

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

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



**Save the Children**



## ACKNOWLEDGEMENTS

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We would like to thank UNICEF and the Canadian International Development Agency for funding this evaluation.

A special thanks to the study participants including the Ministry of Health, Implementing Partners, health workers and mothers for being so generous with their time and being willing to share their experiences with us. We acknowledge the work of Dr David Hercot on the evaluation plan for Mali.

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This report is disseminated by the South African Medical Research Council, University of the Western Cape and Save the Children.

## Suggested citation

Besada D, Rohde S, Daviaud E, Kerber K, Doherty T for the IHSS Evaluation study group\*. Report on the Summative External Evaluation of the Catalytic Initiative (CI)/ Integrated Health Systems Strengthening (IHSS) Programme in Mali. Cape Town: South African Medical Research Council, University of the Western Cape and Save the Children, 2014.

**ISBN:** 978-1-920618-29-2

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## ACRONYMS

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ACSD	Accelerated Child Survival and Development
ACT	Artemisinin-based combination therapy
AIM	AIDS impact module
AMM	Association des Municipalites du Mali/Mali Association of Municipalities
ANC	Antenatal Care
ASACO	Community Health Association
ASC	Agents de Sante Communautaire/Community Health Worker
CFA	West African CFA franc
CI	Catalytic Initiative
CPS	Planning and Statistics Department
CREDOS	Centre de Recherche, d'Etudes et de Documentation pour la Survie de l'Enfant/ Centre for Research, Studies and Documentation of Child Survival
CSCOM	Centre de Santé Communautaire/Community Health Centers
CSCR	Cadre Stratégique pour la Croissance et la Réduction de la Pauvreté/Poverty Reduction Strategy
CSLP	Cadre Stratégique de Lutte Contre la Pauvreté/Poverty Reduction Strategy
CSREF	Centre de Santé de Référence/Referral Health Center
DNS	National Health Directorate
DRS	Regional Health Directorate
DTC	Clinical Director of Health Services (CSCOM)
DTP	Diphtheria, Tetanus, Pertussis vaccine
EAS	Epidemiological alert system
EBF	Exclusive breastfeeding
EPI	Expanded Programme on Immunization
FENASCOM	National Federation of Community Health Associations
GAVI	Global Alliance for Vaccines and Immunization
GDP	Gross domestic product
GF	Global Fund
Hep B	Hepatitis B
Hib	Haemophilus influenza type b
HIPC	Heavily Indebted Poor Countries
HIS	Hospital Information System
iCCM	Integrated community case management of common childhood illnesses
IGME	UN Inter-agency Group for Child Mortality Estimation
IHP	International Health Partnership
IHSS	Integrated health systems strengthening
IMCI	Integrated Management of Childhood Illness
IMF	International Monetary Fund
INRSP	National Institute of Public Health Research
IP	Implementing partner
IPTp	Intermittent Preventive Treatment of malaria in pregnancy
ITN	Insecticide treated net

LiST	Lives saved tool
LLIN	Long-lasting insecticidal net
LQAS	Lot Quality Assurance Sampling
MCWH	Maternal Child and Women's Health
MDGs	Millennium Development Goals
MDP	Malaria, Diarrhoea, and Pneumonia
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal Neonatal and Child Health
MOH	Ministry of Health
M&E	Monitoring and evaluation
NMR	Neonatal mortality rate
ORS	Oral rehydration salts
PDSS	Plan décennal de développement sanitaire et social/Ten Year Health and Social Development Plan
PMTCT	Prevention of Mother to Child Transmission of HIV
PSI	Population Service International
PRODESS	Programme de Développement Socio-Sanitaire
RDT	Rapid Diagnostic Test
SD-SNISS	National System of Health and Social Information
SEC	Soins Essentiel Communautaire/iCCM
SLIS	Local Health Information System
SWAP	Sector Wide Approach
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
U5MR	Under-five Mortality Rate
WASH	Water, sanitation and hygiene interventions
WHO	World Health Organization

## EXECUTIVE SUMMARY

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### Background

Despite some progress in coverage of select maternal and child health interventions achieved through the Accelerated Child Survival and Development (ACSD) programme implemented between 2001 and 2006, Mali continued to report extremely high rates of maternal and child mortality according to the Demographic and Health Survey (DHS) of 2006. In 2007, Mali adopted a national child survival strategy in an effort to harmonize interventions proven to be effective at reducing child mortality, with the launch of the Catalytic Initiative (CI) in 2008. Funds provided through the Catalytic Initiative, were utilised to support the implementation of the Integrated Health Systems Strengthening (IHSS) programme in 44 of the country's 59 districts covering 6 of the country's regions including Kayes, Koulikoro, Sikasso, Segou, Mopti, and Gao. Funds from the grant supported training and supervision of the relais volunteer cadre in the key family practices covering areas of nutrition, health and water, sanitation and hygiene interventions (WASH), training of traditional birth attendants in the management of pregnancy and delivery, as well as training of health facility staff in Integrated Management of Childhood Illnesses (IMCI). Furthermore, funds were also utilized to support activities at the district level and health centers through the provision of transportation to carry out outreach activities and the procurement of supplies including long-lasting insecticidal nets (LLINs), Vitamin A, cold chain equipment, oral rehydration salt (ORS), Zinc, and intermittent preventive treatment of malaria in pregnancy (IPTp).

In an attempt to further increase health care access in the country, the Ministry of Health, in conjunction with its health partners, adopted a strategy referred to as "Soins Essentiels dans la Communaute (SEC), defined as essential community care, aimed at developing a new layer of preventative and curative health services beyond the health centres, in the community. In March 2009, Mali held a national forum to inform discussions on how the strategy would be operationalized. Outcomes of the forum included the creation of a new cadre of health workers, termed the Agents de Santé Communautaire (ASC) who would be placed in hard to reach communities, defined as at least 5 kilometres away from a health facility. The ASCs would be trained, for a period of 15 days in addition to 25 days of practical training, to provide Integrated Community Case Management (iCCM) of malaria, pneumonia, diarrhoea and acute malnutrition for children under five years of age. At the time, approximately 43% of the population lived beyond 5 km of a health facility.<sup>1</sup> Planning for the SEC programme lasted approximately 2 years, within which iCCM policies were finalized, including the national iCCM implementation guide, the training modules and manuals, as well as stock management, monitoring, supervision, registers, and financial tools. By 2011, the tools had been tested and validated, and training of the trainers and the newly recruited ASCs began. ASCs were placed in villages, with housing and consultation rooms provided by the communities. As per the principles of the Bamako Initiative, ASCs charge a consultation fee and sell drugs including antibiotics, and ORS and Zinc, while malaria diagnostics and medication are supplied free of charge as per government policy, although patients must still pay for the consultation fee.



## **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.<sup>2</sup>

## **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”.<sup>3</sup> 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.<sup>4</sup>

## **Purpose and objectives**

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 Mali.
2. To inform programme and policy decisions in Mali and regionally.

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

- **Relevance:** In terms of alignment to national priorities and plans, enhanced policy environment, multi-sectoral collaboration and promotion of gender equity.
- **Effectiveness:** Effect on strengthening the six (World Health Organization (WHO)) building blocks of the health system and the capacity of government and/or civil society organizations to train, equip, deploy, and supervise front-line health workers to deliver a limited package of proven, high impact and low cost health interventions.<sup>5</sup>
- **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 program 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.

Plausibility for this evaluation was defined as “apparently true or reasonable, winning assent, a plausible explanation”<sup>6</sup>. In assessing plausibility of contribution, the external evaluation attempted to “rule out external factors [factors outside of the program] 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 program; 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:

- Mali – hard to reach areas in five Regions (Kayes, Koulikoro, Mopti, Sikasso, and Ségou). It is important to note that over 90% of Mali’s population lives in the southern half of the country. Bamako, the country’s capital, situated in the South, is mainly urban, and therefore, was not one of the focus regions for the programme.

Temporally the scope of the external evaluation included the period 2001-2006 (secular trend) prior to the start of the IHSS programme, and the period 2006-2012 known as Phase I of the program.

## **Intended Audience**

The intended audience of this external evaluation includes the MOH of Mali, 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<sup>7,8</sup> 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 (DHS 2001, 2006, 2012 and MICS 2010). Raw data was not available for the 2012 DHS survey, and consequently, confidence intervals around the point estimates could not be calculated. The coverage and trend analysis was restricted to the country’s five Southern Regions (Kayes, Koulikoro, Mopti, Sikasso, and Ségou). Data to assess implementation strength, utilisation and quality of care were taken from the Lot Quality Assurance Sampling (LQAS) Survey conducted in 2013.

Using subnational population characteristics and household survey data, LiST was used to investigate the extent to which changes in child mortality could be attributed to changes in intervention coverage in the five regions. On the basis of baseline mortality values and changes in coverage of newborn and child health interventions from the Demographic and Health Surveys, we forecasted child mortality over two time periods (pre-IHSS, and during the IHSS programme) to identify the number and proportion of lives saved due to various child health interventions, including, but not limited to, those supported by the IHSS programme. We compared predicted mortality values with those measured by household surveys. The terminology “lives saved” refers to deaths averted.

The costing component focussed on the *additional* costs incurred by the health services (including donor funding) due to the introduction at community level of curative interventions by ASCs for the treatment of malaria, diarrhoea and pneumonia in children under five, assuming that treatment protocols are followed as well as supervision protocols. It also assessed the financial sustainability of the programme in relation to current coverage and scale up of the program countrywide; in relation to public health expenditure and the government’s own health expenditure. The year of reference for

number of ASCs and number of treatments is 2012-13. Costs are annualised and expressed in US\$ 2012.

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 modeled 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, and using these costing figures would, therefore, be inappropriate as it underestimates the full costs (government and donor costs combined) of delivering the iCCM.

The effects of contextual factors were described using data from document reviews and relevant databases. Contextual data to support the quantitative coverage data were collected during key informant interviews and focus group discussions with national stakeholders, key district personnel, ASCs, their supervisors and beneficiaries.

Data collection occurred at a national, regional and district level. Thereafter, each set of data 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 program'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 program's objectives include a focus on women's participation and a gender equality approach?

The program objectives fed directly into the government move towards new health policies at community level. Mali has since the 1990s used community health workers for the distribution of medication and treatment at the community level: the relais communautaires had been performing a wide range of functions but largely unregulated. Furthermore, Mali's cost recovery mechanism, through payment for services and drug sale, presents a financial barrier to accessing health care, leading to use of medication from alternative sources, including shops and unregulated health workers. The government of Mali, in conjunction with its development partners, launched a forum to define ways to achieve increased geographical access to care. The planning process, including the development of the policies and tools to drive the programme, entailed positive collaboration between the Ministry of Health and its development partners. The process of evidence-based policy making was successful in dispelling concerns and resistance from formal health cadres in Mali regarding the provision of curative services by community based health workers.

In 2009, all Implementing Partners signed the Mali Compact Agreement under the IHP+ Initiative in an effort to effectively coordinate the health system through harmonization of its budget, implementation and Monitoring and Evaluation (M&E) systems. The Government incorporated a community health plan and strategy for implementation in its 2011 Health Plan, and the IHSS programme aligned itself to the country's Poverty Reduction Strategic Plan as well as its 10-year health sector plans.

With the exception of drug and supply procurement, all financial transactions are channelled through the national health system, and implementing partners have been successful in ensuring effective coordination and division of labour across districts so as to avoid unnecessary overlap of resources. In addition, a National Adhoc group for iCCM, made up of the Implementing Partners, was formed and has been meeting every quarter to discuss effective coordination and support to the government in rolling out these community-based services.

While Mali has implemented successive policies to ensure the promotion of the rights of women in the country and equitable access to basic social services, the IHSS programme does not have a specific gender recruitment policy. There has been evidence, however, of a feminization of the health sector, and by mid-2012, 56% of trained ASCs were women. This ratio was not sustained, however, and by the end of the programme, this ratio had dropped to 43%. As a result, there is a need to address issues around the attrition of women, as evidence shows a high quality of service provision by female ASCs.

The programme did result in the promotion of community dialogue and mobilization among women, with groups being formed in the community to ensure a form of income generation to support access to the services provided by the ASCs.

### **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 program?
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?

The SEC programme experienced significant challenges during the period of the Catalytic Initiative, including a long preparatory period, a suspension of Global Fund finances in 2010 due to concerns with the management of the grants, concurrent Sahel droughts and food crises in 2008, 2010 and 2012, and a military coup in 2012 with the resulting suspension of a large proportion of donor funding which affected many of the iCCM partners.

The SEC programme was able to achieve 94% of its target for ASC recruitment, with 2,052 trained ASCs by 2013, or approximately 3 ASCs per 1,000 under-five population, according to the latest UNICEF

statistics. However, political insecurity has led to challenges with the deployment of some ASCs in at least 4 of the 40 implementing districts, including the three districts bordering the north in Mopti region, which have about 69% of their planned ASCs trained, of which only one in five are functional due to insecurity. Other challenges linked to ASC deployment have resulted from difficulties in integrating ASCs into a heavily subsidized free health care scheme put in place by international NGOs. Retention of trained and deployed ASCs was initially affected by the lack of a stable system for ensuring consistent salaries, however, many ASCs, who had previously been working as matrons report higher job security through this programme.

Consistent supervision of ASCs was problematic, due to a combination of financial strain to pay allowances, lack of transportation, and time management (or time pressure on the only doctor or nurse supervisor at the health centre). Data from routine monitoring and the 2013 LQAS demonstrate that approximately 63% of the ASCs had received a supervision visit in the last 3 months, and supervision of case management during one of those supervisory was just over 50%. Consistent supervision is particularly important in Mali, as it not only serves as a quality assurance mechanism, but is also the mechanism by which ASCs have their drugs replenished every month. Data on drug availability demonstrate generally low levels of stock-outs, likely largely as a result of Mali's cost recovery mechanism ensuring a relatively low dependence on donor funding. UNICEF attempted to circumvent stock-outs of malaria diagnostics and treatment at the community level during the Global Fund crisis of 2010, in addition to procuring the initial kits and stock provided to newly trained ASCs. Drugs reporting the highest frequency of stock-outs are those provided free of charge by government and supported by the Global Fund, including RDTs and ACTs, with reported stock-outs of 37% and 29%, respectively, over the past 3 months.

The IHSS programme has been able to achieve commendable gains in health care utilization at the community level. Routine data reports ASCs treated 18% of all under-five cases of pneumonia, malaria and diarrhoea cases treated in the public sector. Utilisation of commodities purchased with UNICEF and DFATD funds for the programme is, however, very low still, with approximately 7% of zinc tablets, 4% of antimalarials, 3% of RDTs, 1% of ORS sachets, and 6% of antibiotics utilized.

The period under which the IHSS programme was implemented in Mali was extremely challenged as described above and this would be expected to have a significant effect on a large range of health interventions in the country, with resulting impact on coverage changes of maternal and child health indicators.

Both ORS coverage and the proportion of children under five sleeping under an insecticide treated net (ITN) had high positive annual rates of coverage change during the IHSS programme period, corresponding to almost 4 and 7 percent per year, respectively. While ORS coverage increases were significantly higher over the IHSS programme period (2006-2012) in comparison to the pre-IHSS period (2001-2006), data on ITN coverage was not available in 2001 to be able to make the same comparison. However, net distribution started in 2001 under the ACSD program, and the early gains would have reflected this. Efforts towards mass distributions of bed nets were sustained under the IHSS programme with the procurement of large numbers of nets in addition to support provided through the provision of transportation to health facilities to carry out outreach campaigns. While data on two doses of Fansidar was not available for 2001, positive annual rates of coverage change were noted during the IHSS programme period, corresponding to approximately 1 percentage point per year. Significant decreases in coverage corresponding to negative coverage changes were noted during the

IHSS programme in comparison to the pre-IHSS periods with regard to tetanus toxoid vaccination coverage for pregnant women (-2 vs. 4 percentage points per year), exclusive breastfeeding rates (-1 percentage points per year vs. 3 percentage points), vitamin A supplementation (-2 percentage points vs. 7) and DPT3 vaccine coverage (-1 vs 6 percentage points). Small but marginally significant coverage change were achieved during the IHSS programme period for coverage with Fansidar for prevention of malaria in pregnant women (IPTp) and early breastfeeding rates, though both had significantly lower average annual coverage change than those of the pre-IHSS programme period (1 vs 4 percentage points respectively for both coverage estimates). Care seeking for suspected pneumonia and fever had negative average annual coverage change. However, the rates were not significant as the confidence limits around the estimates crossed 0, suggesting that coverage was maintained during the IHSS programme period. Care seeking practices for pneumonia and fever also remained stable in the pre-IHSS period, so overall, throughout the 2001-2012 period, no significant changes in care seeking for those conditions were noted. There were decreases in coverage in the provision of antimalarials for fever during the IHSS programme period, corresponding to a negative annual rate coverage change of approximately 2 percentage points; negative annual rates of coverage change were similar in the pre-IHSS period. Postnatal care was not comparable in pre- and post-IHSS periods as earlier surveys restricted definitions to women who delivered at home while the 2012 survey included all deliveries.

The programme was not able to achieve positive impacts on equity with the exception of a few indicators including ITNs and ORS. Equity with regard to malaria treatment access also improved in Mali, however, only due to a larger drop in coverage in the richest wealth quintile in comparison to the poorest wealth quintile. While equity improved for some other indicators in the pre-IHSS period, such as tetanus toxoid vaccination, these positive outcomes were not maintained by 2012. Equity decreased with respect to most coverage indicators either due to the poorest wealth quintiles experiencing more significant coverage drops or a maintenance of coverage, while coverage in the richest quintile increased over the IHSS programme period. Equity remained stable with regard to early breastfeeding, exclusive breastfeeding and care seeking for pneumonia.

## 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 after the neonatal period in 2013 in Mali were estimated to be malaria (14%), pneumonia (13%), and diarrhoea (11%). The LiST analysis estimated similar average regional mortality rates to those of the demographic health surveys in the pre-IHSS period but during IHSS programme period LiST underestimated mortality change compared to measured rates, indicating that the coverage changes cannot account for all factors relating to child mortality reductions, or that the model is not accurately capturing the mortality impact of the coverage changes. According to the LiST analysis, over 31,000 deaths of children under five were averted between 2001 and 2006 prior to IHSS programme implementation, in relation to the baseline year of 2001. In the pre-IHSS period, measles deaths were significantly decreased due to increases in measles vaccination coverage (responsible for an estimated 30% of the lives saved) and vitamin A for measles treatment (responsible for 24% of lives saved). Vitamin A supplementation accounted for an estimated 12% of lives saved. An increase in ORS coverage was responsible for 6% of lives saved. Other than ORS and

vitamin A for treatment of measles, there was very little change in coverage, and therefore impact, of curative interventions in the pre-IHSS period.

The average rate of mortality reduction of 2.6% per year in the IHSS programme implementation phase is higher than the pre-IHSS period average annual rate of reduction of 1.5%. The modelled results indicate that approximately 41,900 lives of children under five were saved between 2007 and 2012. According to the model, an estimated 90% or 37,900 of these lives saved were due to increases in coverage of interventions also supported by the IHSS programme. ITN use was responsible for an estimated 15,300 lives saved, or 36% of the total in this period. The newly introduced pneumococcal vaccine accounted for approximately 20% (8,300) of lives saved. Increases in ORS coverage accounted for 22% (9,000) of lives saved. Decreases in vitamin A supplementation coverage and decreases in rates of care seeking for pneumonia resulted in approximately 1,700 and 3,400 additional deaths in 2012 compared to 2007.

### **Sustainability**

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

The net cost per malaria treatment amounts to \$12.4, \$10.5 for diarrhea treatment, and \$9.5 for pneumonia, with a weighted average across treatments of \$11.4. The share of ASC fixed costs represents an average of 85% of treatment costs. Cost per treatment would reduce with increased utilisation, due to lower ASC fixed cost per treatment. With 30% more treatments per ASC, moving from 134 to 174 a year, the net cost per treatment (consultation + drugs) decreases by 20%, and the cost of the program covering all ASCs increases by 4% (higher utilisation of drugs), moving from the current \$2.8 million to \$2.9 million. Such an increase in visits due to increased demand and increased population in the areas covered would be manageable by existing ASCs, translating to a total of 4 hours a week on malaria, diarrhoea and pneumonia treatments and related tasks. An additional 15% must be added to the net cost of iCCM to reflect strengthening of the health system to enable iCCM to be implemented (iCCM+). The net program costs of the iCCM+ would stand at \$3.2 million. With 30% more treatments per ASC, the cost would be \$3.4 million.

In 2011, 43% of public health expenditure was covered by the government's own health expenditure and 57% by donors. With the current system, where the government does not pay for ASC subsidies, the current program covering 22% of children under five would amount to 1% of the government's own expenditure on health in 2011. However, trends in the health budget, where government health expenditure per capita decreased from \$10.7 in 2007 to \$8.7 in 2011, combined with the increased security demands on the national budget may threaten the maintenance of the programme. Scaling up the programme to cover the whole country could not be possible without donors' contributions, as it would represent 4.7% of the government's own health expenditure, but 2% of public health expenditure. If the government pays the ASC subsidies and receives payment from the patients, the current program would represent a sizeable 2.6% of the government's own health expenditure, but a

feasible 1.1% of public health expenditure. Extended to the whole country, the cost of the programme would amount to 12% of government own health expenditure, but 5% of public health expenditure.

The current number of ASCs is sufficient for the current geographical coverage, and could cope with an increase number of treatments for these conditions, still leaving additional time available to cover other conditions and older age groups in their areas. However, geographical scale-up to cover the country would require an increase in the number of ASCs from the current number to 8,320.

With the program being so recent, it was not appropriate to quantify the cost per life saved since this would not represent costs of a mature programme. With an extension of ASCs' scope of practice, much asked for by communities, the additional cost of these new treatments will be significantly smaller and would contribute to an additional health impact.

Qualitative findings show that there are still concerns with the future sustainability of the programme. Discussions with the FENASCOM and Mali Association of Municipalities (AMM) are underway to try to develop a plan for them to take over the running costs of the programme through locally generated funds and budget allocations from government. It is unclear whether the capacity of the local municipalities has been developed sufficiently in the short term, however, to take over financial management of the SEC programme, and donor funding will need to continue in the immediate future.

## **Conclusions**

### **Relevance**

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

One of the key factors that explain the gains that have been made through the IHSS programme in Mali is the investment made in strengthening the health system through capacity building of both front line ASCs, relais communautaire, and traditional birth attendants at the community level as well as facility-based staff. Prior to the programme, Mali implemented a successive series of health and social development plans aiming to increase its population's geographical access to health facilities which pre-dated the IHSS programme and contributed a strong foundation upon which iCCM could be implemented. The IHSS programme supported advocacy activities that promoted the establishment of a new cadre of community health workers and the revitalization of its existing relais volunteer cadre, through which iCCM could be implemented. The IHSS programme drew strongly on elements of both a top down approach, including investment at the national level in the creation of policy and plans, tools for implementation, and monitoring and supervisory structures, while ensuring that communities were engaged and sensitized through participatory meetings.

The Malian MoH has demonstrated commitment to, and ownership of, iCCM as evidenced by its integration into the national health system through the incorporation of a community health plan and strategy (the 2011 Health Plan) and alignment of the iCCM strategy to Mali's Poverty Reduction Strategic Plan as well as its 10-year health sector plans.

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

A factor that was repeatedly cited as being influential to the success of the IHSS programme is the strong collaborative relationship between the MoH and international agencies and partners in Mali.



Strong collaboration between the Ministry of Health and its development partners, including UNICEF, through the IHSS programme, resulted in the successful formation of the SEC programme in the country and ensured its alignment to national priorities and goals. Development partners committed to effective partnership in Mali to ensure that their physical presence in implementation districts was divided up efficiently and resources were allocated appropriately thereafter. While overall, development partners followed the lead of the Ministry of Health in agenda setting and coordination and participated effectively in the development process of the programme to ensure systematic roll out, interviews revealed some divergence in the areas of supervision and health subsidies counter to the pay for service characterization of Mali's health system. Furthermore, while the decentralised health system of Mali saw many local health structures take responsibility for the management of health systems, many felt that this required concurrent financial allocations from the centralized level to these decentralised structures for effective realization of their roles.

#### *Women's participation and gender equality*

Achieving a gender balance at the ASC level remains a problem in Mali as a result of the absence of a deliberate prioritisation of female participation in community-based service delivery through policy. The pre-requisite requirement for ASCs to have some health background, resulted in higher rates of recruited females, however, the disproportionate attrition of female ASCs resulted in the gender balance of ASCs to move in favour of men. The IHSS-supported SEC programme did, however, provide a stimulus for the mobilization of women's groups in the community who participate in income generating activities as a means to gain economic independence and increase their financial access to the newly generated health services of the programme. As women in Mali continue to be disproportionately affected by low literacy rates and limited economic opportunities against a backdrop of socio-cultural barriers that limit their access to basic services including health and education, a more active role will have to be taken by the government to ensure that progressive Gender Action Plans that have been established in Mali move beyond policy discourse to actualizing practical differences in the lives of women in the country.

#### **Effectiveness**

*THE IHSS programme contributed to the expansion of community-based health-care for pregnant women and children through deployment of ASCs but their availability needs to be improved*

The IHSS programme investment, in building on the gains achieved through the ACSD programme by further investing in the relais cadre and seeing the inclusion of traditional birth attendants, ensured that health promotion activities as well as the provision of commodities, including ORS and bed-nets were sustained. After the adoption of a comprehensive community health policy in the country, the districts where iCCM was implemented by ASCs in Mali had communities who not only valued their presence but directly attributed the reduction in child mortality to their services. Furthermore, the relais cadre that existed prior felt increasingly supported to carry out their activities. Communities were able to appreciate the importance of, and the difference made by, having ASCs who were available to treat their children, saving them time and money.

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

UNICEF, through the IHSS programme, has made significant effort in the area of ASC training, and invested in the training of the ASCs, and those of thousands of relais prior to that. Due to the high

level of competency of the ASCs, as many had already been working as health care providers prior to implementation of the IHSS programme, the training period of two weeks was sufficient to capacitate them in providing effective care to children under five. Many reported having received refresher training as well in specific topics, and this will have to be sustained to ensure ongoing capacitation of ASCs. There are discussions underway to up-skill the ASCs to become nurses, but this will need to be sufficiently questioned to ensure that there is a need for this, given the seemingly high quality of health services currently being provided by the ASCs and the country's potential to sustain this as it would likely entail significantly higher health care worker salaries.

While the IHSS programme did invest in training close to 200 health care workers in IMCI, training appears to be rerouted to the community level since the roll out of the SEC programme. In light of the fact that IMCI training is not incorporated into the national training curriculum, a gap in the quality of service provision is beginning to develop at the health facility level.

*The IHSS programme strengthened the health system through strengthening supervision of ASCs*

Through IHSS programme support, UNICEF was able to work with the government and other development partners to finalize and field-test the supervisory tools for monitoring ASC service delivery. The IHSS programme further invested in the training of health facility staff in iCCM to be able to carry out their activities as well as provide them with transportation for field visits. Through IHSS programme support, supervisory missions by sub-district and higher levels have also been carried out.

Despite these investments, supervision was repeatedly highlighted as a shortfall in the implementation of the programme, with approximately only 60% of the ASCs having received a supervisory visit in the last three months, and an even lower frequency of observed case management. Observations from the field visit point to insufficient supervision visits resulting from lack of transport and the fact that only the clinical director at the health centre is authorized to carry out supervisory activities.

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

UNICEF was responsible for the initial procurement of ASC kits and drugs, with the exception of malaria diagnostics and treatment. Transparency in the financial management of the Global Fund Round 10 grant will have to be ensured so as to avoid a repeat of the 2010 Global Fund crisis and resulting disruptions in drug supply. Furthermore, government will have to begin to consider how it will sustain its free malaria policy in the absence of Global Fund support.

Challenges around poor forecasting of drug needs were cited as one of the major reasons for drug stock-outs. However, the cost recovery mechanism put in place to ensure that drugs are replenished through the sale of medication and consultation fees ensures limited dependence on donor funding to sustain the programme.

Another issue around consistent supply to the village level stems from the country's distribution system currently in place. Stock replenishment to the community level is dependent on supervision visits from the health centre, and in light of the challenges cited with supervision, highly vulnerable to consistent drug flow.

### *Assessment of the contribution of the IHSS programme to coverage changes*

There were large improvements in both ORS coverage and the proportion of children under five sleeping under an ITN during the IHSS programme period, as a result of significant investment in the procurement of both commodities and the training of staff (relais and ASCs) to distribute them. Furthermore, increases in coverage were noted with regard to one dose of Fansidar to women during pregnancy and the rates of early breastfeeding. However, since raw endline data was not available to determine significance, and because the increases were marginal, it is unlikely. This could point at the very least to a maintenance in coverage in these two indicators, as well as for measles vaccination coverage, which remained unchanged during the IHSS programme period. The IHSS programme supported the implementation of outreach campaigns which would have plausibly contributed to sustained immunization rates. Care seeking for suspected pneumonia and fever remained unchanged both in the pre-IHSS and IHSS programme period, which possibly alludes to the fact that financial barriers to health care access remains a significant problem in the country. It is important to note that the iCCM component of the IHSS programme is still in its infancy, and as it attempts to address this challenge through reduced consultation fees and costs related to travel, and therefore may need to be assessed at a later stage to see impact. Maternal indicators, including ANC care, were maintained during the period of IHSS programme implementation, while skilled birth attendance doubled by 2012, likely due to IHSS programme investment in the relais and traditional birth attendants.

As expected, the effect of the financial and political crisis in Mali had a disproportional impact on coverage drops for select child health interventions in the poorest wealth quintile. As a result, the programme was not able to achieve positive impacts on equity with the exception of a few indicators including ITNs and ORS. Equity remained stable with regard to early breastfeeding, exclusive breastfeeding and care seeking for suspected pneumonia.

### **Impact**

Mali is on track for Millennium Development Goal 4 for child survival, with an under-five mortality rate (U5MR) of 128 per 1000 live births in 2012 and a target of 84 per 1000 live births by 2015. Between 2010 and 2012, Mali experienced a significant drop in under-five mortality, from 178 per 1000 live births to where it currently stands, a commendable gain in light of the significant turmoil during that two-year period in the country. The main causes of under-five deaths after the neonatal period in Mali were malaria (14%), diarrhoea (11%), and pneumonia (13%). In the pre-IHSS period, increases in measles vaccination coverage and vitamin A for measles treatment were responsible for 30% and 24% of deaths averted, respectively. Vitamin A supplementation accounted for an estimated 12% of lives saved. The same coverage is assumed for vitamin A supplementation as use of vitamin A for measles treatment, which is a limitation with the data. An increase in ORS coverage was responsible for 6% of lives saved. Other than ORS and vitamin A for treatment of measles, there was very little change in coverage, and therefore impact, of curative interventions in the pre-IHSS period.

The average rate of mortality reduction of 2.6% per year in the IHSS programme implementation phase is higher than the pre-IHSS period annual rate of reduction of 1.5%. The modelled results indicate that approximately 41,900 lives of under-fives were saved between 2007 and 2012. Approximately 90%, or 37,900, of these lives saved were due to increases in coverage of interventions also supported by the IHSS programme. ITN use was responsible for an estimated 15,300 lives saved, or 36% of the total in this period, consistent with the decline in malaria mortality (23%). The newly introduced pneumococcal vaccine accounted for approximately 20% (8,300) of lives saved. Increases

in ORS coverage accounted for 22% (9,000) of lives saved. Decreases in vitamin A supplementation and decreases in rates of care seeking for pneumonia resulted in additional deaths in 2012 compared to 2007.

## **Sustainability**

With 30% more treatments per ASC, the net cost per treatment (consultation + drugs) decreases by 20%, the cost of the program covering all ASCs increases by 4% (higher utilisation of drugs), moving from the current \$2.8 million to \$2.9 million. Increased utilisation has a small impact on program costs whilst it is likely to improve health status.

In 2011, 42.7% of public health expenditure was covered by the government's own health expenditure and 57.3% by donors. With the current system, where the government does not pay for ASC subsidies, the current program covering 22% of children under five would amount to 1% of the government's own expenditure on health in 2011. However, trends in the health budget, where government health expenditure per capita decreased from \$10.7 in 2007 to \$8.7 in 2011, combined with the increased security demands on the national budget may threaten the maintenance of the program. Scaling up the programme to cover the whole country would not be possible without the donors' contribution, as it would represent 4.7% of the government's own health expenditure, but 2% of public health expenditure.

If the government pays the ASC subsidies and receives payment from the patients, the current program would represent a sizeable 2.6% of the government's own health expenditure, but a feasible 1.1% of the public health expenditure. Extended to the whole country, the cost of the program would amount to 12% of the government's own health expenditure, but 5% of the public health expenditure.

The current number of ASCs is sufficient for the current geographical coverage and could cope with an increase in the number of treatments for these conditions and other conditions in these areas. However, scale-up to cover the country would require an increase in the number of ASCs from the current 1,847 to 8,320.

With the programme being so recent, it is not appropriate to quantify the cost per life saved, as this would be misleading. The study has shown that managing MDPs for children under five leaves ASCs with a significant amount of time to manage other conditions, and cover older children. With an extension of ASCs' scope of intervention, much asked for by communities, the additional cost of these new treatments will be significantly smaller and would contribute to an additional health impact.

### *Likelihood of sustainability post-IHSS*

Qualitative findings show that there are still concerns with the future sustainability of the programme, although discussions are underway to develop long-term solutions. The political crisis in the country both disrupted timely implementation of the programme as well as plans for the Ministry of Health to absorb financial responsibility for its continuity, with an estimated shrinking of the health budget by development partners by as much as 40% over that period. Advocacy activities are underway, however, and include discussions with the FENASCOM and Association of Malian Mayors (AMM) to try to develop a plan for them to take over the running costs of the programme through locally generated funds and budget allocations from government. There do remain, however, concerns with the capacity of the ASACO's to sustain the programme independently of external support, and it is unclear whether the municipalities would be ready in 2014 to sustain the programme without

sufficient allocations by government. The government's ability to sustain its initiative to provide malaria diagnostics and drugs for free is an additional concern in the absence of external funding.

## **Lessons learnt**

### **Relevance**

- iCCM in Mali was implemented within a well-organized health system with an established decentralised structure facilitating linkages between the community to higher levels of care. The MOH has played a leadership and coordinating role when engaging implementing partners who support the health system thereby ensuring that the IHSS programme is in line with national priorities.
- While there have been successes in recruiting large proportions of women for the implementation of iCCM, retention is a challenge due to broader socio-cultural norms that limit female decision making powers. Further efforts to address this will be required for sustainable and measured impacts on gender equality

### **Effectiveness**

- The presence of relais compliments the work of the ASCs through their promotive and preventive activities and by encouraging care-seeking for iCCM conditions. Furthermore, the presence of ASCs has enabled a supportive environment for the relais and a sense of increased recognition of their work by communities.
- The evaluation has highlighted that approximately 63% of ASCs received a quarterly supervision, with just over 50% receiving supervision that included observation of case management.
- The evaluation found that just under 30% of ASCs reported stock-outs of antimalarials with closer to 40% reporting stock-outs of RDTs. Due to the country's free malaria policy, Mali is heavily dependent on the Global Fund for replenishment of stock, as evidenced by significant stock-outs during the 2010 financial crisis. Stock-outs of other essential commodities, including ORS and Amoxicillin, were less problematic as the sale of medication goes to replenishing stock supply. Supplies for iCCM are not channeled through the national system but rather through a parallel system which supplies districts with commodities directly. This approach is contrary to the health system strengthening goals espoused by the IHSS.
- The evaluation revealed that overall health care utilisation was low in Mali. A very low proportion of IHSS-procured drugs were used at the community level, corresponding to 7% of zinc tablets, 4% of antimalarials, 3% of RDTs, 1% of ORS sachets, and 6% of antibiotics. A health system based on user-fees, coupled with political instability and the infancy of iCCM implementation, are some of the reasons linked to low health care utilisation at the community level. Despite this, ASCs were found to have treated 18% of all under-five cases treated in the public sector.
- Significant increases in coverage were noted for ORS and ITNs, while smaller coverage increases were achieved for Fansidar for prevention of malaria in pregnant women (IPTp) and early breastfeeding rates.

## Impact

- The modeled annual rate of reduction was faster during the IHSS programme period than the pre-IHSS period.
- At the time of the evaluation, iCCM had been implemented in 62% of all districts in the five regions (Kayes, Koulikoro, Sikasso, Ségou, and Mopti) and had been at scale for only 11 months. Thus, the number of lives saved over such a short period is likely to be an underestimate of its potential after being implemented for longer.

## Sustainability

- If ASC utilisation increased by 30%, the net cost per treatment would decrease by 20% while the cost of the program would only increase by 4%. This shows that increased utilisation would only marginally increase programme costs but have a significant impact on health status through increased access to services for a large proportion of the population that remains underserved.
- The ASACO are an effective model for health system management and accountability at the community level, but their technical and financial capacity will have to be strengthened to ensure that they are effective in their roles and have the potential to support the generation of local funds to sustain the programme.

## Recommendations

### Relevance

- While the MOH has been successful in ensuring coordination of funding and programme implementation among partners, issues of various models of supervision linked to iCCM implementation and health care subsidies by partners despite an overall health system that implements user-fees represents areas in which further coordination and management of partners is required.

### Effectiveness

- Increase investment in IMCI at the CSCOM level is necessary to ensure a strong continuum of care, starting at the community level, and to ensure that the CSCOMS are fully equipped to handle referrals and complicated cases. Furthermore, as supervisory roles are the responsibility of the CSCOMS, IMCI training is necessary to ensure high level of competency of supervisors.
- Supervision for ASCs should be integrated along with other outreach activities to reduce the burden on the health system, which is currently understaffed. Furthermore, extending supervisory roles to other health cadres, including the nurses at the CSCOM level, rather than leaving the responsibility solely on the head doctor in charge, should be considered.
- It is important to ensure that once utilisation increases at the ASC level that there is an effective system to ensure that their stock is replenished and not held and used at the health facility. However, in the interim, these large volumes of drugs should be used at the health facility until demand is sufficiently generated at community level to prevent wastage.
- Mali has not yet achieved elimination of maternal and neonatal tetanus<sup>9</sup> and greater efforts need to be made to achieve this important milestone.

- The lack of further progress in coverage of breastfeeding practices across the IHSS programme period highlights a need for further investment and emphasis to ensure that trained relais and traditional birth attendants are effective at promoting these key child survival practices.
- Though some gains were made from 2001 in antenatal attendance, these rates are still very low and efforts to increase access to antenatal care are imperative.
- While user fees and drug sales have ensured replenishment of drug supply and health care worker salaries, they represent a major barrier to health care utilisation and result in ongoing use of informal health care providers. The Government of Mali will need to assess its capacity to reduce user-fees for health care in an effort to promote increased utilisation. A further assessment of the Ministry of Health's capacity to sustain its free malaria care in the absence of donor funding will be required.

### **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 skilled birth attendants, have also played a role in child survival and that the modelled estimates reflect changes in coverage at all levels of the health system, beyond the community level. It is recommended that future evaluations strive to collect data at other levels of the health system.
- The underlying reasons for decline in coverage in important preventive interventions such as vitamin A need to be further scrutinized.
- It is recommended that programmes are allowed sufficient time for roll out and full scale implementation to ensure that evaluations are able to fully capture their impact.

### **Sustainability**

- Currently 85% of net treatment costs reflect the share of ASC fixed costs. It may be desirable in areas where villages are not too distant to increase the catchment area per ASC, as this could decrease the number of ASCs required and increase utilisation per ASC, thereby decreasing the cost of the programme. This in turn would require that ASCs are given an allowance for cell phones and that bicycles are properly maintained.
- Recognising that care-seeking patterns take time to change significantly, a new sustainability study should be undertaken when iCCM implementation has reached higher maturity, and possibly covers other conditions and older children. Patterns of utilisation at health centres and community level would have stabilized, and the additional costs of the program could then be better put in the perspective of other savings in the health system.
- With such stabilization, health impact could be quantified, and new costing should calculate the cost per life saved.

# 1. Background

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## 1.1 Country context

Mali is a landlocked country in West Africa, bordered by Algeria in the north, Niger in the east, Senegal and Mauritania in the West, and Burkina Faso and Cote d'Ivoire in the South. Despite the country's vast size, spanning 1.2 million square kilometers, the majority of the northern half lays in the Sahara Desert, a sparsely populated area inhabited by nomadic groups who constitute approximately 10% of the country's population. This northern part of the country has seen much destabilization and fighting over the past three years and the already poor health services have been further reduced. Over 90% of the country's 14.5 million reside in the country's southern half, with access to the Niger and Senegal rivers for their livelihoods.<sup>10</sup>

Mali is divided into eight administrative regions and the District of Bamako, the country's capital, which also corresponds to a region. Each region is divided into circles, the equivalent of which would be districts. Mali has 50 circles which includes the 6 urban communes of Bamako. The majority of the population is rural, estimated at over 70%, though the country is rapidly urbanizing at a rate of approximately 5% per year.<sup>11</sup> With a fertility rate of 6.4 children per woman and a birth rate of 45.2 births per 1,000, just under 50% of the population is under 15 years of age.<sup>10</sup> Mali is characterized by a number of different ethnic groups, the largest of which is Bambara, making up 37% of the population. While the country's official language is French, about 80% of the population can communicate in Bambara, with over 40 other languages used by the different ethnic groups inhabiting the country.<sup>10</sup>

Islam is the country's predominant religion, practised by approximately 90% of the population. The remaining 10% are Christian and traditional animists, in equal proportions. The government is, however, secular, as established by the constitution.<sup>10</sup>

### Economy

Mali is one of the poorest countries in the world ranking 182/187 in the human development index.<sup>12</sup> Approximately half the population lives below the international poverty line, set at US\$1.25 a day.<sup>13</sup> Mali's Gross Domestic Product (GDP) per capita was \$476.44 US dollars in 2012.

A combination of livestock, agriculture, and gold make up 80% of the country's exports, and contribute approximately 33% to Mali's GDP<sup>10</sup>. The most fertile agricultural land can be found along the banks of the Niger River, where average rainfall varies from 50 centimeters per year around Mopti to 140 centimeters in the south near Sikasso. This area is largely known for its production of cotton, rice, millet, corn, vegetables, tobacco, and tree crops. This area is also known for fishing, however due to recurrent droughts and the diversion of water for agriculture there has been a steady decline in the industry since the 1980s. In an attempt to increase fish production, the government has plans to invest in fish breeding.<sup>10</sup>

Mali is the third largest producer of gold in Africa and the second largest cotton producer in sub-Saharan Africa.<sup>10</sup> Mali has suffered serious economic setbacks, having lost 40% of its herds during the Sahel droughts of 1972-1974 and 1983-85. The price of cotton dropped drastically in 2003, as a result of subsidies imposed by the World Trade organization.<sup>14</sup> Other food shortages occurred more recently in the country, including the Sahel droughts of 2005, 2008, 2010, and 2012, with millions of people



affected.<sup>15</sup> Seventy percent of the country's workforce is employed in the agricultural sector, while 15% work in the service sector.<sup>10</sup> Being landlocked, Mali is vulnerable to circumstances in the surrounding region, including political instability. The tourism industry, which comprises approximately 2.4% of the GDP, has recently suffered as a result of insecurity in the country's north.

<sup>16</sup>

Between 1982 and 1995 the country went through several Structural Adjustment Plans with the World Bank and the International Monetary Fund (IMF). Whilst some successes were registered in terms of economic growth and decrease of debt, their sustainability has been questioned. The social impact has been widely acknowledged as very negative on employment, education, public health and poverty in general.

In 2000, Mali was eligible for debt relief under the HIPC Initiative and received a debt write-off amounting to \$523 million, resulting in a 36% reduction of Mali's external debt from \$1,445 to \$922 million.<sup>17</sup> As a requirement of debt relief, Mali adopted its first poverty reduction strategic framework "Cadre Stratégique de Lutte Contre la Pauvreté (CSLP 2002 - 2006)" in 2002 and established a system to monitor its poverty programmes, followed by a second poverty reduction strategy, (CSCR) 2007-2011.

### **Political situation**

Military dictatorships, recurrent coups, and a tribal separatist movement in the north characterize Mali's political history. Mali gained independence in September 1960, after more than 60 decades of rule by France, and a one-party state was established. By 1968, the country's first elected President Modibo Keita was overthrown by a military coup. Moussa Traore, who took control of the country, stayed in power until 1992 when the regime was overthrown by another military coup, after years of growing dissent and violent clashes with student groups in the country. A new constitution was established, and Mali's first democratic multi-party election was held in 1992. Mali experienced years of peace and stability following the election of Amadou Toumani Toure, in 2002. The peace lasted for 10 years, before an armed conflict erupted in the north of Mali, where Tuareg rebels took control and declared an independent state of Azawad. A military coup followed in March 2012, in which a military officer, Amadou Sanogo seized power of the country. Tuareg control of the north was short-lived, with Islamist groups including Ansar Dine and Al-Qaeda in the Islamic Maghreb seized control with hopes of implementing sharia law. In response to land gains by these Islamic groups, France launched a military intervention in January 2013, and within a month's time, recaptured most of the northern territory. Presidential elections were held in July 2013, and the second round in August, seeing Ibrahim Boubacar Keita voted in as the current president of Mali.

## **1.2 Mali's health system**

At the national level, Mali's Ministry of Health is made up of the cabinet of the minister and national directorates reporting directly to the secretary general of the MOH. The Ministry of Health develops health policies, with implementation carried out by the National Health Directorate, DNS.

As stated in the background section, Mali is divided into eight administrative regions, each of which has a regional health directorate. The regions are further divided into the fifty administrative circles, which are then divided into sixty health districts. Management is decentralised into a total of seven hundred and three communes, each of which is under the authority of an elected local council headed by a mayor.

Mali's health system is divided into three levels: a central level with five National Hospitals, an intermediate level with eight Regional Hospitals and a district level with sixty Centres de Santé de Référence (CSREF, Referral Health Centres). The CSREFs are linked to the Regional Health Directorates, which are playing an increasingly large role in managing regional health programmes as a result of the country's adoption of a decentralization policy in 1992. CSREFs are financed by the State (infrastructure, equipment and top management), by local government (middle level clinical staff), and by the CSREF's own funds through cost recovery (support staff and running costs). CSREFs are akin to health centres, however better resourced ones perform the role of district hospitals. The CSREFs represent the link between the Centre de Santé Communautaire (CSCOM, Community Health Centres) and the Hospitals; each CSREF is responsible for a few CSCOMs (Figure 1). Primary health care is also provided by a range of para-public, religious, and private facilities.

The CSCOMS were established according to the principles of the Bamako Initiative in the late 1980's, to which Mali was a signatory, and in response to the goals of its 1991 health care policy. This policy drew on elements of community involvement in financing and management of CSCOMs, cost recovery, equitable access to health care, and essential medicines. Cost recovery mechanisms were put into place by charging for health consultations, drugs and supplies. In order to establish a CSCOM, communities had to create a community health association (ASACO) and raise a minimum of 10% of the cost of construction or renovation of the facility. ASACOs are responsible for the hiring of health personnel. All CSCOMs are expected to provide the minimum package of services including curative, preventive and promotional health services. While nurses head the majority of the CSCOMS, the MOH initiated a process of medicalizing the CSCOMS in 2011 by appointing medical doctors in lieu of nurses. According to the 2013-2022 Strategic Plan for Health and Social Development 30% of CSCOMS were headed by a medical doctor in 2011.

The MOH provides equipment and an initial stock of medicines, while communes contribute in a limited way, as they are expected to allocate 15% of their budget for social services including water, education, and health. The CSCOMS are managed by the ASACO, which is responsible for recruiting and paying the personnel operating out of the CSCOMS through the cost recovery mechanisms, as well as from some subsidies from the state. As an incentive to be part of ASACO, its members are charged half price for consultations and medication at the CSCOMS.

The CSCOMS generate revenue through membership fees, sales of essential drugs, and fees for services. The consultation fees vary by health area and are set by the ASACO after holding consultations with the community. The money generated from the sale of medication is kept in a separate account as a mechanism to avoid overprescribing and to prevent the decapitalization of pharmacy stock. The ASACO is responsible for replacing the drugs for the CSCOM through procurement from the national pharmacy system or from approved private sector companies. Some drugs, including selected antimalarials for pregnant women and children under five, vitamin A, and immunization services are provided free of charge by the government or external donors, but consultations are paid by the patients.

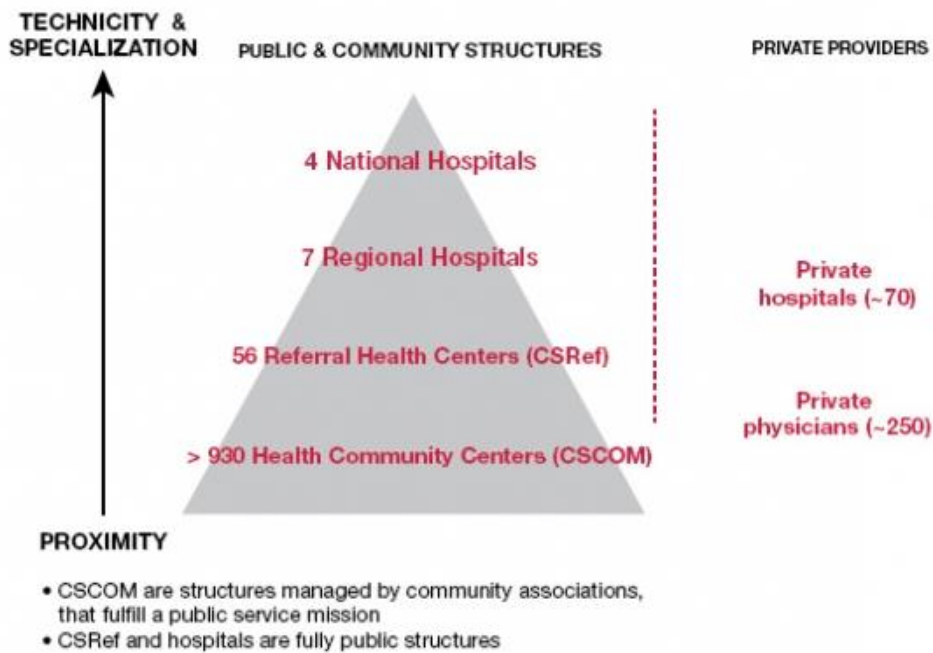
The Malian National Federation of Community Health Associations (FENASCOM), established in 1994, is responsible for the management of the ASACOs, in an effort to improve their management capacity. The FENASCOM receive funds through the premiums paid by members of the ASACO, as well as through government and donor support.<sup>18</sup>

At a community level, Mali has had a long history of using CHWs for the distribution of medication and treatment, dating back to the 1990s. This broad cadre of workers have been recruited to perform a wide range of functions and exist under various names, including distributor of Ivermectin, Azithromycin, Albendazole, Praziquantel, ART, ORS and Vitamin A, as well as other names such as community relais, village pharmaceutical agent, guinea worm extractors and nutrition promoters. More recently, this community level cadre, broadly grouped under the name of “relais communautaire” have been trained to provide home management of malaria using ACT.

Due to growing concerns about antibiotic resistance, the sale of drugs by the relais communautaire was halted in an attempt to mitigate the potential impact in the population. In September of 2008, The MoH drafted a discussion paper on the use of community volunteers in Mali, in an attempt to understand the current scope of practice of this cadre of community workers and in order to increase the efficiency of their tasks to ensure widespread coverage and high quality of delivery of essential health services. The document demonstrated unanimous agreement regarding the important role this cadre plays in the community. As a result, commitment was made to better define their selection criteria, scope of practice and distribution in the community, the need for appropriate administrative and technical supervision to increase the quality of their activities, and the need to harmonize their motivation levels, training, provision of equipment and materials, and to define an appropriate system for monitoring and evaluating their activities.

Regarding health financing, private health expenditure, including households contribution, was and remained increasingly the largest source of funds in the health sector standing at 51% in 2004, 52% in 2007, 56% in 2011, and 61% in 2012.<sup>19</sup> Government expenditure on health has not changed significantly over the last decade standing at 13% in 2004 and 12.5% in 2012. When taking into consideration total public health expenditure (government and donors), health expenditure increased to 49.2% in 2004 and dropped slightly to 45.4% by 2011. Public health expenditure on the health sector in 2004 amounted to 3.1% of GDP, 3.4% in 2007, 3.0% in 2011, and 2.3% in 2012, an indication of the pressure on government budgets due to the security situation.<sup>19</sup> In 2006, the Government of Mali and its Implementing Partners signed a framework agreement on sectoral budget support for the health and social sectors, which resulted in many Implementing Partners beginning to pledge funds towards the country’s national health plans. The main donors contributing to the health sector include Canada, the Netherlands, UNICEF, the Global Alliance for Vaccines and Immunization (GAVI) and the Islamic Development Bank.<sup>20</sup> According to the MOH Operational Plans, Canada, through sector budget support, contributed 5.5% of the total pledges to the health sector, while UNICEF contributed just under 4%.<sup>20</sup> The political crisis in 2012, however, resulted in a suspension of direct foreign aid by many Implementing Partners. UNDP estimated that 85% (USD 98 million) of external state budget support was suspended, with specific project aid shrinking by USD 398 million. In addition to the health and social services being impacted, disruptions in the construction and public works sectors were noted, resulting in significant layoffs and loss of revenues for individuals.<sup>21</sup>

**Figure 1: Organogram of Mali's Health System**



Source: <http://factsreports.revues.org/docannexe/image/2234/img-2.jpg>

[\\*please note that number of facilities have changed since this publication](#)

## Health Information System

Guidelines for the National Health and Social Information System were drafted in 1998 and highlight the requirements for the operationalization of each of the country's information systems made up of four components: The Health Information System, Social Information System, Information System for Surveys and Research, and the Administrative and Management Information System.

The Health Information System has three components which include the Local Health Information System (SLIS), the Hospital Information System (HIS), and the Epidemiological Alert System (EAS). These three sub-components of the Health Information System allow for the collection of epidemiological data, the surveillance of communicable and non-communicable diseases, mortality and morbidity, as well as routine data from the health centers and hospitals. The SLIS and EAS fall under the responsibility of the National Health Directorate (DNS), while the HIS falls under the responsibility of the Planning and Statistics Department (CPS).

Overall coordination is provided by the Planning and Statistics Department, while the collection, processing and analysis of data is conducted by each level of the health system, before transferring data up to the next level.<sup>22</sup>

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

Mali has implemented several successive policies and plans, signifying the country's political will and financial backing to ensure improved access to basic social services, including health and education for women and children, as well as legislative frameworks to ensure the promotion and protection of their rights. In 1997, Mali implemented the 'Women Promotion Action Plan' (1996-2000) policy aimed at strengthening women's access to basic social services, recognizing their fundamental rights, strengthening their role in decision making platforms and ensuring their participation in civil society. The policy specifically aimed to increase female school enrollment and literacy rates, as well as ensuring a supportive socio-cultural environment to promote access and uptake of reproductive services.

Thereafter, the country's ten-year health and social development plan known as "Plan décennal de développement sanitaire et social (PDDSS) 1998- 2007" has been implemented through a series of five-year programs, PRODESS I (1998-2002), PRODESS II (2005-2009), and the extension of PRODESS II (2009-2011). The plan committed to increasing access to, and improving the quality of, health care in Mali, in addition to improving coordination and optimizing the use of foreign aid. The PDDSS, through its implementation plans, aimed to realise Mali's commitment to the Millennium Development Goals (MDGs) and several other international treaties targeted at enhancing aid effectiveness.

During the same period, the Action Plan for the Promotion of Women, the Child and Family was developed, and implemented between 2002-2006, and it aimed to improve conditions around child survival including the creation of a favourable environment for child development and the inclusion and sensitization of families and communities.

Mali was one of the countries in which UNICEF, with support from DFATD, implemented its Accelerated Child Survival and Development (ACSD) project between 2001 and 2005<sup>23</sup>. The project involved the implementation of a set of interventions grouped into three packages including the Expanded Programme on Immunizations (EPI), which also included the use of long lasting insecticide treated nets, Integrated Management of Childhood Illness (IMCI), and services provided through antenatal care. Implementation took place in six of the country's sixty health districts, including Banamba and Kolokani in the Koulikoro Region, Niono and Nla in the Segou Region, and Koro and Djenne in the Mopti Region. UNICEF supported an additional twenty six districts for the expansion of the ASCD project in the regions of Koulikoro, Segou, Mopti, and Kayes. The programme included the provision of supplies and medication, as well as training of health staff in IMCI. Towards the end of 2003, the programme invested in the promotion of the thirteen key essential family practices, by mobilizing an already existing volunteer community health cadre (the relais) to visit homes for health promotion activities.

The country's poverty reduction strategy implemented in 2007 titled "Cadre Stratégique de Croissance pour la Réduction de la Pauvreté (CSCR) 2007-2011" highlights as one of its three strategic objectives, the strengthening of the social sector by focusing on improved delivery of key basic social services, including education, health, water, sanitation and living conditions. This was accompanied by a ten-year MDG plan in 2007, in which the government of Mali highlighted the financial resources that would be required to achieve the MDGs.

During the period of the Health and Social Development Plan, geographical access to health facilities greatly expanded, with the number of CSCOMS expanding from 345 in 1998 to 993 by 2009,

corresponding to an increase from 29% to 57% in the proportion of the population living within 5 kms of a health center in the country.<sup>1</sup> By 2011, the number of CSCOMS increased further to 1135.<sup>24</sup> Furthermore, for the duration of its 10 year plan, the minimum package of activities was extended to include IMCI, malaria related interventions, ANC, HIV counseling and testing and PMTCT. In 2005, the government of Mali announced that it would provide free caesarian sections. This was followed by a decision in 2007, in which malaria diagnostics and treatment would be provided free to children under five, although patients would still be required to pay for the consultation.

Challenges in the health sector, however, still remain, including the affordability of health care, low numbers of qualified health staff, inequitable distribution of specialized health personnel, low levels of literacy and education among the population, socio-cultural barriers to accessing care, and the population's geographical access to health facilities.<sup>22</sup>

Although some progress was made under the ACSD programme, Mali was still one of the worst performing countries with regard to maternal and child health, with infant and under-five mortality rates, according to the 2006 Demographic and Health Survey, estimated at 96 and 191 per 1,000 live births, respectively, while maternal mortality was estimated at 464 per 100,000 live births. In 2007, Mali adopted a national child survival strategy, in an effort to harmonize interventions proven to be effective at reducing child mortality.

## 2. Object of Evaluation: The IHSS Programme

The Catalytic Initiative was launched in late 2007 to support the implementation of the IHSS programme in six of Mali's regions including Kayes, Koulikoro, Sikasso, Segou, Mopti, and Gao, with particular focus on rural areas. At the time, the country did not yet have a comprehensive policy for community case management. By September of that year, the MOH with support from UNICEF, drafted a discussion paper on the use of community volunteers in order to develop a systematic framework for their use in health services.

**Table 1:** IHSS programme and UNICEF interventions in Mali

IHSS programme selected interventions	Activities supported by DFATD IHSS funds	Activities supported by UNICEF matching funds
<p>Strengthening of Community Health Systems in the areas of:</p> <p>Integrated community case management of malaria, diarrhoea and pneumonia</p> <p>The detection and management of acute moderate malnutrition</p> <p>Essential newborn care practices.</p> <p>Basic family planning methods</p> <p>Essential family health behaviours for child survival</p>	<p>Equipping of relais (bicycles, supplies, drugs)</p> <p>Training of relais on key family health practices</p> <p>Training of traditional birth attendants on management of pregnancy and delivery to provide safe delivery and refer in case of danger signs</p> <p>Supervision of relais and traditional birth attendants</p> <p>Development and implementation of integrated communication plan</p> <p>Support for monitoring sessions at all levels, including use of knowledge, attitude and practice study tools</p> <p>Expansion of community health volunteer's training manual</p> <p>Starting in 2010: Recruitment and Training of ASCs in full package of iCCM (diagnostic and treatment of ARI, malaria, diarrhea, malnutrition and essential care for newborns)</p> <p>Procurement of Essential Medicines and Supplies for ASCs</p>	<p>Technical Assistance</p> <p>M&amp;E support, including LQAS in 2013</p> <p>Development of supervisory tools</p>

Clinical IMCI	Training of front line health workers at the CScom level	
Reinforcement of local partnerships:	Support for monthly meetings with local partners	
Strengthening of health system at district & national level:	<p><u>At district:</u> Equipping district health team with vehicles for supervision and mobile strategy</p> <p>Training on District Health Systems Strengthening processes, including use of data (LQAS and routine) for bottleneck analysis, root cause analysis, and implementing corrective actions</p> <p>Supply of drugs and commodities (Vitamin A, SP, ORS, Zinc, LLIN) Support for quarterly meetings with all stakeholders.</p> <p><u>At national level:</u> Support to monitoring training process</p> <p>Support to meetings between Direction Nationale de la Sante (DNS) and Direction Regionale de la Sante (DRS)</p> <p>Training on District Health Systems Strengthening processes, including use of data (LQAS and routine) for bottleneck analysis, root cause analysis, and implementing corrective actions</p>	
Immunization and ANC	<p>Outreach activities to villages greater than 15 km of a health facility to provide immunization and antenatal care including LLIN and Vitamin A, and to carry out social mobilization activities to sensitize populations around essential health practices as well as the need for polio mop-up campaigns</p> <p>Equip Community Health Centers (Centres de Sante Communautaire, CScom) with motorbikes for immunization and social mobilization activities.</p>	Introduction of the vaccine against Meningococcal meningitis, the achievement of measles control targets, and the elimination of maternal and neonatal tetanus in high-risk districts.



Malaria Control	Distribution of LLINs during outreach campaigns	In conjunction with National Malaria Control Program, implementation of Seasonal Malaria Chemotherapy strategy for malaria control in children in the first wave of the 10 most malaria affected districts in the country.
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The initial phase of the IHSS programme (2008-2010) focused on supporting the training and supervision of around 4000 relais volunteers in the key family practices covering areas of nutrition, health and water, sanitation and hygiene (WASH), and training of traditional birth attendants on the management of pregnancy and delivery. Other elements of the early IHSS programme phase included support to the district health level in immunisation activities including the provision of transport, cold chain equipment and supply of drugs including Vitamin A, ORS, Zinc, and LLINs. Approximately 180 health care workers at CSCOMS were also trained in clinical IMCI during the early phase of the programme.

In March 2009, Mali held a national forum, with participation of international partners including UNICEF, to address health care at the community level. The forum focused on several issues including the types of interventions and service delivery models to be implemented in the community, the profile and level of training of health workers who would be providing this package of community level interventions, models of supervision to support these health workers, and the target population for health service delivery. The forum led to consensus on the need to scale up preventive and promotional interventions, while simultaneously piloting a range of curative interventions to be provided in two regions of the country, which would later be scaled up. These activities would be realized through the adoption of a national strategy, termed Essential Community Care programme, or Soins Essentiel dans la Communauté (SEC), which aimed to incorporate a range of services at the community level to address maternal and child morbidity and mortality. Furthermore, it was agreed that the upcoming health plan (PRODESS 2011) would incorporate a community health plan and strategy for implementation. The month thereafter, Mali signed a compact document under IHP+ with its key health Sector Wide Approach (SWAP) partners in an effort to effectively coordinate its health system through a harmonization of its budget, implementation and M&E systems.

The forum recommended several action plans to be implemented in the short, medium and long term in the country. The three short term plans consisted of implementation of SEC in a few districts (1-2), a compilation of lessons learned from this pilot phase to inform the two year plan to be developed after 2011, and lastly, elaboration on a strategic plan for the whole country. In the medium term (2012-2015), the country planned on the implementation and scale up of the SEC programme, investment in the development of qualified human resources, including up-skilling of ASCs to become professional nurses (either by replacing ASCs with nurses, or when possible, upgrading the ASCs), and to put into place an intersectoral collaboration plan in the areas of communication, education, and health, in addition to reinforcing the M&E system in the country to monitor the programme.

The Government, with the support of its technical and financial partners created a new cadre of health workers, termed the Agents de Sante Communautaire (ASC) who would be placed in hard to reach communities, defined as at least 5 kilometres away from a health facility and would be trained to provide Integrated Community Case Management (iCCM) of malaria, pneumonia, diarrhoea and acute malnutrition. At the time, close to 60% of the population lived within five km of a health facility,<sup>1</sup> indicating a high level of need for the extended service. Work on rolling out the strategy began in August 2009.

During 2010, the majority of the iCCM policy and plans were finalized, including the national iCCM implementation guide, training modules and manuals, as well as the stock management supervision, and financial tools. The IHSS programme supported the development of the policies around the newly adopted SEC strategy, of which iCCM was a component, and UNICEF participated in the development process of the tools for its implementation. By 2011, the tools had been tested and validated, and training of the trainers and of the newly recruited ASCs began. Starting in 2011, the IHSS programme began to invest in the training of ASCs in the iCCM package.

To roll out the SEC programme in Mali, a set of co-ordinating committees at various levels of the health sector were established to oversee particular elements of the programme. At the central level, an adhoc group was established by the Minister of Health and chaired by the Secretary General. Members of the group consisted of central health services, technical and financial partners and civil society organizations including the FENASCOM. This group is responsible for creating the guidelines and tools for the roll out of the programme and overall coordination of activities including the monitoring of programme implementation at the regional level, including resource allocation. The IHSS programme supported activities at this level, including joint supervision activities in conjunction with other development partners, in addition to providing ongoing support and advice to the Ministry of Health. Furthermore, the IHSS programme provided financial and technical support during national meetings and training sessions linked to the SEC strategy.

At the regional level, a steering committee was also established and was mainly responsible for the choice of districts in which the programme would be implemented and for the provision of overall guidance for its roll out. This steering committee consisted of donors and NGOs as well as FERASCOM and the Regional Directorate for the Promotion of Women, Children and Family, amongst others. The Regional level team provides training and supervision support in the form of oversight and mentoring to the district and CSCOM support structures which are charged with supervision of ASCs and relais, and manages the review of the programme through quarterly meetings. The District level management team is responsible for technical and financial support to the health areas that are managed by the ASACO and supported by the mayors. The district team conducts monthly meetings to monitor the programme. The IHSS programme supported these district level activities through field visits to ensure the quality of the activities.

Below that, the health area team is made up of the ASACO, the CSCOM technical team, the mayor, and local donors. This health area team is responsible for selecting the ASC sites, sensitizing the community, and monitoring the activities of the ASCs. Technical staff from the CSCOM level is responsible for the training of the ASCs with the support of the district teams, while the training of the relais is the responsibility of the ASACO with support from the mayor and the CSCOM technical team. The head of the CSCOM, along with the ASACO and the mayoral committee, is responsible for supervising the ASCs and the relais.

Site selection is the responsibility of the ASACO with support from the CSREF team. Before site selection, the villages are enumerated to determine the size of their population, in addition to conducting an epidemiological assessment to determine the state of maternal, newborn and child indicators to ascertain need. Village leaders as well as those from the satellite towns that the ASCs are also expected to serve also participate in discussions around the placement of ASCs. The minimum criteria for a village to have an ASC is that it must be greater than 5 km from the CSCOM or in a hard to reach area, and the ASC must cover a population of about 1500 inhabitants within a radius of 3 km around the village. As a result, the ASC may actually serve between 1-3 villages. The schedule for ASC visits to satellite villages is agreed upon between the ASC and the villages. The criteria for selection of the ASC sites provides a caveat for nomadic areas, in which the regional and district teams may be able to adapt the selection criteria, as the villages are not densely populated.

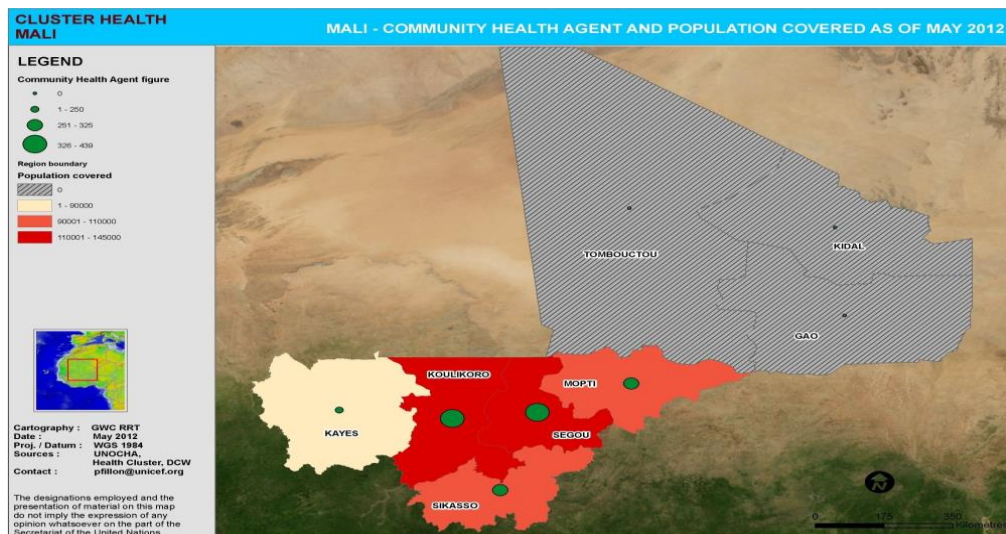
Once the site is selected and the ASC is placed an initial stock supply is provided through the Director of supply and essential drugs. Drug prices are set according to national standards; regional health facilities set their drug prices to be equal to those at the national levels, while the district level depots mark-up drug prices by 20%, and the CSCOMS mark-up drug prices by 50% in comparison to national levels. Drug prices at the community level do not exceed those at the CSCOM level. The IHSS programme supported the procurement of medicines and equipment for newly trained ASCs.

Some products, including RDTs and ACTs for children under five, as well as vitamin A and immunizations, are provided free of charge according to national policy, although patients still pay a consultation fee. The sale of medication thereafter sustains stock levels for the ASCs. The sale of products by the relais, such as contraceptives, includes a small profit margin.

The SEC programme was initially rolled out in five districts of the Sikasso region, in collaboration with Save the Children. By June 2011, a total of 325 ASCs were operational in Sikasso, and by the end of April 2013, a total of 1,847 ASCs were operational in all five southern regions of the country; 85% of the target set for the first phase of the programme (Figure 2).

The three northern regions including Gao, Kidal and Timbuktu were excluded from this first phase of implementation as populations living in the north are nomadic and, therefore, very sparsely populated. With 90% of the population living in the country's south, in which the programme is implemented, the program covers the vast majority of the population, although expansion to the north is considered as a necessary next step.

**Figure 2:** Map of Mali showing UNICEF and other partners IHSS supported regions (in red, orange and white)



According to the 2010-2011 Mali Catalytic Initiative Work Plan, the programme initially aimed to recruit a total of 2,250 ASCs for the first batch of training. This target was later downsized to 2,176 ASCs to what was thought to be feasible given the economic and political situation, after discussions with relevant authorities. Significant resources were invested to rapidly scale up the number of frontline ASCs in the five targeted regions during the last period of implementation between June 2012 and May 2013. Many ASCs, however, particularly from the Mopti Region, were not functional during this period, due to a combination of factors including un-liquidated expenses and subsequent suspension of funding from UNICEF, in addition to a spill over effect from the northern conflict. The 285 non-functional ASCs did, however, continue clinical training and supervision in the health facilities while awaiting deployment in May 2012. During the period of scale up, resources from UNICEF were utilised towards paying the functional ASCs until a sustainable method was arranged in conjunction with the Ministry of Health to transfer responsibility over to the Department of Health for the payment of salaries. UNICEF also supported the procurement of essential medicines for the treatment of diarrhoea and pneumonia and all the clinical tools (thermometers, respiratory rate timers, etc.), as well as supplies to the ASCs including (bicycles, raincoats, boots, etc.). Malarial drugs are funded largely by the Global Fund, and provided for free according to national policy, but due to a disruption of funding in 2010, UNICEF stepped in from August 2011 and procured the essential malarial drugs and diagnostics to support iCCM. This crisis did, however, affect supply throughout the country, and in particular, Sikasso according to UNICEF reports.

## 3. Evaluation Rationale, Purpose and Objectives

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### 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”.<sup>3</sup> 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.<sup>4</sup>

### 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 Mali.
2. To inform programme and policy decisions in Mali and regionally.

#### Objectives

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

#### Relevance:

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

#### Effectiveness:

- Strengthening the health system, including all six WHO health system building blocks namely health workforce, service delivery, information, supplies, financing and leadership/governance<sup>5</sup>.
- The capacity of government and/or civil society organizations to train, equip, deploy, and supervise front-line health workers to deliver a limited package of proven, high impact and low cost health interventions.

#### Impact:

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

### **Sustainability:**

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

### **3.3 Scope of the Evaluation**

The scope of the external evaluation was focused on estimating the plausible effect of the IHSS programme on coverage of interventions funded by the IHSS programme, and estimating the additional lives saved by the program using LiST. The external evaluation considered any interventions not funded by the IHSS programme but necessary in order to execute the LiST estimation and construct a robust plausibility argument 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”<sup>6</sup>. In assessing plausible contribution, the external evaluation attempted to “rule out external factors [factors outside of the program] 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 program; 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:

- Mali – rural, hard to reach areas in five regions (Kayes, Koulikoro, Mopti, Sikasso, and Ségou). It is important to note that over 90% of the Mali’s population lives in the southern half. Bamako, the country’s capital, situated in the south, is mainly urban, and therefore, was not one of the focus regions for the programme.

Temporally the scope of the external evaluation included the period 2001-2006 (secular trend) prior to the start of the IHSS programme and the period 2006 to 2012 known as Phase I of the program. In other analyses within this evaluation, an additional time point (2010) was used to mark the start of the iCCM implementation (or Phase II of the IHSS programme) but given that iCCM implementation began later in Mali, only two time periods were considered.

### **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.<sup>2</sup>

### **3.5 Intended Audience**

The intended audience of this external evaluation includes the MOH of Mali, 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 program'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 program'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, and a focus on 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 program?
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 three 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

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The evaluation used a mixed methods approach, in that quantitative, qualitative, and economic evaluation methods were utilised.<sup>7,8</sup> 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 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, ASCs, their supervisors, beneficiaries, and, where relevant, community-based leaders/structures involved in supervision.<sup>7</sup>

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 Mali 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 review highlighted several issues for exploration during the country visit which had not previously been explored and were expected to make a unique contribution to documenting lessons learnt from this programme. Mali, like Niger, provided an opportunity to explore a community based health model where there are two levels of community based workers. Firstly, there is the paid ASC with clearly defined expectations who is accountable to the health care system. Secondly, there is the volunteer relais who is accountable to the community and works to promote the key family practices, and since the introduction of iCCM, influence care-seeking behaviour.

### 4.1 Quantitative data sources and analysis

#### 4.1.1 Coverage trend analysis

A full list of all indicators collected for coverage and LiST analysis can be found in Appendix C. Data sources for the coverage and LiST analyses included the Mali Demographic and Health Survey (DHS) 2001, 2006, 2012; Multiple Indicator Cluster Survey (MICS) 2010. The endline data source was the 2012 DHS. For the anthropometric data, the 2001 z-scores were re-calculated using the 2006 WHO growth reference standards to be comparable with the 2010 MICS. Datasets were available for all the 2001 and 2006 DHS and 2010 MICS. However, only point estimates were available from the preliminary DHS 2012 report. The analysis was restricted to the country's five Southern regions including: Kayes, Koulikoro, Mopti, Sikasso, and Ségou. LQAS data was available from January 2013 only from the districts that were implementing the SEC programme. This data was only available as point estimates, with some reported confidence intervals, and was used to report on implementation strengths in the programme.



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. Trend analysis was performed on data for rural areas only, corresponding to the areas of implementation of iCCM through the IHSS programme funded by UNICEF/DFATD. The complex sampling design of the DHS surveys such as regional and rural/urban stratification, clustering at enumeration areas, and sampling weights (due to non-proportional sampling) were taken into account.

Graphical presentations of the derived results in the form of line graphs and bar charts with confidence limits were generated in Excel. Figures provided in the report are for rural areas, reflecting the main areas of support for the IHSS programme and main areas of activity of the ASCs and relais. National estimates are also shown for comparison purposes. The figures showing wealth quintiles are national estimates.

In order to assess the plausible contribution of the IHSS programme to changes in coverage (if such were observed) coverage levels of pertinent indicators in the IHSS regions were compared between the pre-IHSS period (2001-2006) and the IHSS implementation period (2006-2012). Linear rates of change were assumed and 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, these were calculated for rate of change. In order to assess whether the annual rates of change within the relevant time periods were significantly different from each other, 95% confidence intervals around the average annual rates of change are reported.

It is important to note, however, that because the IHSS-supported SEC programme only began roll out in 2011, with some programme expansion taking place in 2012, coverage estimates retrieved from the 2006 DHS, 2010 MICS, and 2012 DHS surveys could not be expected to capture very early potential impacts of the programme.

Contextual factors such as implementation strength (extent of drug stock outs, utilisation and supervision) were taken into account using available LQAS data, routine UNICEF data, and relevant data from qualitative interviews. Where the contribution of the IHSS programme is not clear this has been stated.

#### **4.1.2 Lives Saved analysis**

Using household survey data as described above, the Lives Saved Tool (LiST) was used to investigate the extent to which changes in under-five mortality could be attributed to changes in intervention coverage. The use of the terminology “lives saved” refers to deaths averted. Changes in under-five mortality were forecasted over two time periods:

- Prior to the start of the programme: under-five lives saved from the year 2001 to the start of the IHSS programme implementation (2001-2007)
- IHSS programme implementation: under-five lives saved between 2007-2012

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.<sup>25</sup> To estimate deaths averted overall and by specific interventions, LiST uses country-specific or region-specific baseline information on mortality rates, causes of death, population characteristics, and coverage of more than 60 interventions and their associated effectiveness values. Table 2 shows the data sources used for the baseline characteristics - population, fertility, mortality rates, causes of death, and nutrition. The modelling methods have been widely reviewed and published.<sup>26,27</sup> The Mali analysis was done with Spectrum version 5.01 beta 23.

**Table 2:** Additional data used to create LiST projections

Indicator	Source
Population and annual births	World Population Prospects, 2010 revision IHSS regional proportion based on 2009 Mali census
Total fertility rate	Demographic and Health Surveys
Stunting, wasting rates	Demographic and Health Surveys
Cause of death	CHERG trend analysis (national)
Mortality (under5, infant, neonatal)	Demographic and Health Surveys (average of IHSS regions, 10 year rates)

Coverage data for key indicators, representing the scope of the IHSS programme as well as broader health system indicators, were extracted from the three DHSs and entered into the projections. The population and total fertility rates were adjusted to account for the 78% of the national population residing in the five IHSS programme regions. Coverage data from the 2001, 2006, and 2012 DHS were entered for each intervention in the year of the survey and interpolated linearly for the years in between. We present the annual number of estimated lives saved and the cumulative number of estimated lives saved across both periods of analysis.

We used LiST to investigate the extent to which changes in child mortality could be attributed to changes in intervention coverage in five regions of Mali. On the basis of measured baseline mortality values and changes in coverage of newborn and child health interventions, we forecasted changes in child mortality prior to IHSS programme implementation from 2001-2007 and from 2007 to up to the latest household survey data point (2012). In other analyses within this evaluation, an additional time point (2010) was used to mark the start of the iCCM implementation (Phase II of the IHSS programme) but given that iCCM implementation began later in Mali, only two time periods were considered.

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 modeled 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, and using these costing figures would, therefore, be inappropriate as it underestimates the full costs (government and donor costs combined) of delivering iCCM.

### 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 ASCs for malaria, diarrhoea, and pneumonia for 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 this study because 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 and 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 for ASC supervisors who come from the CSCOM (health centre). The table below shows which costs are included in the costing exercise. The focus on additional costs is to ensure that costs are not double-counted when put in the perspective of the existing health budgets and assessment of sustainability (Table 3).

**Table 3:** Costs included and excluded in this costing exercise

Costs NOT Included	Costs Included
Initial one-off design costs for iCCM	iCCM training of ASCs
Salaries of ASC supervisors	iCCM training of ASC supervisors
Basic training of ASC supervisors	Allowances for Supervisors from CSCOM and District
Cars/Motorbikes for supervisors	ASC kit for iCCM
	Drugs for iCCM
	Overheads: distribution costs, admin

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

**Fixed Costs per ASC:** (independent from the number of treatments)

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

- iCCM training cost per ASC. Initial training has been allocated five life years, to reflect the current absence of refresher training. Should refresher training take place the number of training life years could be set at ten). An annual attrition rate of 5% was applied, following information from the Mali UNICEF office.

- Equipment cost per ASC: different numbers of life years were applied to different pieces of equipment.

**Table 4** : Annualisation of ASC equipment

Equipment Cost: Kit	Unit Cost Fcfa	US\$ - Dec 2012	Life Years	Annualised Costs
Registers Total Cost	4 850	9.50	1	9.50
Referral/contre Referral sheet	50	0.10	1	0.10
Thermometer	5 000	9.79	1	9.79
Minuter	2 000	3.92	3	1.31
Scale	15 000	29.38	3	9.79
MUAC tape	1 000	1.96	3	0.65
Torch	1 000	1.96	1	1.96
Raincoat	5 000	9.79	3	3.26
Boots	9 000	17.63	3	5.88
Bag	8 000	15.67	3	5.22
Rapport mensuel d'activite	200	0.39	1	0.39
Jeu carte-conseil	3 825	7.49	3	2.50
Fiche integree prise en charge	200	0.39	1	0.39
Boite a images	12 865	25.20	3	8.40
Bicycle	47 500	93.04	3	31.01
Cupboard	30 000	58.76	10	5.88
<b>Total</b>	<b>145 490</b>	<b>284.98</b>		<b>96.04</b>

- ASC subsidies: Currently paid by ASACOs but included as costs to the health service
- Supervision: These costs covered iCCM training for ASC supervisors. Training was allocated five life years in the absence of refresher training. An annual attrition rate of 3.75% was applied (average between 2.5% and 5%). Allowances for supervision were also included at the rate of \$4.9 per supervision for the direct supervisor from the CSCOM (monthly) and \$14.7 per supervision for the district supervisor (quarterly).
- Overheads: 5% of the annualised costs, to cover management costs.

The annualised fixed costs per ASC are then divided by the number of treatments per ASC in 2012 to give the 'Share of ASC fixed cost per treatment'. With the program being very recent, 11 months data regarding number of treatments were available for 2012-13. It was extrapolated proportionally to 12 months to reflect one year data.

**Variable Costs** (dependent on the number of iCCM treatments):

- Drug and diagnostic tests (RDT) costs for each of the three treatment conditions. For malaria, the number of RDTs per treatment is weighted by the positivity rate in Mali which stands at 50%. In the system of costing drugs at different levels of care in Mali, the following rates apply: cost of a drug at national level increases by 20% at district level and by 50% at CSCOM level. Cost of drugs reflects national price +50%.

Cost per treatment per condition = Share ASC 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

As patients pay for consultation and for the non-malaria drugs, NET COST was calculated by subtracting patients' contribution from the total cost.

The number of ASCs deployed and number of children treated per ASC were extracted from 2013 UNICEF Annual Report to DFATD (UNICEF, 2013). Training costs, ASCs' subsidies, supervision allowances, treatment protocols and tests, drugs unit costs were provided by the UNICEF Mali Country Office.

The exchange Rate for 2012 was extracted from Index Mundi; 1US\$=510.53 FCFA.

**Program costs:** two outcomes are presented.

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

### **Increased utilisation per ASC**

In order to assess whether a higher number of treatments per ASC per year was possible, the *time spent on iCCM for the three conditions* was calculated with the following assumptions:

- The length of a visit at the ASC room was set at 30 minutes.
- Besides the number of treatments, an additional 20% of visits were made, reflecting visits which did not end up in treatments. Whilst this ratio is arbitrary, a sensitivity analysis was conducted setting this ratio at 40%, and the time impact would be under 20 minutes a week, not affecting the conclusions of the analysis.
- 5 hours a month was allocated for the iCCM share of supervision and going to the CSCOM for refilling of kits.
- An ASC worked an average of 46 weeks per year.

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

Cost of country-wide implementation was calculated by applying utilisation per ASC and cost per treatment to the country and number of iCCM-trained ASCs.

Due to the fact that iCCM had only started to be implemented recently and would not have been expected to make a meaningful impact in terms of number of lives saved, cost per life saved could not be calculated.

### **Financial sustainability of the programme:**

Four scenarios are presented, based on costs of iCCM+ with the current level of utilisation per ASC

Scenario 1: The government does not pay ASCs subsidies; these are paid by ASACOs

- Scenario 1A: Current geographical coverage

- Scenario 1B: Geographical coverage extended to all children under five in Mali (maximum option)

Scenario 2: The government pays fully the ASCs subsidies and receives the payments from patients

- Scenario 2A: Current geographical coverage
- Scenario 2B: Geographical coverage extended to all children under five in Mali (maximum option)

iCCM+ additional costs 2012 are calculated as a percentage of the total Public Health Expenditure (government + donors) and as a percentage of the government's own health expenditure. Data on public health expenditure and share of donors were extracted from the World Databank World Development Indicators Database, covering year 2011, the most recent year where data were available.<sup>28</sup>

## 4.2 Qualitative data sources and analysis

The country visit took place in late September and early October 2013. Individual interviews and focus group discussions were held with UNICEF staff and other implementing partners, representatives of the Malian Ministry of Health in Bamako, volunteers from the Relais Communautaire, ASCs, and staff from Health Centres (CSCOMS), District Health Management Teams and CSREFs. The list of potential interviewees was discussed in advance with the UNICEF country team, who assisted us in 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 Mali. The interviews were conducted by one or more members of the country field team. Where necessary the services of an interpreter were used. The interpreters were organised by UNICEF and later by the visiting team. All interviews took place either at the offices of the interviewees, at the district health team offices, or in the communities. Interviews were audio recorded, and the researchers took field notes.

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

## 5. Findings

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### 5.1 Relevance

#### 5.1.1 Policy environment

The IHSS programme in Mali was introduced against a backdrop of strong initiative by the Ministry of Health to address inequities in access to health services by implementing a series of successive policies to improve aid effectiveness and to address issues of poverty, as well as social and gender disparities limiting access to basic services. Furthermore, the process of health care expansion through heavy investments in CSCOM development that characterized the decade between 2000 and 2010, while pivotal in increasing geographical access to health care, highlighted a need for a further decentralised level of service delivery to close the gap. As a result, a receptive environment was in place for the IHSS programme, whose particular objectives included investment in community level care while strengthening the linkages between the community and higher levels of the health care system. From the onset, the IHSS programme was able to invest in the training of an already existing relais volunteer cadre that had been historically used in Mali for the provision of specific health services and more recently to promote the key family health practices through the ACSD programme.

However, of the six countries included in the evaluation, Mali was the last country to implement iCCM at scale, and had only begun to implement the full spectrum of services by mid-June of 2011, and only in 2012 had implementation reached 80% of the target number of ASCs. The planning process, including the development of the policies and tools to drive iCCM implementation, saw the inclusion of many actors in conjunction with the Ministry of Health and developed momentum through a gradual accumulation of evidence around the successful delivery of community-based health delivery starting with the positive outcomes of the Accelerated Child Survival Development programme on reducing child mortality<sup>23</sup>.

Implementation of iCCM did, nevertheless, experience resistance from the formal health cadres including pharmacists and doctors concerned about the quality of health service delivery and the delivery of medication by informal health workers as they felt that only formally trained health workers could fill such a role. However, such practices were already taking place, with the provision of medication by the relais in some instances as well as the procurement of medication from shops. In an effort to better coordinate such practices and ensure quality control, the Ministry of Health held a forum with the aim of harmonizing the existing community cadres in the country and better define their roles. Growing evidence from the region, including Senegal, Niger, Ethiopia, and Madagascar, as well as Asian countries including China and Nepal, on the successful utilisation of community health workers to provide preventive and curative services served as a catalyst for the consideration of similar policies in Mali. As further impetus to the successful implementation of community-based treatment, the Centre for Research and Child Survival was commissioned to carry out an evaluation of the quality of pneumonia management of children under five by the relais; the evaluation was carried out between June 2008 and July 2009. The results, presented in March 2010, showed that both mothers and the relais communautaire, despite a wide range of literacy and education levels, were able to correctly recognize the signs and symptoms of pneumonia and use the appropriate medication for the recommended duration.<sup>29</sup> This positive evidence base added further stimulus for the adoption of iCCM,<sup>30</sup> and the 2009-2011 Health plan was drafted to include a community health component.

Furthermore, there was recognition that there was an unmet need for health services that could not be solely provided through the creation of the CSCOMS in the country. According to in-country interviews, up to 8 out of 10 deaths of children under five occurred at the community level, with over 40% of the population living further than 5km from a health facility before the roll out of the SEC programme. The creation of a further decentralised layer of care would address health care access issues by addressing indirect costs on patients through reducing travel time by bringing care for simple cases closer to home and facilitating referrals for complex cases.

The outcome of the forum resulted in the establishment of two layers of community level health workers, the relais who would continue with promotion and prevention activities, and the creation of a new cadre, the ASCs, who would be trained to provide treatment to children under five for malaria, pneumonia and diarrhoea. In order to achieve geographical coverage of health services in the community, two relais were allocated per village in the regions of Koulikoro, Segou, Sikasso and Mopti, while Kayes, Gao, Timbuktu, and Kidal required a minimum of one relais per village. All of the relais outside of Bamako were to be provided with a bicycle for transportation.<sup>31</sup>

*“There was no resistance from the MOH to implement the programme. This was a national strategy adopted by MOH after a national forum was held in Bamako to find a strategy to provide care at the community level.”* (Implementing Partner)

The SEC strategy did, however, experience significant challenges during its roll out in the second half of the IHSS programme. Firstly, the long preparatory phase of the programme led to some concerns about the feasibility of the approach in the country. Despite this, many in-country interviewees, including members of the Ministry of Health and implementing partners, felt that it was important not to rush the process and rather ensure unanimous buy-in and preparation of the tools necessary for effective roll out.

*“It took two years for Mali to start implementing SEC. UNICEF wanted a clear understanding and buy-in from the MOH. If they did not understand what was meant by SEC, it would be difficult to have a successful programme. They took enough time to discuss the issues with MOH to come up with an agreement and a national policy and strategy on SEC. As a result, SEC is in line with government policy, an essential strategy for care at the community level.”* (Implementing Partner)

### **5.1.2 Multi-sectoral collaboration and alignment**

In 2009, all Implementing Partners (IPs), including UNICEF, signed the Mali Compact agreement under the IHP+ Initiative. The IHP+ Initiative aimed to coordinate in-country initiatives and resources by ensuring that Implementing Partners commit to sustainable and predictable funding in addition to harmonizing initiatives with national plans and strategies to promote mutual accountability and performance monitoring. As a result, UNICEF’s programmes in country were aligned to Mali’s Poverty Reduction Strategic Plan as well as the 10-year health sector plans. As a sign of the alignment to the national systems, all financial transactions, including those implemented by the IHSS programme, are channelled through the national health system, with the exception of drug and supply procurement.

Building on this initiative, Implementing Partners in Mali have been successful in ensuring effective coordination of their support towards the SEC programme so as to avoid unnecessary overlap of resources. Multi-sectoral collaboration was ensured through the creation of a National Adhoc group for iCCM, which was supported by the IHSS programme, made up of the Implementing Partners



meeting every quarter to discuss effective coordination and support to the government in rolling out the programme. Successful collaboration has extended beyond policy discourse, financial management, and the shaping of implementation tools, to include partners coordinating their efforts in the areas of capacity building of government staff and ASCs through training and supervision as well as the procurement of essential supplies. Funds provided through the IHSS programme were expected to cover the majority of the SEC's commodity needs, with the exception of antimalarials; procured drugs are provided to the districts. Furthermore, the IHSS programme helped bring together IPs to provide the Ministry of Health with technical assistance to monitor the implementation strength of the programme and run the first phase of the LQAS in 2013, as part of a District Health System Strengthening process, known locally as "monitorage".

In addition, the IHSS programme supported the establishment of UNICEF field offices and recruited health specialists in all regions apart from Sikasso in order to reinforce supervision and capacity building of national and regional staff implementing SEC.

Both Ministry of Health and partners have emphasized the role of UNICEF in developing the coordination between partners and the link between partners and the Ministry.

**Table 5:** Activities of different Implementing Partners in Mali

<b>Region</b>	<b>UNICEF partner</b>	<b>Domains of partnership</b>
Kayes	MCHIP	Capacity building, monitoring and supervision
Koulikoro	PKC II (Care International), Plan Mali	Capacity building, monitoring and supervision
Sikasso	Save the Children USA	Capacity building, monitoring and supervision
Segou	Population Services International (PSI), PKCII	Monitoring and supervision
Mopti	PKCII, Agha Khan Foundation*	*Still under discussion

Table 5 above outlines the areas of focus of the different IPs in all regions implementing SEC, and highlights the kind of support provided and regions covered by each of the implementing partner. Starting in 2010, with the launch of the programme, UNICEF partnered with Save the Children to expand its focus on community case management of malaria in the Sikasso region to include the treatment of diarrhoea and pneumonia. UNICEF collaborated with Save the Children in this region for the procurement of essential medicines using DFATD's support while USAID funding channelled through Save the Children was utilised to cover all other programme costs. In the Segou region, PSI provides financial and technical support for supervision and monitoring of the programme provided by PKCII, while MCHIP is supporting the programme in Kayes by placing supervisors in two of the regions' districts.

The spectrum of services provided by the ASCs requires coordination between the health and nutrition sectors with support from the CSCOM and higher levels, with the CSCOM outreach health teams having to work closely with the ASCs to mobilize communities to ensure the efficient distribution of bednets, vitamin A, and immunisation. Furthermore, ASCs also play an integral role in nutrition by screening children, providing children with plumpisoup, and referring severely malnourished children, while the relais cadre play an integral role in WASH activities by conducting home visits to advise on proper hand-washing techniques and appropriate disposal of waste.

### **5.1.3 Women's participation and gender equality**

Mali has implemented successive policies to ensure the promotion of the rights of women in the country and equitable access to basic social services. Such policies have included the 'Women Promotion Action Plan' (1996-2000) policy aiming to strengthen women's role in decision making and participation in civil society as well as improving their literacy rates and access to reproductive health services. Starting in 2008, the Ministry for the Promotion of Women and Children participated in the development of a National Gender policy that culminated in a Gender Action Plan that was adopted in November 2010. This process drew on intersectoral collaboration between the Prime Minister and the Minister of Health, and the Ministry for the Promotion of Women and Children. The Gender Action Plan aims to address the underlying causes of gender inequality and poverty that limit women's access to basic services. The main purpose of the IHSS programme, which aims to increase both quality and access to primary health services as well as to create a new level of demand to address more unmet needs, aligns itself to the objectives of the Gender Action Plan. Between 2010 and 2012, UNICEF has participated in the development of the Common UN Strategy for the promotion of equality between men and women (2010-2012), including providing financial support for its implementation.

While Mali does not have a specific gender recruitment policy, there is a feminization of the health sector in the country. Supported by the IHSS programme, by mid-2012, 56% of trained ASCs were women, a high ratio given the 24% literacy rate amongst women. The IHSS programme further invested in the training of a large number of relais. As members of the community, women's groups played an active role in community dialogue sessions prior to ASC deployment and there has been evidence of women groups being formed in the community, following the implementation of the IHSS-supported SEC programme, to ensure some income generation to support access to the services provided by the ASCs. In addition, as part of IHSS programme targets, UNICEF participates in advocacy activities to raise awareness among decision makers and communities to promote the participation of women in the management of health systems, in particular at the community level. There has been evidence of regular meetings between UNICEF at country level with the Ministries of Health, Finance, and Women biannually for these purposes.

*"We have three women's associations in this village-population. One for young women-called Development in the Future, and another one called: Don't Listen to What People Say Behind Your Back, while the third one is for older women. Every Tuesday, each of us contributes 200 CFA to the group. With that money we developed a collective field and we are selling products. The benefits from that are used to organise celebrations and collective equipment. Money is not just spent like that; it is invested. What is left over, we share equitably, and we use the money to lend to each other to be used for consultations with the ASCs." (Woman in village)*

**Figure 3:** Women gathered in Bougouni community



There are challenges, however, with the retention of female ASCs. Women represented 56% of ASCs in 2012, but this ratio dropped to 43% by the end of the programme; a drop of 13% in a year. Based on qualitative interviews, many of the husbands do not want them to stay away should they not be recruited from the same village they live in. Furthermore, as many of the female ASCs had previously been nursing assistants or matrons, and thus qualified to provide a broad spectrum of health services, the narrow scope of practice of the ASCs, with a specific focus on children under five, led to dissatisfaction among many women and resulted in resignations.

Despite a protective political environment, the legal and social status of women remains unchanged due to poor access to social services and socio-cultural barriers to economic opportunities. Women in Mali continue to suffer from poor access to health and education. Illiteracy among women is high in Mali, which limits their access to work opportunities and economic empowerment. While overall adult literacy rates are extremely low at 33.4%, females are particularly affected, with a literacy rate of 24%. Furthermore, utilisation of reproductive health services is low among women; contraceptive use, according to the latest DHS 2012 is 10%, with a fertility rate of six children per woman.

## 5.2 Effectiveness

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

#### 5.2.1.1 Human resources: Relais Communautaire and ASCs

##### *Relais Communautaire*

The relais are selected from the community and a number were trained through the IHSS programme in promotion of maternal, newborn, and child health through the Essential Family Practices. These Essential Family Practices consist of 16 health promotion and prevention activities ranging from hand washing practices, breastfeeding, immunization and vitamin A supplementation, and the use of bednets for malaria prevention. The relais represent the link between the community and the ASCs, other CHWs, including traditional healers and birth attendants, and social and health services. This cadre is volunteer based, and as a result, does not receive any formal remuneration for its work.

Criteria for the selection of the relais include ability to read and write in a local language, belonging to the community, being selected by members of the community, having some experience in social mobilization potentially by having been a relais previously, and having some sort of alternative form of income. The distribution of relais is approximately 1 per 50 households. The IHSS programme trained a total of 3960 relais. While no updated data is available on the number of functional relais in Mali, by late 2009, up to 16,000 relais were estimated to be functional, indicating that the IHSS programme was responsible for training almost 25% of the total number of relais.<sup>30</sup> After receiving five days of training, the relais are provided with a kit that includes IEC materials, soap and a hand washing kit to support their health promotion activities, a set to control the quality of iodized salt, contraceptives (not including injectables), water treatment tablets, LLINs to distribute to households, and ORS and zinc to provide to children with diarrhoea, amongst other utensils and supplies to support their work. The IHSS programme supported the procurement of these commodities, in addition to supervision support initially provided by the CSCOMS and districts to monitor their activities. Once ASCs were trained and placed into the communities, supervision responsibilities for the relais were transferred to them. No formal policy is in place for refresher training for this cadre, however, some of the relais interviewed indicated that they received specific trainings linked to campaigns they were asked to participate in. It is unclear what attrition is like among this cadre. However, in light of the fact that recruitment is based on relatively low educational criteria there are limited opportunities for upskilling in this cadre. During interviews, many relais indicated that attrition was higher prior to the SEC programme, as they felt less supported before ASCs were placed in the communities.

While the relais are a volunteer cadre, they are provided with some incentives. These include in-kind gifts including product crops, one-time payments during training, mass campaigns and meetings, free consultation visits at the CSCOM, materials for their recognition including badges, t-shirts, the organization of annual days for the relais, exchange visits, logistical materials through their kits, and some discounts on the products they sell. The relais are also provided with bicycles that were supported by the IHSS programme. The majority of the relais indicated that they need to supplement their work through other income generation activities to sustain their livelihoods.

### *Agentes de Santé Communautaire*

The investment in community level care by the IHSS programme, initially through the relais communautaire and traditional birth attendants, and the participation of UNICEF in policy discussion platforms, contributed to the establishment of a new cadre of community health care workers, known as the Agentes de Santé Communautaire (ASC), who would be responsible for providing curative services at the community level. UNICEF in conjunction with other development partners, have supported the training of ASCs in the full package of iCCM (diagnostic and treatment of ARI, malaria, diarrhoea, malnutrition and essential care for newborns) through both financial and technical support to the government, in addition to supporting the provision of essential supplies and commodities for their activities.

The ASCs have to hold a minimum DEF level of education (9<sup>th</sup> grade) and hold a certificate as a caretaker or matron, and thus, have some prerequisite health training. Furthermore, they must be fluent in the language of the area they are placed in, and be willing to reside in the villages. Experience in social mobilization is desirable.

The ASC recruitment notice is developed at the CSREF level, and the district team in conjunction with members of the CSCOM SEC team manage the recruitment of the ASCs. Applicants are expected to take a written test and participate in an interview. Successful applicants then receive training and are placed in the villages thereafter, where they are expected to undergo a three-month trial period. During this period, members from the CSCOM with final confirmation from the CSREF determine the technical aptitude of the ASCs for them to retain permanent positions.

Each ASC is expected to cover a population of 1500, and this may include other satellite villages surrounding the area. Catchment populations of the surrounding health centres are approximately 8,000 to 10,000. Once ASCs are placed in the village, the community is expected to build a structure for them, which often consists of two rooms, one of which is used for health consultations, while the other serves as the ASC's home.

In order to sensitize the communities about the new service, members of the SEC coordinating team organize community meetings in each site, in addition to meetings at the CSCOM, prior to an ASC being placed there.

#### ***ASC Salary and attrition***

With the roll out of the SEC programme, all implementing partners, including UNICEF, engaged in discussion to decide what the appropriate salary would be, and they decided to align it to the minimum wage standards of the country. According to the national SEC policy, the ASCs receive a monthly salary of \$80, in addition to a range of other incentives including gifts in kind from the community including land in which to grow agricultural products, allowances that are paid during training, campaigns and meetings, free health consultations, and a performance bonus. Findings from the interviews indicate that despite this, some partners still continue to pay the ASCs differently in areas where they are implementing their programme, and this will have to be addressed for the long-term sustainability of the programme.

Largely because of the political insecurity in Mali, there have been challenges with the deployment of ASCs in the country. The deployment of ASCs has suffered setbacks in at least four of the forty implementing districts, including the three districts bordering the north in Mopti region, which have about 69% of their planned ASCs trained, of which one in five are functional. Furthermore, in the Kangaba district of Koulikoro, there have been difficulties in integrating ASCs into a heavily subsidized free health care scheme put in place by MSF.

Retention of trained and deployed ASCs was initially affected by a lack of a system for ensuring consistent salaries. UNICEF, with IHSS programme support, had taken on the responsibility for ASCs salaries at the beginning of the programme. However, some implementing districts experienced a suspension in the disbursements of funds due to incomplete financial reports of expenditures. This led to a negative perception of job security among ASCs and as a result, subsequent resignations. The most severely affected region was Koulikoro, where 13% of ASCs dropped out.

*“Attrition was higher before because there were no guarantee of payment/employment. Attrition rate has gone down because now they have job security because of incorporation into government establishment.”* (Implementing Partner)

Mali has recently signed the Round 10 Global Fund grant for Mali, in which 50% of salaries for the approximately 3,000 ASCs in the country would be covered for the next three years, starting from January 2014. Furthermore, as the IHSS programme grant comes to a close, additional NGO partners are taking up the financial costs, including Plan International in Baroueli and Kangaba districts, who will be taking up the running costs for 79 ASCs, and the potential for World Vision is to take over the costs of 110 ASCs in two other districts. In Sikasso region the ICRC has taken over the costs of over 40 ASCs, while in Sikasso, Save the Children has funding to support over 300 ASCs until the end of 2014.

Despite initially high dropout rates, overall attrition, based on findings from the in-country interviews are no higher than 10% per year. The ASCs are incorporated into the formal government establishment, and as a result, salaries are now guaranteed, either through donor support or income generation at the community and health facility level through consultation fees and the sale of medication. Many ASCs who had previously been matrons made note of increased job security once they had been trained through the IHSS programme.

*“By being an ASC I am paid every month, when I was a matron, I was not being paid consistently. If I work I get paid”* (ASC)

Other reasons cited for attrition amongst ASCs include a lack of acceptability by the communities. Recruitment is done at the district level, and therefore, ASCs are not necessarily recruited from the villages where they originally come from. However, some ASCs noted that they preferred not being placed in the same community that they belonged to, as they would now have to charge for the consultation fees and sale of medication. Other reasons cited for attrition include female ASCs getting married and later moving elsewhere. Furthermore, while overall comprehension among the ASCs appeared to be quite high despite a relatively short training period, as many of them had previous health experience as nurse assistants or matrons, some who had left did not feel adequately supported. There are current considerations to increase the profile of the ASCs to become nurses to ensure an overall high level of health training within this cadre.

Furthermore, long-term discussions are now underway to advocate for the government to provide a specific line item to municipalities for the payments of salaries. According to in-country interviews with district managers, approximately 30-40% of overall health staff are paid by the municipalities either through local income generation activities or state support, while the ASACO supports the salaries of the remaining 60% of staff through consultation fees.

In-country interviews made note that now attrition amongst the relais cadre was also lower due to the formalization of their roles and the establishment of a consistent support mechanism provided through the ASCs.

*“There had been a drop out of relais because of lack of satisfaction. The health facilities were supervising the relais prior to the ASC cadres. Also when there are district or health facility visits, they supervise the relais. It has been motivating for the relais to be working and be supervised by the ASCs.”* (District Health Team)

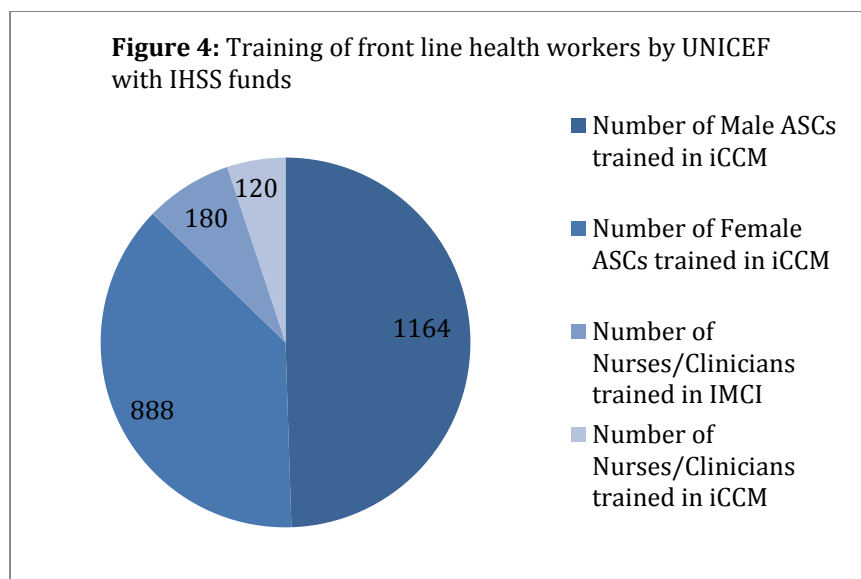
### **Training**

ASCs receive a fifteen day training. After training and before the ASC is placed in the community, they are placed in the health facility for approximately 25 days, where they get additional practical training. Furthermore, this allows the ASC to establish a relationship with the health facility staff, which in turn strengthens the package of services provided through the CSCOM by reinforcing the link between facility and community level care. However, based on interviews with in country staff, should a village lose an ASC, the new one that is placed in the village does not have the opportunity to stay in the health facility for practical training due to the urgency in replacing an ASC in the village.

As a large majority of the ASCs had some sort of health training previously, all of those interviewed felt that the two week training they had received was sufficient. Some of the ASCs who had been interviewed also noted that they had received refresher training on specific modules such as nutrition, family planning, and the use of registers, which is impressive in light of the fact that the roll out of the SEC programme and the start of ASC training has only been taking place for a couple of years.

*“I received my training in the district. My two week training was enough, but if I got more it would be good. If I wasn’t a matron I’m not sure the training I got would be enough. In my class, all of us had some health training before becoming ASCs.”* (ASC)

Training provided covers: newborn care, including the resuscitation of infants, hygienic cord care, maintenance of body temperature for newborns, and special care for newborns with low birth weight, the support of moderate malnutrition through growth monitoring and nutrition counselling, the diagnosis and treatment of uncomplicated malaria using RDTs and treatment using ACT, the treatment of diarrhoea with ORS and zinc, and the treatment of ARIs using Amoxicillin. Furthermore, the ASCs work in the area of family planning through counselling as well as the provision of contraceptives including injectables. In addition, the ASCs participate in outreach campaigns which include the distribution of Vitamin A, vaccines, deworming drugs and LLINs. They carry out epidemiological surveillance of communicable diseases and are responsible for regular data capturing to be sent to the CSCOMs.



According to the latest UNICEF statistics, the SEC programme was able to achieve 94% of its target for ASC recruitment, with 2052 trained ASCs by 2013 (Figure 4), comprising approximately 3 ASCs per 1000 under 5 population. Furthermore, 180 nurses and clinicians were trained in IMCI. In country interviews indicated that the frequency of IMCI training of nurses and clinicians had significantly dropped however, and given that it was not integrated into the regular curriculum, it was felt that this was a significant gap in the quality of care that could be provided at the health facility level.

*“Six or seven years ago, doctors were trained in IMCI, and the new ones have not received this training. IMCI is still not part of the curriculum of doctors and nurses, although they want it to be.”* (Health District team)

*“A district in which someone is trained in IMCI works better-you can see the difference.”* (Implementing Partner)

Members of the health facility, who would have the additional responsibility of supervising the ASCs, also received training in iCCM in addition to further training in specific supervision tasks and tools. Those numbers, consisting of 120 nurses and clinicians, are also included in the figure above. Not all of the trained ASCs were provided with the initial kits, however, and as indicated in the UNICEF reports, a total of 1562 ASCs received supplies. This was due to the political crisis in the country, and as a result many of the trained ASCs were not deployed to provide services.

### **Supervision**

The protocol for supervision aims to ensure that the ASCs are able to diagnose and treat children appropriately and adequately refer children to the CSCOMs when needed, correctly fill out their registers, conduct follow up of children in the homes, and effectively supervise the relais. Furthermore, stock availability and management is observed, and the sites are replenished with drugs. Additionally, supervisors are meant to interview mothers who have utilised the ASC services to gauge that they have been effectively advised on their children’s treatment, understand the danger signs for illness, and are satisfied with the services they received. Once the ASC is trained and placed in the community, the ASC is encouraged to visit the CSCOM frequently in the first few months to ensure that they receive supplementary practical training. The ASCs are supervised by the DTC (Clinical



Technical Director) who manages the clinical services at the CSCOM. Each DTC supervises between of three and four ASCs. Supervision visits from the district level to the DTCs are expected to happen every two months, while supervision from both the regional and district level jointly is supposed to happen every trimester, and national level supervision happens bi-annually.

ASC supervisors go through the general training that the ASCs receive, and receive additional training, for approximately two days thereafter in their specific supervisory roles and the tools they would be using. Based on in country interviews, supervision at the start of the programme was delayed as some of the supervisory tools were not completed. Supervisors are expected to include their supervisory schedules in their annual supervision plans and get a daily allowance up to a maximum of ten days per month for supervision. Currently, only the doctor in charge of the health facility is expected to carry out the supervision activities to the ASCs. However, discussions are underway to try to integrate ASC supervision into other supervisory activities, as this would alleviate the pressure on the health facility, both in terms of reducing costs and easing the strain on the sole health provider, the doctor in charge, currently authorised to carry out this task.

Interviews in country repeatedly highlighted that supervision was not occurring monthly, as stipulated by the policy.

*“In practice, supervision does not happen once a month as stipulated by policy. If politically there is buy in to ensure health services at the community level then funding has to be provided there to ensure proper functioning.”* (Implementing partner)

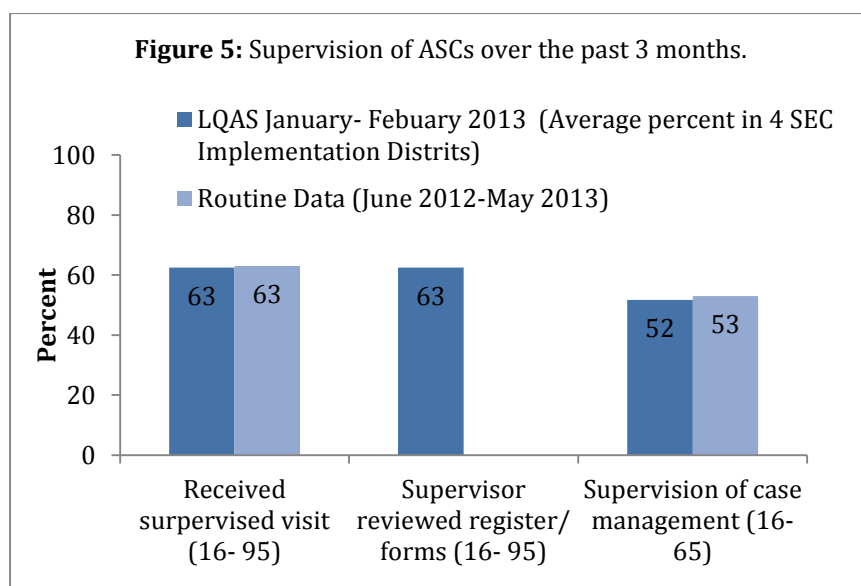
A combination of financial strain, lack of transportation, and time management were cited as reasons for lack of supervisory visits. The integrated supervision model could serve to address this concern.

*“If you have a vertical programme that asks for specific supervision, it is a waste of resources; it is better to have integrated programmes. Integrated supervision is lacking because of poor organizational planning and coordination. You need strengthened leadership for integrated supervision.”* (Implementing Partner)

The graph below (Figure 5) depicts the frequency of supervision from two different data sources including routine data collected from the various partners implementing SEC, as well as from data collected from the recently conducted LQAS in certain districts. While the periods of analysis from the two data sources are not identical, they overlap to some degree. Both routine data sources from implementing partners as well as the LQAS conducted in 2013 report that 63% of the ASCs had received a supervision visit in the last three months. This is quite low given that ASCs should actually be receiving monthly supervision visits from the health centres. Furthermore, the LQAS data represented below is a calculated average of supervision frequencies by four implementing districts. The data below shows a very large range in the frequency of supervision visits between the four districts, with supervision rates as low as 16% for Diema and as high as 95% for Bougouni. This is a further reflection of the different supervision models implemented by partners in the country. While Bougouni’s achievement of high rates of supervisory visits to ACS is commendable, it is clear that a model consisting of the placement of specific staff, funded by implementing partners, to carry out this role is not sustainable, in light of discrepancies between other districts that rely on national staff to carry out supervision activities amidst other job requirements. The coup d’état in 2012 resulted in the suspension of a large proportion of donor funding which affected many of the iCCM partners in Mali

including USAID, the President’s Malaria Initiative, and Save the Children. This suspension in funding resulted in significant disruptions in various elements of the programme including supervision activities.

The supervision of case management during one of those supervisory visits is lower, with only just over 50% of ASCs reporting to have had this, both from routine data and from the LQAS. Once again, the LQAS reflects a large variation when comparing districts. Even the best performing district, Bougouni, reports a 65% frequency of the observation of case management. This is a significant gap in the quality of supervision. It is important to consistently monitor the accuracy and effectiveness of health care service delivery by the ASCs, who serve as the first point of entry of care for communities. The frequency in which supervisors review ASC registers also follows a similar trend, with the LQAS reporting an average of just over 60%. It is important to note that supervisory activities were severely affected by the political crisis of 2012, especially in USAID-supported districts of Sikasso, and could partly be reflected in the low rates of supervision as represented in the Figure below.



\*(values in brackets correspond to the range of values for reporting districts)

### 5.2.1.2 Supply of Medicines/Commodities and stockouts

As mentioned earlier, the health system in Mali, draws on elements of the Bamako Initiative including cost-recovery. As a result, drugs provided by the ASC, with the exception of malarial diagnostics and treatment are sold by the ASCs to patients, and funds generated, both through the sale of medication and consultation fees, goes towards the replenishment of stock. Drug prices are set according to national standards. However, UNICEF, through the IHSS programme, has supported the SEC programme through the procurement of initial kits and drugs for a total of 1562 ASCs once they are placed in the villages. The delivery of drugs and commodities are not channelled through the national system, but rather UNICEF supplies drugs and commodities to the district level, that is then responsible for the transportation to the CSCOMS and ASCs thereafter. ASCs receive their drugs from the CSCOMS either when their supervisor comes for their visits to the community or by coming into the CSCOMS themselves to pick them up. As a result, ASC stock availability is highly dependent on the frequency of supervisory visits or contact with the health centre.

While the supply of drugs that are sold are less vulnerable to funding disruptions, this is not the case for RDTs and ACTs, which are supported by the Global Fund. Based on in country interviews, ASCs have reported higher stock-outs of malaria drugs. This was especially problematic during the 2010-2011 period, in which funding was halted by the Global Fund, due to an audit revealing mismanagement of finances. UNICEF did intervene in 2011, through IHSS programme support, and procured some RDTs and ACTs, with a focus on distribution at the community level, to ensure that supplies were not completely disrupted. During that period, UNICEF procured, through DFATD funds, 12,000 ACT blisters and 12,500 RDTs, with a further 38,900 RDTs and 22,773 ACTs procured through UNICEF funds. However, the Global Fund did hand over some of the grants that were utilised towards the procurement of nets and ACTs to another principal recipient in order to ensure that services were not entirely disrupted. In addition to financial challenges, other reasons have been cited for stock outs that include shortcomings in forecasting needs for drugs, given the increase in the demand and utilisation of services through a new layer of service delivery facilitated by the ASCs.

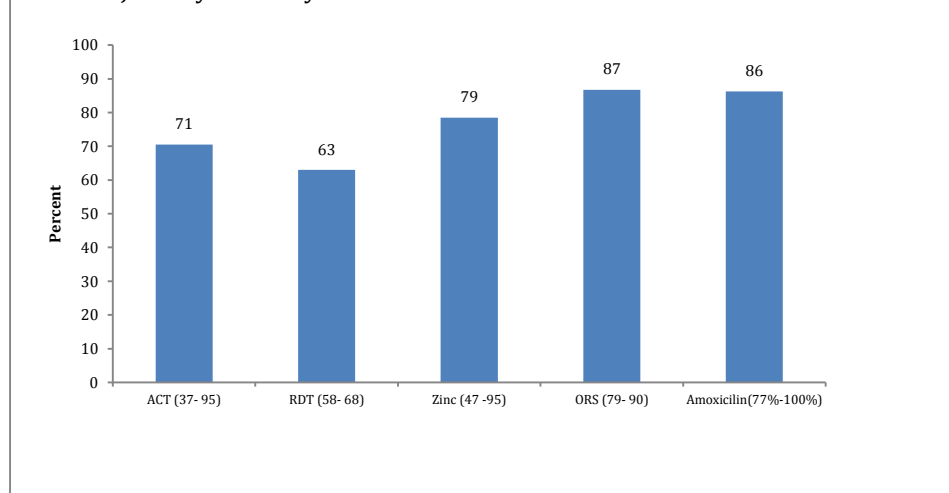
*“The issue of stock-outs of malaria drugs-one of the reason is because of the Global Fund crisis, but also there has been an increase in the utilisation of drugs because of the ASCs, and they were not properly planned for.” (MOH respondent)*

ASCs did not report stock-outs of plumpy nut, as they are provided for free also by implementing partners and delivered through a parallel supply chain system.

Data from routine sources on stock-outs were not available until the end of 2012, and as a result, the full impact of the Global Fund crisis on stock-outs of antimalarials could not be adequately captured, as by the time the LQAS was launched and data on stock availability was collected, funding had resumed. Furthermore, iCCM was not at scale during the time period between 2010 and 2011.

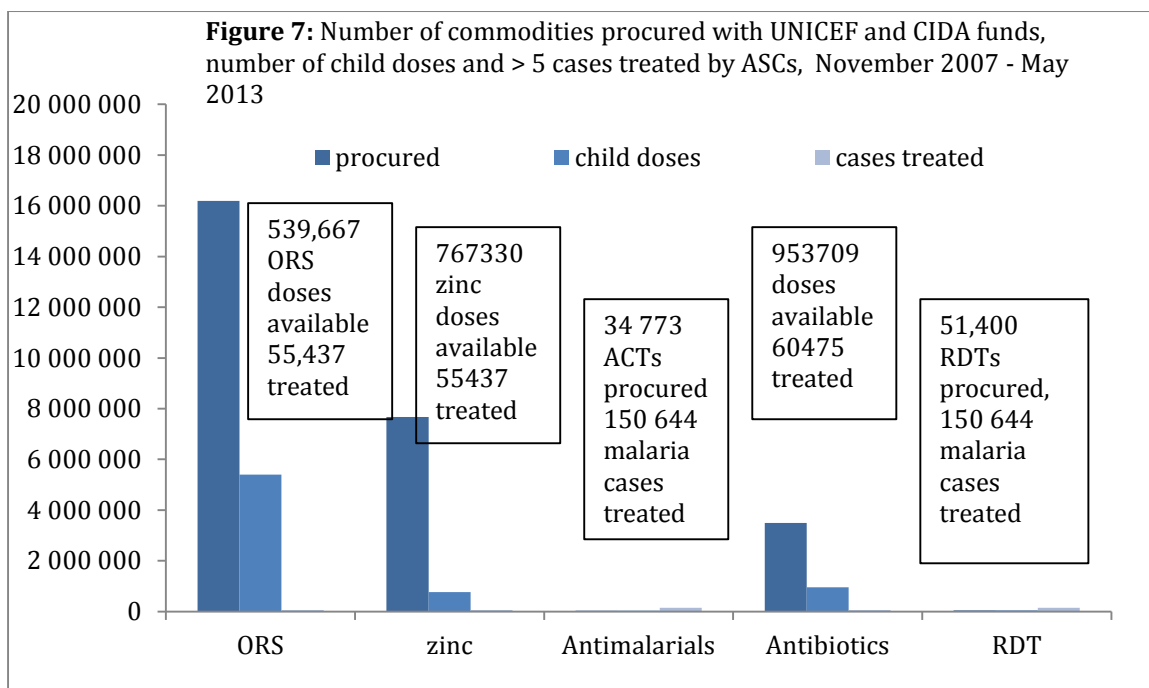
Data on drug availability demonstrate generally low levels of stock-outs, likely largely as a result of Mali’s cost recovery mechanism ensuring a relatively low dependence on donor funding. This is further emphasized by the fact that the drugs reporting the highest frequency of stock-outs are those provided for free by the government and supported by the Global Fund, i.e., the RDTs and ACTs, reporting stock outs of 37% and 29%, respectively, over the past three months (Figure 6). As highlighted above, there seem to be challenges with drug forecasting, which will have to be addressed as a matter of urgency as the programme continues to scale up. Furthermore, the dependency of ASC stock on the frequency with which they receive supervision visits will have to be addressed, either by ensuring a mechanism of consistent supervision visits or implementing an alternative supply chain mechanism that is not dependent on the DTCs coming into the villages to restock ASC supplies.

**Figure 6:** Average proportion of ASCs reporting no stockouts in the last 3 months in 4 SEC implementation districts, Mali. LQAS January- February 2013



\*(values in brackets correspond to the range of values for reporting districts)

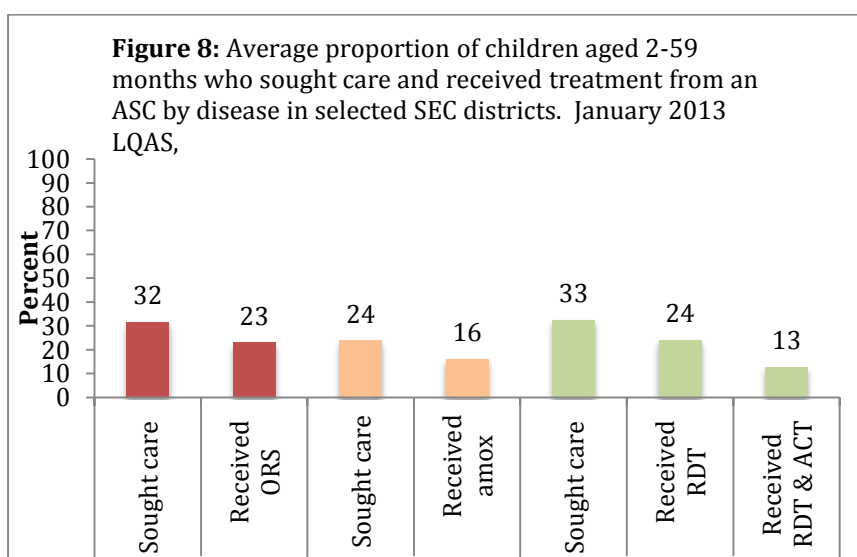
With regard to utilisation of commodities purchased during the IHSS programme period to treat under-fives, approximately 7% of zinc tablets were utilised, 4% of antimalarials, 3% of RDTs, 1% of ORS sachets, and 6% of antibiotics (Figure 7). This points to very low rates of utilisation of health services from the ASCs. It is important to note, however, that the SEC programme is in its infancy stages, and only began scaling up in late 2011, and throughout 2012, and as a result, utilisation at that level cannot be expected to be very high. Furthermore, due to the political crisis in the country, a large number of trained ASCs were not deployed and, thus, not provided with their initial start-up kits, which include drugs. This could further explain the reason why some of the procured drugs were not utilised by the ASCs, should procurement by UNICEF have preceded ASC deployment and been based on expected numbers of ASCs that would be trained in the country. As mentioned earlier, supplies to the ASCs are channelled by UNICEF through the district health teams, who are then responsible for supplying the CSCOMS and ASCs thereafter. It is, therefore, likely that these large numbers of drugs procured by UNICEF are remaining at the health facility level, as ASCs would only have their stock replenished upon demonstrating which drugs they had already used.



## 5.2.2 Utilisation, M&E and quality of care

### Utilisation

Despite Mali's low population density, last measured at 12.6 people per square kilometre, and late roll out of iCCM implementation, coupled with a political and food crisis in 2012, the country has been able to achieve commendable gains in health care utilisation at the community level. Routine implementation data has revealed that the average caseload for June 2012 to May 2013 was approximately 342 per 1,000 children under 5 for the three diseases. In comparison to the other five IHSS programme countries being evaluated, Mali has achieved the third highest iCCM treatment rate. Based on routine data, ASCs treated 18% of all under-five cases treated in the public sector, with 32% of diarrhoea cases, 20% of pneumonia cases, and 15% of malaria cases treated by ASCs in comparison to the health facilities. The LQAS conducted in 2013 reveals similar utilisation rates, as seen in Figure 8 below.



This represents a significant extension to Mali's health system into the community through the IHSS-supported SEC programme, with latest 2013 data revealing coverage of over 5,000 villages in 62% of all districts in the five regions (Kayes, Koulikoro, Sikasso, Ségou, and Mopti) implementing the programme.

*"A demand for health was created. The SEC strategy helped improve access to health, and created a new layer of care. Health care should not stop at the health facility layer."* (District Health Member)

IHSS programme investment in the development of further decentralised community based care did not divert access to care at the health facility level but was seen instead to promote service delivery uptake and ensure that serious cases were referred for appropriate care.

*"Health facility utilisation has increased because of referrals from the ASCs-they get a referral slip."* (Implementing Partner)

Therefore, it is important to note that while overall utilisation of health services from ASCs is low, it corresponds closely to utilisation rates from other appropriate providers. The LQAS aimed to assess reasons behind these low utilisation rates, against a backdrop of relatively high geographical access as a result of the scale up of the programme. According to the LQAS, 65% of the families cited financial obstacles as one of the main reasons for not accessing care for malaria, despite the fact that antimalarials are free of charge. This indicates that the consultation fees were the major barrier to health care access. Further evidence of this is seen with regard to accessing pneumonia treatment, where people cited accessing informal providers more as they were less strict with regard to payment for health consultations, and as a result, represented less of a financial burden.<sup>32</sup>

Despite this, in-country interviews revealed a high level of acceptability and satisfaction with the SEC programme. The SEC programme in Mali invested heavily in community mobilization and involvement and represented a good combination of a bottom up and top down approach. Health policies were developed and driven by partners in conjunction with the MOH while communities were mobilized to identify villages in which ASCs would be placed, construct housing and service delivery points for them, support their work through community sensitization and mobilization through the formation of community associations, and begin investing in solutions for the long term sustainability of the programme.

*"Advocacy took place at all levels-including the community level, so that everyone could understand the impact of the strategy. The ASACO and the municipality- they are working with FENASCOM, the national association for community health. These together are really the two entities working at community level. They are looking at SEC as their baby."* (Implementing Partner)

Furthermore, despite overall financial barriers to accessing care, health consultation fees at the community level are lower than that of the CSCOM level, 100-300 CFA vs. 500 CFA, respectively, while drug prices are equivalent at both levels. The increased proximity of ASCs to households does alleviate some of the financial burden placed on households with regard to travelling, as expressed through in country interviews.

*“There was solidarity between people to help pay for the CSCOM, but the problem was that the facilities were far and inaccessible. Before the matron who was in the village used to charge 5000 CFA, and now the ASC charges 100 CFA.”*(ASACO and elders in village)

*“We don't have to go all the way to the CSCOM when our children are sick, and we don't have to ask our husbands for permission... the ASC is near and can treat our children.”* (Mother)

In addition, associations of women have been formed in the communities to ensure that they are able to generate their own money and support each other to access health services by the ASC. The ASCs interviewed noted that they would not turn patients away should they not be able to afford their services, and gave them leeway to pay at a later time.

*“They pay what they can and get the medication.”* (ASC)

Interviews with communities highlighted, however, that they would like the ASCs to increase their scope of practice to include older children and adults, as this would serve to meet further unmet demand at the community level.

### **Monitoring and evaluation**

Through IHSS programme support, UNICEF was integral in the process of tool development and invested in the training of both ASCs and supervisors on the use of tools. The participatory process of tool development, which saw the inclusion of both implementing partners and the MOH, led to agreement on a concise and effective register for ASCs to use to monitor their work and facilitate effective diagnosis and treatment at the community level (Figure 9). ASCs in the community noted that they were comfortable with the tools developed and could effectively use them for their work

*“Initially, the form used by ASCs to classify and identify symptoms was nine page long. Now, it is a two page document-after weeks of work with partners. The form follows the country policy on treatment of the diseases.”* (Implementing Partner)

By 2012, the system was still not able to collect data on the frequency of supervisory visits and stock-outs as many of the supervisors on the ground had still not been trained on the new supervisory tools that had been developed. Training on these tools was completed by the end of 2012, however, with IHSS programme support.

**Figure 9:** An ASC with his registers



Furthermore, there was successful evidence from in country interviews of some districts implementing innovating strategies for data analysis to strengthen implementation of their programme and even use it as a lobby tool to advocate for policy change at the national level.

*“This programme was created for easy analysis of data and generation of reports. There is now a way to register new ASCs and monitor their work. It includes all levels of data; curative, newborn care, IEC, promotion, finance, family planning, etc. It can generate monthly and three-monthly reports. We still need to validate the programme for the national level, but the programme was created from here and presented to the regional level. It also includes the target population for the ASCs and satellite villages they serve. We use the data to evaluate the work of the ASCs, and [it] helps us orient our priorities. We also use the data to send it to the national level to create bulletins to help lobby strategies for maternal and child health. We use data to help ASCs who are struggling to cover a big population and may be sick, to get another ASC to help.” (District Health Team)*

Data is collected from the ASCs by their supervisors on a monthly basis during supervision visits. Data on health activities is kept disaggregated between the ASCs and CSCOMS at the sub-district level but is then aggregated and sent to the districts. As a result of the advocacy activities of UNICEF, in an



attempt to optimize the country's data collection system and facilitate data analysis for programme strengthening at every level of service delivery, there is a move to disaggregate community level data from that of the health facilities. The districts are now being encouraged to keep disaggregated data while the reporting tool is being amended to track disaggregated data. Data on implementation strength is centralized at the district and regional levels.

*"The ASC data is combined with the health facility data. We would like to separate out the data. The USAID funded project will help revise the M&E system to ensure that the ASC data is included in the national system."* (MOH representative)

To ease the burden on the health system in light of donor reporting requirements, there is a move to try to align indicators required by the new Global Fund malaria strategy and those of the SEC programme, while ensuring effective tracking and monitoring of the SEC's performance.

The IHSS programme further invested in training activities to conduct the LQAS in 2013 and in the use of data retrieved from the survey to monitor implementation of iCCM. Furthermore, UNICEF, through IHSS programme support, is working with the National Health Directorate to strengthen the decentralised monitoring system to be able to conduct bottleneck and root cause analysis, and, as a long term prospect, is moving towards supporting the country to integrate LQAS methodology into the districts' regularized monitoring activities.

### **Quality of care**

Field interviews indicated a high level of competency on the part of the ASCs in addition to high confidence amongst service users in the quality of care delivered by the ASCs. The move towards regulating community based care ensured that people were able to get treated according to national protocols and the latest scientific evidence. This was made possible through policy dialogues between UNICEF and the Ministry of Health, supported by the IHSS programme, to advocate for the adoption of a national community health policy in Mali.

*"Since I became an ASC, people are getting simpler treatment. Before they were getting injections when they didn't need them."* (ASC)

*"The ASCs trained to deliver drugs based on national protocol."* (Implementing Partner)

Furthermore, simplified treatment protocols developed for use at the community level ensure that the ASCs are able to provide accurate diagnosis and treatment for childhood diseases. In country interviews revealed that this was a long process of ensuring concise and harmonised tools.

*"It took time to harmonise the tools used to train the ASCs. All partners and government used the same tools for training and supervision."* (Implementing Partner)

Prior to the development of the programme, large numbers of people were accessing care from matrons who had not necessarily received formal accreditation from accepted government establishments. In addition, in country interviews revealed that unregulated use of medication, both from the matrons, the relais, as well as shops was present. According to data from the 2006 DHS, approximately 20% of the population was retrieving care from informal sources including pharmacies, shops, mobile sales, traditional practitioners, etc. This represents a significant proportion of the

population, especially in light of the fact that just under 60% were not accessing care for the three childhood diseases. While such practices still continue in Mali, given the financial challenges cited in the above utilisation section, there does appear to be a shift towards accessing care from appropriate sources. In addition, the focus on the SEC programme by implementing partners aimed to ensure a consistent supply of medicine to the community level. This of course was impeded by a combination of the Global Fund crisis and the disruption of funding by implementing partners following the political coup. UNICEF, through IHSS programme support, did however try to circumvent the impact of this by supplying drugs to the community level to ensure continuity of the programme. This was indicated by some interviewees who noted that the full spectrum of drugs was relatively consistently available at the community level, while this was not always the case at the health center level.

*“ASACO told her that ASC medicines are better than health facility medicines because they have zinc. An ASC will never treat malaria without an RDT.”* (Implementing Partner)

Mali represents a good example of evidence-based advocacy to inform policy change. This approach not only formed the basis of the programme’s inception but has been sustained as Mali continues to develop the SEC programme and scale it up. A culture of evidence based programme development and optimisation was established in Mali, due to IHSS programme investment in creating concise tools for monitoring the programme and investing in capacitating staff to analyse data on an ongoing basis to its track progress. Interviews at the Ministry indicated that data had already been analysed, despite its infancy, to begin to assess the impact of the SEC programme on child mortality. This is indicative of the awareness of programme data and its implications at all levels of service delivery, including the national level.

*“In 2011, there were twenty child deaths during malaria season. With the ASCs in 2012, there were only 2 deaths.”* (MOH representative)

However, ASC supervisors noted that some of their visits revealed poor reporting quality while district teams highlighted a failure to analyse ASC reports at the district level to interpret the data in order to inform decision making.

The programme was not implemented without its challenges however. Those cited by ASCs and the communities include insufficient equipment for ASCs in their consultation rooms including chairs and tables. Furthermore, ASCs noted that the housing provided for them was too close to the consultation rooms and did not provide sufficient privacy to patients, while sometimes two rooms were not provided by the community and instead ASCs had to provide care from their own houses. Furthermore, ASCs reported stock-outs of certain commodities including RDTs, books for stock inventory, supervision booklets and supervision guides for the relais. Some districts felt that the programme was not adequately supported as there was not enough supervision taking place at all levels, including the regional, district and health facility level.

### 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 2001 to 2012. Coverage analysis was restricted to the five southern regions of the country, namely Kayes, Koulikoro, Sikasso, Segou, and Mopti due to the fact that the three northern regions were not surveyed in 2012 as a result of political insurgency and instability within these regions.

Descriptions, therefore, include changes within the five regions of the south, where the IHSS programme is being implemented and is restricted to rural populations within those five regions. The urban centre of Bamako was excluded, as it was not a target of the IHSS programme. Changes in equity between the richest and poorest wealth quintiles were also restricted to the country's five regions, with a focus on trends in the poorest quintile over time. Data from the DHS 2012 was only available as preliminary published point estimates and, therefore, confidence intervals could not be generated for this time point. However, point estimates of the five southern regions reported from 2012 were averaged to attain a comparable estimate to earlier years except in the case of exclusive breastfeeding where regional estimates were not published. Wealth quintiles data for 2012 also included the urban populations residing in Bamako, which were excluded from earlier survey analysis. This may have resulted in increased inequity in coverage, as the richest quintile would be more likely to reside in Bamako and be reflected in comparably inflated estimates.

Only figures for indicators included in the coverage trend analysis are included in this section. National and regional coverage profile figures which include indicators not part of the trend analysis can be found in Appendix E. These profiles have been included as an analysis product for in-country stakeholders, such as the Ministry of Health.

Table 6 below provides a summary of changes in coverage in the main IHSS programme indicators in the five IHSS programme regions. When comparing pre-IHSS (2001- 2006) average annual rates of coverage changes to changes that occurred during the IHSS programme period (2006- 2012), only ORS coverage appears to have significantly increased. Coverage for children under five sleeping under an insecticide treated net also showed very large increase (average 7% per year) during the IHSS programme period, but as there was no data from 2001, it is impossible to compare this with pre-programme rates. However, net distribution started in 2001 under the ACSD programme, and the early gains would have reflected this.

Significant decreases in coverage were noted for tetanus toxoid vaccination of pregnant women, exclusive breastfeeding rates, vitamin A supplementation, and DPT3 vaccine coverage when comparing the two time periods. Small coverage increases were achieved during the IHSS programme period for Fansidar for prevention of malaria in pregnant women (IPTp) and early breastfeeding rates, though both had significantly lower annual coverage rate change than the earlier gains made in the pre-IHSS period.

Care seeking and treatment for suspected ARI and fever had negative average annual growth rates and were not significantly different when comparing the two periods.

Data on ITN and two doses of IPT was not available in the 2001 DHS survey to enable an assessment of coverage change for the pre -IHSS period. Postnatal care was not comparable in pre- and post-IHSS

periods as earlier surveys were restricted to women who delivered at home while the 2012 survey included all deliveries, regardless of place.

**Table 6:** Summary of coverage trend indicators

Indicator	Mali (5 IHSS regions)			Average annual rate of change pre IHSS (2001-2006). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2006-2012). Data shown as % per year with confidence intervals
	DHS 2001 (pre IHSS) % (95%CI)	DHS 2006 (baseline) % (95%CI)	DHS 2012 (endline) % (95% CI)		
Tetanus toxoid vaccination of pregnant women (at least 2 doses)	27 (24- 30)	47 (44- 50)	35	4.0 (3.6- 4.4)	-2.0 [12.4-(-1.6)]
At least one dose of IPTp	1 (0.6 - 1.5)	23 (20 -26)	30	4.3 (4.1 - 4.6)	1.3 (0.9 - 1.7)
2 doses or more of IPTp	N/A	19 (16 - 21)	17	N/A	-0.2 (-0.5 - 0.1)
Postnatal care for the mother	8 (6 - 9)	13 (11 - 16)	N/A	1.1 (0.9 - 1.4)	N/A
Early breastfeeding within one hour of birth	30 (28 - 33)	52 (48 - 55)	58	4.2 (3.8 - 4.6)	1.1 (0.6 - 1.5)
Exclusive breastfeeding (0-6 months)	26 (22 - 31)	39 (35 - 43)	*33	2.6 (1.8 - 3.3)	-1.0 [(-1.9)- (-0.2)]
Vitamin A supplementation (6-59 months)	38 (35 - 41)	72 (70 - 75)	59	6.9 (6.6 - 7.2)	-2.2 [(-2.5) -(-1.9)]
Measles immunisation (12-23 months)	45 (41 - 49)	67 (62 - 74)	69	4.5 (3.9 - 5.1)	0.3 (-0.3- 0.9)
DPT3 immunisation (12-23 months)	35 (30 - 40)	67 (63 - 71)	59	6.4 (5.8 - 7.1)	-1.3 [(-2.0) -(-0.7)]
Care-seeking of suspected pneumonia	40 (35 - 45)	35 (30 - 41)	28	-0.8 (-1.9 - 0.2)	-1.2 (-2.9 - 0.5)
Care-seeking for fever	37 (34 - 39)	31 (28 - 35)	28	-1.0 [(-1.6) -(-0.4)]	-0.6 (-1.3 - 0.2)
Treatment with any antimalarial for fever	39 (36 - 43)	32 (28 - 36)	22	-1.5 [(-2.0 - (-0.9)]	-1.7 [(-2.5) - (-1.0)]
Under 5 sleeping under an ITN	N/A	26 (24 - 29)	69	NA	7.1 (6.9 - 7.4)
ORS coverage	10 (8 - 12)	13 (10 - 16)	35	0.5 (0.1 - 1.0)	3.7 (2.9 - 4.5)

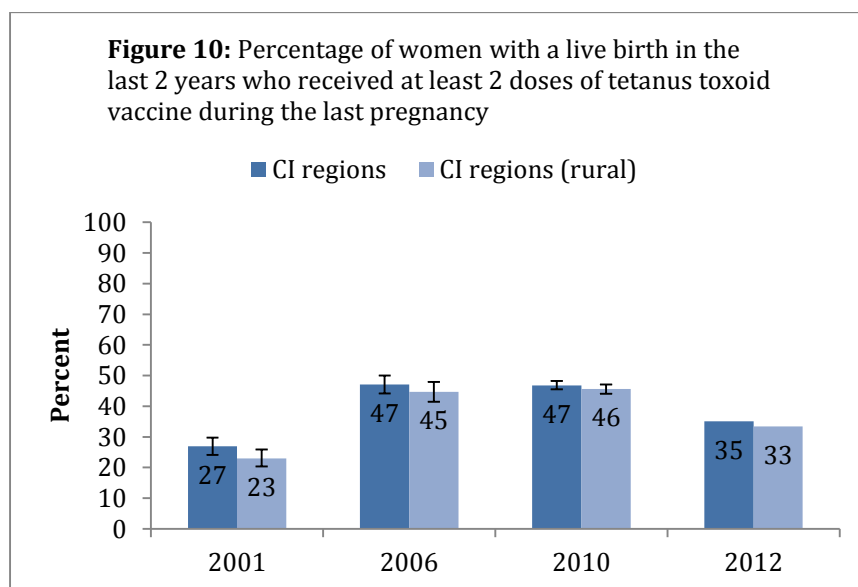
*IPTp = intermittent preventive treatment of malaria for pregnant women; ITNs = Insecticide Treated Nets; DPT = diphtheria, pertussis and tetanus , \*National estimate which includes Bamako*

	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

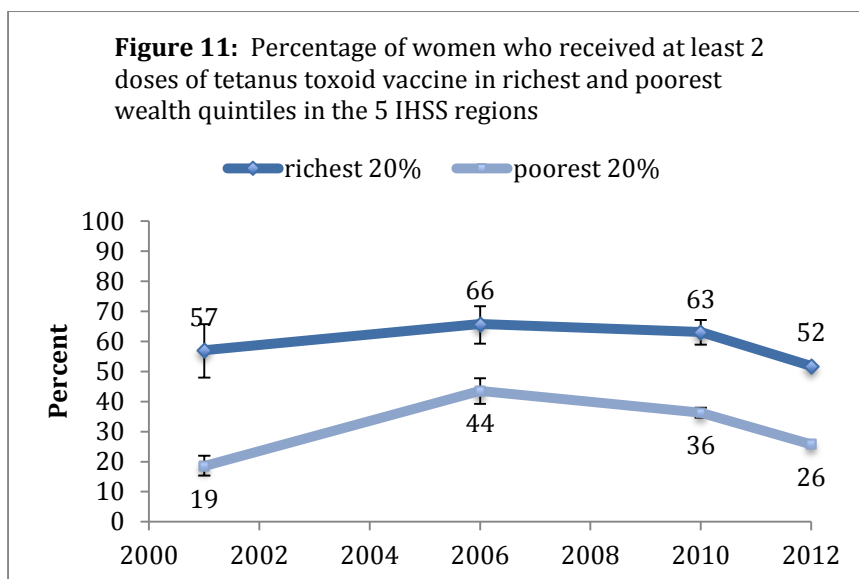
#### *Tetanus Toxoid vaccination of pregnant women*

Coverage of women receiving at least two doses of tetanus toxoid vaccine during their last pregnancy increased significantly from 2001 to 2006 in the IHSS programme regions on the whole and in rural populations of these regions. This coverage was maintained through 2010, after which it decreased (what appears to be significantly) in 2012 to around 35%. Reasons for the apparent decline from 2010 rates are unclear (Figure 10).



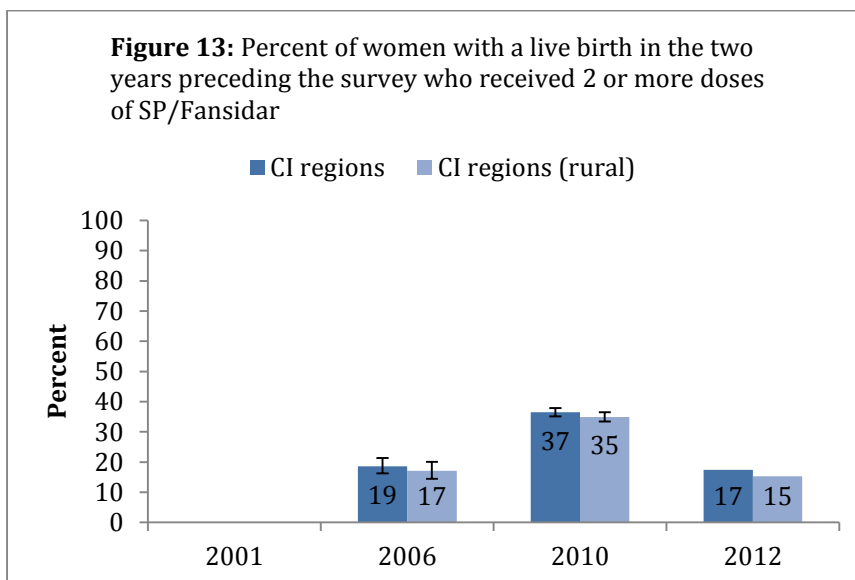
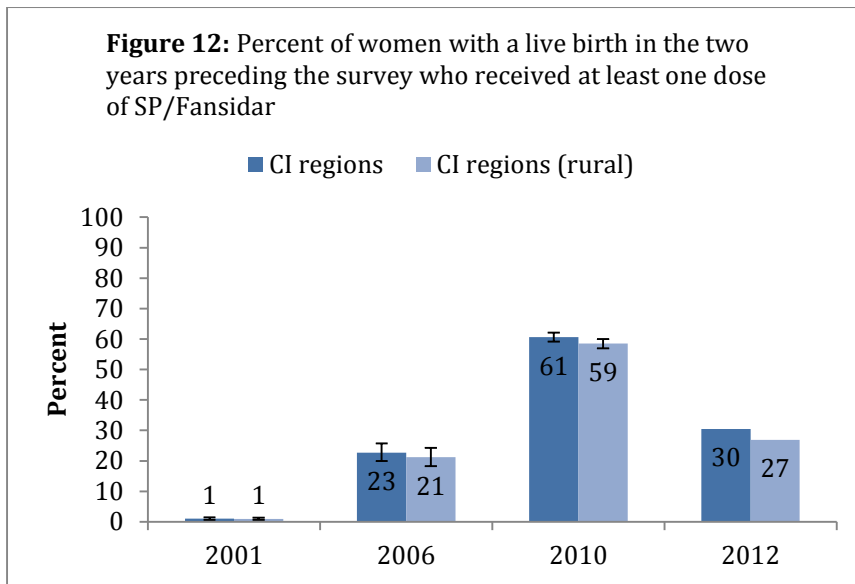
Coverage of tetanus toxoid vaccination in pregnant women in the richest 20% of the population within the IHSS programme regions remained relatively constant between 2001 and 2010, fluctuation from 57% to 66% to 63% with overlapping confidence intervals. By 2012, however, coverage dropped to 52% (no confidence intervals available). Coverage of two doses of tetanus toxoid vaccination in the poorest 20% of pregnant women more than doubled between 2001 and 2006 (19% to 44%) before dropping significantly to 36% in 2010. The majority of pre-IHSS coverage gains were lost by 2012 with reported values at 26% for the five IHSS programme regions (no confidence intervals available). There was slight improvement in equity between these two quintiles between 2001 and 2006, which thereafter did not change (Figure 11).

TT vaccine is given during pregnancy, and it would be expected that all women attending antenatal care should have received this vaccine. The promotion of antenatal care is emphasized through the IHSS programme trained relais, ASCs, and the supervised traditional birth attendants and likely the reason why rates of attendance were maintained throughout this period.



### ***Malaria prevention in pregnancy***

Coverage for the prevention of malaria with at least one dose of SP/Fansidar for pregnant women was virtually non-existent (1%) in 2001 but rose significantly to 23% by 2006 and peaked at 61% in 2010. With almost 70% of women reportedly receiving at least one ANC visit in 2010, this can be seen as a marker of quality coverage during ANC services at this time. Antenatal care attendance, and resulting access to services including the provision of Fansidar to pregnant women, can be plausibly attributed to the IHSS programme through the promotion activities of community health workers including the traditional birth attendants, relais and ASCs. Furthermore, during the first two years of the programme, IHSS programme funds supported the procurement of 2,500 packs of 1000 Fansidar tablets for the CSCOMS, to be distributed during antenatal care sessions. These marked gains, however, were lost by 2012 with reported coverage dropping back down to 30% in the IHSS regions and 27% in rural area of the IHSS regions (Figure 12). Coverage for two or more doses of SP/ Fansidar followed a similar trend over time with 19% coverage in 2006, rising significantly to 37% in 2010 before dropping down to 17% in 2012 (Figure 13). In late 2010, the drugs for malaria prevention to be supplied by the Global Fund were withheld due to the Global Fund crisis, and though UNICEF procured medicines to fill the gaps in August of 2011 this crisis in funding may have had a longer lasting effect on IPTp coverage rates reported in 2012.

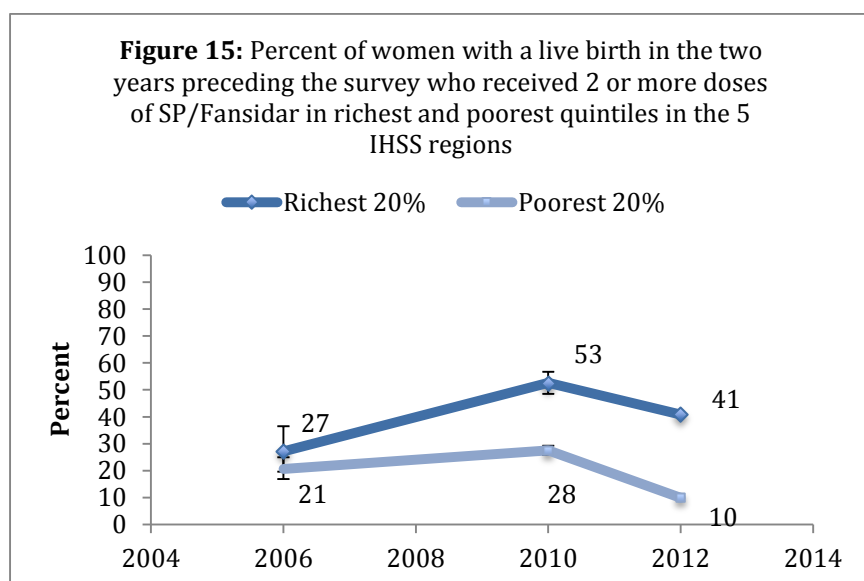
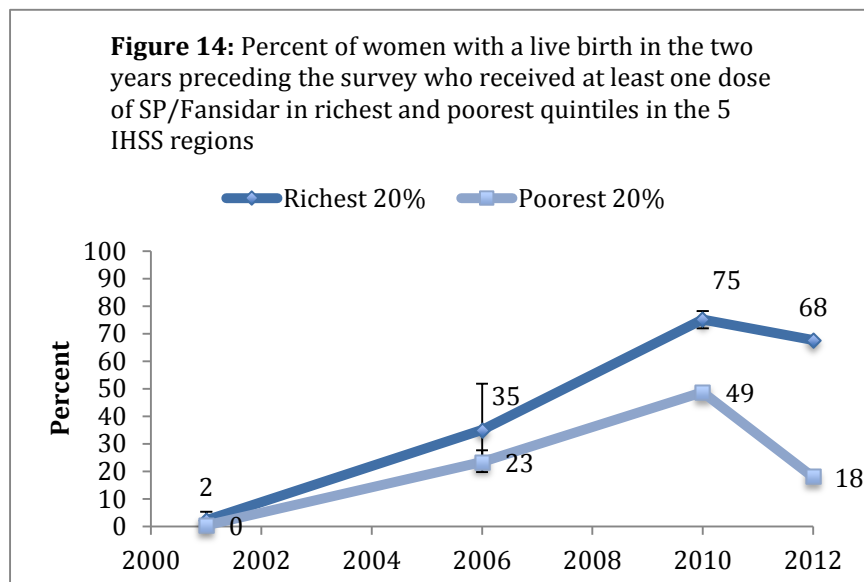


No significant difference in coverage of at least one dose of SP/Fansidar was noted when comparing pregnant women in the richest and poorest populations between 2001 and 2006, with both quintiles experiencing a steady rise in coverage. By 2010, however, a significant gap emerged with the richest quintile achieving 75% coverage while the poorest reached 49%. These gains were lost for both quintiles by 2012, though for the poorest levels went down to 18%, lower than 2006 or pre-IHSS rates (Figure 14).

Equity in coverage of two or more doses of SP/ Fansidar in pregnant women between the richest and poorest quintiles decreased over time. In 2006, no significant difference between coverage in the richest and poorest populations was noted (27% and 21% respectively, with overlapping confidence intervals). By 2010 the difference became significant with a nearly two-fold increase in the richest population while coverage was maintained in the poorest population (28% with overlapping CI to 2001). By 2012, both quintiles experience a decline with the poorest most affected, dropping to a low of 10% (Figure 15). This is likely due to the fact that a disruption to free anti-malarial drugs would have a bigger impact on the poorest population. Variation in equity coverage is likely a factor of financial



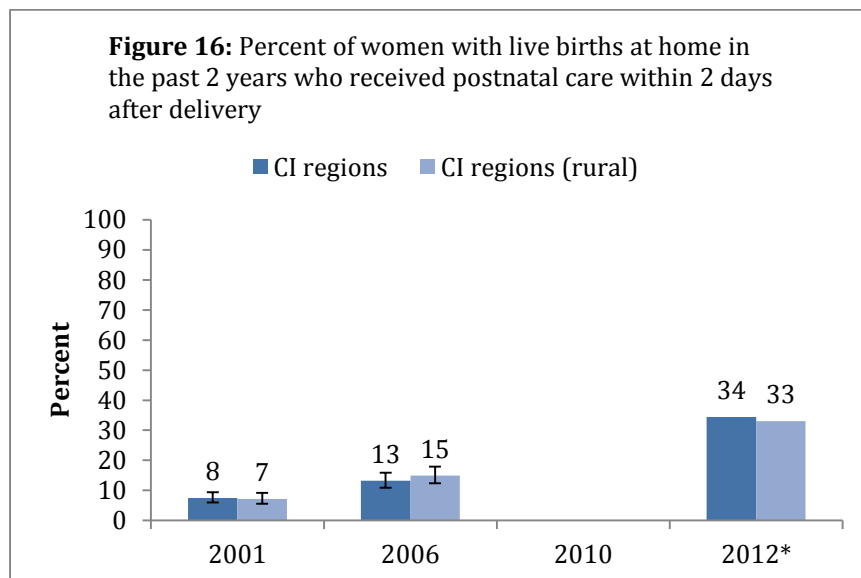
barriers to health care access. Despite investment at the community level through the IHSS programme to promote increased awareness and access to antenatal care services, consultation fees, which are significantly higher at the CSCOM level in addition to travel costs represent a barrier to health care access.



### 5.2.3.2 Postnatal care

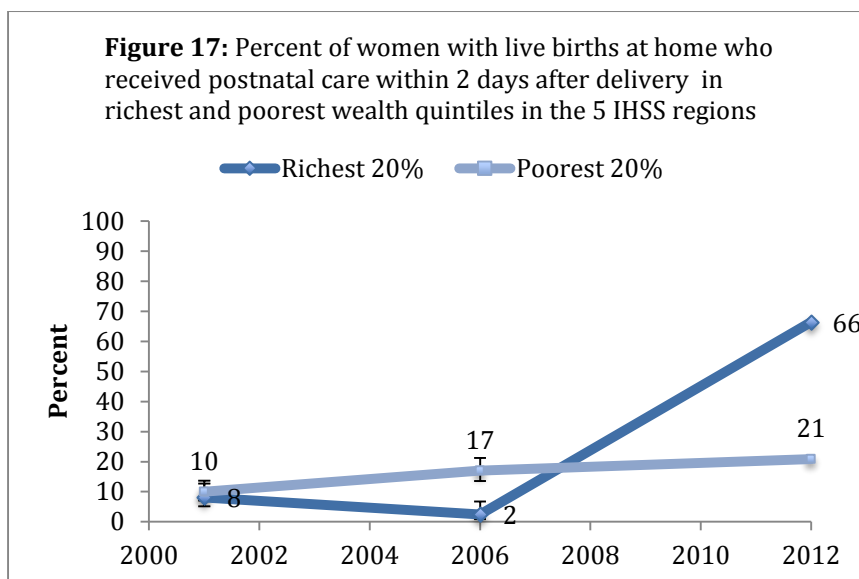
The percentage of women who delivered outside a facility and received postnatal care within two days after delivery in 2001 was 8% in the IHSS programme regions. This rose to 13% in 2006. By 2012, coverage was reported at 34%. However, this is inflated as the 2012 DHS included women who delivered in a facility along with those who delivered out of a facility, and it would be expected that these women are more likely to have received a postnatal check-up within two days compared to those who delivered at home. Therefore, the data cannot be restricted to match indicator definitions across years and should be interpreted with caution. There was no significant difference when

comparing the IHSS programme regions as a whole to rural populations in those regions alone (Figure 16). The increase in postnatal attendance can be partly attributed to the IHSS programme through which investments, especially in the first half of the programme, were made in the supervision of traditional birth attendants and the training of relais who would collectively promote postnatal check-ups for newborns and their mothers.



*\*Note 2012 DHS includes facility and home births while the 2001 and 2006 DHSs only include home births.*

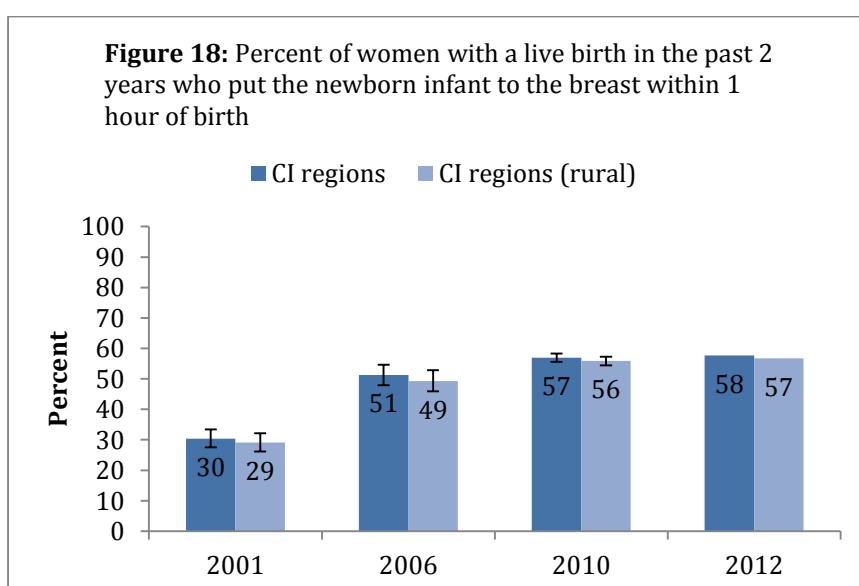
Coverage for postnatal care within two days for women in the poorest quintile who delivered at home did not change significantly between the survey time periods. With regard to equity between the richest and poorest quintiles, data shows that in 2006 coverage in the richest population actually decreased from 8% to 2% while 17% of the poorest quintile received a check up after a home delivery. Thereafter, coverage in the richest quintile surpassed the poorest, rising to 66%, while the poorest remained statistically unchanged at 21% in 2012 (Figure 17). This is most likely due to the fact that in 2012 over 95% of the richest quintile had a facility birth compared to less than 30% of the poorest quintile (data not shown). Also, data on quintiles from the DHS 2012 includes residents of Bamako, which would inflate coverage in the richest quintile due to increased urban accessibility to services available in the capital.



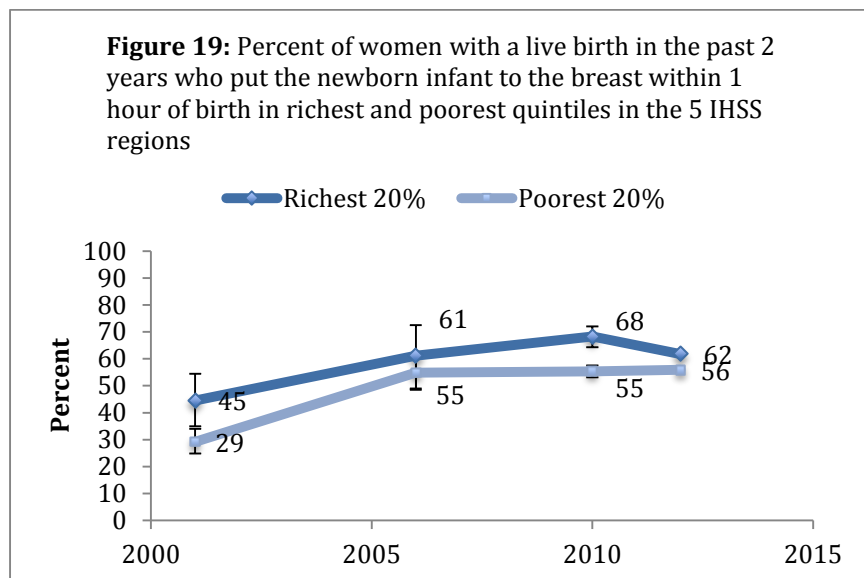
2012 DHS includes Bamako

### 5.2.3.3 Early initiation of breastfeeding and Exclusive Breastfeeding (EBF)

The proportion of women who reported initiating breastfeeding within an hour of birth did not change over the IHSS programme implementation period (2006 to 2012). Rates in the IHSS programme regions started at 30% in 2001 and rose to 51% in 2006, and thereafter remained stable with no significant change across survey years (57% and 58% in 2010 and 2012, respectively). There was no statistical difference in coverage between rural and general IHSS programme populations (Figure 18). The promotion of breastfeeding is one of the elements of the key essential family practices promoted by the IHSS-supported relais and is expected to be encouraged at the time of delivery in the presence of a skilled birth attendant. This reflects both a need to increase the attendance of skilled health care workers during delivery and a shortcoming by trained health care workers to promote this activity during antenatal care and right after delivery.

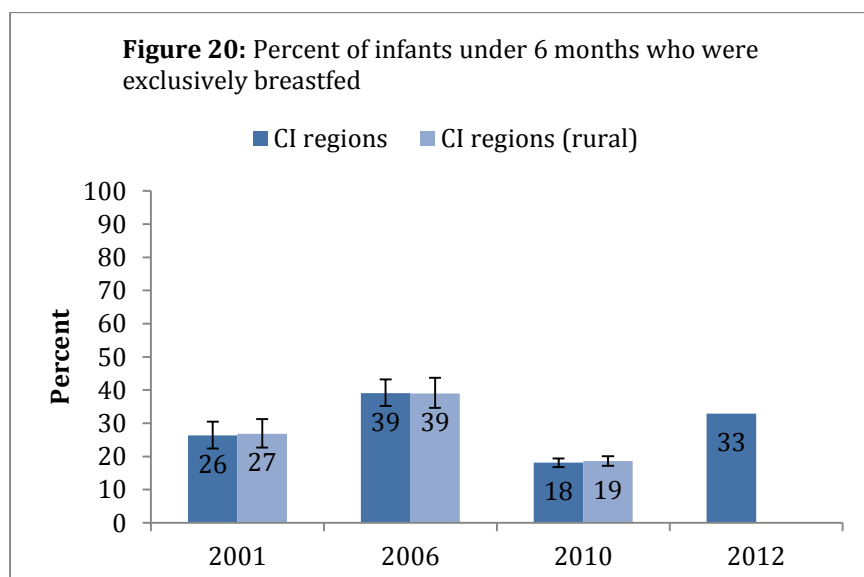


Data from wealth quintiles indicates that there was no statistical difference between rates of early initiation of breastfeeding in the richest and poorest quintiles between 2001, 2006 and 2012. There was no statistically significant increase in rates across survey years in the richest quintile while rates increased significantly in the poorest between 2001 and 2006 (29% to 55%), thereafter remaining stable at 55% and 56% in 2010 and 2012, respectively (Figure 19).

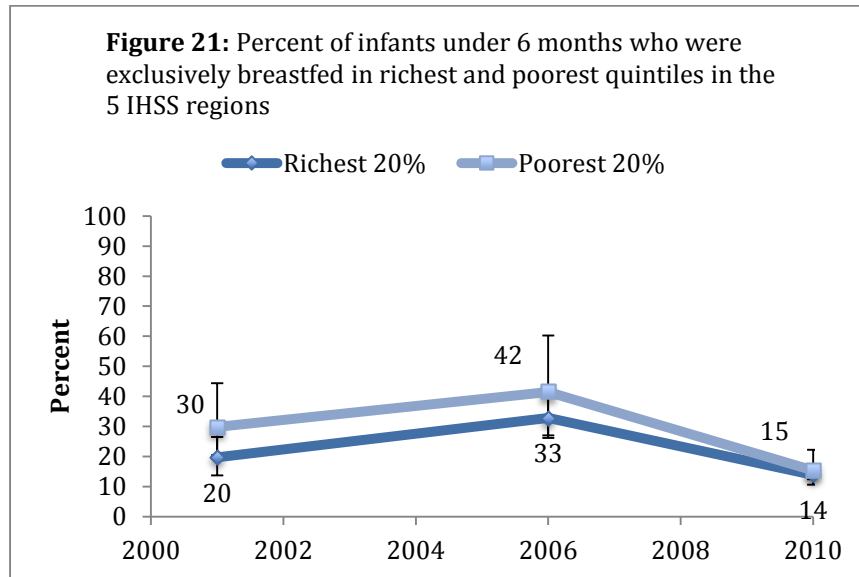


### Exclusive Breastfeeding (EBF)

Exclusive breastfeeding rates did not significantly increase between 2001 and 2012 in the IHSS programme regions or rural areas of these regions. However, the proportion rose significantly during the pre-IHSS period, from 26% in 2001 to 39% in 2006. Thereafter, the rate fell significantly to 18% in 2010 before increasing to 33% in 2012. There was no difference in rates when restricting to the rural population of IHSS programme regions as compared to the IHSS regions as a whole (Figure 20). The improvements in breastfeeding practices between 2001 and 2006 were most likely a result of efforts from the ACSD programme, which used the relais cadre to promote such feeding practices in communities.



In terms of equity, there is no significant difference between rates of exclusive breastfeeding in the richest and poorest quintiles in the IHSS programme regions across survey years, with confidence intervals overlapping. Rates rose insignificantly in the poorest quintile from 2001 to 2006 (20% to 33%) and fell significantly to lower than 2001 levels by 2010 (14%). No data is available for EBF by wealth quintile in 2012 but it seems highly likely, based on regional data and trends, that some coverage would be regained by 2012 (Figure 21).



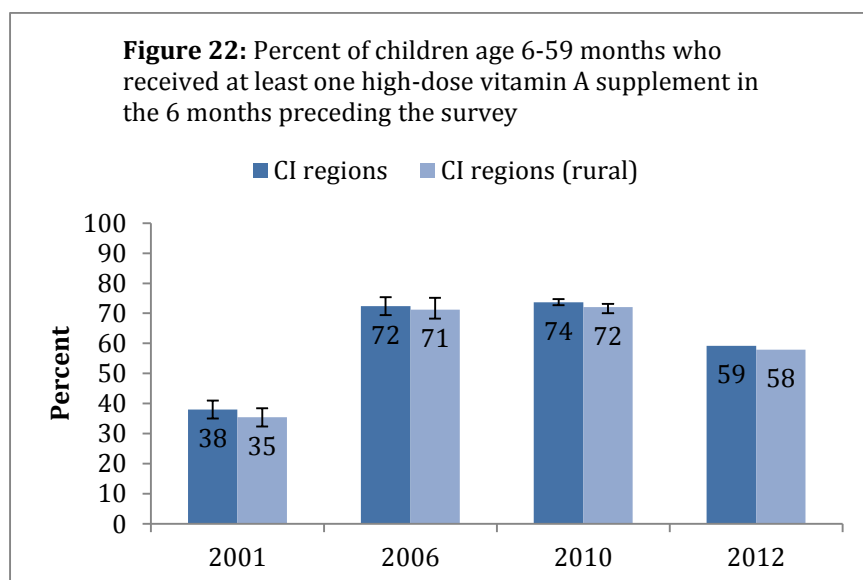
### 5.2.3.4 Preventive care

#### ***Vitamin A supplementation***

The percentage of children receiving at least one dose of vitamin A supplement in the six months preceding the survey increased significantly in the pre-IHSS period, rising from 38% in 2001 to 72% in 2006. Coverage was maintained by 2010 (at 74%); thereafter it dropped to 59% in 2012, in what is likely to be a statistically significant downward shift. There is no significant difference when restricting to rural populations in the five IHSS programme regions only (Figure 22).

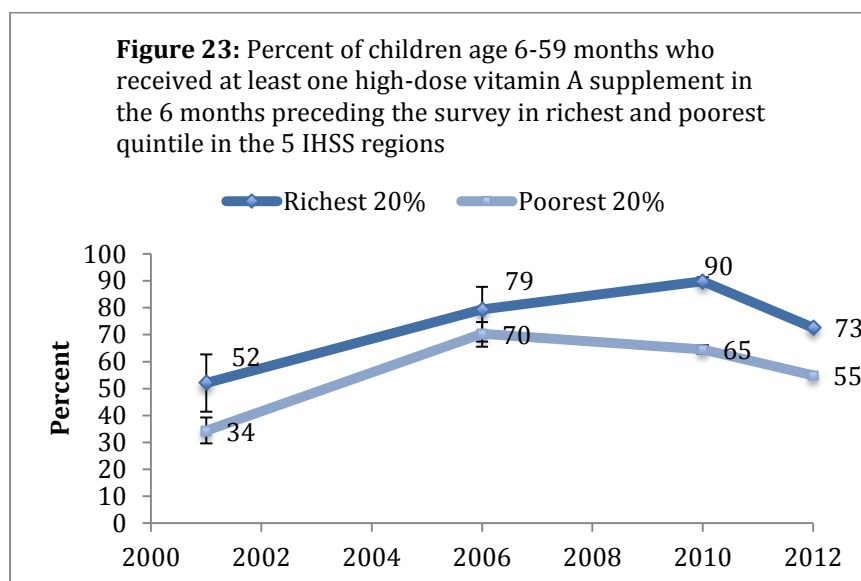
Vitamin A coverage estimates taken from surveys are highly dependent on timing of campaigns, the most effective way to reach large numbers of children. The timing of the survey in relation to timings of the campaign may have affected coverage estimates. As the surveys ask about the receipt of vitamin A in the last 6 months, and may not be timed well to coincide with the timing of the campaign (e.g. the survey is conducted in different districts over several months), the survey could misrepresent true coverage by sampling districts still due to receive their six monthly dose of vitamin A. Another plausible reason for the drop in coverage in 2012 is that these campaigns may have been interrupted by the political crisis that started in March 2012, affecting rates for children who were surveyed between October and December of that year.

The IHSS programme invested in the procurement of vitamin A and supported immunisation activities through the procurement of vehicles for district health teams to carry out their mobile health strategy to distribute vitamin A in villages located more than 15km from a health facility. This support could have plausibly contributed to the maintenance of a relatively high level of vitamin A coverage in Mali in the period between 2006 and 2010.



There are equitable rates of vitamin A supplementation coverage when comparing the richest and poorest quintiles in the IHSS programme regions between 2001 and 2006. However equity was not maintained as coverage in the poorest quintiles dropped from 70% in 2006 to 65% in 2010 (though marginally insignificant) while coverage rose to 90% (marginally not significant) in the richest quintile. Thereafter, rates in both quintiles drop, though without confidence intervals it is not possible to assess if the gap is statistically significant (Figure 23).

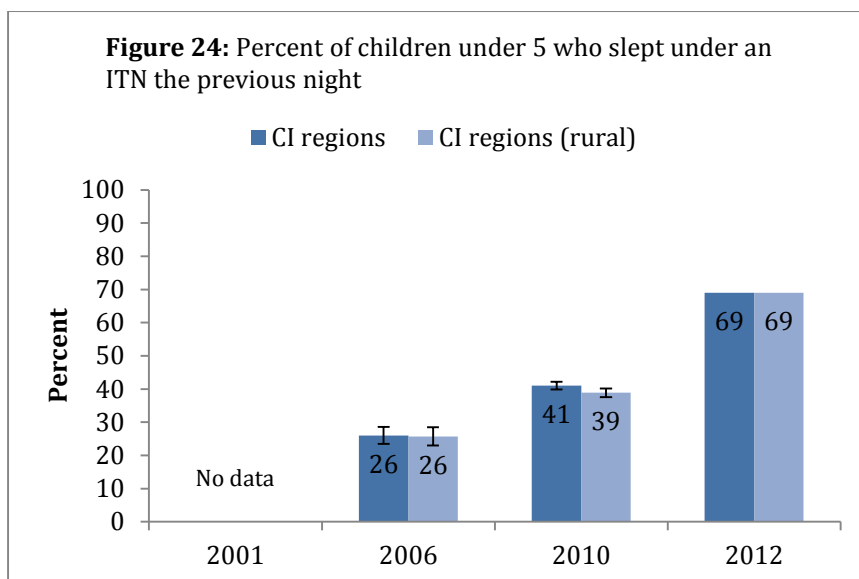
Though overall rates of vitamin A supplementation are maintained between 2006 and 2010, the shift in coverage to favour the richest quintile from 2006 and 2010, with no improvement in the poorest quintile over the same period, is contrary to the IHSS programme objective of increasing equity, and reasons for this should be further explored.



### ***Children under five sleeping under ITNs***

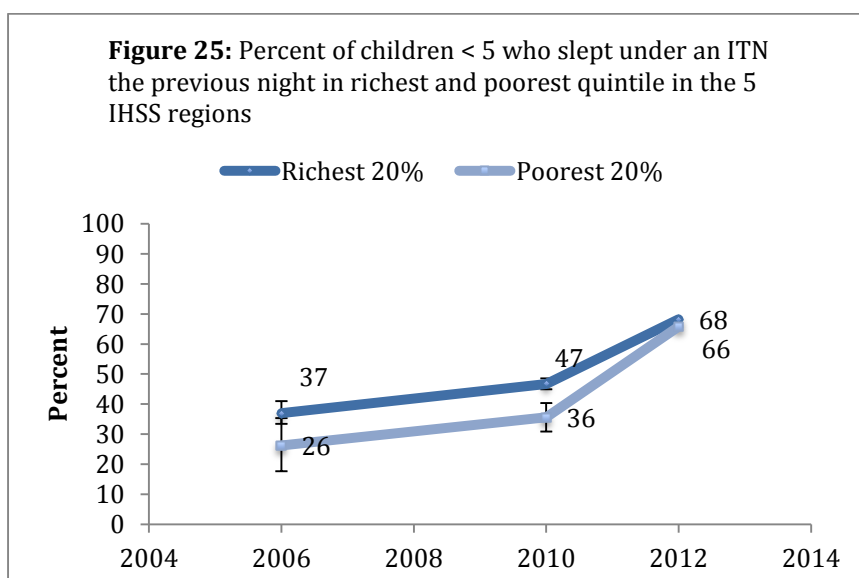
Malaria prevention through the distribution and usage of ITNs in children under five shows a steady and significant increase during the IHSS programme period, significantly rising from 26% in 2006, to 41% in 2010, to 69% in 2012. These rates are not statistically different from overall IHSS programme regional rates when restricting to only the rural populations in these regions, a measure which shows the rural population is being reached by the programme (Figure 24).

Early gains in ITN coverage in the IHSS regions can be plausibly attributed to UNICEF through IHSS programme funds, where 660,000 nets were procured in the first three phases of the programme roll out. During this time, UNICEF also supported the delivery of nets through strengthening of services at the CSCOM level and through training and support of the relais cadre who sensitized communities to procurement and usage and assisted with outreach campaigns. During the second half of the IHSS programme period, funding for ITNs came largely from the Global Fund. However, it is important to note that earlier health systems strengthening work under the IHSS programme could plausibly have contributed to success in distribution and utilization coverage. In 2011, there was a massive campaign funded by the Global Fund to ensure 90% of pregnant women and children under five received LLINs, and despite the Global Fund crisis funds were transferred to a new principle recipient to ensure distribution. This would most likely be reflected in 2012 coverage estimates as the nets have a two year life span. Therefore, the political crisis of 2012 would have been less likely to have impacted on these rates.



Utilisation of ITNs in children under five in the poorest quintile in the IHSS programme regions started at 26% in 2006 and rose to 36% in 2010, though the increase is not statistically significant. After 2010, utilisation rose sharply to 66%, and though there are no confidence intervals available, it is highly plausible that this increase is statistically significant.

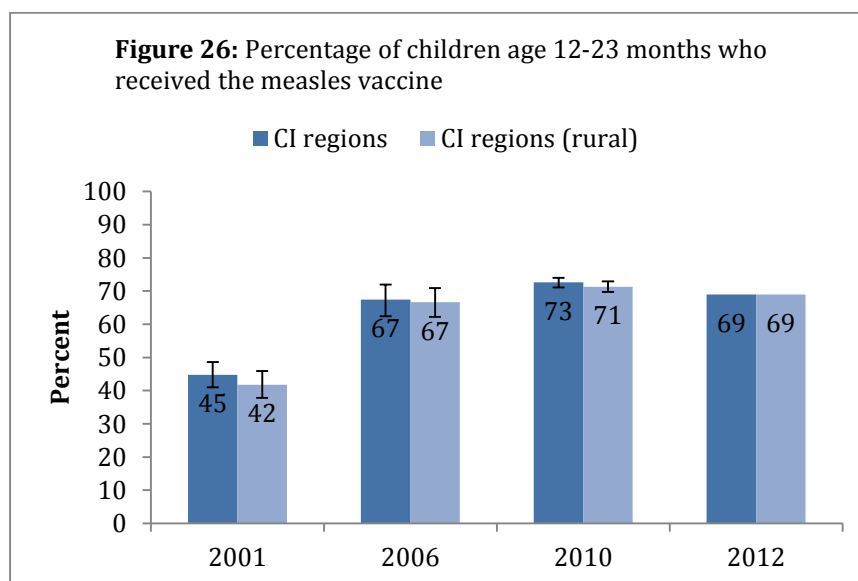
Data shows there is equitable distribution and utilisation of ITNs in children under five across both the richest and poorest quintiles in 2006, with overlapping confidence intervals. However, by 2010, these estimates no longer overlap though gains in coverage in each quintile were equal. This is likely due to variation in sample sizes and resulting precision of estimates between years). By 2012, the gap between the richest and poorest populations closes, with coverage at 68% and 66%, respectively (Figure 25).

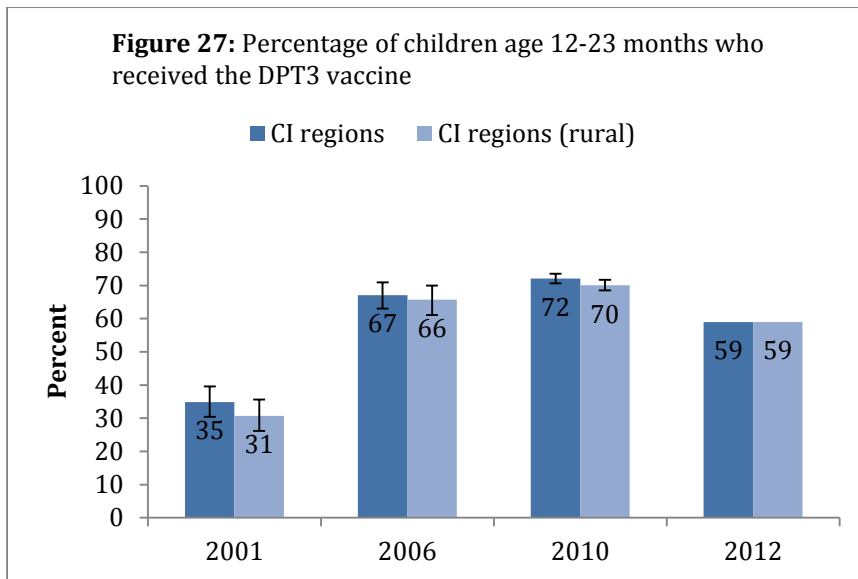




### **Vaccinations: Measles and DPT3**

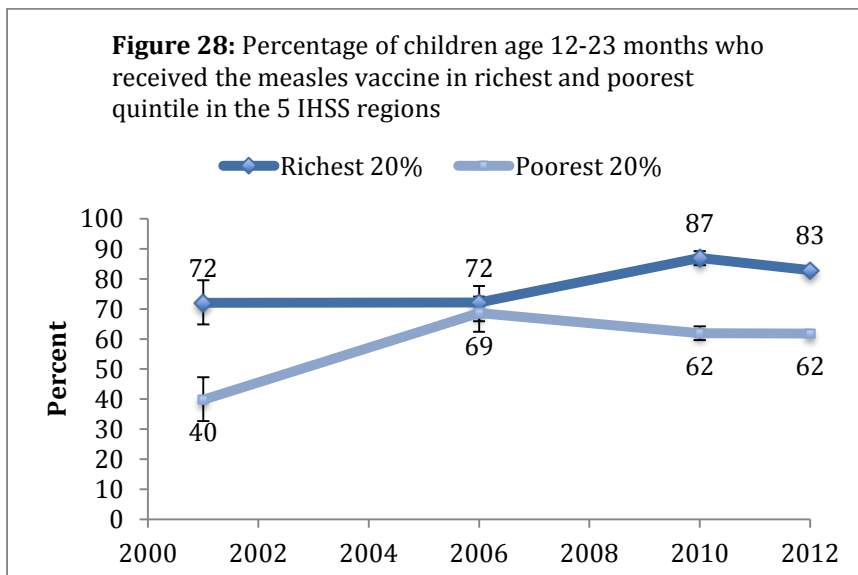
Early gains in the pre-IHSS period were made for immunisation coverage for children in Mali, rising significantly from less than half (45%) of all children in their first year of life receiving measles vaccine to 67% in 2006. A similar trend is seen in DPT3 coverage, with a significant increase from 35% to 67% in 2006. Thereafter, rates are maintained for measles vaccination (69% in 2012) but drop by 2012 for DPT3 vaccination coverage to 59%. The early gains in immunisation coverage are expected given the low starting point in 2001. While gains did not occur, rates were maintained during the IHSS programme period, except for DPT3 which dropped in 2012 (Figures 26 and 27). The IHSS programme invested in supporting outreach immunisation activities for villages located more than 15 km from a health facility, by financially supporting travel costs including through the procurement of vehicles for district health teams. Furthermore, the relais were trained in the essential family practices which include ensuring that children receive the full course of immunisations. These activities likely contributed to the maintenance of relatively high immunisation coverage amongst children during the IHSS programme period. It is plausible that routine delivery of immunisation for children was impacted by the political instability earlier in 2012 which could have affected coverage for DPT3. Measles immunisations are delivered through campaigns and through routine service delivery. Typically in emergencies, such as the political crisis of 2012 in Mali, measles immunisation campaigns (or mop-ups) are held, and this is likely the reason why measles coverage was maintained during this period.

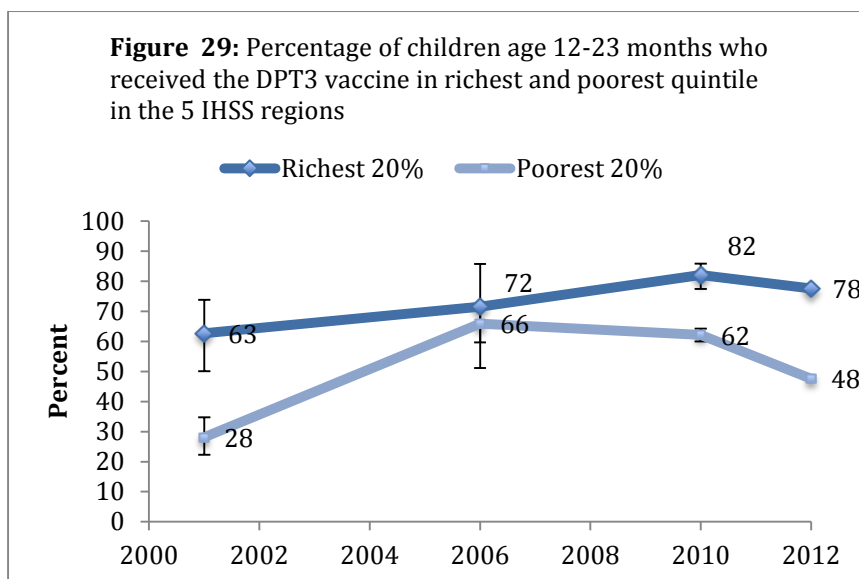




Measles vaccination in the richest and poorest quintiles was highly inequitable in 2001 (72% and 40%, respectively). Thereafter, significant gains made in regard to reaching the poorest quintile led to significant gains such that in 2006 there was no significant difference between the quintiles. Thereafter, gains are seen in the richest (87%) and non-significant losses in the poorest (62%) in 2010, resulting in inequity between the two groups in terms of vaccination coverage. Rates were maintained in the poorest quintile (62%) despite service disruption during the crisis, though coverage in the richest dips to 83% in 2012 (Figure 28).

Equity in regard to DPT3 vaccination coverage follows a similar trend as measles vaccination with the important difference being a loss in coverage in the poorest quintile in 2012, dropping significantly from 62% in 2010 to 48% in 2012 (Figure 29).

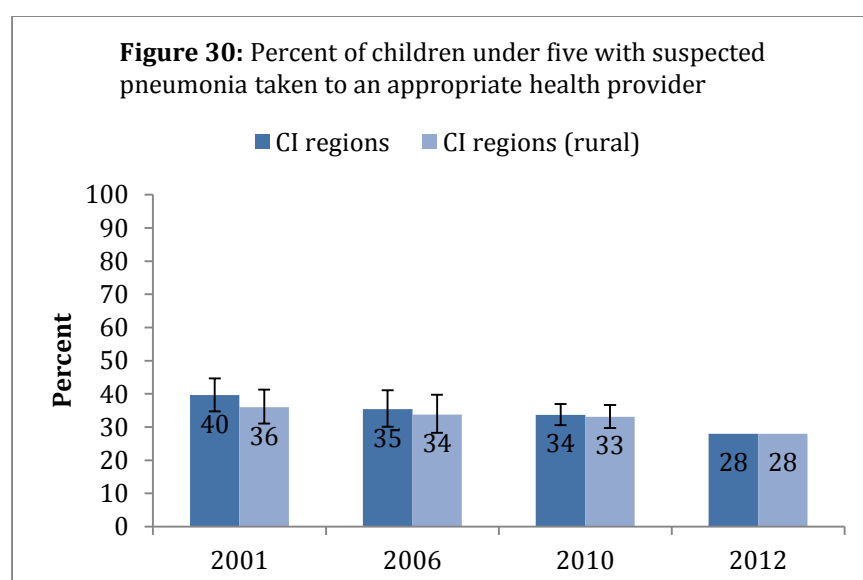




### 5.2.3.5 Curative care for malaria, suspected pneumonia and diarrhoea

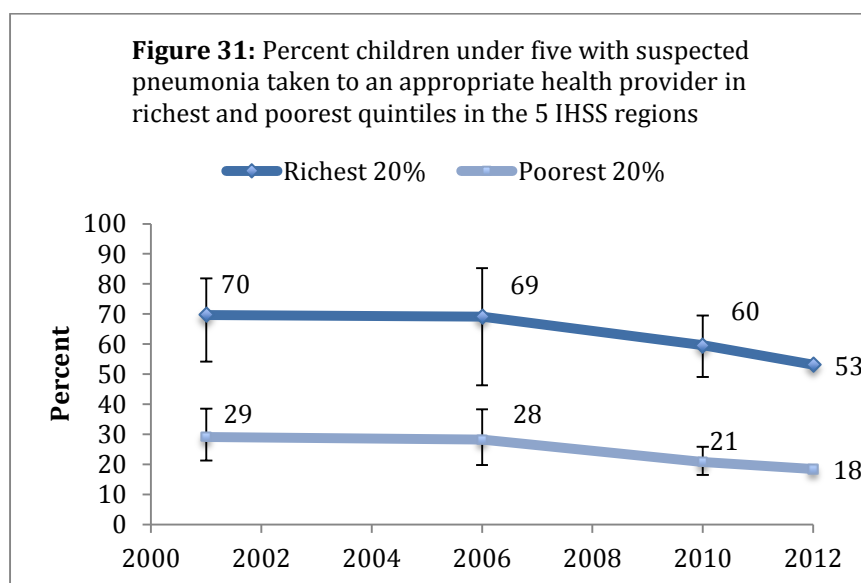
#### *Care-seeking and treatment of suspected pneumonia*

Care seeking from appropriate providers for suspected pneumonia in children under five started at 40% in 2001 and did not change significantly through 2006 (35%) and 2010 (34%) in the IHSS programme regions. By 2012, rates were reported at 28%, significantly lower than pre-IHSS rates of 2001, although without confidence intervals it is possible that this decline is insignificant (Figure 30).



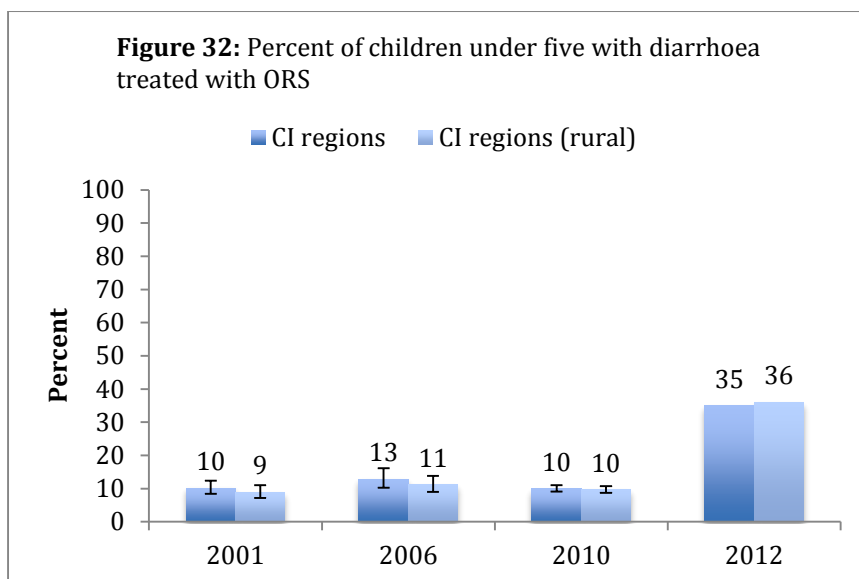
Less than a third of children with suspected pneumonia in the poorest quintile sought care from an appropriate provider in 2001. This rate remained unchanged in the pre-IHSS years and dropped, though insignificantly, to 21% in 2010 and 18% in 2012. With regard to equity, the gap between rich and poor children remained significantly wide across survey years starting with reported rates of 70% in the richest and 29% in the poorest populations in 2001 before dropping in both quintiles to 53% and 18%, respectively, in 2012 (Figure 31).

One possible reason for apparent decline in care-seeking across years may be the non-utilisation of services for financial reasons, with up to 87% of respondents citing financial barriers to access to treatment for suspected pneumonia for their sick children in the 2013 LQAS survey. UNICEF reports “anecdotal evidence suggests that the informal providers have less strict terms of payment and so more people are likely to seek treatment from them because the financial burden is lower.”<sup>33</sup> Furthermore, the IHSS programme only began investing in the training of ASCs to diagnose and treat suspected pneumonia, in addition to supporting the procurement of Cotrimoxazole for the treatment of children under five, in 2011. The late start of the programme meant that it did not reach national scale at the time of the evaluation, and thus it may have been too early to assess its impact on increasing care seeking practices.

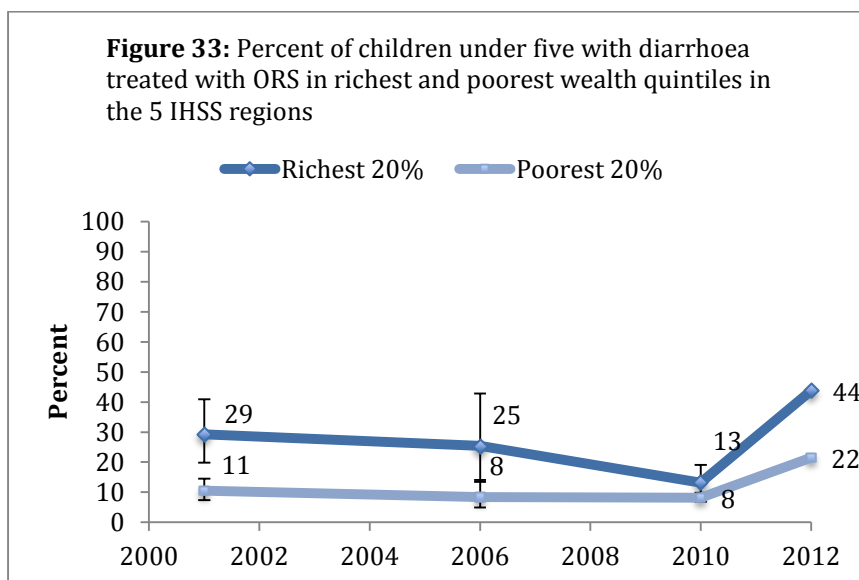


### ***Treatment of diarrhoea***

No significant gains were made in ORS coverage between 2001 and 2010 with estimates remaining around 10% in the IHSS programme regions. From 2010 to 2012, however, coverage increased significantly three and a half fold to 35%, showing remarkable gains over a two year period. These rates were mirrored when restricting the coverage to the rural populations of the IHSS programme regions (Figure 30). As Mali is predominantly rural, and the country’s rural population is the focus of the IHSS programme, this reflects good geographical coverage and successful implementation of the programme. By 2012, 32% of children with diarrhoea sought care from a facility or appropriate health provider (data from DHS not shown). Increased ORS coverage could be plausibly attributed to the IHSS programme as UNICEF procured, with DFATD funds, around 15 million ORS sachets for distribution over the programme time period plus a further 3 million from UNICEF matching funds. These were distributed to the district management structures which were responsible for stocking the CSCOM and community level providers (Figure 32).



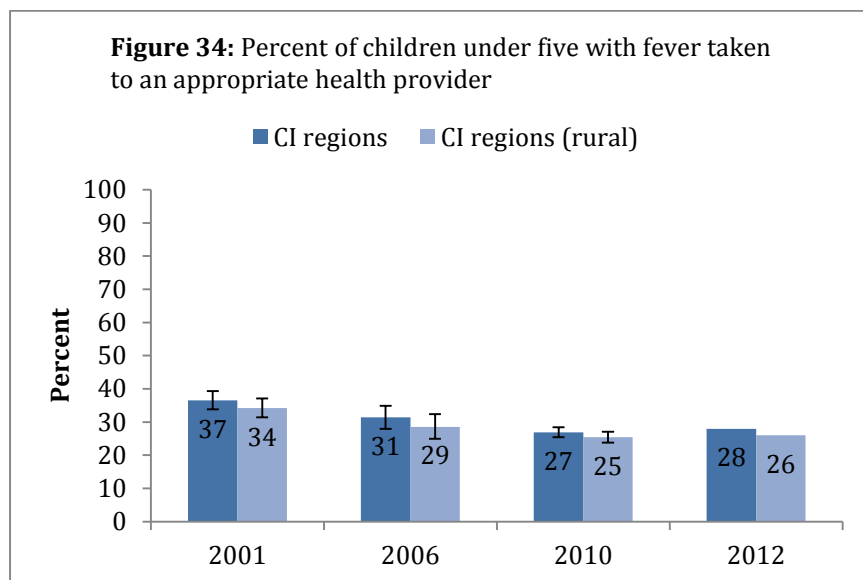
ORS coverage in the poorest quintile remained constant (ranging between 11% in 2001 and 8% in 2006 and 2010) until 2012 when rates increased to 22%. With regard to equity, children with diarrhoea in the poorest quintile had significantly lower ORS coverage than those in the richest in the pre-IHSS period. However, by the beginning of the IHSS programme in 2006, the rates had decrease in both populations (but with overlapping confidence intervals between the two quintiles). By 2010, rates in the richest 20% quintile dropped to 13% while rates among the poorest 20% stagnated at 8%. In 2012, large gains were made in the richest quintile (reaching 44%) with lesser but significant increases in the poorest quintile (22%) (Figure 33).



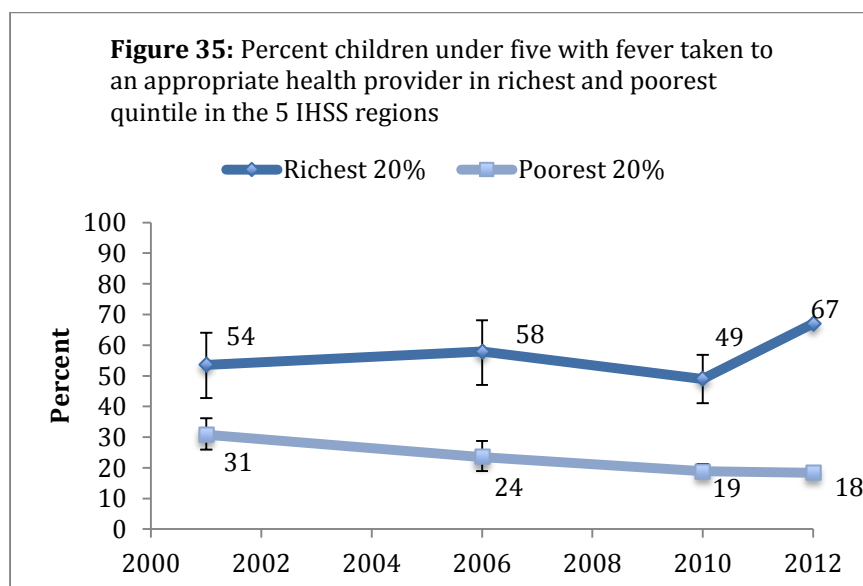
### ***Care-seeking and treatment of children with fever (suspected malaria)***

Overall, rates of care seeking for fever in children under five years of age have decreased from 37% in 2001 to 28% in 2012. However, changes between each survey year are not significantly different from one another, with overlapping confidence intervals. Care seeking rates across the IHSS programme period were maintained, with estimates between 31% (2006) and 28% (2012). There is no significant difference in care seeking for fever when restricting to only rural populations in the IHSS programme

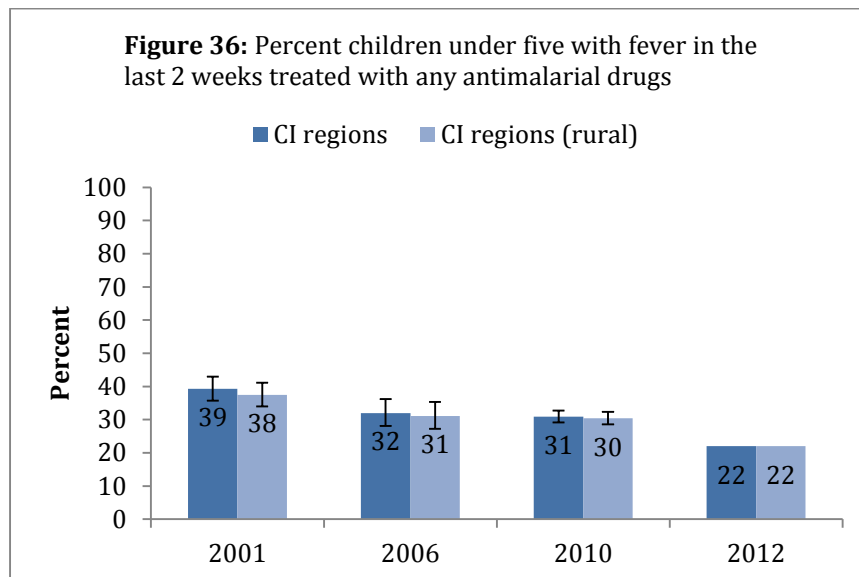
regions as compared to the IHSS programme regions as a whole (Figure 34). Although the investment through the IHSS programme in the training of ASCs and the provision of drugs only came into effect by 2011, it is likely this investment in community level care contributed to the maintenance of coverage during a period of significant political instability and financial upheaval due to the Global Fund crisis. The IHSS programme supported the provision of antimalarials at the community level during the period of the crisis in order to ensure that services would not be disrupted.



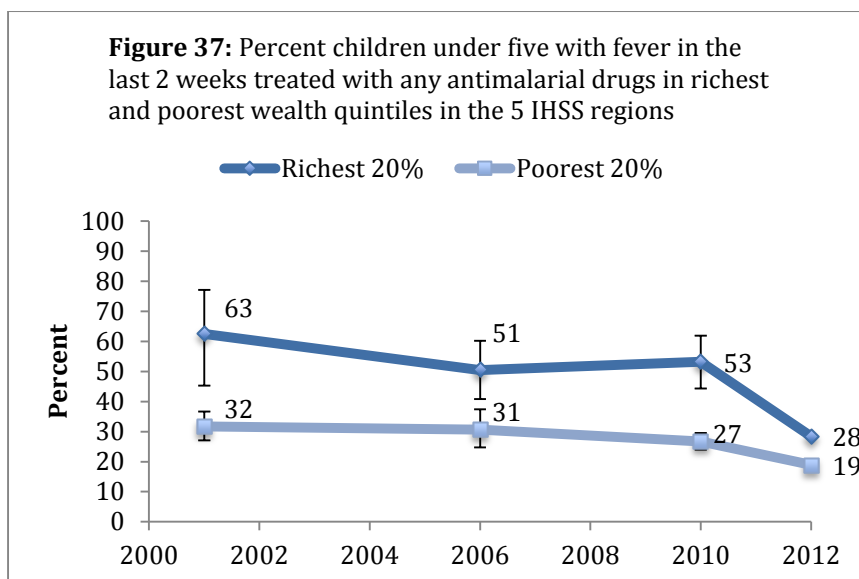
There did not appear to be any gains in equity between the richest and poorest quintile in regard to care-seeking from an appropriate provider for children with fever. Rates in the poorest quintile decreased between 2001 and 2006, dropping from 31% to 24%, and again between 2006 and 2010, from 24% to 19%. Thereafter, rates in the poor stabilised. Care seeking for fever in the richest quintile did not change significantly between 2001 and 2010, though by 2012 rates rose to a peak 67% (Figure 35). It should be noted that the data for 2012 wealth quintiles includes the urban (and wealthier) centre of Bamako, which would likely inflate coverage in the richest quintile as access to appropriate care for this population would be greatly enhanced by residence in the capital city.



The proportion of children with fever who received any antimalarial drug decreased overall when comparing coverage in 2001 (39%) and 2012 (22%). While a significant decrease occurred in the pre-IHSS years, rates were maintained in the early IHSS programme period at around 32%. Thereafter, rates dropped to 22% in 2012 in what appears to be a significant decrease (Figure 36).



Treatment with antimalarials for the poorest 20% of children with fever decreased overall between 2001 and 2012 (32% to 19%). The gap between richest and poorest quintiles remain significantly different between 2001 and 2010. In 2001, 63% of children in the richest quintile received treatment compared to nearly half that (or 32%) in the poorest. By 2012, rates in the richest dropped to 28% compared to 19% in the poorest quintile, though without confidence intervals it is not clear if rates between these two groups are significantly different (Figure 37). Again, the Global Fund crisis in 2010 is likely to have impacted on the availability of antimalarials. While the IHSS programme invested in antimalarial procurement for the community level, the graph above reflects treatment at all levels of the health care system, including the CSCOMS, who received less partner support to circumvent the crisis. Furthermore, it is also important to note that ACTs became available in health facilities by mid-2007, and between 2010 and 2012, the majority of antimalarial provisions would be made up of ACTs. The change in policy for the provision of antimalarials could have also contributed to the temporary decline in coverage as the country moves towards systematic implementation of the new ACT policy.



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

No data for disaggregation was available for the endline year of 2012 to be able to assess changes in care-seeking patterns for fever, suspected pneumonia and diarrhoea by provider compared to previous survey years. As the SEC program only began roll out in 2011, coverage would not be captured in earlier available survey data. Therefore, analysis was not done to assess changes in this trend.

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

#### Antenatal care

##### *ANC visits*

Utilisation of antenatal care services at least once during pregnancy increased from an average of 48% for the 5 IHSS programme regions in 2001 to 69% in 2006. Thereafter, coverage remained largely unchanged at around 70% in 2010 and 2012. Only one quarter of pregnant women in the five IHSS programme regions attended at least four ANC visits in 2001, but by 2012, this proportion had reached 35% in the rural IHSS programme areas (see Appendix E). The IHSS programme invested in the promotion of antenatal care attendance and services, initially through the training of the relais cadre and supervision of traditional birth attendants and later complimented through its promotion by the ASCs, and thus could have plausibly contributed to the gains made.



## **Childbirth and newborn care**

### ***Skilled attendance***

In the pre-IHSS period, the proportion of pregnant women having been seen by a skilled birth attendant during delivery in the 5 IHSS programme regions increased from an average 15% to 20%. In the early part of the IHSS programme (2006- 2010) rates dropped back to 15% before doubling in 2012 to 31%. Of all regions, Mopti remained the lowest, peaking at 19% in 2012 (see Appendix E). Early IHSS programme investment included the training of relais and traditional birth attendants to promote facility deliveries. The IHSS programme also invested in the training of traditional birth attendants on the management of pregnancy and delivery to provide safe delivery and refer in case of danger signs. The DHS surveys usually qualify skilled birth attendants to include doctors, nurses and midwives, so it is unclear if the investment in the training of traditional birth attendants would be reflected in an increase in skilled birth attendants as captured by the surveys. It is likely, however, that the complimentary activities of the ASCs who were trained later through IHSS programme support complimented their health promotion activities in the community and resulted in some gains in the coverage of skilled birth attendance at the facility level.

## **Infant and Young Child Feeding**

### ***Complementary feeding***

The proportion of children 6-8 months who were breastfed and received complementary foods in the 5 IHSS programme regions decreased from an average of 32% in 2001 to around 25% in 2006 and 2010 before reaching 45% in 2012 (Appendix E). It is important to note that the 2012 DHS includes Bamako in this estimate whereas the other years do not. The food security crisis in the Sahel during 2005 and 2010 would likely have impacted the rates for complimentary feeding for these years. Rates may have increased by 2012 as relief measures were implemented by this time. The IHSS programme promoted complimentary feeding through the health promotion messages delivered to the community through the relais and ASCs.

## **Vaccinations**

As mentioned earlier, the IHSS programme invested in strengthening the delivery of immunisation through the country's mobile strategy by equipping health staff with transportation to carry out their activities and the procurement of commodities.

### ***BCG***

BCG coverage increased from 65% to 75% in the pre-IHSS period of 2001 – 2006. Thereafter, all 5 IHSS programme regions reached above 80% in 2010 and 2012, with the exception of Mopti which only achieved 72% and 64% in 2010 and 2012, respectively. Bamako (not included in the regional averages) reached 95% coverage in 2012.

## **Polio**

The proportion of children receiving the polio vaccine was only 36% in 2001 in the 5 southern regions where IHSS programme was implemented. This increased to 60% at the start of the IHSS programme in 2006 and was maintained to 2010 at 62%. By 2012, however, the coverage was reported at 48% in the 5 IHSS programme regions with the lowest coverage in Mopti at 34%.

## **HepB and Hib**

Mali introduced the pentavalent vaccine (DPT-HepB- Hib) with support from the Global Alliance of Vaccines and Immunisations (GAVI) in March 2011. Coverage estimates for Hib and HepB are reported separate to the estimates for DPT3 alone in DHS 2012. In 2012, only 26% of children aged 12-23 months had received three doses of pentavalent vaccine, with Mopti and Sikasso reporting vaccination rates of 17% and 35%, respectively.

## **Nutrition indicators: Stunting and underweight**

An estimated forty percent of children under five were stunted in 2001 in the 5 IHSS programme regions, and half of those (20% of children) were severely stunted. Sixteen percent of all children were underweight (<-2 SD). These rates remained virtually unchanged in 2006. By 2010, progress had been made in regard to stunting and severe stunting with rates dropping to 29% and 10%, respectively. However, the proportion of children under five who were underweight increased to 19% that year, although this 3% change is likely not significant. By 2012, rates of stunting were back to 40% or pre-2010 levels, while severe stunting had risen back up to 21% and underweight was 13%. Overall this pattern reflects improvement in stunting, and unchanged or perhaps worsening rates of children who are underweight.

It is not clear what caused the dip in recorded stunting rates in 2010. The differences in measurement standards between the DHS and MICS could serve as one explanation. The food crises of the Sahel region in 2005 and 2010 would have impacted the stunting rates in 2012 with increased rates expected. However, it is not clear why similar patterns would not have been apparent in 2010 as a result of the 2005 emergency food situation.

## **5.3 Impact**

### **5.3.1 Change in child mortality**

#### **Changes in under-five mortality rates**

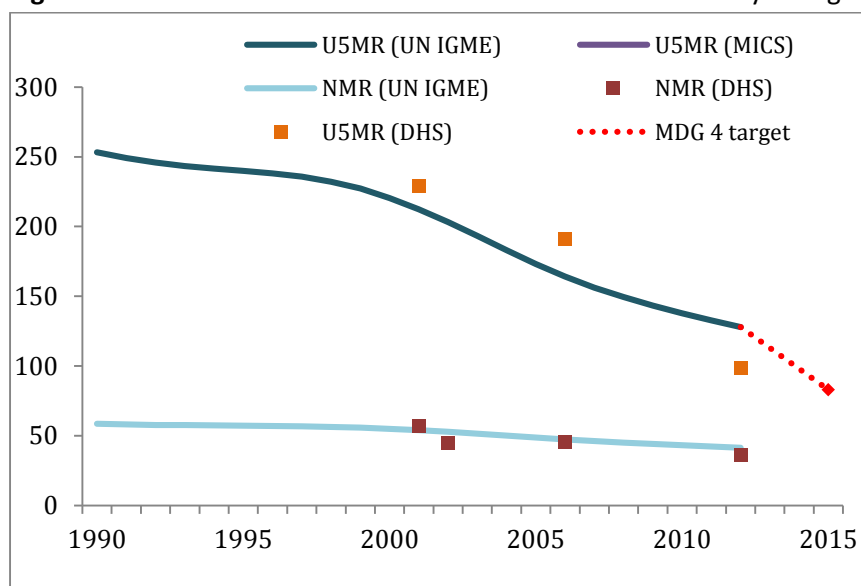
According to the UN Inter-Agency Group for Child Mortality Estimation in 2013, Mali is on track for Millennium Development Goal 4 for child survival (Figure 38) with an U5MR of 128 in 2012 and a target of 84.<sup>34</sup> An estimated 83,000 children died before their fifth birthday in Mali in 2012. Approximately 32% of under-five deaths occur in the first month of life, i.e., the neonatal period, up from 23% in 1990. The average rate of reduction in under five mortality for Mali is 3.1% per year since 1990, which is similar to the average for sub-Saharan Africa (2.7%).<sup>34</sup> The rate of decline in the DHS post-2006 is faster than the UN Inter-agency Group for Child Mortality Estimation (IGME) rate, but DHS surveys before 2012 should not be compared directly with the 2012 DHS given that the 2012 DHS was not able to sample the northern regions due to civil unrest. Even when previous DHS surveys are adjusted to

only include the 5 Southern Regions so as to be comparable to the 2012 survey, an increasing proportion of neonatal mortality rate (NMR)/U5MR is noted, signifying that neonatal mortality has not declined as has the overall U5MR. This is to be expected given the increased investment in interventions (iCCM) that affect mortality in older children.

**Table 7: Average Regional Rates of Neonatal and Under 5 Mortality**

	NMR	U5MR	NMR/U5MR
2001	70	249	28%
2006	60	229	26%
2012	36	108	34%

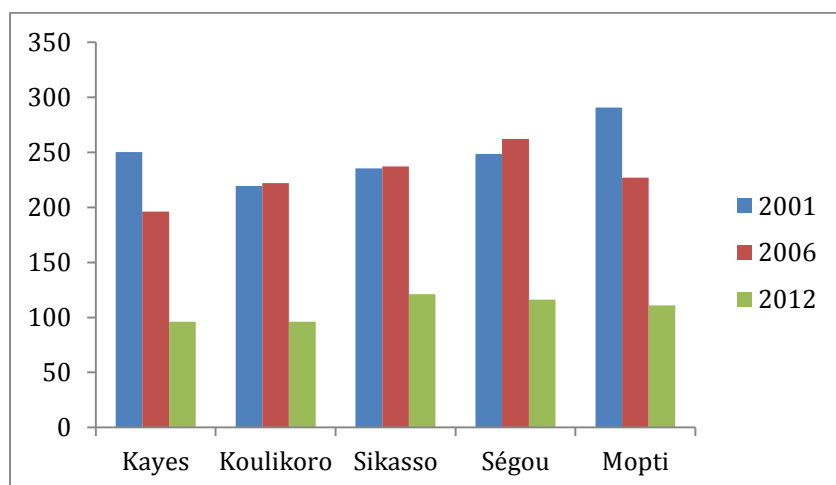
**Figure 38: National and rural under-five and neonatal mortality change**



Data sources: IGME 2013 mortality estimates ([www.childmortality.org](http://www.childmortality.org)), 2001, 2006, and 2012 Mali DHS, 2010 MICS.

In the 5 IHSS programme regions, the rate of mortality decline at rural level is similar to the national rates, given they comprise 78% of the country's population. The regional mortality rates calculated from the household surveys reflect the ten years prior to the survey and may mask more rapid recent change.

**Figure 39:** Regional under-five mortality, 10 year rates

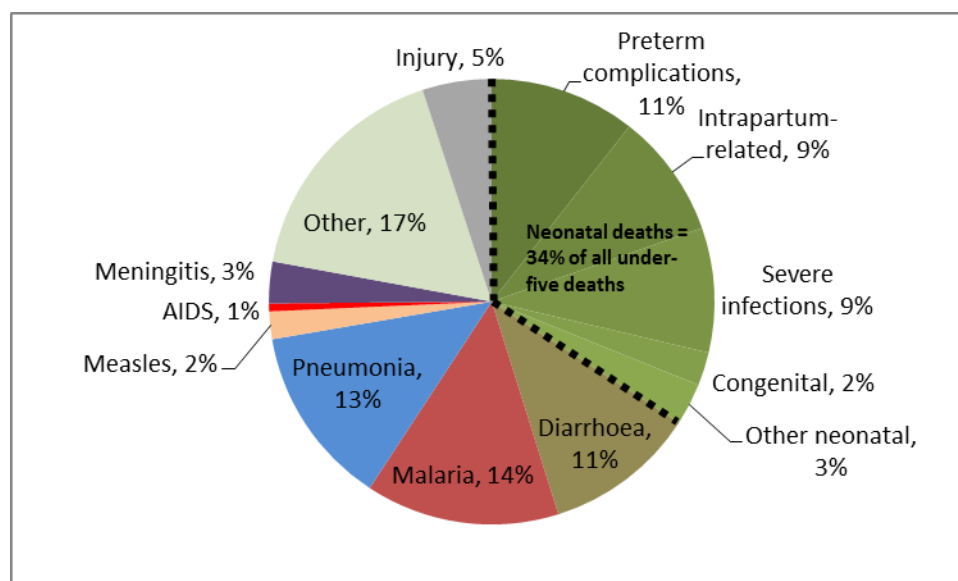


In 2013, the main causes of under-five deaths after the neonatal period in Mali were estimated to be malaria (14%), pneumonia (13%) and diarrhoea (11%).<sup>35</sup> According to these modelled estimates, since 2000 only the proportion of deaths due to malaria has dropped significantly while proportionately, deaths due to other conditions and to neonatal causes are becoming increasingly more important in the first month of life and beyond.

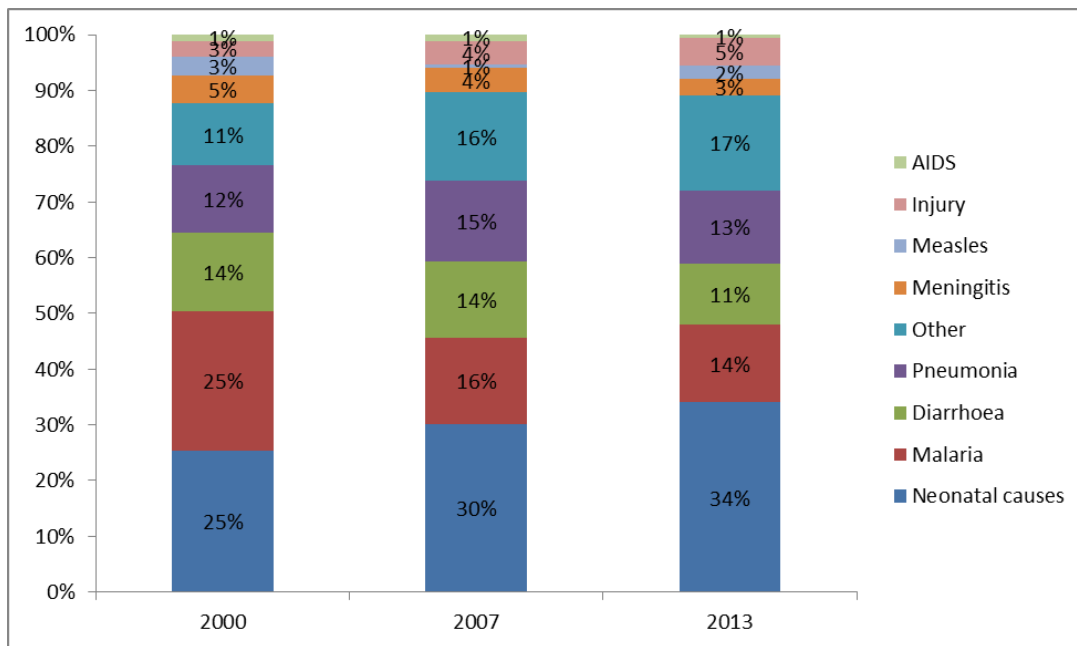
**Figure 40. Causes of under-five deaths in Mali**

Data source: Liu L, Oza S, Hogan D, et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. Lancet 2014; published online Oct 1. [http://dx.doi.org/10.1016/S0140-6736\(14\)61698-6](http://dx.doi.org/10.1016/S0140-6736(14)61698-6).

**(a) In 2013**



**b) Trend from 2000-2013**



**5.3.2 Lives saved results**

The proportion of child lives saved by intervention was calculated using the LiST-estimated number of child lives saved in 2007 and 2012 relative to the situation in 2001 and 2007, respectively. Results are presented cumulatively and by intervention for both phases.

***Pre-IHSS implementation (2001-2006)***

Using a baseline average U5MR of 249 and intervention coverage across the 5 IHSS programme regions from DHS 2001, LiST predicted an U5MR of 230 in 2006. This prediction is similar to the average regional mortality from the DHS 2006 at 229. According to the modelled results, over 31,000 deaths of children under five were averted between 2001 and 2006 prior to IHSS programme implementation (Table 8). In the pre-IHSS period, measles deaths were significantly decreased due to increases in measles vaccination coverage (responsible for an estimated 30% of the lives saved) and vitamin A for measles treatment (responsible for 24% of lives saved). During this time period, measles deaths reduced from 4% of all child deaths to less than 1%. Vitamin A supplementation accounted for an estimated 12% of lives saved. An increase in ORS coverage was responsible for 6% of deaths averted. Increases in water and sanitation interventions and DPT and Hib vaccines were responsible for 5% and 3% of deaths averted, respectively (Figure 41).

**Table 8:** Results from Lives Saved analysis for Mali IHSS regions (2001-2006)

	2001	2002	2003	2004	2005	2006	Cumulative deaths prevented
Proportion of under five deaths averted		2%	4%	5%	7%	9%	
Additional under five deaths prevented per year*	0	2,400	4,400	6,500	8,800	11,000	33,100
Predicted under-5 mortality rate	249	245	241	238	234	230	
Annual rate of mortality reduction		1.8%	1.5%	1.5%	1.5%	1.5%	1.5%

\*numbers rounded to avoid spurious accuracy

### ***IHSS implementation (2007 to 2012)***

Given that Mali started iCCM implementation in 2011, only one analysis was conducted for the duration of IHSS programme implementation rather than a two-phased approach as in the external evaluation reports for the other IHSS programme countries. For this analysis, the average regional U5MR of 229 in 2006 was used. The U5MR predicted by LiST based on measured coverage change between 2006 and 2012 was 198, much higher than the regional average of 108, 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. The modelled results indicate that approximately 41,900 lives of children under five were saved between 2007 and 2012, a 15% reduction compared to the 2007 baseline (Table 9). The average rate of mortality reduction of 2.6% per year in the IHSS programme implementation phase is higher than the pre-IHSS period annual rate of reduction of 1.5%. Approximately 90% (37,900) of these lives saved were due to increases in coverage of interventions to which the IHSS programme contributed. ITN use was responsible for an estimated 15,300 lives saved, or 36% of the total in this period (figure 41). The newly introduced pneumococcal vaccine accounted for approximately 20% (8,300) of lives saved. Decreases in vitamin A supplementation coverage and decreases in rates of care seeking for pneumonia resulted in approximately 1,700 and 3,400 *additional* deaths, respectively, in 2012 compared to 2007. The lack of breakdown of breastfeeding data by age in the 2012 DHS, due to unavailability of raw data, meant that changes in breastfeeding rates were not considered in this time period.

**Table 9:** Results from Lives Saved analysis for Mali IHSS regions (2007-2012)

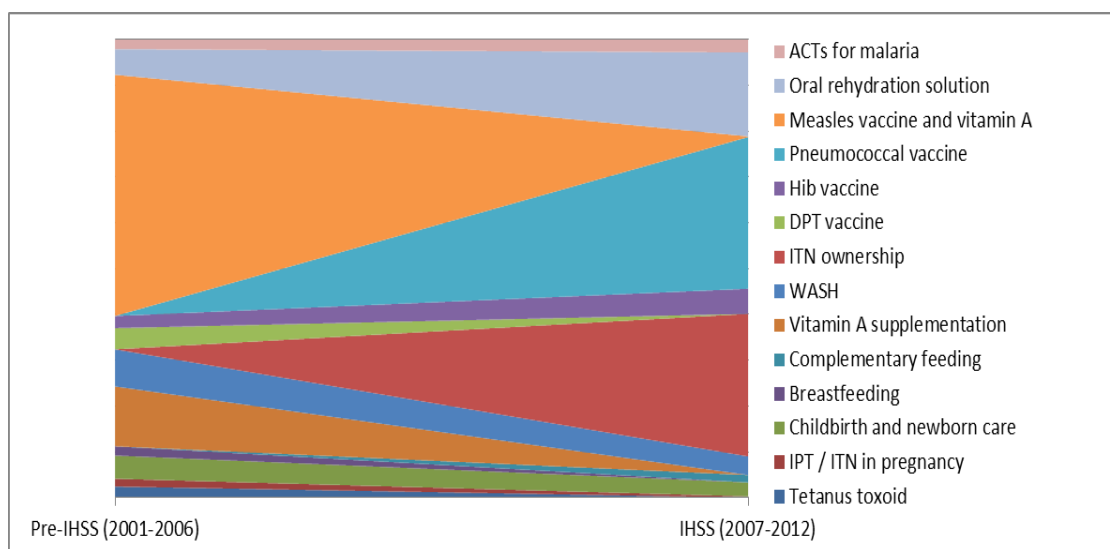
	2007	2008	2009	2010	2011	2012	Cumulative deaths prevented
Proportion of under-five deaths averted		2%	3%	5%	10%	15%	
Additional under-five deaths prevented per year*		2000	4100	6300	11800	17700	41900
Predicted under-five mortality rate	226	222	219	215	207	198	
Average annual rate of mortality reduction		-1.5	-1.5	-1.6	-4.1	-4.3	2.6%
Number (%) of deaths averted due to interventions to which the IHSS contributed*^							37,900 (90%)

\*numbers rounded to avoid spurious accuracy

^As per page 5 of Schedule A of the Grant Agreement and the tailored Mali programme implementation, in this context "IHSS programme interventions" in LiST are assumed to include maternal tetanus vaccination; exclusive breastfeeding; complementary feeding; ITN use and IPT in pregnancy; DPT, Hib, 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). PMTCT interventions are not included in this result.

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

**Figure 41:** Proportion of deaths averted by intervention before and after IHSS implementation



## 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 of malaria, diarrhoea and pneumonia through iCCM?
- What would be the cost of increased utilisation?
- What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends? Are committed financial and human resources sufficient to maintain benefits and results?

The results below do not reflect the actual expenditure on iCCM implementation. They reflect expected costs if iCCM 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. Detailed costing tables can be found in Appendix D.

In the year June 2012 to May 2013, a total of 1 847 iCCM-trained ASCs were deployed in the 5 regions. Each of them provided an average of 134 malaria, diarrhoea and pneumonia (MDP: signifying the combination of the three diseases) iCCM treatments a year. Malaria treatments represented 59% of MDP treatments, diarrhoea 20%, and pneumonia 21%.

#### 5.4.1.1 Current cost per treatment

Additional annualised fixed costs per ASC stand at \$1 333.50. Subsidies at \$960 (\$80 a month) represent 72% of these costs. The share of ASC fixed costs per treatment amounts to just under \$10 as shown in Table 9 below.

**Table 10:** Additional annualised costs per ASC for 2012

Additional Annualised Fixed Cost by ASC in \$	Fixed Cost/ASC/Year	% Distribution	# MDP treatments under 5 /year	Share ASC Fixed Cost per Treatment
Training	86.57	6.5%		
Subsidy	960.00	72.0%		
Equipment	96.04	7.2%		
Management & Supervision	127.39	9.6%		
Other Overheads 5%	63.50	4.8%		
<b>Total Additional fixed cost</b>	<b>1 333.50</b>	<b>100.0%</b>	<b>134</b>	<b>9.94</b>

Patients paid for consultation an amount ranging from \$0.2 to \$0.6, an amount fixed by the local ASACO. The lower value has been retained for this costing in light of the 2013 LQAS survey which showed financial barriers were the main cause for non-utilisation of ASCs services. Following this survey, ASACOs in the study area agreed to cap the consultation cost at \$0.2. Patients also paid a predetermined amount for diarrhoea and pneumonia drugs. Both total cost per treatment and net costs (whether paid by government or ASACOs), after excluding patients' payments, are presented.



Following the costing system in Mali, the cost of Drugs and Tests is at CSCOM level 50% higher than at national level.

Total cost of malaria treatment amounts to \$12.6, diarrhoea treatment \$10.9, and pneumonia \$10, with a weighted average across treatments of \$11.7.

Net Cost per treatment comprises Net Consultation Cost at \$9.74 and the Net Drug/Diagnosis Costs (Table 10). Net cost per malaria, diarrhoea, and pneumonia treatment amounts to \$12.4, \$10.5, and \$9.5, respectively, with a weighted average across treatments of \$11.4 (Table 11).

**Table 11:** Drugs and Tests per iCCM treatment for year 2012/13

Medicine & Diagnostic test / Treatment	Cost at CSCOM	Paid by patient	Net Cost	Share Treatments
Malaria, incl RDT	2.67	-	2.67	59%
Diarrhea	1.01	0.21	0.80	20%
Pneumonia under 1	0.47	1.30	-0.84	4%
Pneumonia 1 to 4	0.05	0.08	-0.03	17%
Weighted Average	1.80	0.11	1.69	100%

**Table 12:** Total and Net Costs per ICCM treatment

Total Cost per treatment 2012-13	Share ASC fixed cost	Drug/ Diagnostic CSCOM cost	Total	% Fixed Cost
Malaria, incl RDT	9.94	2.67	12.60	79%
Diarrhea	9.94	1.01	10.94	91%
Pneumonia	9.94	0.09	10.02	99%
Weighted Average	9.94	1.80	11.73	85%

Net Cost per treatment 2012-13	Share ASC fixed cost A	Consult paid by patient - B	Net Consultation C=A-B	Drug/ Diagnostic Net cost - D	Net Cost C+D
Malaria, incl RDT	9.94	0.20	9.74	2.67	12.41
Diarrhea	9.94	0.20	9.74	0.80	10.54
Pneumonia	9.94	0.20	9.74	-0.19	9.55
Weighted Average	9.94	0.20	9.74	1.69	11.43

The 134 MDP treatments a year per ASC translates into 2.8 treatments a week. Assuming that an additional 20% of visits were made which did not end up in treatment, the combined consultations and meetings (for supervision, planning or other purposes) time spent on iCCM for the MDPs amounted to an average of 3 hours a week per ASC. Note that this arbitrary ratio of 20% additional visits does not impact on cost, but only on time.

#### 5.4.1.2 Scenario for increased iCCM service utilisation

iCCM implementation is very new and utilisation tends to increase with maturity of implementation. If the number of treatments per ASC increases by 15%, translating to 3.2 treatments, or 4 visits, a week, the time spent by the ASC on MDP treatments would increase from the current 3 to 3.3 hours a week, and to 4 hours for a 30% increase in treatments representing 3.6 treatments, or 4.4 visits, a week. Required time increases by a smaller ratio than the increase in number of visits because the time on meetings is largely independent from the number of treatments. An increase in number of visits per ASC can be absorbed in the current system.

With an increase of 30% in utilisation (treatments), ASC annualised fixed costs are shared between higher numbers of treatments, as a consequence the net cost per consultation (share of ASC fixed cost) decreases from the observed \$9.7 to \$7.4. The cost per treatment (consultation + drugs) decreases by 20%. The cost of the programme covering all ASCs increases by 4% for 30% more treatments, moving from the current \$2.8 million to \$2.9 million. ASCs' subsidies remain stable at \$1.78 million a year (Table 13).

**Table 13:** Impact on time and costs of increased number of treatments by ASC

Increased Utilisation by ASC/Year	2012 number of Treatments	With 15% increase in treatments	With 30% increase in treatments
<b>Increase rate</b>		15%	30%
Number Treatments / Year / ASC	134	154	174
Number Treatments / Week	2.8	3.2	3.6
Number Visits / Week	3.4	3.9	4.4
Hours on visits/meetings / Week	3.06	3.32	3.58
Net cost per Consultation	9.74	8.44	7.45
Net cost per Treatment	11.43	10.13	9.13
% variation in cost per treatment		-11%	-20%
Net cost of all treatments by ASC / Year	1 534	1 564	1 594
Share ASC Subsidy	63%	61%	60%
ASC subsidies for the program	1 773 120	1 773 120	1 773 120
iCCM Net Cost program	2 832 471	2 887 896	2 943 322
% increase in program cost		2.0%	3.9%

However, introduction of iCCM requires some level of system strengthening to make it possible. To reflect this wider platform, iCCM+, an arbitrary additional 15% was added to the iCCM basic costs, recognizing that this additional 15% underestimates these additional costs at the beginning of the programme but will overestimate them as the programme matures. The costs of the iCCM+ would stand at \$3.2 million. With 30% more treatments per ASC, the cost would be \$3.4 million (Table 14).

**Table 14:** iCCM implementation net cost for districts covered

Cost of the program for Districts Covered	2012 number of Treatments	With 15% increase in treatments	With 30% increase in treatments
iCCM Cost program	2 832 471	2 887 896	2 943 322
iCCM+ Cost program	3 257 341	3 321 080	3 384 820

iCCM implementation has been at scale in the districts covered for only 11 months. With already an average of 0.4 visits per year per child under five, iCCM clearly responds to a need. In response to the questions, **What is the additional cost per treatment of malaria, diarrhoea and pneumonia through iCCM? And what would be the cost of increased utilisation?**, the analysis shows the following:

The net cost per malaria, diarrhoea, and pneumonia treatment amounts to \$12.4, \$10.5 and \$9.5 pneumonia, respectively, with a weighted average across treatments of \$11.4. The share of ASC fixed costs represents an average of 85% of treatment costs.

The combined time spent on consultations and meetings for the MDPs amounted to an average of 3 hours a week per ASC (treatments + additional 20% visits which did not translate into treatments).

Cost per treatment is dependent on the level of utilisation.

An increase of 30% in visits due to increased demand and increased population in the areas covered would translate into 4 hours a week. The current number of ASCs could respond to this increase.

With 30% more treatments per ASC, the net cost per treatment (consultation + drugs) decreases by 20%, the cost of the programme covering all ASCs increases by 4% (higher utilisation of drugs), moving from the current \$2.8 million to \$2.9 million. Increased utilisation has a small impact on programme costs whilst it is likely to improve health status.

An additional 15% must be added to the net cost to reflect strengthening of the health system to enable iCCM implementation. The net implementation costs of iCCM+ would stand at \$3.2 million. With 30% more treatments per ASC, the cost would be \$3.4 million.

#### **5.4.1.3 Financial Sustainability**

To assess the financial sustainability of iCCM implementation, the 2012 cost of iCCM for MDPs was compared to the total annual public health expenditure (government and donors), and to the government health expenditure in 2011. Four scenarios are presented for the net cost of iCCM+, with current level of utilisation per ASC.

Scenario 1: The government does not pay ASCs subsidies; these are paid by ASACO

- Scenario 1A : Current geographical coverage
- Scenario 1B: Geographical coverage extended to all children under five in Mali (maximum option)

Scenario 2: The government pays fully the ASCs subsidies

- Scenario 2A : Current geographical coverage
- Scenario 2B: Geographical coverage extended to all children under five in Mali (maximum option)

Currently each ASC covers an average of 360 children under five. Keeping the same ratio, the number of ASCs required for 100% coverage of children under five (maximum option) would be 8 320, up from the current 1 847 for 22% coverage.

In 2011, public health expenditure in Mali stood at \$291.9 million, and the government's own health expenditure represented 42.7% of this amount, i.e., \$124.5 million.

In the case of Scenario 1 (government does not pay ASCs subsidies), patients' payments will go to the ASACOs, and the average cost per treatment for the government would stand at \$4.58. The cost to government of the current iCCM+ implementation would represent 0.45% of total public health expenditure and 1.05% of the government's own health expenditure. With absolute coverage of children under five, Scenario 1B, the cost to the government of iCCM+ implementation would represent 2% of the total public health expenditure and 4.72% of the government's own health expenditure.

With Scenario 2, government pays the ASCs subsidies and patients' payments go to the government, net cost per treatment (currently \$11.43) is paid by the government. The net cost of iCCM+ implementation would represent 1.12% of the total public health expenditure and 5.03% of the government's own health expenditure. With absolute coverage of children under five, Scenario 2B, the cost to the government of iCCM+ implementation would represent 2.62% of the total public health expenditure and 11.78% of the government's own health expenditure (Table 15).

**Table 15:** iCCM impact on Mali's health expenditure

Public Health expenditure	Total 2011 (\$)	Government	Donors
		100.0%	42.7%
	291 881 567	124 552 088	167 329 479

Scenario 1 : Government does NOT pay subsidies	1A Current	1B Scale-Up
Number ASCs	1 847	8 320
Cost program to Government iCCM+	1 305 370	5 880 417
Share Public Expenditure	0.45%	2.01%
Share Government own Expenditure	1.05%	4.72%

Scenario 2 : Government pays ASC subsidies	2A Current	2B Scale-Up
Number ASCs	1 847	8 320
Net Cost program to Government iCCM+	3 257 341	14 673 635
Share Public Expenditure	1.12%	5.03%
Share Government own Expenditure	2.62%	11.78%

In the context of the current iCCM+ implementation where subsidies are paid by ASACOs, there were many repeated concerns that ASACOs, in particular in the poorer and less dense areas, will not be able to maintain their payments to ASCs. This will particularly be the case if iCCM+ implementation is to be extended to the North of the country, a wish expressed clearly by the government. If the government pays the ASC subsidies and receives payment from the patients, this would amount for the current iCCM+ implementation to a sizeable 2.62% of the government's own health expenditure for 22% of the target children. Government health expenditure per capita decreased from \$10.7 in 2007 to \$8.7 in 2011. With the increased demands on the budget to address security issues in the country, it is unlikely that government budget for health will be able to increase significantly. As such, contribution of donors is required to ensure maintenance and development of iCCM, which has demonstrated very quickly that it indeed responds to a real need.

While the current iCCM implementation is not cheap, the current cost per treatment could decrease by 20% with increased utilisation. On the other hand, the absence of iCCM would represent a mostly insurmountable cost to patients, with visits at CSCOMs costing patients a minimum of \$1, as opposed to \$0.20 per ASC visit. As a consequence many would not attend, translating into increased mortality. For those who would go to the CSCOMs, more serious conditions due to delayed attendance would likely result. This in turn would increase the number of hospitalizations at higher cost for both government and patients. Thus, cost at community level must not be seen in isolation from costs/savings at higher levels of the health system.

This costing covers the training of ASCs and their full subsidy. This evaluation has shown that managing MDPs for children under five leaves ASCs with a significant amount of time to manage other conditions, and attend to older children. With an extension of ASCs' scope of intervention, much

asked for by communities, the additional cost of these new treatments will be significantly smaller and would contribute to an additional health impact.

**What is the likelihood that results/benefits continue after DFATD/UNICEF's involvement ends? Are committed financial and human resources sufficient to maintain benefits and results?**

If the government does not pay for ASC subsidies, the current iCCM+ implementation covering 22% of children under five would amount to 1% of the government's own expenditure on health in 2011; a share which could be manageable. However, the increased security demands on the national budget may threaten the maintenance of iCCM+ implementation. Scaling up to cover the whole country would require an increase in the number of ASCs from the current 1,847 to 8,320. This could not be possible without donors' contribution as it would represent 4.7% of the government's own health expenditure, but 2% of public health expenditure.

There have been many repeated concerns that ASACOs, in particular in the poorer and less dense areas, will not be able to maintain their payments to ASCs, thereby threatening the existence of iCCM implementation, even with the current coverage.

If the government pays the ASC subsidies and receives payment from the patients, the cost of the current iCCM+ would represent a sizeable 2.6% of the government's own health expenditure, but a feasible 1.1% of public health expenditure. Extended to the whole country, it would amount to 12% of the government's own health expenditure, but 5% of public health expenditure.

The New Funding Model of the Global Fund could ensure the maintenance of the current coverage as well as the expansion to new areas, building on the gains resulting from the Catalytic Initiative funding and ensuring that the impact of the IHSS programme remains after the end of the programme.

The current number of ASCs is sufficient for the current geographical coverage and could cope with an increase number of treatments for these conditions and other conditions in these areas. However, scale-up to new areas will require additional ASCs.

In order to assess whether the costs of the community programme are justifiable, these must be put in the perspective of the health impact and savings at higher levels of care through avoided visits at the CSCOMs and avoided hospitalizations.

With iCCM implementation being so recent and as described in the Methodology section, it was not possible to quantify the cost per life saved.

The study has shown that managing MDPs for children under five leaves ASCs with a significant amount of time to manage other conditions, and attend to older children. With an extension of ASCs' scope of intervention, much asked for by communities, the additional cost of these new treatments will be significantly smaller and would contribute to an additional health impact.

#### 5.4.2 Qualitative findings related to sustainability

Interviews with in country implementing partners and the Ministry of Health indicated that the political crisis in the country both disrupted timely implementation of the IHSS programme as operationalized through SEC as well as plans for the Ministry of Health to absorb financial responsibility for its continuity. The political crisis was estimated to have reduced the health budget support by as much as 40% over that period, as well as disrupting specific programme funding by partners, according to UNICEF reports.<sup>36</sup> UNICEF and USAID developed the case for IHSS programme scale up and presented it to the health implementing partners in 2012 in order to gain additional interest in, and financial commitment to, the programme. Further advocacy initiated by UNICEF and Save the Children took place in November 2012, where members of the National Assembly's parliamentary health committee were briefed, in an aim to advocate for an approved budget line for the programme. Other advocacy activities included ongoing discussions with the FENASCOM and Association of Malian Mayors (AMM) to try to develop a plan for them to take over the running costs of the programme through locally generated funds and budget allocations from the government. In country interviews highlighted current concerns with the capacity of the ASACOs to sustain the programme independently of external support, and it is unclear whether the municipalities would be ready by 2014 to sustain the programme without sufficient allocations by government.

*"The ASACO have technical capacity problems; they can't read or write." How does the limited technical capacity impact the programme? The ASC is paid by the ASACO-if they don't have the capacity to analyse the situation to see what is happening, then it can negatively impact the programme. The planning capacity of the ASACO is limited; they are supposed to help the DTC plan their supervision visits and for microplanning. If the ASACO were stronger-they could negotiate with municipalities to get money for the programme." (Implementing Partner)*

UNICEF has attempted to invest in the areas of demand generation for the programme by working with the Ministries of Communication and Health towards the end of 2012 and in mid-2013. Through this effort journalists were supported to visit ASC sites and government authorities at all levels to compile best practices in the field, gain insights into community perceptions of the programme, and sensitize communities further about the programme.

*"It should not be a one way system for the state to start programmes; rather have communities demand the services. And UNICEF helps make this demand obvious and facilitate the voice of the community." (MOH official)*

As highlighted by the LQAS, financial barriers still represent a significant impediment to accessing care. According to the latest MICS and DHS surveys, up to 49% of household income goes towards health care payments. While the free malaria programme announced by the government aimed to alleviate the financial burden on families, interviewed members of the Ministry of Health felt that the government announced it without sufficient planning as to how it would be sustained. This was clearly demonstrated with the disruptions of services once Global Fund grants were halted in 2010, essentially supporting the procurement of the large majority of malarial diagnostics and drugs in Mali. Given now that Global Fund finances will go towards the salaries of approximately half of the country's ASCs for the next three years, financial transparency will have to be ensured to avoid any further disruptions from the Global Fund.

*“Mali has a policy of decentralisation. The process is administrative only. How do you ensure that financial flow and decisions are also decentralised? The community does not have money to implement a development plan. This is a big fight at the moment because they feel that they are given the responsibility for sectors (health, education, etc.) without the financial backing. There is [a] need at the national level [for] appropriate funds for the programme in order to expand the programme.” (MOH official)*

Further discussions indicated that the Ministry is beginning to look at ways to integrate the SEC programme further into national systems for M&E and supervision to reduce unnecessary costs.

*“We have to look at a more integrated approach rather than focus on specific line items for the programme such as supervision as stipulated by plans.” (MOH official)*

Interviews with ASACO members indicated that they began planning for the long-term sustainability of the programme by putting aside extra finances generated through the sale of drugs and consultation fees. This demonstrates ownership at the community level of the programme, and this was iterated through several in-country interviews.

*“After buying drugs, if there is money left over, we save it. We were told one day that the project will finish. We will continue the programme through these funds that are being saved.” (ASACO member)*

### **Infrastructural challenges**

Infrastructural challenges cited by implementing partners and health facility staff in Mali comprise a range of issues including limited access to transportation, especially at the health centre level. Often the same motorcycles in facilities were being used for multiple functions, and as a result consistent monthly supervision suffered. Transportation availability was cited repeatedly as a challenge to ensuring consistent monthly supervision visits. This in turn presents an additional supply challenge, as many ASCs depend on their supervision visits to restock their drug supply. ASCs are responsible not only for their own villages but also the surrounding satellite villages within a 3 km radius. This, as a result, requires consistent availability of functioning bicycles for the ASCs to reduce travel time. The IHSS programme supported newly trained ASCs by procuring bicycles. However, no clear policy is outlined on how frequently they will replenished. Given the infancy of community activities, non-functional bicycles were not noted as a concern. Furthermore, when supervisors are not able to come to the villages to supply ASCs with drugs, the burden is placed on the ASC to travel to the health centre to collect medication. However, because ASCs provide care out of stable structures in their communities, the burden of travelling from door to door for health consultations is alleviated.

Field interviews with community members revealed that they felt a large burden was placed on them to ensure proper functioning of the programme in their villages once an ASC is placed there, including the building of ASC housing and consultation rooms, which did not always happen. Some interviews with ASCs noted that they would like batteries to be able to have light in their houses at night for consultations.

## 6. Conclusions

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### 6.1 Relevance

#### **The health systems strengthening approach of the IHSS programme was well aligned with the health policies of the Malian government**

One of the key factors that explains the gains that have been made through the IHSS programme in Mali is the investment made in strengthening the health system through capacity building of both front line ASCs, relais communautaire and traditional birth attendants at the community level as well as facility-based staff. Prior to the programme, Mali implemented a successive series of health and social development plans aiming to increase its population's geographical access to health facilities, which pre-dated IHSS and contributed a strong foundation upon which iCCM could be implemented. The IHSS programme supported advocacy activities that promoted the establishment of a new cadre of community health workers and the revitalization of its existing relais volunteer cadre, through which iCCM could be implemented. IHSS investment in community based care resulted an extension of the country's health services to further address health care access to the remaining 40% of the country's population. The IHSS programme drew strongly on elements of both a top down approach, including investment at the national level in the creation of policy and plans, tools for implementation, and monitoring and supervisory structures, while ensuring that communities were engaged and sensitised through participatory meetings.

Qualitative interviews highlight the strength of community structures including the Community Health Associations, responsible for the management of the health centres, including the recruitment and payment of personnel, as well as oversight of the ASCs in their villages. These community structures enabled community driven ownership of the programme and ensured that a system of accountability was in place. Despite the limited current capacity of these associations to sustain the programme in the absence of external support, interviews revealed a strong sense of responsibility towards it and early signs of initiatives to ensure ongoing support.

The Malian MOH has demonstrated commitment to, and ownership of, iCCM as evidenced by its integration into the national health system through the incorporation of a community health plan and strategy (2011 Health Plan) and alignment of the programme to Mali's Poverty Reduction Strategic Plan as well as its 10-year health sector plans.

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

A factor that was repeatedly cited as being influential to the success of the IHSS programme is the strong collaborative relationship between the MOH and international agencies and partners in Mali.

Strong collaboration between the Ministry of Health and its development partners, including UNICEF, through IHSS, resulted in the successful formation of the SEC programme in the country and ensured its alignment to national priorities and goals. Development partners committed to effective partnership in Mali to ensure that their physical presence in implementation districts was divided up efficiently and that resources were allocated appropriately thereafter. UNICEF, through IHSS, took on the support of drug procurement, with the exception of malaria drugs and diagnostics, while all the partners invested in capacity building and supervision activities in different districts. In general development partners followed the lead of the Ministry of Health in agenda setting and coordination



and participated effectively in the development process of the programme to ensure systematic roll out. However, interviews revealed some divergence in the areas of supervision and health subsidies not in accordance to the pay for service characteristic of Mali's health system. A failure to coordinate these elements amongst developmental partners will continue to result in implementation barriers and threats to the sustainability of the programme. Furthermore, while the decentralised health system of Mali saw many local health structures take responsibility for the management of health systems, many felt that this required concurrent financial allocations from the central level to these decentralised structures for effective realisation of their roles.

### **Women's participation and gender equality**

Achieving a gender balance at the ASC level remains a problem in Mali as a result of the absence of a deliberate prioritisation through policy of female participation in community-based service delivery. The pre-requisite requirement for ASCs to have some health background, resulted in higher rates of recruited females. However, the disproportionate attrition of female ASCs resulted in the gender balance of ASCs to move in favour of men. The IHSS-supported SEC programme did, however, provide a stimulus for the mobilisation of women's groups in the community who participate in income generating activities as a means of gaining economic independence and increasing their financial access to the newly generated health services of the programme. This is a positive movement towards enabling women by providing them with economic opportunities and decision-making power. This was complimented at the national level through UNICEF's engagement in policy dialogues with the Ministries of Health as well as Ministry of Women to promote increased participation of women in the health sector and ensure that the services cater to their needs. Such opportunities for engagement will need to be taken advantage of and result in clear policies and plans on how these ambitions will be realised.

As women in Mali continue to be disproportionately affected by low literacy rates and limited economic opportunities against a backdrop of socio-cultural barriers that limit their access to basic services including health and education, a more active role will have to be taken by the government to ensure that progressive Gender Action Plans that have been established in Mali move beyond policy discourse to actualising practical differences in the lives of women in the country.

## **6.2 Effectiveness**

### **6.2.1 Assessment of the contribution of the IHSS to health system strengthening**

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

IHSS investment in building on the gains achieved through the ACSD programme by further investing in the relais cadre and seeing the inclusion of traditional birth attendants ensured that health promotion activities as well as the provision of commodities, including ORS and bednets, were sustained. After the adoption of a comprehensive community health policy in the country, the districts where iCCM was implemented by ASCs had communities who not only valued their presence but directly attributed the reduction in child mortality to their services. Furthermore, the relais cadre that existed previously felt increasingly supported to carry out its activities. Communities were able to appreciate the importance of, and the difference made by, having ASCs who were available to treat their children, saving them time and money. While financial challenges linked to health care utilisation

still remain in Mali, the SEC programme aims to alleviate some of this burden through closer proximity to the community, and as a result, reduced travel times and lower consultation fees as agreed upon by the village members. Furthermore, interviews at the village level highlighted a strong sense of communal support to ensure that people are not turned away from the ASCs if they can't afford the consultation or drug fees.

By building homes and fixed structures for health consultations for the ASCs in the villages, community members were able to ensure that they could access care from the ASCs at any time. The additional responsibility of home visits for health promotion and prevention activities is placed on the relais cadre, who work closely with the ASCs. This two tiered community health model allows for an effective distribution of roles to meet the communities' promotion and prevention and curative health needs.

### ***IHSS strengthened the health system through training of ASCs and facility-based staff***

UNICEF through the IHSS has made significant effort in the area of ASC training, and invested in the training of the ASCs, and those of thousands of relais, prior to that. Due to the high level of competency of the ASCs, as many had already been working as health care providers prior to the introduction of the IHSS programme, the training period of two weeks was sufficient to capacitate them in providing effective care to children under five. Many reported having received refresher training as well as new training in specific topics, and this will have to be sustained to ensure ongoing capacitation of ASCs. There are discussions underway to up-skill the ASCs to become nurses, but this will need to be sufficiently questioned to ensure that there is a need for this, given the seemingly high quality of health services currently being provided by the ASCs and the country's potential to sustain this, as it would likely entail significantly higher health care worker salaries.

While the IHSS programme did invest in training close to 200 health care workers in IMCI, training appears to be rerouted to the community level since the roll out of the SEC programme. In light of the fact that IMCI training is not incorporated into the national training curriculum, a gap in the quality of service provision is beginning to develop at the health facility level. This is especially problematic as the SEC programme in the villages serves as the first service delivery access point, and relies on the health centre level for practical training, supervision, and referrals for complicated cases. Furthermore, a large proportion of the population still access care at the CSCOM level first, and each layer of the health system will need to be strengthened to ensure increased and sustained impacts on childhood and maternal mortality.

### ***IHSS strengthened the health system through strengthening supervision of ASCs***

Through IHSS support, UNICEF was able to work with the government and other development partners to finalise and field-test the supervisory tools for monitoring ASC service delivery. The IHSS programme further invested in the training of health facility staff in iCCM to be able to carry out their activities as well as provide them with transportation for field visits. Through IHSS support, supervisory missions by sub-district and higher levels have also been carried out.

Despite these investments, supervision was repeatedly highlighted as a shortfall in the implementation of the programme, with approximately 60% of the ASCs having received a supervisory visit in the last 3 months, and an even lower frequency of observed case management. Challenges from field observations resulting in insufficient supervision visits include a lack of transport and the fact that only the clinical director at the health centre is authorised to carry out this activity. Models around integrated supervision activities that would include the SEC programme, amongst other health

services, is being considered and would serve to efficiently utilise the system's resources including health personnel time and budget. Considering alternative health personnel to conduct supervisory visits would also serve to alleviate the burden on the DTC.

Another issue linked to supervision that emerged from field visits includes the different supervision models being implemented by implementing partners. While policy places supervision responsibilities on health staff employed at the CSCOMs some implementing partners have placed their own personnel to carry out this role. While this has resulted in much higher frequencies of supervision in comparison to other districts, considerations of how this will be sustained in the absence of donor support is essential.

***IHSS enabled the procurement, supply and distribution of medicines and commodities, with increased support during a financial and political crisis, but more systems strengthening is required***

UNICEF was responsible for the initial procurement of ASC kits and drugs, with the exception of malaria diagnostics and treatment. Transparency in the financial management of the Global Fund Round 10 grant will have to be ensured so as to avoid a repeat of the 2010 Global Fund crisis and resulting disruptions in drug supply. Furthermore, government will have to begin to consider how it will sustain its free malaria policy in the absence of Global Fund support.

Challenges around poor forecasting of drug needs were cited as one of the major reasons for drug stock-outs. However, the cost recovery mechanism put in place to ensure that drugs are replenished through the sale of medication and consultation fees ensures limited dependence on donor funding to sustain the programme.

Another issue around consistent supply to the village level stems from the country's distribution system currently in place. Stock replenishment to the community level is dependent on supervision visits from the health centre, and in light of the challenges cited with supervision, highly vulnerable to consistent drug flow.

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

To address health care access over the last decade, Mali scaled up the country's health facility layer, with the numbers of available CSCOMS increasing from 345 in 1998 to 993 by 2009, corresponding to an increase from 29% to 57% of the population living within 5 kms of a health centre, and according to the country's 2011 Health and Social Development Plan<sup>1</sup>, the number of CSCOMS increased to 1235 by 2011. <sup>24</sup>The SEC programme, through IHSS programme support, was able to further extend health care access. The latest UNICEF 2013 data<sup>37</sup> revealed coverage of the programme in over 5,000 villages in 62% of all districts in the 5 regions (Kayes, Koulikoro, Sikasso, Ségou, and Mopti) implementing the programme. However, overall utilisation of health services remains low in the country, both at the village and CSCOM level, with financial barriers repeatedly cited as the largest impediment to health care access.

There were large improvements in both ORS coverage and the proportion of children under five sleeping under an ITN during the IHSS programme period, as a result of significant investment in the procurement of both commodities and the training of staff (relais and ASCs) to distribute them. Furthermore, increases in coverage were noted with regard to one dose of Fansidar to women during pregnancy and rates of early breastfeeding. The IHSS programme supported the implementation of outreach campaigns which would have plausibly contributed to sustained immunisation rates. Care

seeking for suspected pneumonia and fever remained unchanged both in the pre-IHSS and IHSS programme period, which possibly alludes to the fact that financial barriers to health care access remains a significant problem in the country. It is important to note that the iCCM component of the IHSS programme is still in its infancy, and it attempts to address this challenge through reduced consultation fees and costs related to travel, and therefore many need to be assessed at a later stage to see impact. Maternal indicators, including ANC care were maintained during the IHSS programme period, while skilled birth attendance doubled by 2012, likely due to IHSS programme investment in the relais and traditional birth attendants.

Mali is extremely food insecure and has been experiencing recurrent food shortages in the past decade. This is largely reflected in significant fluctuations in child nutrition indicators including stunting and wasting, despite some interventions by development partners including the provision of ready to use food supplements that may have offset some of the impact of the droughts. Food production, less prone to climate fluctuations, needs to be explored in Mali to avoid reactionary emergency relief interventions that cannot avoid the long-term impacts of food deprivation in children, as the nutritional status of children plays a fundamental role in their vulnerability to other infections and mortality outcomes.

### **Impact on equity**

As expected, the effect of the financial and political crisis in Mali had a disproportional impact on coverage drops for select child health interventions in the poorest wealth quintile. As a result, the programme was not able to achieve positive impacts on equity with the exception of a few indicators including ITNs and ORS. Equity remained stable with regard to early breastfeeding, exclusive breastfeeding, and care seeking for suspected pneumonia.

## **6.3 Impact**

### **6.3.1 Assessment of the contribution of the IHSS programme to mortality and lives saved**

Mali is on track for Millennium Development Goal 4 for child survival, with an U5MR of 128 per 1000 live births in 2012 and a target of 84 per 1000 live births by 2015. The average rate of reduction for Mali is 3.1% per year since 1990, which is similar to the average for sub-Saharan Africa. However, between 2010 and 2012, Mali experienced a significant drop in under-five mortality, from 178 per 1000 live births to where it currently stands. This is commendable in light of the significant turmoil during that two-year period in the country. Approximately 32% of under-five deaths occur in the first month of live (the neonatal period), up from 23% in 1990.

The main causes of under-five deaths after the neonatal period in Mali were malaria (13%), diarrhoea (11%), and pneumonia (13%). In the pre-IHSS period, increases in measles vaccination coverage and vitamin A for measles treatment were responsible for 30% and 24% of deaths averted, respectively. Vitamin A supplementation accounted for an estimated 12% of lives saved. The same coverage is assumed for vitamin A supplementation as use of vitamin A for measles treatment, which is a limitation with the data. An increase in ORS coverage was responsible for 6% of lives saved. Other than ORS and vitamin A for treatment of measles, there was very little change in coverage, and therefore impact, of curative interventions in the pre-IHSS period.

The average rate of mortality reduction of 2.6% per year in the IHSS programme implementation phase is higher than the pre-IHSS period annual rate of reduction of 1.5%. The modelled results indicate that approximately 41,900 lives of children under five were saved between 2007 and 2012. Approximately 90% (37,900) of these lives saved were due to increases in coverage of interventions also supported by the IHSS programme. ITN use was responsible for an estimated 15,300 lives saved, or 36% of the total in this period, consistent with the decline in malaria mortality (23%). The newly introduced pneumococcal vaccine accounted for approximately 20% (8,300) of lives saved. Increases in ORS coverage accounted for 22% (9,000) of lives saved. Decreases in vitamin A supplementation and decreases in rates of care seeking for pneumonia resulted in additional deaths in 2012 compared to 2007.

In light of the significant financial, political, and food challenges plaguing the period, the maintenance of, and even some increases in, the coverage of maternal and child health interventions with significant impacts on mortality are commendable. However, coverage in a large number of interventions did suffer during this period, as would be expected. It is important to note that despite the crisis and setbacks in health access coverage, Mali was able to achieve significant mortality declines between 2010 and 2012, indicating that a combination of both some IHSS programme related interventions and other occurrences in the country, either outside of the health system, or beyond the scope of the IHSS programme interventions, contributed to significant mortality declines.

## **6.4 Sustainability**

### **6.4.1 Programme Costs**

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

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

The net cost per malaria, diarrhea, and pneumonia treatment amounts to \$12.4, \$10.5, and \$9.5, with a weighted average across treatments of \$11.4. The share of ASC fixed costs (consultation cost) represents an average of 85% of treatment costs. Cost of consultation would decrease with higher utilisation by ASC. Such an increase in utilisation would be manageable since ASCs currently spend an average of 3 hours a week on iCCM implementation (consultations and meeting time combined).

An increase of 30% in visits due to increased demand and increased population in the areas covered would translate to 4 hours a week. The current number of ASCs could respond to this increase. With 30% more treatments per ASC, the net cost per treatment (consultation + drugs) decreases by 20%, and the cost of the program covering all ASCs increases by 4% (higher utilisation of drugs), moving from the current \$2.8 million to \$2.9 million. Increased utilisation has a small impact on program costs whilst it is likely to improve health status. An additional 15% must be added to the net cost to reflect strengthening of the health system to enable iCCM. The net program costs of the iCCM+ would stand at \$3.2 million. With 30% more treatments per ASC, the cost would be \$3.4 million.

In 2011, 42.7% of public health expenditure was covered by the government's own health expenditure and 57.3% by donors. With the current system where the government does not pay for ASC subsidies, the current programme covering 22% of children under five would amount to 1% of the government's own expenditure on health in 2011. However, trends in the health budget, where government health expenditure per capita decreased from \$10.7 in 2007 to \$8.7 in 2011, combined with the increased security demands on the national budget, may threaten the maintenance of the program. Scaling up the programme to cover the whole country would not be possible without donors' contribution, as it would represent 4.7% of the government's own health expenditure, but 2% of public health expenditure.

There have been many repeated concerns that ASACOs, in particular in the poorer and less dense areas, will not be able to maintain their payments to ASCs, thereby threatening the very existence of the programme, even with the current coverage. If the government pays the ASC subsidies and receives payment from the patients, the current programme would represent a sizeable 2.6% of the government's own health expenditure, but a feasible 1.1% of public health expenditure. Extended to the whole country, the cost of the programme would amount to 12% of the government's own health expenditure, but 5% of public health expenditure.

The New Funding Model of the Global Fund could ensure not only the maintenance of the current coverage but also an expansion to new areas, ensuring that the impact made as a result of the Catalytic Initiative funding is felt beyond the lifetime of the IHSS programme.

The current number of ASCs is sufficient for the current geographical coverage and could cope with an increase in the number of treatments for these conditions and other conditions in these areas. However, scale-up to cover the country would require an increase in the number of ASCs from the current 1,847 to 8,320.

Given its short life (11 months), iCCM has a high level of utilisation, showing clearly that it responds to a need. In order to assess whether the costs of this community strategy are justifiable, these must be put in the perspective of health impact, and savings at higher levels of care through avoided visits at CSCOMs or admissions in hospitals.

With iCCM being so recent, it is not appropriate to quantify the cost per life saved as this would be misleading. The study has shown that managing MDPs for children under five leaves ASCs with a significant amount of time to manage other conditions, and attend to older children. With an extension of ASCs' scope of intervention, much asked for by communities, the additional cost of these new treatments will be significantly smaller and would contribute to an additional health impact.

#### **6.4.2 Likelihood of sustainability post-IHSS**

Qualitative findings show that there are still concerns with the future sustainability of the iCCM strategy, although discussions are underway to develop long-term solutions. The political crisis in the country both disrupted timely implementation as well as plans for the Ministry of Health to absorb financial responsibility for its continuity, with an estimated shrinking of the health budget by development partners by as much as 40% over that period. Advocacy activities are underway, however, and include discussions with the FENASCOM and Association of Malian Mayors (AMM) to try to develop a plan for them to take over the running costs through locally generated funds and budget allocations from the government. However, concerns with the capacity of the ASACOs to

sustain iCCM implementation independently of external support remain, and it is unclear whether the municipalities would be ready in 2014 to sustain the costs without sufficient allocations by the government. The government's ability to sustain its initiative to provide malaria diagnostics and drugs for free is an additional concern in the absence of external funding.

## **7. Strengths and limitations of the evaluation**

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### **7.1 Strengths and limitations of the quantitative component**

A statistical trend analysis was performed on all available data over two time periods corresponding to pre-IHSS (2001- 2006), and Phase 1 (2006- 2012) of the programme. Where necessary, indicator definitions were adjusted to ensure valid comparisons over time and between surveys. Furthermore, due to the political crisis of 2012, the last conducted DHS did not capture data from the three Northern regions, and as a result, earlier surveys had to be restricted to only include analysis of the five Southern Regions. Furthermore there was no raw data available for the DHS 2012 survey. Therefore, those data points do not have confidence intervals.

The coverage trend analysis is limited by the lack of endline data as the last available survey, the 2012 DHS captures less a year of SEC implementation. A further limitation is the lack of comparison areas or counterfactual. Rural coverage in the five Southern Regions was included alongside coverage of all populations in these regions in all figures; however, given that the majority of the country is rural, a true counterfactual with the absence of any intervention was not available. Given the fact that the focus of the programme was in the country's rural areas, the analysis did provide a reflection of the geographical coverage that was achieved through the set of interventions.

DHS and MICS surveys may dilute the effect of community-based mechanisms when data is aggregated to regional or national levels since exposure to ASCs is localised. Where coverage of a district or region with ASCs is low, care-seeking at that level will be consequently low; therefore, the effect of ASCs is best measured within communities that have ASCs compared with communities that don't which was not possible in this evaluation due to the scale of the programme, or by comparing communities that should have ASCs (according to policy) and do have them compared to communities that should have ASCs but don't have them.

### **7.2 Limitations of the LiST analysis**

Household survey indicator definitions do not perfectly match LiST indicators in all cases and closest available proxies were used where needed. The lack of raw data from the most recent DHS resulted in a lack of comparable, regional data to use in the model for 2012. This is a particular limitation for breastfeeding which is a high impact intervention for child survival.

The household surveys used as LiST inputs do not capture data on a number of high impact interventions included in LiST (e.g. resuscitation after birth, Kangaroo Mother Care, full supportive care for infection, therapeutic feeding for severe wasting, vitamin A for measles treatment), and coverage 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.

Population data in IHSS programme regions was extracted from the 2009 census and applied to national population distribution rates. Other inputs where national level data were used as proxy for regional data include causes of newborn and child deaths, nutritional deficiencies, economic status, and indicators in the AIDS impact module (AIM) which calculates lives saved from prevention of mother-to-child transmission of HIV.

Due to a lack of available endline data, the lives saved analysis only captures the time period from 2007 through 2012, missing the most recent year of implementation, just as iCCM services were



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

The LiST model did not accurately predict measured mortality change within a confidence range for either phase under consideration, resulting in an inability to directly link measured mortality reduction with coverage change. For this reason and those mentioned above, the results of the LiST analysis should be treated with caution. The number and proportion of total 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.

While 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, efficiency in terms of a single cost per life saved figure is not provided. The methodology for assessing lives saved impact using LiST is based on modelled estimates, not measured outcomes linked to specific interventions delivered at different levels of the health system. Additionally, the lives saved results reflect inputs across the health system resulting in coverage change which include, but are not limited to, IHSS programme inputs.

### **7.3 Strengths and limitations of the costing exercise**

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

- The normative costing approach used in this evaluation has the benefit of reflecting costs as per programme design, and to make it comparable to other iCCM costing exercises (current multi-country evaluation and MSH study). 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 programme effectiveness. As a consequence it also does not reflect actual use of donor funds of which a significant proportion was spent on initial design, set-up and systems strengthening.
- The benefit of the additional costs approach is that it recognises existing structures and systems and avoids double-counting (e.g. ASCs' or supervisors' salaries already covered in existing government budgets). Knowledge of the added cost of iCCM can inform decision-making and planning about the cost of rolling-out the iCCM activities to other areas where a similar ASC infrastructure exists. This additional costing model also allows building scenarios for increasing cost-efficiency based on changes in service utilisation. 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 three key diseases in isolation is limited as in practice health services are delivered in an integrated way at health posts and between health posts and health centres.

The validity of the costing exercise is dependent on the availability of accurate cost data. This was more specifically an issue for training costs which were extracted from budgets rather than actual expenditure.

#### **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 Mali are experienced in health systems research. The key strength of this evaluation was that this group of researchers are not in the direct employ of UNICEF and, therefore, are able to objectively assess the impact, outcomes and experiences of the implementation of the IHSS programme and to see and experience for themselves how the IHSS programme was implemented. The field visits also helped the team to understand the cultural and political context in which the intervention took place, something that could not have been achieved by merely conducting a desk-based evaluation.

While in Mali the team spoke to a wide range of stakeholders. These included participants at national, regional, district, facility and village level.

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

Selection of participants for interviews may have been biased towards those more favourable towards the programme, partly because the evaluation team was dependent on the UNICEF office to assist with selecting appropriate people to interview. The team was able though to gather a wide range of perspectives during the visit and via document reviews. Although the team was able to explain to high-level participants that it was separate and not employed by UNICEF, it may have been harder for community level participants to make the distinction. This 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. This meant that the team was reliant on the translators' interpretation of both the questions and the participants' responses.

## 8. Lessons learned and Recommendations

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### 8.1 Lessons learned

#### Relevance

- iCCM in Mali was implemented within a well organised health system with an established decentralised structure facilitating linkages between the community and higher levels of care. The MOH has played a leadership and coordinating role when engaging implementing partners who support the health system, thereby, ensuring that the IHSS programme is in line with national priorities.
- While there have been successes in recruiting large proportions of women for the implementation of iCCM, retention is a challenge due to broader socio-cultural norms that limit female decision making powers. Further efforts to address this will be required for sustainable and measured impacts on gender equality

#### Effectiveness

- The presence of relais compliments the work of the ASCs through their promotional and preventive activities and by encouraging care-seeking for iCCM conditions. Furthermore, the presence of ASCs has enabled a supportive environment for the relais and a sense of increased recognition of their work by communities.
- The evaluation has highlighted that approximately 63% of ASCs received a quarterly supervision, with just over 50% receiving supervision that included observation of case management.
- The evaluation found that just under 30% of ASCs reported stock-outs antimalarials with closer to 40% reporting stock outs of RDTs. Due to the country's free malaria policy, Mali is heavily dependent on the Global Fund for the replenishment of stock, as evidenced by significant stock-outs during the 2010 financial crisis. Stock-outs of other essential commodities, including ORS and Amoxicillin, were less problematic as the funds from the sale of medication are utilised to replenish stock supply. Supplies for iCCM are not channeled through the national system for distribution, and this represents a gap in health system strengthening by directly supplying the districts with commodities.
- The evaluation revealed that overall health care utilisation was low in Mali. A very low proportion of IHSS-procured drugs were used at the community level, corresponding to 7% of zinc tablets, 4% of antimalarials, 3% of RDTs, 1% of ORS sachets, and 6% of antibiotics. A health system based on user-fees, coupled with political instability, and the infancy of iCCM implementation are some of the reasons linked to low health care utilisation at the community level. Despite this, ASCs were found to have treated 18% of all under five cases treated in the public sector.
- Significant increases in coverage were noted for ORS and ITNs, while smaller coverage increases were achieved for Fansidar for prevention of malaria in pregnant women (IPTp) and early breastfeeding rates.

## Impact

- The modeled annual rate of reduction was faster during the IHSS programme period than the pre-IHSS period.
- At the time of the evaluation, iCCM had been implemented in 62% of all districts in the five regions (Kayes, Koulikoro, Sikasso, Ségou, and Mopti) and had been at scale for only 11 months. Thus, the number of lives saved over such a short period is likely to be an underestimate of its potential after being implemented for longer.

## Sustainability

- If ASC utilisation increased by 30%, the net cost per treatment would decrease by 20% while the cost of the programme would only increase by 4%. This shows that increased utilisation would only marginally increase programme costs but have a significant impact on health status through increased access to services for a large proportion of the population that remains underserved.
- The ASACO are an effective model for health system management and accountability at the community level, but their technical and financial capacity will have to be strengthened to ensure that they are effective in their roles and have the potential to support the generation of local funds to sustain the programme.

## 8.2 Recommendations

### Relevance

- While the MOH has been successful in ensuring coordination of funding and programme implementation among partners, issues of various models of supervision linked to iCCM implementation and health care subsidies by partners, despite an overall health system that implements user-fees, represent areas in which further coordination and management of partners is required.

### Effectiveness

- Increase investment in IMCI at the CSCOM level is necessary to ensure that a strong continuum of care starting at the community level up exists, and to ensure that the CSCOMS are fully equipped to handle referrals and complicated cases. Furthermore, as supervisory roles are the responsibility of the CSCOMS, IMCI training is necessary to ensure high level of competency of supervisors.
- Supervision for ASCs should be integrated along with other outreach activities to reduce the burden on the health system, which is currently understaffed. Furthermore, extending supervisory roles to other health cadres, including the nurses at the CSCOM level, rather than leaving the responsibility solely on the head doctor in charge, ought to be considered.
- It is important to ensure that once utilisation increases at the ASC level, that there is an effective system to ensure that their stock is replenished and not held and used at the health facility. However, in the interim, these large volumes of drugs should be used at the health facility until demand is sufficiently generated at community level to ensure that they do not go to waste.

- Mali has not yet achieved elimination of maternal and neonatal tetanus,<sup>9</sup> and greater efforts need to be made to achieve this important milestone.
- The lack of further progress in coverage of breastfeeding practices across the IHSS programme period highlights a need for further investment and emphasis to ensure that trained relais and traditional birth attendants are effective at promoting these key child survival practices.
- Though some gains were made from 2001 in antenatal attendance, these rates are still very low, and efforts to increase access to antenatal care are imperative.
- While user fees and drug sales have ensured replenishment of drug supply and health care worker salaries, they represent a major barrier to health care utilisation and result in ongoing use of informal health care providers. The Government of Mali will need to assess its capacity to reduce user-fees for health care in an effort to promote increased utilisation. A further assessment of the Ministry of Health's capacity to sustain its free malaria care in the absence of donor funding will be required.

### **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 skilled birth attendants, and that the modelled estimates reflect changes in coverage at all levels of the health system, beyond the community level. It is recommended that future evaluations strive to collect data at other levels of the health system.
- The underlying reasons for decline in coverage in important preventive interventions such as vitamin A need to be further scrutinized.
- It is recommended that programmes are allowed sufficient time for roll out and full scale implementation to ensure that evaluations are able to fully capture their impact.

### **Sustainability**

- As currently 85% of net treatment costs reflect the share of ASC fixed costs, it may be desirable in areas where villages are not too distant to increase the catchment area per ASC, as this could decrease the number of ASCs required and increase utilisation per ASC, thereby decreasing the cost of the programme. This in turn would require that ASCs are given an allowance for cell phones and that bicycles are properly maintained.
- Recognising that care-seeking patterns take time to change significantly, a new sustainability study should be undertaken when the programme has reached higher maturity and possibly covers other conditions and older children. Patterns of utilisation at health centres and community level would have stabilized, and the additional costs of the program could then be better put in the perspective of other savings in the health system.
- With such stabilization, health impact could be quantified, and new costing should calculate the cost per life saved.

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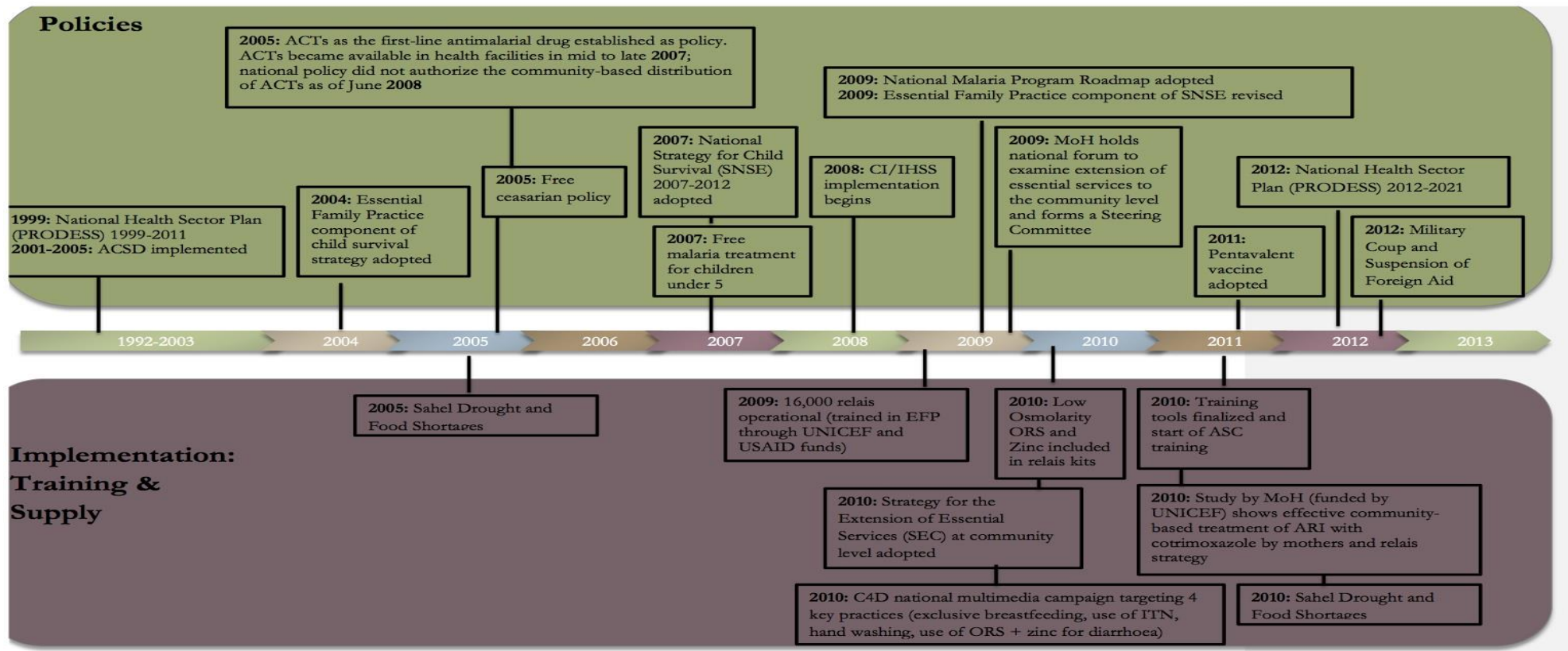
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## 10. Appendices

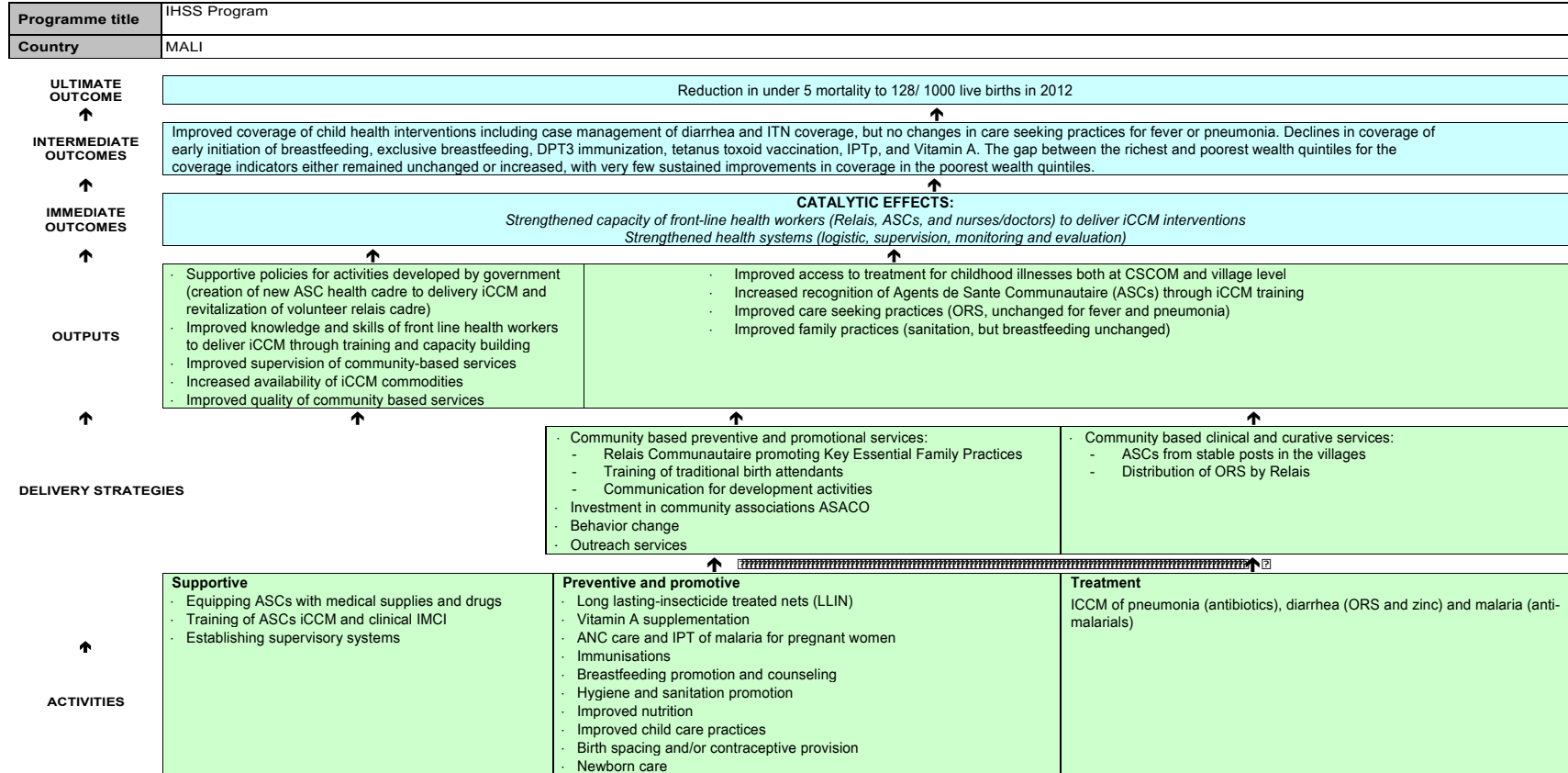
### Appendix A: Mali- Policy and implementation timeline





# Appendix B: Mali Country Logic Model

## Appendix B: Country logic model



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## Appendix C: Table of indicators included in the evaluation

Indicators collected for coverage and LiST analyses (IHSS programme indicators taken from the DFATD grant agreement)

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

		test and treated with 2.4 miu benzathin penicillin, if needed					
	PMTCT – prevention of mother to child transmission of HIV	Proportion of HIV+ pregnant women receiving prenatal prophylaxis – single dose Nevirapine, dual ARV, HAART	National country program data, UNAIDS/PEPFAR	X			
<b>Childbirth &amp; Immediate Newborn Care</b>	Facility based births	Proportion of infants delivered in a facility	Household surveys			X	
	Skilled birth attendance (1.3.2.21)	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			
<b>Breastfeeding</b>	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		
<b>Preventive care</b>	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 faecal 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		
<b>Vaccines</b>		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

\* Indicator definitions correspond to the objective numbers provided in brackets

Information source: Lives Saved Tool manual; DFATD/UNICEF Request for proposal for services indicators by objective

\*\*Included in the coverage trend analysis

## Appendix D: Detailed costing tables

### Additional costing tables

Table 16: Treatments and Visits iCCM 2012-13 year

Treatments ASCs per Year:	Number Program Treatments	MDP Treatments per Year /ASC	Share	% Visits not treated	Total Visits per ASC
Malaria	145 546		59%		
Diarrhea	50 089		20%		
Pneumonia	52 271		21%		
Total	247 906	134	100%	20%	161.06

Table 17: Drugs and Tests protocols

Treatment Protocol & cost	Medicine & Tests	Units/Treatment	Proportion cases	Unit Cost US\$	Cost per treatment	Cost at CSCOM
Malaria, incl RDT	Coartem 1*6	6	20%	0.01200	0.014	0.022
	coartem 2*6	12	80%	0.00400	0.038	0.058
	Paracetamol 500 mg.	3	20%	0.00467	0.003	0.004
	Paracetamol 500 mg.	6	80%	0.00467	0.022	0.034
	RDT	1	200%	0.85	1.700	2.550
	Average Malaria				1.778	2.667
Diarrhea	ORS sachet	4	100%	0.09	0.360	0.540
	Zinc	10	100%	0.031	0.310	0.465
	Average Diarrhea				0.670	1.005
Pneumonia	Amoxicilline sirop	1	20%	0.31	0.062	0.093
	Amoxicilline 250 mg c	1	80%	0.03	0.024	0.036
	Average Pneumonia				0.086	0.129



Table 18: Training costs per ASC

Training ASC	Days	Cost per Training	Life Years	Annualised Cost (A)	Attrition Rate	Annualised Cost (B)
Initial ICCM Training ASC	15	412.3	5			
Total per ASC		412.3	5	82.5	5.00%	86.57

Table 19: Supervision and Management

Number ASCs per	
Supervisor DTC - CSCOM	4
District Supervisor - CSREF	20

Training of Supervisors & Managers	Days	Cost per Training	Life Years	Annualised Cost	Attrition Rate	Annualised Cost (B) per Supervisor	Annualised Supervisor Cost per ASC
Supervisors training		190.1	5	38.02	3.75%	39.45	9.86

Allowances for supervision	Per Supervision	Number Supervision/Year /ASC	Annualised Cost per ASC
Supervisor	4.9	12	58.8
District Co-ordinator	14.7	4	58.8
Total			117.5

Table 20: Number of ASCs required for Scale-up

	Current	Country	Difference
Population <5	664 848	2 995 000	
ASCs	1 847	8 320	450%
Pop/ASC	360		

Table 21: Health Expenditure 2007-2011

	2007	2008	2009	2010	2011
Health expenditure per capita (current \$)	35.88	40.72	41.18	39.48	44.57
External resources for health (% of total expenditure)	18.59%	19.63%	21.13%	22.18%	26.04%
External resources per capita	6.67	7.99	8.70	8.76	11.61
Share Public Health expenditure per capita	48%	47%	46%	44%	45%
Public Health expenditure per capita (current \$)	17.35	18.95	18.93	17.18	20.25
as % of Government Expenditure	13.8%	14.8%	12.1%	12.3%	12.2%
Government ownHealth Exp per capita	10.68	10.95	10.23	8.42	8.64
Population					14 416 737

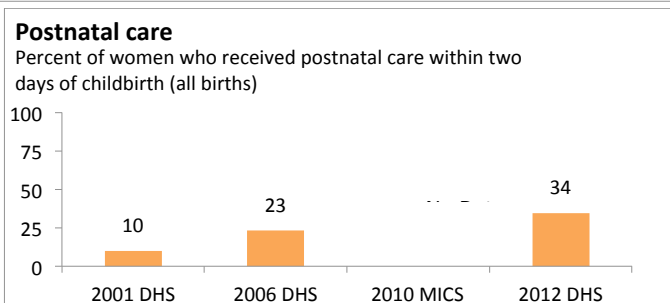
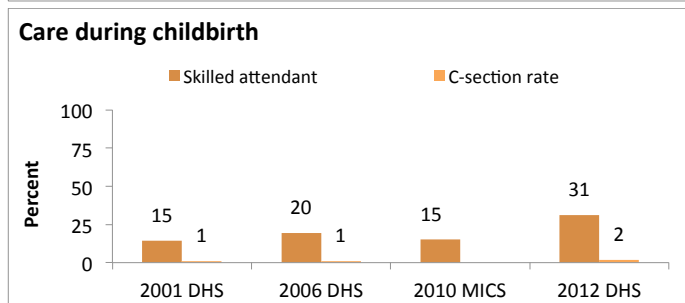
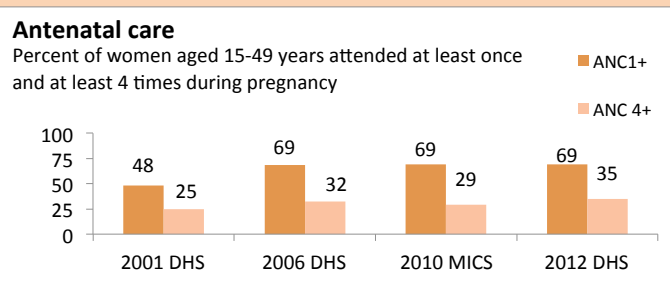
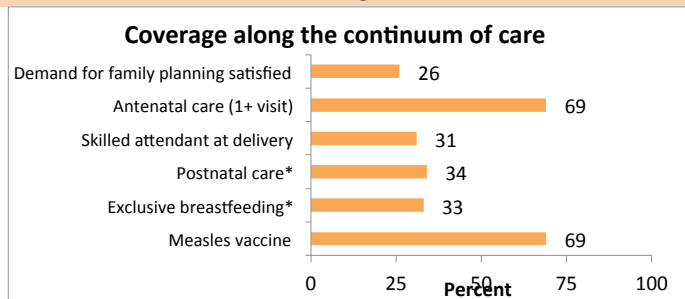
## Appendix E: National and regional coverage profiles

# Mali: Five CI/ IHSS Regions

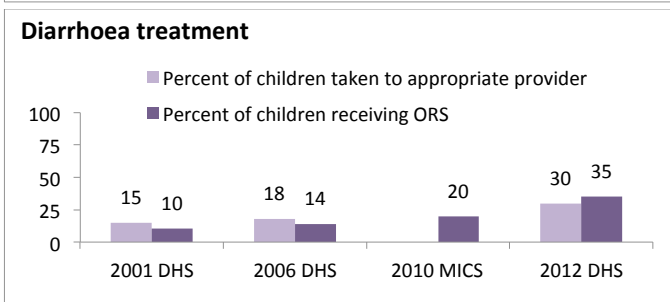
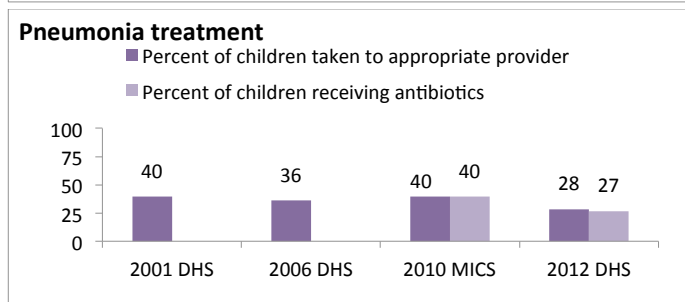
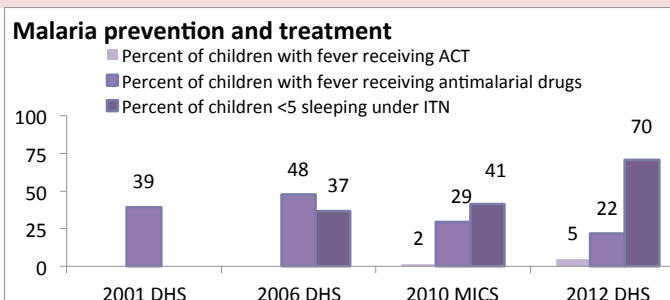
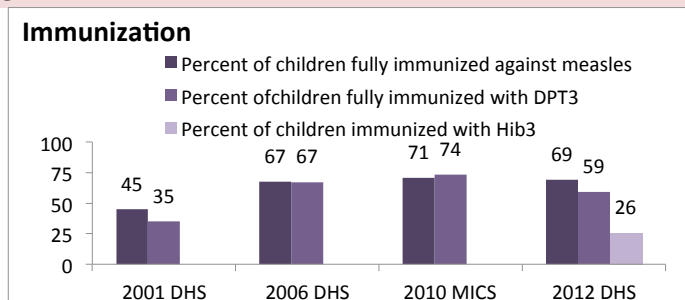
## DEMOGRAPHICS<sup>1</sup>

Total population		Annual births	
Neonatal mortality rate (per 1000 live births)		Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)		Total fertility rate	6
Under-five deaths			

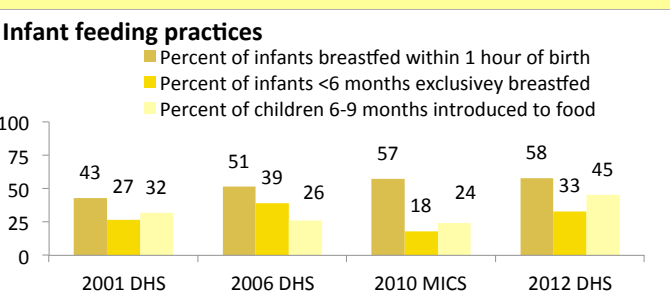
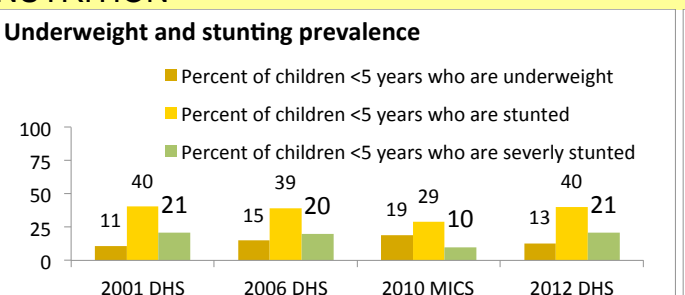
## MATERNAL AND NEWBORN HEALTH



## CHILD HEALTH



## NUTRITION



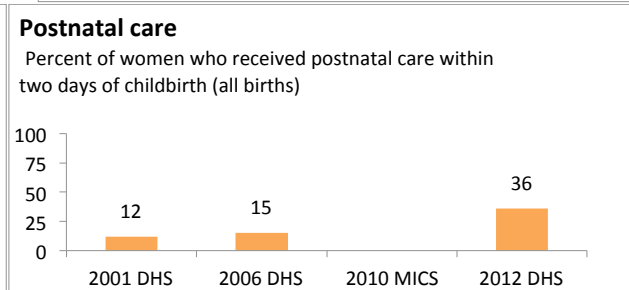
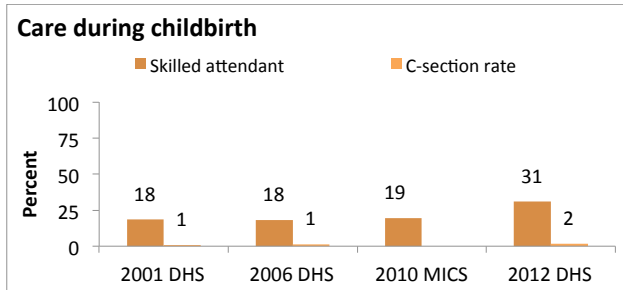
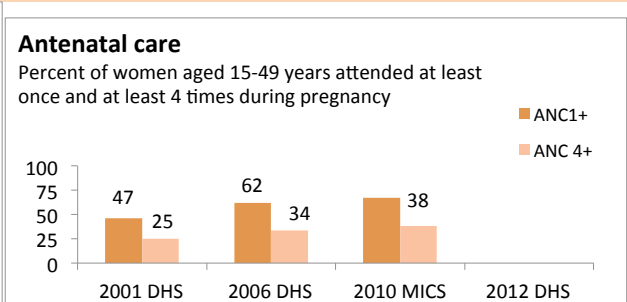
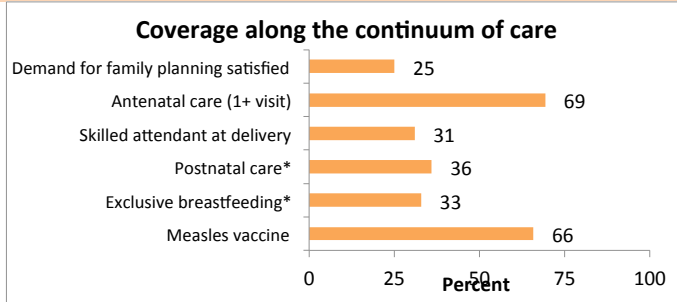
<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.

## DEMOGRAPHICS<sup>1</sup>

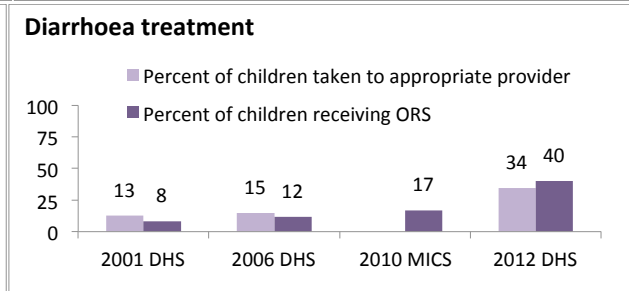
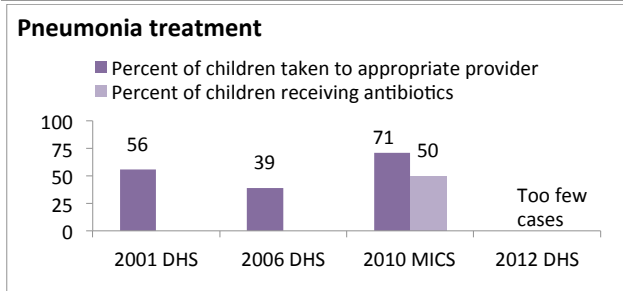
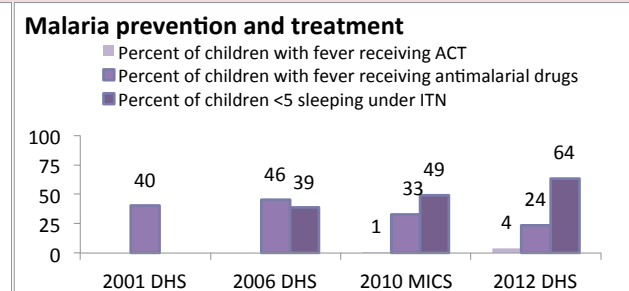
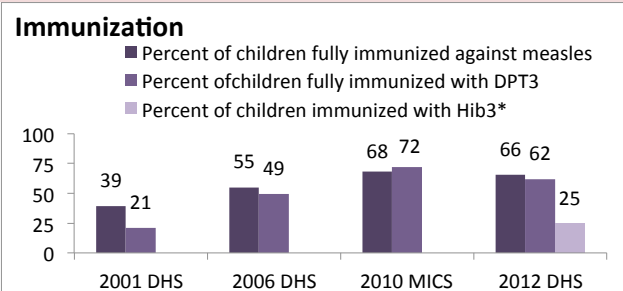
Total population		Annual births	
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)	96	Total fertility rate	6
Under-five deaths			

\* Refers to national data, not region-specific

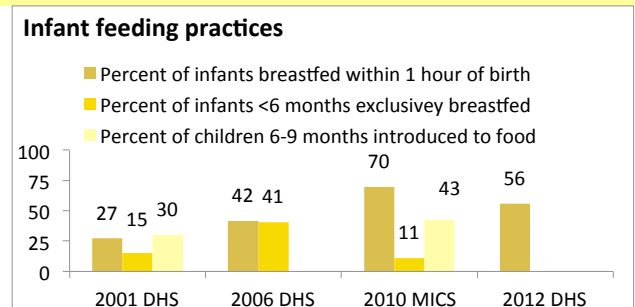
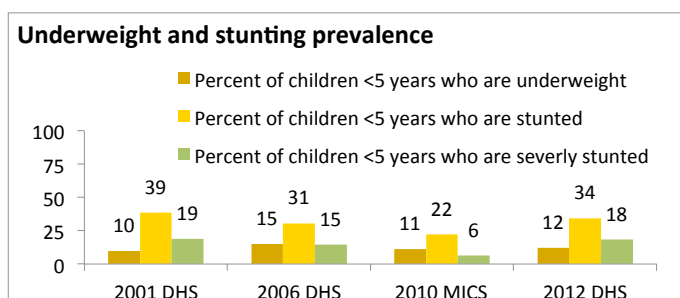
## MATERNAL AND NEWBORN HEALTH



## CHILD HEALTH



## NUTRITION



<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.

# Koulikoro

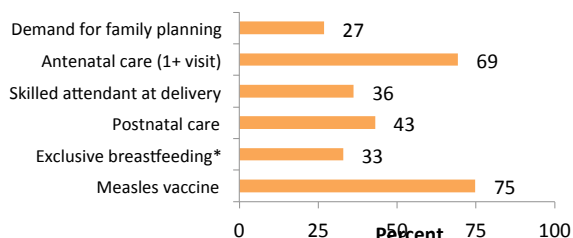
## DEMOGRAPHICS<sup>1</sup>

Total population		Annual births	
Neonatal mortality rate (per 1000 live births)	35	Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)	96	Total fertility rate	6
Under-five deaths			

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

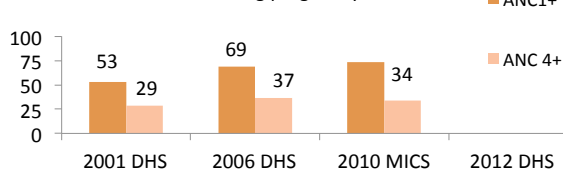
## MATERNAL AND NEWBORN HEALTH

### Coverage along the continuum of care

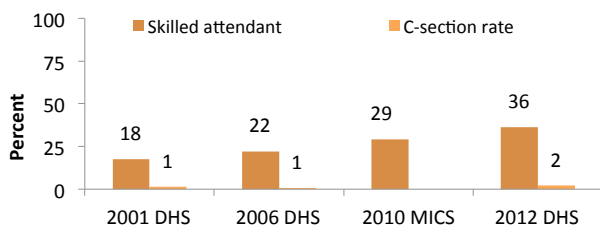


### Antenatal care

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

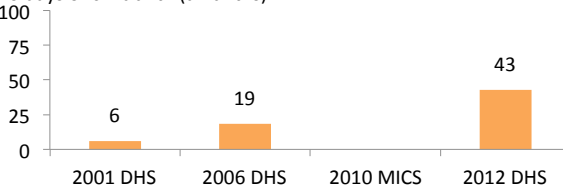


### Care during childbirth



### Postnatal care

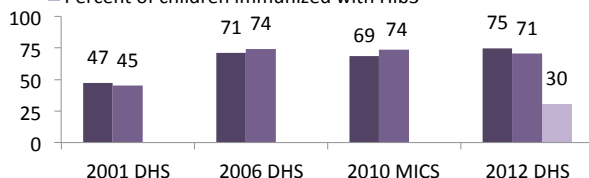
Percent of women who received postnatal care within two days of childbirth (all births)



## CHILD HEALTH

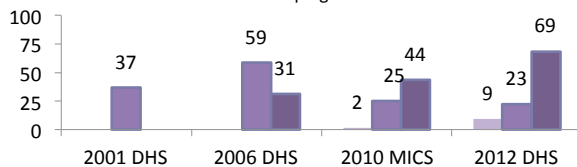
### Immunization

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



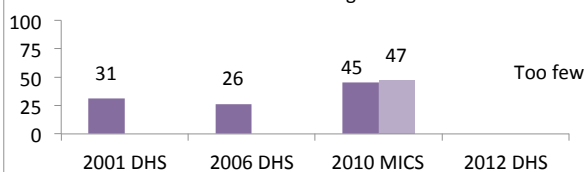
### Malaria prevention and treatment

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



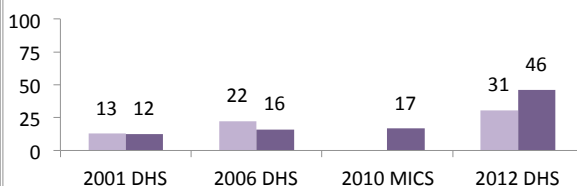
### Pneumonia treatment

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



### Diarrhoea treatment

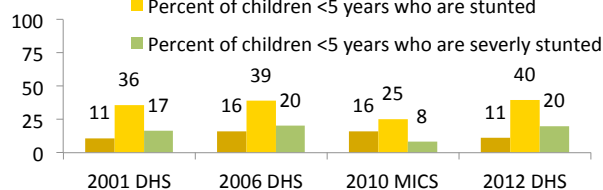
- Percent of children taken to appropriate provider
- Percent of children receiving ORS



## NUTRITION

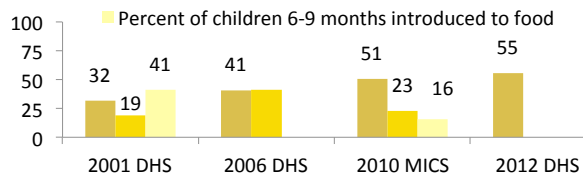
### Underweight and stunting prevalence

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



### Infant feeding practices

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



<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.

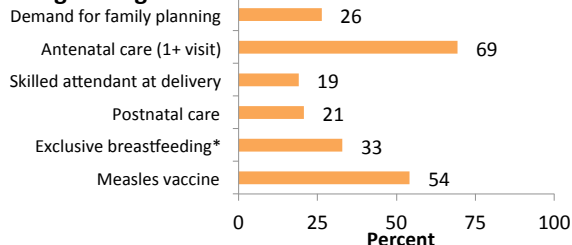
# Mopti

## DEMOGRAPHICS<sup>1</sup>

Total population		Annual births	
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)	111	Total fertility rate	7
Under-five deaths			<i>* Refers to national data, not region-specific</i>

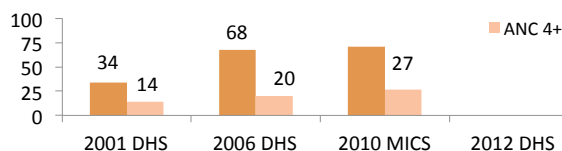
## MATERNAL AND NEWBORN HEALTH

### Coverage along the continuum of care

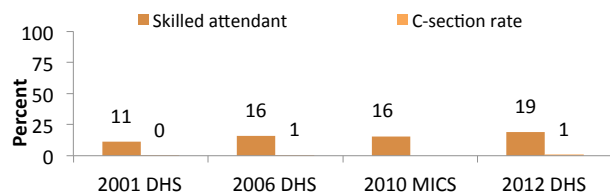


### Antenatal care

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

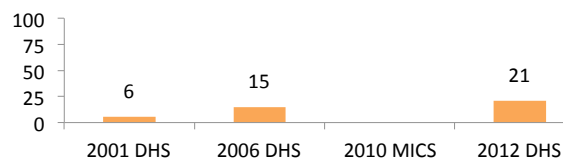


### Care during childbirth



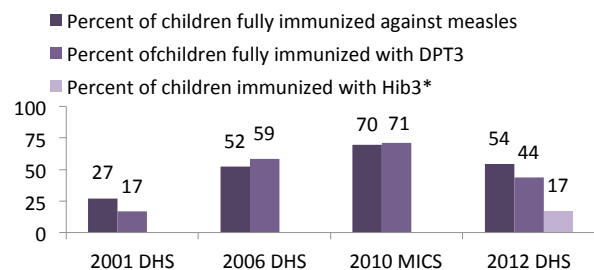
### Postnatal care

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

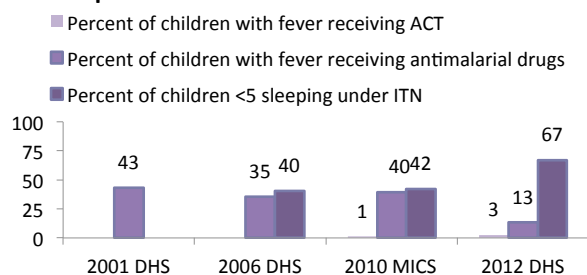


## CHILD HEALTH

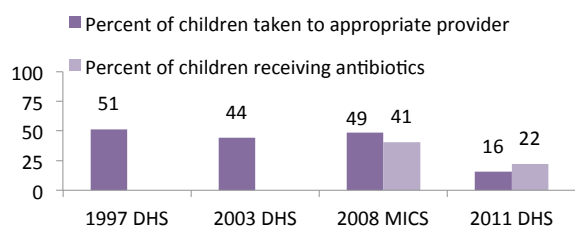
### Immunization



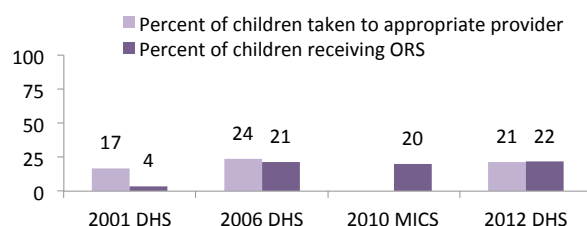
### Malaria prevention and treatment



### Pneumonia treatment

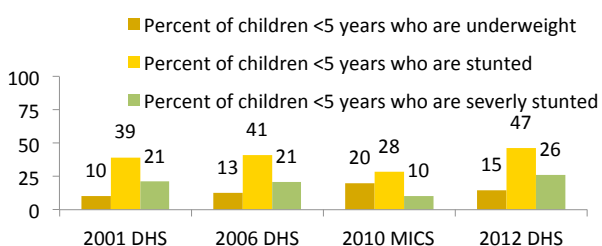


### Diarrhoea treatment

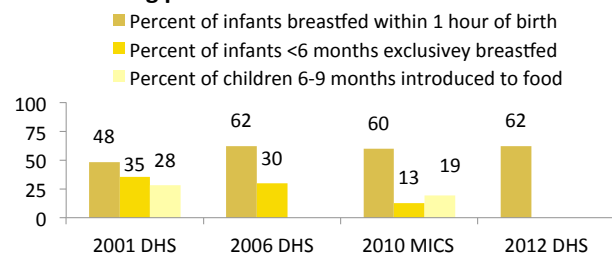


## NUTRITION

### Underweight and stunting prevalence



### Infant feeding practices



<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.

# Ségou

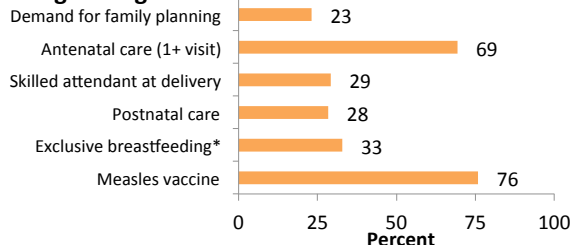
## DEMOGRAPHICS<sup>1</sup>

Total population		Annual births	
Neonatal mortality rate (per 1000 live births)	34	Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)	116	Total fertility rate	6
Under-five deaths			

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

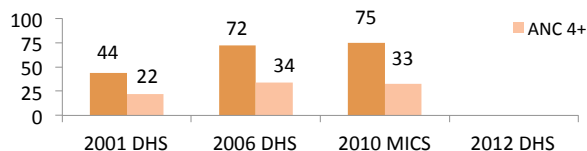
## MATERNAL AND NEWBORN HEALTH

### Coverage along the continuum of care

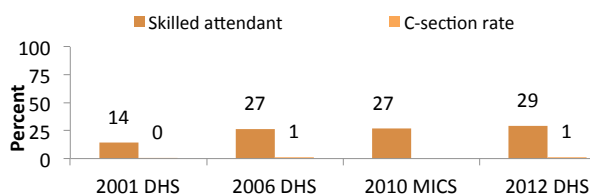


### Antenatal care

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

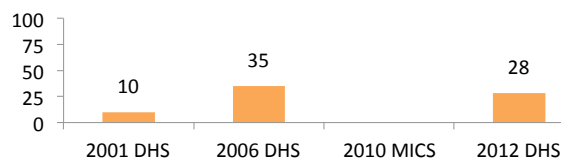


### Care during childbirth



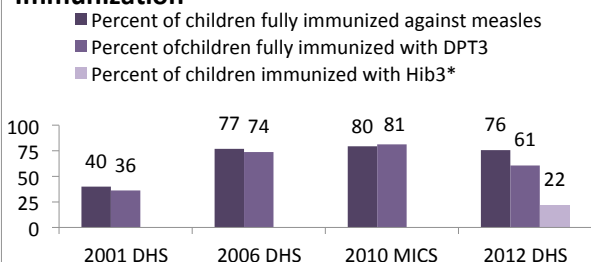
### Postnatal care

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

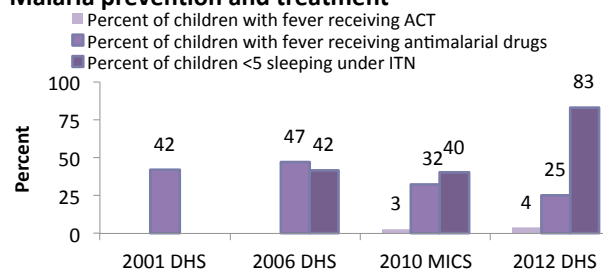


## CHILD HEALTH

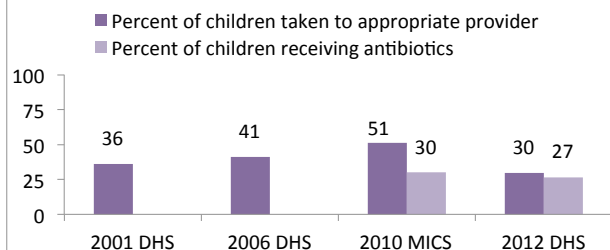
### Immunization



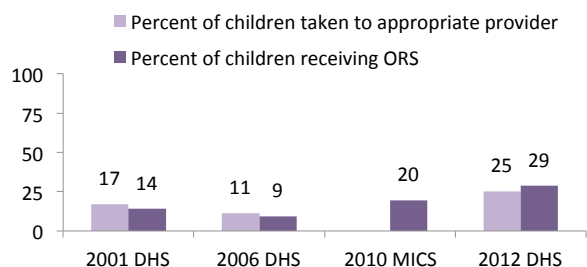
### Malaria prevention and treatment



### Pneumonia treatment

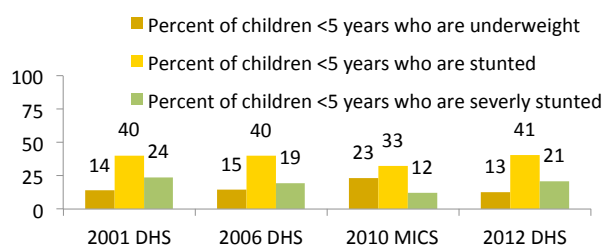


### Diarrhoea treatment

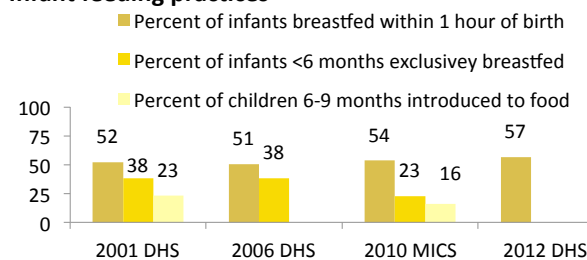


## NUTRITION

### Underweight and stunting prevalence



### Infant feeding practices



<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.

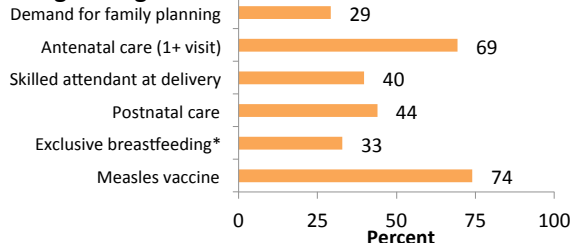
# Sikasso

## DEMOGRAPHICS<sup>1</sup>

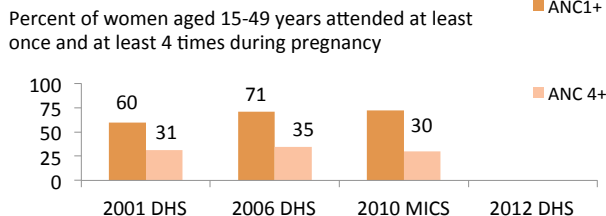
Total population		Annual births	
Neonatal mortality rate (per 1000 live births)	44	Maternal mortality ratio* (per 100,000 live births)	
Neonatal deaths		Maternal deaths	
Under-five mortality rate (per 1000 live births)	121	Total fertility rate	7
Under-five deaths			<i>* Refers to national data, not region-specific</i>

## MATERNAL AND NEWBORN HEALTH

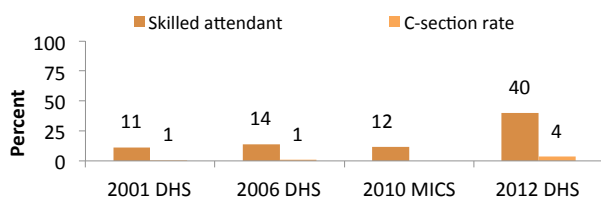
### Coverage along the continuum of care



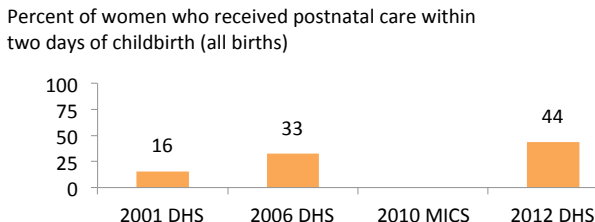
### Antenatal care



### Care during childbirth

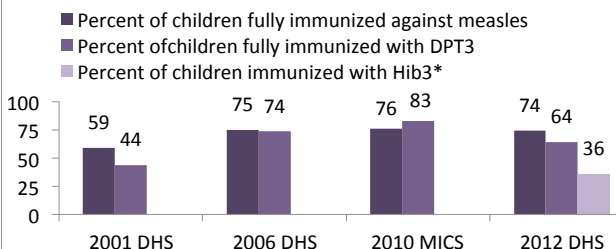


### Postnatal care

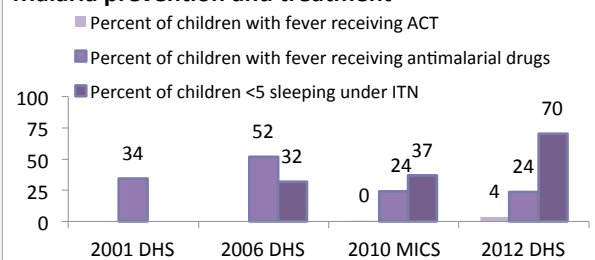


## CHILD HEALTH

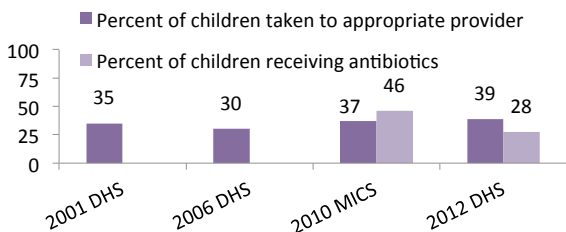
### Immunization



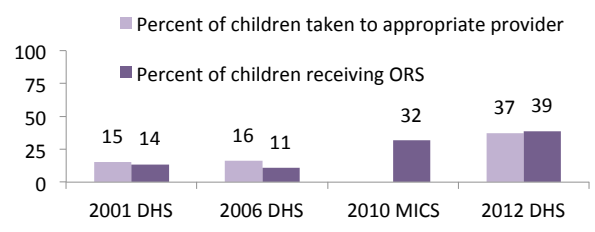
### Malaria prevention and treatment



### Pneumonia treatment

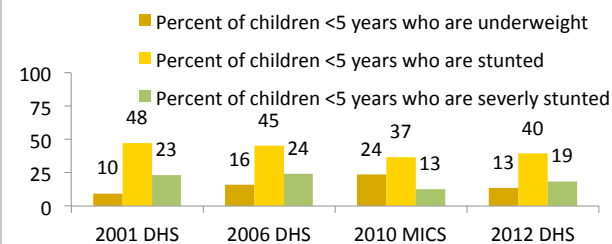


### Diarrhoea treatment

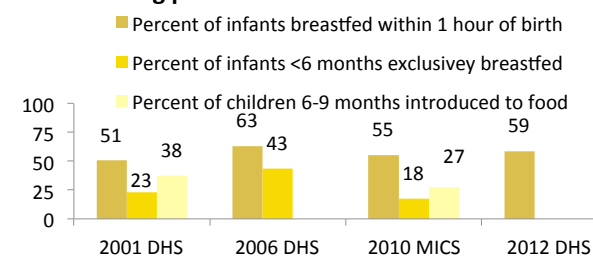


## NUTRITION

### Underweight and stunting prevalence



### Infant feeding practices



<sup>1</sup> Population, births, maternal mortality data collected from XX projected data for 2013. Neonatal and under-five mortality rates as well as total fertility rate are collected from DHS 2012 and numbers applied to births from census.