

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

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



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## ACRONYMS

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ASC	Agents de Santé Communautaire (Community Health Workers)
ACSD	Accelerated Child Survival and Development
ACT	Artemisinin-based combination therapy
ANC	Antenatal care
BCG	Bacillus Calmette–Guérin
CFA	West African CFA franc
CI	Catalytic initiative
CI/IHSS	Catalytic Initiative/Integrated Health Systems Strengthening
CS	Cases de Santé
CSI	Centres de Santé Integres (Integrated Health Centres)
DFATD	Department of Foreign Affairs, Trade and Development
DHS	Demographic and Health Survey
DTP	Diphtheria, Tetanus, Pertussis vaccine
EBF	Exclusive breastfeeding
EPI	Expanded Programme on Immunisations
FGD	Focus group discussion
GAVI	Global Alliance on Vaccines and Immunisation
GDP	Gross domestic product
GF	Global Fund
HDI	Human Development Index
iCCM	Integrated community case management of common childhood illnesses
IMF	International Monetary Fund
HIPC	Heavily Indebted Poor Countries
IHSS	Integrated health systems strengthening
IMCI	Integrated Management of Childhood Illness
IMNCI	Integrated Management of Neonatal and Childhood Illness
INS	National Statistics Institute
IP	Implementing partner
IPTp	Intermittent preventive treatment of malaria in pregnant women
ITN	Insecticide treated net
KFPs	Key Family Practices
LiST	Lives saved tool
LLIN	Long-lasting insecticidal net
MCWH	Maternal Child and Women’s Health
MICS	Multiple Indicator Cluster Survey
MNCH	Maternal Neonatal and Child Health
MDGs	Millennium Development Goals
MOH	Ministry of Health
MRC	Medical Research Council
M&E	Monitoring and evaluation
NGO	Non-governmental Organization
NSI	National Statistics Institute of Niger
NMR	Neonatal mortality rate
ONPPC	Office National des Produits Pharmaceutiques et Chimiques du Niger
ORS	Oral rehydration salts
PHC	Primary health care
PMTCT	Prevention of Mother to Child Transmission of HIV
PNC	Postnatal care
RED	Reach Every District approach

RDTs	Rapid Diagnostic Tests
SAMRC	South African Medical Research Council
U5MR	Under five mortality rate
UN	United Nations
UNICEF	United Nations Children’s Fund
USAID	United States Agency for International Development
VAT	Value Added Tax
WASH	Water, sanitation and hygiene interventions
WHO	World Health Organisation
WCARO	UNICEF’s West and Central Africa Regional Office



## EXECUTIVE SUMMARY

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### Background

The Catalytic Initiative/Integrated Health Systems Strengthening (CI/IHSS) programme (here after referred to as the IHSS programme), is a UNICEF/DFATD programme to improve child survival in Niger through implementation of a limited package of proven, high impact, and low cost maternal and child health interventions. The Canadian-funded component of the IHSS programme, often referred to as Catalytic Initiative (CI), was implemented from November 2007 to May 2013 with a focus on the package of services known as the Integrated Community Case Management (iCCM), delivered by community health care workers, known as the Agents de Santé Communautaire (ASC) at the Case de Santé (CS) or health posts. This evaluation aimed to assess the programme's relevance to the country's health priorities, effectiveness with regard to coverage changes of selected health interventions and health system strengthening, impact on child survival, and programme sustainability.

The aim of the IHSS programme, which started in 2006/07, was to align itself to the national poverty reduction initiative and the National Health Development plans of the country and to strengthen the health system to deliver essential high-impact and cost effective maternal, newborn and child health services at the primary care level. The IHSS programme package of interventions implemented under the Catalytic Initiative included the training of ASCs in iCCM, the provision of essential drugs and supplies to prevent and treat the main contributors to under-five mortality, distribution and promotion of the use of long lasting insecticidal nets (LLINs), and the promotion of key family practices (KFPs) via the ASCs and Relais. It also included the training of nurses and doctors in Integrated Management of Childhood Illness (IMCI), immunisation techniques, and participation in outreach immunisation activities. In 2012, the package of services provided at the CS were extended, and the programme further invested in training of health workers in revised antenatal guidelines as well as in essential newborn/emergency obstetrical care. The IHSS programme was implemented at a national scale, covering the country's 8 regions, with a total population of 17.16 million.

### 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>1</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>2</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>3</sup>.

## **Purpose and objectives**

The purpose of this external evaluation was two-fold:

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

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

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

## **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 (together with other relevant interventions), using LiST. The evaluation scope was limited to assessing the plausible contribution of the IHSS programme to observed changes in coverage of selected indicators, due to the lack of true comparison areas (as iCCM and the ASCs were operationally on a national scale) and the lack of feasibility of a randomized intervention/control design. Geographically the scope of the external evaluation included all regions of Niger as the program is national. Temporally, the scope of the external evaluation included the period 2000-2007 (secular trend) prior to the start of the IHSS programme, the period 2007 to 2010 known as Phase I of the IHSS programme, and the period 2010 to March 2013 known as Phase II of the IHSS programme.

## **Intended Audience**

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

## **Methodology**

This was a mixed method evaluation<sup>4,5</sup> in that quantitative, qualitative and economic evaluation methods were used. Data sources for the coverage included the Niger Demographic and Health Survey (DHS) 1998, 2006, 2012, Multiple Indicator Cluster Survey (MICS) 2000, and the Niger Survival and Mortality Report 2010. For analysis of coverage, trend analysis was performed using a non-parametric

test of trend across years and wealth quintiles for all available surveys. Estimates of intervention coverage at population level from household surveys were used as inputs to model lives saved using the Lives Saved Tool (LiST). Data to assess implementation strength, utilisation and quality of care were taken from routine data collected by UNICEF as well as the newly conducted 2013 Census of Case de Santé and Centres de Santé Intégrés (hereafter referred to as 2013 Census survey or 2013 Census). The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework<sup>6</sup>.

Estimates of intervention coverage at population level from household surveys were used as inputs to model lives saved using the Spectrum Lives Saved Tool (LiST). The tool was used to investigate the extent to which changes in child mortality could be attributed to changes in intervention coverage prior to IHSS (2000-2007) and during the period of IHSS programme implementation from 2007-2012, using baseline mortality values and changes in coverage of newborn and child health interventions from DHS, together with the LiST default input data.

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. First of all, the methodology for assessing lives saved using LiST is based on modelled estimates, not measured outcomes linked to specific interventions. Second of all, the lives saved analysis reflects inputs across the health system, which include, but are not limited to IHSS programme inputs, resulting in coverage change. Third of all, 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. Lastly, the costing analysis was based on *additional costs* and not the full cost of providing iCCM. Not being able to quantify the total cost of health system strengthening, in particular at health post level, it is not possible to ascertain the full cost of delivering iCCM. Use of these costing figures would, therefore, be inappropriate as it underestimates the full cost (government and donor costs combined) of delivering iCCM.

The costing component, for the purpose of this evaluation, assessed the *additional costs* incurred by the health services (including donor funding) due to the introduction of the curative interventions by ASCs for the treatment of malaria, diarrhoea and pneumonia in children under 5, assuming they were delivered according to protocols. This does not represent the full costs of iCCM, or the actual costs of the IHSS programme. The design of the financial system in the public health sector does not allow for identifying amounts spent on specific programs, nor on specific levels of care such as the CS level, and it is therefore not possible to ascertain the full cost of iCCM. The costing component also assessed the financial sustainability in relation to current utilisation and anticipated increased future levels of utilisation.

The effect of contextual factors was described using data from document reviews and relevant databases. Contextual data to supplement the quantitative coverage data was collected during an 11 day field visit in April 2013. Qualitative data was collected through key informant interviews and focus group discussions (44 interviews), which were held with national and regional health officials, district personnel, NGOs and other donor partners, clinicians, ASCs and their supervisors, Relais, as well as UNICEF officials. The full list of interviewees is provided in Appendix D. The field visit was limited to two regions, due to limited time available and due to security concerns.

Data collection occurred at a national, regional and district level. Each set of data (household survey, qualitative, costing and LiST) was analysed and reported on independently. The analyses and their separate findings are brought together and synthesised in this report.

## Findings

### Relevance

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

Niger has a long history of expanding community-based service delivery through the development of the CS and ASC cadre, and in 2006, through the Free Health Care Policy<sup>7</sup> for children under-five and pregnant women. Government funded the 6 months basic training of ASCs which shows a high level of commitment, and the IHSS programme catalysed this development through funding iCCM training of the ASCs beginning in 2007. The Ministry of Health (MOH) was initially opposed to community-based curative activities being undertaken by the ASCs. UNICEF used an incremental approach, through its two initial pilots, to demonstrate successful health care provision by community health workers and to gain support for the expansion of their roles, which led to the adoption of the iCCM policy in 2008. UNICEF and the MOH in Niger appear to have a good collaborative working relationship, which was consolidated by the significant incentive of 5 year consistent IHSS programme funding through DFATD and UNICEF. This enabled effective planning and coordination to catalyse the iCCM implementation. The government's provision of strategic leadership with expanding community-based health care, coupled with the involvement of clinical governance organisations (such as the Paediatric Association), contributed to the successful uptake and roll-out of iCCM across the country. The timing of the IHSS programme was also opportune as it was able to support the country's policy shift towards Free Health Care for pregnant women and children under five.

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

The IHSS programme in Niger was successful in aligning itself with the national priorities and plans and was able to take advantage of a window of opportunity with the creation of a new platform of service delivery, the Cases de Santé (CS). The IHSS programme was successful, and indeed catalytic, in strengthening the health system at the level of the CS through the provision of drugs and the training of primary care health workers to meet the increase in demand for services. The IHSS programme also funded IMCI training of nurses, which laid a strong foundation for the nurses to provide iCCM supervision for the ASCs. MOH policies to expand access to maternal and child clinic services via the CS level attest to the acceptability of the roles of community health workers, with the IHSS programme providing a strategic framework through which it could be implemented. Nevertheless, some interviewees indicated that the IHSS programme could have been better aligned to the MOH's broader

focus on mother, child and women's health policies by, for instance, striking a better balance with other priority problems such as neonatal and maternal morbidity and mortality

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

With regard to gender equality, there continues to be large gender disparities in the general population, with significantly higher rates of illiteracy among women as well as early marriage and childbearing. Despite these disparities in the general population, the IHSS programme contributed to women's participation and a gender equity approach with more than half (58%) of the total ASCs trained in iCCM being female. This is a substantial achievement given the lower levels of women's access to education in Niger. However, attrition amongst females appears to be higher, as according to the 2013 Census of CSs and CSIs only a quarter of ASCs deployed in 2013. The timing of the 2013 Census did not allow for further investigation of the underlying reasons. Previous studies have indicated how gender inequality influences and restricts the agency of women in relation to health care seeking,<sup>8,9</sup> and it may be that these factors extend to their ability to take up and retain employment as ASCs.

The IHSS programme has included a gender equity focus by delivering interventions known to be effective for addressing gender dynamics, such as making services more accessible to carers of children, interventions promoting accessing households directly through home visits and seeking to mobilize and engage communities for improving child health and nutrition outcomes.<sup>9</sup>

#### **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 increase in the target populations? 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?

#### *Expansion of Cases de Santé infrastructure*

Government and donor partner investment in, and development of, community-level health services resulted in geographical access to health services being increased by 402 functional CSs during the IHSS programme period. The iCCM training and supplies provided by the IHSS programme ensured that functional CSs could deliver a service to children under five years old. In the pre-IHSS period, the percentage of the population living within 5km of a health facility (CS or CSI) increased marginally, from 40% in 2002 to 41% in 2006, and during the IHSS programme period this proportion increased to 48% by 2012.

#### *Expansion of access through support of the Free Health Care policy*

The Free Health Care policy, which eliminated user fees for pregnant women and children under five years of age, implemented just prior to the start of the IHSS programme, removed financial barriers

to health care access, resulting in a major increase in utilisation of health care by these patient groups at all levels of the health system, including the CS. This Free Health Care initiative would not have been effective without the health systems strengthening support of the IHSS programme. The IHSS programme's major contribution to ensuring the functionality of the CS, through training, supplies and supervision, therefore, increased geographic access to health care for women and children. For others, the cost of travel and time to a point of service delivery remains high as geographic access is not completely achieved in Niger.

#### *Human resources and training: ASCs and Relais*

The IHSS programme trained a total of 2560 ASCs by 2013 in iCCM, which focussed on curative care for the three main childhood diseases as well as the management of acute malnutrition. It further invested in training ASCs and nurses in immunization techniques and supported the organisation of immunization sessions aimed at ensuring optimal vaccination coverage in hard to reach areas. IHSS programme exceeded its targeted number of 2502 trained in Phase 2 (June 2008-May 2009). Ninety percent (90%) of the 2560 ASCs had been trained by 2011, with ongoing training in 2012/13, accommodating for an approximate 7.5% per year attrition. Based on 2013 Census survey data, approximately 1997 CSs were functional (429 reported as having closed), with a distribution of 1535 ASCs and 535 nurse related cadres being deployed to the CS. This indicates that the actual number of ASCs deployed remains in flux.

There is a two-tier community health care workers system in Niger, with the first tier being the Relais, a volunteer cadre delivering household level preventive health and promotion of care-seeking. The Relais often form the link between the community and the health service and work closely with the CS and CSI. The in-country assessment revealed an appreciation for the contribution of the Relais to child survival, especially because of their focus on raising community awareness and focussing on health promotion at the household level, including encouraging care seeking for sick and malnourished children. In 2013, there was at least one Relais per CS, while about one third of CSs had two Relais, with between 5 to 6 Relais per CSI. The IHSS programme was supportive of the Relais cadre and reinvigorated their activities through the promotion of the Key Family Practices (which was informed by evidence-based health promotion messaging developed with them); most likely contributing to the observed increase the use of bed nets, improved hand washing techniques, breastfeeding and the use of ORS for diarrhoea. The IHSS programme contributed to the acceptability of a curative care role for ASC, a community-based cadre. This is likely to have had a spill-over effect in terms of stakeholders also embracing extended community health care roles for the Relais.

Increasing the number and quality of antenatal care visits, as well as childbirth and newborn care, was another focus of the programme, through training on the revised antenatal guidelines, provision of newborn kits, and the incremental upgrading of the CSs to allow for deliveries of babies. According to the National Statistics Institute (INS) in Niger, 8% of deliveries the public sector were done at CS level in 2012. Government is now planning to expand the package of services offered at community-level by increasing the scope of practice of the ASC, placing nurses at CSs and by enlisting the Relais more formally, especially in hard to reach areas.

### *Supervision*

The IHSS programme invested in training of frontline health workers (294 nurses/clinicians) in IMCI to enable nurse supervision of the ASCs. Currently IMCI training is integrated into the regular curriculum of nurse training,<sup>10</sup> reflecting government ownership of the approach. Although less than 10% of ASCs received a monthly supervision visit (required by the MOH protocol), quarterly supervision was relatively frequent. The percentage of ASCs receiving at least four visits in the previous 12 months increased, from 46% in 2010 to 71% in 2013. Of the 71% receiving quarterly supervision in 2013, the majority reported supervision visits involving observation of case management; over 80% of ASCs had at least one such case observation supervision visit in 2013. The IHSS programme funding contributed to this improvement.

A major challenge with regular supervision was due to the lack of regular transport, due to broken motorcycles or lack of funds for petrol. This is not a failure of the IHSS programme but appears to be a general failure of the health system with regards to access to appropriate transport. The long-term plan of the MOH is to upgrade the level of service delivery at the CS by placing a nurse at this level, which will also allow for onsite supervision of the ASC. There is no formal supervision processes for the Relais, though in practice there may be informal supervision of Relais by the ASCs.

### *Procurement, distribution and availability of medicines and commodities*

The IHSS programme with matching funds from UNICEF funded the provision and distribution of the main medicines required for treating the top three childhood illnesses (malaria, pneumonia and diarrhoea) as well as acute malnutrition. Without this contribution from IHSS programme, which enabled government to provide free medicines to children under 5, the provision of Free Health Care would not have been successful. This procurement and distribution was done parallel to the MOH supply chain systems for other drugs to circumvent the challenges faced by government systems, including poor infrastructure and limited administrative, storage and transport systems.

Stock-outs remain a problem, however. The percentage of CSs with no stock-out of any iCCM commodities was 54% in 2010. This was much improved by 2013, but when factoring in expired drugs the stock availability showed little change from 2010 levels, at both CSs and CSIs. Poor management and forecasting of stock is one of the reasons, as about 50% of the facilities surveyed had the theoretical stock match up with the actual stock on the day of the survey. Delays in reimbursement of consultation fees by government (for children and pregnant women) were raised as another reason for stock-outs of medicines, apparently due to staff dipping into stocks of child drugs to dispense to adults when the adult drugs run out (which in turn leads to shortage of child drugs). Furthermore, there are limitations in terms of equipment and means of transport at the CS, with only 2% having a bicycle in working order, only 9% having a functional fridge and 8% having a source of power although a high proportion (almost 80%) of CSs had a functional delivery table. Approximately 50% of CSIs had access to a functional motorbike, which enabled supervision at the CS. Funding dispersal delays from other donors, in light of Niger's dependence on foreign aid, affected the procurement of bed nets which seriously compromised malaria prevention efforts.

### *Utilisation, monitoring and evaluation, and quality of care*

Routine data on utilisation of iCCM was not disaggregated to CS level, though MOH reforms are underway to allow for disaggregation. The IHSS programme funds enabled Technical Advisors from the UNICEF Headquarters and WCARO to support this reform. The 2013 Census indicated that the

average number of iCCM consultations per CS per month was 72 and 419 at the CSI, with the largest number of cases being for malaria treatment at both CSI and CS level. The estimated number of treatments per under-five child per year is 2 visits at primary care level (CS+CSI). As close to 30% of iCCM visits are at the CS level, when taking total visits at primary care level: CS+ CSI into account. This amounts to 0.7 treatments per child per year at the CS level in 2013, or 0.84 curative visits, if an additional 20% of visits do not translate into treatment. Regarding the rationale for the 20% assumption, please refer to the 'Costing' in the Methods section of the main report. This number reaches the national target of 0.8 for total curative visits (adults + children) at the primary care level.

Once the IHSS programme was launched in Niger in 2008, the MOH, with the support of UNICEF, embarked on developing tools and methodologies to monitor the progress and impact of the programme on child survival. This included developing registers for ASCs to report their activities to their supervisors on a monthly basis. CS utilisation data was combined with the data from the CSI and sent to the district, regional and national levels. Examples of innovative practices of data interrogation/utilisation have been reported, for example in the Maradi region, where CS level data is routinely collated and shared at community meetings.

UNICEF, with the support of IHSS programme funds have used national surveys, such as the annual SMART surveys to monitor the most vital public health indicators, as well as a recent 2013 Census of CSs and CSIs with geo-location. This is an important contribution towards providing critical information for planning and development to the government and the health services.

Nevertheless, monitoring and evaluation of service delivery remains one of the major challenges with bottlenecks in data collection and effective use of the health information for quality improvement, at CS, sub-district, regional, and national levels.<sup>11</sup> The lack of routinely disaggregated CS data represents a missed opportunity for effective monitoring and evaluation of the community platform of service delivery. As mentioned earlier, MOH, with the help of UNICEF, is implementing reforms to improve the health information management system which will allow for such disaggregation and to move to an electronic system. Furthermore, some nurses have been trained in data collection and have been deployed to support the district-level data management activities.

Quality of care of iCCM treatments remains an important consideration for ongoing monitoring, with some evaluations pointing to good quality of care (with the majority of ASCs found to be competent at treating the three main childhood diseases)<sup>12,13</sup> and other sources raising concerns.<sup>14</sup> The 2013 Census of CSs and CSIs will give an indication of concordance between signs and symptoms, classifications and treatment (based on patient record reviews), but the analysis was not available at the time of writing.

#### *Trends in coverage of selected maternal and child health indicators*

During the period of implementation of the IHSS programme, increases in coverage in the large majority of focal interventions were noted. Interventions delivered during pregnancy, such as tetanus toxoid vaccination and Intermittent Preventive Treatment of malaria in pregnant women (IPTp), increased between 2006 and 2012. The annual rate of increase in coverage of tetanus toxoid for the IHSS programme period was approximately 5 percentage points per year, significantly higher than that of the pre-IHSS period. Because IPTp only came into policy after the 1998 DHS, only annual rates of increase for the IHSS programme period were available, with coverage significantly increasing at an average of 10 percentage points per year. Coverage with respect to postnatal care did not significantly



increase during the IHSS programme period, though the indicator definition and questionnaire changed over this time, making measurement difficult.

Furthermore, preventive interventions, such as measles and DPT3 vaccination and LLIN utilization, also increased, in addition to ORS provision. Measles and DPT3 vaccination coverage during the IHSS programme period increased at an average annual rate of 4 and 5 percentage points respectively, significantly higher than corresponding pre-IHSS rates of 2 and 3 percentage points. ORS coverage during the IHSS programme period increased at a significantly higher rate than the pre-IHSS period, increasing at an average of 5 percentage points per year in comparison to the pre-IHSS period, in which no significant increases in coverage were noted.

There was an overall increase in the proportion of children sleeping under nets between 2006 and 2012. Taking into consideration 2010 coverage rates from the Survival and Mortality Survey, the increase in coverage between 2006 and 2010 appears to be greatest. However, there is a substantial drop in coverage of long-lasting insecticidal net (LLIN) use among children between 2010 Mortality Survey and 2012 DHS, which is likely to be, in part, related to the decline in the Global Fund funding for bed net provision. However, other factors contributing to the difference in coverage levels could be the timing of the surveys, as the 2010 Mortality Survey was taken during the country's rainy season, in which utilisation is expected to be highest, while the 2012 DHS was conducted during the dry season. Taking into consideration 2006 and 2012 coverage estimates, coverage increased by an average of 2 percentage points per year during the IHSS programme period, with no increases in coverage being noted in the pre-IHSS period.

Care-seeking practices for suspected pneumonia and fever increased during the IHSS programme period, each at an average rate of 1 percentage point per year, although these increases were not significant. This indicated maintenance of care-seeking practices during the IHSS programme period. The annual rate of increase in care seeking was higher in the pre-IHSS period, between 2000 and 2006, in which care seeking for both fever and pneumonia increased at an average of 4 percentage points per year. Larger increases in care-seeking practices in the pre-IHSS period are likely due to the rapid expansion of CSs in the country during that period. However, when overall care-seeking was considered during the IHSS programme period, taking into account all 3 childhood diseases, there was a significant increase in care-seeking in the public sector, including at the CS level, probably largely due to the Free Health Care policy.

Breastfeeding practices, including early breastfeeding and exclusive breastfeeding of children under 6 months, increased during the IHSS programme period, although the annual rate of increase in early breastfeeding was significantly higher during the pre-IHSS period (3 percentage points per year, while the average annual increase of 1 percentage point per year in the IHSS programme period was not significant), whereas annual rates of coverage increase for exclusive breastfeeding were comparable between the two periods (2 percentage points per year). There was a decline in breastfeeding amongst older children (aged 12-23 months) during the IHSS programme period.

Coverage for the provision of Vitamin A in the last 6 months for children aged 6-59 months declined by 10 percentage points in the IHSS programme period, in comparison to an average annual increase of 2 percentage points per year in the pre-IHSS period. Malaria treatment declined in both periods, at a comparable rate (3 and 2 percentage points per year, respectively for pre-IHSS and IHSS programme periods). Reasons for the declines in Vitamin A coverage possibly include due to the timing of the DHS 2012 survey in relation to the outreach campaigns where Vitamin A is provided. Due to the fact that

the survey and outreach campaigns ran concurrently in the first half of the 2012 year, districts that had been surveyed in the DHS, may still have been scheduled to receive the Vitamin A campaigns later in the year, and as a result coverage would be artificially low. However, this logic would also hold true for the 2006 DHS, and rates of Vitamin A coverage have declined by 10 percentage points between the 2006 and 2012 Demographic Surveys. Consequently, the extent to which the decline is an accurate reflection of reality or an artifact of the seasonality of the surveys cannot be ascertained.

The largest increases in antenatal coverage (both for one and four or more visits) occurred between 2006 and 2012. Coverage for one antenatal visit increased from 46% to 82%, and coverage for four or more increased from 14% to 33%.

## Impact

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

Coverage changes during the pre-IHSS period (2000-2007) accounted for an estimated total of 65,300 lives saved over 7 years of analysis, amounting to approximately 9,300 lives saved per year. In comparison, during the 5-year IHSS programme period (2007-2012), an estimated 63,600 lives were saved, amounting to approximately 12,700 lives saved per year. The modelled annual rate of mortality reduction was faster in the IHSS programme period than the years directly preceding IHSS, though the LiST model overestimates the total under-five mortality rates compared to the mortality rates measured by the DHS for both periods.

While the true number of lives saved on coverage change is difficult to ascertain given that the mortality rates predicted by the LiST model are higher than the mortality measured by the household surveys, the LiST analysis is presented for illustrative purposes to highlight which interventions may have had the largest effect. The LiST analysis demonstrates that for the IHSS programme period, the introduction of the Hib vaccine in 2009 as well as the increase in ORS coverage, accounted for approximately 50% of deaths averted (or lives saved) in 2012.

Children sleeping under ITNs and anti-malarial treatment accounted for an additional 24% of deaths averted, while care-seeking for pneumonia accounted for another 6%. Childbirth and newborn care, and WASH interventions accounted for the remainder of deaths averted. Given the notable increases in coverage of these important interventions during the IHSS programme period, it is plausible that the IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012, than in the period of 2000-2007 preceding the IHSS programme. According to LiST, IHSS programme interventions accounted for an estimated 89%, or 56,600 of the total lives saved between 2007 and 2012.

The List analyses also indicate that the decline in coverage of vitamin A supplementation and breastfeeding amongst older children (aged 12-23 months) during the IHSS programme implementation period was associated with a decrease in potential lives saved relative to the baseline year of 2007. However, once again it is important to note that the decrease in Vitamin A coverage noted in the IHSS programme period may be an artefact of the timing of the 2012 DHS field work in relation to the national VAS/ITN campaigns.

## Sustainability

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

Two aspects affect the sustainability of iCCM: the financial sustainability and the organisational sustainability. Financial sustainability of iCCM is assessed through an evaluation of the additional costs incurred by the health services with the implementation of the iCCM. The costing excludes costs already covered by the health services, such as salaries. During the last year of the IHSS programme (2012-13), each ASC provided an average of 603 under 5 treatments, of which 54% comprised of malaria treatments, 18% diarrhoea and pneumonia. Implemented according to protocol, the cost per malaria treatment, including rapid diagnostic tests (RDTs) and drugs, stands at US\$5.04. The cost per diarrhoea treatment with ORS and zinc is \$0.91 and that per pneumonia treatment is US\$1.52. These costs include drugs and diagnosis as well as a proportion of ASC fixed costs (training, kit, supervision and management), the latter amounting to \$0.31 per treatment. With an additional 15%, or 30%, of number of treatments per existing ASC, iCCM costs would increase by only 13.6%, or 27.2%, respectively, due to the fact that the majority (90%) of treatment costs pay for drugs and diagnostic tests. The feasibility of increasing the number of visits by 30% in response to increased demand has to be checked by quantifying the time implications of iCCM for the 3 conditions. Not all visits translate into treatment. We assumed that the number of visits was 20% higher than the number of treatments. With a 30% increase in the number of visits, ASCs' time on visits and meetings for iCCM would move from the current 8.6 hours a week to 11 hours a week. Increase in utilisation could, thus, be accommodated by the existing ASCs and would not require additional human resources.

The costs of iCCM for the three conditions were placed in the context of government expenditure to assess its capacity to ensure ongoing funding. The incremental costs of iCCM accounted for 2.8% of the total public health expenditure and 5.7% of the government's own health expenditure. In 2011, the Gross Domestic Product (GDP) per capita in Niger was US\$248, and in 2012 the government expenditure represented 49% of public health expenditure. Adding 15% to iCCM costs, to cover additional systems strengthening activities (iCCM+) costs would represent 3.2% of total public health expenditure and 6.5% of government own health expenditure. With a 30% increase in treatments, iCCM+ would represent 4.1% of total public health expenditure and 8.3% of government health expenditure.

Given the relatively high levels of utilisation of iCCM services at the CS, efficiency is high. As a consequence there are limited avenues for cost reduction per treatment. Each increase in utilisation translates to an almost proportional increase in costs. With competing demands on government budget with increased security concerns, there is a real possibility that government's own expenditure on health may decrease, and support from donors for this program will have to remain to ensure financial sustainability, especially with the likelihood of increased demand for services given the country's high population growth rate. In this context the Global Fund new funding model which can

support iCCM systems' running costs as well as giving at least 3 years security of funding may ensure the continuity of the program, assisting in addressing issues which also affect organisational sustainability.

Although the ASCs are paid by the government, the sustainability of the iCCM in the medium-term will need continued donor support. At an organisational level, sustainability is dependent on maintenance of training, regular supply of iCCM drugs and a supply chain system to deliver this. There is concern amongst various stakeholders about the sustainability of the Free Health Care initiative, due to backlogs in re-imbursements. These backlogs appear to also affect the availability of iCCM drugs as these are sometimes used when there are stock-outs of adult drugs.

Given the dependence on donor support for the iCCM drug supply and the increasing pressures on government funding, the likelihood of the continuation the positive results associated with iCCM after DFATD/UNICEF involvement ends remains unclear.

## **Conclusions**

### **Relevance**

*A receptive policy environment, medium-term funding and strong collaboration contributed to a policy shift*

Prior to the IHSS programme, Niger prioritised primary health care services and created a community-based service delivery platform via CS and ASCs, aimed at increasing access to health care. The IHSS programme was well aligned with these priorities and reforms and could build on the existing community-based service delivery platform. A strong collaborative relationship, considerable advocacy efforts and the significant incentive of consistent IHSS programme funding for 5 years consolidated government and partner support and resulted in an eventual policy shift to allow ASCs to provide curative case management for childhood illnesses. MOH leadership and involvement of clinical managers served as additional promotive factors.

Government policy and plans include expanding the roles of the ASC to include neonatal and maternal health care, which attests to the increased acceptance of the role of the community health worker in curative care. The IHSS programme made a major contribution to this policy shift. Nevertheless, not all stakeholders agree with the focus of the IHSS programme, with some expressing the view that IHSS programme goals could have been more closely aligned with the government's broader vision and policy by, for instance, including maternal survival as a focus.

*Gender disparities, women's health priorities and missed opportunities*

Despite gender disparities in the general population, the IHSS programme contributed to women's participation and a gender equity approach by training more female than male ASCs. Nevertheless, the higher attrition rate amongst females, as shown in the latest 2013 census survey, indicates there is greater difficulty with retaining female ASCs, and the reasons for this should be investigated. To promote increased participation of female ASCs will, therefore, require extra effort to recruit, train and retain female ASCs.

Niger has made less progress in certain maternal and women's health indicators, than in child health indicators, with maternal mortality remaining extremely high. These issues are connected to wider socio-economic and socio-cultural factors which affect access to education for women, and will

require inter-sectoral efforts to ensure gender equity is promoted, especially improving the extremely low literacy levels among young women (23%).

## **Effectiveness**

### *The IHSS programme contributed to the expansion of geographical access*

During the IHSS programme period, the number of functional CSs grew, from 1594 in 2006 to 1997 in 2013, a growth of 402 CSs, which shows continued government commitment to increase access to a basic package of health care services for the population. The 2006 free child health care policy was paramount in increasing the accessibility of health services to populations that previously could not afford them. This, together with the large increase in the number of CSs, the basic training of ASCs by government and the iCCM training through the IHSS programme, dramatically increased population coverage of health services. The Free Health Care initiative may not have been effective without the health systems strengthening support of the IHSS programme as it enabled the CS to deliver curative health care to children and to dispense free drugs.

User fees have been shown in other LMIC settings to reduce health care seeking.<sup>15,16</sup> Although, the Free Health Care policy eliminated user fees for pregnant women and children under five years of age, the cost of travel and user fees for older children and adults remain barriers.<sup>8</sup>

### *The IHSS programme strengthened the health system through training and supervision of ASCs*

The IHSS programme reached its target for iCCM training early, with 90% of the 2560 ASCs trained by 2013. With the early training and deployment of ASCs, the IHSS programme in Niger has the earliest implementation of the six African countries evaluated, which provides a better platform for evaluation of its impact. The provision of basic training to ASCs by government ensured that they could receive further training in iCCM, though the latest 2013 Census shows that only 1535 ASCs (and 535 nurse-related cadres) were deployed to the CS level. With an annual attrition rate estimated at around 6%, this will require continued training of new recruits to replace those leaving, which will most likely require continued donor support.

The IHSS programme also invested in training of frontline health workers (294 nurses/clinicians) in IMCI, to enable nurse supervision of the ASCs. Quarterly supervision was relatively frequent with most facilities having at least one quarterly session with observation of case management, which is a requirement for effective supervision. Currently IMCI training is integrated into the regular curriculum of nurse training,<sup>10</sup> reflecting government ownership. There is no formal supervision processes for the Relais, though in practice there may be informal supervision of Relais by the ASCs.

### *The Relais as an important component of community health services*

The Relais, the volunteer community health worker cadre described earlier, appears to be central to linking communities to CSs and CSIs, but their role has not been fully evaluated.<sup>17</sup> They are well integrated with their communities, engage the community in health promotion activities, and they have a higher ratio to the population, which allows for more effective household level interaction. The MOH and UNICEF have begun formulating a new community-based care strategy that not only expands the package of care for the ASCs, but also increases the number of responsibilities for the Relais related to maternal and child health preventive and curative care. There are ongoing discussions on how to incentivise this cadre through, for example, provision of training and income generating projects, but they are still essentially sustained through volunteerism. The IHSS programme's most

likely contributed to the embracing of this expanded role for Relais, through initially advocating and demonstrating the feasibility and effectiveness of expanding the curative role of ASCs.

*The IHSS programme contributed to increased health care-seeking*

There was an average of 72 iCCM cases treated per month per CS, with the largest number of cases being for malaria treatment at both CSI and CS level. Child visits to the primary level (CS and CSI) amounted to close to 2 visits per child per year in 2013. This represents 0.7 curative visits per child per year at the CS level, already very close to the national target of 0.8 for total new curative visits per person at the primary care level. This relatively high level of service utilisation could be ascribed to the removal of financial barriers and the availability of child services, and it may be reflecting the maturing of both the Free Health Care initiative as well as iCCM, with enough time for care seeking behaviour patterns to change.

Qualitative findings confirm this and indicate that parents regard accessibility of the CS and child curative services, the Free Health Care and the role played by the Relais in the community, as the main factors influencing their ability to seek appropriate health care for children under 5 years.<sup>8</sup>

With the proposed upgrading of the CS to deliver some CSI services, it is unclear what the implications are for the role of the CS and the ASC. For instance, will it lead to reduction in number of CSs due to cost implications? Further, with the formalising and expansion of the role of the Relais, will this lead to a reduced need for the ASC cadre? And what will the cost implications be of all the above?

*The IHSS programme strengthened the procurement, supply and distribution of medicines and commodities, but more systems strengthening is required*

The IHSS programme, with matching funds from UNICEF, funded the provision and distribution of the main medicines required for treating the top three childhood illnesses (malaria, pneumonia and diarrhoea) as well as acute malnutrition. This procurement and distribution was done parallel to the MOH supply chain systems for other drugs due to challenges faced by government systems, such as poor infrastructure and limited administrative, storage and transport systems. The positive side of this parallel supply approach was quicker and reliable provision of iCCM drugs and equipment. However, the negative side was the increased reliance on external donor support and a government drug supply system that was not sufficiently strengthened to take over the service, thus posing a risk to the sustainability of iCCM.

The IHSS programme contributed to the reduction in stock-outs, but expiry of drugs at CS and CSI level undermined that improvement. When taking into account expired drugs as well, stock-outs remain a problem, with little change from the 50% stock-out levels seen in 2010. It is critical to strengthen the drug supply chain management system at both CS and CSI level and for national systems. Frequent and severe stock-outs at CSI and CS mean that the free drugs are not available and therefore mothers/caregivers are given prescriptions to purchase the drugs elsewhere, which adds another financial barrier. This is likely to dampen the utilisation of the iCCM services. Further, the use of expired drugs could contribute to ineffective treatment or even fatalities.

Delays in reimbursement of consultation fees by government (for children and pregnant women) were raised as another reason for stock-outs of medicines. The explanation given by frontline managers was that they use the free child drugs for adults when they are left without sufficient resources to buy new stocks of adult drugs, which in turn leads to shortages of child drugs. The sustainability of drug

supply is also a concern due to involvement of other donors and fluctuations in funding, which has in the past been shown to cause disruptions in services, such as the provision of insecticidal bed nets.

*The IHSS programme strengthened monitoring and evaluation system, but more system strengthening is required to evaluate progress and quality*

UNICEF and the IHSS programme have done much to put in place tools and systems for monitoring and evaluation. Nevertheless, routine monitoring and evaluation of service delivery remains a major challenge with bottlenecks in data collection and effective use of the health information for quality improvement, at CS, sub-district, regional, and national levels.<sup>11</sup> The lack of routinely disaggregated CS data represents a missed opportunity for effective monitoring and evaluation. The MOH, with the help of the IHSS programme, implemented reforms to improve the health information management system, aimed at disaggregation of data and moving to an electronic system.

Quality of care of iCCM treatments remains an important consideration for ongoing monitoring, and the 2013 Census of CSs and CSIs will give an indication of concordance between signs and symptoms, classifications and treatment (based on patient record reviews). The analysis was not available at the time of writing.

*Trends in coverage of selected maternal and child health indicators*

Notable increases during the IHSS programme period occurred with regard to ITN and ORS coverage, as well as vaccination coverage increases of measles and DPT3 vaccination. The most notable increases in antenatal coverage, both for one and four or more visits, occurred between 2006 and 2012. During this period coverage for one antenatal visit increased from 46% to 82% and coverage for four or more visits increased from 14% to 33%. These dramatic increases in antenatal coverage likely provided a platform for increases in IPTp and tetanus toxoid vaccination coverage, from less than 1% to 60% and 23% to 50%, respectively. However, other reproductive, maternal and newborn health services have not seen similar increases. The rate of contraceptive use is very low, at 14%, and fertility rates are extremely high, at 7.52 births per woman. It is important to note that there has been little progress in important maternal health indicators, such as rates of assisted births and family planning. Facility deliveries were just 30% by 2012 and postnatal care within 2 days of delivery remains low. This reflects a need for increased focus on maternal care in the country and for addressing the barriers associated with access to reproductive health services and uptake of contraceptive use. The overall low proportion of exclusive breastfeeding (22% in 2012) points to the need for further investment in health promotion effort, including exploring and addressing the reasons for early introduction of complementary feeding.

## **Impact**

During the pre-IHSS period (2000-2007) improvements in coverage accounted for an estimated 9,300 lives saved per year. In comparison, the LiST analyses estimated that during the IHSS programme period, an equivalent of approximately 12,700 lives were saved on average per year in Niger. The modelled annual rate of reduction was faster in the IHSS programme period than the years immediately preceding the IHSS programme. Based on the LiST analysis, the interventions that contributed the most to saving these lives were the introduction of the Hib vaccine in 2009, the increase in ORS coverage, children sleeping under ITNs and antimalarial treatment and care-seeking for pneumonia. Childbirth and newborn care, and WASH intervention which are not core IHSS programme interventions, also contributed substantially to lives saved. Given the notable increases

in coverage of these important interventions during the IHSS programme period, it is plausible that IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012. According to LiST, IHSS programme interventions accounted for an estimated 89%, or 56,600, of the total lives saved between 2007 and 2012.

## **Sustainability**

The iCCM services are highly utilised at the CS level leading to high efficiency, with limited avenues for further cost reduction per treatment. With competing demands on government budget as a result of increased security concerns, there is a real possibility that government own expenditure may decrease. Another risk is the uncertainty on whether Heavily Indebted Poor Countries financial assistance will continue. While the debt forgiveness in the early-to-late 2000s was helpful, debt has slowly started growing and if long term interest rates increase globally in the next few years this would have an adverse effect on Niger's debt and possibly cause further contraction of the health budget. Although some financial relief may be brought by the renegotiation of the uranium mining contract with the French company Areva, support from donors for this program will have to remain to ensure financial sustainability, especially with the likelihood of increased demand for services given the country's high population growth rate.

In this context the Global Fund's (GF) new funding model which can support running costs of iCCM systems, as well as providing at least 3 years of secured funding, may ensure the continuity of the program. This will help address issues that also affect organisational sustainability such as supply chain management, a major systems issue that also falls within the scope of the GF new funding model. At a wider level, there is concern amongst various stakeholders about the sustainability of the Free Health Care initiative, due to backlogs in re-imburements. These backlogs also appear to affect the availability of iCCM drugs as these are sometimes used when there are stock outs of adult drugs.

Given the issues of financial and organisational sustainability, the government's planned switch of the iCCM curative role to Relais needs a thorough evaluation to assess whether the additional costs, supervision and logistics requirements, due to the much higher number of Relais, is justified by increased coverage and is sustainable.

## **Lessons learnt**

### **Relevance**

- The successful implementation of the IHSS programme was dependent on a receptive political environment, good collaboration, and alignment with government priorities, MOH leadership, an existing community-based health care platform, and the Free Health Care Policy.
- Without the introduction of free health care, it is unlikely the increased utilisation of iCCM services, to which the IHSS programme contributed, would have occurred in Niger. This is a lesson for other LMICs, about the importance of reducing financial barriers to access, alongside increased delivery of services at the primary care level.
- Promoting gender equity in training of ASCs was achieved, but the gains could not be sustained due to high attrition of female ASCs, most likely due to broader gender dynamics limiting women's roles.



## Effectiveness

- It is also likely that without the support of the IHSS programme, the Free Health Care initiative may not have succeeded, as the iCCM training and free drugs and supplies ensured the delivery of free curative child services at CS level. The relatively high level of service utilisation at CS level may be reflecting the maturing of both the Free Health Care initiative and iCCM (to which the IHSS programme contributed), with enough time for health seeking patterns to start shifting.
- The IHSS programme demonstrated the acceptability and feasibility of an ASC community-based cadre trained in iCCM, in conjunction with health systems strengthening, for delivering life-saving child health interventions.
- The contribution of the volunteer community health worker cadre to child survival is increasingly acknowledged by government and donors, and the IHSS programme contributed to this shift towards embracing an expanded role for Relais.
- The IHSS programme contributed to the substantial improvement seen in quarterly supervision of ASCs.
- The IHSS programme contributed to the reduction in stock-outs, but expiry of drugs at CS and CSI level undermined that improvement.
- During the IHSS programme period, there were significant increases in a range of health preventive and curative services targeted by the IHSS programme, with many of coverage increases being pro-poor, which has plausibly contributed to sustained reduction in child mortality.

## Impact

- Given the notable increases in coverage of important interventions during the IHSS programme period, it is plausible that IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012.
- Due to the specific parameters of the LiST modelling, e.g. not attributing lives saved to specific health service levels, and the parameters of the costing analysis, i.e. calculating additional, not full costs of delivering iCCM, the evaluation did not calculate cost-per-life saved.

## Sustainability

- The high level of utilisation of iCCM in Niger has resulted in a lowering of costs per treatment by decreasing the share of fixed costs by ASCs. There may be further efficiency gains to be made by increasing iCCM utilisation by up to 30%, but given the pressures linked to government budget, it is unlikely that this could be achieved without continued donor support.
- Government plans for an iCCM curative role for the Relais need a thorough evaluation to assess whether increase in coverage can justify the added financial and organisational implications for the sustainability of the program.
- Given the dependence on donor support for the iCCM drug supply, and the increasing pressures on government own funding, the likelihood that the positive results associated with iCCM will continue to be achieved, after DFATD/UNICEF involvement ends, remains unclear.

- Pressures on government funding, amongst these security issues, lack of harmonisation amongst donors and an increasing population, may compromise the government's ability to sustain expansion of access to community-based health care services, making the new Global Fund funding model a condition for its sustainability following the end of the IHSS programme.

## **Recommendations**

### **Relevance**

- Continued donor support is required to sustain the health system strengthening gains made during the IHSS programme, particularly for iCCM drug supply. Such donor support should have a concurrent focus on strengthening the government drug supply systems to promote sustainability of iCCM.
- The higher female attrition rate amongst ASCs requires further investigation, and given the large gender disparities in Niger continued efforts are required to address gender equity in health and more broadly in education and economic empowerment.

### **Effectiveness**

- The supply chain and stock-outs of essential iCCM medicines need to be improved if the gains of the iCCM intervention are to be sustained, especially strengthening stock management at facility level to address the problem of expired drugs.
- Routine health information systems should be strengthened on all levels of the health system, and the current government efforts, supported by UNICEF and the IHSS programme, for the disaggregation of utilisation data to the CS level, constitute an important step.
- Assessment of the quality of clinical care of iCCM should be an ongoing priority, to ensure continuous quality improvement and to prevent adverse events, and will require increased case observation during supervision visits.
- During the IHSS programme period there was stagnation or decline in coverage of important preventive and curative interventions associated with the IHSS programme, such as Vitamin A coverage, anti-malaria treatment, optimal feeding practices in older infants and wasting, and the underlying reasons require closer scrutiny.

### **Impact**

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

### **Sustainability**

- Challenges with receiving reimbursement for Free Health Care delivered at the CS may be negatively impacting on service delivery, and it is recommended that a formal system should be developed to facilitate efficient validation and payment of claims, and funds should be allocated for reimbursement.

- The proposed changes to the PHC platform of delivery should be monitored closely. Up-scaling the package of PHC services offered at the CS level could potentially address major gaps in access to obstetric services (deliveries), neonatal care and reproductive health services (such as ANC and injectable contraception), but consideration should be given to cost implications and the impact on the various roles of ASCs and the Relais.
- To sustain the steady decline in child mortality and to extend these gains to other sectors of the population, it is recommended that future health programmes address high impact interventions in reproductive health and in mother, child and neonatal survival more broadly. Also, consideration should be given to broad-based, inter-sectoral strategies focussing on poverty alleviation, increased food security and nutrition support, including extending free access to health care to the broader population.

# 1. Background

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## 1.1 Country context

Niger is a West African landlocked country, bordering Nigeria and Benin in the south, Burkina Faso and Mali in the west, Algeria and Libya in the north and Chad in the east. It extends over 1.3 million square kilometres, but the vast majority of the country (over 80%) is covered by the Sahara desert, which is sparsely inhabited. The majority of its 17,129,076 inhabitants live in the southern and western parts of the country. Niger has 8 regions with those in the north and north-west (Agadez and Diffa) being the least densely populated and in the south and south west, the regions of Tillabéri, Dosso, Tahoua, Maradi and Zinder (Figure 1). The capital city of Niamey, located in Tillabéri region, has approximately 1.5 million people, approximately 50 % of the population of that region. Figure 1 shows the map of Niger.

**Figure 1: Regional map of Niger**



Since independence from French rule in 1960, the country has undergone a series of political transitions, including three periods of military rule and five newly drafted constitutions. Niger's political system is a democracy with multi-party elections being run regularly since 1993. Most recently, in a peaceful military coup in 2010, then President Mamadou Tandja was ousted, ironically in an effort to restore democracy by preventing an unconstitutional further extension of his political term.

Islam is the predominant religion, practiced by 93 % of the population, with the minority practicing Christianity or African Traditional Religion. The Niger political system is multi-party democracy, with a constitution that guarantees freedom of religion. French is the country's official language, alongside 8-20 indigenous languages, depending on how the closely related languages are counted.

Niger is considered one of the poorest countries of the world, ranking 186 out of 186 on the latest Human Development Index (HDI).<sup>18</sup> According to International Monetary Fund (IMF) ratings, it is amongst the top ten poorest countries in the world, based on Gross Domestic Product (GDP) per Capita 2009-2013.<sup>19</sup> The economy runs primarily on agriculture (which is heavily dependent on climate

fluctuation), livestock, and the export of uranium. The economy of Niger has suffered as a result of continuous droughts, desertification, reductions in the demand for uranium, which accounts for 72% of export proceeds, as well as a growing population.

Until 2011, real GDP growth was around 5% when harvest was fair. Higher future growth is projected due to new mining projects, a planned oil refinery, recovery of uranium prices and renegotiation of the uranium contract. Despite this, almost half of the nation's budget comes from foreign donors. In December 2000, Niger qualified for enhanced debt relief from the IMF for Heavily Indebted Poor Countries (HIPC). This resulted in funds being made available for in country expenditure on health care, primary education, and rural infrastructure. In December 2005, the IMF announced that Niger received 100% multilateral debt relief, with approximately US \$86 million debt being written off; this was in addition to the financial assistance under HIPC.<sup>20</sup> In an effort to align itself with the IMF's Poverty Reduction and Growth Facility Plan, Niger developed a Poverty Reduction Strategy Plan to improve health and educational services as well as infrastructure and judicial restructuring. A subsequent agreement was reached for the 2012-2014 period for Niger to receive approximately US\$123 million under the IMF's Extended Credit Facility.<sup>21</sup>

### **Regional instability and defence**

Niger has a small defence budget, making up approximately 1.6% of government expenditure. Security, however, is becoming an increasing concern in the country and may result in a redirection of resources to the country's defence budget. The unrest in nearby Libya and the Ivory Coast has resulted in over 250,000 migrants returning to Niger, resulting in both a loss of income for many and an increasing burden on the population facing food challenges. The closure of borders with northern Nigeria, as a result of Boko Haram attacks, has affected trade and import of foods between the two countries. Furthermore, the conflict in Mali may also result in an increasing influx of refugees, with the risk of aggravated insecurity in the Tillaberi and Tahoua regions and the displacement of local residents.

### **Lack of food security**

Niger has been experiencing both acute and chronic food insecurity for decades. Drought, extreme heat and locust infestations have contributed to food shortage in 2005 and famine in 2010, the latter affecting nearly half of the population. The country's National Early Warning System estimated that approximately 2.5 million Nigeriens would remain food insecure in 2013.

Economic and food security remains a difficult challenge, with government tax revenues dependent on both the vagaries of climate and the willingness of donors. The food crisis remains a chronic concern, resulting from cereal and fodder production deficits and high food prices within a highly impoverished population unable to cope. This is aggravated by the impact of the political insecurity in the surrounding region and the massive influx of migrants. The IMF conditions of 'free trade' in the region may have contributed to reduced food reserves and escalating food prices, as agricultural products are now traded by the private sector with higher paying neighbouring countries, which may be exacerbating household level food shortages.

## **Population growth, education, urbanisation, water and sanitation**

Niger is experiencing a population growth rate of 3.8% annually, particularly influenced by the highest fertility rate in the world of 7.5 births per woman. In urban areas, the population growth rate is approximately 6.2%, double the national average, in part due to migration into urban areas. Such population growth translates to immense challenges for the state to ensure sufficient resources for the promotion of sustainable development. The high fertility rate in the country is a result of a complex mix of economic, cultural and religious factors. Low levels of education and literacy, predominantly among women, pose challenges in terms of access to, and appropriate use of, family planning.

Niger has one of the lowest literacy rates in the world, with women disproportionately affected, at a 23.2% literacy rate, compared to 52.4% among males aged 15-24 years (UNICEF 2008-2012 estimates). Despite primary education being compulsory in Niger, attendance rates are low, particularly among girls.

The rate of urbanisation in Niger is continuing to grow, rising from 16% in 2001 to 20% in 2010. Should this trend continue, it is estimated that the urban population will make up more than 40% of the total population by 2030. Furthermore, Niger has a young population, where over 45% of the country is made up of people under the age of 20.

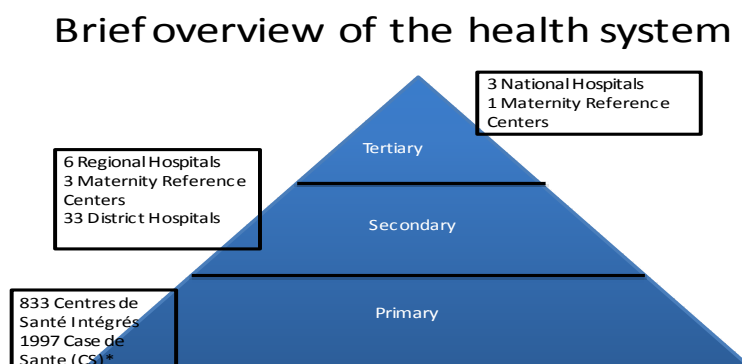
According to the 2006 Demographic Health Survey, the majority of the population did not have access to safe drinking water or sanitation facilities. Access to safe drinking water for urban areas was 93% and for rural areas was 30%, and access to sanitation stood at 38% and 2%, respectively. The combination of these factors impacts directly on the health needs of the population.

### **1.2 Niger's Health system**

The Health Development Plan of 1994 outlined the country's decentralisation plan aimed at creating an operational district level with support from the central level and ensuring community participation. The plan outlined a decentralised health system with three tiers: central management level at the National Ministry of Health (MOH) and management teams at regional and district levels.<sup>22</sup> There are 8 regions and 42 health districts.

Each level is managed by corresponding administrative units, including the health district, the departmental health directorate, and the Ministry of Public Health and central directorates. The first level includes the village health team, together with the Case de Santé (CS), with the next being the Centres de Santé Intégrés (Integrated Health Centers or CSI). The CS, staffed primarily by community health workers or Agent de Santé Communautaire (ASC), is responsible for providing basic healthcare and preventive services. The CSI is staffed mainly by nurses and doctors, who provide health services not requiring hospitalisation. CSIs are categorised as Type 1 or Type 2 depending, in particular, on whether there are maternity facilities. A CS was considered functional if it had at least one ASC delivering a service. According to the latest 2013 census, there were 1997 functional CSs out of the 2432 surveyed, and 429 were closed.<sup>23</sup> There were 833 CSIs in 42 districts (see Figure 2). The secondary level comprises of 33 district hospitals, 6 regional hospitals and 3 maternity 'reference' centres, and the tertiary level has 3 national level hospitals and one national level maternity centre.

**Figure 2: Structure of the health system**



Part of the restructuring and decentralisation of the health system (1995-1996) included what was considered the revitalisation of primary healthcare through cost recovery, following the Bamako Initiative. The Bamako Initiative was a formal statement adopted by African health ministers in 1987 in Bamako, Mali, to implement strategies designed to increase the availability of essential drugs and other healthcare services for Sub-Saharan Africa. In Niger, the piloted cost recovery approach was implemented in order to recover the administrative and drug cost and ensure wide spread coverage of health services. Communities were involved through the establishment of health centre committees, whose members participated in a district health committee responsible for the financial management of the cost recovery scheme. Drugs were purchased from the district pharmacies under the jurisdiction of the wholesaler of the national government [Office National des Produits Pharmaceutiques et Chimiques du Niger (ONPPC)]. Because of frequent stock outs of drugs, districts were allowed to purchase medication from private wholesalers, who often charged much higher prices.

### **Financing of the health system**

Niger's health expenditure in 2011 was funded in significant part (45%) by households' funds as well as private and public employers. Public Health Expenditure was funded on an almost equal basis by the government's own funds (49%) and by donors (51%). Following a significant dip in the government's own health expenditure, partly compensated by an increase in donor funding in 2010, the government's own health expenditure increased again, and the public health expenditure increased significantly in 2011. The reason for this dip in government expenditure is unclear and given the other demands on government budget, it remains unclear if the financing from government's own expenditure will be maintained. Overall, the proportion of national Gross Domestic Product (GDP) spent on the public health expenditure varied little between 2007 and 2011, between 3.4% and 3.1%.

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

Prior to 2007, there was a range of maternal, child and women's health (MCWH) policies, plans and projects implemented to strengthen health services across all levels of care, i.e. community-based, clinic and hospital. This included nurses carrying out outreach work in communities living 5-15 km from a health facility.

In an effort to address extreme challenges with health access and ensure that the population had access to a health structure within 5km of where they lived, the then president committed in 2001 to creating 1500 CSs and training ASCs to become operational at these posts. The majority of the funding for the development of the CSs (87%) was accessed through the HIPC funds. ASCs were trained and placed in these CSs, as salaried employees (50 000 CFA, approximately 100 US dollars per month). This was funded in part by money freed up from programmes aimed at debt-relief for poor countries referred to earlier.

The CSs were responsible for providing a minimum package of largely preventive health services. The Ministry of Health (MOH) was responsible for the infrastructure and equipment needs of the CSs, while the community took responsibility for the first round of procurement of medicines, using out of pocket funds or with support from NGO/donor funding. The village was also expected to contribute some infrastructure and maintenance. They were responsible for building a house for the ASC (adjoining the CS) and for the greening and upkeep of the area surrounding the CS.

UNICEF, through the Accelerated Child Survival and Development Strategy (ACSD) 2002 to 2004, was involved in supporting these initiatives, including increasing access and improving services for antenatal care, improved obstetric services, PMTCT, nutrition and treatment of malnutrition, immunisation campaigns and training of nurses in Integrated Management of Childhood Illness (IMCI). At that time, the ACSD focused on a broad range of development areas that targeted several of the Millennium Development Goals (MDGs) beyond health: the integrated basic services (water and sanitation), gender inequity, promoting child protection and child rights, improving quality of primary care education and enrolment of girls, facilitating health and nutrition policy making, assisting with initiatives to strengthen birth registration, monitoring and evaluation mechanisms, decentralising health system governance, and restructuring of the health department.<sup>24</sup>



## 2. Object of Evaluation: The IHSS programme

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By 2007, the majority of ASCs in Niger were already in place in CSs, implementing mainly preventive interventions for children and adults. While they may have been allowed to treat malaria and diarrhoea by 2007, there is no data indicating that they were in fact doing so to any significant degree at the population level. They were not allowed to treat pneumonia and give injections or prescribe antibiotics, as this was outside the scope of this cadre of worker. In 2007 an iCCM training guide was developed and training of ASCs in iCCM officially began. In 2008, the focus on community-based child survival was achieved with the adoption of the National Child Survival Strategy, where iCCM was acknowledged and provision was made for ASCs to treat pneumonia. The scale up of iCCM in Niger took place once funding from UNICEF/DFATD through the CI/the IHSS programme enabled the training of ASCs in iCCM between 2007 and 2013. UNICEF support through the IHSS programme was implemented nationwide in the country's 8 regions, with a particular emphasis on rural/hard to reach areas. In 2006, in the pre-IHSS period, there were 2,052 CSs (of which 1,594 were functional with ASCs in place), and this grew to 2,432 (with 1,997 functional) in 2013.<sup>23</sup> Table 1 below shows the interventions included in the IHSS programme, those funded by the Catalytic Initiative grant and those with matching UNICEF funding in Niger.

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

IHSS focused interventions	Activities supported by the IHSSgrant	Activities supported by UNICEF matching fund
Integrated Management of Childhood Illnesses	<ul style="list-style-type: none"> <li>-Training of ASCs in iCCM</li> <li>-Supervision and monitoring,</li> <li>-Development and printing of training materials</li> <li>-Basic drugs availability and improved capacity of community health workers for proper treatment of the illnesses</li> </ul>	<ul style="list-style-type: none"> <li>-Training of ASCs in iCCM</li> <li>-Training nurses/clinicians in IMCI prior to IHSS</li> <li>-Procurement of drugs for malaria, diarrhoea, and pneumonia</li> <li>-Screening for malnutrition</li> <li>-Provision of refresher training to health workers in iCCM and IMCI</li> </ul>
Immunisation	<ul style="list-style-type: none"> <li>-Reach Every District (RED) approach (five operational components for improving immunization coverage)</li> <li>- Through integrated interventions (immunisation, Vitamin A supplementation, nutrition screening)</li> <li>-Training of health workers on RED approach and Expanded programme on Immunisation (EPI)</li> <li>-Support for micro-planning</li> <li>-Support for mobile teams/outreach activities</li> <li>-Provision of cold chain equipment</li> <li>-Training of health workers in immunisation techniques</li> <li>-Organisation of immunisation sessions targeting hard to reach populations</li> </ul>	<ul style="list-style-type: none"> <li>-Organisation of advanced immunisation sessions in hard to reach populations</li> <li>-Training of health workers in RED strategy and EPI</li> </ul>
Antenatal and Neonatal Care	<ul style="list-style-type: none"> <li>-Supply of long lasting impregnated mosquito nets, iron and folic acid, de-worming tablets, sulfadoxine/ pyrimethamine for IPT and toxoid tetanus vaccines.</li> <li>-Training of health workers in revised antenatal consultation guidelines and community case management of newborns</li> <li>-Provision of newborn kits to community health workers</li> </ul>	<ul style="list-style-type: none"> <li>-Training of health workers in revised antenatal consultation guidelines</li> <li>-Procurement of drugs provided during ANC: ferrous folic acid, sulfadoxine-pyrimethamin, of albendazole LLIN</li> <li>-Training of health workers in newborn care and emergency obstetric care</li> </ul>
PMTCT	<ul style="list-style-type: none"> <li>-Access to HIV testing and counselling during ANC</li> <li>-Provision of nevirapine and AZT at district level</li> </ul>	<ul style="list-style-type: none"> <li>Access to HIV testing and counselling during ANC</li> <li>-Provision of nevirapine and AZT at district level</li> </ul>
Behaviour Change	<ul style="list-style-type: none"> <li>-Training of health workers and Relais on Key Family Practices (KFPs), including: breastfeeding, use of mosquito bed nets and ORS (Oral Rehydration Salt), hand washing</li> <li>-Integrated Communication involving national radio channel, TV, local community radio channel, Traditional leaders, Religious leaders and community volunteers</li> </ul>	<ul style="list-style-type: none"> <li>-Training of health workers and Relais on Key Family Practices (KFPs), including: breastfeeding, use of mosquito bed nets and ORS (Oral Rehydration Salt), hand washing</li> <li>-Integrated Communication involving national radio channel, TV, local community radio channel, Traditional leaders, Religious leaders and community volunteers</li> </ul>

## 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>2</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>3</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 Niger.
2. To inform programme and policy decisions in Niger and regionally.

#### Objectives

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

#### Relevance:

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

#### Effectiveness:

- Strengthening the health system, including all six health system building blocks namely health workforce, service delivery, information, supplies, financing and leadership/governance.<sup>25</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 IHSS programme.

## **Sustainability:**

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

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

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

Plausibility for this evaluation was defined as “apparently true or reasonable, winning assent, a plausible explanation”.<sup>26</sup> As defined by the OECD-DAC,<sup>27</sup> attribution represents “the extent to which an observed development effect can be attributed to a specific intervention or to the performance of one or more partners taking account of other interventions, (anticipated or unanticipated) confounding factors, or external shocks”.

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

- Non-existence of true comparison areas due to the national scale of the programme.
- Lack of feasibility of a randomised intervention/control design due to political and ethical considerations.

Geographically, the scope of the external evaluation includes all regions of Niger as the programme is national. Temporally, the scope of the external evaluation included the period 2000-2007 (secular trend) prior to the start of the IHSS programme, the period 2007 to 2010, known as Phase I of the program, and the period 2010 to March 2013, known as Phase II of the program.

### **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>1</sup>

### **3.5 Intended Audience**

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

## **3.6 Research Questions**

### **Relevance**

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

- a. alignment with the health policies, planning and health surveillance of the Government? and
- b. training, equipping, deploying and supervising front-line health workers to deliver the selected high impact and low cost health interventions?

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

### **Effectiveness**

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

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

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

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

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

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

### **Impact**

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

### **Sustainability**

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

11. What is the cost of increased utilisation?

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

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

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

## 4. Methodology

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

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

The Niger country evaluation framework was based on a preliminary country logic model (Appendix B), which was developed following a desk review. The review highlighted several issues for exploration during the country visit which had not previously been explored and were expected to make a unique contribution to documenting lessons learnt from this. Niger provided an opportunity to explore a community-based health model where there are two levels of community-based workers, one formalised and the other an informal and volunteer cadre (Relais). Niger also has full iCCM roll-out with the longest duration of all the IHSS programme countries. It, therefore, provides an opportunity to evaluate the impact of a somewhat more mature iCCM.

### 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 Niger Demographic and Health Survey (DHS) 1998, 2006, 2012; Multiple Indicator Cluster Survey (MICS) 2000; and the Mortality Survey 2010. The end line data source was the 2012 DHS. For the anthropometric data, the 1998, 2000 and 2006 z-scores were re-calculated using the 2006 WHO growth reference standards to be comparable with the 2012 DHS. Datasets were available for all the three DHS and the MICS. However, only point estimates of the coverage of included trend indicators were available from the Mortality Survey.

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. This was not conducted across wealth quintiles as only the 2006 and 2012 DHS surveys began to collect wealth information, and, as a result, there were insufficient data points for the trend analysis. Trend analysis was performed on data for both the national and rural areas, as implementation of iCCM

through UNICEF/DFATD support was done at a national scale with a particular focus on areas further away from established health centres, likely to be the more rural areas of the country. The complex sampling design of these 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. 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 any were observed), coverage levels in the implementation areas (rural areas) were compared with the national coverage levels over the period of implementation for which data were available (2006 to 2012). Taking into consideration that the majority of the population (>80%) live in rural areas, this comparison serves as a reflection of the scope of implementation at a national level. Furthermore, we assessed whether there was a significant difference in the average annual rate of change in coverage of pertinent indicators in the rural areas between the pre-IHSS period (1998/2000-2006) and during IHSS programme implementation (2006-2012). The 1998 DHS survey was used as the baseline data point in this comparison when data was available, but given that this survey was conducted on children less than 3 years of age, the MICS 2000 served as the baseline for indicators that pertained to children aged 5 and below. We assume linear rates of change, which we simply calculated by subtracting the end line point estimate from the baseline point estimate, divided by the total number of years within the time period of analysis. Using the statistical formulae for variance and confidence intervals for proportions, we calculated these for rate of change. In order to assess whether the annual rates of change within the relevant time periods were significantly different from each other, the 95% confidence intervals around the changes are reported.

It is important to note, however, that the time period of analysis utilised to capture IHSS programme implementation did not capture the entire period of implementation, as the DHS survey conducted in 2012 was prior to the end of the programme (2013).

Contextual factors, such as implementation strength (extent of drug stock-outs, supervision) and relevant data from qualitative interviews, were also considered. Where the contribution of the IHSS programme is not clear this has been stated.

Data to assess implementation strength, utilisation and quality of care were taken from routine data collected by UNICEF as well as the newly conducted 2013 Census of Case de Santé and Centre de Santé Intégré<sup>23</sup> (referred to as 2013 Census in this report). The indicators reported are aligned with the global iCCM indicators of the Expanded Results Framework.<sup>6</sup>

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

We used the Lives Saved Tool (LiST) to investigate the extent to which changes in child mortality could be attributed to changes in intervention coverage at the national level. Rural projections were also run but the national results are presented here. The scope of the IHSS programme was not exclusively rural, with policy change and increases in staffing and training also benefitting urban centres. The population of Niger is predominantly rural (80%) so the national and rural averages are similar. The rural LiST analysis required many assumptions, namely rough estimates of rural population and annual births in rural areas. Some of the input data, such as cause of death, is not available at rural level.

Mortality rates, in particular, are less precise for rural areas as they refer to the past ten years (compared to the past five years for national) and cover the entire period of implementation.

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>28</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>29,30</sup> The Niger analysis was done with Spectrum version 5.01 beta 23.

### Data sources

A full list of all indicators collected for coverage and LiST analysis can be found in Appendix C. Data sources for the coverage analyses included the Niger Demographic and Health Survey (DHS) 1998, 2006, 2012; Multiple Indicator Cluster Survey (MICS) 2000; and the Niger Survival and Mortality Report 2010. While all household surveys were considered for coverage and trend, the LiST analysis includes only the 3 DHSs because they had the majority of indicators under consideration and allowed for greater comparability across the periods of implementation.

Using household survey data as described above, we used the LiST to investigate the extent to which changes in under-five mortality could be attributed to changes in intervention coverage. We forecasted changes in under-five mortality over two time periods:

- Prior to the start of the IHSS programme programme: under-five lives saved between the year 2000 and the start of IHSS programme implementation (2000-2007).
- IHSS programme implementation: under-five lives saved between 2007 and 2012.

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

Indicator	Source
Population and annual births	World Population Prospects, 2010 revision
Total fertility rate	DHS 1998, 2006, 2012
Stunting, wasting rates	DHS 1998, 2006, 2012
Cause of death	CHERG trend analysis
Mortality (under-5, infant, neonatal)	DHS 1998, 2006, 2012

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. Coverage data from the 1998, 2006 and 2012 DHSs 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.



### 4.1.3 Costing

This evaluation has quantified both the additional cost incurred by the health system and the estimated under-five lives saved due to changes in coverage of healthcare interventions.

A cost-per life-saved was not calculated, for several reasons:

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

The costing in this evaluation focuses on additional costs incurred by the health services, for the treatment of MDPs in children under-five, if carried out according to protocols. This does not represent the full cost of iCCM, or the actual costs of the IHSS programme. The design of the financial system in the public health sector does not allow identifying amounts spent on specific programs, nor on specific levels of care like the CS level.

The costing component, for the purpose of this evaluation, addresses the following question: What are the additional costs incurred by the health services (including donor funding) due to the introduction of the curative interventions by ASCs for the treatment of malaria, diarrhoea and pneumonia in children under 5? For the purpose of the costing, iCCM will refer to children under five years old.

Costs are incurred in two 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 iCCM is rolled out to new districts. These costs can be very significant, but they are not included in the costing because they will not be incurred again, and including them would artificially inflate the cost of iCCM scaling-up and distort calculations on its sustainability.
- Implementation/running phase. This is the focus of this costing.

The implementation of iCCM takes place in the context of existing health services with pre-existing funding. The Table below shows which costs are included in the costing exercise.

The focus on additional costs is to ensure that costs are not double-counted when put in the perspective of the existing health budgets and assessment of sustainability (Table 3).

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

Costs NOT Included	Costs Included
Initial one-off design costs for iCCM	iCCM training for ASCs
Salaries of ASCs and supervisors	iCCM training for ASC supervisors
Basic training of ASCs and supervisors	Mentorship training for health facilities mentors
Bicycles for ASCs and 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

The 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. Annualising costs, thus, allows the assessment of the average financial implications across the years. Table 4 below demonstrated the impact on the annualised costs of having to replace different types of equipment at different times.

**Table 4:** Annualised cost of ASC Equipment

Content	Unit Costs \$	Life Years	Annualised Cost
Bag	NA		
Thermometer	2.0	1	2.0
Chronometer	0.7	2	0.4
Salter Scale	13.8	5	2.8
Electronic Scale	124.4	5	24.9
MUAC tape (pack of 5)	3.4	2	1.7
iCCM Registers	42.0	2	21.0
IMCI tables book	42.0	2	21.0
IMCI training book	16.0	2	8.0
Total			81.7

- The iCCM training cost per ASC: Initial training has been allocated 5 life years, to reflect the absence of refresher training. An annual attrition rate of 3.75% was applied.
- ASCs kit: equipment, excluding consumables, expected to need replacement after 3 years.
- Supervision and management costs included:
  1. The iCCM training for ASCs' supervisors. As for ASCs, an annual attrition rate of 7.5% was applied, and training was allocated 5 life years.
  2. Overheads of 5% of the annualised costs, to cover administration and distribution costs.

Annualised fixed costs per ASC are then calculated by treatment by dividing the annualised fixed costs per ASC by the number of treatments per ASC in 2012. Data from year 2012/13 was chosen because it represented the highest level of activity and the highest number of ASCs trained.

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

- Costs of Drugs and Rapid Diagnostic Tests (RDT) for each of the three treatment conditions. For malaria, the number of RDTs per treatment is weighted by the positivity rate in Niger, which stands at 67%.

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

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

**Two costing outcomes will be presented.**

- Additional cost of iCCM (Basic): the minimum costs associated with the introduction of the iCCM
- Additional cost of iCCM Plus (iCCM+): this factors in a portion of the costs associated with those required for health systems strengthening interventions necessary to allow for the implementation of iCCM, e.g. some Integrated Management of Neonatal and Childhood Illness (IMNCI) training, some logistics set-up, and demand creation. An average 15% increase in iCCM costs was modelled to give the cost of iCCM+. This value is based on estimated costs of health system strengthening inputs but will vary over time and between regions, depending on the existing capacity before introduction of iCCM and on the maturity of iCCM services.

In order to assess whether a higher number of treatments per ASC was possible, the time spent on the iCCM was calculated in the following way:

- The number of treatments was increased by 20% to reflect the number of visits. During the period under study the routine monitoring system did not separate visits at CSIs and visits at CSs. Knowing that some visits do not translate into treatment, e.g. in cases of malaria negative results, whilst still requiring ASC time, we assumed that 20% of visits did not translate into treatment. Such an assumption will need to be tested with additional research.
- The length of a visit at the CS was set at 30 minutes
- An average of 3 hours per month was allocated for the iCCM share of supervision and going to the CSI for refilling of kits. These 3 hours do not represent all the time on meetings but rather the share attributable to iCCM.
- We assumed that an ASC worked an average of 46 weeks per year.

**Scenario for increase in coverage:**

- Increase in the number of treatments per existing ASC per year: increases of 15% and 30% were modelled to assess the impact of efficiency gains.

### **Financial sustainability of iCCM:**

- iCCM Basic and iCCM+ additional costs (2012) are calculated as a percentage of total public health expenditure (government + donors) and as a percentage of government's own health expenditure. Data on public health expenditure was extracted from the World Databank.
- Similar calculations are made for an increase of 30% of treatments scenario.

The number of ASCs deployed and number of children treated per ASC were extracted from UNICEF 2013 CI Report Main Tables (Master) (July 2013)<sup>31</sup>. Training costs were provided by UNICEF Niger Country Office.

## **4.2 Qualitative data sources and analysis**

The country visit took place from the 8<sup>th</sup> to the 17<sup>th</sup> of April 2013 in the capital city of Niamey and surrounds and in Maradi region. Individual interviews and focus group discussions (FGDs) were held with UNICEF staff and a wide range of donor partners, representatives of the Nigerien National and Regional Ministry of Health in Niamey and Maradi, district health managers and health workers at CSIs and at CSs, including ASCs, nurses and doctors, and management staff in nutrition and malaria programmes. The locations for the evaluation were restricted to city of Niamey and to specific sites in the Maradi region due to security concerns, which limited the ability to travel freely, as well as due to the limited time available for the country visit. The Maradi region has a long history of NGO activity and use of ASCs and was chosen as an example of best practice in a rural area.

Informal conversations occurred with the Relais, a volunteer cadre and with a village chief. For a full list of interviews refer to Appendix D. The list of potential interviewees was discussed in advance with the UNICEF country team and colleagues who were knowledgeable about Niger. The Niger country office in Niamey assisted the team in pre-scheduling appointments. In compiling this list consideration was given to gaining as wide a range of opinions as possible so as to ensure a fair representation of how the IHSS programme was experienced in Niger. The interviews were conducted by one or more members of the country field team.

Niger is a French-speaking country and the team used the services of interpreters for most interviews. The health economist in the team is a native French speaker, which helped greatly with communication and establishing a rapport. Two other members had a basic command of French, and this assisted the team with note-taking. For most interviews there were two MRC members and a translator. The team used the services of three translators who were not connected to the UNICEF office or to the Ministry of health. Extensive notes were taken during the interviews, and in most cases the interview content could be triangulated between at least two interviewers. One of the interpreters was a final year medical student with useful insights into the health systems and services and was invited to two debriefing sessions. This provided another opportunity for triangulation of data.

Interviews took place either at the offices of the interviewees, at the CSI or at the CSs. The detailed notes were typed up and double-checked for accuracy by two members of the country team. 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, reflections from the annual reports, review of documents collected from the country visit and peer-reviewed literature on Niger. 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**

##### **5.1.1.1. History of community-based preventive health care**

Niger has a long history of promoting access to health services through community-based systems that evolved from volunteer health workers. The existence and rationale for the cadre of community volunteers precede the Bamako Initiative in 1987, with volunteer work programmes in the late 1960s. Village health teams, primarily in the Agricultural Department and the Maradi project (run by an NGO), existed in the 1970s.<sup>32</sup>

As shown in the timeline in Appendix A, between 1995 and 2000, the Nigerien government introduced a series of policies and plans to promote PHC and access to community-based health services. This was done on several levels: nurses visiting villages and households (before the ASC cadre was established), community participation in cost recovery of clinic fees, establishment of CSs to provide basic health services closer to villages, and through creation of community health workers who were initially placed at the clinic level and later staffed the CSs. In 1999 a law formalised the establishment of physical infrastructure (through CSs) and formalised the promotion of community participation. Community participation was in the form of village health committees, whose members helped with the building and maintenance of these CSs, the housing for the health worker and selection of ASCs.

By 2000, Niger had made plans to expand health coverage to ensure that the proportion of the population living within 5km of a health centre increased from 32%. At the time, the district development plans included the establishment of CSs and integrated health centres, to offer a minimum package of services, as well as referral hospitals at the district level. In November 2005, a MOH orientation and planning workshop with stakeholders from the district and community levels resulted in an agreement between the health authorities and political and traditional structures key to implementation, including securing technical and financial support. By the time the iCCM was ready for implementation in Niger, the country had already created and trained a cadre of community workers, the ASCs, who would be integral in its roll out.

In the pre-IHSS period, the percentage of the population living within 5km of a health facility increased only marginally, from 40% in 2002<sup>33</sup> to 41% in 2006.<sup>34</sup> By 2006 there were 2052 CSs, of which 1594 were functional.<sup>34</sup>

### **5.1.1.2 Policy shift to integrated community case management (iCCM)**

Prior to the IHSS programme, the package of services offered by ASCs was largely focused on health promotion and prevention, including encouraging utilisation of clinic services for sick children and adults, but included treatment of malaria and diarrhoea. This changed in 2008, when there was a policy shift to allow ASCs to provide further curative care for children, including antibiotic treatment for pneumonia. UNICEF and MOH stakeholders indicated that the Catalytic Initiative program played a key role in the policy development process that culminated in the acceptance of iCCM and formalised 'integrated' community case management. UNICEF had been advocating for ASCs to provide curative care for some time, but in the early years of 2000, the idea of community based curative care for children was met with opposition by health professional bodies and the government, and was not adopted by the Ministry. With time, following a short pilot of iCCM in two health districts in 2006, and further advocating by UNICEF, the MOH agreed to expand the scope of work of the existing cadre of ASCs. The positive results from the pilot in 2006 resulted in an increased commitment by the country to invest in community IMCI. iCCM was thought to be well aligned with the MOH policy shift towards community-based child care. According to a MOH official, child survival constitutes a large component of health activities in the country. His view was that child survival programs are used as a driver for development in the health services:

*"Child survival is the sort of motor for our health system."* (MOH official)

### **5.1.1.3 Policy to expand access to maternal and child clinic services at CS level**

The MOH is in the process of reviewing its policies regarding community-based care and is proposing a few key changes to increase access to higher level services at the CS level, which will have major financial implications. There are plans to eventually place one nurse in each CS, alongside an ASC, and to expand the package of services to include deliveries and neonatal care. CS infrastructure and equipment will be upgraded to allow for deliveries. By 2012, roughly 8% of deliveries were already taking place at the CS level.<sup>35</sup> Already 25% of CSs have a nurse, and this allows for onsite supervision of ASCs where both cadres are in place. In addition, ASCs will be trained to provide immunisations, neonatal care and to assist the nurse with deliveries. The IHSS programme's efforts contributed to acceptance of the role of lay health workers and, thus, to efforts to expand their roles.

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

There appears to be a close collaboration between UNICEF and the MOH decision-makers and officials, as reported by both parties and by other NGOs. Collaboration over a number of years involved joint projects and high level engagement with the Ministry on policy development for maternal and child health. MOH officials interviewed noted the good quality of their relationship with UNICEF, especially their responsiveness to needs and their flexibility:

*"UNICEF listens to us, and they are responsive to our needs."* (MOH official)

It would seem that the Niger government and the MOH were, for many years, neither in favour of focusing on child survival nor in favour of ASCs providing curative care such as prescribing antibiotics. The reason for this reluctance is not clear, but appears to be related to a caution about extending the largely preventive role of ASCs to provide curative child care, as well as due to concerns of antibiotic abuse by ASCs in Niger in the past. Another point of contention, reportedly, was a difference of opinion

with donors about focusing on broader maternal child and women's health (MCWH), including mother survival, versus focusing on one aspect, such as child survival.

UNICEF credits its engagement and advocacy with MOH over a period of years as the reason for the shift to acceptance of iCCM. A workshop in Dakar in 2005, followed by another in 2006, reportedly facilitated a positive shift towards accepting the idea of using community health workers to provide curative care for children. UNICEF already had a working relationship with MOH and was involved with funding, and training, of nurses in IMCI, which laid the foundation for nurses at CSI to be able to supervise ASCs at CS level.

Prior to the implementation of the IHSS programme, the MOH appeared to have had a broader focus on mother, child and women's health policies as per the Population Policy Plan released in 2007. The main objective of the policy was to contribute to poverty reduction through reproductive and population health strengthening.<sup>36</sup> The bigger goal of the government of Niger was to establish a functional community-based (ASC) platform that could be built upon to deliver not only iCCM, but also strengthen maternal, child and neonatal services. The next phase of iCCM will determine if this bigger goal will be achieved.

The timing of the IHSS programme funding, coinciding with the time of the introduction of the Free Health Care Policy,<sup>7</sup> allowed the MOH to respond to the dramatic increase in utilisation by providing training for a curative service for children, as well as free drugs, at the CS level. According to UNICEF officials, the scope, the duration and timing of the DFATD funding had indeed had a 'catalytic' effect in terms of iCCM. The medium term (5 years) funding from DFATD was central to UNICEF's ability to advocate for iCCM, to support the policy shift in the MOH, and to initiate, plan, implement and scale up the iCCM. This security of 5 years funding was very positively highlighted by the MOH, as opposed to short term funding from other donors, which would not allow for appropriate planning of new programmes.

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

There are large gender disparities amongst males and females in Niger, with women being nearly twice as likely as men to be illiterate, combined with early marriage and early childbearing. The reason for these disparities is thought to be a combination of socio-economic factors and traditional/cultural or religious beliefs associated with a patriarchal system.

Although the MOH does not appear to have a defined policy for gender balance in recruitment of ASCs, the IHSS programme objectives addressed this issue in training of ASCs. The IHSS programme contributed to women's participation and a gender equity approach with more than half (58%) of the total ASCs trained in iCCM being female. This is a substantial achievement, given the lower levels of women's access to education in Niger. However, attrition amongst females appears to be higher, as only a quarter of ASCs deployed in 2013 were female. This information was made available from the 2013 Census of CSs and CSIs and the timing did not allow for further investigation of the underlying reasons. Nevertheless, one could speculate, that the social, cultural and economic inequalities facing women in Niger, may in large part be responsible for their attrition following the ASC training. Previous studies have indicated how these gender dynamics influence and restrict the agency of women in relation to health care seeking,<sup>8,9</sup> and it may be that these factors extend to their ability to take up and retain employment as ASCs.

Studies have drawn attention to the importance of exploring the role of gender dynamics in leading to health service user outcomes, including influences on child health and nutrition outcomes and service utilisation. Women's bargaining positions and their access to and control over resources is often limited, which limits their ability to seek not only health care, but also other resources for development, such as education and economic opportunities. Recommendations emerging from these studies emphasise the need to develop interventions that address gender dynamics. Interventions found to be effective in addressing gender dynamics include service delivery that 'involve making services more accessible to carers of children; interventions which have included a focus on accessing households directly through home visits or that address barriers to reaching facilities and seek to mobilize and engage communities have been effective in improving child health and nutrition outcomes'.<sup>9</sup> These important components of promoting gender equity in health service access are captured in the activities of the IHSS programme. Other broad-based recommendations to improve gender equity include developing opportunities for promoting women's access to educational and financial resources.<sup>8,37</sup>

Despite these gender disparities for the majority of the population, women are not excluded from leadership in government. There is female leadership in management at all levels of the health service, from MOH to regional to district level and clinical governance level. For instance, the top health officials in the MOH in the Reproductive Health Directorate and the child health divisions are all female. Some health managers of CSIs are also female and a MOH official expressed the wish to have gender parity for the Relais cadre.

## **5.2 Effectiveness**

### **5.2.1 Availability and access (infrastructure, Free Health Care policy, human resources, supplies and commodities)**

#### **5.2.1.1 Expansion of Cases de Santé infrastructure**

Government and donor partner investment in, and rehabilitation of, community-level health services resulted in increased accessibility to basic health services via the CS. As mentioned earlier, in the pre-IHSS period, the percentage of the population living within 5km of a health facility (CS or CSI) increased marginally, from 40% in 2002 to 41% in 2006. During the IHSS programme period this proportion increased to 48% in 2012. There was an increase in the number of functional CSs during the IHSS programme period. Although the number of functional CSs dropped between 2012 and 2013 (2242 CSs functional in 2012<sup>35</sup> and 1997 functional in 2013), there was an increase of 402 functional CSs during the IHSS programme period (from 2006 with 1594 functional CSs to 2013 with 1997<sup>23</sup> functional CSs).

The IHSS programme contributed to this expansion of the service delivery platform by providing the ASCs with iCCM training, drugs and equipment, thereby ensuring that functional CSs could deliver a service to children under five years old.

#### **5.2.1.2 Expansion of access through support of the Free Health Care policy**

In 2006, the then president of Niger announced a Free Health Care Policy,<sup>7</sup> offering free health care for children aged 5 and below and for pregnant women. Prior to this, since 1995 patients were required to pay for basic PHC health services and for drugs. The Free Health Care Policy resulted in a



major increase in utilisation of health care services (estimated doubling to tripling utilisation) for children and pregnant women at all levels, including the CS, clinic and district hospital levels.<sup>38</sup>

Respondents noted that the implementation of the Free Health Care Policy was not well planned and resulted in a range of effects, including unanticipated increased utilisation and, thus, lack of preparedness of facilities as well as patients seeking health care inappropriately at higher levels of care. A MOH official explained that although the decision to implement the Free Health Care policy was a political one, the underlying reason for it was to address the financial barriers of poverty:

*“The decision to make health care free was a political decision made without any planning... The first reason the president made this decision was because of the level of poverty in Niger. There were many paediatric deaths due to a lack of access... mothers did not seek care even if they were close to the health facility due to financial barriers.” (MOH official)*

The Free Health Care Policy removed some financial barriers to health-care access for those living near a CS or a CSI. The policy, which eliminated user fees for pregnant women and children under- five just prior to the start of the IHSS programme, would not have been effective without the health systems strengthening support of the IHSS programme. The IHSS programme made a significant contribution to ensuring the functionality of the CS, through training, supplies, and supervision, and even some CSI, and thereby increased geographic access to health-care for women and children. UNICEF/DFATD assisted the process by not only providing free drugs but also a parallel supply chain system for storing and transporting the drugs to districts.

**Box 1: Role of UNICEF in Niger**

*“UNICEF was the first partner that helped implement this (Free Health Care) - they did this by giving supplies in the health centre.” (MOH official)*

*“Niger was already in the process of developing the Case de Santé and community health workers. There was a presidential decision to make healthcare free. They then had to put planning in place to make sure this could be implemented. So the Catalytic Initiative arrived just at the right time to ensure that the Case de Santé could actually function.” (UNICEF official)*

*“Prior to the Catalytic Initiative there were insufficient drugs and resources to provide appropriate training and good supervision.” (UNICEF official)*

It is also not clear to what extent the government is able to continue to afford free health care as there are major backlogs in reimbursing CSs for the free consultations. Government gives reimbursements to health facilities (CS and CSI) for the cost of the consultations for children under five and pregnant women. With Free Health Care for children under five and pregnant women, the drugs for children are supplied by UNICEF/DFATD and are issued free of charge to the patients. The government then reimburses the CS or CSI for the cost of the consultation. There is disagreement as to whether the delay in reimbursements is due to the government questioning the validity of some of the reimbursement demands, a lack of government funds, or a combination of the two.

Facilities use the income they receive from adult services, and services for children older than 5 years, to purchase drugs for this patient population. It emerged from our qualitative findings that when

health facilities do not have sufficient funds to purchase the adult drugs, reportedly due to delay in reimbursement from government, they do a form of internal cross-subsidising. They dip into their free supply of children's drugs and dispense this to adults, adjusting the dosages appropriately. This then leads to stock-outs of children's drugs, resulting in parents being issued with prescriptions for medicine which they have to fill at private pharmacies at their own expense.

Delays in reimbursement have been identified as the cause of stock-outs of medicines at CSs and health centres as they are left without sufficient resources to buy new stocks of adult drugs. Other reasons for stock-outs will be discussed later in this section. Regardless of the reasons, the stock-outs of drugs for children are likely to limit the utilisation of the iCCM services, as prescriptions to purchase the drugs elsewhere represent another financial barrier. For others the cost of travel and time to a point of service delivery remains high as geographic access is not completely achieved in Niger.

### **5.2.1.3 Human resources**

#### **Doctors, nurses and midwives**

The health worker ratio per population falls far below World Health Organisation's (WHO) minimum staffing requirements. In 2010, Niger had a projected shortage of 12838 doctors and 43678 nurses and midwives for 2020. However, when using earlier WHO ratios, these shortages were less dramatic, with a projected shortage in 2020 of 1783 doctors and just over 3000 nurses and midwives.<sup>39</sup> Either way, there is clearly a need for extensive training or recruitment of clinicians to meet the standards based on forecasted population growth rates. Nurses, who are permanently employed by the state, are paid US\$450 at the CSI.

Nurses were trained countrywide in IMCI between 2010 and 2013. UNICEF/DFATD funded and facilitated this training and was involved in training master trainers from the MOH who conducted the training in regional centres across the country. By 2013, a total of 294 nurses had been trained in IMCI. Currently IMCI training is integrated into the regular curriculum of nurse training.<sup>10</sup>

Although the integration of IMCI into basic nurse training was seen as a positive step, a concern was raised by UNICEF staff that the IMCI training nurses currently receive may not be sufficient to enable them to provide the ASCs with supervision for iCCM.

#### **Agents de Santé Communautaire (ASC)**

The new cadre of lay health workers, the ASC who staff the CS, received three months of basic health care training and three months practical training, usually at a CSI that is closest to the CS where they were deployed. The six months of training is provided and funded by the MOH and does not include iCCM training. The ASC cadre based at the CS is a paid community-based lay health worker, with a monthly salary of approximately US\$100 (50,000 CFA). ASCs are not on the formal government salary system, but they are paid by the municipalities via a grant from the state. Initially, there was a cost recovery system based on user fees, and salaries for ASCs were expected to come through revenue generated by the CSs. However, limited attendance and the high levels of poverty made this challenging. As an alternative, the ASCs obtained their salaries from HIPC funds paid by the state.

As mentioned earlier, a functional CS is defined as having at least one ASC and, where possible, support from a volunteer community health worker (Relais). The policy was that the first ASCs were

selected by, and within, the community itself. From our observations, it was not clear to what extent this practice is still in place. Women were particularly encouraged for the role.

In 2008, the package of services expanded from mainly preventive care for maternal and child health (MCH) to include curative care for children through iCCM. This required policy changes to allow ASCs to administer antibiotics. As mentioned previously, the IHSS programme played a role in strengthening access to curative child services, through the training of the ASCs and provision of drugs and equipment.

The ASC workload includes children under 5, older children and adults. According to a MOH regional manager, the time spent on adults and children is roughly equal:

*“At least half of work load is for minimum package of services for children, but they do see some adults as well who accompany children.”* (MOH regional manager)

Niger is embarking on a process of increasing the capacity of the CS level to provide an extended package of services, necessitating a change in staff profile. A long term plan is to place nurses and midwives at the CS to allow for an expansion under the package of services delivered at this level, including the delivery of babies. By 2012, an estimated 25% of CSs were staffed by a nurse and/or midwife. Further criteria for being classified as functional are being developed. These include services being available 100% of the time, the facility not reporting any stock-outs of essential drugs and equipment, the facility having at least one ASC and being supported by a Relais, ongoing outreach vaccination campaigns and health promotion activities being undertaken with the support of Relais, appropriate recording of data and reporting to the national health information system.

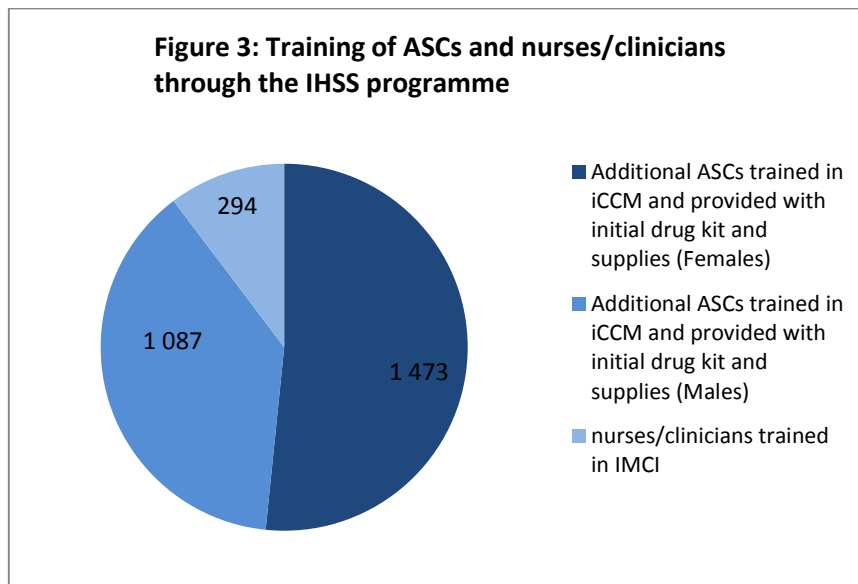
#### **5.2.1.4 ASC Training**

ASCs are required to undergo two types of training. The first is the basic health training which is usually six months, with three months being content-based and three months in-service practical training at a CSI. This training is funded and provided by the MOH, which indicates a good level of ownership by government. The entrance requirement for selection of an ASC is a school leaving certificate (12 years of schooling). Once qualified as an ASC, (s)he receives additional training on curative care of the three most common childhood diseases (malaria, diarrhoea and pneumonia) as well as acute malnutrition. This iCCM training takes six days. UNICEF, together with the MOH, developed a training manual for iCCM. The iCCM training was funded by UNICEF, using IHSS programme funds.

Figure 3 shows the total number of ASCs trained in iCCM and clinicians (nurses) trained in IMCI, through the IHSS programme from 2007 to 2012. IHSS programme funding resulted in a total of 2560 ASCs being trained in iCCM, with a gender mix of 43% men and 57% women. Having exceeded its targeted number of 2502 ASCs trained in Phase 2 (June 2008-May 2009), the training in 2010-2012 concentrated on training new recruits to replace those who left. The estimated annual attrition rate of ASCs is around 7.5%. All ASCs trained in iCCM were already stationed at a CS so deployment of iCCM-trained ASCs would have been 100%. Based on updated information from the 2013 Census, 2432 CSs were surveyed (3 refused and 429 were reported as closed), with 1997 being classified as functional. The total number of ASCs that were deployed in 2013 was 1535.

The gender distribution of the 1535 deployed ASCs varies greatly from the proportions that had been trained in iCCM (see Figure 3), with a 75% male and 25% female breakdown, suggesting that attrition is significantly higher among women. The census did, however, report on other qualified staff working

(n=575) at the CS, including different spectrums of nurses who are also authorized to provide curative services at the CS. Given the move towards placing nurses at the CS, this is to be expected. Based on these 2013 figures, approximately 27% of the total health care workers employed at the CS level are nurses, corresponding to previous estimates by the MOH. As a result, all of the 1997 CSs surveyed were functional, given that each had, on average, one qualified health worker (n=2110) to provide curative care, while just over 110 CSs would have had more than one.



### 5.2.1.5 Relais Communautaire

The Relais Communautaire is a volunteer cadre at village level, focusing on health promotion and prevention activities and household-level visits. These volunteer workers are not a formalized cadre of worker but appear to be a feature of village life. They are often older women who are respected and influential elders in the community and some are traditional birth assistants. The Relais often form the link between the community and the health service. Until recently there were no official numbers, but it was estimated that they had a much higher ratio to population than ASCs, and this was confirmed by the latest census of CSs and CSIs. According to the 2013 Census (based on 1997 CSs) there were 2672 Relais linked to the CSs, with at least one Relais per CS, and approximately one third having two Relais. Of the 833 CSIs that responded to the census, there were 4608 Relais deployed, corresponding to 5 to 6 Relais per CSI.

The Relais work closely with both the ASCs at the CS and the clinicians at the health centre in their catchment area to help organize and prepare the community for outreach activities, including identifying target groups that would benefit from vitamin A supplementation and vaccination campaigns. They may accompany the ASC on home-visits, carry out home-visits on behalf of the ASC, encourage the community members to visit the health facility and help create community health awareness (referred to as ‘community-sensitisation’) and give health promotion talks at the health facility. The Relais demonstrate Key Family Practices (KFPs), a set of key evidence-based prevention practices adopted in 1998 by UNICEF Niger, which include exclusive breastfeeding for the first six months of life, appropriate infant feeding from 6 months, hand washing, use of insecticide-treated

mosquito nets, recognising danger signs of illness and using preventive and curative services, and use of oral-rehydration for diarrhoea.<sup>40</sup> They identify sick and malnourished children, motivating parents to seek health care and nutritional support for malnourished children at the health facility. In some parts of Niger, they are used to deliver the Community-Led Total Sanitation programme.<sup>41</sup>

Some of these education and awareness tasks are meant to reduce the time spent with the patient by the ASC at the CS. During a field visit to a busy CSI in the Niamey district, a group of Relais (all older women) were observed doing a hand washing demonstration in an outdoor waiting area. From the team's observation, the women appeared to be respected elders who used their authority to educate and motivate others, and they were clearly knowledgeable about proper hand washing technique.

Senior MOH officials described the tasks for which Relais are used as including a similar range of activities as mentioned above. This includes education and awareness, social mobilization for health campaigns (such as immunization, polio campaigns, including census of neighbourhoods, tracking households and children needing immunization), sensitizing the community during epidemic outbreaks, carrying out malnutrition prevention tasks, including identifying children at risk, malaria prevention, including sensitization on the use of impregnated bed nets and distribution and alerting households to the signs and symptoms of a sick child. Box 2 illustrates some of the roles of the Relais and the appreciation of their contribution to child and maternal health.

#### **Box 2: Roles of the Relais**

*"The ASC is responsible for sending the Relais to the houses. The Relais will give advice on vaccination, immunization etc. When pregnant women do not come for antenatal visits, the ASC will go to them with the Relais to encourage them. The Relais will be sent to the home of pregnant woman due to deliver to make sure she delivers in a good condition."* (MOH official)

*"The Relais existed in the villages well before the existence of ASCs, but they were only responsible for sensitizing the community about health promotion."* (MOH official)

*"Principal activity using Relais are the campaigns-so it depends on geographical coverage and duration of campaign."* (MOH Regional director)

*"The Relais- they are everywhere. Even though they may not be in policy, I know they do much, including identifying problems, doing home visits and reducing the rate of defaulting on treatment."* (NGO respondent)

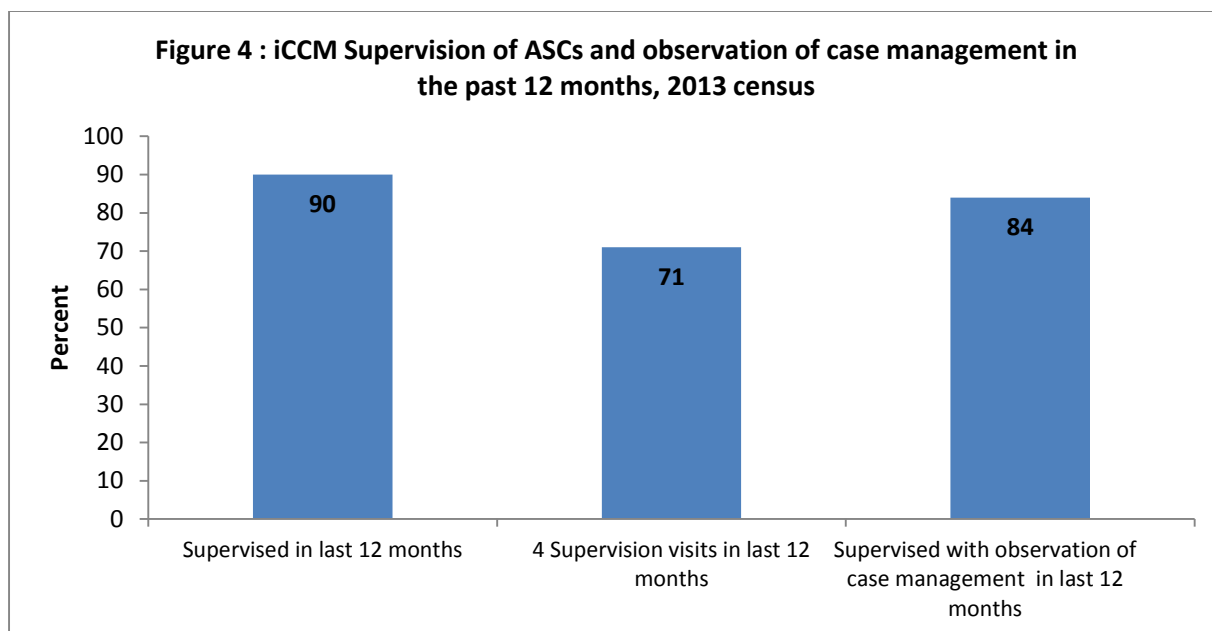
Most people interviewed, including Relais themselves, shared the sentiment that the Relais were widespread and that their roles were well appreciated by the communities. While the Relais are volunteers, often the community can decide on particular incentives for them. Donor partners and government are also providing training and incentives for Relais. The Relais are reportedly trained by the health staff on a wide range of topics including health, nutrition, hygiene and sanitation. Some of the current incentives include providing access to training and the financial payment that is associated with training, i.e. per diem, and with participation in immunisation campaigns. Where there is a health or nutrition NGO active in a village, the Relais will often be used for outreach work for which they will receive financial incentives.

When various stakeholders were asked what contribution, if any, the Relais may have made to the reduction in child mortality, all indicated that they played an important role. MOH officials, health facility staff and NGOs interviewed pointed to the importance of the health promotion and prevention roles and their role in identifying danger signs and encouraging mothers to visit the health facility. Several respondents felt the contribution of the Relais to reduced child mortality may be underestimated.

UNICEF has been involved in the funding of the Relais training or activities in targeted districts, thus strengthening the contribution of this volunteer cadre at village and household level in these areas. In terms of future developments, the MOH wants to expand and formalise the roles of the Relais, particularly in remote areas where there are no ASCs, and they are finalising a policy in this regard. The Relais will be equipped to provide basic curative care at the household level including using medications such as Paracetamol, ORS and Zinc, some antibiotics, including Cotrimoxazole and Amoxicillin. They will also use rapid tests for malaria and ACTs for malaria treatment as well as distribute mosquito nets. Planned incentives will include training, per diems for training days, as well as income generating opportunities, such as donating a donkey cart that the Relais can rent out as transport for the villagers.

#### **5.2.1.6 Supervision**

The target for supervision of ASCs, according to the protocol, is one supervision visit by a CSI nurse per month, though in practice this was seldom the case, with less than 10% receiving a monthly supervision visit. Nevertheless, quarterly supervision was relatively frequent, with 71% of ASCs receiving at least 4 visits in the last 12 months in 2013. This is a remarkable increase from the 46% quarterly supervision reported in the Joint Supervision data. Observation of clinical case management by the supervisor is considered a requirement for effective supervision, and among those that received four quarterly visits, 84% of the facilities reported that there was observation of case management in at least one of the quarterly supervisory visits (Figure 4). The IHSS programme contributed to this remarkable increase in quarterly supervision and the likely spillover effect into observation of case management as well.



UNICEF and MOH officials identified challenges around supervision and quality assurance of the iCCM service. This includes inadequate monitoring of the number and quality of supervision visits, and irregular supervision visits. These challenges were confirmed by interviews with health staff at the CS and the CSI. For instance, a CSI health manager in the Gabi district of Maradi indicated that they have not carried out a supervision visit to the CS in their area in the past 3 months. Reasons given include lack of transport, e.g. broken motorcycle, and no funds for petrol.

In line with a long-term plan of the MOH to upgrade the level of service delivery at the CS, the MOH estimated that about 25% of the CSs now have a nurse appointed, having replaced ASCs, an estimate close to the 27% found in the latest 2013 census. Most of the CSs in the capital, Niamey, have a nurse, and this was also observed at a more remote CS in Gabi in the Maradi region. Where there is a nurse and an ASC deployed, this allows for onsite supervision:

*“Presence of the nurse solves the problem of supervision and quality of care.” (Clinician)*

### **Supervision of the Relais**

There is no formal supervision processes for the Relais, though in practice there may be informal supervision of Relais by the ASCs. The national strategy document for integrated community based health services cites several problems with the supervision of the Relais, mainly related to them being an informal, volunteer cadre. Many volunteers struggle to balance their voluntary health role with their own economic livelihood activities and, therefore, cannot be expected to dedicate a set amount of time to their health worker duties. There are also challenges around inadequate training, monitoring and supervision of the Relais and how to link the ASCs and the health system more closely with the community concerns identified by the Relais. There are government and donor efforts, in the pilot phase, to address this, through formalising the roles of the Relais, and to use the CS and CSI as a basis for supervision and supply. The IHSS programme contributed to the shift towards embracing the role of community-based cadres, with advocating for the expansion of the roles of ASCs to include curative care. This is likely to have had a spillover effect in terms of extending community health care roles to the Relais.

### 5.2.1.7 Procurement, distribution and availability of medicines and commodities

UNICEF has been funding the provision of the main medicines required for treating the top three childhood illnesses as well as acute malnutrition. The IHSS programme and UNICEF, through matching funds, funded the purchasing of the iCCM drugs and supplies for acute malnutrition from the UNICEF procurement division in Denmark and delivered them to the district pharmaceutical depot. This procurement and distribution is done in parallel to the MOH supply chain systems for other drugs, as government systems were unable to deliver the goods required for iCCM in good time for reasons which include poor infrastructure, administrative issues, storage and transport systems of the MOH central pharmaceutical depot, the ONPPC. This was especially so following the implementation of the free child health-care and the resulting increase in health service utilisation. MOH officials and health personnel at all levels of the health service acknowledge the problems with capacity of the ONPPC. As one official explained:

“There are challenges; drugs arrive, but the system is very slow. Government helps ONPPC to have vehicles to distribute medicines but often this is not enough. There is still a need for UNICEF to help in logistics and distribution because of this.” (MOH official)

Availability of drugs is an important element of quality of care. A 2008 evaluation of CSs in the country involving 28 districts and 199 ASCs showed the following results.<sup>12</sup> Whilst 80% percent of the CSs were fully equipped, there was wide variability in availability of medicines. This ranged from more than 80% having stocks of Cotrimoxazole and Paracetamol, 66% having low osmolarity ORS to only 52% having zinc and 40% having Artemether + Lumefantrine for malaria (during high transmission).<sup>12</sup>

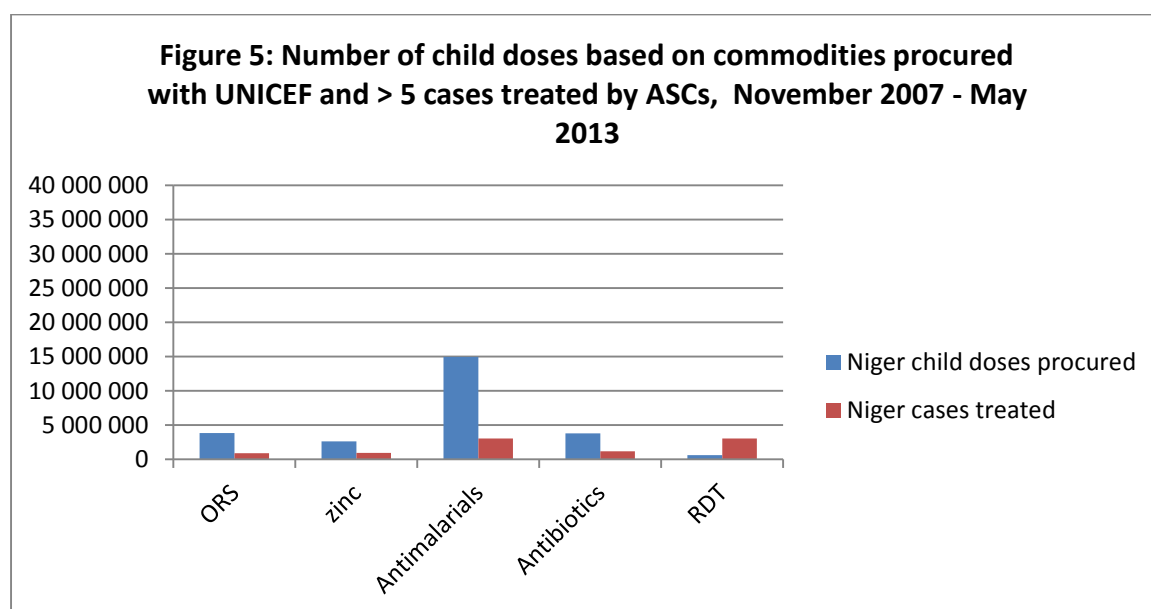


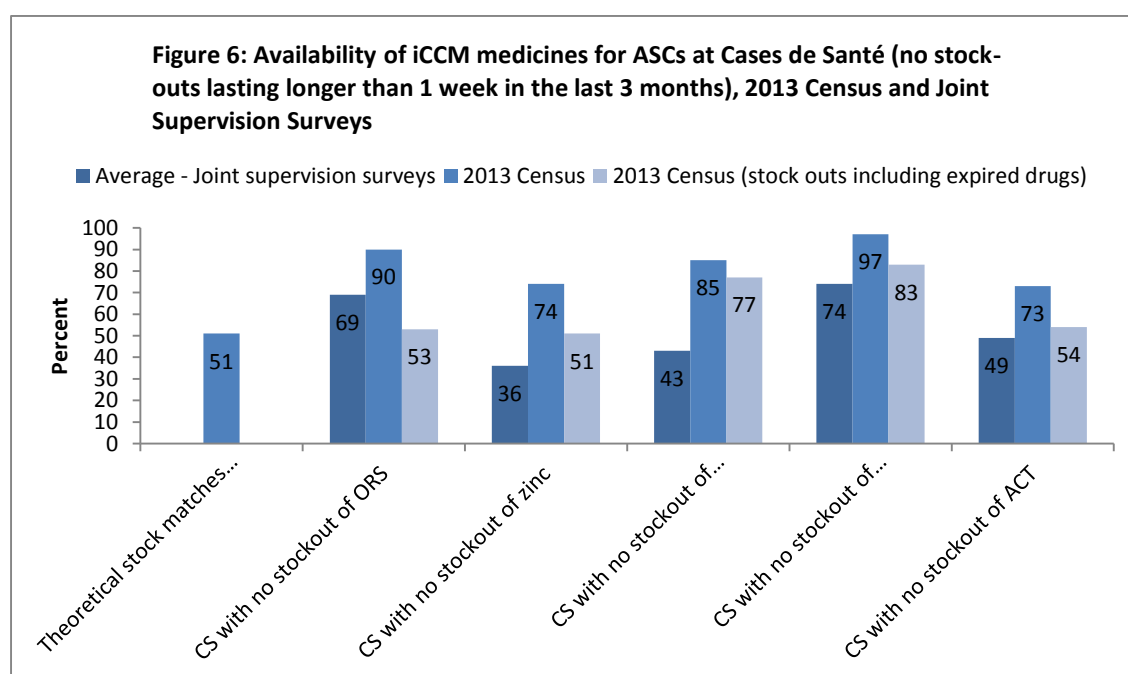
Figure 5 shows the number of child doses that could be provided based on the commodities purchased using UNICEF and DFATD funds, based on 3 ORS sachets and 10 zinc tablets per diarrhoea treatment and 10 antibiotic tablets per pneumonia treatment and 1 blister consisting of 6 ACT tablets per episode of malaria. Adding in the numbers of under-fives treated with these commodities during the IHSS programme period shows that 36% of the child doses of zinc, 24% of the ORS sachets, 31% of the antibiotics, 20% of the anti-malarials were used by ASCs to treat children under-five.



There could be a range of reasons to explain the differences between the expected child doses based on procured drugs and the number of cases treated in Figure 5. The calculation for the child treatments provided at the CS level was based on modelled estimates as disaggregated data was not available prior to the 2013 Census. Less than half of the procured medicines were used at the CS level, and according to UNICEF this could be due the fact that some of the drugs procured were intended for utilisation at the CSI level, that UNICEF orders large purchases that are not meant for one year only, and that there may be a small percentage leakage of drugs to the private sector, though the latter is speculative at this stage. The main reason is likely due to poor management of stock as evidenced by a large proportion of expired drugs noted in the 2013 Census survey, almost 50% for ORS, zinc and ACT. This may also be related to transporting large numbers of stock from the depots to the regional level and CS level, resulting in large proportions of expired drugs in the CS.

It is also important to note that far fewer RDTs were purchased in comparison to the numbers of anti-malarials. As protocol stipulates that cases of fever should be administered an RDT in order to confirm malaria before commencing treatment, the number of RDTs used should be higher than the number of malaria treatments dispensed. Far fewer RDTs than malaria treatments were procured, and based on this graph, the number of RDTs used was roughly equivalent to the number of anti-malarials dispensed, reflecting an under-utilisation of RDTs. Reported stock-outs of RDTs may be the underlying reason, and if so, this would impede the delivery of effective malaria services.

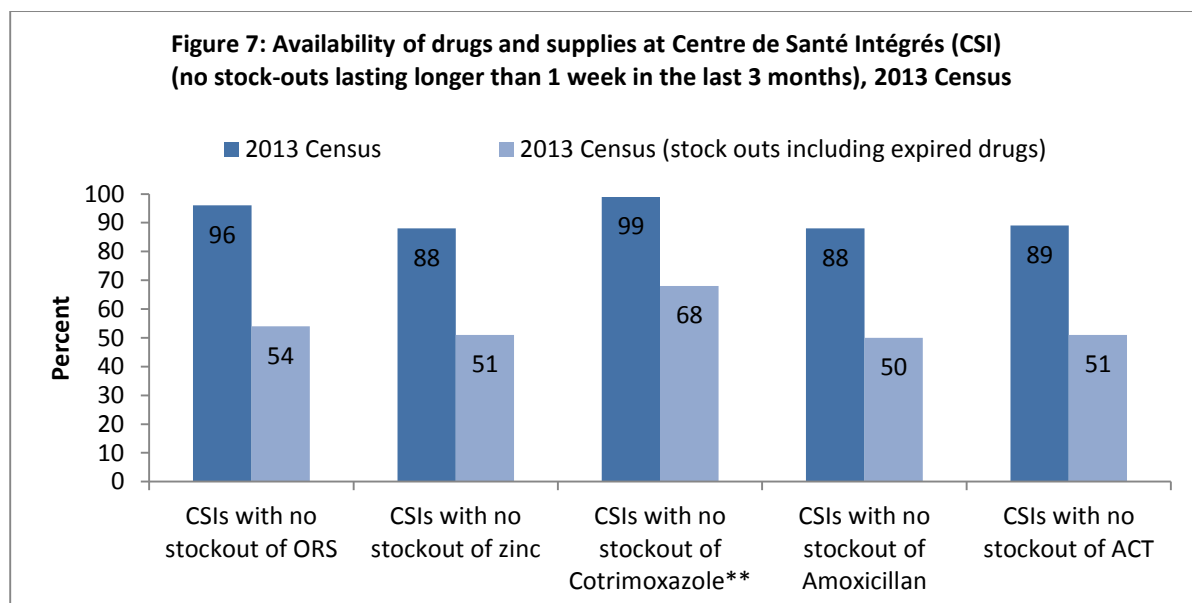
Figure 6 below shows the availability of iCCM medicines in the CS, using data from two different sources, the Joint supervision surveys and the latest 2013 Census survey. The Census survey was collected between the end of July and early August 2013. An average of the three data points was reported on for the Joint supervision surveys including: period 3 data from the 2009 Enquete Supervision Conjointe, which is representative of 3 regions (Diffa, Maradi and Zinder), period 4 data from the July-October 2010 Enquete Supervision Conjointe, which is representative of the national level (all 8 regions), and period 5 data from the January 2012 Enquete Supervision Conjointe, which is representative of the national level (all 8 regions).



\*stock-out was calculated if both dispersables and tablet form was stocked out for longer than 7 days

Although stock-outs were found for all iCCM drugs, the proportion of CSs with stock-outs was not high, or conversely, as shown in the graph, the proportions of CSs with *no stock-outs* for longer than 1 week, were high. Once expired drugs were considered, however (the 3<sup>rd</sup> column in the graph), stock availability was considerably lower, by as much as 37% lower as in the case of ORS, 23% for zinc and 19% for ACTS. The medicines that had the most stock-outs across CSs were zinc and ACT. Stock-outs for Amoxicillin were also high, but the availability of an alternative antibiotic (Cotrimoxazole) would have made this less of a problem. There was a discrepancy or mismatch, in 49% of CSs surveyed, between the theoretical stock and the actual stock on the day of the census. When considered together with the issue of expired stock, it points to a problem with the stock management and monitoring systems and processes.

The CSIs reported lower rates of stock-outs in comparison to the CSs (Figure 7). However, when expired drugs are taken into consideration, the CSIs report higher rates of stock-outs in comparison to the CSs. This speaks to stock management challenges at all levels of care and requires attention. In sum, the IHSS programme contributed to the reduction in stock-outs, but expiry of drugs at CS and CSI level undermined that improvement.



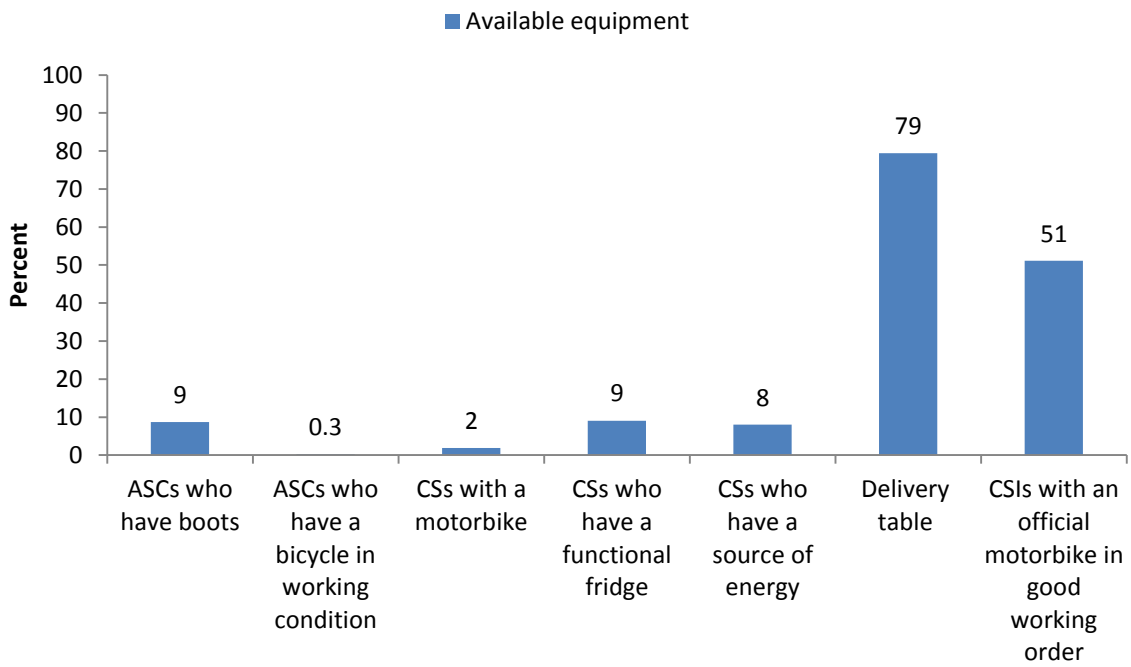
Data from the interviews points to concerns being raised at various levels of the health system about stock-outs of essential drugs. The Free Health Care Policy has also affected how CSs are funded in that they are dependent on MOH reimbursing them for the mother and child visits. However, in the last 3 years there has been a lack of regular re-imbusement for CS and CSI claims. One explanation given by MOH officials was that the delay is due to claims being over-inflated, whilst others noted that this is due to shortage of funds. The latter was disputed as there appears to be budgeted amounts for re-imburements. Either way, the CS and CSIs regard this as a serious limitation to their ability to deliver services. They reported that it resulted in them not being able to purchase adult drugs. As mentioned earlier, they reported that it was common practice to do a form of internal cross-subsidising of adult services by using the free child health drugs. As mentioned earlier, this in turn results in stock-out of child drugs and the need to issue scripts which need to be filled privately.

Although the provision of drugs and diagnostics for malaria is covered by the IHSS programme for under-fives, there are other donor partners involved in malaria support. Furthermore, as the IHSS programme comes to an end, negotiations are under way for the MOH to take on the support of the under-five malaria needs in the country. The main partner is the Global Fund (GF), a fund that operates in the country by filling in the gaps not covered by other partners or the state. For instance, the GF funds community awareness activities and provides drugs, insecticide spray, bed nets, and prophylaxis. Due to serious funding shortages and the restructuring of the Global Fund, Niger is experiencing a gap in support previously filled by the GF. Niger is currently under the transitional funding period of the Global Fund but needs to respond to conditions for funding by 2014 for money to be released. The Clinton Foundation is another supporting partner that embarked on a 2 year affordable medicines initiative, from which Niger was able to benefit. However, this subsidisation of drug costs is also coming to a close at the end of 2013. Additional malaria medicine support comes from Korea and Japan.

MOH and UNICEF officials agree that there continues to be a need for the country to strengthen its national drug supply system, and UNICEF is currently working with the MOH to do so. The goal is to eventually strengthen the financial capacity and human resources of the national system, so that UNICEF is able to channel drugs through the central depot to be distributed equitably across all health care levels. UNICEF initially distributed medication directly to the level of health facilities (CS and CSI), but according to MOH officials, MOH requested that this be changed so that distribution to facilities become the responsibility of the regional and district authorities.

There is low availability of transport for ASCs, in the form of either a bicycle or a motorbike. Where a means of transport exists, it may not always be functional, i.e in working order. As shown in Figure 8, only about 2% of CSs surveyed had access to a motorbike that was functional on the day of the survey. This is not a failure of the IHSS programme but a general failure of the health system. The situation for CSIs is much improved though, with 51% of CSIs having access to a functional motorbike. Only 9% of CSs had a functional fridge. This may in part be related to fact that a low proportion of facilities (8%) have a source of energy but it is not clear what type of energy the fridges use for power. The different sources of energy include solar energy, a generator, or power supplied by the local organization "NIGELEC". Almost 80% of CSs have access to a functional delivery table, highlighting the rapid scale-up of CSs to provide deliveries. The ability of the CSs to provide delivery services is, of course, dependent on the availability of a nurse at this level, authorized to do so.

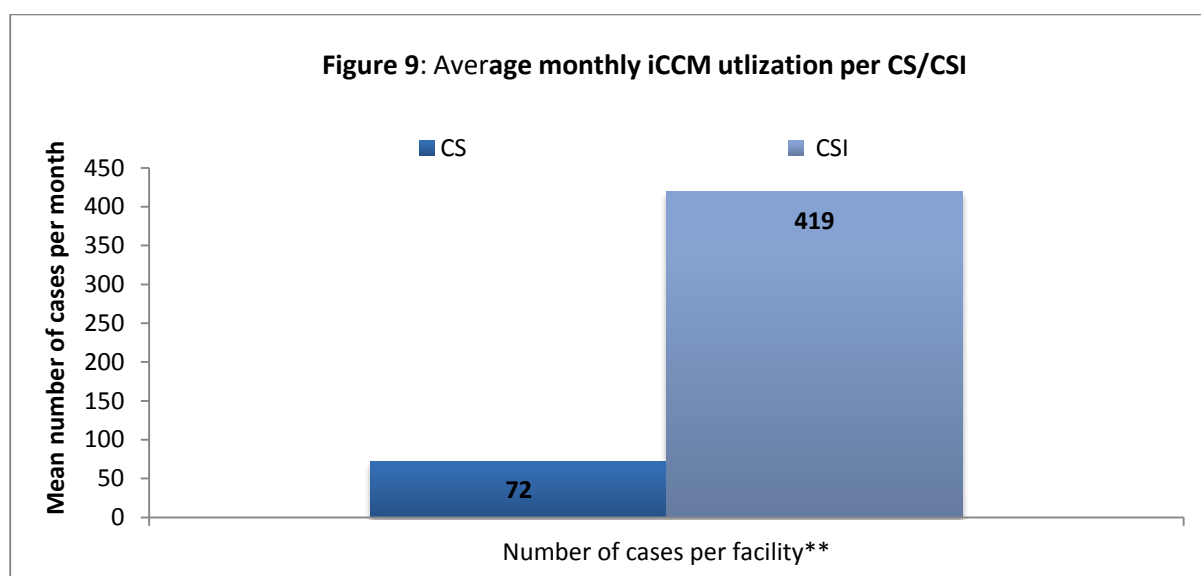
**Figure 8: Availability of basic equipment for ASC, CS and CSI, that are functional on the day of the survey, 2013 Census**



## 5.2.2 Utilisation, monitoring and evaluation, and quality of care

### Utilisation

Data on utilisation of iCCM was not disaggregated to CS level. The Niger health information management department is currently finalising a reform of the health information system and the disaggregation issue is being solved as part of that process, supported by UNICEF. IHSS programme funds were used to push to have disaggregated data. As of 2012-2013, the data was not properly disaggregated, hence the need for the 2013 Census survey of CS and CSIs. This census indicated that the average number of iCCM consultations per CS per month was 72, and per CSI it was 419 (Figure 9), with the largest number of cases representing those for malaria treatment, at both CSI and CS level.



*\* based on 1997 CS and 833 CSI that contributed to the 2013 Census survey*

The attendance rate at the CSs is used to monitor how well they are functioning. Each CS is expected, according to national policy, to have an attendance rate of at least 0.8 new consultations/ person per year, for all ages, not only under-fives. Should attendance fall below this rate, it may imply challenges with access to care including a closed CS, lack of availability of an ASC, distance from the CS or depleted medicine stocks at CS. This is, however, not the case when taking into consideration the number of iCCM treatments to children under-five in the 2013.

In the 2013 Census, children under five represent approximately 20% of the population. When taking the annual number of iCCM treatments at CS and CSI level, the estimated number of treatments per under 5 child per year is 2 visits in 2013, using an under-five population of 3.7 million as per the 2013 Census, enumerated from the CSI level. The proportion of iCCM visits at the CS level represents close to 30% of the total number of iCCM visits at PHC level (CS + CSI) per year in 2013. In order to determine the curative visits per child per year at the CS level, the 30% proportion of iCCM visits seen at the CS was applied to the total number of calculated curative visits at the PHC level. This amounts to 0.7 curative visits per child per year at the CS level in 2013, already very close to the national target of 0.8 for total curative visits per person per year. Should we assume that an additional 20% of children may attend, but may not require treatment (medication) for the three diseases (as has been done in the

costing section of this report), this proportion will be closer to an estimated 1 visit per child per year, thus exceeding the national target for number of CS visits per child per year.

A 2012 qualitative study commissioned by UNICEF identified demand and supply-side barriers to care seeking that still persist. These include financial barriers (lack of money for transport or to fill prescriptions, as well as user fees for older children and adults), access (e.g. distance to the nearest facility), limited health knowledge and information (especially if there is no Relais in the community) and socio-cultural and religious issues (e.g. lack of support from husbands, use of traditional healers). Health facility deterrents included perceptions of limited availability of services, opening times and lack of drugs. The report recommended expanding the network of Relais as mothers valued their role highly, especially when far from a CS. Another recommendation was to expand the coverage of CSs and to address supply side issues such as stock-outs, improved diagnostic capabilities and the need for follow-up services.<sup>8</sup>

### ***Monitoring and evaluation***

Once the Catalytic Initiative was launched in Niger in 2008, the Ministry of Health, with the support of UNICEF, embarked on a process to develop tools and methodologies to monitor the progress and impact on child survival. Nevertheless, monitoring and evaluation of service delivery remains a challenge with bottlenecks in data collection and problems with effective use of the health information for quality improvement at CS, sub-district, regional, and national levels.<sup>11</sup>

Officials from the MOH praised the role of UNICEF in supporting their monitoring and evaluation system. The tools developed included the roll out of Annual SMART surveys that would enable the country to monitor the coverage of the selected child survival interventions. The SMART surveys preceded the IHSS programme and were implemented in 2005 by the MOH and National Institute of Statistics (INS) in response to the food crisis, in an effort to monitor nutrition and mortality indicators for children. In 2008, the survey was expanded to include health related questions, and by 2010, the survey covered the full range of child survival topics, including where care was sought. During the IHSS programme period, UNICEF and IHSS programme funds supported these surveys in part, which is an important contribution.

UNICEF commissioned and funded, together with IHSS programme funds, the 2013 Census of CS and CSIs. This Census provides critical data for planning on the geo-location of all CSs and CSIs in the country in addition to providing data on human resources, commodities, supplies, supervision, utilisation and some quality of care issues.

In 2008, the MOH created registers that would allow the ASCs to report, to their supervisors at the CSIs, the progress of their work on a monthly basis. These registers include utilisation data at the CS which was combined with the data from the CSI and sent to the district, regional and national levels. As mentioned earlier, the MOH health information management department is in the process of developing a system for disaggregation of iCCM data to the level of the CS. IHSS programme funds enabled Technical Advisors from the UNICEF Headquarters and WCARO to support this reform.

One of the challenges reported by the MOH and UNICEF is that health information is collected, but not analysed and used for quality improvement, especially at CS and CSI level. To address this, in 2011, the MOH, with the support of UNICEF, developed tools to enable the analysis of bottlenecks both at the CS and CSI levels. The tool consists of a health dashboard of six indicators to be interpreted by staff. Supervisors at the CSI level are supposed to convene monthly, and annual, meetings with the

ASCs to review performance. The annual meetings are to include not only ASCs, but also Relais to develop micro plans for each catchment area, but it is unclear how well this is working.

A mid-term evaluation of the IHSS programme in 2010 reported an example of innovative practice in the Maradi region, where CS level data is routinely collated, displayed at the CS and shared at regular meetings with health workers and political figures. Health centres performing well have a green coding for each reported indicator, and red for those performing poorly. Well performing health centres are congratulated and asked to share the strategies used, and poorly performing ones are asked to explain their performance.<sup>17</sup>

Furthermore, some nurses have been trained in data collection and have been appointed to the districts to support their data management responsibilities. According to the MOH, UNICEF, and INS officials, Niger is moving towards an electronic health management information system, with roll-out of the system planned for 2014. At this stage it is not clear how far along the implementation is.

### ***Quality of Care***

In a 2008 evaluation of the quality of care provided by 199 ASCs<sup>12</sup>, positive results have been reported. A high proportion of ASCs observed at work (83%) knew how to assess, diagnose and treat children for the three major diseases and track malnourished children. There was good education and counselling of mothers by ASCs. The evaluation also reported a high level of adherence to treatment and follow-up amongst mothers, with 73% of mothers who went to the CSs recognising at least two danger signs for the three main conditions, 93% of mothers who took their children to CSs complying with the dosage of drugs provided by the ASC, and 98% of them returning with their child for a check-up. A similar evaluation of quality, based on case observation, has not been carried out. However, the 2013 Census collected some data on quality of care which is still in the preliminary analysis stage.

Quality of care of iCCM treatments remains an important consideration for ongoing monitoring. A few informants (clinical managers) in this study, and literature on iCCM in sub-Saharan Africa<sup>14</sup>, have raised concerns regarding over-diagnosis, over-treatment and the potential risk of drug resistance, whilst evaluations of iCCM elsewhere (e.g. Oromia in Ethiopia<sup>13</sup>) described a high level of quality of care. The increased focus on malaria, pneumonia and diarrhoea was also a source of discomfort for some clinical managers, who expressed the view that this may detract from increasing prevention efforts for malaria and malnutrition, while others felt more of a balance. As noted earlier, the quality of care has been investigated in the latest 2013 Census of CSs and CSIs, by assessing the concordance between signs and symptoms, classifications and treatment, based on patient record reviews, but the analysis was not available at the time of writing.

### **5.2.3 Trends in coverage of selected maternal and child health indicators**

This section includes analysis of coverage for selected maternal and child health indicators from 1998 to 2012. Descriptions include changes at the national level, within rural areas and in the richest and poorest wealth quintiles. Only figures for indicators included in the coverage trend analysis are included in this section. National and regional coverage profile figures which include indicators not part of the trend analysis can be found in Appendix E. These profiles have been included as an analysis product for in-country stakeholders, such as the Ministry of Health.

Statistically significant trends are indicated in figures with \*\*. The trend analysis was not conducted on the coverage changes according to wealth quintile, or for changes in ITN coverage at the national

and rural levels, as only two data points, DHS 2006 and DHS 2012, were available. Furthermore, the trend analysis did not incorporate the 2010 Morality Survey as only point estimates were available for that survey, and, therefore, incorporation of the 2010 Mortality Survey may have changed some of the trend outcomes.

Table 5 below provides a summary of changes in the main IHSS programme indicators in rural areas of Niger. When possible, the pre-IHSS period was calculated using data from the 1998 and 2006 DHS surveys. However, the 1998 surveys only sampled children less than 3 years of age, so for all indicators referring to children 5 years of age and below, the MICS 2000 was used as the baseline data point for that period. Higher annual rates of change in the IHSS programme period are noted in tetanus toxoid coverage, DPT3 and measles vaccination coverage, ITN and ORS coverage. A stable annual coverage rate between the pre-IHSS and IHSS programme periods was observed for exclusive breastfeeding and malaria treatment, although it is important to note that malaria treatment coverage is declining both in the pre-IHSS and IHSS programme period at approximately the same rate. A decline in the annual rate of coverage change between the pre-IHSS and IHSS programme period coverage occurred for early breastfeeding, vitamin A supplementation, care-seeking for suspected pneumonia, and care-seeking for fever coverage. However, confidence intervals for the point estimates of coverage between 2006 and 2012 for early breastfeeding, care-seeking for suspected pneumonia, and care-seeking for fever overlap suggesting that although the rate of change was faster in the pre-IHSS period, IHSS programme support was able to maintain the levels of coverage and prevent declines in levels of coverage. IPTp and postnatal care did not have data points available for the pre-IHSS period, but since IPTp only came into policy midway through the past decade, it is likely that coverage was 0 prior to the 2006 survey. Postnatal care did not significantly change over the same time period but changes in the way the questions were asked over the implementation period could bias these findings.



**Table 5:** Summary of coverage trend indicators

Indicator	Niger rural areas			Average annual rate of change pre-IHSS (1998-2012). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2006-2012). Data shown as percentage points per year with confidence intervals
	DHS 1998 (pre-IHSS) % (95%CI)	DHS 2006 (proxy for phase I baseline) % (95%CI)	DHS 2012 (proxy for phase II end line) % (95%CI)		
Tetanus toxoid vaccination of pregnant women (at least 2 doses)	13 (11-16)	21 (19-24)	51 (48-54)	1 (0.8-1.2)	5 (4.6-5.3)
IPTp (at least one dose)	N/A	0,4 (0.1-1)	58 (54-61)	N/A	10 (9-10)
Postnatal care for the mother	N/A	11.7	12.5	N/A	0.1 (-0.1-0.4)
Early breastfeeding	24 (21-28)	44 (40-48)	48 (45-51)	3 (2-3)	1 (0-1)
Exclusive breastfeeding	0.4 (0-1)	13 (10-17)	22 (19-26)	2 (1-2)	2 (1-2)
Measles immunisation	28 (24-32)	42 (37-47)	67	2 (1-2)	4 (4-5)
DPT3 immunisation	15 (12-19)	35 (30-41)	65	3 (2-3)	5 (5-6)
Indicator	Niger rural areas			Average annual rate of change pre-IHSS (2000-2012). Data shown as % per year with confidence intervals	Average annual rate of change during IHSS (2006-2012). Data shown as percentage points per year with confidence intervals
	MICS 2000 (pre-IHSS) % (95%CI)	DHS 2006(proxy for phase I baseline) % (95%CI)	DHS 2012 (proxy for phase II end line) % (95%CI)		
Vitamin A supplementation	58 (53-64)	68 (65-72)	58 (55-61)	2 (1-2)	-2 [-2(-1.5)]
Care-seeking for suspected pneumonia	23 (18-29)	45 (38-51)	50 (43-57)	4 (3-4)	1 (0-2)
ORS coverage	13 (11-16)	16 (13-18)	44 (40-47)	0 (0-1)	5 (4-5)
Care-seeking for fever	17 (14-20)	42 (40-47)	49 (45-54)	4 (4-5)	1 (1-2)
Malaria treatment	47 (43-51)	31 (27-35)	17 (15-20)	-3 (-3,-2)	-2 [-3 (-2)]
ITN	4 (1-10)	6 (5-8)	18 (16-19)	0 (0-1)	2 (1.7-2.1)

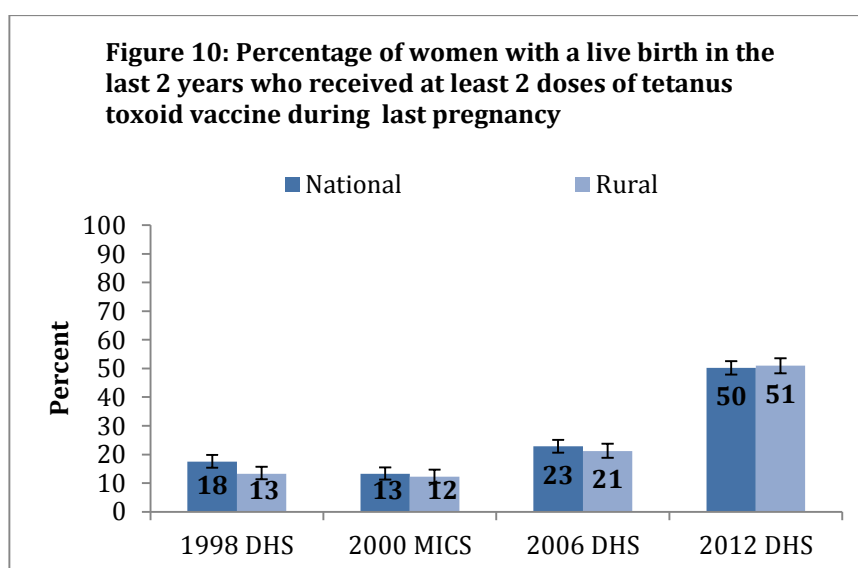
*IPTp = intermittent preventive treatment of malaria for pregnant women; ITNs = Insecticide Treated Nets; DPT = diphtheria, pertussis and tetanus*

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

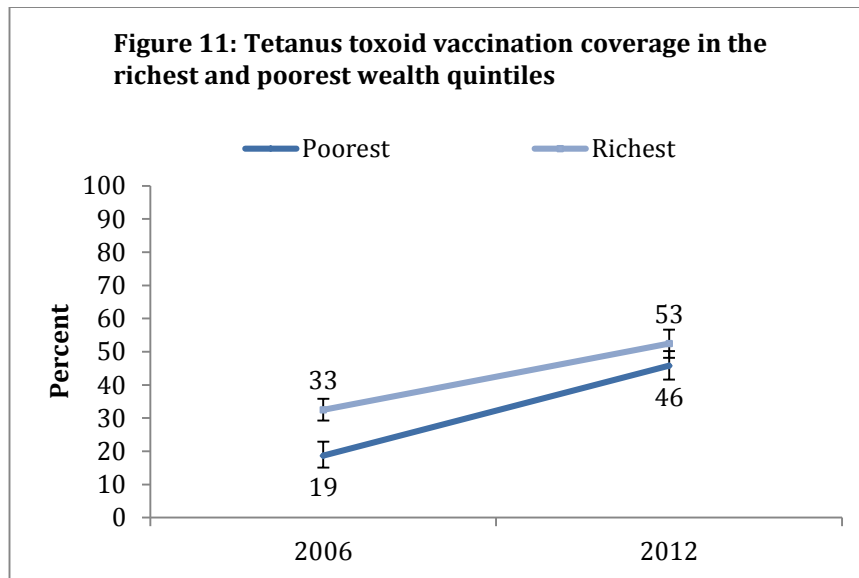
### 5.2.3.1 Antenatal care

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

Nationally, the proportion of pregnant women having received at least two doses of tetanus toxoid (TT2+) to prevent neonatal tetanus in their previous pregnancy has increased considerably between 1998 and 2012, rising from 17.5% in 1998 to 50% in 2012 ( $p < 0.05$ ). The slight dip in coverage between 1998 and 2000 is not significant, with slightly overlapping confidence intervals. The majority of the increase occurred between 2006 and 2012 (IHSS programme period), a period which experienced an increase in coverage of about 5% per year, in comparison to a 1% increase in coverage per year in the 1998-2006 period. This trend is similar both at a national level and in the rural parts of the country, which saw a significant increase in TT coverage from 13% to 51%. As over 80% of the population of Niger live in rural areas, we would expect the rural coverage estimates to mirror that of national trends. By 2012, 51% of children were protected at birth from tetanus toxoid. Some regional variation in coverage for tetanus toxoid in 2012 exists, however, most within a 10% difference, with Agadez reporting the lowest estimates of approximately 37% (Figure 10).

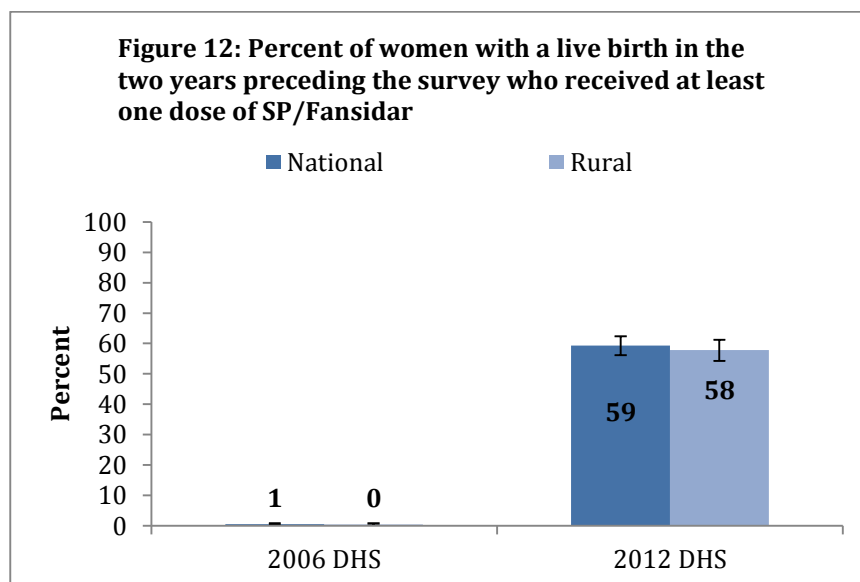


Equity in coverage of tetanus toxoid vaccination can be seen in Niger, with the rate of growth in the poorest quintile being faster than that of the richest quintile. In 2006, coverage estimates amongst the poorest were markedly lower than the richest (19% vs. 33% respectively). By 2012, coverage estimates between these two quintiles were not significantly different from each other, with the poorest quintiles reporting 46% coverage, and the richest quintiles reporting 53% coverage (Figure 11).



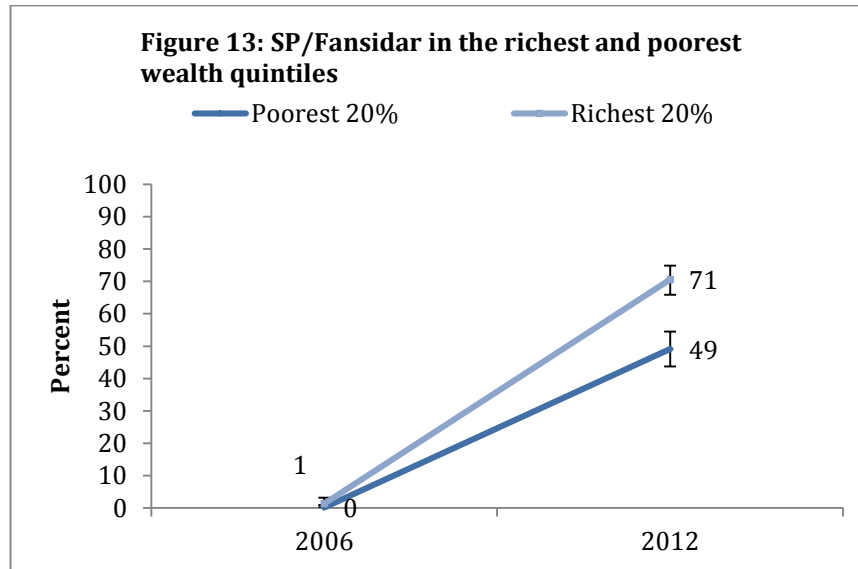
***Malaria prevention in pregnancy***

Data collection regarding the provision of Fansidar to pregnant women is sparse. The two data points for this indicator come from the 2006 and 2012 DHS surveys, and as a result trend analysis was not conducted. The increase over 6 years is impressive with almost no pregnant women receiving Fansidar in 2006 (0.5%) to approximately 59% of women receiving IPT in 2012 (Figure 12). Once again, this increase is mirrored in the rural population, with coverage estimates not significantly different from the national estimate, increasing from 0.4% to 58% by 2012. The average rate of increase in coverage in rural areas during the IHSS programme period is approximately 10% per year. Some regional variation exists, with variations in coverage estimates of approximately 30%, with Dosso at 74% (best performing) and Diffa at 40% (see Regional profiles).



The richest and poorest quintiles were not significantly different from each other in 2006, in terms of coverage of women having received Fansidar during pregnancy. However, by 2012, the coverage

for the richest quintile had increased to 71% while coverage in the poorest population was approximately 50%. This reflects a higher rate of coverage change over the 6 year period in the richest quintile and speaks to a need to further invest in antenatal care in the poorest quintiles to ensure women receive appropriate care during their pregnancy (Figure 13).



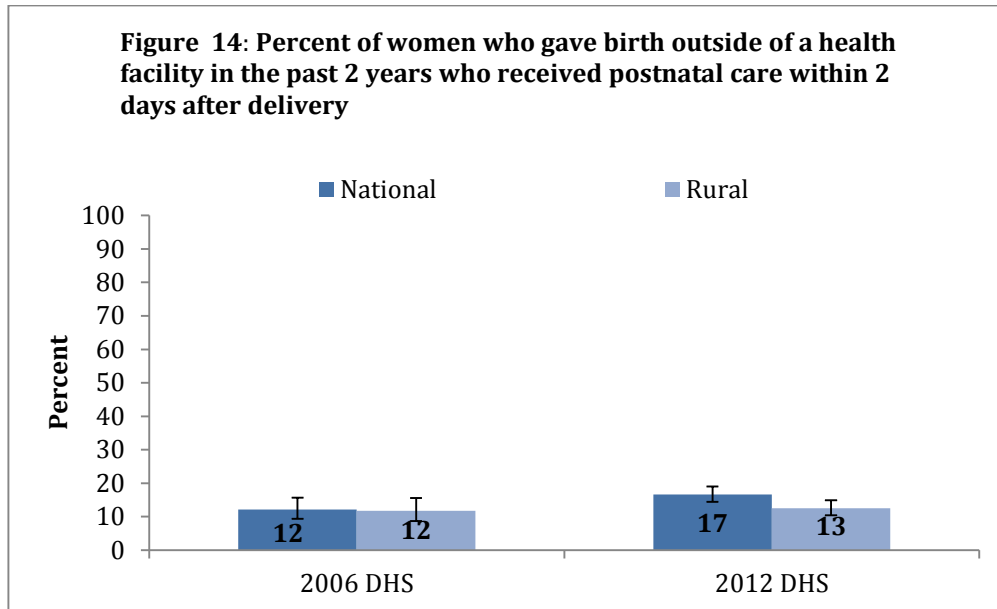
### 5.2.3.2 Postnatal care

#### *Postnatal visits*

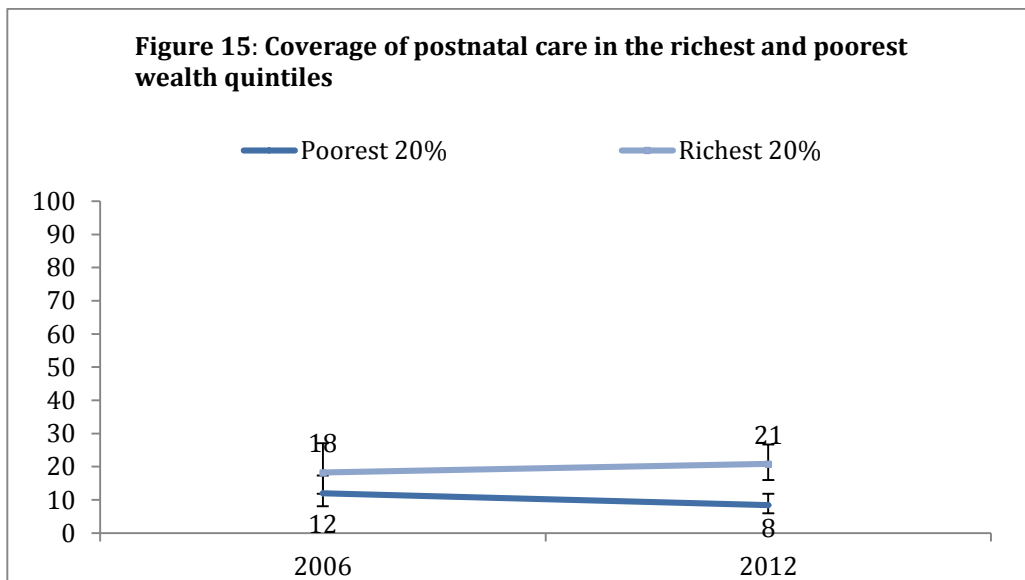
Currently, limited survey data exist on receipt of postnatal care by pregnant mothers in Niger, due to variations in how the data pertaining to this indicator was collected. The 1998 survey does not collect information on whether the mother received postnatal care within two days of delivery and only provides information on what type of health provider supplied postnatal care. The 2006 and 2012 surveys collected information on whether postnatal care was received within two days of delivery. However, while the 2006 survey collected this information for deliveries outside of a health facility, the 2012 survey included all deliveries. As a result, the 2012 survey was restricted accordingly. National coverage for postnatal care within two days of delivery amongst women who gave birth outside of a health facility increased, from 12% in 2006 to almost 17% in 2012, although this increase is not significant with overlapping confidence intervals. Similarly, there was no significant change in rural coverage (12% - 12.5%), and the annual rate of change crosses 0 over the 6 year IHSS programme time period.

The lack of progress in postnatal coverage over the six year period highlights a missed opportunity because coverage is low overall, though the change in definition over time for this package may skew results. At the regional level, there is significant variation in postnatal coverage, with Niamey reporting coverage of 78%, and Agadez, the second best performing region, reporting 43%, while Diffa reports an alarming postnatal coverage of 1%. Other regions range from 7 to 30% (See regional profiles). Rural estimates, with 13% PNC coverage (Figure 14), are much lower than those of the urban areas that show almost 67% coverage of postnatal care within two days. By 2012, the confidence intervals for PNC coverage for the rural and national estimates just overlap, indicating that the rural and national coverage are not significantly different from one another.

By 2012, almost 30% of women delivered in a health facility, a promising increase from 17% in 2006. However, the large majority of women still deliver outside of health facilities in Niger. This, coupled with extremely high and stagnating fertility rates, presents a major risk for complications during pregnancy and resulting maternal deaths.



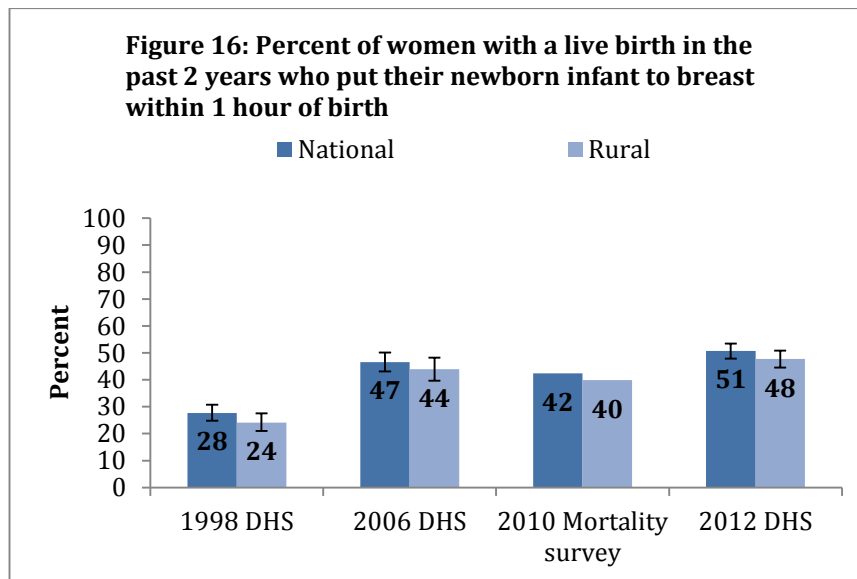
Inequity with regard to postnatal coverage is increasing in Niger, with the gap in coverage between the poorest and richest wealth quintiles increasing significantly from 2006 to 2012. The drop in coverage in the poorest wealth quintiles, from 12% to 8%, and the increase in coverage in the richest wealth quintile, from 18% to 21%, are not significant (Figure 15).



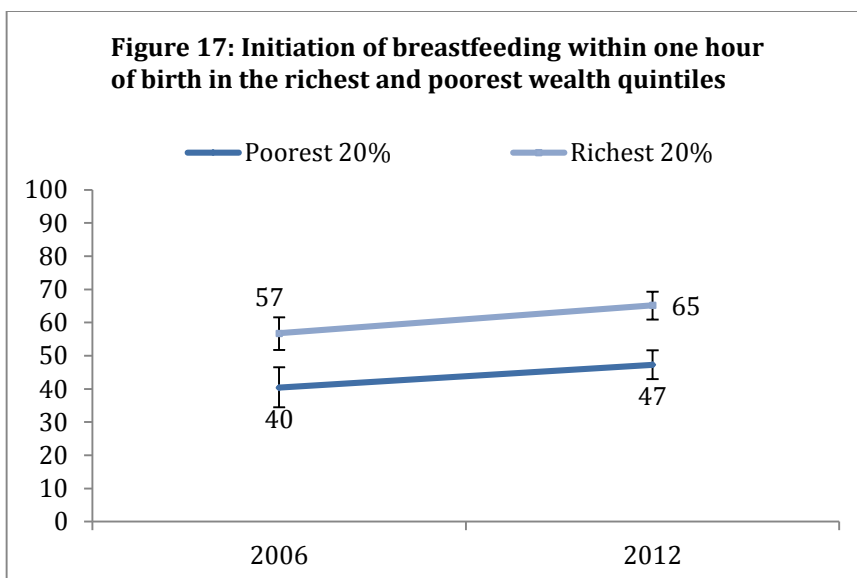
### 5.2.3.3 Early initiation and Exclusive Breastfeeding (EBF)

#### *Early breastfeeding*

The proportion of women with a live birth in the last 2 years who began breastfeeding within 1 hour of birth increased significantly between 1998 and 2012, with coverage increasing from 28% to 51%. The rural coverage estimates once again follow a very similar trend ( $p < 0.05$ ), with rural coverage estimates in 2012 of 48% not significantly different from the national estimate. The period between 1998 and 2006 experienced the largest increase in coverage, with an estimated 3% increase in coverage per year, in comparison to less than 1% increase in coverage per year in the IHSS programme period (2006-2012). The increase between 2006 and 2012 is not significant, with overlapping confidence intervals, either at the national or rural levels, suggesting that coverage of early breastfeeding was maintained during this period (Figure 16). Regional variation in coverage exists, with Diffa reporting coverage of 83% and Maradi reporting 41% by 2012. The remaining regions report coverage estimates between those two, with the majority exceeding national coverage estimate of 50% (See Regional profiles).

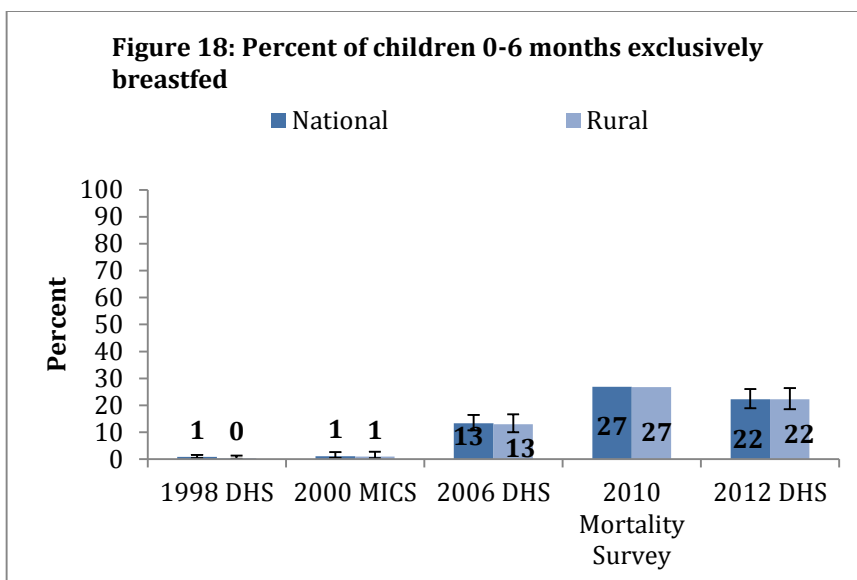


There was no change in the rates of early breastfeeding initiation, in either the richest or the poorest populations, and the gap between the two quintiles remained significant over the IHSS programme period. By 2012, the poorest quintile reported 47% coverage, while the richest quintile reported 65% coverage (Figure 17).

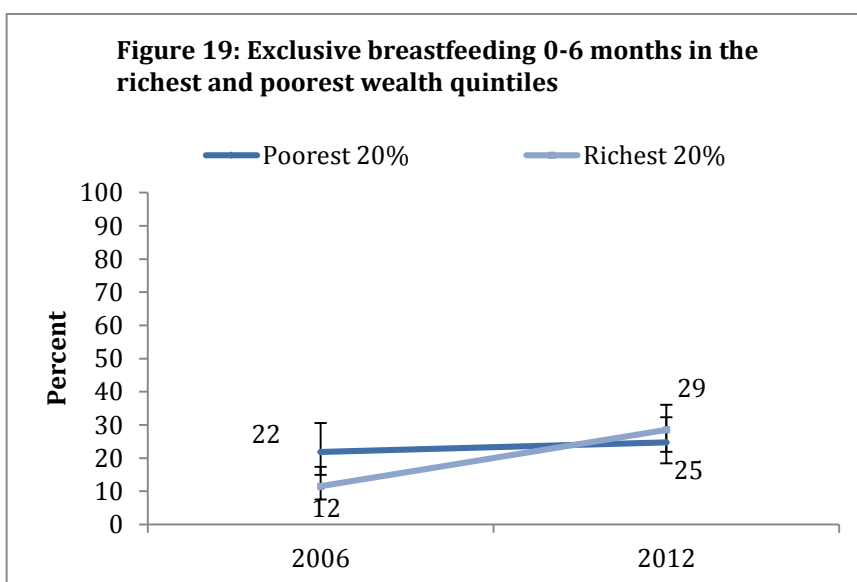


### ***Exclusive Breastfeeding***

There was significant progress between 2006 and 2012 in the proportion of children who were exclusively breastfed. In 1998, almost no children under 6 months were exclusively breastfed, with a high proportion of children likely being supplemented with water due to the extreme temperatures. By 2006, the proportion of children being exclusively breastfed increased to approximately 13%. While still very low, this was a significant increase over the eight year period from 1998. The proportion virtually doubled to 27% in 2010 before stabilising, and appearing to slightly decrease to 22% in 2012. Because only point estimates are available for the 2010 period, conclusions cannot be made about whether the apparent decrease between 2010 and 2012 is significant. Changes in coverage in the rural population are virtually identical to national trends ( $p < 0.05$ ), as shown in Figure 18. The rate of increase in the pre-IHSS period between 1998 and 2006 is approximately 1.5% per year, virtually identical to the rate of increase between 2006 and 2012. Some regional variation in coverage of exclusive breastfeeding exists in Niger, with Dosso reporting 7% coverage and most regions reporting coverage estimates between 20% and 30%, with Maradi reporting 34% coverage, indicating low levels of exclusive breast feeding (See Regional profiles).



The poorest quintile was actually performing better than the richest quintile in 2006 in exclusive breastfeeding rates, reporting a 22% coverage estimate, while the richest quintile reported almost half of that, with coverage of 11.5%. Coverage did not significantly increase in the poorest quintile, which reported 25% coverage by 2012. The richest quintile experienced a significant increase in coverage over the 6 years; by 2012, coverage was estimated to be 29%. However, the difference between the rates remains insignificant across the period, with confidence intervals for the two quintiles overlapping at both time points (Figure 19).



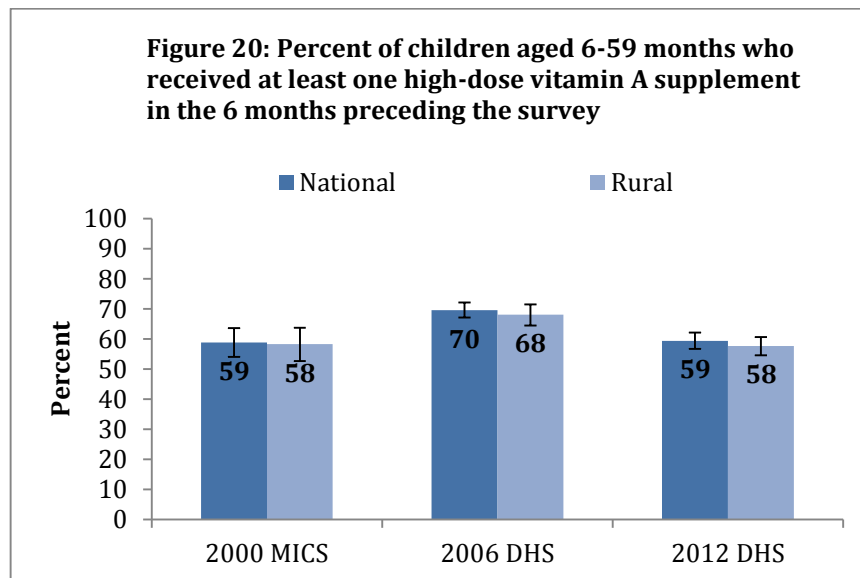
#### 5.2.3.4 Preventive care

##### *Vitamin A supplementation*

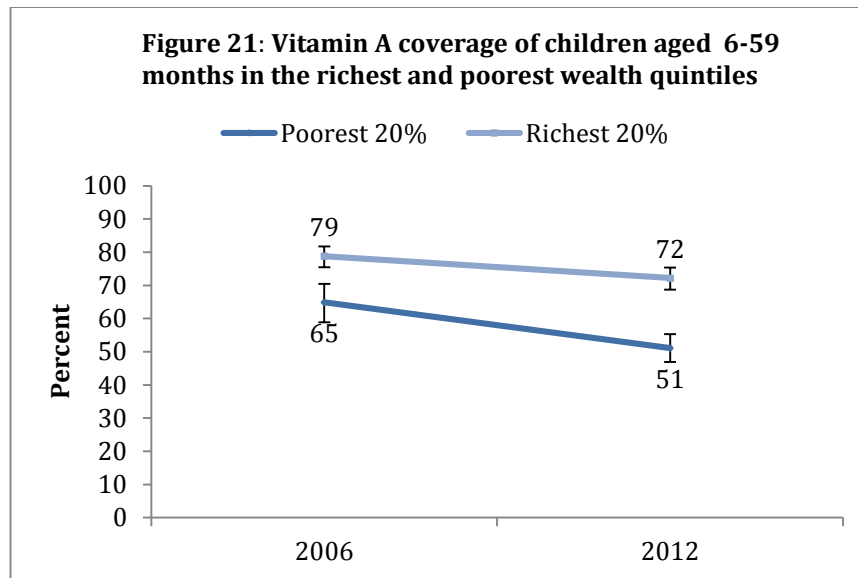
The proportion of children aged 6-59 months receiving a vitamin A dose in the last 6 months increased significantly in the pre-IHSS period, rising from 58% to 70% with no overlap of confidence intervals. These gains, however, were not maintained during the programme period. By 2012, coverage had significantly decreased back down to 60%. This pattern is mirrored in the rural population, which



remained significantly similar to the national coverage estimate. The rate of increase in the pre-IHSS period was calculated at 1.6% per year, with a similar but declining rate of 1.7% in the IHSS programme period. This may be due to the concurrent timelines of the 2012 DHS survey and the first round of outreach campaigns scheduled for the year. Consequently, areas still due to receive their 6 monthly dose of Vitamin A through the campaigns may have been surveyed by the DHS first, thus artificially capturing reduced coverage estimates (Figure 20). At the regional level, Agadez reports the lowest coverage of Vitamin A supplementation at 43%, while Maradi reports 73% coverage. The coverage estimates of the other regions fall between these two regions, with the remaining reporting over 50% coverage (See regional profiles).



Inequity in coverage of vitamin A supplementation increased in Niger between 2006 and 2012, with the variation in coverage between the richest and poorest quintile increasing by 2012. Both quintiles, however, report significant drops in coverage in the 6 years. By 2012, the richest quintile reported coverage of 72% while the poorest quintile reported coverage 20% lower, of 51% (Figure 21). Again, the timing of the DHS survey in relation to the vitamin A outreach campaigns may be a factor in the observed decreases in coverage.



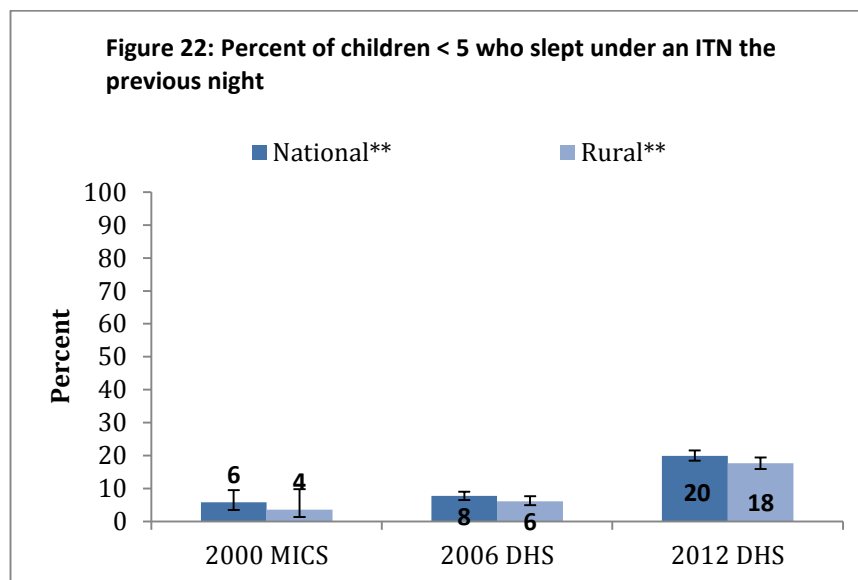
### **Children under 5 sleeping under ITNs**

#### **Malaria: LLIN/ITN vs. ITN ownership**

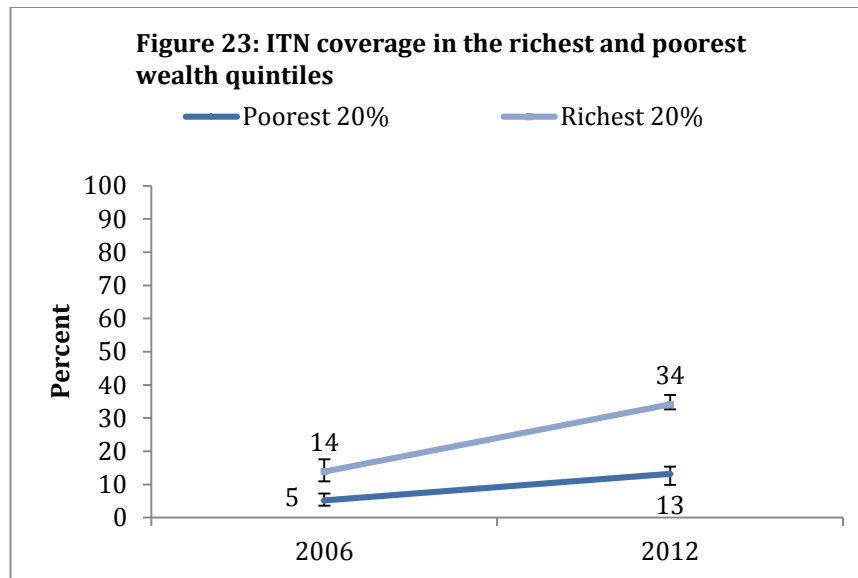
Data on malaria-related prevention and curative services, including IPTp during pregnancy, ITN coverage and the provision of anti-malarials, only began to be collected in the 2000 MICS and was not reported in the 1998 DHS. With regard to children under 5 sleeping under ITNs, no significant increase in coverage was noted between 2000 and 2006 (5.8% to 7.7%, with overlapping confidence intervals). Thereafter, coverage rose significantly to 20%. The trend is similar in the rural population, where coverage estimates stagnated between 2000 and 2006 (3.6% and 6%, respectively) but rose to 18% by 2012. The rate of coverage increase in the IHSS programme period was 2% per year in comparison to 0.4% in the pre-IHSS period, indicating significant efforts made in the IHSS programme period to distribute nets through campaigns and antenatal care. Throughout the period, rural estimates did not significantly vary from national estimates.

It is important to note that the 2010 Mortality Survey was not included in Figure 22 as the survey only reported on children from households that own a net, who slept under a net the previous night. On the other hand, the other surveys are reporting on children sleeping under a net, regardless of household ownership. Of the households who owned an insecticide treated net, the proportion of children who slept under a net was reported at 83% in the 2010 Mortality Survey. This same indicator for DHS 2012 has a coverage estimate of 30%, which points to a significant drop in ITN coverage in Niger in the two year period. Reasons for this need to be explored further to ascertain whether the changes could be due to the way the information was collected in the DHS survey and the 2010 Mortality Survey, seasonal timing of the surveys, or whether these data are reflective of a true change in the country that could be attributed to funding challenges that had been noted during the qualitative interviews. It is important to note that the 2006 DHS data was collected between January and May, the country's dry season, while the 2010 Survey data was collected between July and September, Niger's rainy season. Similarly, the 2012 DHS data was collected between February and June of 2012. Consequently, it is to be expected that more children would sleep under an ITN during the country's rainy season, and this, therefore, partly explains the reduction in coverage between the DHS 2006 and 2010 Mortality Survey estimates, and later the 2012 DHS estimates.

Other possible explanations include the availability of ITNs in the home. The proportions of households owning an ITN rose, from 43% in 2006 to 61.3% by 2012. However, given that lack of estimates on household ownership of a net in 2010, it is difficult to say whether a drop in household ownership could have contributed to the decline in children sleeping under a net. Niger did, however, experience a funding crisis in 2010, in which money from the Global Fund, largely responsible for the procurement of bed nets in Niger, was not disbursed. Respondents from the Malaria department of the MOH indicated that bed nets were usually procured every two years, and as a result of the crisis, bed nets were not purchased in 2012/2013 period (Figure 22).



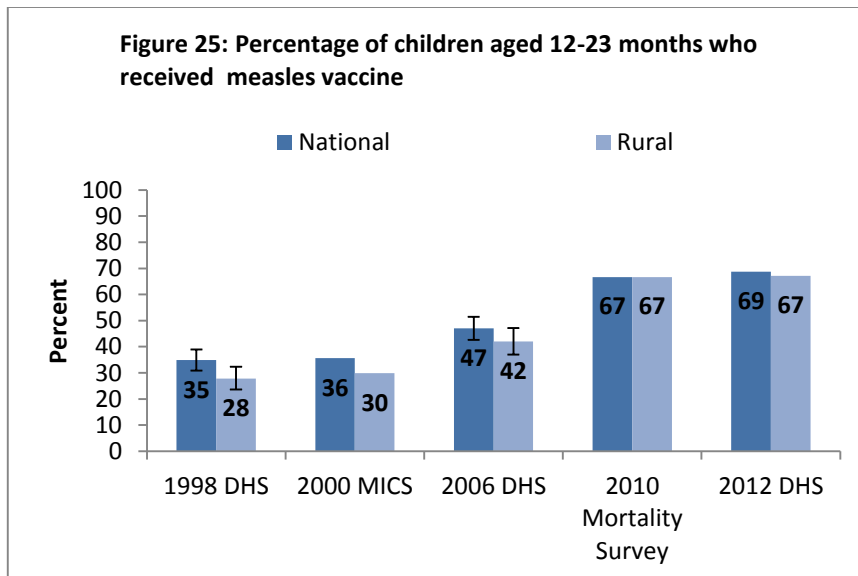
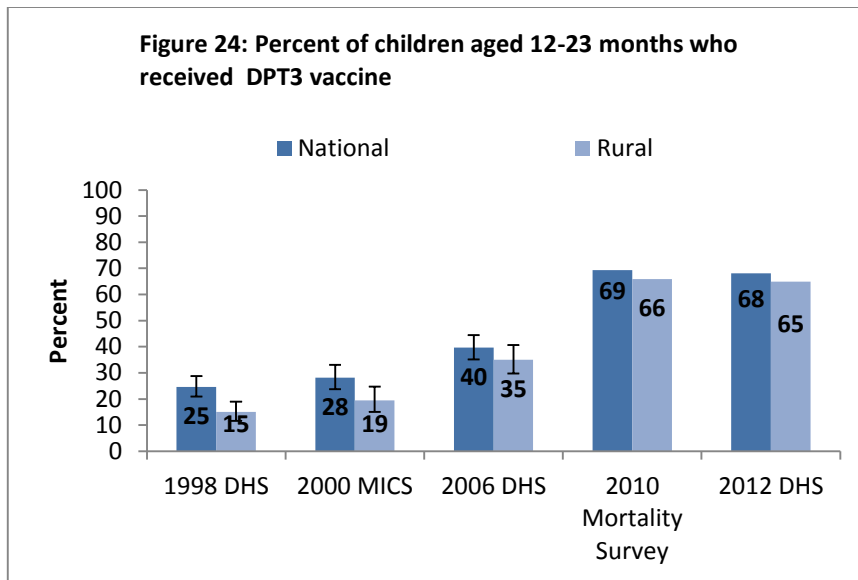
Inequity in coverage of children under 5 sleeping under an ITN appears to be increasing in Niger, with the proportion of children having slept under a net increasing from 5% to 13% in the poorest quintile, while the richest quintile experienced a much larger increase from 14% to 34%. It is important to note, however, that coverage did increase almost three-fold in the poorest quintile over the 6 year period, although initial ITN coverage was very low. Given the notable benefits of bed net utilisation in decreasing malaria related mortality and morbidity, significant efforts should be made to increase coverage levels in the country, and especially in the poorest quintiles (Figure 23).



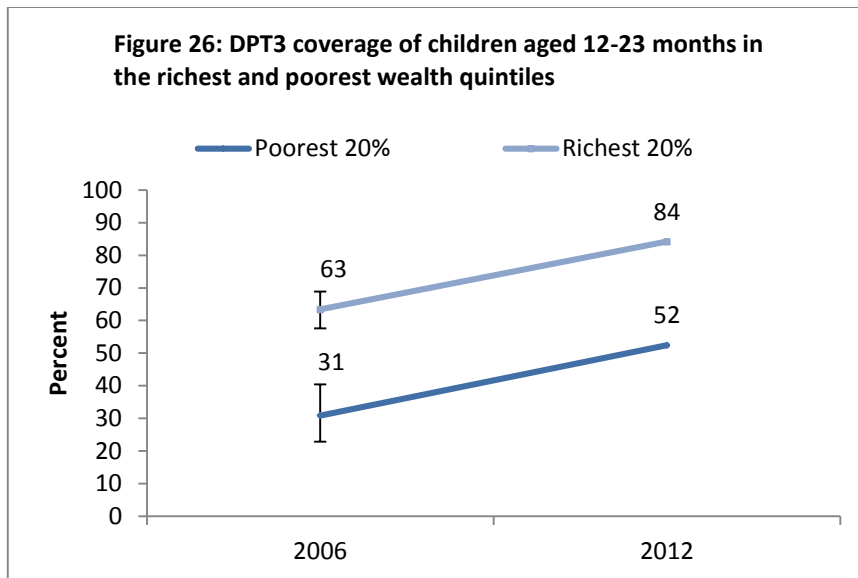
### ***Vaccinations: Measles and DPT3***

The proportion of children receiving the measles and DPT3 vaccines steadily increased between 1998 and 2012, with the majority of coverage gains occurring between 2000 and 2010, whereby the proportions increased significantly, from 36% to 67% and 28% to 69% for measles and DPT3, respectively ( $p < 0.05$ ). Coverage rates remained stable over the next 2 years. With regard to DPT3 immunization, rural coverage estimates were significantly lower than national coverage in 1998, but by 2006, there is no statistical difference in these estimates. However, there was no difference between the rural and national populations from the onset in 1998 for measles vaccination coverage. The annual rate of change in both measles and DPT3 vaccination coverage was significantly higher in the IHSS programme period, with measles increasing at approximately 4% per year, and DPT3 increasing at 5% per year. This is in comparison to a 1.8% and 2.5% increase in coverage per year in the pre-IHSS period, respectively (Figure 24 & 25). However, maintenance of relatively high immunisation coverage levels during this period was important. Confidence intervals around the 2012 estimates of measles and DPT3 coverage were not included due to uncertainty on where to find “mother’s declaration” in the raw data, with respect to receiving the corresponding vaccinations.

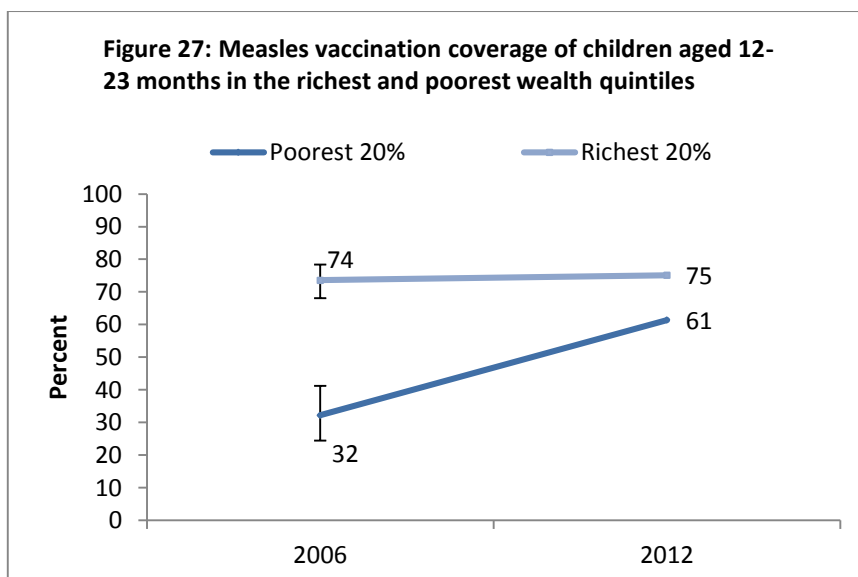
Inter-regional variations in coverage existed for these two vaccines in the earlier years, with Niamey reporting much higher proportions, both in comparison to other regions and to the overall national average. With the other regions increasing their immunisation coverage over the years, the variations across the regions began to narrow while Niamey reported a relatively stable coverage, since 1998, of around 80% for measles, and over 85% for DPT3. It is, however important to note that Niamey had a notable drop in DPT3 coverage to 55% in 2006, which increased back up by 2010. Diffa region had the lowest coverage for measles and DPT3 in 2012 at 59% and 52%, respectively.



Equity in coverage of immunisation did not appear to change between 2006 and 2012 for DPT3 coverage, where the gap between the richest and poorest quintiles remained constant. Both quintiles reported an increase of approximately 20% in coverage in the 6 year period. The poorest quintile is still reporting significantly lower rates of DPT3 coverage (52% in comparison to the 84% coverage reported in the richest quintile), highlighting the need to increase immunisation efforts in the poorest populations through outreach campaigns (Figure 26).



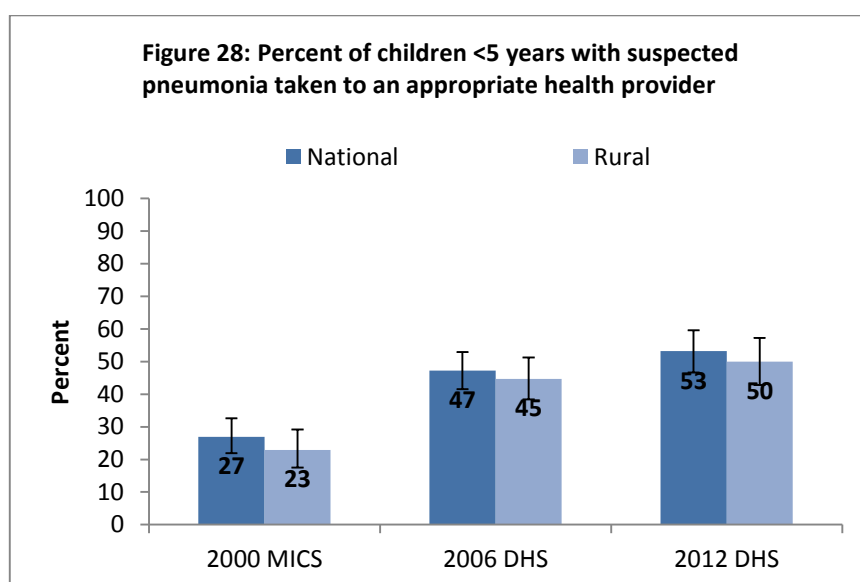
Conversely, the gap in coverage for the richest and poorest quintiles for measles has significantly declined between 2006 and 2012. In 2006, coverage rates between the poorest and richest quintiles were significantly different, with the wealth quintiles reporting 32% and 74% coverage, respectively. This gap has dramatically narrowed, with the poorest quintiles reporting an increase in coverage to 61% (note: no confidence intervals are available to determine statistical significance for 2012). Coverage in the richest quintile was maintained (Figure 27). This successful increase in coverage for the poorest children can be explained by regular targeted measles campaigns that followed successive outbreaks in the country. While the IHSS programme focused on vaccinations through outreach activities, other partners (specifically MSF) were heavily involved in achieving these gains through these campaigns.



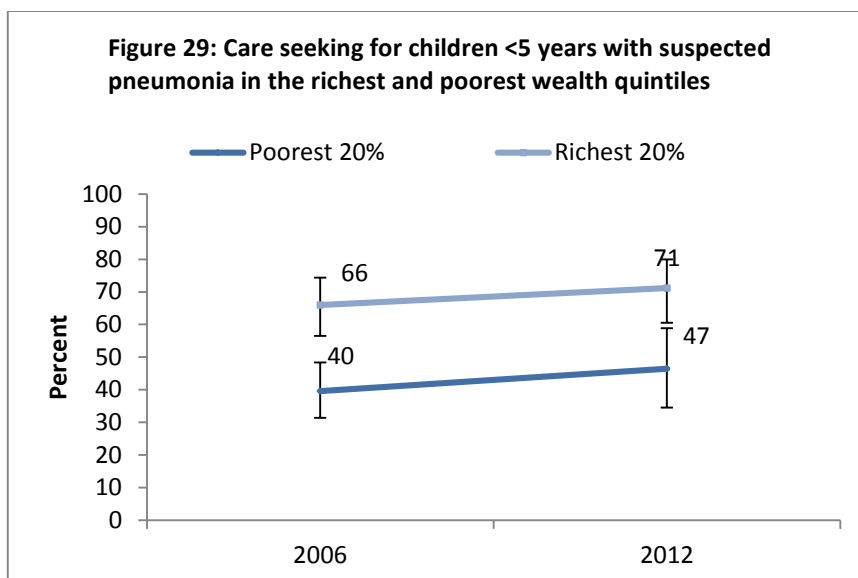
### 5.2.3.5 Curative care for malaria, pneumonia and diarrhoea

#### *Care-seeking for suspected pneumonia*

The proportion of children taken to an appropriate provider upon reported symptoms of suspected pneumonia rose from 27% in 2000 to 53% in 2012, respectively ( $p < 0.05$ ). The largest increase, however, occurred prior to the IHSS programme after which these care-seeking rates essentially stabilised. Rural estimates remained similar to national estimates and followed a similar trend. The average annual rate of increase in the pre-IHSS period was calculated at 3.6% per year, compared to 1% per year during the IHSS programme period. While the average annual rate of increase slowed down, coverage for care-seeking was maintained during this period, and 2012 levels did not significantly differ from 2006 levels (Figure 28).

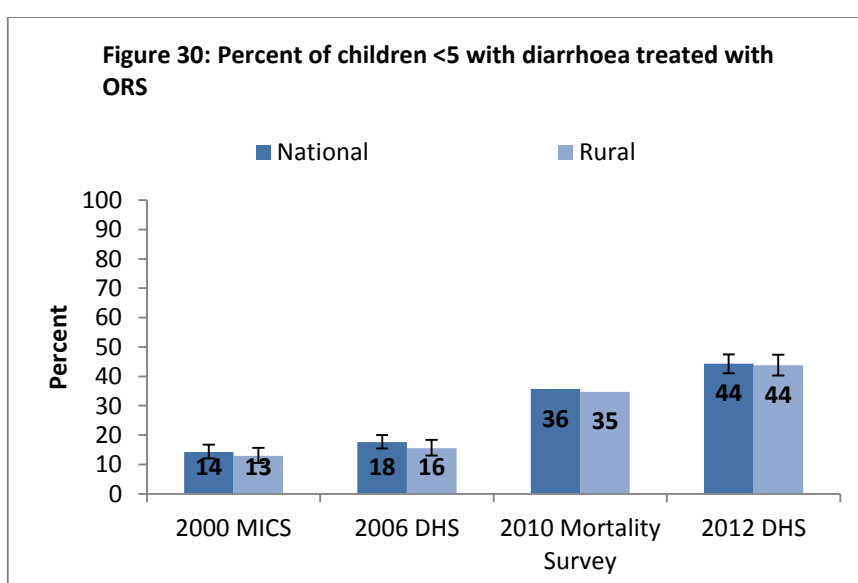


The increases in coverage of care-seeking for suspected pneumonia for both the richest and poorest quintiles between 2006 and 2012 do not appear to be significant as their confidence intervals over the 6 year period of analysis overlap. Hence, the gap between the richest and poorest quintiles remained relatively consistent (Figure 29). The confidence intervals are very wide for the 2012 calculations, likely because of the change in the definition of suspected symptoms for pneumonia, which results in increased specificity of suspected cases and smaller sample sizes.



### ***Care-seeking and treatment of diarrhoea***

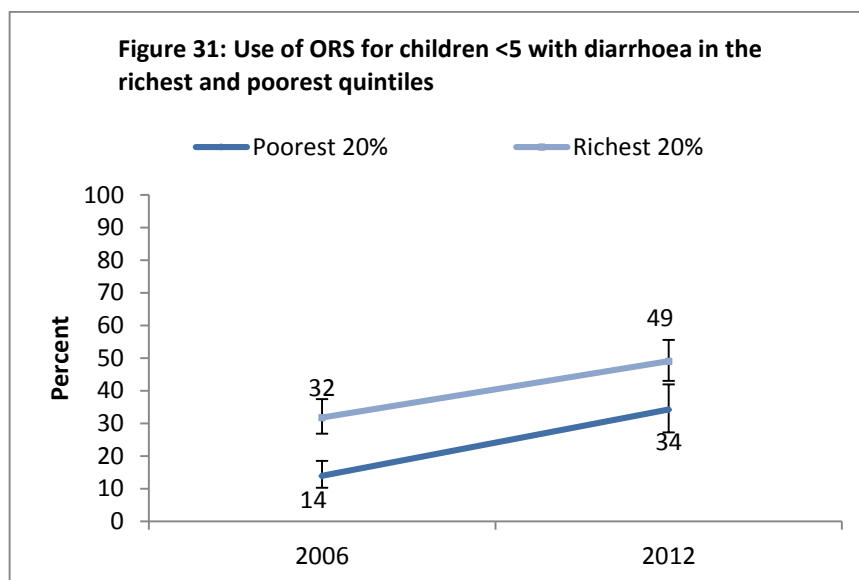
Significant efforts were made during the IHSS programme period to increase the provision of ORS to children with diarrhoea. This is evident in the significant increase of national ORS coverage from 18% to 44%, between 2006 and 2012, when compared to the pre-IHSS period that essentially maintained coverage rates of 14% to 18% between 2000 and 2006. Rural trends follow the same pattern, and are not significantly different than national estimates throughout the period ( $p < 0.05$ ) (Figure 30). The annual rate of increase in coverage rises from 0.4% in the pre-IHSS period to almost 5% in the IHSS programme period, highlighting successful efforts to increase coverage during that period. Coverage within the country ranges from 31% in Agadez to 50% in Tillaberi, which mirrors the regional variation in care-seeking from an appropriate provider for diarrhoea (See Regional profiles).



Inequity in ORS coverage between the richest and poorest wealth quintiles appears to have decreased during the IHSS programme period. Both wealth quintiles show significant increases in coverage, but

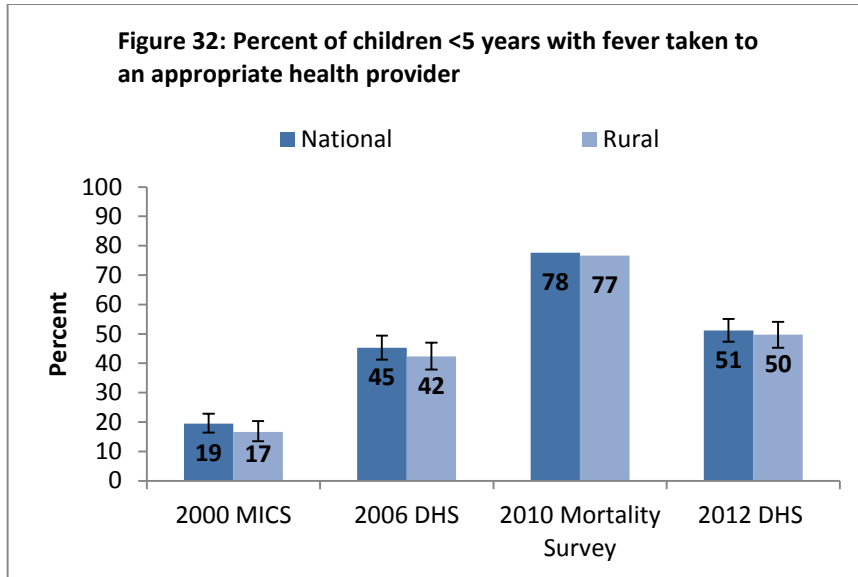


these gains are markedly higher in the poorest quintile whose coverage of ORS more than doubled (14% to 34%), in comparison to a rise from 32% to 49% in the richest quintile. Although by 2012 coverage estimates between the poorest and richest wealth quintiles were still significantly different from each other, the confidence intervals around the ORS coverage estimate fall only slightly short of one another (Figure 31).

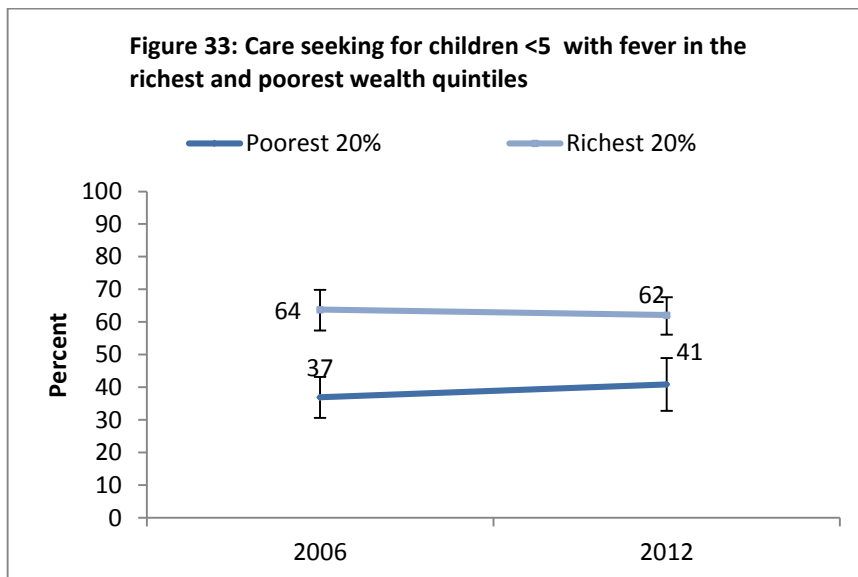


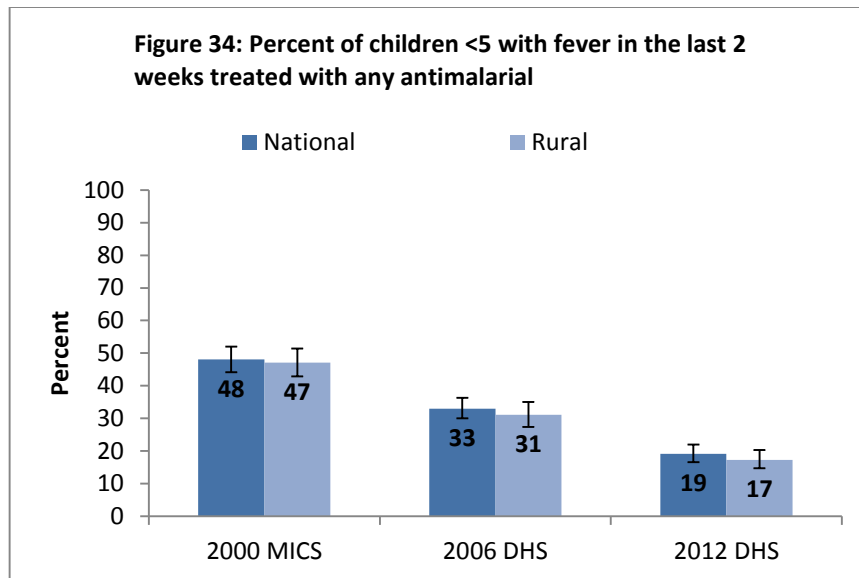
### ***Care-seeking and treatment of children with fever (suspected malaria)***

The proportion of children with fever taken to an appropriate provider increased significantly from 19% in 1998 to 45% in 2006. Interestingly, the 2010 Mortality Survey reports a spike in care seeking rates to 78%; however, by 2012, the rates fell back to 2006 levels (51%). The rate of increase in the pre-IHSS period was approximately 4% per year, while the rate of increase in the IHSS programme period was 1.2% per year - not taking the 2010 estimates into consideration. It is important to interrogate the dramatic increase of 30 percentage points between 2006 and 2010, and the consequent decrease between 2010 and 2012, to ascertain if the changes in coverage are real or reflective of differences between the surveys. Again, it is important to note that the 2010 Mortality Survey was conducted during the rainy season, while both the 2006 and 2012 DHS Surveys were conducted during the dry season. Consequently care-seeking for fever would be expected to be higher during the malaria season, in which the 2010 Mortality Survey took place, possibly explaining the reduction in coverage between 2010 and 2012. Not taking the 2010 survey into consideration, care-seeking levels between 2006 and 2012 are similar to each other, with overlapping confidence intervals, suggesting that if the 2010 coverage levels are an anomaly, coverage was maintained throughout the IHSS programme period. Once again, rural trends are similar to the trends at the national level ( $p < 0.05$ ) with no significant difference between rural and national populations throughout the period of analysis (Figure 32). Care-seeking patterns for fever are similar across the regional level in Niger, with all the regions reporting coverage between 40% and 50% (See Regional profiles).



Equity with regard to care seeking for fever does not appear to be increasing in Niger, although the gap between the poorest and the quintiles appears to be narrowing slightly by 2012. There is no statistically significant increase in the rates of care-seeking for fever within both the richest and poorest quintiles that are largely maintained over time. The 2010 Mortality Survey does not report on coverage according to wealth, and as a result, the analysis cannot conclude whether care-seeking patterns according to wealth quintiles follow the same rural and national patterns as above (Figure 33).



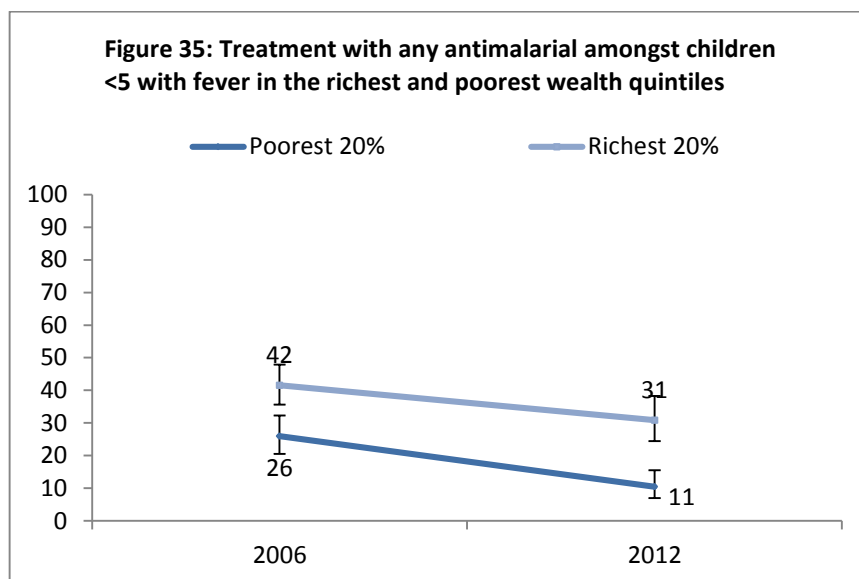


There has been a decline in the percentage of children under-5 with fever in the last two weeks treated with any anti-malarial (Figure 34). It is important to decipher the reasons for the decrease in coverage of anti-malarials in Niger. The observed changes in care-seeking behaviours for fever cannot explain the declines in anti-malarial coverage between 2000 and 2006, as care-seeking for fever went up during that period. The apparent decrease in care seeking for fever between 2010 and 2012 could be attributed to the seasonality of the surveys, in which both the 2006 and 2012 Demographic Health Surveys were collected in the dry season, whereas the 2010 Mortality Survey was collected in the rainy season. This could have resulted in expected decreases in care-seeking for fever between the wet and dry seasons and could partly explain the decrease between 2006 and 2012. However, given that overall care-seeking for fever between 2006 and 2012 has remained stable, it is evident that other factors are at play. Other reasons for the decline in coverage of anti-malarials could be the introduction of RDTs in 2008, which would increase accuracy of the diagnostic method and consequently reduce the number of children with fever being given an anti-malarial treatment.

Improved accuracy of diagnosis is integral to ensuring rational use of drugs and may contribute to reduced likelihood of resistance to drugs. Based on evidence presented at the 2014 Integrated Community Case Management Symposium in Ghana, the use of RDTs reduced the median number of treatments for malaria per child per year from 0.3 to 0.2, and the median treatments for pneumonia by more than half from 0.13 to 0.5. Moving from 0.3 median treatments per year to 0.2 median treatments per year corresponds to a reduction in approximately 30% of treatments for fever that were not malaria cases, and thus did not require ACTs, so the use of RDTs resulted in less unnecessary treatments of fever cases. The use of RDTs helped reduce unnecessary treatments of pneumonia with antibiotics, with 50% less cases being treated. Furthermore, the use of diagnostics, such as timers for pneumonia, may have improved the accuracy of the diagnosis for pneumonia and, hence, reduced the dual treatment of children with fever with both antibiotics and anti-malarials.

Another possible reason for the decline in anti-malarial treatment in Niger is the frequency of stock-outs of anti-malarials, which could have further contributed to this reduced coverage of anti-malarials treatment. For instance, with the introduction of ACTs in 2005, less of the other types of anti-malarials may have been available. As a result, stock-outs of ACTs would have a greater impact as there would be no alternative anti-malarials available for treatment. ACT coverage estimates are only available for

2012, with national and rural estimates of 15% and 14%, respectively (data not shown). The 2013 Census did report on stock-outs of ACTs, with approximately 27% of CSs reporting stock-outs in the last 3 months, which increased to 46% when taking expired drugs into consideration.

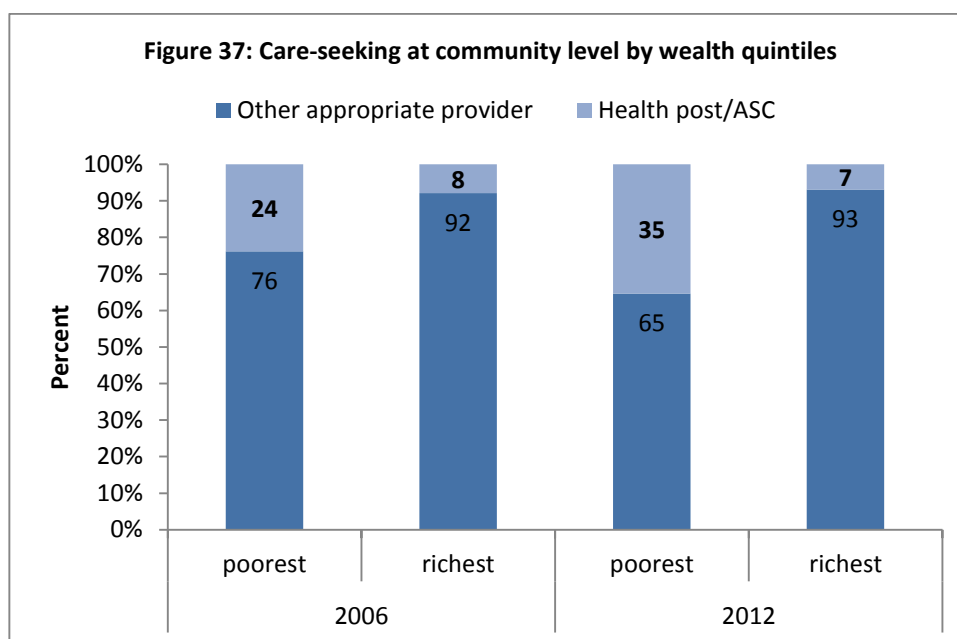
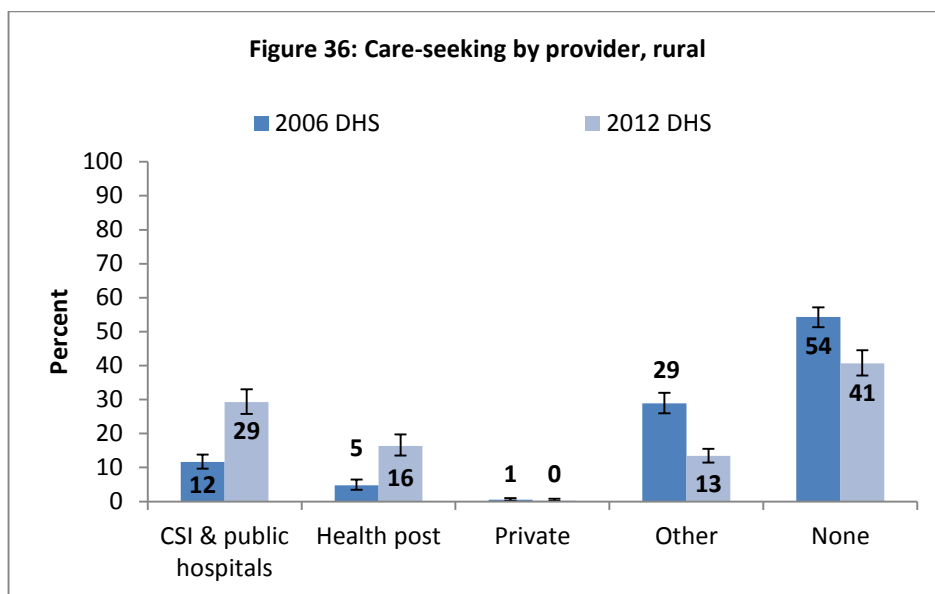


Inequity in coverage of children with suspected fever being given an antimalarial appears to be increasing, with the gap widening between the richest and poorest quintiles by 2012 in comparison to 2006. The poorest quintiles report a drop of almost 16% in antimalarial coverage, from 26% in 2006 to 11% in 2012. The drop in the richest quintile is less marked, dropping from 42% to 31%, with overlapping confidence intervals, indicating a non-significant decrease (Figure 35). The greater decline in access to anti-malarials in the poorest quintile would support the explanation of stock outs, rather than the increased use of RDTs, as the main reason for this decline.

#### 5.2.3.6 Care-seeking for fever, suspected pneumonia and diarrhoea by provider (rural level)

There is evidence of an increase in utilization at the CS level, with care-seeking more than doubling, from 5% to 16%, during the IHSS programme period. Furthermore, care-seeking also increased significantly at other levels of the public sector (CSI and public hospitals) with coverage going up from 12% to 29% over the same period. The increase in care-seeking at the CS level, while modest, is an achievement for a platform that has only been providing iCCM services at scale since 2011. Given that the IHSS programme supported both the CSs and the CSIs, the increases in care-seeking at other levels of the public sector (excluding the CSs) are a positive outcome for the programme. It is also promising to note that the proportion of the rural population who did not seek care at all for any of the 3 diseases decreased between 2000 and 2012, from 54% to 41%, respectively. This drop of 13 percentage points is indicative of new people accessing health care at all levels, including the community and other levels of the public healthcare system. It should be noted that the 11 percentage points increase in care-seeking at the CS level, and 17 percentage points increase in care-seeking in the rest of the public system (including CSI and public hospitals), is also partly explained by the significant decrease of 16 percentage points in care seeking from other sources (including pharmacies, traditional practitioners, boutiques) between 2006 and 2012, further highlighting the success of the programme in ensuring that care is sought from appropriate sources. Further work will be required in this area, given that

13% of the population still seek care from health-care providers that are not recommended (Figure 36).



In Figures 36 and 37, 'Other' appropriate providers include: government hospital, government health centre, government CS, mobile clinic, other public sector, private hospital/clinic, private doctor, other private sector.

Figure 37 above demonstrates an increase in care-seeking at the CS level in the poorest wealth quintiles. However, due to the small sample size of the estimates, the confidence overlap, and therefore the increase, is not significant (confidence intervals not included). Furthermore, the apparent decrease in care-seeking, among the poorest quintile, from any other appropriate provider was also not significant. There was no change in care-seeking patterns in the richest wealth quintile, when analysing care-seeking at the CS level in addition to any other appropriate provider. By 2006, there had already been evidence of some access at the CS level across wealth quintiles, largely because

of the MOH's significant investments in building CSs since 2000 to increase access to care in the country. By 2006, the proportion of people in the poorest wealth quintile accessing care at the CS level was 24%, in comparison to 8% of people in the richest quintile. By 2012, this trend continued, with a higher proportion accessing care at the CS level in the poorest quintile in comparison to the richest quintile. This speaks to a shift in care-seeking patterns towards the CS level within the poorest wealth quintile, although further increases have to be sustained in order for the changes in care-seeking patterns at the CS level to be significant. However, the 11 percentage point increase in care-seeking at the CS level corresponds with the concurrent decrease of 11 percentage points in care-seeking at any other appropriate provider, indicating that care seeking patterns in the poorest wealth quintile may be shifting from other public sector facilities to the CSs, rather than new people accessing care. However, neither of these changes is significant, and so this cannot be determined conclusively. Furthermore, non-significant declines in those not accessing any care were noted in the poorest wealth quintiles (figures not included). Increased care-seeking at the CS level is most likely due to a variety of factors including the population's closer proximity and, as a result, increased convenience to seek care at that level, reduced financial barriers to accessing care (elimination of user fees and lower travel costs to travel to CS), human resource scale up at the CS, 25% of which now have a nurse available, in addition to the IHSS programme and its investment in care for children under 5 at that level. This highlights that the programme has been successful in targeting care-seeking patterns of the segment of the population with the largest barriers to accessing care, although the ideal pattern would be increased care-seeking overall from those not currently accessing any form of care.

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

#### **Antenatal care**

##### ***ANC visits***

Exploring the shift in antenatal care attendance from 1998 to 2010 highlights an upward increase in both the proportion of women who are attending at least one antenatal visit and the proportion of women attending at least 4, as recommended. The apparent increase in the proportions of women attending antenatal visits is more pronounced for women attending at least one visit rather than 4 or more, though the latter is also rising. In addition, the increase is more pronounced between 2006 and 2010, where the proportion of women attending at least one visit increased from 47% to 83%. For the same period, the proportion of women attending 4 or more visits doubled, from 15% to 33%. These increases are noted across all regions of the country.

#### **Childbirth and newborn care**

##### ***Skilled attendance***

Between 1998 and 2006, nationally the proportion of women having a skilled birth attendant at delivery stayed consistently low at approximately 18%, and even dipped slightly to 16% in 2000 although this change is likely not significant. Between 2006 and 2012, the proportion of women delivering with a skilled birth attendant began to increase, with the most dramatic rise between 2010 and 2012, where the proportion rose from 20% to 30%. There were significant variations across the regions in Niger, however. Niamey, the country's capital, reported the highest rates of skilled birth

attendance, rising from 75% in 1998 to 87% by 2012. Whereas, areas such as Zinder reported a 20% skilled birth attendance by 2012, and others such as Maradi and Tahoua reported a 25% rate. Overall progress, while slow in the majority of the regions of the country, demonstrates an upward trend, with the exception of Diffa where significant fluctuations were reported between 1998 and 2012.

## **Infant and young child nutrition**

### ***Complementary feeding***

There was a marked decrease in the proportion of women providing complementary feeding to their infants aged 6-9 months between 1998 and 2000, with the proportion dropping from 96% to 56%. Complimentary feeding estimates remained stable between 2000 and 2006, until the proportion of infants of that age bracket receiving complementary food rose by approximately 10%, between 2006 and 2010 (55% - 65%). Complementary feeding coverage dropped back down to 58% by 2012. By 2012, there was not much regional variation with regard to complementary feeding coverage with the exception of Dosso, reporting the lowest coverage of 44%. All other regional coverage estimates fell between the 15% coverage range of 53%, as reported by Tillaberi, and 67%, as reported by Diffa and Tahoua regions. The decline in complimentary feeding of children between 6-9 months of age could be due to the extreme climate conditions in the country and resulting food shortages, including the devastating food crisis in 2010. The precarious food situation in the country will continue to have devastating impacts on child nutrition, and alternative harvesting methods that are less climate dependent need to be explored further. However, Niger has experienced cyclical food shortages since the 1990s, and as a result, other factors could be at play, including reduced efforts in maintaining complimentary feeding rates. However, it is important to note that the forty percentage point drop in complementary feeding rates between 1998 and 2000 is very unusual, and could also allude to potential variations in how the data were collected and compiled between the 1998 DHS survey and 2000 MICS survey, given that this is a complex multi-question indicator.

## **Vaccinations**

### ***BCG***

National BCG coverage rose dramatically from 47% in 1998 to 84% in 2012, while rural estimates rose from 39% to 82% over the same period. Coverage for BCG immunisation stabilised by 2010, with not much change occurring over the next two year period. Niamey reported very high coverage estimates of 96% while Diffa reported the lowest coverage of 75%.

### ***Polio***

Between 1998 and 2010, the proportion of children receiving the polio vaccine increased three-fold, from 24% to 74%. These early gains in coverage were maintained after 2010. Once again, Niamey reported the highest vaccination coverage for polio, at 86%, while Diffa, the poorest performing region, reported 55% coverage. Coverage in Niamey had already been very high in 1998, at 80%, but the 2006 DHS reported drops in coverage in the better performing regions of Niamey and Agadez; however, coverage rose once again by 2010.

### ***HepB and Hib***

The HepB and Hib vaccines were introduced in 2009 in the country, and the two antigens are provided in the DPT3/Pentavalent Vaccine. Maintenance of relatively high pentavalent coverage has a significant impact on lives saved during the IHSS programme period.

### **Nutrition indicators: Stunting and wasting**

Food security in Niger is precarious, with a history of droughts and famines threatening access to basic nutrition for its population. The country has experienced several episodes of extreme food shortages including the 2004 drought, as well as another crisis in 2010 resulting from extreme temperatures and harvest failure. The high disease burden in children under 5, coupled with low proportions of early and exclusive breastfeeding, declines in rates of complementary feeding and decreasing vitamin A coverage, amplify the crisis. The proportion of children who were stunted rose from 46% in 1998 to 54% by 2000. This rate remained stable up to 2006, before dropping to 44% by 2012. Wasting rates declined from 25% in 1998 to 13% in 2006. These rates, however, rose back up again by 2012, to 18%. At the regional level, Niamey reports the lowest stunting and wasting rates of 20% and 9%, respectively, by 2012, while Diffa reports the highest stunting and wasting rates of 54% and 36%, respectively. The nutritional status of children under 5 has a great effect on mortality and requires immediate and sustainable interventions.

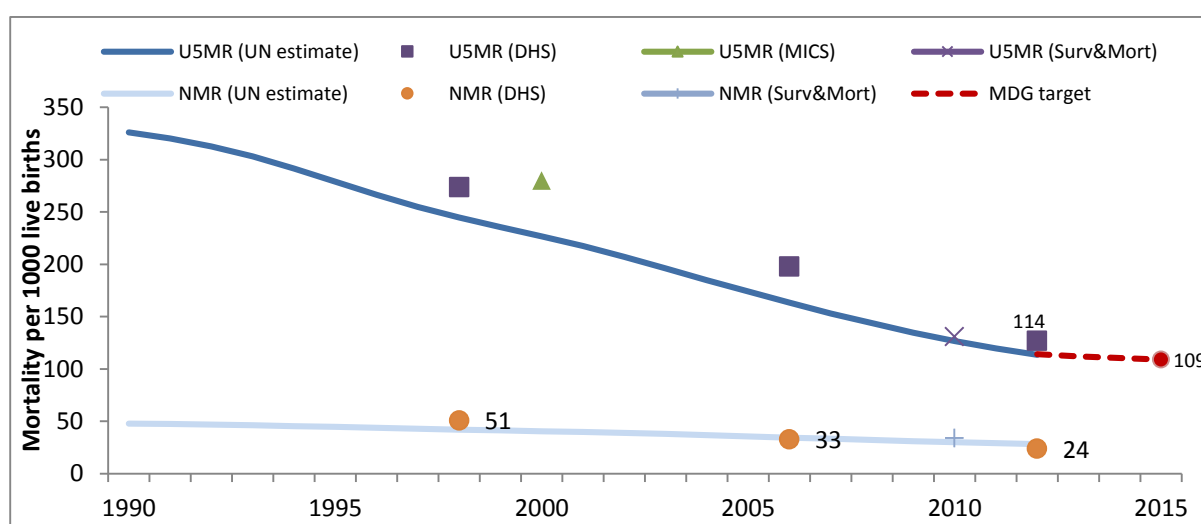


## 5.3 Impact

### 5.3.1 Change in child mortality

According to the UN Inter-Agency Group for Child Mortality Estimation in 2013, Niger is on track for Millennium Development Goal 4 for child survival (Figure 38), with an U5MR of 114 in 2012 and a target of 109.<sup>42</sup> An estimated 91,000 children died before their fifth birthday in 2012. Approximately 25% of under-five deaths occur in the neonatal period, up from 15% in 1990. The average rate of reduction of under-five mortality for Niger is 4.8% per year since 1990, which is higher than the average for sub-Saharan Africa (2.7%).<sup>42</sup> The 2012 DHS reported the national under-five mortality rate (U5MR) at 127 deaths per 1000 live births down from 198 in 2006, which is an average reduction of 5.7% per year.

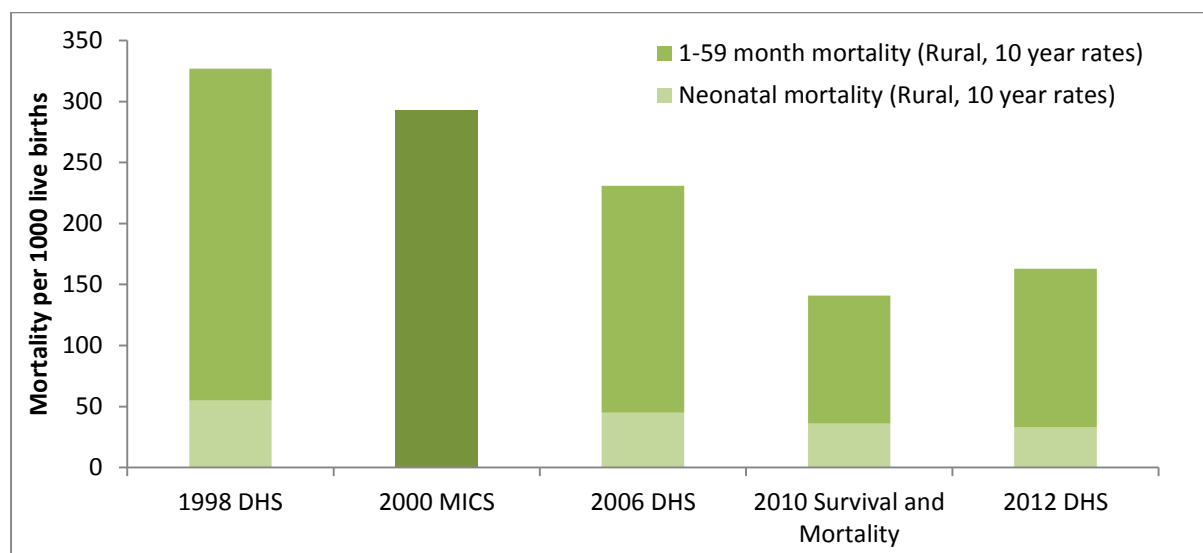
**Figure 38: National and rural under-five and neonatal mortality change**



Data sources: IGME 2013 mortality estimates ([www.childmortality.org](http://www.childmortality.org)), 1998, 2006, and 2012 Niger DHS, 2000 MICS and 2010 Survival and Mortality report.

At national level, Niger has experienced change in under-five mortality since the establishment of the MDGs. The rate of mortality decline at rural level is less pronounced, but the rates calculated from the household surveys reflect the ten years prior to the survey and may mask more rapid recent change. Between the 2010 Survival and Mortality Report and the 2012 DHS, it appears that under-five mortality in rural areas has increased for children after the first month of life, but decreased slightly amongst neonates. Differences in the way the birth histories were collected may account for this discrepancy (Figure 39).

**Figure 39: Rural neonatal and under-five mortality**



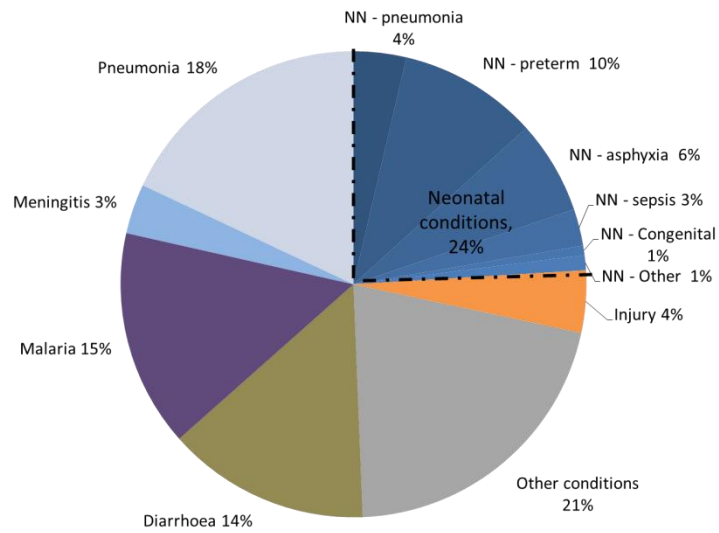
Note: The lighter shaded area of the bars represents the proportion of under-five mortality that occurs in the neonatal period. The darker shaded area is the proportion of mortality amongst children aged 1-59 months. The indirect methodology of estimating mortality in the MICS 2000 does not provide neonatal mortality rates.

In 2010, the main causes of postneonatal under-five deaths in Niger were pneumonia (18%), diarrhoea (14%), and malaria (15%)<sup>43</sup> (see Figure 40a). According to modelled estimates, since 2000 the proportion of deaths due to malaria has dropped from 22% to 15%. Measles deaths have also dropped from nearly 5% of all under-five deaths in 2000 to less than 1% in 2010 (see Figure 40 b). With deaths due to infectious causes in the postneonatal period decreasing, proportionately more deaths are occurring in the neonatal period, and due to other causes.

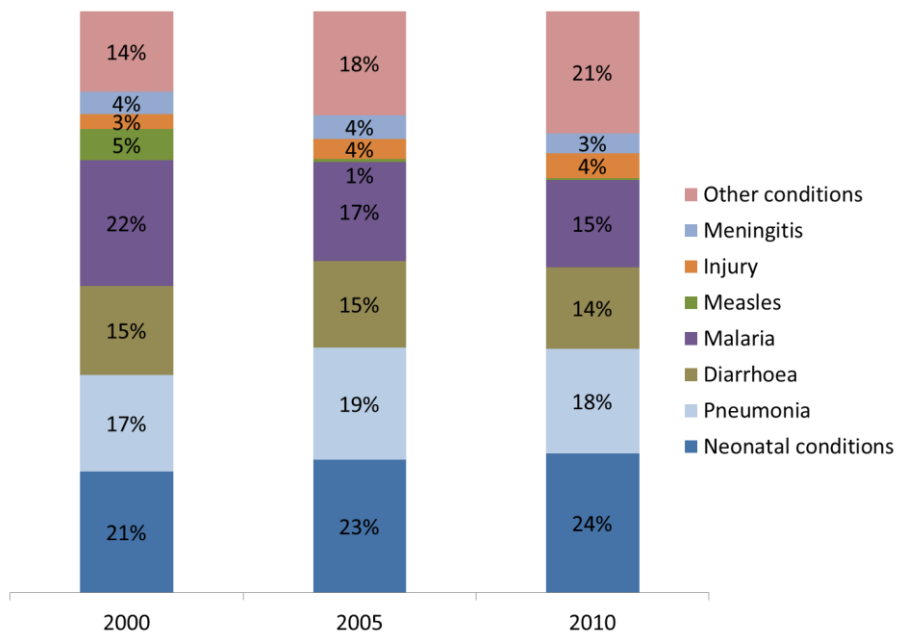
**Figure 40: Causes of under-five deaths in Niger**

Data source: Liu et al, Lancet 2012.<sup>43</sup>

(a) 2010



(b) National cause of death trend, 2000 to 2010



### 5.3.2 Lives saved results

We calculated the proportion of child lives saved by intervention using the LiST-estimated number of child lives saved in 2007, 2010 and 2012 (relative to the situation in 2000 and 2007, respectively) as a denominator. We adjusted the total fertility rate to approximate the number of live births from 2000 and 2012. Results are presented by intervention for both phases.

#### ***Pre-IHSS implementation (2000-2007)***

Using a baseline U5MR from DHS 1998 of 274 per 1,000 live births, LiST predicted an U5MR of 251 in 2007. This prediction was higher than the DHS 2006 estimated mortality at 198 (error range 184 - 211), 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. According to the modelled results, over 65,000 deaths of children under five were averted between 2000 and 2007, prior to IHSS programme implementation (Table 6). In 2007, one quarter of the deaths averted was due to care-seeking for suspected pneumonia. Increases in vitamin A supplementation were responsible for 17% of deaths averted, and measles treatment for 15%. Measles vaccination also contributed to 8% of lives saved. During this time period, measles deaths reduced from over 7,300 to 4,800. Increases in optimal breastfeeding practices and appropriate complementary feeding accounted for 9% of the deaths averted (Figure 41).

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

	2001	2002	2003	2004	2005	2006	2007	Cumulative deaths prevented
Proportion of under five deaths averted	1%	3%	4%	5%	7%	8%	12%	
Additional under five deaths prevented per year*	1,900	4,000	6,200	8,500	11,000	13,700	20,000	65,300
Predicted under-5 mortality rate	268	266	263	260	257	254	251	
Annual rate of mortality reduction**	1.1%	1.1%	1.1%	1.1%	1.1	1.1%	2.9%	1.4%

*Numbers rounded to avoid spurious accuracy*

*\*\*the marked increase in annual rate of reduction between 2006 and 2007 reflects the linear interpolation of coverage rates between the 2006 and 2012 DHS.*

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

Given that Niger started with iCCM implementation from the start of the IHSS programme, only one analysis was conducted for the duration of implementation. For this analysis, we used the baseline U5MR of 198 in 2006. The U5MR predicted by LiST, based on measured coverage change between 2006 and 2012, was 166, higher than the national household survey point estimate of 127 (sampling error 119-136). The modelled results indicate that approximately 63,600 deaths of children under five were averted between 2007 and 2012, a 19% reduction compared to the 2007 baseline (Table 7). The average rate of mortality reduction of 3.1% per year in the IHSS programme implementation phase is

higher than the pre-IHSS period annual rate of reduction of 1.1%. In 2012, the Hib vaccine (newly introduced in Niger in 2009) accounted for 25% of the deaths averted. Increases in ORS coverage accounted for 24%. Children sleeping under ITNs and antimalarial treatment accounted for 13% and 11% of deaths averted, respectively. Care-seeking for pneumonia, childbirth and newborn care, and WASH interventions each accounted for 6% of the deaths averted. Decreases in vitamin A supplementation and optimal breastfeeding practices amongst older children (complementary feeding and breastfeeding amongst 12-23 month old children) resulted in additional deaths in 2012 compared to 2007.

**Table 7:** Results from Lives Saved analysis for Niger IHSS programme implementation

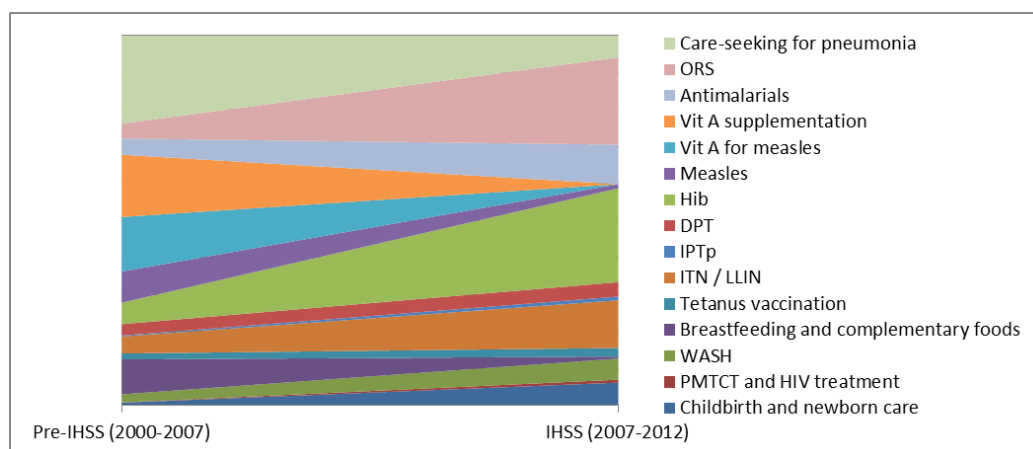
	2008	2009	2010	2011	2012	Cumulative deaths prevented
Proportion of under-five deaths averted	2%	5%	9%	13%	19%	
Additional under-five deaths prevented per year*	3,100	6,400	12,000	17,800	24,300	63,600
Predicted under-five mortality rate	194	190	186	180	173	
Average annual rate of mortality reduction	2.1%	2.1%	3.5%	3.6%	4.3%	3.1%
Number (%) of deaths averted due to interventions to which the IHSS contributed*^						56,600 (89%)

\*numbers rounded to avoid spurious accuracy

^As per page 5 of Schedule A of the Grant Agreement and the tailored Niger programme implementation, in this context "IHSS programme interventions" in LiST are assumed to include maternal tetanus vaccination; PMTCT; exclusive breastfeeding; complementary feeding; ITN use and IPT in pregnancy; DPT, Hib, pneumococcal, and measles vaccines; vitamin A supplementation; vitamin A for measles treatment (vitamin A supplementation used as proxy for coverage); ACTs for malaria; ORS for diarrhoea; zinc for diarrhoea; and case management of pneumonia (care-seeking used as proxy for coverage).

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

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



In summary, coverage changes during the pre-IHSS period (2000-2007) accounted for an estimated total 65,300 lives saved over 7 years of analysis, amounting to approximately 9,300 lives saved per year. In comparison, during the 5-year IHSS programme period (2007-2012), an estimated 63,600 lives were saved, amounting to approximately 12,700 lives saved per year. The modelled annual rate of mortality reduction was faster in the IHSS programme period than the years directly preceding the IHSS programme, though the LiST model overestimates the total under-five mortality rates compared to the mortality rates measured by the DHS for both periods.

While the true number of lives saved on coverage change is difficult to ascertain given that the mortality rates predicted by the LiST model are higher than the mortality measured by the household surveys, the LiST analysis is presented for illustrative purposes to highlight which interventions may have had the largest effect. The LiST analysis demonstrates that for the IHSS programme period, the introduction of the Hib vaccine in 2009, together with the increase in ORS coverage, accounted for approximately 50% of deaths averted (or lives saved) in 2012.

Children sleeping under ITNs and anti-malarial treatment accounted for an additional 24%, while care-seeking for pneumonia contributed an additional 6%. Childbirth and newborn care and WASH interventions (not a core part of the IHSS programme) accounted for the remainder of deaths averted. Given the notable increases in coverage of these important interventions during the IHSS programme period, it is plausible that IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012. IHSS programme interventions accounted for an estimated 56,600 lives saved between 2007 and 2012, or 89% of the total lives saved over this period.

### **Comparison with previous Lives Saved analysis for Niger**

We compared the results from this analysis with one conducted by Amouzou et al<sup>37</sup>, which used the 1998 DHS as the baseline and the 2010 Survival and Mortality Survey as the end line coverage input. While both analyses note massive declines in under-five mortality and coverage increases for maternal and newborn interventions, the addition of the 2012 DHS demonstrates somewhat different results. When 2012 stunting and wasting rates are directly entered, reductions in stunting rates account for 31% of deaths averted in 2012 in comparison to 10% in 2009 in the analysis by Amouzou et al. While ITN ownership and anti-malarials still account for a large proportion of deaths averted in 2012, the smaller coverage increases seen in the 2012 DHS, compared to the 2010 Survival and Mortality Report, result in these interventions having proportionately less impact compared to the 2009 analysis.

## **5.4 Sustainability**

### **5.4.1 Costing**

The costing component, for the purpose of this evaluation, assessed the additional costs incurred by the health services, including donor funding, due to the introduction of the curative interventions by ASCs for the treatment of malaria, diarrhoea and pneumonia in children under 5. It also assessed the financial sustainability of the iCCM intervention in relation to current utilisation and anticipated increased future levels of utilisation. Costs are expressed in US\$, with 2012 rates.

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

- What is the additional cost per treatment for each of the 3 Malaria, Diarrhoea and Pneumonia (MDP) conditions?
- What is the cost of increased utilisation?
- What is the financial sustainability of this?

The results below do not reflect the actual expenditure on iCCM. They reflect expected costs if the intervention is implemented according to protocol: a normative approach which determines the cost of treatments as per the clinical protocol and the costs of support services (supervision, etc.) as per the prescribed plans. Appendix F shows details of the protocols, unit costs and calculations.

#### 5.4.1.1 Current cost per treatment

In 2012, a total of 2560 iCCM-trained ASCs delivered 1.5 million MDP treatments in the CSs to children under-five. Each of them provided an average of 603 MDP treatments a year. Malaria treatments represented 54% of MDP treatments, diarrhoea 18% and pneumonia 27%.

Additional annualised fixed costs per ASC stand at US\$188 and at \$0.31 per treatment, as shown in Table 8 below. The cost of a malaria treatment, including rapid diagnostic tests (RDTs) and drugs (Coartem, Asaq, Paracetamol) is \$5.04, diarrhoea treatment with ORS and zinc costs \$0.91, and pneumonia treatment (Amoxicillin) costs \$1.52. The ASC fixed costs represent 6% of cost per malaria treatment, 34% of diarrhoea treatment and 20% of pneumonia treatment, an average of 9.4% of the cost per treatment (Table 9). This proportion is lower when the cost of drugs and diagnosis is higher.

**Table 8:** Additional annualised costs per ASC for 2012

Additional Annualised Fixed Cost by ASC in \$	Fixed Cost/ASC/Year	Number MDP treatments under 5 /year / ASC	Fixed Cost per Treatment
Training	55.04		
Salary	-		
Equipment	81.73		
Management & Supervision	42.28		
Other Overheads 5%	8.95		
<b>Total Additional fixed cost</b>	<b>188.00</b>	<b>603</b>	<b>0.31</b>

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

Cost per treatment	Fixed Cost	Drug/ Diagnostic	Total	% Fixed Cost
Malaria, incl RDT	0.31	4.73	5.04	6.2%
Diarrhea	0.31	0.59	0.91	34.4%
Pneumonia	0.31	1.21	1.52	20.5%
<b>Weighted Average</b>	<b>0.31</b>	<b>3.01</b>	<b>3.32</b>	<b>9.4%</b>

Based on 603 MDP treatments a year per ASC, or an average of 13 treatments a week, the combined consultations and meeting time spent on iCCM for the MDPs amounted to an average of 7.3 hours a week per ASC, less than 20% of ASC's working time.

### 5.4.1.2 Scenario for increased iCCM service utilisation

If the number of treatments per ASC per year increases by 15%, or 15 treatments a week, the time spent by an ASC on MDP treatments for children under 5 would increase from the current 7.3 hours a week to 8.3 hours a week, and to 9.3 hours for a 30% increase in treatments representing 17 treatments a week. Required time increases by a smaller ratio than the increase in the number of treatments because the time spent in meetings does not increase with higher number of treatments.

Due to the fact that 90% of additional treatment costs are due to drugs and diagnosis, the cost per treatment would only change very marginally, but the costs across the program would increase by 13.6% with 15% more treatments and by 27.2% with 30% more treatments (Table 10).

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

Increased Utilisation by same ASCs	Per ASC/Year		
	2012	15%	30%
<b>Increase rate</b>			
Number Treatments / Year / ASC	603	693	784
Number Treatments / Week	13	15	17
Hours on visits/meetings / Week	7.3	8.3	9.3
Fixed Cost per Treatment	0.31	0.27	0.24
Average Cost per Treatment	3.32	3.28	3.25
<hr/>			
Program Cost	5 125 615	5 822 263	6 518 912
% increase in cost		13.6%	27.2%

Utilisation of iCCM services is high. The Ministry of Health indicated that the goal for 2013-14 was to have an average of 0.8 curative visits at the CS per capita per year. The observed number of MDP-related visits at CS (including 20% additional visits that did not translate into MDP treatments) amounts to 1.05 visits per child under 5 per annum (in 2012). With a 15% increase in treatments it would reach 1.21 and with 30% increase in treatments 1.36. The number of MDPs treated does not include visits which did not translate into treatments. It is widely acknowledged that children under-five need a higher average number of visits per year than older children or adults. MDPs are not the only curative consultations for children under-five, thus the current 1 MDP treatment per child under-five per year reflects high utilisation levels with the current number of CSs and ASCs.

This costing, focusing on additional costs, has assumed that health workers were already trained in IMCI and iCCM, that ASCs had already received basic training, that drugs/tests were available at the CSs and that treatments were given as per protocol. In practice additional funds were used as part of the IHSS programme to provide the conditions to enable iCCM to be delivered. To reflect this wider platform, iCCM+, an additional 15% was added to the iCCM basic costs, as described in the methods, in the analysis of sustainability, recognising that this additional 15% underestimates these additional costs at the beginning of the program but will overestimate them as the program matures.



### 5.4.1.3 Financial Sustainability

To assess the financial sustainability of this programme, the 2012 additional expenditure on iCCM for MDPs was compared to the total annual public health expenditure (government and donors), and to the government health expenditure in 2011. In 2011, government expenditure stood at 49% of public health expenditure. With the current number of ASCs and current number of treatments per ASC, additional costs of iCCM basic accounts for 2.8% of the total public health expenditure and 5.7% of the government's health expenditure (see Table 11). For iCCM+ (iCCM basic + 15% cost for additional support to the health system) these percentages would stand at 3.2% of total public health expenditure and 6.5% of the government's health expenditure. The budget impact of the iCCM is in fact likely to be smaller since a part of the treatments delivered by ASCs were previously provided, and budgeted for, in health centres. As shown in the last row of Table 11, with a 30% increase in treatments, iCCM+ would represent 4.1% of the total public health expenditure and 8.3% of the government's health expenditure.

**Table 11:** iCCM impact on Niger health expenditure

	Total 2011 (\$)	Government	Donors
Public Health expenditure	100.0%	49.2%	50.8%
	183 127 855	90 022 391	93 105 465
<b>Current # of ASCs current # of Treatments</b>			
Program Cost	5 125 615		
	% Public Health Exp.	% Government Own Health Exp.	
<b>iCCM</b> as % Public Health Expenditure	2.8%	5.7%	
<b>iCCM +</b> as % Public Health Expenditure	3.2%	6.5%	
<b>Current # of ASCs, +30% Treatments</b>			
Program Cost	6 518 912		
	% Public Health Exp.	% Government Own Health Exp.	
<b>iCCM</b> as % Public Health Expenditure	3.6%	7.2%	
<b>iCCM +</b> as % Public Health Expenditure	4.1%	8.3%	

The programme is widely spread and has a high level of utilisation. Its financial impact on the budget reflects this. With an annual population growth of 3.9% a year, the expected number of treatments will grow, as will the financial impact. Public Health expenditure stood in 2011 at 11% of the government's expenditure, a stable proportion since 2009 (Table 12). However, given the increasing demands on the budget to respond to security issues, the share of the health budget is likely to decrease. As shown in Table 12, donor partners' contribution to Public Health Expenditure has varied significantly from one year to the next, a concern emphasised by the Ministry of Health. Nevertheless, it still represents half of the Public Health expenditure.

**Table 12:** Past trends in public health expenditure

	2007	2008	2009	2010	2011
Public Health expenditure per capita (current \$)	8.18	10.08	9.55	8.57	11.09
PHE as % of Government Expenditure	12.2%	11.38%	11.07%	11.08%	11.08%
Donors as % Public Health Expenditure	63.6%	38.8%	39.6%	66.4%	50.8%
Population rate of increase		3.81%	3.83%	3.86%	3.89%

The programme is highly utilised and efficient in its current form. Given the pressures on the government's own budget, support from donors for this program will have to remain to ensure sustainability with the additional challenge of increasing demand linked to population growth.

The current discussion of shifting treatments to Relais needs to take into account the financial implications and sustainability issues. Costs of this approach are likely to be higher due to the fact that there will be more Relais than ASCs, and the cost of training, supervision, kits and logistics will, thus, increase proportionally. This has to be balanced with the possible higher coverage that could be achieved when using Relais.

The Global Fund's New Funding model with its focus on including iCCM activities and systems costs, (apart from drugs for diarrhoea and pneumonia), will play a central role in ensuring the financial sustainability of the program, as well as doing it in a way which allows for better planning with a secured time horizon of three years until the next replenishment.

#### **5.4.2 Qualitative findings related to sustainability**

##### **Perceptions of success and sustainability of iCCM**

The overall perception of the IHSS programme, amongst government, other NGO partners and UNICEF informants, is that it has made a positive contribution to child survival and health systems strengthening in Niger. The sentiment was expressed that iCCM has contributed to the drop in child mortality and to Niger being on track to achieve the MDG for child survival. The IHSS programme was seen as being a catalyst for other positive developments and policies.

Most MOH officials and staff interviewed expressed their concerns that if UNICEF-DFATD funding was to end, this would negatively affect sustainability. A top official expressed the hope that the positive results achieved in Niger would provide the motivation for donors to continue their funding, noting that:

*"The success of the Catalytic Initiative speaks for itself."* (MOH Official)

Most of the success of the IHSS programme is ascribed to the way UNICEF works in partnership with the MOH and the way MOH takes ownership and leadership. Besides the training of ASCs in iCCM, UNICEF's role in funding and providing drugs and supplies for free child health care, is considered a crucial component to the success of the programme. The timing of the IHSS programme funding was also seen as opportune as it assisted the government to respond to the increase in utilisation due to the Free Health Care Policy. Another catalytic effect was that it increased appreciation for the role of lay health workers, which has resulted in new policy shifts. To this effect, MOH is now considering how best to utilise the volunteerism of the Relais. They are considering formalising the roles of the Relais, expanding their preventive role and to build in training and other incentives, such as compensation and motivation.

With respect to iCCM, although there is concern about the negative impact of DFATD funding ending, this concern is largely focused on the provision and supply of drugs. A top MOH official acknowledged that the core costs of the iCCM are covered by the MOH and the Niger Treasury department, because they have paid for the infrastructure of the CSs, they pay for the salaries of the ASCs and the nurses who act as supervisors. However, UNICEF funds would still be required to fund the purchase of drugs for the three childhood diseases and the drug supply chain system.

### **Perceptions of success and sustainability of Free Health Care Policy**

There is awareness amongst MOH officials and other NGO partners, that the reduction in child mortality is due to a wide variety of factors, including, but not restricted to, curative care activities at the CS. When asked about the factors that contributed to the sustained reduction in child mortality, there was a wide range of responses. Most felt the largest contribution was made by the Free Health Care Policy, as this dramatically increased access. This perception is supported by quantitative estimates of a doubling, to a tripling, of increase in utilisation after Free Health Care was introduced. Several respondents noted the important role of malaria prevention via distribution of bed nets, as well as the nutrition support programmes for acute and chronic malnutrition. The Relais were also credited for their role in increasing health awareness, assisting with immunisation campaigns, and in encouraging health promotion practices and health care-seeking behaviour. A few of the NGO partners and some MOH officials thought this was an important role that is not well recognised, partly because of the informal nature of this cadre of volunteer community worker. Other factors mentioned were that nurses had been doing outreach work as early as 1998, before the establishment of CS and that is when the mortality rate started to fall. One NGO noted that the increased use of motorbikes allowed more patients to reach health facilities quicker and supervisors to reach CSs.

The Nigerien government held a conference in March 2012 to discuss the impact and the challenges linked to the free child healthcare policy in the country. Despite the positive gains made by the Free Health Care initiative, health staff and some MOH officials raised serious concerns about the sustainability of this policy. Annually, approximately USD 7.8 million has been allocated, but this is estimated to be only half of what is needed. In 2011, the government allocations began to improve; however, there remain a substantial number of unpaid bills, amounting to USD 41.4 million as of March 2012. It was reported that funding shortfalls may be threatening both the impact and sustainability of the programme, as facilities experience stock-outs of essential medicines and equipment. Staff at facility level explained that there is a problem with the lack of re-imburement of CSI and IHSS programme costs for mother and child care visits, and this posed a serious threat to their functioning as they are dependent on reimbursement funding to purchase the medicines needed for adult treatments. One example mentioned how health facilities manage the financial shortfall, by using the free drugs for children (provided by UNICEF) for treating adults when the clinic runs out of adult drugs. This then has the knock-on effect of stock outs of child drugs, which could reduce the effectiveness of the curative child services. A senior MOH official commented that ‘free healthcare’ does have costs attached to it, and that the costs are increasingly difficult to manage. The official explained:

*“Free care was ‘paid for’ by the exchange of debt relief - where Niger had a cancellation of debt in exchange for free care for children under-5 years. Free care is very popular, but this government is struggling to continue.” (MOH official)*

The financial challenges linked to the policy stem from the fact that it was announced and implemented without appropriate assessment of the financial requirements to ensure its success and with lack of planning as to how it would be funded. Furthermore, funding from donors is limited. The French Development Agency which has proposed to reimburse 1/5 of the costs, and support from UNICEF is among the only donor commitments for the initiative. Furthermore, there are concerns about inaccurate invoicing and double payments at health facilities, as well as an increased workload on health workers without an appropriate change in compensation. An NGO head echoed this sentiment and shared an example of the strain on resources in the health services:

*“With Free Care, the CSI does not have enough resources for services, for example the CSI does not have enough gas for the fridges.”* (NGO)

While the Free Child Healthcare policy has alleviated pregnant women and children from the financial constraints of accessing care, user fees for the rest of the population remain high. The WHO has estimated that out of pocket payments make up 41% of health expenditure in the country, which is more than double the recommended amount. This is particularly concerning in a country where the majority of the inhabitants live in poverty.

### **Donor relations and sustainability of health systems strengthening**

UNICEF and MOH officials acknowledged that sustainability of iCCM is dependent on continued external donor funding, at least for cost and supply of medicines, and have been applying themselves to securing such funding to sustain the program in the medium term. There are also plans to support MOH to expand the focus to neonatal and maternal health as well as to preventive care.

There is a complex interaction between issues of sustainability of donor funding, free healthcare, focus on child survival and need for broader health systems strengthening. There appears to be overall poor tracking of donor funding allocations to different areas, which makes it difficult to evaluate and optimize the impact of donor support. A donor partner explained:

*“National MOH does not have a complete set of National Health Accounts that can account for all the donor contributions.”* (Implementing partner)

To address this part of this problem, donors collaborated in starting a ‘common basket of funds’ in order to streamline and optimise donor funding, though the success of these efforts is uncertain.

There were diverse views amongst NGO respondents, on the role of donors in Niger. Some argued for increased collaboration between donors, to improve efficiency and monitoring of funding mechanisms, and also for increased donor support for more complex and costly health programmes, e.g. for maternal and neonatal health, that is also aligned with government priorities.

The complexity of competing demands in health systems strengthening can be illustrated by the situation observed at one CSI. The CSI consisted of a set of very basic rooms for consultation. Most of the rooms had a shared function, with different types of consultations taking place in very cramped space and with no privacy. Through donor support, the CSI had acquired a well-constructed maternity unit building that was being utilised at capacity. However, basic challenges such as irregular supply of electricity, lack of functional sterilisation equipment and other tools hampered the work of this facility. Amongst their greatest needs was a generator for back-up power supply.

## 6. Conclusions

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### 6.1 Relevance

#### **A receptive political and policy environment, alignment and medium-term funding contributed to a policy shift**

The IHSS programme was launched during a period of political will and health reform that provided a window of opportunity for its acceptance and success. Prior to the IHSS programme, as far back as the start of the multi-party democracy in 1993, Niger introduced health policy and reform aimed at increasing access to health care for the poorest population. There was a prioritisation of primary health care services by the MOH, fortified through the establishment of a community-based service delivery platform via the CS and ASCs. Although based on a cost recovery model at the time, this CS platform provided for a receptive environment for introducing the IHSS programme.

The IHSS programme was well aligned with the government's continued efforts to expand community-based care. Funding through the IHSS programme helped to ensure that the MOH vision of increasing access to care at community level was realised. The significant incentive of consistent IHSS programme funding for five years consolidated government and partner support, enabled effective planning and coordination, and catalysed the process. The timing of the IHSS programme was also opportune as it was able to support the country's policy shift towards free health-care for pregnant women and children under five.

Government policy and plans include expanding the roles of the ASC to include neonatal and maternal health care, attesting to the increased acceptance of the role of the community health worker in curative care. The IHSS programme made a major contribution to this policy shift. Nevertheless, not all stakeholders agree with the focus of the IHSS programme, with some expressing the view that IHSS programme goals could have been more closely aligned with the government's broader vision and policy, by, for instance, including maternal survival as a focus.

#### **UNICEF collaboration, MOH leadership and involvement of clinical governance were promotive factors for implementation**

A long standing and good quality collaborative relationship between UNICEF and the Nigerien MOH, together with advocacy activities carried out by UNICEF, resulted in an eventual policy shift to allow ASCs to provide curative case management for childhood illnesses, despite reluctance on the part of government during the earlier years. Collaboration with, and ownership by, high level managers and clinical staff, including the Association of Paediatricians, ensured a relatively smooth integration of iCCM into the existing roles of the ASC. Strategic leadership from the top is essential, and leadership from clinical managers is also a strong determinant of uptake and diffusion of complex health interventions,<sup>44</sup> such as this IHSS programme.

#### **Women's participation, gender disparity and women's health priorities**

Despite gender disparities in the general population, the IHSS programme contributed to women's participation and a gender equity approach by training more female than male ASCs, thus promoting gender equity. This is a substantial achievement, given the lower levels of women's access to education in Niger. However, the higher attrition rate amongst females, as shown in the latest 2013 Census, indicates that there is greater challenges with retaining female ASCs, as only a quarter of ASCs

deployed in 2013 were female. The reasons could not be investigated due to the timing of the data source (2013 Census of CSs and CSIs). One could speculate that the social, cultural and economic inequalities facing women in Niger may, in large part, be responsible for their attrition following the ASC training. Previous studies have indicated how these gender dynamics influence and restrict the agency of women in relation to health care seeking,<sup>8,9</sup> and it may be that these factors extend to their ability to take up and retain employment as ASCs. Promotion of increased participation of female ASCs will, therefore, require extra effort to recruit and train even higher numbers of female ASCs as well as greater effort to retain them.

Literature points to the leading role of gender dynamics in health service user outcomes, including influences on child health and nutrition outcomes, the role of gender dynamics in service utilisation, as well as to the importance of developing interventions that address gender dynamics.<sup>9</sup> The IHSS programme has captured many of the components found to be effective in addressing gender dynamics, including making services more accessible to carers of children, promoting the accessing households directly through home visits and seeking to mobilise and engage communities.

Niger has made less progress in certain maternal and women's health indicators. The objective of the 2007 Population Policy Plan was to contribute to poverty reduction through reproductive and population health strengthening. However, since then, the average number of children per woman has increased rather than decreased, there has been only a modest increase in modern contraceptive prevalence, and the level of maternal mortality remains extremely high. The large gender disparities between men and women in the general population, with significantly higher rates of illiteracy among women as well as early marriage and childbearing, are factors that impact negatively on women's health. These issues are connected to wider socio-economic and socio-cultural factors, which affect the education level and status of women. Broad-based initiatives to promote gender equity are required to address these issues, including increasing women's access to educational and financial resources.<sup>8,37</sup> These will require inter-sectoral efforts to ensure the promotion of gender equity, especially in improving the extremely low literacy levels among young women (23%). As mentioned earlier, given the reproductive and maternal health priorities, some stakeholders in Niger are of the opinion that the IHSS programme should have been more closely aligned with government's broader vision of reproductive health by, for example, including maternal survival as a focus.

## **6.2 Effectiveness**

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

#### ***The IHSS programme contributed to the expansion of functional Cases de Santé and the implementation of free health care for pregnant women and children***

During the IHSS programme period, the number of functional CSs grew from 1594 in 2006 to 1997 in 2013, a growth of 402 CSs, which shows continued government commitment to increase access to a basic package of health care services for the population. The IHSS programme contributed to this growth in functional CSs by providing free drugs and iCCM training for the ASCs deployed to those CSs. The latest 2013 Census survey showed that 429 CSs had closed, which raised questions about the capacity of the government to continue the expansion of CSs.

The 2006 Free Health Care Policy was paramount in increasing the accessibility of health services to populations who previously could not afford it. This, together with a large scale up of building of CSs and the basic training of ASCs, dramatically increased population coverage of health services especially for populations living in remote areas and demonstrated the Nigerien government's commitment to increasing access to health care. This dramatic increase in utilisation at CS level provided additional impetus for the MOH to implement iCCM. However, this free healthcare initiative would not have been effective without the health systems strengthening support of the IHSS programme, provided through training, supervision, supplies and monitoring, which contributed to increased geographic access to health care for women and children.

Although the Free Health Care Policy eliminated user fees for pregnant women and children under five years of age, thus removing financial barriers to health care access for these groups, for others, the cost of travel and user fees remain as barriers. There may be a need to further extend free health care as indications are that financial constraints act as a disincentive for seeking health care for children over 5 and adults in Niger.<sup>8</sup> User fees have been shown in other LMIC settings to reduce health care-seeking.<sup>15,16</sup> In the context of Niger, it is therefore worth asking whether the concept of community-based curative care for children (at CS level) can only be successful in the context of free health care.

### ***The IHSS programme strengthened the health system through training and supervision of ASCs***

The IHSS programme reached its iCCM ASC training target of 2502 early, with 90% of the 2560 ASCs trained by 2013. With the early training and deployment of ASCs, the IHSS programme in Niger has the earliest implementation of the six African countries evaluated, which provides a better platform for evaluation of its impact.

The IHSS programme focused on curative care for the three main childhood diseases, as well as the management of acute malnutrition, and further invested in training ASCs and nurses in immunisation techniques and supported the organisation of immunisation sessions aimed at ensuring optimal vaccination coverage in hard to reach areas. This ensured that the majority of the CSs that had been constructed over the past decade had the human resources available to become functional service delivery points for iCCM. Based on 2013 Census Survey data, approximately 1997 CSs were functional (with 429 reported as having closed), with 1535 ASCs and 535 nurse-related cadres being deployed to the CS. The actual numbers of ASCs deployed remain in flux, with an annual attrition rate estimated at around 7.5%. This will require continued training of new recruits replacing those leaving. It is highly likely that continued donor support would be required for such ongoing iCCM training as well as for refresher training.

The IHSS programme invested in training of frontline health workers (294 nurses/clinicians) in IMCI, to enable nurse supervision of the ASCs, serving as an important contribution to strengthening the health system in support of iCCM. Currently IMCI training is integrated into the regular curriculum of nurse training, reflecting government ownership. It is unclear if the training is sufficient to allow for effective supervision of ASCs.

Although less than 10% of ASCs received a monthly supervision visit in 2013, as required by the MOH protocol, quarterly supervision was relatively frequent, with 71% of ASCs receiving at least 4 visits in 12 months in 2013; a remarkable increase from 46% in 2010. Of those supervised quarterly, the majority (84%) reported that there was observation of case management in at least one of the

supervisory visits, which is a requirement for effective supervision. The IHSS programme contributed to this remarkable increase in quarterly supervision and the likely spillover effect on increased observation of case management.

MOH stakeholders reported that there are challenges with regular supervision, and the reasons given include lack of transport due to, for example, broken motorcycles and no funds for petrol. The long-term plan of the MOH to upgrade the level of service delivery at the CS by placing a nurse at this level will allow for onsite supervision of the ASC. There is no formal supervision process for the Relais, though in practice there may be informal supervision of Relais by the ASCs.

### ***The Relais as an important component of community health services***

The Relais, the volunteer community health worker cadre described earlier, appears to be central to linking communities to CSs and CSIs, but their role has not been fully evaluated.<sup>17</sup> It would seem that their volunteer role is integral to the fabric of the Nigerian traditional village society. This includes working with the village chief and being a representative on the village health committee. Although ASCs may also carry out household visits, they are mostly based in the CS, and it is the Relais who operate at village and household level, including identifying families with pregnant women and young children, increasing community awareness of illness and prevention of diseases, encouraging health care seeking and assisting with community-based immunisation campaigns, as well as in advising on early treatment of diarrhoea with home fluids.

Their contribution has been difficult to quantify as this is an informal volunteer cadre, their numbers at the community level are uncertain and roles are not standardised. The 2013 Census of CS and CSIs confirmed impressions that numbers of Relais are more than those of ASCs, with about 2 Relais to a CS and 5 to 6 to a CSI. In 2012, UNICEF and the MOH began formulating a new community-based care strategy that not only expands the package of care for the ASCs, but also increases the number of responsibilities for the Relais, related to maternal and child health preventive and curative care. There are ongoing discussions on how to incentivise this cadre through, for example, provision of training and income generating projects, but they are still essentially sustained through volunteerism.

At the moment the WHO is supporting World Vision, an international NGO, to implement a pilot project using the Relais in 4 districts, over a four year period. There are discussions underway for other donors, such as UNICEF, to support the work of those Relais linked to CSIs and CSs, during the second year of the implementation of the pilot.

The expansion of both the role of the Relais and the ASCs ensures that their roles become complimentary rather than redundant, with the CS now providing delivery and immunisation services. Now that the plan is for the Relais to be provided with drugs and diagnostics to be used in the community, it is paramount to ensure that the CS and CSI levels are fully equipped. The IHSS programme contributed to this embracing of the role of community-based cadres, with their initial advocating for the expansion of the roles of a community-based ASC cadre to include curative care. This is likely to have had a spillover effect in terms of also embracing extended community health care roles for the Relais.



### ***The IHSS programme contributed to increased health care seeking***

There is evidence of increased access to basic primary health care services for the whole population, including for children under-five. As mentioned earlier, the population now living within 5 km of a health facility (CS or CSI) increased, from 41% in 2006 to close to 50% in 2012. This is also against the background of an increase in care-seeking at the community or CS level and a reduction in the proportion of people who previously did not access care. The Free Health Care Policy was central to this increase in care seeking, but the IHSS programme contributed through the supply of trained ASCs, provision of free medicines and supplies and the distribution of these supplies. The IHSS programme, therefore, enabled care-seekers to receive appropriate medicines and treatment at the CS level. Qualitative findings confirm this and indicate that parents regard accessibility of the CS and child curative services, the free health care, and the role played by the Relais in the community, as the main factors influencing their ability to seek appropriate health care for children under 5 years.<sup>8</sup>

There was an average of 72 iCCM cases treated per month per CS, with the largest number of cases being for malaria treatment at both CSI and CS level. Child visits to the primary level (CS and CSI) amounted to close to 2 visits per child per year in 2013. This represents 0.7 curative visits per child per year at the CS level, already very close to the national target of 0.8 for total new curative visits per person per year at the CS level. This relatively high level of service utilisation could be ascribed to the removal of financial barriers and the availability of child services. It may be reflecting the maturing of both the Free Health Care initiative and iCCM, to which the IHSS programme contributed, with enough time for health seeking patterns to start shifting.

There is a need to increase the package of services at the CS, as there may be missed opportunities for delivering much needed improvements for other reproductive, maternal and neonatal health services. The MOH has already embarked on expanding the package of services, by increasing the scope of practice of ASCs, upgrading the scope of services to be offered at a CS, including plans for maternity services, and enlisting the services of the Relais more formally, the latter especially in hard to reach areas. At this stage it is not clear what the capacity of CSs is for increasing their headcounts for services delivered by ASCs, or how feasible the plans are to add nurses to complement or replace ASCs, considering that it remains unclear how this will be funded.

With the proposed upgrading of CS to deliver some CSI services it is also unclear what the implications are for the role of the CS and the ASC. For instance, will it lead to reduction in number of CSs due to cost implications? Further, with the formalising and expansion of the role of the Relais, will this lead to a reduced need for the ASC cadre? And what will the cost implications be of all the above?

***The IHSS programme strengthened the procurement, supply and distribution of medicines and commodities, but more systems strengthening is required***

The IHSS programme and matching funds from UNICEF funded the provision and distribution of the main medicines required for treating the top three childhood illnesses as well as acute malnutrition. This procurement and distribution was done in parallel to the MOH supply chain systems for other drugs, due to the challenges faced by the government systems, such as poor infrastructure and limited administrative, storage and transport systems.

Nevertheless, drug stock-outs remain a problem. The percentage of CSs with no stock-out of any iCCM commodities was 54% in 2010. This was much improved by 2013, but when factoring in expired drugs, the stock availability showed little change from 2010 levels, at both CSs and CSIs. Poor management and forecasting of stock seems to be one of the reasons indicating a weakness in administrative and management systems at both CS and CSI levels. Strengthening of administrative and management systems for effective drug supply and management is critical for a high quality iCCM services and the health system in general. Frequent and severe stock-outs at CSI and CS mean that the free drugs are not available, and, therefore, mothers/care-givers are given prescriptions to purchase the drugs elsewhere, and this represents another financial barrier. This is likely to dampen the utilisation of the iCCM services. Further, the use of expired drugs could contribute to ineffective treatment or even fatalities.

Delays in reimbursement of consultation fees by government, for children and pregnant women, were raised as another reason for stock-outs of medicines. The explanation given by frontline managers was that they use the free child drugs for adults when they are left without sufficient resources to buy new stocks of adult drugs, which in turn leads to shortages of child drugs.

There are also limitations in terms of equipment and means of transport at the CS. Only 2% of CSs have access to a bicycle in working order. On the other hand, about 50% of CSIs have access to a functional motorbike, which would have enabled supervision at the CS. There is also low availability of fridges that are functional (9%) and power supply at the CS level, though a high proportion (almost 80%) of CSs have a functional delivery table.

As mentioned earlier, due to poor supply chain infrastructure, UNICEF is also responsible for managing the purchase and transportation of these drugs to the MOH regional depot. This constitutes a drug supply system parallel to that of the MOH. MOH and UNICEF officials agree that there continues to be a need for the country to strengthen its national drug supply system, through strengthening the financial capacity and human resources of the national system, and UNICEF is currently working with the MOH to do so. The sustainability of drug supply is also a concern due to involvement of other donors and fluctuations in funding, which has in the past been shown to cause disruptions in services, such as the provision of insecticidal bed nets.

***The IHSS programme strengthened monitoring and evaluation systems, but more system strengthening is required to evaluate progress and quality***

UNICEF and the IHSS programme have done much to put in place tools and systems for monitoring and evaluation. Once the IHSS programme was launched in Niger in 2008, the MOH, with the support of UNICEF, embarked on developing tools and methodologies to monitor progress and impact of on child survival. This includes registers and supervision tools to identify areas for quality improvement, some of which are considered best practice.<sup>11,17</sup>

Nevertheless, monitoring and evaluation of service delivery remains one of the major challenges with bottlenecks in data collection and problems with effective use of the health information for quality improvement at CS, sub-district, regional, and national levels.<sup>11</sup> The lack of routinely disaggregated CS data represents a missed opportunity for effective monitoring and evaluation. As mentioned earlier, MOH, with the help of UNICEF, is implementing reforms to improve the health information management system, which will allow for disaggregation of data and will include moving to an electronic system. Furthermore, some nurses have been trained in data collection and have been deployed to support the district-level data management activities. Addressing this gap highlights national recognition of community as a new level of care that needs to be monitored and assessed for quality assurance. It would be worth investigating how well the disaggregated routine data match those collected by the periodic household and/or facility surveys that collect utilisation data.

Quality of care of iCCM treatments remains an important consideration for ongoing monitoring, with some evaluations pointing to good quality of care,<sup>13</sup> with the majority of ASCs being competent in dealing with the three main childhood diseases, and other sources raising concerns<sup>14</sup>. The 2013 Census of CSs and CSIs will give an indication of concordance between signs and symptoms, classifications and treatment, based on patient record reviews, but the analysis was not available at the time of writing.

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

Coverage trend analysis indicates large increases in the proportion of children who were breastfed within one hour of birth as well as the proportion of children being exclusively breastfed. There have been some declines, however, in exclusive breastfeeding between 2010 and 2012, which reversed some of the gains in mortality decline due to this intervention. While further emphasis on breastfeeding practices is required in Niger, as exclusive breastfeeding still stands at 23%, notable increases in optimal breastfeeding coverage indicate the successful impact of the IHSS programme's focus on key essential family practices. Awareness raising campaigns and communication efforts, as well as the important role played by the ASC and Relais cadres, ensured widespread reach of these promotion efforts. The overall low proportion of exclusive breastfeeding in Niger points to the need for further investment in community education and awareness of the benefits of exclusive breastfeeding in the crucial first 6 months of life and the need to explore the reasons for early introduction of other fluids and foods.

The emphasis on the outreach immunisation campaigns and the provision of a cold chain in the CSs are reflected in the significant increases seen in measles and Hib vaccine coverage in the country. Although the most notable increases in coverage occurred between 2000 and 2006, maintenance of relatively high immunisation coverage rates up to 2012 required significant efforts and contributed to continued mortality declines in children under-five. Surprisingly, however, there has been a decrease in vitamin A coverage in the country by about 10 percentage points over the same period. The reasons for this should be ascertained. The LiST analysis showed that in the pre-IHSS period this intervention accounted for significant decline in mortality, which not only disappeared during the IHSS programme period, but in fact resulted in increases in deaths due to declines in vitamin A coverage. However, this decline in the IHSS programme period may be an artefact of the timing of the 2012 Demographic Health Survey in relation to the timing of the outreach campaigns, facilitated over two rounds spanning a few months each year. As a result of the concurrent timing of the DHS survey and the outreach campaigns, coverage may be underestimated if children are sampled in the DHS before they

are due to receive their six-monthly dose of Vitamin A through the campaigns. However, this should hold true for the DHS 2006 survey as well, and thus there may still be a real coverage decline when comparing 2006 and 2012 estimates, which reflect a 10 percentage point reduction in coverage. However, the extent to which the decline in the six-year time span is a real one or an artefact of the timing of the surveys in relation to the outreach campaigns cannot be assessed with certainty. Coverage estimates for Vitamin A from the campaign data are much higher than those in the Demographic Health Surveys.

Care-seeking practices for suspected pneumonia and fever increased significantly in the pre-IHSS period, while care-seeking for diarrhoea, and the resulting increases in ORS coverage, are most notable in the IHSS programme period. The significant efforts made by the MOH to construct CSs throughout the country are likely the major contributor to increased care-seeking practices in the pre-IHSS period. With the introduction of free maternal and child health care by 2006, as well as the roll out of the IHSS programme with the resulting provision of under-five drugs further contributed to the increasing care-seeking trend. Overall increases in care-seeking are noted with the proportion of people not seeking care at all for the three main childhood conditions decreasing by 13 percentage points over the IHSS programme period, in addition to the proportion of the population seeking care from non-recommended sources (shops, pharmacies, etc.) declining by 16 percentage points.

Furthermore, there is a notable shift, between 2006 and 2012, in care-seeking practices towards the community CS level with an increase of 11 percentage points in families bringing children to care at a CS. Implementation strength data further reflect successful service provision at the community level, with high levels of utilisation observed with over 70 children under 5 seen on average per month at each CS. The scale up and training of ASCs during the IHSS programme period, and the provision of drugs and supervision, ensured the CS level was strengthened, thus likely further contributing to increased care seeking practices.

What is, however, alarming, is that coverage of anti-malarials actually decreased in the IHSS programme period by close to 14 percentage points, from 33% in 2006 to 19% in 2012. This decline could be attributed to several factors, including a decline in care-seeking for fever between 2010 and 2012 (if the 2010 mortality survey is included in the analysis) and seasonality of the surveys. The mortality survey was conducted during the rainy season, as opposed to the DHS surveys that were both conducted in the country's dry season. Overall, however, care-seeking for fever between 2006 and 2012 remained consistent, and, as a result, is not likely to have contributed to the steady decline in malaria treatment observed between the 2000, 2006 and 2012 health surveys. The average declines have been between 13 and 15 percentage points between the six year periods. As a result, more likely explanations could include the introduction of RDTs resulting in increased accuracy in the diagnosis of malaria, as well as stock-outs of both RDTs and anti-malarials. Stock-outs of RDTs and Artemisin combination therapy would have only impacted coverage declines in the IHSS programme period, as RDTs were only introduced in 2008 and the change in malaria treatment policy introducing ACTs took place in 2005. Consequently, stock-outs of other anti-malarials are likely to have played a larger role in the pre-IHSS period.

The most notable increases in antenatal coverage are seen between 2006 and 2012, where coverage for one, and four or more, antenatal visits increased significantly. One of the major activities of the IHSS programme included training of health care workers on antenatal care with the provision of IPTp, tetanus toxoid vaccination and LLNs during visits. This represents a major opportunity, with resulting

increases in IPTp and tetanus vaccination coverage. Facility-based deliveries were still at a low 30% in 2012, and postnatal care has not significantly increased.

Emphasis on nutrition interventions was an important part of demand-side messaging and health care services. Stunting and wasting rates for children under-five were decreasing in the first part of the past decade, and while stunting rates have continued to decline, wasting rates increased by 5% over the same period. Despite an emphasis on nutrition screening through the IHSS programme, and the provision of Ready to Use Foods at the CS, the country remains vulnerable to climate fluctuations, resulting in extreme food shortages as well as insufficient domestic food production for its population. The still high rates of stunting and wasting in the country reflect the challenges of food insecurity and require a consideration of alternative cropping techniques and the development of irrigable land that would be less dependent on rainfall fluctuations. There is also a need to invest in inter-sectoral, community-based nutrition programmes that more deliberately link health and nutrition interventions to agricultural activities and WASH interventions.

With regard to impact on equity, a closing of the gap between the richest and poorest wealth quintiles was noted for tetanus toxoid and measles coverage, and coverage for ORS. Other indicators for which inequity between the wealth quintiles did not decrease, but for which coverage within the poorest quintile did still increase, include IPT ITN and DPT3 coverage (confidence intervals not available). A decrease in coverage for the poorest quintile occurred for postnatal care, coverage of anti-malarials, as well as vitamin A coverage.

The IHSS programme was implemented at a national scale, with a particular emphasis on rural and hard to reach populations. With over 80% of the population living in rural areas, rural and national comparison rates serve to reflect the scope of coverage of the IHSS programme. Rural and national trends were similar across the majority of the interventions reflecting good geographical coverage of the programme.

## **6.3 Impact**

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

Niger has had considerable success in reducing under-five mortality in the past 10 years and is on target to achieve the Millennium Development Goal 4 for child survival. This considerable success is noteworthy given that Niger is one of the world's least developed nations, ranked last according to the Human Development Index, with a less than 30% literacy rate. Furthermore, the country has an extremely high and stagnating fertility rate of 7.5 children per woman, with an annual population growth of 3.9%.

The Lives Saved Analysis indicated that in the pre-IHSS period approximately 65,300 lives were saved over the seven years of evaluation, amounting to 9,000 lives saved per year. This is in comparison to approximately 63,600 lives saved over the five years of IHSS programme implementation under review, amounting to an estimated 12,720 lives saved per year. The annual rate of mortality reduction between 2000 and 2007 was 1.1%, and between 2007 and 2012 it was 3.1%. The results from the LiST analysis indicate that in the pre-IHSS period (2000-2007), increases in coverage of care-seeking for pneumonia and vitamin A coverage were responsible for the large majority of deaths averted. The IHSS programme period (2007-2012) showed a different spectrum of interventions, largely reflective of the IHSS programme focus, to be responsible for under 5 mortality declines. The newly introduced

Hib vaccine, increases in ORS coverage, children sleeping under ITNs and antimalarial treatment accounted for the largest proportionate reduction in under-5 mortality in 2012, in comparison to the 2007 baseline. Care-seeking for pneumonia, care during childbirth. New-born care services and WASH interventions (not core IHSS programme interventions) also accounted for substantial reductions in child mortality. It is important to note that there has been little progress in important maternal health indicators, such as rates of assisted births and family planning. This, together with the continued high maternal mortality, indicates that maternal health needs more attention.

To summarise, during the pre-IHSS period (2000-2007), improvements in coverage, with no contribution from the IHSS programme, accounted for an estimated 9,300 lives saved per year. In comparison, the LiST analyses estimated that during the IHSS programme period, an equivalent of approximately 12,700 lives were saved on average, per year. The modelled annual rate of reduction was faster in the IHSS programme period than the years immediately preceding the IHSS programme. Based on the LiST analysis, the interventions that contributed the most to saving these lives were the introduction of the Hib vaccine in 2009, the increase in ORS coverage, children sleeping under ITNs and antimalarial treatment. Given the notable increases in coverage of these important interventions during the IHSS programme period, it is plausible that IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012, contributing to 89% of the lives saved during this period.

## **6.4 Sustainability**

### **6.4.1 Programme costs**

In order to assess the financial implications of the addition of iCCM services to CSs, the costing focused on additional costs, excluding costs already covered by the health services, such as basic training and salaries. The additional cost of a malaria treatment, including RDTs and drugs, stands at US\$5.04, diarrhoea treatment with ORS and zinc at US\$0.91, and pneumonia treatment with Amoxicillin US\$1.52. The share of ASC fixed costs (training, kits, supervision and management) represents an average of 9.4% of the cost per treatment. With an average of 13 MDP treatments a week and an additional 20% of untreated visits, the combined consultations and meeting time spent on iCCM amounted to 8.6 hours a week per ASC, which represents just over 20% of ASC working time. An increase of 30% utilisation, due to increased demand and increased, would translate into 11 hours a week for 17 MDP treatments and added visits. The current number of ASCs could, most likely, manage such an increase.

In 2011, donor partners' share of public health expenditure amounted to 51%. The additional costs of iCCM (basic) account for 2.8% of the total public health expenditure and 5.7% of the government's health expenditure. For iCCM+ (iCCM basic + 15% cost for additional support to the health system), these percentages would stand at 3.2% of the total public health expenditure and 6.5% of the government's own health expenditure. A 30% increase in treatments iCCM+ would represent 4.1% of the total public health expenditure and 8.3% of the government's own health expenditure.

The program is well utilised and efficient in its current form. Given the pressures on the government's own budget, support from donors for this program will have to remain to ensure sustainability, especially with the additional challenge of increasing demand linked to population growth. Another risk is the uncertainty around the continuation of HIPC's financial assistance, as well as the effect of slowly growing debt, which could possibly cause further contraction of the health budget. The Global

Fund's New Funding Model can provide much needed financial security through the scope of its funding, which includes iCCM systems costs, but also through the secure three year time horizon before replenishment, allowing for better planning.

The current discussion of shifting treatments to Relais needs to take into account the financial implications and sustainability issues. Costs of this approach are likely to be higher due to the fact that there will be more Relais than ASCs, and the cost of training and kits will, thus, increase proportionally. This has to be balanced with the possible higher coverage.

#### **6.4.2 Broader sustainability**

The contribution of iCCM, to supporting increased utilisation, and Free Health Care is well acknowledged in Niger. As MOH pays for the infrastructure and the salaries of ASCs, the iCCM could feasibly continue and grow. However, the greatest concern is regarding the funding of iCCM drug supply, which is donor-dependent, and this threatens the sustainability of the iCCM service. Given the dependence on donor support for the iCCM drug supply, and the increasing pressures on government funding described above, the likelihood of the continuation of the positive results associated with, after DFATD/UNICEF involvement ends, remains unclear.

Free health care is likely to have had a direct and dramatic effect on increasing utilisation of services for children under-five and pregnant women. However, user fees are still in place for older children and adults, and this is likely to remain an obstacle to utilisation of health services more generally. Lack of reimbursements and cross-subsidising of drugs at primary care level, and a possible shrinking percentage of government expenditure going to health, has led some to question the sustainability of the Free Health Care initiative. Nevertheless, it is widely acknowledged that Free Health Care addressed an unmet need for health care.

Besides the challenges posed by the additional demands placed on health services by the growing population, there are increased costs associated with government plans to upgrade the CS packages and provision of nurses at CS level. Some ASCs who have trained as entry level nurses are still being employed and paid as ASCs, as nursing posts have only been filled at 25% of CS, mainly in the city of Niamey.

An expanded role is envisaged for the Relais to standardise and promote their role in community-level health promotion and prevention of illness. Increasing the scope of Relais to give antibiotics and incentivising them has cost implications. There is a need for caution around formalising a community-based volunteer system that may be functioning exactly because Relais are well integrated within their communities.

There is uncertainty regarding the impact of economic and security factors on future health funding and funding from donors, as a result of regional political instability. Concerns have also been expressed about how programmes are prioritised for donor support, the lack of harmonisation amongst donors, and poor tracking of donor funds to different areas in Niger. Other challenges to sustainability that have been highlighted include the project-focus approach of some donors and short duration of funding sources for programmes that require long-term commitment to see results, such as those focused on maternal and neonatal survival.

## 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 points over two time periods corresponding to the pre-IHSS phase and the IHSS programme phase. Where necessary, indicator definitions were adjusted to ensure valid comparisons over time, across different surveys. Raw data were not available for the 2010 mortality survey, and as a result, this survey could not be standardised to the other surveys when indicator definitions varied. Furthermore, the significance of coverage changes in 2010 could not be determined with certainty as confidence intervals could not be calculated.

As the programme was implemented nationally, a counterfactual was not available for comparison. National and rural estimates were compared. Given that the majority of the population lives in rural areas, this comparison served to demonstrate the scope of implementation in hard to reach areas.

We combined DHS and MICS data files to recalculate coverage indicators over time, and care was taken to use standard indicator definitions and appropriate sampling weights. The use of this data was guided by two main reasons: both generate household-level survey data needed to measure coverage for maternal and child health in low- and middle-income countries, and they collaborate closely with interagency processes to ensure that their survey tools are harmonised and comparable as far as it is possible. The latter point, therefore, makes combining these data logical. Additionally, both surveys adhere to the fundamentals of scientific sampling that include updating sampling frames and preparation of appropriate sample documentation.

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

### 7.2 Limitations of the LiST analysis

The survey indicator definitions do not perfectly match LiST indicators in all cases. Additionally, the national surveys used in this analysis do not capture many of the facility-based interventions included in LiST. These interventions are often high impact for children, e.g. resuscitation, Kangaroo Mother Care, full supportive care for infection, and might have changed during the period under consideration. LiST automatically calculates some of these indicators based on coverage of a contact point, such as antenatal care, or facility birth, e.g. antenatal corticosteroids, case management of severe neonatal infection.



### **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 design and making it comparable to other iCCM costing exercises, e.g. the current multi-country evaluation. However, the limitation of this approach is that it does not reflect the variations in actual implementation, such as stock-outs and uneven supervision, with its impact on effectiveness of programmes. 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, for example of ASC and supervisors' salaries already covered in existing government budgets. However, by excluding those already funded as part of the existing system, it means the additional cost approach does not reflect the total cost of iCCM.

Some elements of the total additional cost of the iCCM are excluded, such as the cost of design, policy development and broad capacity development, as these costs are 'once-off' costs and will not recur with expansion of iCCM. It is also important to note that costing only curative (iCCM) activities for three key diseases in isolation is limited, as in practice ASCs deliver both preventive and curative services, in a complementary manner.

### **7.4 Strengths and limitations of the qualitative component**

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

The field visit was conducted over a period of 10 days, which limited the amount and scope of information that could be gathered. Furthermore, the evaluation was carried out in only two districts that were deemed to be well performing, which may bias the study findings. When speaking to key informants at national level, however, the evaluation team aimed to obtain country-wide statistics and information, in addition to having conducted a comprehensive desk review. Further, support was provided from UNICEF staff knowledgeable in the history of Niger, to develop a comprehensive list of key informants who would be interviewed during the evaluation period to assess different aspects of the programme.

While the evaluation focused heavily on the health sector, there was recognition of the need to assess other sectors in the country, due to their interdependence on population health outcomes, including water, sanitation and education. Whilst this could not be done sufficiently during the field visit, the SAMRC staff did manage to meet some informants working in the water and sanitation sectors.

It is also important to note that the interviews were mostly conducted in French with the support of translators, as the SAMRC staff was made up of one fluent French speaker, with two others who had

moderate proficiency in French. It is possible that some aspects of the interviews were lost in the process of translation. However, many of the interviews included more than one evaluator and generated more than one set of notes, which enabled the team to compare the interview content and to triangulate the data between the interviewers.

## 8. Lessons learned and Recommendations

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### 8.1 Lessons learned

#### Relevance

- The successful implementation of the IHSS programme was dependent on a receptive political environment, good collaboration, and alignment with government priorities, MOH leadership, an existing community-based health care platform, and the Free Health Care Policy.
- Without the introduction of the Free Health Care, it is unlikely the IHSS programme would have seen the increased utilisation of iCCM services witnessed in Niger. This is a lesson for other LMICs about the importance of reducing financial barriers to access, alongside increased delivery of services at the primary care level.
- Promoting gender equity in training of ASCs was achieved, but the gains could not be sustained due to high attrition of female ASCs, most likely due to broader gender dynamics limiting women's roles.

#### Effectiveness

- It is likely that without the support of the IHSS programme the Free Health Care initiative may not have succeeded, as the iCCM training and free drugs and supplies ensured the delivery of free curative child services at the CS level. The relatively high level of service utilisation at the CS level may be reflecting the maturing of both the Free Health Care initiative and iCCM (to which IHSS contributed), with enough time for health seeking patterns to start shifting.
- The IHSS programme demonstrated the acceptability and feasibility of an ASC community-based cadre trained in iCCM, in conjunction with health systems strengthening, for delivering life-saving child health interventions.
- The contribution of the volunteer community health worker cadre to child survival is increasingly acknowledged by government and donors, and the IHSS programme contributed to this shift towards embracing an expanded role for Relais.
- The IHSS programme contributed to the substantial improvement seen in quarterly supervision of ASCs.
- The IHSS programme contributed to the reduction in stock-outs, but expiry of drugs at CS and CSI level undermined that improvement.
- During the IHSS programme period, there were significant increases in a range of health preventive and curative services targeted by the IHSS programme, with many of coverage increases being pro-poor, which has plausibly contributed to sustained reduction in child mortality.

#### Impact

- Given the notable increases in coverage of important interventions during the IHSS programme period, it is plausible that IHSS programme inputs across the health sector, and specifically towards key child survival interventions, contributed to the faster reduction in child deaths between 2007 and 2012.

- Due to the specific parameters of the LiST modelling, e.g. not attributing lives saved to specific health service levels, and the parameters of the costing analysis, calculating additional, not full costs of delivering iCCM, the evaluation did not calculate cost-per-life saved.

## **Sustainability**

- The high level of utilisation of iCCM in Niger has resulted in a lowering of costs per treatment by decreasing the share of fixed costs by ASC. There may be further efficiency gains to be made by increasing iCCM utilisation by up to 30%, but given the pressures linked to government budget, it is unlikely that this could be achieved without continued donor support.
- Government plans for an iCCM curative role for the Relais need a thorough evaluation to assess whether increase in coverage can justify the added financial and organisational implications for the sustainability of the program.
- Given the dependence on donor support for the iCCM drug supply, and the increasing pressures on the government's own funding, the likelihood of the continuation of the positive results associated with iCCM after DFATD/UNICEF involvement ends, remains unclear.
- Pressures on government funding, amongst these security issues, lack of harmonisation amongst donors and an increasing population, may compromise the government's ability to sustain expansion of access to community-based health care services, making the Global Fund New Funding Model a condition for its sustainability following the end of the IHSS programme.

## **8.2 Recommendations**

### **Relevance**

- Continued donor support is required to sustain the health system strengthening gains made during the IHSS programme, particularly for iCCM drug supply. Such donor support should have a concurrent focus on strengthening the government drug supply systems to promote sustainability of iCCM.
- The higher female attrition rate amongst ASCs requires further investigation, and given the large gender disparities in Niger, continued efforts are required to address gender equity in health and more broadly in education and economic empowerment.

### **Effectiveness**

- The supply chain and stockouts of essential iCCM medicines need to be improved if the gains of the iCCM intervention are to be sustained, especially strengthening stock management at facility level to address the problem of expired drugs.
- Routine health information systems should be strengthened on all levels of the health system and the current government efforts, supported by UNICEF and the IHSS programme, for the disaggregation of utilisation data to the CS level, form an important step in that direction.
- Assessment of the quality of clinical care of iCCM should be an ongoing priority to ensure continuous quality improvement and to prevent adverse events, and will require increased case observation during supervision visits.
- During the IHSS programme period there was stagnation or decline in coverage of important preventive and curative interventions associated with the IHSS programme, such as Vitamin

A coverage, anti-malaria treatment, optimal feeding practices in older infants and wasting, and the underlying reasons require closer scrutiny.

### **Impact**

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

### **Sustainability**

- Challenges with receiving reimbursement for free health care delivered at the CS may be negatively impacting on service delivery, and it is recommended that a formal system should be developed to facilitate efficient validation and payment of claims, and funds should be allocated for reimbursement.
- The proposed changes to the PHC platform of delivery should be monitored closely. Up-scaling the package of PHC services offered at the CS level could potentially address major gaps in access to obstetric services, such as deliveries, neonatal care and reproductive health services, such as ANC and injectable contraception, but consideration should be given to cost implications and the impact on the various roles of ASCs and the Relais.
- To sustain the steady decline in child mortality and to extend these gains to other sectors of the population, it is recommended that future health programmes address high impact interventions in reproductive health and in mother, child and neonatal survival more broadly. Also, consideration should be given to broad-based, inter-sectoral strategies focussing on poverty alleviation, increased food security and nutrition support, including extending free access to health care to the broader population.

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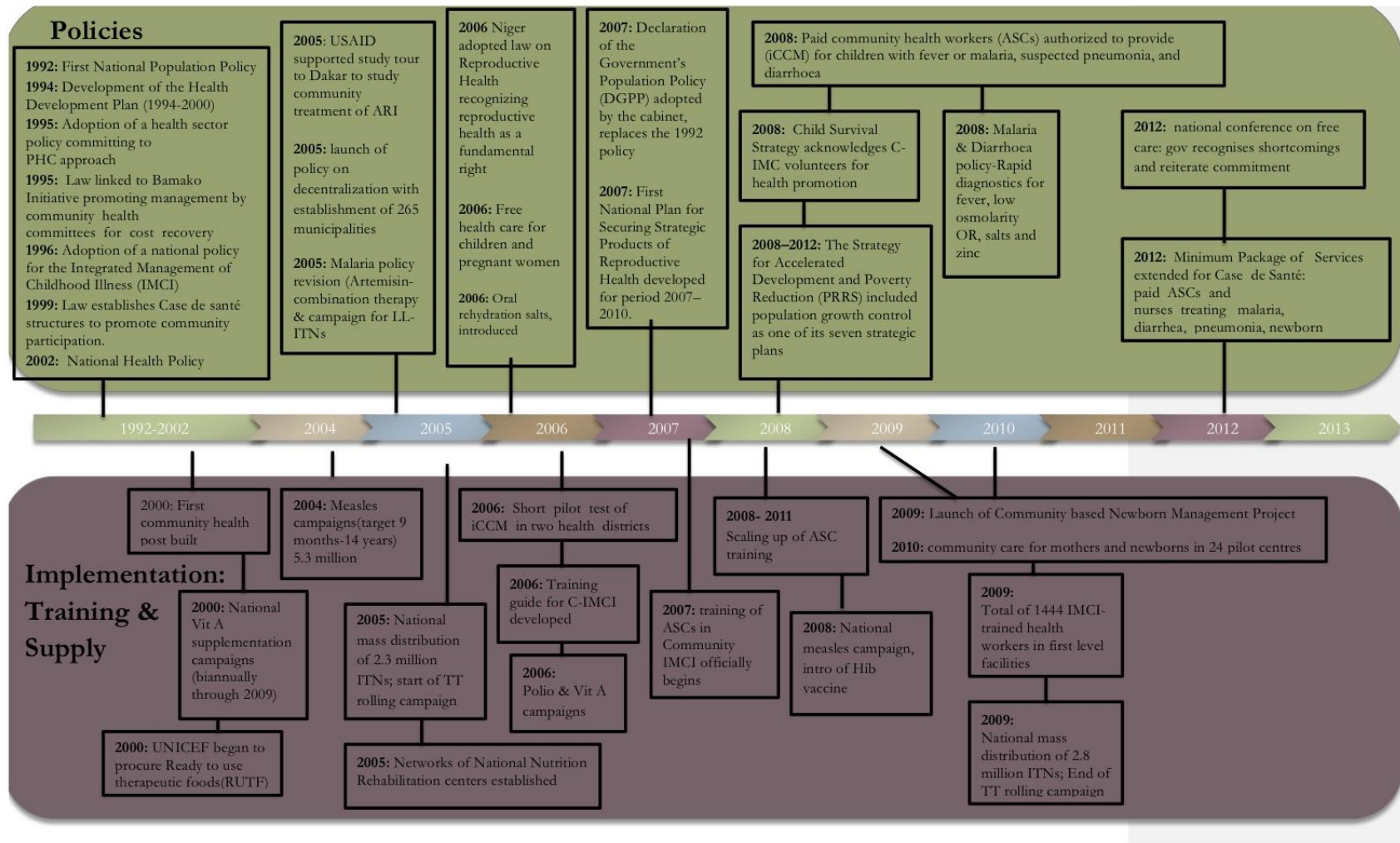
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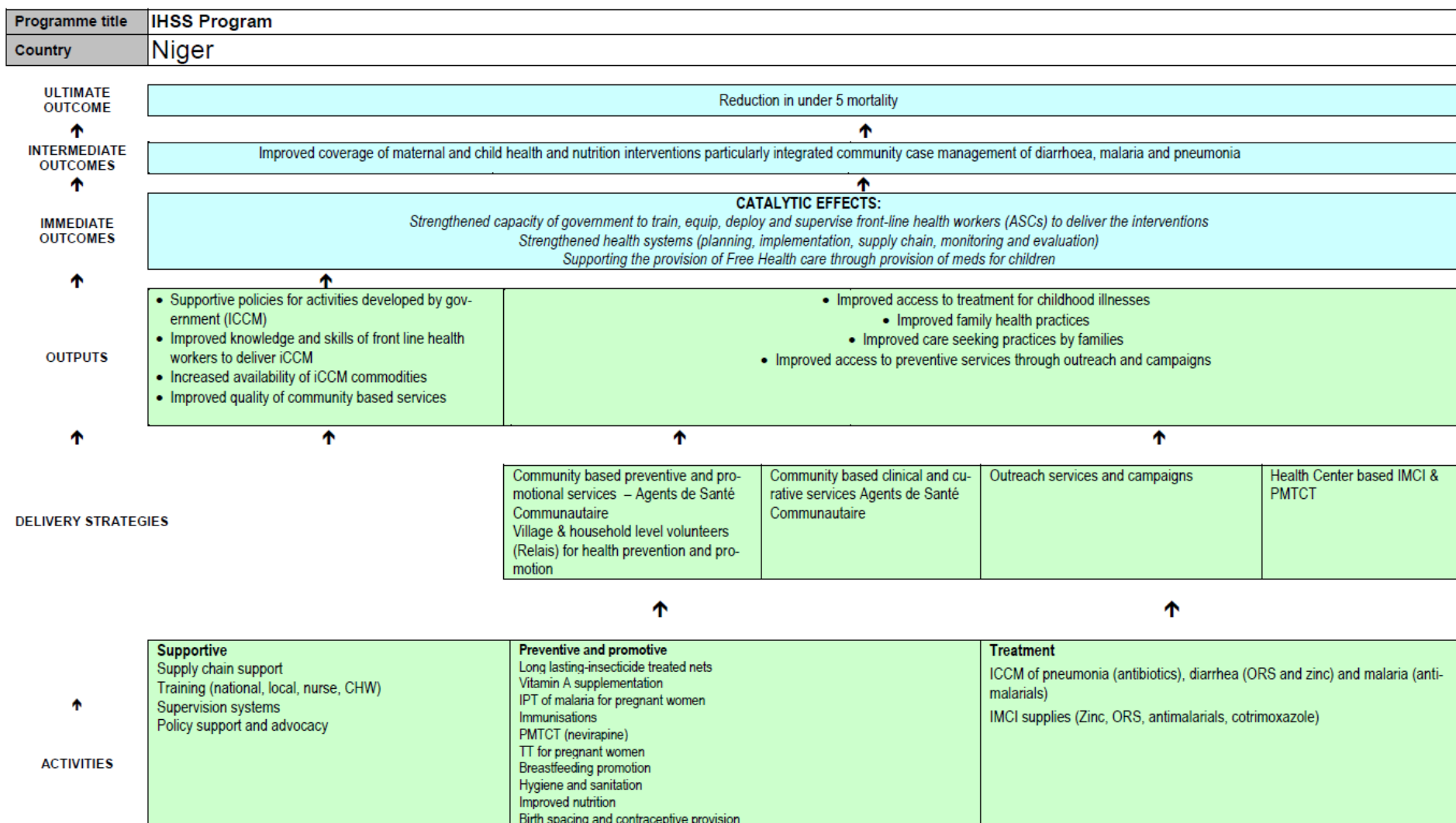


## 10. Appendices

### Appendix A: Niger Policy and implementation timeline



## Appendix B: Niger Country logic model



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

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

			plasma reagent 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 data, UNAIDS/PEPFAR	X		
Childbirth & Immediate Newborn Care		Facility based births	Proportion of infants delivered in a facility	Household surveys			X
	Skilled birth attendance (1.3.2.21)	Skilled birth attendance	Proportion of births attended by skilled health personnel (doctor, nurse, midwife, auxiliary midwife)	Household surveys			X
		Essential care for all women and immediate essential newborn care		Calculation in LIST based on facility delivery			
		Basic emergency obstetric care (clinic)		Calculation in LIST based on facility delivery			
		Comprehensive emergency obstetric care		Calculation in LIST based on facility delivery			
		Clean birth practices	Proportion of neonates delivered with appropriate clean birth practices	Calculation in LIST based on facility delivery			
		Immediate assessment and stimulation	Proportion of neonates with appropriate drying and stimulation immediately after birth	Calculation in LIST based on facility delivery			
		Labour and delivery management		Calculation in LIST based on facility delivery			
		Neonatal resuscitation	Proportion of newborns with access to detection of breathing problems and resuscitation	Calculation in LIST based on facility delivery			
		Antenatal corticosteroids for preterm labour	Intramuscular injection of betamethasone sodium phosphate to	Calculation in LIST based on facility delivery			

			women with suspected premature labour				
		Antibiotics for PROM	Administration of oral erythromycin to women with premature rupture of membranes who are not in labour to prevent PROM	Calculation in LIST based on facility delivery			
Breastfeeding	Breastfeeding initiation** (1.3.2.23)	Breastfeeding initiation	Proportion of newborns put to the breast within one hour of birth	Household surveys	X		
	Exclusive breastfeeding prevalence (0-5 months)** (1.3.2.24)	Exclusive breastfeeding prevalence (0-5 months)	Proportion of infants aged 0-5 months of age who are exclusively breastfed: 0-<1 month, 1-5 months	Household surveys	X		
	Complementary feeding (1.3.2.25)	Complementary feeding	Proportion of infants aged 6-8 months of age who are breastfed and receive complementary food	Household surveys	X		
Preventive care	Preventive postnatal care - includes thermal care and clean postnatal practices (1.3.2.26)	Preventive postnatal care - includes thermal care and clean postnatal practices	Proportion of mothers who received a postnatal care visit within two days of birth	Household surveys			X
	Vitamin A supplementation** (1.3.2.5.1)	Vitamin A supplementation	Proportion of children 6-59 months who received at least one high dose Vitamin A supplement in the last 6 months	Household surveys	X		
		Zinc supplementation	Proportion of children 6-59 months receiving full coverage with zinc	Household surveys			X
	Improved water source (1.3.2.28)	Improved water source	Proportion of the population using improved drinking water sources	Household surveys			X
		Improved sanitation – utilization of latrines or toilets	Proportion of homes with access to an improved latrine or flush toilet	Household surveys			X
		Hand washing with soap	Proportion of mothers washing their hands with soap appropriately	No national level data available.			X

				Set at 17% (global average)			
		Hygienic disposal of children's stool	Proportion of children whose fecal matter is adequately contained	Household surveys			X
	ITN ownership** (1.3.2.9)	ITN ownership	Proportion of children under 5 years of age sleeping under an insecticide treated net the previous night	Household surveys	X		
Vaccines		BCG	Proportion of children 12-23 months of age who received 1 dose of BCG vaccine	Household surveys			X
		Polio	Proportion of children 12-23 months of age who received 3 doses of polio vaccine	Household surveys			X
	DPT3** (1.3.2.7)	DPT3	Proportion of children 12-23 months of age who received the third dose of DPT or Pentavalent vaccine	Household surveys	X		
		Hib	Proportion of children 12-23 months of age who received the third dose of Haemophilis influenza type B (Hib) vaccine	Household surveys			X
		HepB	Proportion of children 12-23 months of age who received the third dose of Hepatitis B vaccine	Household surveys			X
		Pneumococcal	Proportion of infants having received 3 doses of pneumococcal vaccine	No national level data available. Set at 0 for baseline			X
		Rotavirus	Proportion of infants having received 3 doses of rotavirus vaccine	No national level data available. Set at 0 for baseline			X
		Measles**	Measles	Proportion of children 12-23 months of age who received measles vaccine	Household surveys	X	

	(1.3.2.6)						
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) (1.3.2.12.5)	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	
	(1.3.2.12.6)	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 data, UNAIDS/PEPFAR		X



## Appendix D: List of individuals interviewed during country visit

Area	Name	Position
Niamey		
	Dr. Adama Ouédraogo	UNICEF- Niger Head of Health
	Dr. Abdourhamane Salamatou	DRSP ( Chief District manager)- Niamey
	Mr. Amadou	DRSP Niamey-Gestionnaire
	Dr. Adam Asma Gali	Niger MOH, GD of resources, finance and HR
Niamey		
	Dr. Harakoye Aissa	MOH Child Health Directorate
	Dr. Seydou Malam Ekoye	MOH Secretary General
	Mr. Ousmane Oumarou	MOH Director of and planning
	Dr. Nassirou Ousmane and team	MOH Nutrition Directorate team
	Dr. Adrien Kisi	Belgian Technical Cooperation
Niamey		
	Dr. Abdoulaye Soumana:	DRSP (Chief District manager)- Niamey
	Dr. Amin Mariame	CSI manager
	1 x ASC	ASC at Cas de Sante
	Dr. Souley Harouna	FORSANI
	Dr. Barro	Medecins du Monde
	Director of UNICEF WASH	UNICEF-WASH
	Mr. Zachary	MOH Niger Deputy-directorate of organization of care Environmental Health
	Dr. Gunter Boussery	Monitoring and Evaluation, UNICEF, West Africa
	Mr. Nicholas Oliphant	Health, UNICEF, New York
	Mr. Jaime Del Rivero	PTF chef de file/Cooperation Spanish Consulate
Maradi Region, Maradi		
	Dr .Idrissa Monkaila	DRSP Chief district manager, Maradi
Maradi Region, Madarounfa		
	1 nurse and 1 ASC	Madarounfa CS –health providers
	One CSI manager + health team	Gabi CSI
	1 x ASC	Case de santé de Tokaraoua
	Relais x 2	Case de santé de Tokaraoua

	Dr Hassane Boureima + team	Local Health System manager + team
	Mr Abdoul Aziz Sani	FORSANI
Maradi and Niamey		
	Dr Hassan Hamidine	Nutrition specialist-UNICEF, Maradi
	Debrief with team in Maradi and in Niamey with UNICEF	UNICEF team + MRC team
Niamey	Dr. Adama Ouédraogo + Dr. Guido Cornale	UNICEF- Niger Head of Health + Head of UNICEF Niger
	Mr.Djibrilla Karamoko	World Bank
	Mr.Omar Habi	National Institute of Statistics
	Mr. Adakal Aboubacar :	Niger MOH mHealth Information management
	Dr Gagara Magagi/ Dr.Moussa Bizo	WHO
	Dr. Asma Gali	Niger MOH, GD of resources, finance and HR
	Mr. Jean Pierre Kabutako	UNICEF budget officer
	Niamey District 3 manager	District manager
	Ms Miriama + one other	ASCs at Cas De Sante
	Dr. Hadiza- + team	Niger MOH Head of Malaria
	Mr. Yacouba-medical student and translator	(Emmanuelle, Natalie and Donela)
	Dr Adama Ouédraogo	UNICEF Niger Head of Health
	Dr. Fatima Hachimou: UNICEF	UNICEF Niger Health Officer
Other	Mr.David Hercot (telephonic interview)	Public Health researcher, Belgium. Ex-official Unicef, Niger

**Appendix E: Niger National and regional coverage profiles (see separate PDF)**

**Appendix F: Detailed costing tables**

Treatment Protocol & cost					
	Medicine & Tests	Units/Treatment	Proportion cases	Unit Cost US\$	Cost per treatment
Malaria, incl RDT	Coartem 1*6	6	30%	0.15383	0.28
	coartem 2*6	12	70%	0.03683	0.31
	ASAQ 67.5	3	30%	0.38000	0.34
	ASAQ 135	3	70%	1.20000	2.52
	Paracetamol 500 mg.	4	50%	0.00467	0.01
	RDT	1	149%	0.85	1.27
	Average Malaria				
Diarrhea	ORS sachet	4	100%	0.0843	0.20
	Zinc	5	3%	0.0402	0.01
	Zinc	10	17%	0.0402	0.07
	Zinc	10	80%	0.0402	0.32
	Average Diarrhea				
Pneumonia	Amoxicilline 250 mg c	5	30%	0.078	0.12
	Amoxicilline 250 mg c	10	70%	0.156	1.09
	Average Pneumonia				

Equipment per ASC	Content	Unit Costs \$	Life Years	Annualised Cost
	Bag	NA		
	Thermometer	2.0	1	2.0
	Chronometer	0.7	2	0.4
	Salter Scale	13.8	5	2.8
	Electronic Scale	124.4	5	24.9
	MUAC tape (pack of 5	3.4	2	1.7
	ICCM Registers	42.0	2	21.0
	IMCI tables book	42.0	2	21.0
	IMCI training book	16.0	2	8.0
	Total			81.7

Fixed Cost per ASC	Days	Cost per Training*	Life Years	Annualised Cost (A)	Attrition Rate	Annualised Cost (B)
<b>Training</b>						
Initial ICCM Training Refresher	4	256.0	5			
Total per ASC		256.0	5	51.2	7.50%	55.04