditure	2007	2008	2009	2010	2011
Per capita (current $)	40.87	39.77	30.64	39.90	42.08
% Government own funding	79.2%	81.1%	76.1%	71.7%	74.8%
% Expernal funding	20.8%	18.9%	23.9%	28.3%	25.2%

Public Health expenditure	2007	2008	2009	2010	2011
as % of Government Expenditure	15.4%	12.2%	12.5%	12.1%	11.9%
as % of GDP	3.7%	3.2%	2.8%	3.0%	2.7%
Population	22 712 402	23 264 174	23 824 404	24 391 823	24 965 820

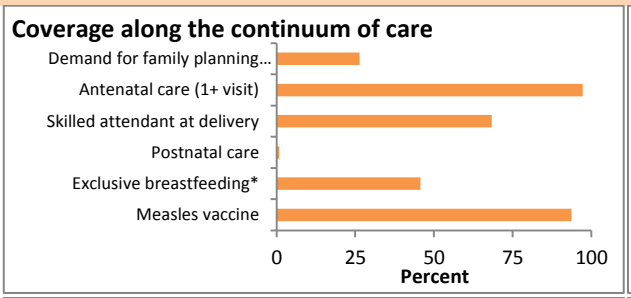
Appendix E: National and regional coverage profiles

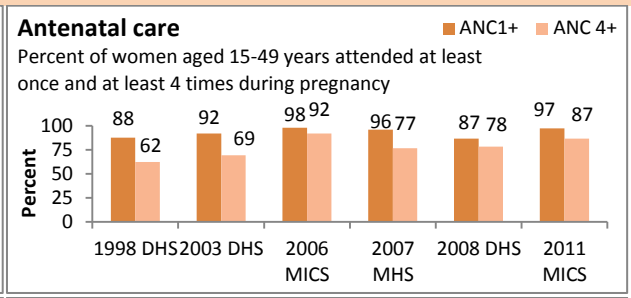
Ghana National Profile

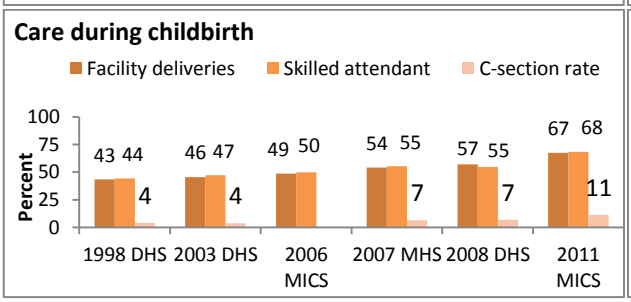
DEMOGRAPHICS[1]

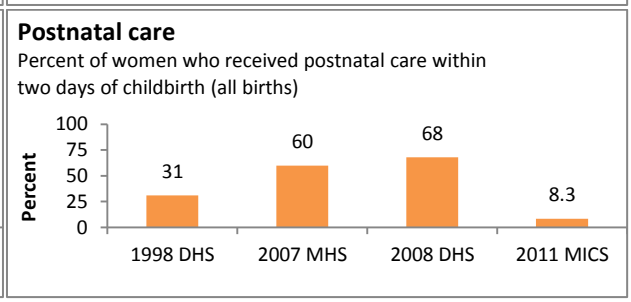
Total population	24,659,000	Annual births	623,700
Neonatal mortality rate (per 1000 live births)	32	Maternal mortality ratio (per 100,000 live births)	485
Neonatal deaths	20,000	Maternal deaths	3,000
Under-five mortality rate (per 1000 live births)	82	Total fertility rate	4,3
Under-five deaths	51,000		

MATERNAL AND NEWBORN HEALTH

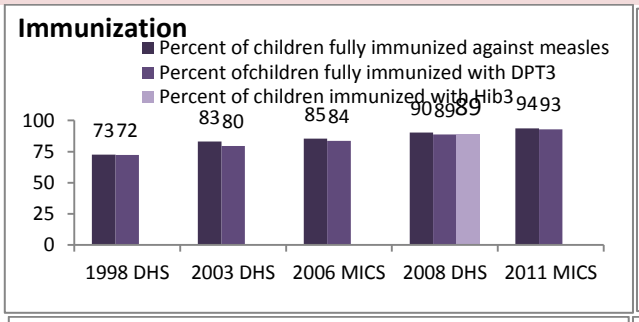


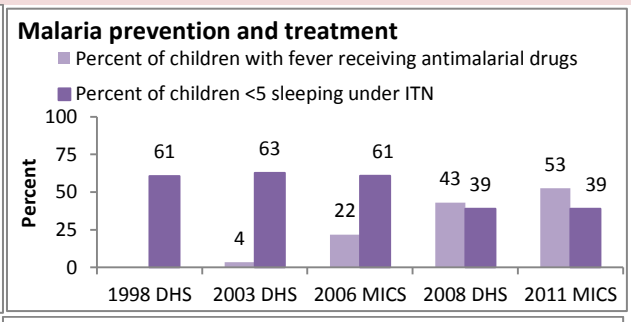


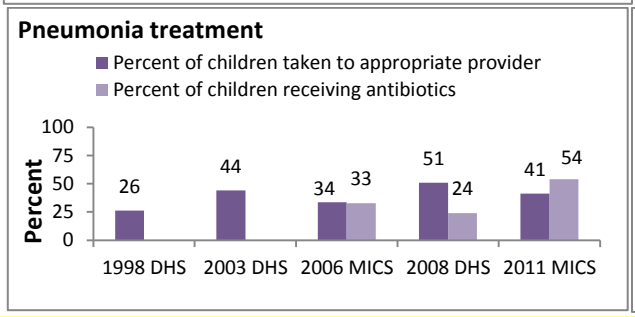


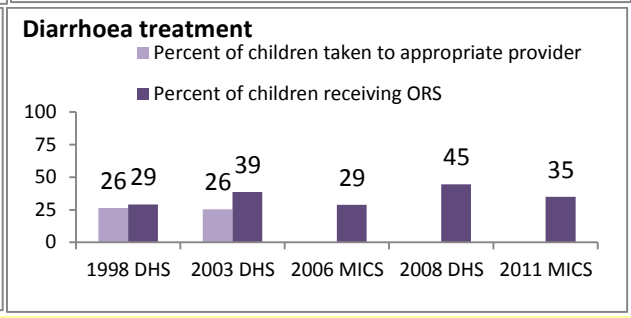


CHILD HEALTH

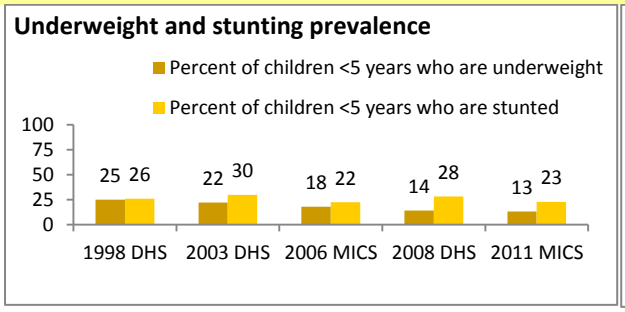


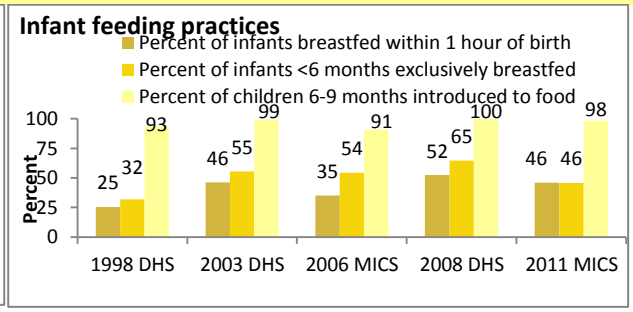






NUTRITION





[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

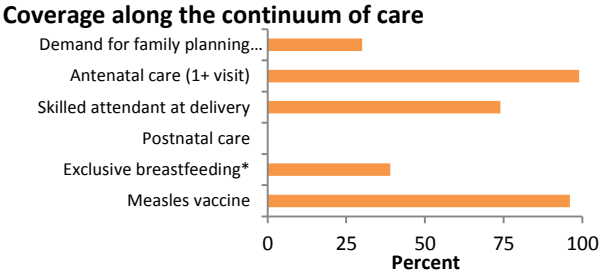
Ashanti

DEMOGRAPHICS[1]

Total population	4,780,000	Annual births	124,000
Neonatal mortality rate (per 1000 live births)	27	Maternal mortality ratio (per 100,000 live births)	421
Neonatal deaths	3,400	Maternal deaths	524
Under-five mortality rate (per 1000 live births)	86	Total fertility rate	3.9
Under-five deaths	10,700	** Refers to national data, not region-specific*	

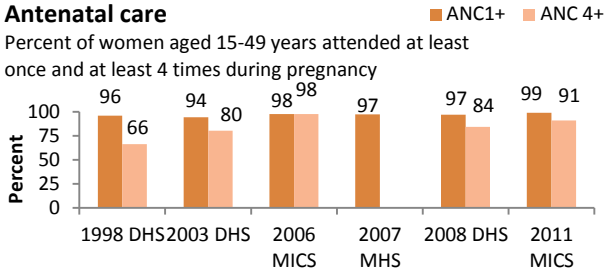
MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care

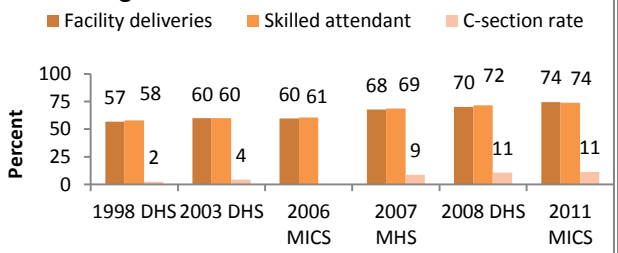


Antenatal care

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

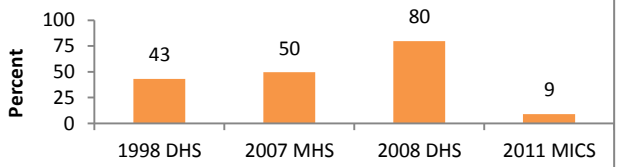


Care during childbirth



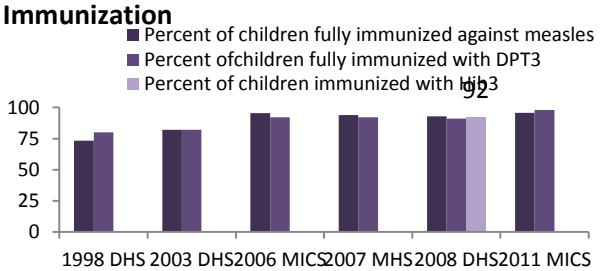
Postnatal care

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

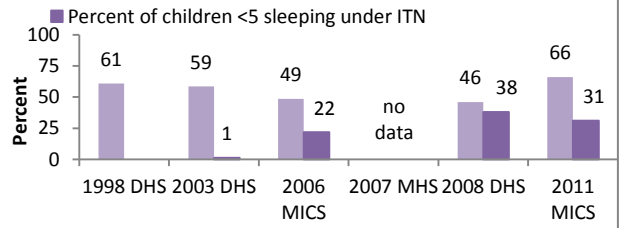


CHILD HEALTH

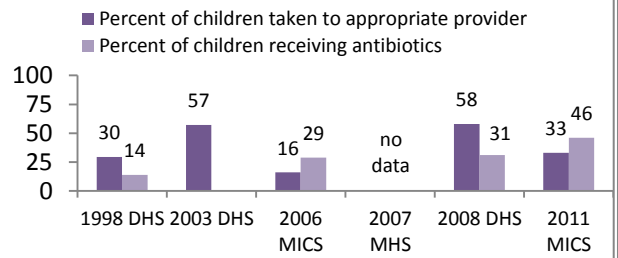
Immunization



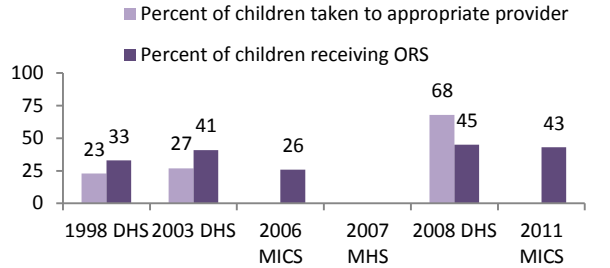
Malaria prevention and treatment



Pneumonia treatment

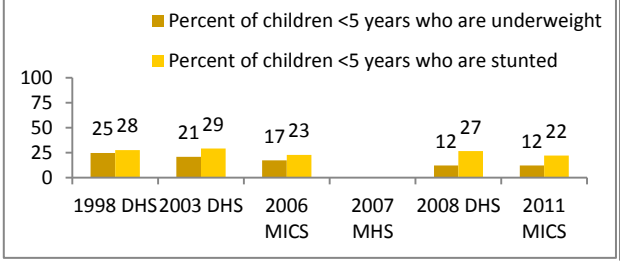


Diarrhoea treatment

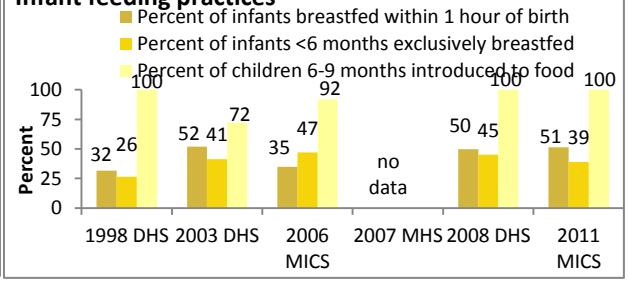


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



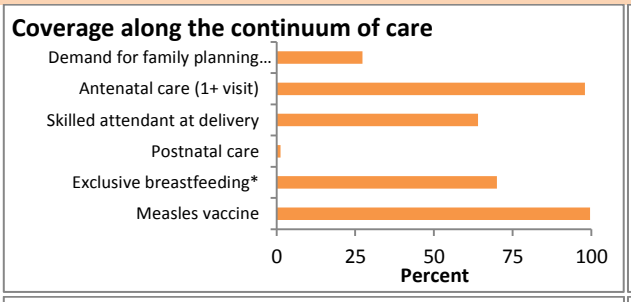
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

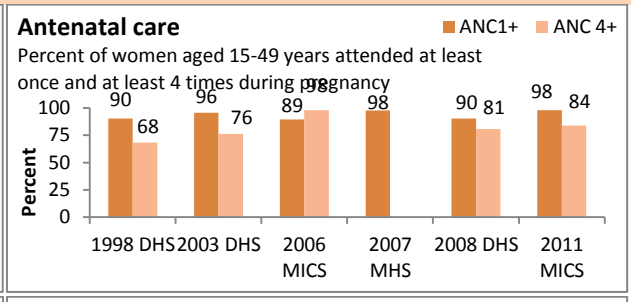
Brong Ahafo

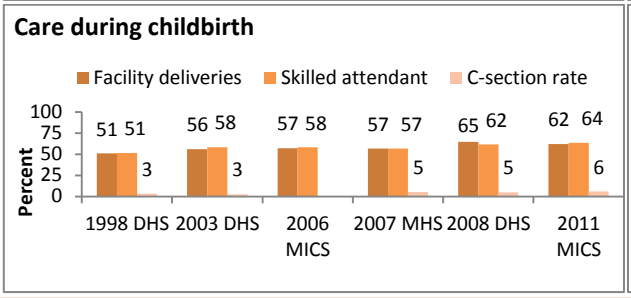
DEMOGRAPHICS[1]

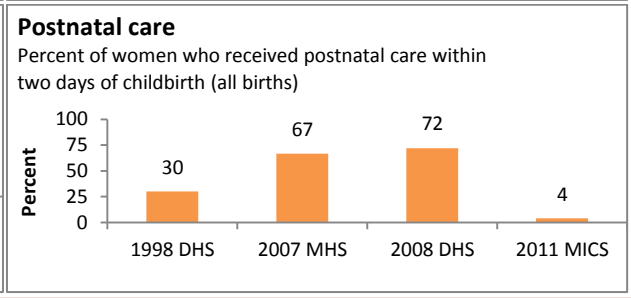
Total population	2,311,000	Annual births	65,000
Neonatal mortality rate (per 1000 live births)	44	Maternal mortality ratio (per 100,000 live births)	422
Neonatal deaths	2,700	Maternal deaths	259
Under-five mortality rate (per 1000 live births)	104	Total fertility rate	4.6
Under-five deaths	6,400	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

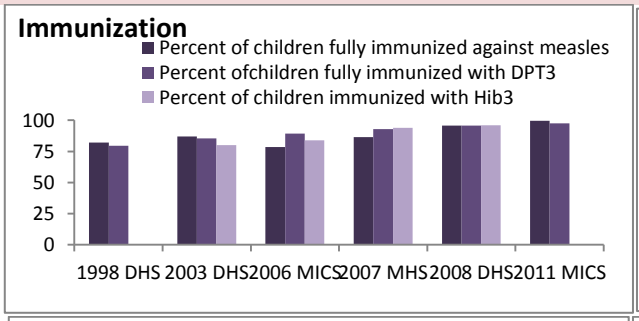


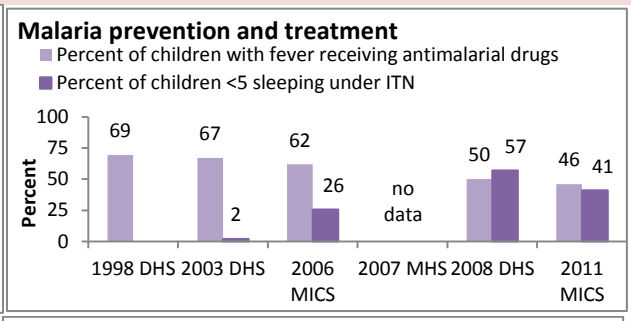


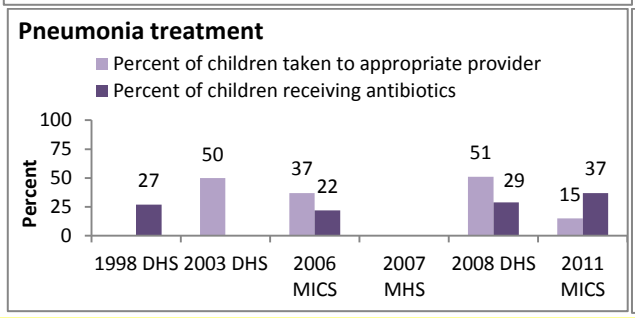


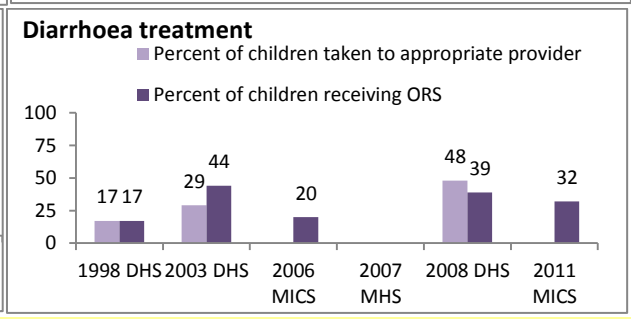


CHILD HEALTH

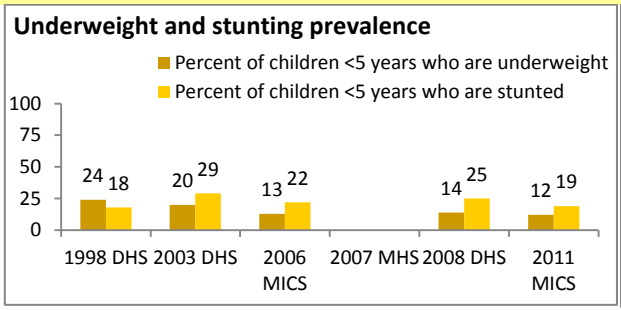


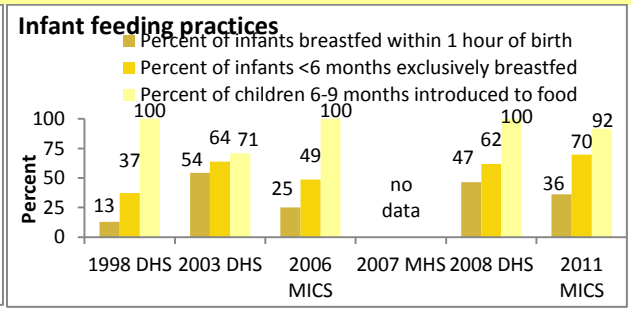






NUTRITION





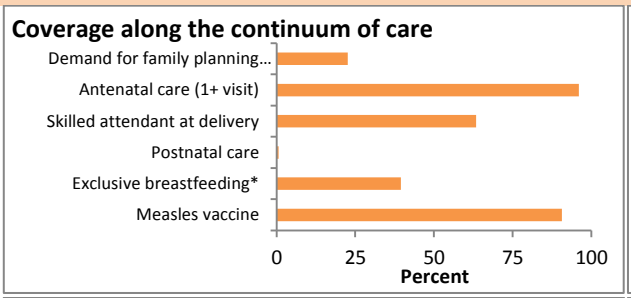
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

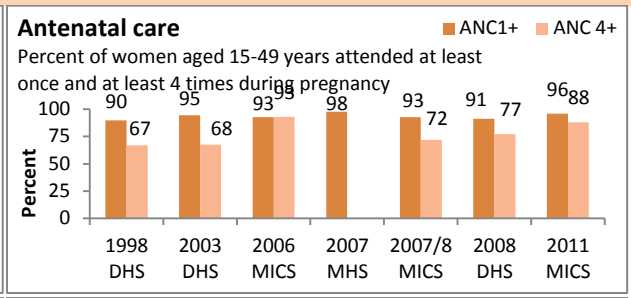
Central

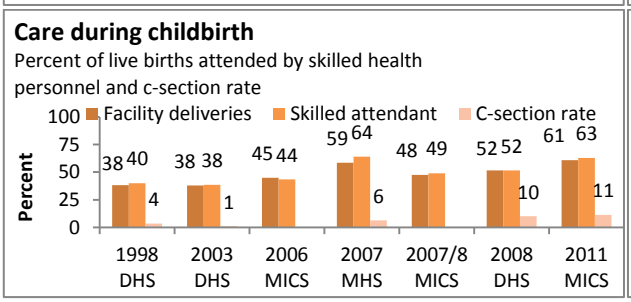
DEMOGRAPHICS[1]

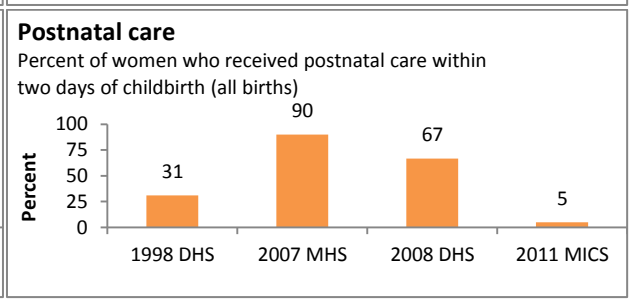
Total population	2,202,000	Annual births	59,000
Neonatal mortality rate (per 1000 live births)	36	Maternal mortality ratio (per 100,000 live births)	520
Neonatal deaths	2,100	Maternal deaths	307
Under-five mortality rate (per 1000 live births)	88	Total fertility rate	4.4
Under-five deaths	5,200	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

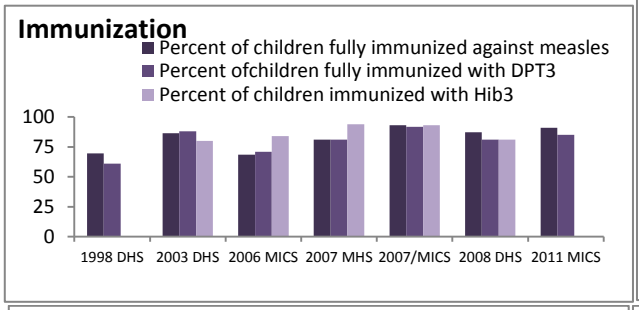


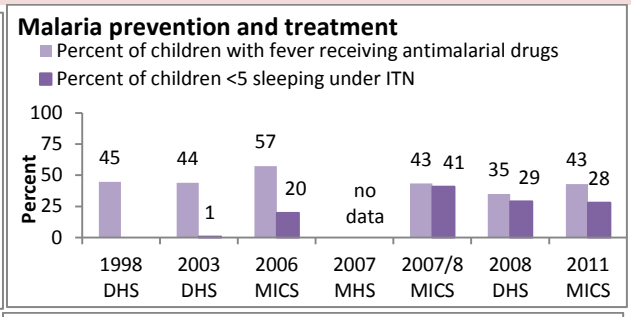


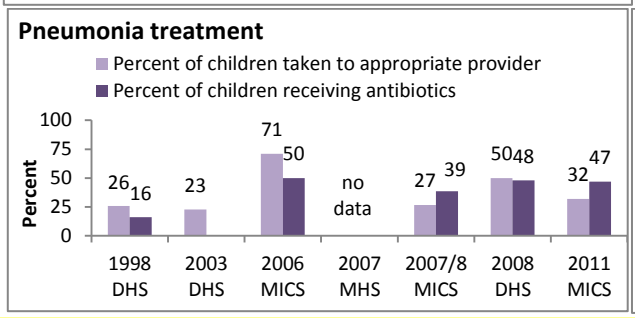


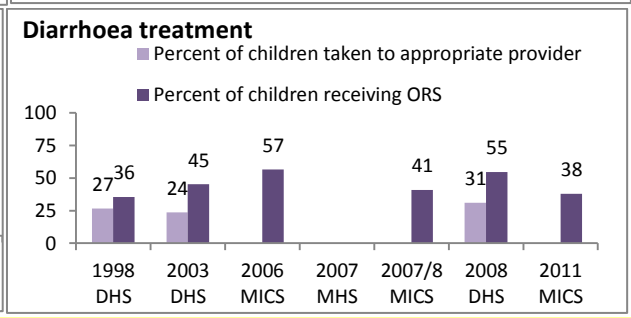


CHILD HEALTH

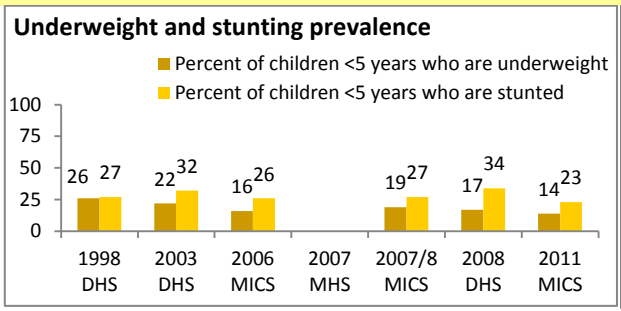


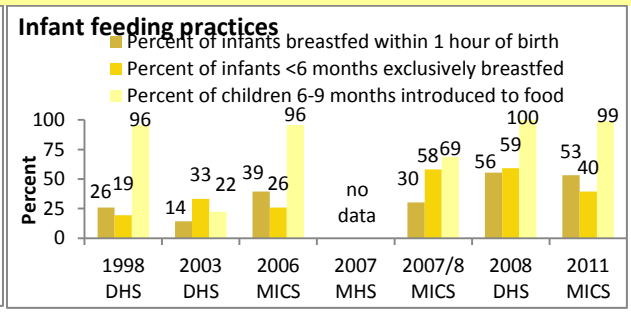






NUTRITION





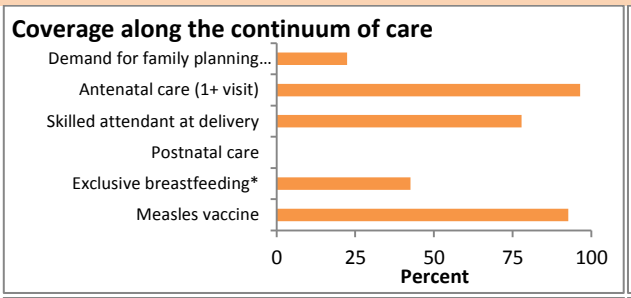
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

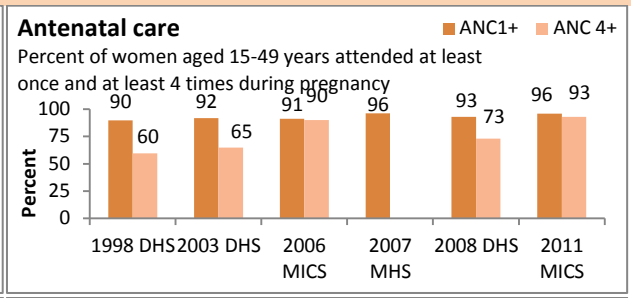
Eastern

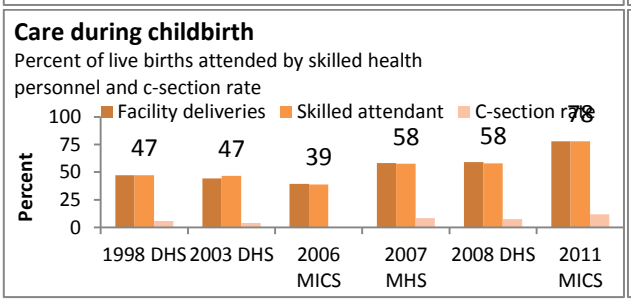
DEMOGRAPHICS[1]

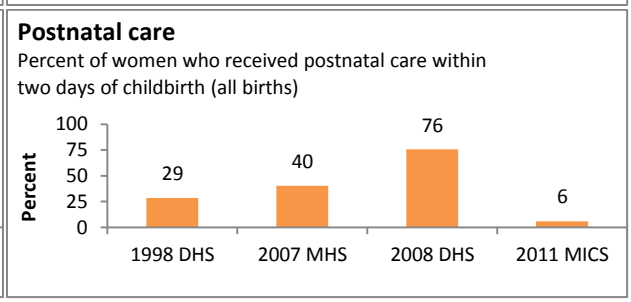
Total population	2,633,000	Annual births	68,000
Neonatal mortality rate (per 1000 live births)	25	Maternal mortality ratio (per 100,000 live births)	538
Neonatal deaths	1,700	Maternal deaths	365
Under-five mortality rate (per 1000 live births)	61	Total fertility rate	4.8
Under-five deaths	4,100	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

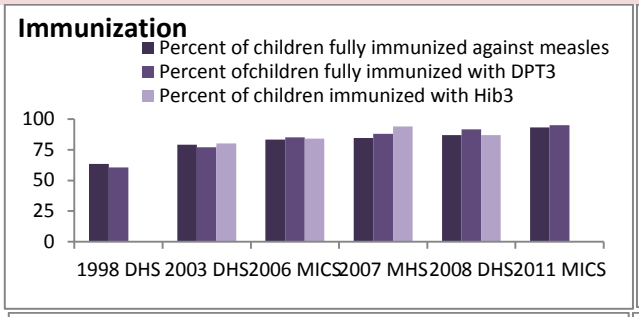


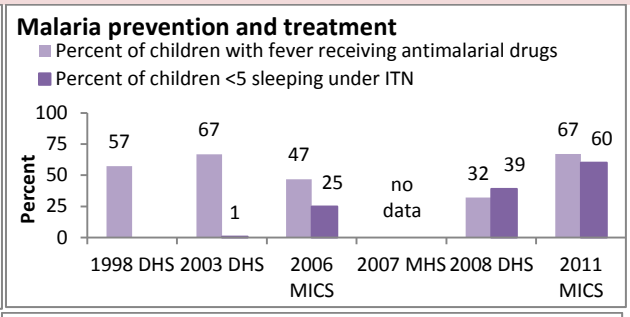


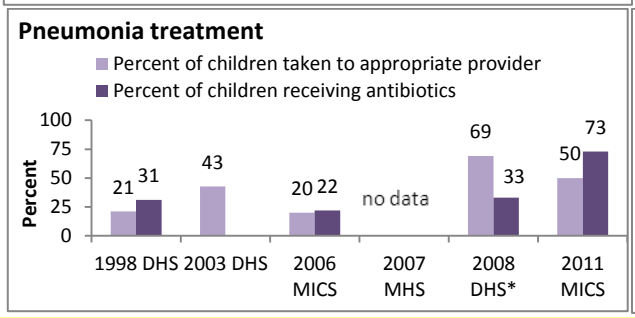


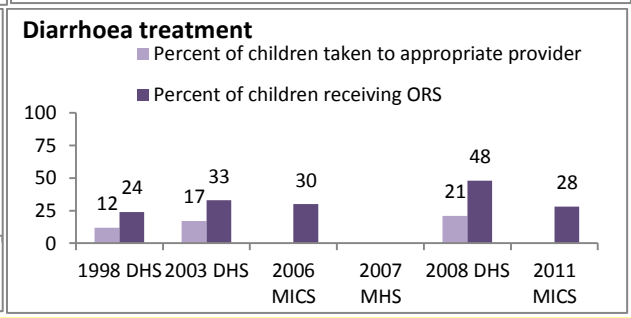


CHILD HEALTH

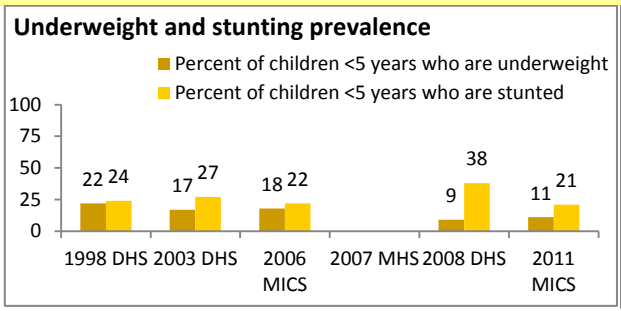


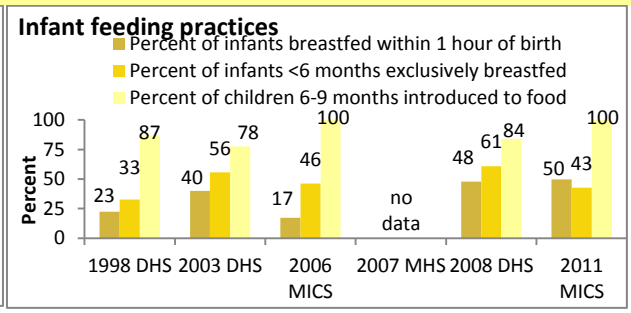






NUTRITION





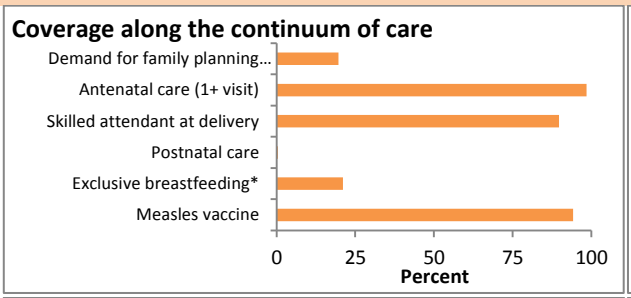
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

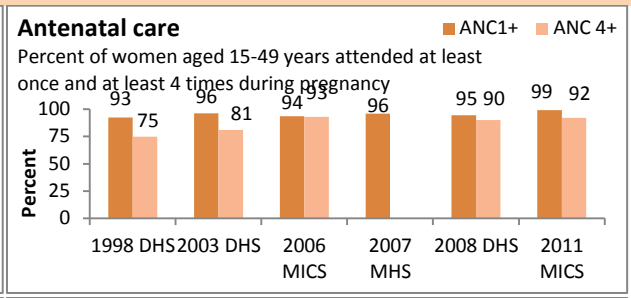
Greater Accra

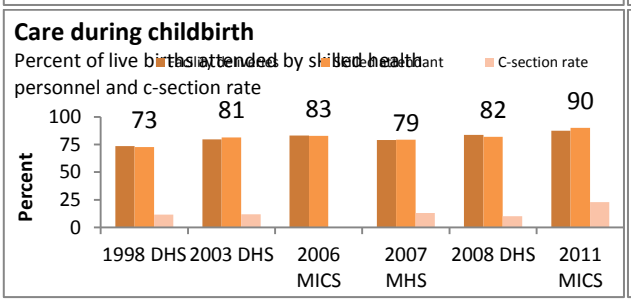
DEMOGRAPHICS[1]

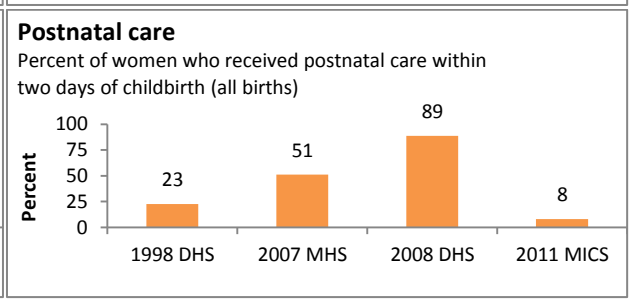
Total population	4,010,000	Annual births	93,000
Neonatal mortality rate (per 1000 live births)	20	Maternal mortality ratio (per 100,000 live births)	355
Neonatal deaths	1,900	Maternal deaths	330
Under-five mortality rate (per 1000 live births)	56	Total fertility rate	3.2
Under-five deaths	5,200	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

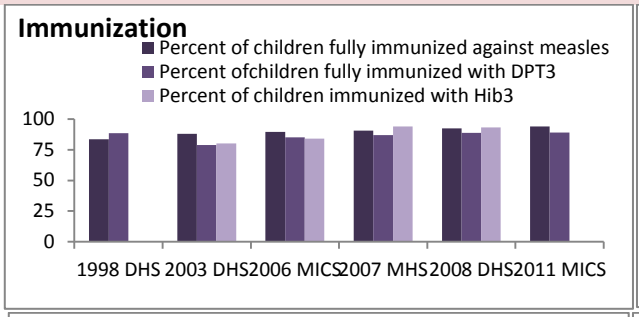


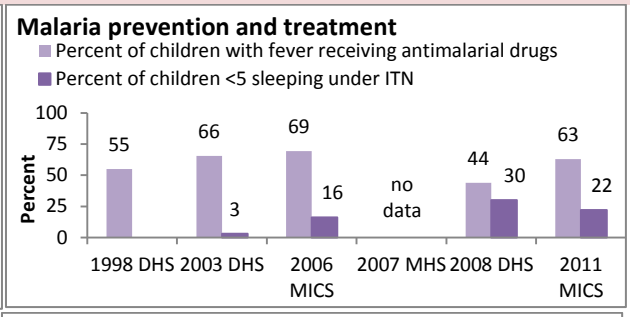


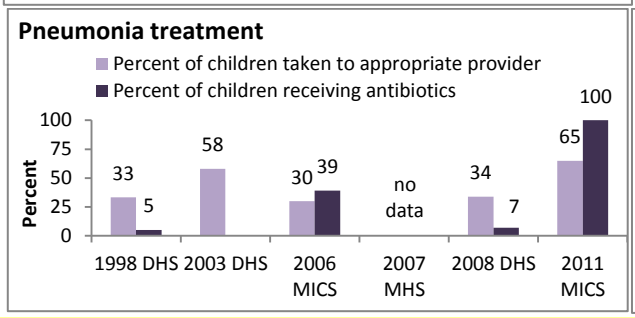


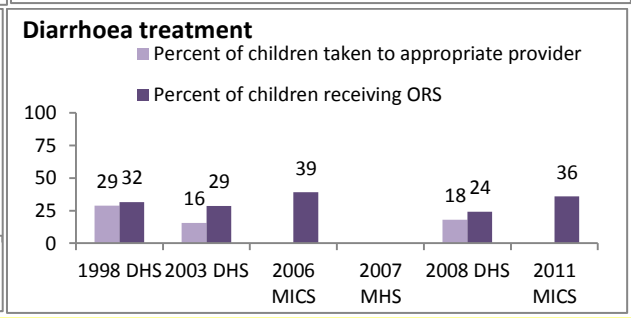


CHILD HEALTH

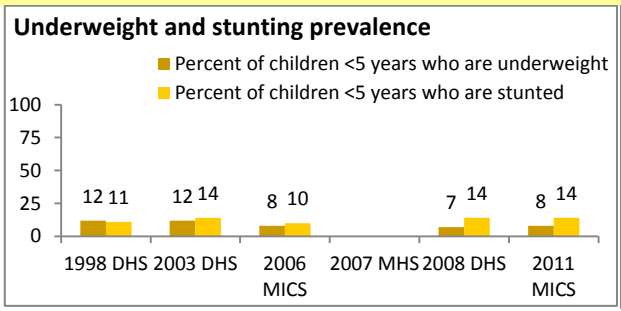


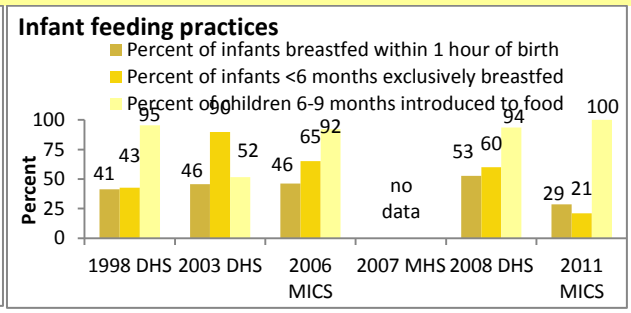






NUTRITION





[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

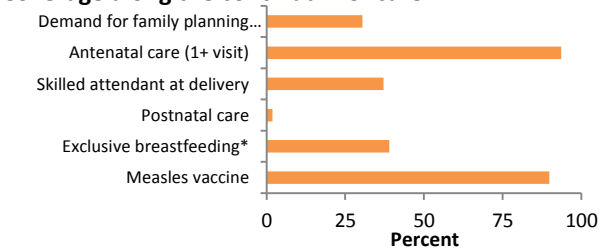
Northern

DEMOGRAPHICS[1]

Total population	2,479,000	Annual births	61,000
Neonatal mortality rate (per 1000 live births)	39	Maternal mortality ratio (per 100,000 live births)	531
Neonatal deaths	2,400	Maternal deaths	322
Under-five mortality rate (per 1000 live births)	124	Total fertility rate	6.2
Under-five deaths	7,500	** Refers to national data, not region-specific*	

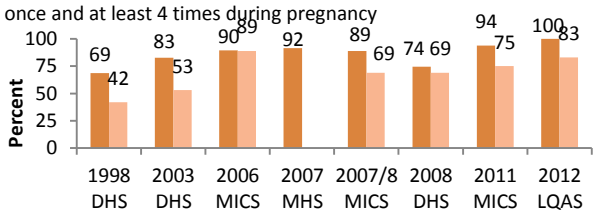
MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care



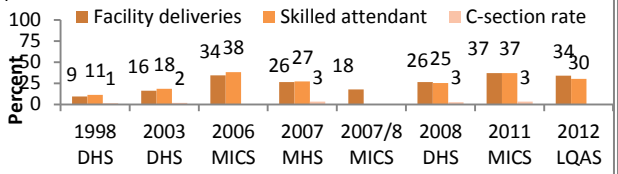
Antenatal care

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



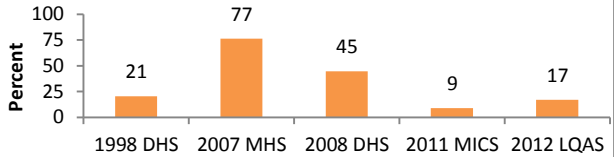
Care during childbirth

Percent of live births attended by skilled health personnel and c-section rate



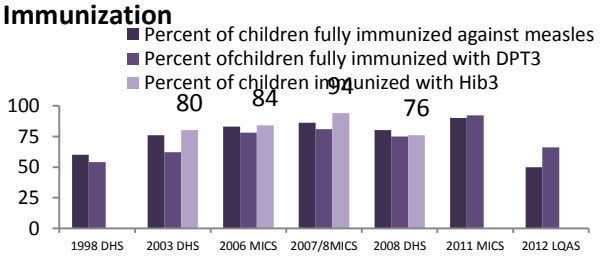
Postnatal care

Percent of women who received postnatal care within two days of childbirth

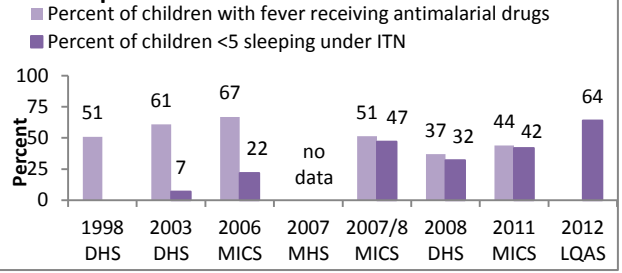


CHILD HEALTH

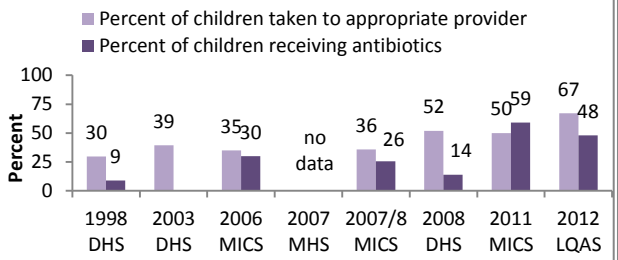
Immunization



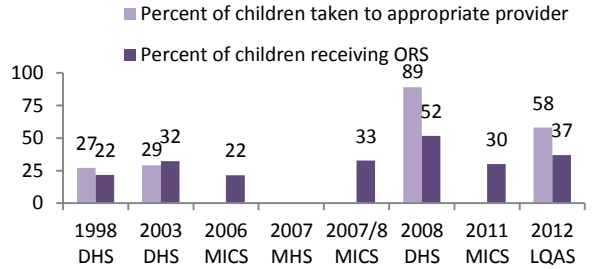
Malaria prevention and treatment



Pneumonia treatment

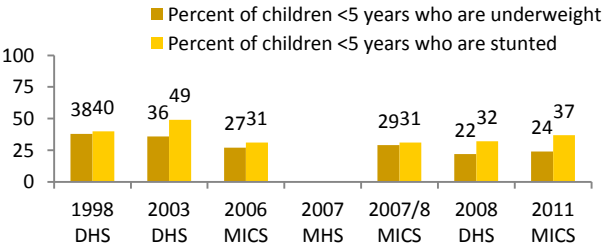


Diarrhoea treatment

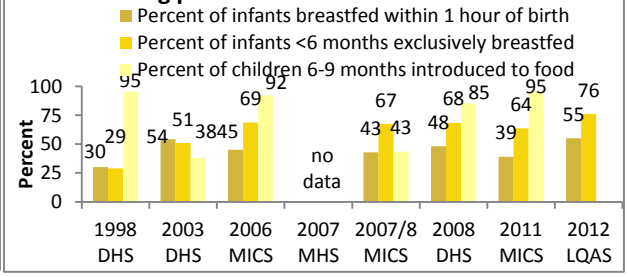


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



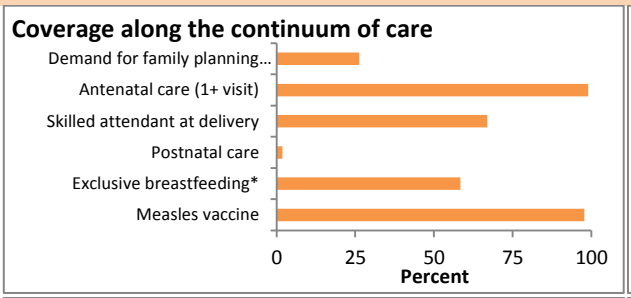
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census. MICS 2007/8 gives regional data for all three indicators under infant feeding practices.

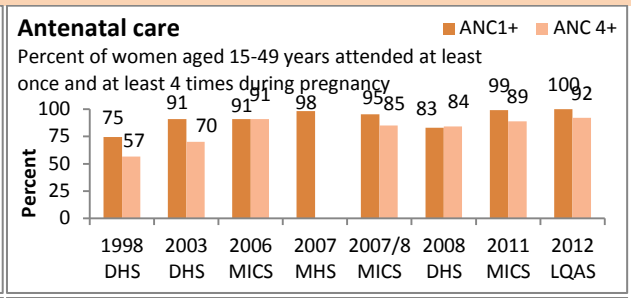
Upper East

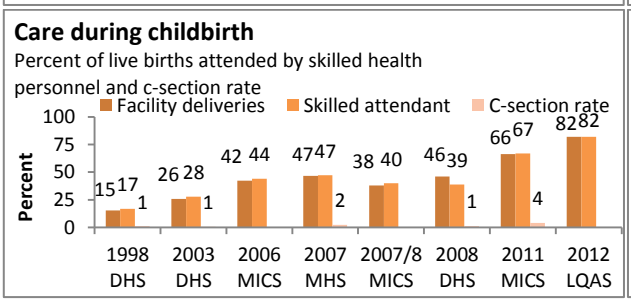
DEMOGRAPHICS[1]

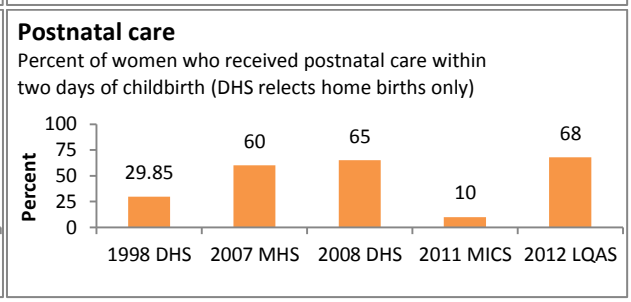
Total population	1,047,000	Annual births	24,000
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio (per 100,000 live births)	802
Neonatal deaths	800	Maternal deaths	193
Under-five mortality rate (per 1000 live births)	98	Total fertility rate	4.9
Under-five deaths	2,400	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

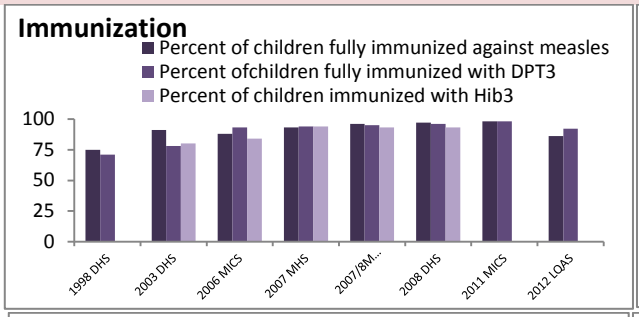


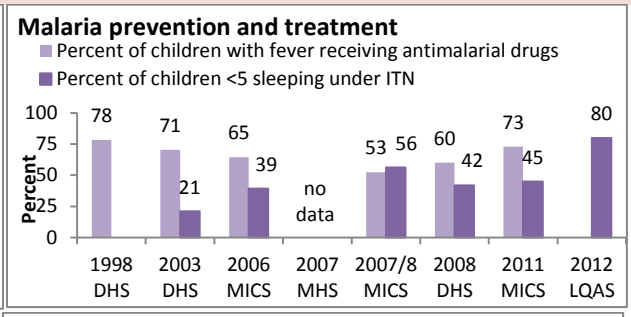


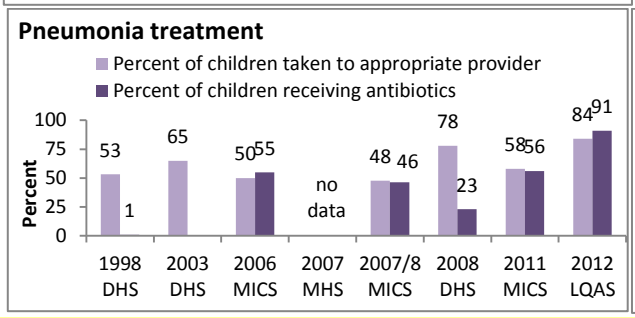


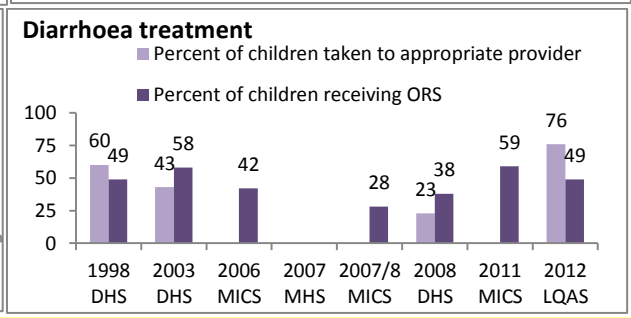


CHILD HEALTH

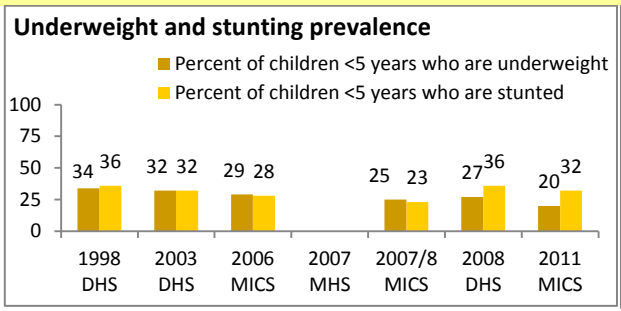


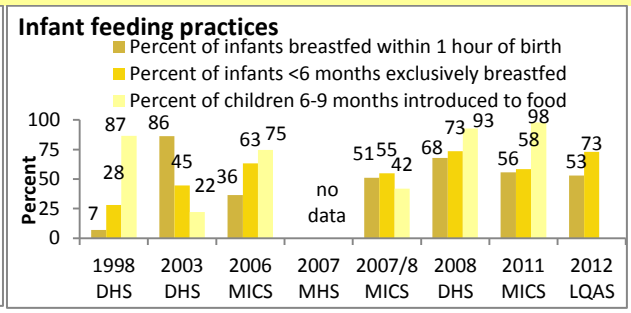






NUTRITION





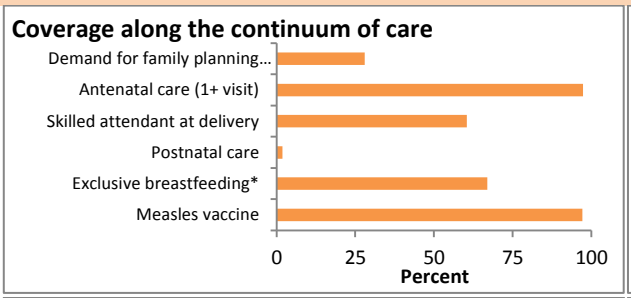
[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census. MICS 2007/8 gives regional data for all three indicators under infant feeding practices.

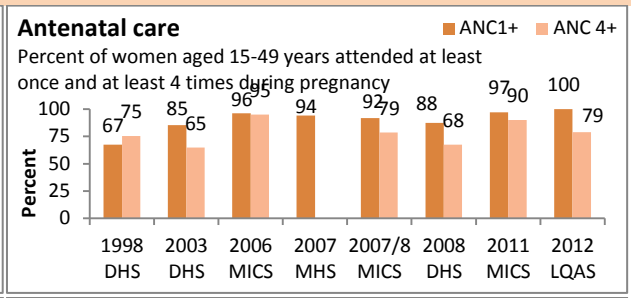
Upper West

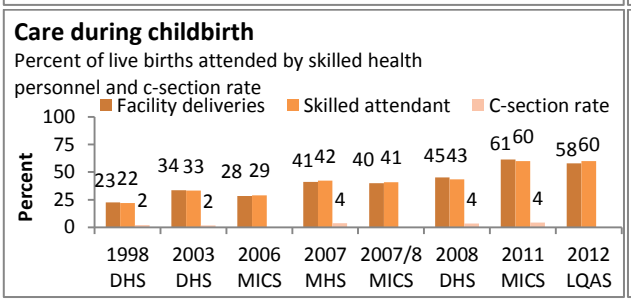
DEMOGRAPHICS[1]

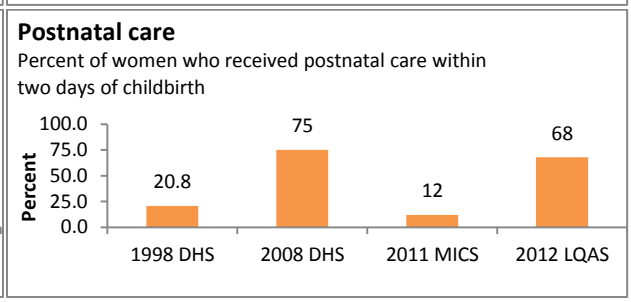
Total population	702,000	Annual births	17,000
Neonatal mortality rate (per 1000 live births)	41	Maternal mortality ratio (per 100,000 live births)	466
Neonatal deaths	700	Maternal deaths	77
Under-five mortality rate (per 1000 live births)	108	Total fertility rate	4.8
Under-five deaths	1,800	** Refers to national data, not region-specific*	

MATERNAL AND NEWBORN HEALTH

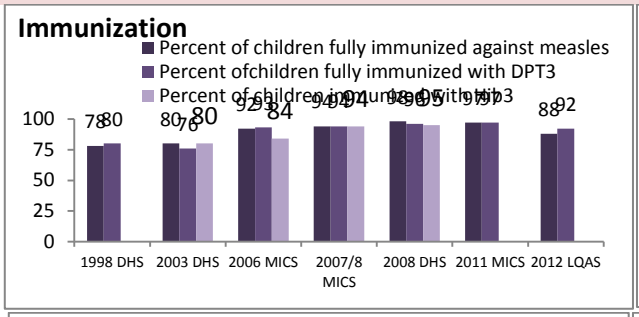


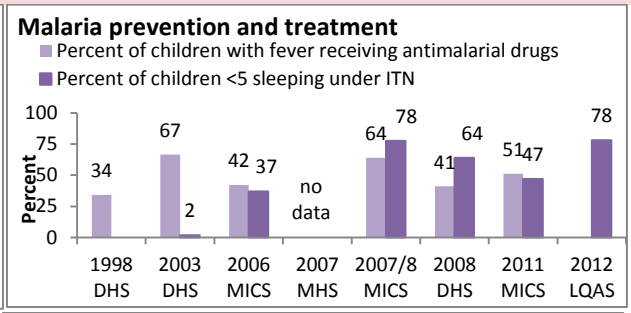


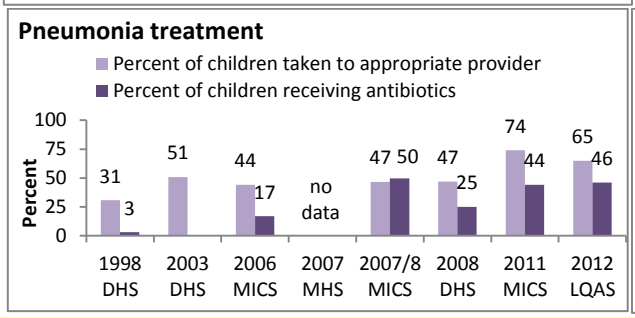


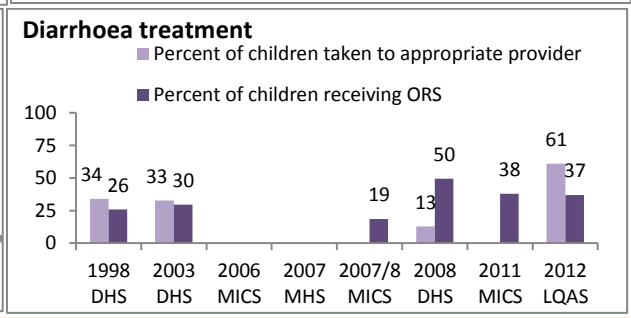


CHILD HEALTH

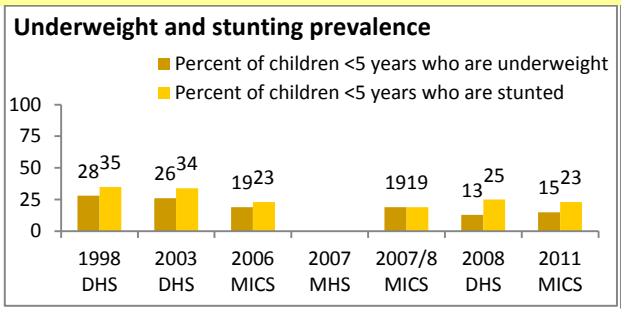


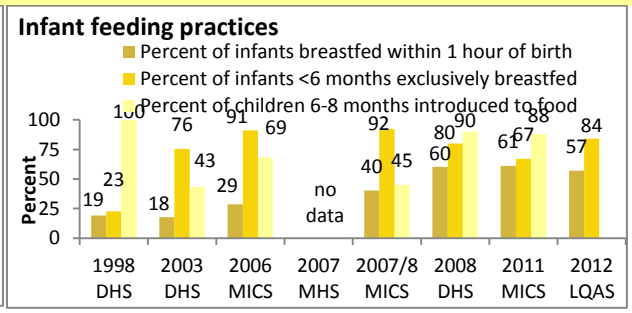






NUTRITION





[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census. MICS 2007/8 gives regional data for all three indicators under infant feeding practices.

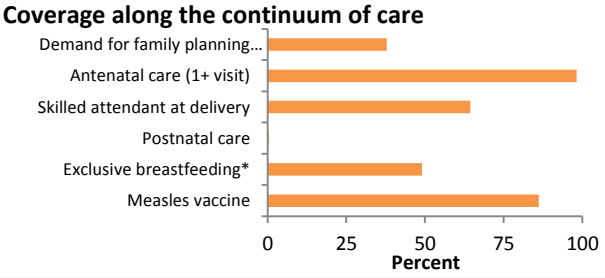
Volta

DEMOGRAPHICS[1]

Total population	2,118,000	Annual births	52,000
Neonatal mortality rate (per 1000 live births)	47	Maternal mortality ratio (per 100,000 live births)	706
Neonatal deaths	2,500	Maternal deaths	368
Under-five mortality rate (per 1000 live births)	89	Total fertility rate	3.9
Under-five deaths	4,600	** Refers to national data, not region-specific*	

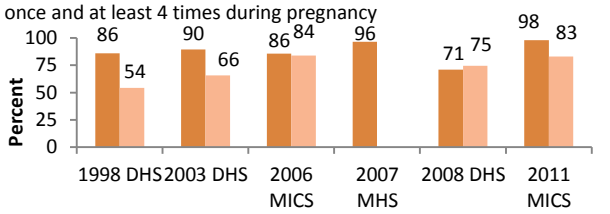
MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care



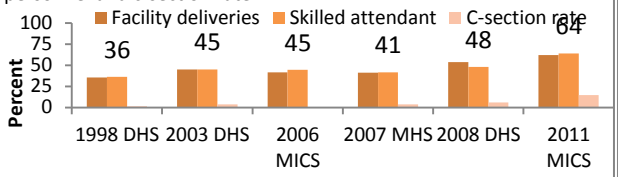
Antenatal care

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



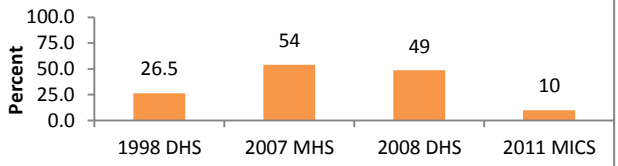
Care during childbirth

Percent of live births attended by skilled health personnel and c-section rate



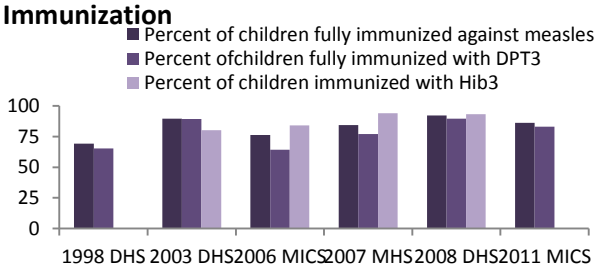
Postnatal care

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

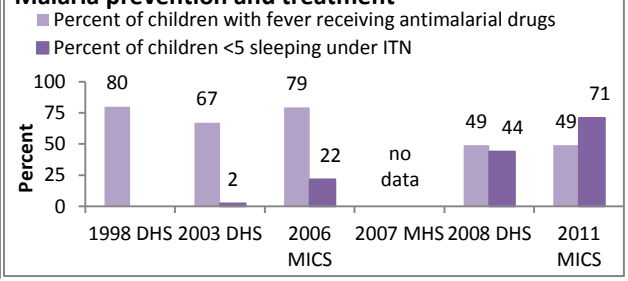


CHILD HEALTH

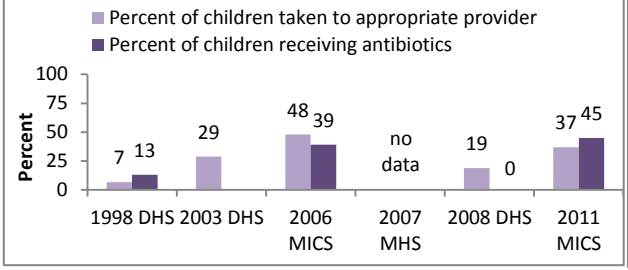
Immunization



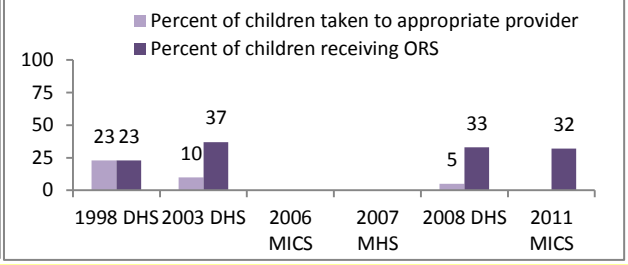
Malaria prevention and treatment



Pneumonia treatment

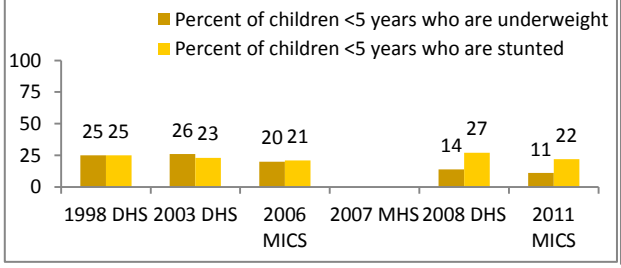


Diarrhoea treatment

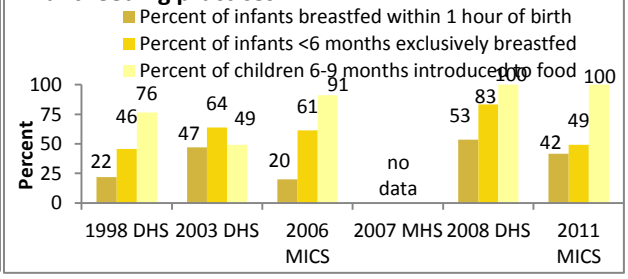


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.

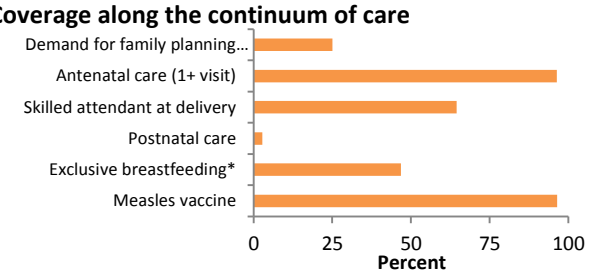
Western

DEMOGRAPHICS[1]

Total population	2,376,000	Annual births	65,000
Neonatal mortality rate (per 1000 live births)	27	Maternal mortality ratio (per 100,000 live births)	435
Neonatal deaths	1,700	Maternal deaths	281
Under-five mortality rate (per 1000 live births)	67	Total fertility rate	4.7
Under-five deaths	4,300	** Refers to national data, not region-specific*	

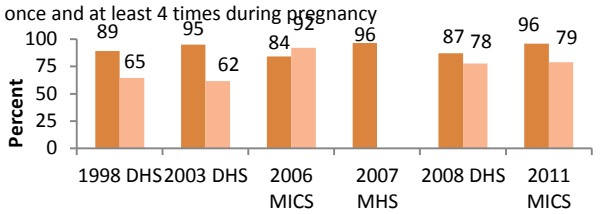
MATERNAL AND NEWBORN HEALTH

Coverage along the continuum of care



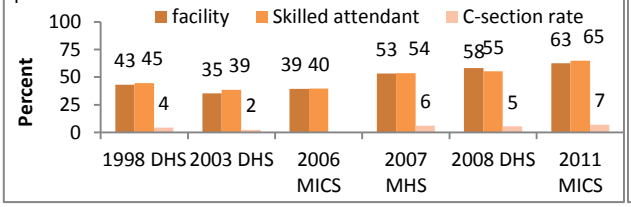
Antenatal care

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



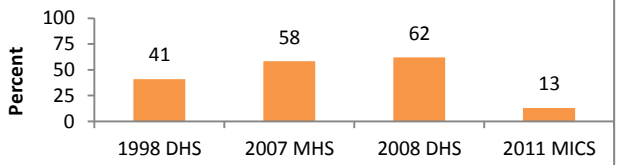
Care during childbirth

Percent of live births attended by skilled health personnel and c-section rate



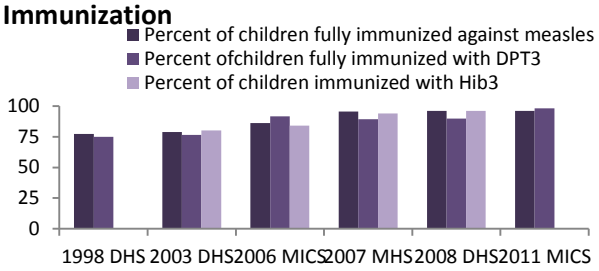
Postnatal care

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

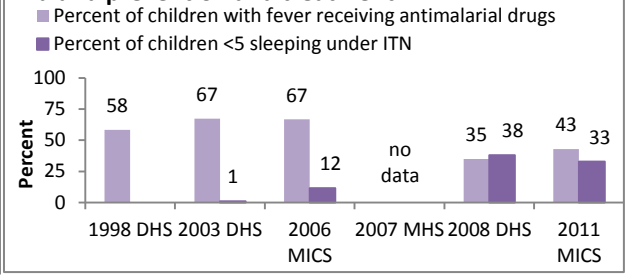


CHILD HEALTH

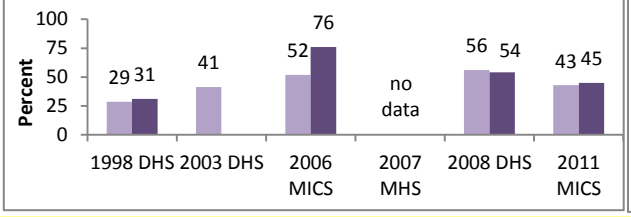
Immunization



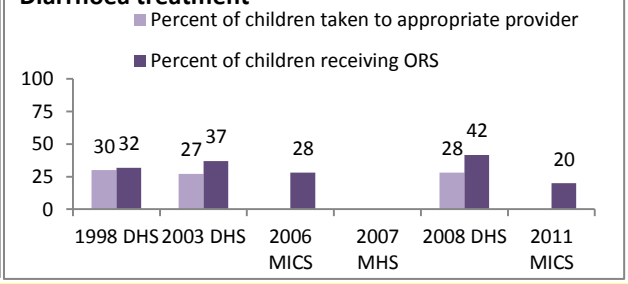
Malaria prevention and treatment



Pneumonia treatment

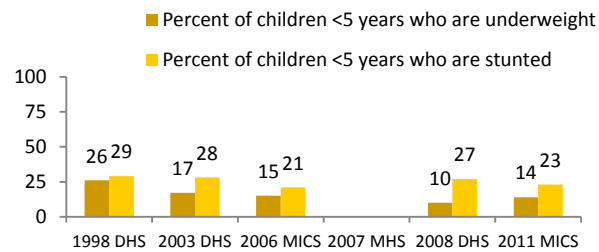


Diarrhoea treatment

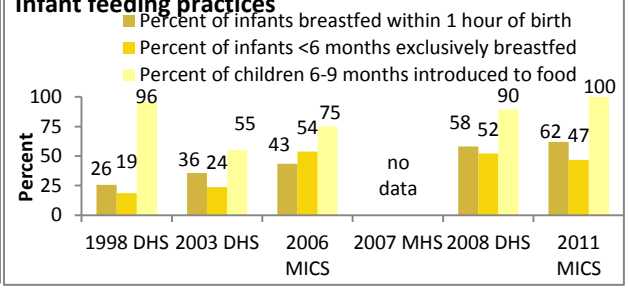


NUTRITION

Underweight and stunting prevalence



Infant feeding practices



[1] Population, births, maternal mortality data collected from Ghana's 2010 Census. Neonatal and under-five mortality rates as well as total fertility rate are collected from Ghana MICS 2011 and numbers applied to 2010 births from census.