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maternal & newborn health

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Change in maternal and newborn health care

Interactions between families and frontline workers – their frequency, quality, and equity – and coverage of interventions for mothers and newborns

Report from Ethiopia surveys 2012-2015

MAY 2016

This report is one of three country-specific reports on change in maternal and newborn health care between 2012-2015, and is based on research findings from Ethiopia.

Abbreviations and acronyms

95% CI	95% confidence interval
DHS	Demographic and Health Survey
IDEAS	Informed Decisions for Action in maternal and newborn health
L10K	Last 10 Kilometers
LLINs	Long-lasting insecticide treated nets
MNH	Maternal and newborn health
PHC	Primary Health Centre

Acknowledgements

While improvements are still needed, access to antenatal and intrapartum health care has increased on a large scale in Ethiopia. Simultaneously, there have been improvements in the readiness of the health system to provide quality care.

Contents

Executive summary

Background and methods

The IDEAS study of interactions between families and frontline workers and coverage of critical interventions for mothers and newborns was conducted between May-June 2012 and May-June 2015 across four regions of Ethiopia. In the context of this study, frontline workers include the Women's Development Army who are community volunteers, Health Extension Workers working in health posts, and auxiliary nurses, nurses and doctors working in primary health centres.

The aim was to estimate changes in maternal and newborn health care in areas where implementation projects funded by the Bill & Melinda Gates Foundation were operating. In 2012 the study methods were defined to include a sub-set of areas where the Last Ten Kilometers (L10K) project was operating, run by John Snow Incorporated.

The study design was to collect data that enabled a 'difference-in-differences' analysis of change and data were collected across 59 woredas (districts) where L10K were working (intervention) and areas from the same zones but where no foundation-funded projects were operating (comparison).

Forty clusters (sub-villages) were sampled across the intervention area, and 40 clusters from the comparison area. The same clusters were surveyed in both 2012 and 2015. Each year, a population-level cluster household survey (clusters defined as villages segmented into groups of approximately 75 households) asked women about events related to their live births in the 12 months preceding the survey. These data were linked to interviews with the frontline workers and with the primary health centres and health posts providing maternal and newborn health services to those households. In the 40 intervention clusters, 2,118 households and 277 women with a birth in the preceding 12 months were surveyed in 2012, 3,000 households and 404 women in 2015. In the 40 comparison clusters, 2,176

households and 404 women with a birth in the preceding 12 months were surveyed in 2012, 3,000 households and 383 women in 2015.

Mapping evaluation of change to expected effects

The main body of the report focuses on change in indicators that were expected to improve as a result of the specific implementation activities in place in the study area. These largely represent demand side indicators across the continuum of care. An expanded list of indicators is included in the Annex for a more comprehensive picture of maternal and newborn health care in the study area.

Evidence of change

Some large scale change was observed in both intervention and comparison areas. The coverage estimates highlighted here reflect intervention area change.

By 2015, 50% of women had at least one antenatal care visit with a skilled provider, rising from 32% in 2012; 39% of women had the recommended four antenatal visits (any provider), rising from 22%. Forty five percent of women were attended at birth by a skilled attendant – almost triple the 16% skilled birth attendant coverage observed in 2012. But coverage of postnatal checks for the mother and the newborn remained extremely low, each below 5%, and represent a problem needing urgent attention.

The coverage of select life saving interventions across the continuum of care improved. Iron and folic acid supplementation during pregnancy increased from 19% to 42%, prophylactic uterotonics to prevent postpartum haemorrhage immediately after delivery from 11% to 35%, use of gloves by birth attendants during delivery from 26% to 54%, and initiation of breastfeeding within one hour of birth increased from 50% to 66%. Other interventions had stable coverage between survey periods despite being targeted interventions for change.

> *The data collection period coincided with a period of remarkable activity in the Ethiopian health system with government led health system strengthening being implemented throughout the country.*

Interpretation

Although some important improvements were observed, change in intervention areas was consistent with change in comparison areas. The data collection period coincided with a period of remarkable activity in the Ethiopian health system with government led health system strengthening innovations being implemented throughout the country. Impressive improvements in survival have already been demonstrated in the country and ambition to build on this momentum is high. The L10K project was working to support the Government throughout this period so that promising innovations could be scaled-up beyond the project area without delay. As such, it was an unusually challenging context within which to demonstrate a greater difference in intervention than comparison areas.

While improvements are still needed, access to antenatal and intrapartum health care has increased on a large scale in Ethiopia. Simultaneously, there have been improvements in the readiness of the health system to provide quality care. But care given to women and newborns immediately after delivery and in the subsequent first days of life – when their health is at most risk – has not yet changed and this problem requires urgent attention if the ambitious mortality targets for Ethiopia are to be addressed.

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Introduction and background

1.1: Maternal and newborn health profile in Ethiopia

Seventy four million people live in Ethiopia's nine regions, 64,000,000 (86%) in the most populous four regions Amhara, Oromia, Tigray, and Southern Nations, Nationalities and Peoples (SNNP).[1] Over the last two decades, maternal, newborn and child survival has improved from very high levels of mortality. The maternal mortality ratio declined from an estimated 1,400 maternal deaths per 100,000 live births in 1990 to 420/100,000 in 2014, although this falls short of the 2015 target of 350/100,000.[2] Child mortality rates declined from 204 child deaths per 1,000 live births in 1990 to 59/1,000 in 2015, meeting 2015 targets. And neonatal mortality declined from 61 deaths in the first 28 days of life per 1,000 live births in 1990 to 28/1,000 in 2015.[3] The country has set ambitious goals to build on these gains even further.

1.2: The context of this investigation

The work fits into a broad portfolio of investigation by the IDEAS project (Informed Decisions for Actions in maternal and newborn health),[4] based at the London School of Hygiene & Tropical Medicine and funded by the Bill & Melinda Gates Foundation. In 2010, the foundation developed a Theory of Change that shaped its investments to improve the survival outcomes of mothers and newborns. (Figure 1) This Theory of Change supposes that in order to reduce mortality, the coverage of interventions that are known to save lives (life saving interventions) must be increased, and to increase coverage of interventions the interactions between families and the frontline workers who can deliver interventions must be enhanced (in that they occur more often, are better quality, and are equitably distributed). To realise these changes the foundation supports innovations that aim to enhance interactions between families and frontline workers in three high mortality geographies: Ethiopia, North-Eastern Nigeria, and Uttar Pradesh, India.

In areas where projects funded by the foundation were working to enhance interactions between families and frontline workers between the three year period 2012-2015, the IDEAS project investigated whether and how these projects enhanced interactions, and whether the coverage of life saving interventions increased as a result. In doing so, IDEAS carried out a baseline survey of households, health facilities and frontline workers in each of the geographies in 2012, repeated with a follow up survey in 2015.

This report describes the changes in maternal and newborn health care that occurred between 2012 and 2015 in four regions of Ethiopia.

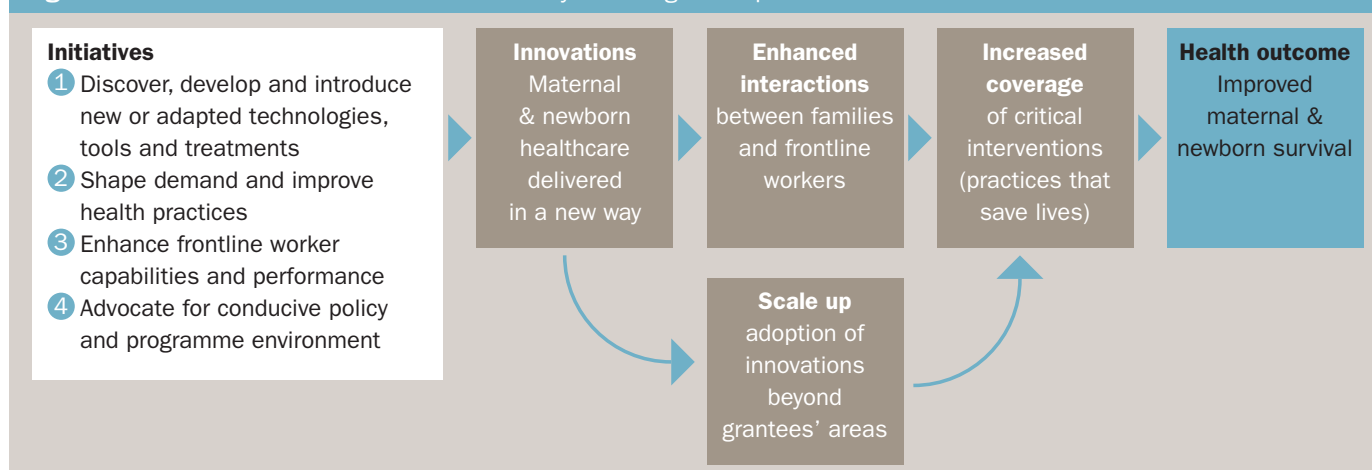## Summary of Ethiopia's health system

Ethiopia's health system is organised in three levels. First, within woredas (districts) is a primary hospital (for every 100,000 population) and multiple Primary Health Care Units (one for every 25,000 population) comprised of one Health Centre and five Health Posts. Health Posts provide promotive, preventive and limited curative services to communities through Health Extension Workers, and additionally through the mobilisation of the Women's Development Army who are community volunteers committed to supporting primary health care. At the second level are general hospitals with population coverage of approximately 1,000,000 people. Finally, specialised hospitals cover a population of 5,000,000.

1.3: Identification of the study area and project activity

The IDEAS investigation into change in interactions and coverage of life saving interventions in Ethiopia was located in the context of foundation-funded innovations implemented by the Last 10 Kilometers project (L10K).

After consultation with the foundation and partners in Ethiopia the study setting

Figure 1: Bill & Melinda Gates Foundation Theory of Change to improve maternal and newborn survival

Initiatives
1. Discover, develop and introduce new or adapted technologies, tools and treatments
2. Shape demand and improve health practices
3. Enhance frontline worker capabilities and performance
4. Advocate for conducive policy and programme environment

Innovations Maternal & newborn healthcare delivered in a new way

Enhanced interactions between families and frontline workers

Increased coverage of critical interventions (practices that save lives)

Health outcome Improved maternal & newborn survival

Scale up adoption of innovations beyond grantees' areas

for this work was defined by a sub-set of the implementation area of L10K, run by John Snow Incorporated. L10K works closely with the Government of Ethiopia to implement innovations that are sustainable at scale by engaging local communities in activities designed to improve maternal, newborn and child health. Core to this strategy is improving linkages between Ethiopian families, communities and the Government of Ethiopia's Women's Development Army (formally known as the Health Development Army) and Health Extension Workers.

L10K began its **first phase of activity** in October 2007 in 115 woredas (districts) over four regions: Amhara, Oromia, SNNP and Tigray. During the first phase of L10K activity, 59 woredas were exposed only to the foundational "Anchor" innovation. "Anchors" are teams of community members who support the Women's Development Army at community meetings and offer them continued assistance and encouragement. The remaining 56 woredas with L10K activity were exposed to other combinations of innovation that were tested by L10K for impacts in maternal and newborn health.

During **the L10K supplemental phase of activity**, from 2012 to 2015, L10K innovations tested in other woredas and found to be effective were rolled out in the 59 woredas previously exposed only to the "Anchor" innovation. These included: (a) "community-based data for decision making" helping Health Extension Workers to work with the Women's Development Army to map households and monitor access to maternal and newborn health services and prioritise efforts e.g. for hard-to-reach families; (b) "non-financial incentives for the Women's Development Army" (e.g. badges, certificates) as recognition of good service to motivate members to increase the number, completeness and timeliness of interactions with families of pregnant women and new mothers and with other community members; (c) "Health (Women's) Development Army training" by supporting Health Extension Workers to train volunteers in kebeles, guided by a handbook and using communication materials; and (d) "participatory community quality improvement" which works through primary health care units to encourage partnership between

communities and service providers and to share responsibility for the quality of maternal and newborn health care.

Further detail about the work of L10K during this period can be found on the IDEAS website.

1.4: Characterising the innovations

The L10K project implemented multiple innovations, and each innovation was expected to effect change on different outcomes along the pathway to improved maternal and newborn survival. In order to align measurement of change with the innovations in place, a characterisation process was undertaken by IDEAS in collaboration with the project leaders to identify the individual innovations, their mode of action and the expected improvements. During the characterisation attention was paid to whether effects were expected to arise as a direct or indirect result of the innovation. A summary of the expected direct improvements is presented in Table 1.

The main body of this report focuses on results mapped to these expected direct improvements. Additional results on maternal and newborn health care are presented in the Annex for information.

1. Ethiopia census 2007 http://www.csa.gov. et/index.php/2013-02-20-14-51-51/2013-04-01-11-53-00/census-2007
2. http://www.countdown2015mnch.org/ documents/2014Report/Ethiopia_Country_ Profile_2014.pdf
3. UN Child Mortality Estimation Inter-agency Group. http://www.childmortality.org/ files_v20/download/IGME%20Report%20 2015_9_3%20LR%20Web.pdf
4. http://ideas.lshtm.ac.uk/

Table 1: Expected improvements in interactions and coverage of life saving interventions arising from innovations implemented by the Last Ten Kilometers Project in Ethiopia

Expected improvement		L10K
Frequency of interactions		
Antenatal care		✔
Institutional delivery		✔
Postnatal care for the mother		✔
Postnatal care for the newborn		✔
Quality of interactions		
Timing	Antenatal care	✔
	Intrapartum care	✔
	Postnatal care for the mother	✔
	Postnatal care for the newborn	✔
Content	Antenatal care	✔
	Intrapartum care	✔
	Postnatal care for the mother	✔
	Postnatal care for the newborn	✔
Knowledge of danger signs		✔
Equity of interactions		
Antenatal care		✔
Intrapartum care		✔
Postnatal care for the mother		✔
Postnatal care for the newborn		✔
Life saving interventions in pregnancy		
Tetanus toxoid vaccination		✔
Iron and folic acid supplementation		✔
Prevention of malaria with IPTp		✔
Prevention and management of sexually transmitted infections and HIV		✔
Screening for and treatment of syphilis		✔
Life saving interventions during delivery		
Hand washing with soap by delivery attendant		✔
Use of gloves by delivery attendant		✔
Prophylactic uterotonics to prevent postpartum haemorrhage		✔
Active management of the third stage of labour		✔
Life saving interventions for the newborn		
Hygienic cord and skin care		✔
Initiation of early breastfeeding		✔
Immediate thermal care		✔
Exclusive breastfeeding for six months		✔

Methodology

2.1: Survey design

Data were collected in areas where L10K was working between 2010 and 2015 (intervention areas), and from comparison areas. Intervention areas included the 59 'Anchor' woredas spread across four regions where new innovations were implemented since the baseline survey in May 2012. Comparison areas include the woredas in the same four regions where no foundation-funded maternal and newborn health innovations were implemented. The purpose of data collected from comparison areas was to estimate the magnitude of change in outcomes between baseline and follow-up using a 'difference-in-differences' approach.

2.2: Sample size and selection

A map of Ethiopia showing the sampled household clusters, facilities and frontline workers interviewed is shown in figure 2. The same clusters were surveyed in both 2012 and 2015 surveys.

Multi-stage sampling was applied. Before field work began, all kebeles (sub-districts) within the eligible woreda were listed and 40 kebeles selected using probability proportional to size of the kebele. During field work, survey supervisors visited officials at each selected woreda and kebele and listed all

the gote (sub-villages – kuseht in Tigray) in the selected kebele, then selected one gote using simple random sampling. At the selected gote, household listing was carried out by the field team. In a gote with more than 75 households,

> **"**
>
> *Data were collected in areas where L10K was working between 2010 and 2015 (intervention areas), and from comparison areas.*
>
> **"**

standard segmentation methods were applied to define a household cluster of approximately 75 households: all households in the selected segment were surveyed. In addition, the health post and the primary health centre (PHC) assigned to provide primary care to those households were visited, and any frontline workers providing maternal and newborn health services to the households were identified and interviewed. Finally, the nearest

referral facility was also visited for record review and data extraction on births and birth outcomes.

In 2012 the minimum target number of households per cluster was set at 50 so that a minimum total number of 2,000 households would be visited. In Ethiopia, where the total fertility rate was estimated to be 4.3,[5] this number of households would result in interviews with a minimum of 200 women with a live birth in the previous 12 months (i.e. one in every 10 households surveyed). This size of sample was sufficient to measure as statistically significant, and with 90% power, changes of 20 or fewer percentage points in a range of interaction and intervention coverage indicators across the continuum of care. In 2015 the survey teams increased cluster size to a uniform 75 households per cluster.

2.3: Survey modules

The **household survey** comprised of three modules. (1) A household module asked all household heads about characteristics of the household, ownership of commodities, and registered all normally resident people in the household. (2) A women's module asked all women aged 13-49 years and normally resident in the household about the health care available to them, their

Figure 2: Map of survey sample showing household cluster locations (purple dots), the location of the surveyed primary health centres or health posts assigned to household clusters (orange dots), and the location of interviewed frontline workers providing services to household clusters (red dots)
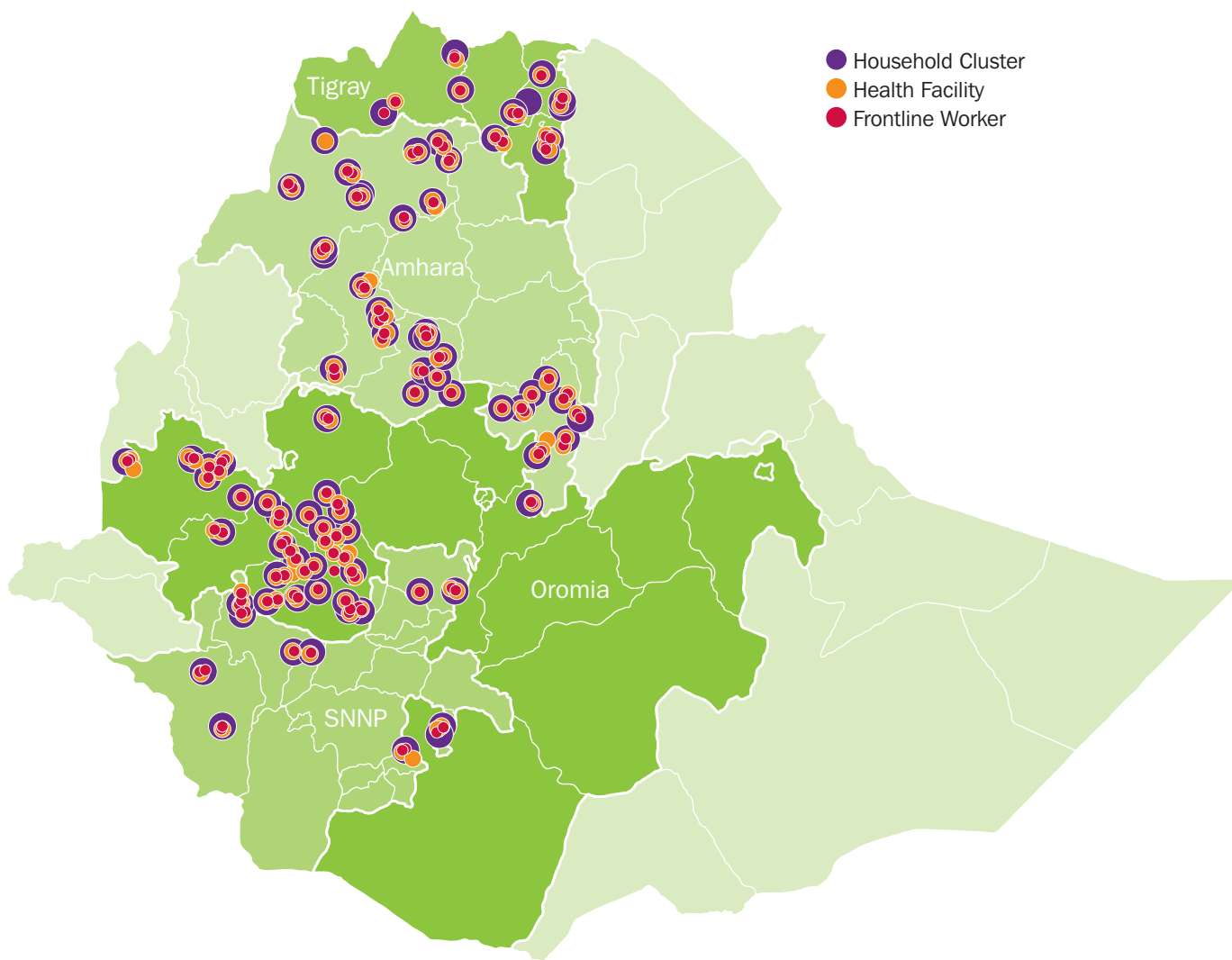
recent contact with frontline workers and their birth history in the two years preceding the survey. (3) A mother's module asked all women who reported a birth in the last two years (identified in the women's module) a detailed set of questions about their contact with health services across the continuum of care from pregnancy to postnatal care.

The facility survey comprised of four sections. (1) An inventory of equipment and supplies that were available and functioning on the day of survey. (2) An

inventory of staff employed at the facility, their cadre, training and whether they were present on the day of survey. (3) An interview with the in-charge of the facility about the services available at that facility, and about recent supervision visits they had received. (4) Data extraction from facility registers recorded the number and outcomes of all births at the facility during the previous six months.

The **frontline worker** survey was comprised of four sections. (1) The services provided by the frontline worker

and the amount of time they typically spend on each service. (2) The training and supervision the frontline worker had received to provide those services. (3) The workload of the frontline worker during the month preceding survey, and their recall of activities that took place during the last delivery they attended. (4) An interview comprising unprompted questions about knowledge of appropriate care for mothers and newborns.

The content of each survey module or section was informed by existing

large scale survey tools such as the Demographic and Health Surveys (DHS), the Service Provision Assessment, Averting Maternal Death and Disability and Safe Motherhood. All questionnaires were extensively pre-tested prior to survey implementation in each year.

2.4: Timeline

The surveys were implemented May-June 2012 and May-June 2015. The same methods were applied in both surveys.

Household interviews with all women aged 13-49 referred to their contact with frontline workers during the six months prior to survey (Dec-April in both 2012 and 2015). Household interviews with ever married women aged 13-49 who had a live birth referred to births that occurred in the 12 months preceding survey (May 2011 – April 2012 in 2012, May 2014 – April 2015 in 2015). Facility assessments referred to the availability of equipment and supplies on the day of survey (May/June in both 2012 and 2015), and data extracted from facility registers for the six month period prior to survey (Dec – April in both 2012 and 2015). Frontline worker interviews referred to their career as a frontline worker and to the last birth that they attended.

2.5: Survey implementation

The surveys were implemented by JaRco Consulting, Ethiopia (www.jarrco.info) using handheld digital devices (Samsung model GT-S6102) with the exception of the 2012 household survey which was implemented using paper questionnaires. All questions were written in Amharic, Oromifa and Tigrinya, depending on the region of implementation. Interviewers from Amhara, SNNP, Oromia and Tigray were recruited from a pool of interviewers previously employed by JaRco. Ten survey teams were recruited, each comprised of one supervisor, four household interviewers, and one facility and frontline worker interviewer who was medically trained. Each team aimed to complete cluster interviews in two days.

In each year the survey teams were trained in-house for five days to familiarise themselves with the questionnaires and procedures, followed by a full pilot (including a review of data downloads) in two clusters (not included in the final data). Each team member carried a survey manual throughout the field work.

In addition to pre-testing the questionnaires, training interviewers and pilot testing all protocols, during field work supervisors carried out at least three re-interviews a day and observed each interviewer in his or her team each day of data collection. These re-interviews and observations were used as a means of providing feedback to interviewers, ensuring consistency between interviewers and continuously improving the standard of work. Finally, the data manager and survey supervisor from JaRco coordinated visits to the survey teams throughout the data collection periods to provide support to team supervisors and to retrieve completed data forms.

2.6: Data management and analysis

In 2012, household survey paper questions were checked by supervisors in the field, transported to JaRco where they were double data entered with any differences reconciled with reference to

the original forms. All other data were synchronised from the interviewer devices to the supervisor's laptop daily: these daily downloads were then copied to a labelled and securely stored compact disc. In addition, when the team had internet connectivity, data were uploaded from the laptop to a secure, dedicated server which senior supervisors checked for completeness and consistency.

Data modules were linked using a set of automatically generated unique identifiers and data tables for the analysis constructed. Data were analysed using STATA 12. Adjustment for clustering was made using *svy* commands when tabulating percentages or calculating means.

2.7: Research ethics

This work obtained national level support from the Ministry of Health in Ethiopia, and ethical approval from the Ministry of Science and Technology. At the regional level, approval was granted by the regional Institutional Review Boards in Amhara, Oromia, SNNP, and Tigray. Ethical approval was also obtained from the London School of Hygiene and Tropical Medicine (reference 6088). All respondents provided informed, voluntary written consent to be interviewed.

5.DHS Ethiopia 2011

Characteristics of the health facilities surveyed

> *Many infrastructure indicators had improved in 2015. But the majority of PHCs continued to lack motorised transport for referrals and only approximately two-thirds in intervention areas and one half in comparison areas had a clean source of running water.*

3.1: Sample selection

The sample selection protocol was to identify and survey the government owned PHC and health post allocated to provide routine maternal and newborn health services to each household cluster. In addition, the referral facility linked to surveyed PHCs was visited for routine data extraction on volume of births and data on caesarean sections. The total number of facilities surveyed each year is shown in Table 2. A larger number of referral facilities was surveyed in 2015 compared to 2012 because the protocol was revised to require survey teams to travel outside the woreda for referral hospitals if necessary.

3.2: Infrastructure of primary health centres

Infrastructure indicators were not part of the expected effects arising from project activities but are described here for PHCs to provide context about the routine health care available to women. In 2012, gaps in the basic infrastructure of PHCs had been identified in both intervention and comparison areas and while some of these were still present in 2015 there was evidence of improvement across many infrastructure indicators. (Table 3) The majority of PHCs continued to lack motorised transport for referrals, and only approximately two-thirds in intervention areas and one-half in comparison areas had a clean source of running water.

Table 2: Number of facilities surveyed each year, by facility type

	Intervention		Comparison	
Facility type	**2012**	**2015**	**2012**	**2015**
Number of clusters	40	40	40	40
Health posts	37	41	37	40
Primary health centres	42	39	41	40
Referral facilities	2	13	3	17

Table 3: Infrastructure of primary health centres in intervention and comparison areas, four-region survey of Ethiopia 2012-2015

|	Intervention		Comparison	
Infrastructure item	**PHC 2012 (N=42)**	**PHC 2015 (N=39)**	**PHC 2012 (N=41)**	**PHC 2015 (N=40)**
Toilet for facility users	98%	100%	95%	100%
Electricity supply (usual)	73%	82%	63%	67%
Functional steriliser or stove	61%	90%	70%	87%
Running water	61%	69%	50%	46%
Room providing physical privacy	63%	97%	65%	82%
Any means of telephone communication	88%	94%	75%	80%
Functional fridge	95%	97%	95%	97%
Motorised transport for referral	29%	36%	33%	49%
24 hour light source	59%	74%	53%	62%

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3.3: Staff employed and at work in health facilities

No difference was seen in staffing levels by intervention or comparison area. In 2012 and 2015 all PHCs employed at least one skilled birth attendant (clinician, registered nurse or auxiliary nurse midwife). Ninety-five percent of health posts had at least one health extension worker employed. In the few health posts where no health extension worker was employed nurses or assistant nurses had been posted to provide cover at the time of the survey. All PHCs had at least one registered nurse, but only four percent employed a clinical doctor. A minority of PHCs reported that a health extension worker was posted there although this is not usual practise.

The proportional distribution of staff cadres employed by health posts and by health facilities in 2015, in both intervention and comparison areas combined is shown in Figure 4. As expected, health posts were predominantly staffed by health extension workers. Beyond other support staff with no medical training, the largest cadre employed in PHCs were registered nurses.

Figure 4: Proportional distribution of staff cadres employed in intervention and comparison areas combined, 2015

Health posts in 2015

Primary health centres in 2015
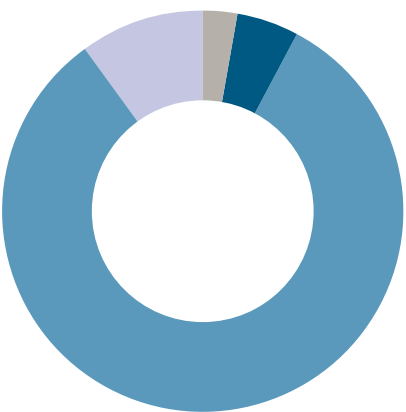
Registered nurse: 3%
Assistant nurse: 5%
Health extension worker: 82%
Other: 10%

Clinician: 1%
Registered nurse: 23%
Assistant nurse: 11%
Health extension worker: 14%
Health officer: 6%
Other: 45%

Characteristics of frontline workers interviewed

No difference was seen in staffing levels by intervention or comparison areas. In 2012 and 2015 all PHCs employed at least one skilled birth attendant.

4.1: Sample selection

The number of frontline workers interviewed each year is shown in Table 4. Each year, approximately two Women's Development Army members were interviewed for each cluster, and one Health Extension Worker and one nurse per cluster.

4.2: Services provided by frontline workers

Services provided by frontline workers are described here to provide context about the health care available to women. No differences were observed between intervention or comparison area and here a summary of selected services

provided by frontline workers in intervention areas is provided.

Eighty-seven percent of Health Extension Workers, all nurses and 25% of Women's Development Army said they provided antenatal care. Twenty percent of Health Extension Workers and all nurses said they provided delivery care. Seventy five percent of Health Extension Workers, 95% of nurses, and 22% of Women's Development Army members said they provided essential newborn care. Ninety percent of Health Extension Workers, all nurses, and 57% of Women's Development Army members said they counselled mothers about breastfeeding.

Table 4: Number of frontline workers interviewed each survey year

	Intervention		Comparison	
	2012	**2015**	**2012**	**2015**
Women's Development Army	84	80	75	80
Health Extension Workers	42	41	38	39
Nurse in primary health centres	40	39	37	40

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Characteristics of households and women interviewed

5.1: Sample selection

The sample selection for the household interviews is shown in Table 5. In both survey years 40 clusters were completed in intervention and comparison areas. The total number of households was higher in 2015 reflecting the fixed cluster size of 75 households per cluster that year. For each group, 90% percent of all resident women in households were individually interviewed about their recent fertility history.

5.3: Characteristics of women interviewed

The characteristics of women with a recent live birth are shown in Table 6. Characteristics were comparable between survey years. The majority of women were married, of Orthodox religion, and had not attended formal school. The relative measure of socio-economic status of households in which women lived is used for disaggregation of outcomes by equity, and is described in the next section; in table 6 we observe that women were distributed equally between groups.

5.2: Socio-economic status of households

The household module asked questions about household building materials (walls, roof, floor), utilities (water, sanitation, cooking fuel, electricity), and assets (radio, bicycle, mobile phone, bed, chair, kerosene or pressure lamp, wrist watch, motorised vehicle).

Each survey year, in order to examine the relationship between key coverage outcomes and socio-economic status, an index of socio-economic status was constructed for each household using principal components analysis. The continuous index variable produced by the principal components analysis was divided into five equal sized groups (quintiles) of households from quintile 1 (most poor) to quintile 5 (least poor). The characteristics of households in the most poor and the least poor quintiles in 2015 are demonstrated in Figure 5.

Table 5: Household survey sample in 2012 and 2015

	Intervention		Comparison	
	2012	2015	2012	2015
N of clusters	40	40	40	40
N of households	2,118	3,000	2,176	3,000
N resident women aged 13-49	2,153	3,480	2,245	3,676
N women interviewed	1,934	3,170	2,003	3,340
N women with birth in 12 months preceding survey	277	404	256	383

Table 6: Characteristics of household survey respondents (resident women with a live birth in 12 months preceding survey date)

Characteristic		Intervention		Comparison	
		2012 N=277	2015 N=404	2012 N=256	2015 N=383
Currently married		96%	97%	93%	95%
Education level	None	61%	54%	64%	60%
	Primary	30%	33%	28%	28%
	Secondary	8%	13%	8%	13%
Religion	Orthodox	50%	51%	57%	64%
	Protestant	17%	19%	13%	15%
	Muslim	33%	28%	30%	20%
Household socio-economic status	1 (most poor)	22%	20%	20%	18%
	2	21%	18%	21%	19%
	3	19%	19%	21%	20%
	4	19%	21%	18%	22%
	5 (least poor)	19%	22%	20%	21%

Figure 5: Characteristics of building materials and ownership of assets in the most poor (Q1) and the least poor (Q5) households surveyed
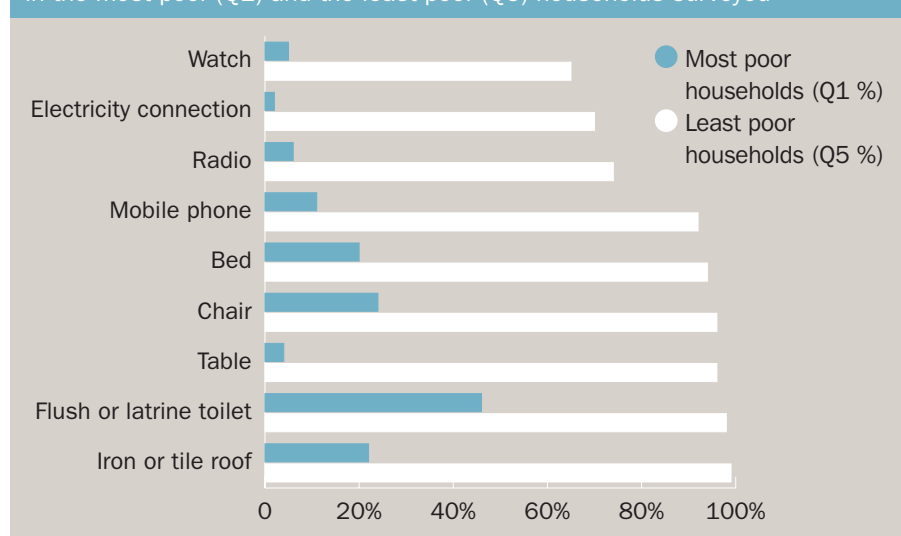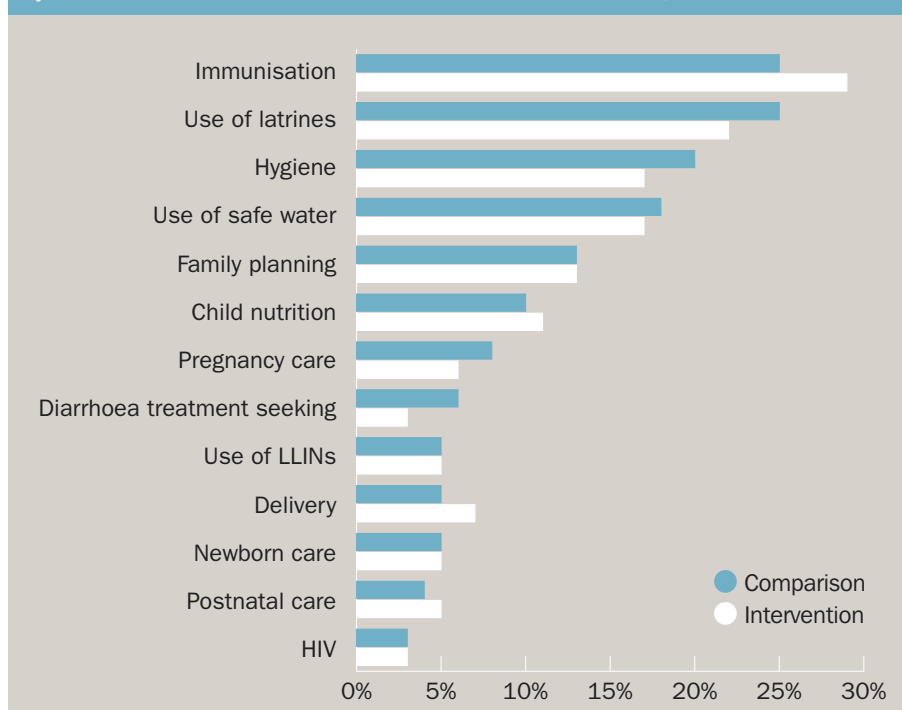
Frontline worker contact with families

In the household survey, women with a live birth in the 12 months preceding survey were asked about the contact that they and their families had with frontline workers in their own home or in health centres or health posts. Results below are shown for 2015 intervention and comparison areas.

6.1 Contact with frontline workers: visits to health centres

In intervention areas, 48% of women reported that there was a health centre within their kebele, 43% in comparison areas. The median time to walk from their home to the health centre was 60 minutes in both settings. In intervention areas, 49% of women had visited the health centre at least once in the previous six months. Among these, the primary reason for the last visit was child immunisation (37% of last visits), followed by care seeking for child illness (22%), delivery care (18%), antenatal care (16%) and family planning (5%).

Figure 6a: Most frequently cited topic of conversation during last home visit by Health Extension Workers to women with a recent birth, 2015

Figure 6b: Most frequently cited topic of conversation during last home visit by Women's Development Army member to women with a recent birth, 2015

In comparison areas, 47% of women had visited the health centre at least once in the previous six months for the same primary reasons as intervention areas.

6.2 Contact with frontline workers: visits to health posts

In intervention areas, 89% of women reported that there was a health post within their kebele, 93% in comparison areas. The median time to walk from their home to the health post was 20 minutes and 15 minutes respectively. In intervention areas, 40% of women had visited the health post at least once in the previous six months. Among these, the primary reason for the last visit was child immunisation (66% of last visits) followed by pregnancy care (12%) and family planning (10%). In comparison areas, 58% of women had visited the health post at least once in the previous six months, reporting the same top three reasons for making the last visit.

6.3 Contact with frontline workers: home visits by Health Extension Workers

In intervention areas, 46% of women reported having a home visit by a Health Extension Worker in the previous 6 months, 43% in comparison areas. Women were asked to recall which topics of conversation had been discussed during the last visit and these are presented in Figure 6a.

6.4 Contact with frontline workers: home visits by Women's Development Army

In both intervention and comparison areas, 50% of women reported having a home visit by a member of the Women's Development Army in the previous 6 months. The topics of conversation during those visits are presented in Figure 6b. Compared with Health Extension Worker visits, women recalled relatively few health topics with Women's Development Army members.
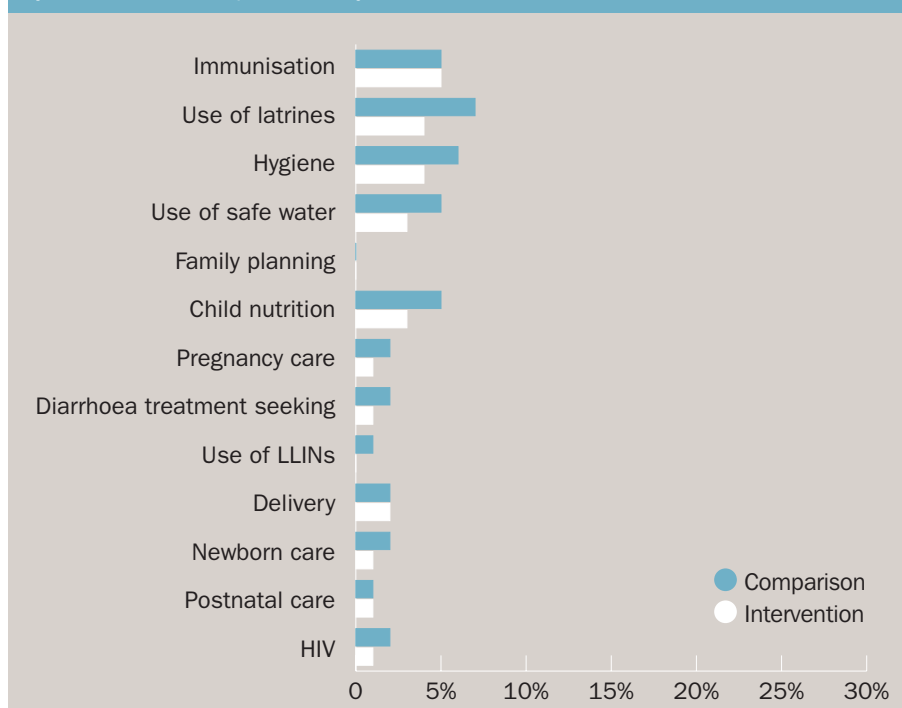
Results on expected improvements

This chapter presents results on the expected improvements arising from the project in the study area, including frequency of interactions, the quality of those interactions and the coverage of life saving interventions. Coverage is also broken down by socio-economic status of households.

7.1 Interaction coverage and quality

Some large scale changes were observed in interaction coverage during the period 2012-2015, and these changes were observed in intervention and comparison areas almost uniformly. Table 7 presents detailed coverage information but here we focus on change in intervention areas only.

There was borderline evidence of an increase in coverage of at least four antenatal care visits, from 22% (14-33) in 2012 to 39% (31-47) in 2015. And there was borderline evidence of improved quality of care as measured by the percent of women receiving core components of focussed antenatal care by the end of pregnancy (rising from 14% (9-21) in 2012 to 26% (19-54) in 2015. The mean gestation at first visit to antenatal care in health posts remained constant, but there was an increase in mean gestation at first antenatal visit in health centres during this period from 13.4 weeks in 2012 to 19.2 weeks in 2015 – possibly a consequence of more women in 2015 – including those less educated and living further away – starting to access antenatal care in health centres.

Large change was observed in coverage of institutional delivery, rising from 15% (9-24) in 2012 to 43% (33-53) in 2015. More women also had skilled attendance at birth (16% in 2012 to 45% in 2015). However the duration of stay in facility after delivery did not change, mean duration of admission being less than one day, (66% of women discharging on same day as delivery in 2012, 53% in 2015).

Postnatal care for the mother and for the newborn within 48 hours of birth remained very low in 2015 at below 5% coverage, its quality poor, and the interval to first postnatal visit being too long to save newborn lives.

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Table 7: Coverage and quality of interactions in Ethiopia in 2012 and 2015					
		Intervention		**Comparison**	
		2012	**2015**	**2012**	**2015**
Number of observations: women with a live birth in the 12 months prior to survey		277	404	256	383
		% (95% CI)	**% (95% CI)**	**% (95% CI)**	**% (95% CI)**
Frequency of interactions	Antenatal care with a skilled provider (≥ one visit)	32% (22-45)	50% (40-59)	33% (24-43)	51% (42-60)
	Antenatal care (≥ four visits)	22% (14-33)	39% (31-47)	24% (18-32)	45% (38-53)
	Institutional delivery	15% (9-24)	43% (33-53)	13% (7-22)	45% (36-55)
	Postnatal care for the mother (<48 hours)	4% (2-7)	4% (2-6)	3% (1-7)	8% (5-12)
	Postnatal care for the newborn (<48 hours)	4% (2-7)	4% (2-7)	4% (2-7)	5% (3-8)
Quality of interactions					
Content	Antenatal care[1]	14% (9-21)	26% (19-34)	20% (13-28)	25% (19-32)
	Skilled attendance at birth[2]	16% (10-26)	45% (35-55)	14% (8-23)	47% (37-56)
	Postnatal care for the mother[3]	1% (0-3)	0	1% (0-3)	2% (1-5)
	Postnatal care for the newborn[4]	0	0	0	1% (0-2)
		Mean (95% CI)	**Mean (95% CI)**	**Mean (95% CI)**	**Mean (95% CI)**
Timing	Mean gestation at first antenatal visit to a health centre (weeks)	13.4 (10.6-16.3)	19.2 (17.3-21.2)	14.9 (11.9-17.9)	19.5 (17.8-21.1)
	Mean gestation at first antenatal visit to a health post (weeks)	15.3 (12.8-17.7)	16.7 (14.4-18.9)	16.4 (14.2-18.6)	17.9 (16.4-19.4)
	Mean duration of stay after delivery (days)	0.8 (0.4-1.2)	0.7 (0.5-0.9)	1.0 (0.5-1.4)	1.7 (0.7-2.7)
	Mean time to first postnatal care visit for the mother (days)	7.4 (3.6-11.1)	7.9 (5.0-10.8)	9.9 (4.3-15.4)	6.8 (4.6-8.9)
	Mean time to first postnatal care visit for the newborn (days)	11.2 (5.0-17.5)	9.2 (5.7-12.6)	5.9 (2.0-9.8)	8.2 (5.4-11.1)
Knowledge of danger signs (mean number cited, unprompted)	Pregnancy[5]	2.4 (2.1-2.7)	1.8 (1.5-2.0)	2.6 (2.2-3.0)	2.0 (1.8-2.3)
	Intrapartum[5]	2.0 (1.7-2.4)	1.9 (1.6-2.1)	2.5 (1.9-3.0)	2.1 (1.9-2.3)
	Newborn[5]	2.2 (1.9-2.6)	2.2 (2.0-2.5)	2.4 (2.0-2.8)	2.5 (2.3-2.8)

1 As defined by L10K: blood pressure checked, weight measured, blood and urine tested
2 Using skilled attendance at birth as a proxy for quality intrapartum care
3 Defined by all of: breasts and bleeding checked; counselled on nutrition, family planning and danger signs
4 Defined by all of weighed, cord checked, danger signs checked, caregiver counselled about breastfeeding and danger signs
5 From a total of 10 coded danger signs at each stage

"

Across the continuum of care we observe large gains in coverage of life saving interventions being made amongst the most poor women, with coverage among all sub-groups increasing.

"

7.2 Intervention coverage

Intervention coverage is shown in Table 8. Some important improvements were observed, while others had stable coverage.

Amongst life saving interventions during pregnancy, coverage of iron and folic acid supplementation increased from 19% (14-26) in 2012 to 42% (35-50) in 2015, but the coverage of tetanus toxoid protection, intermittent presumptive treatment for malaria in pregnancy, and syphilis screening did not change.

Consistent with the increase in institutional delivery, reported use of gloves by the delivery attendant increased from 26% (17-36) to 54% (43-64), as did

the receipt of a prophylactic uterotonic immediately after birth to prevent postpartum haemorrhage (from 11% (6-15) in 2012 to 35% (27-42) in 2015. We observed one life saving maternity intervention to worsen: reported hand washing with soap by birth attendants for home births decreased from 81% (73-87) in 2012 to 72% (64-79) in 2015: this is possibly explained by the pool of women having home births becoming more poor over time.

For the newborn, the initiation of breastfeeding within one hour of birth increased from 50% (42-57) in 2012 to 66% (59-72) in 2015. But there was no statistical evidence of an increase in the number of newborns having clean

Table 8: Coverage of life saving interventions in Ethiopia in 2012 and 2015 (showing % and 95% confidence interval (CI))

		Intervention		Comparison	
		2012 % (95% CI)	**2015** % (95% CI)	**2012** % (95% CI)	**2015** % (95% CI)
Number of observations: women with a live birth in the 12 months prior to survey[1]		277	404	256	383
Life saving interventions: pregnancy	Tetanus toxoid protection	41% (34-49)	43% (34-52)	43% (35-52)	43% (36-51)
	Iron and folic acid supplementation[2]	19% (14-26)	42% (35-50)	21% (16-28)	51% (43-59)
	Prevention of malaria with IPTp (≥2 doses)	5% (3-9)	4% (2-8)	5% (3-9)	5% (3-8)
	Screening for syphilis	8% (5-13)	10% (7-16)	7% (4-14)	13% (9-17)
Life saving interventions: delivery	Hand washing with soap (home births)	81% (73-87)	72% (64-79)	79% (73-85)	75% (66-83)
	Use of gloves by birth attendant (all)	26% (17-36)	54% (43-64)	28% (19-39)	56% (46-65)
	Prophylactic uterotonics to prevent postpartum haemorrhage	11% (6-15)	35% (27-42)	6% (4-9)	38% (28-41)
Life saving interventions: newborn	Hygienic cord care[3]	43% (36-52)	42% (32-53)	38% (28-48)	35% (27-44)
	Initiation of early breastfeeding (<1hr)	50% (42-57)	66% (59-72)	53% (46-61)	59% (51-67)
Immediate thermal care	Immediate wrapping (<first 5 minutes of life)	28% (20-37)	35% (29-43)	28% (22-36)	37% (31-44)
	Delayed bathing (>24 hours of life)	39% (30-49)	51% (42-59)	32% (24-41)	52% (44-59)
Exclusive breastfeeding for six months[4]		N/A	N/A	N/A	N/A

1 'Don't know' responses removed from denominator
2 Supplementation received
3 All of clean cutting, tying and nothing harmful put on the cord
4 Not measured in 2012

cord care or appropriate immediate thermal care.

7.3 Equity

In figures 7 and 8 we see the breakdown of coverage for interactions and intervention coverage across the continuum of care. Encouragingly we observe coverage of antenatal care and of institutional delivery to increase for all socio-economic groups of women. Coverage of postnatal care was still too low to detect inequities. Across the continuum of care we observe large gains in coverage of life saving interventions being made amongst the most poor women, with coverage among all sub-groups increasing.

Figure 7: Coverage of interactions across the continuum of care in intervention areas, disaggregated by socio-economic status of households
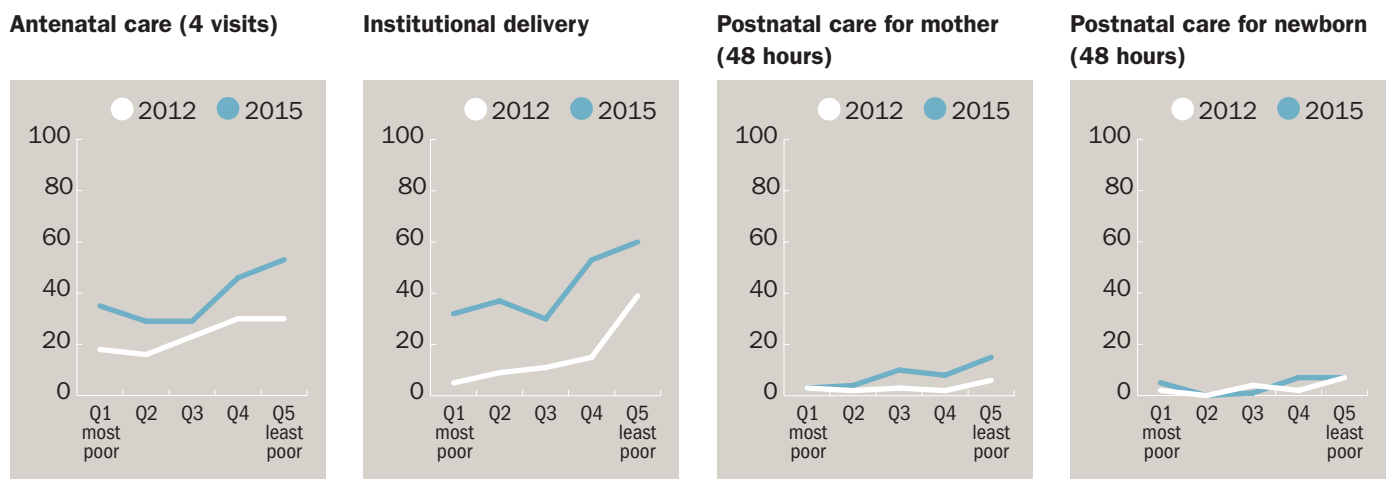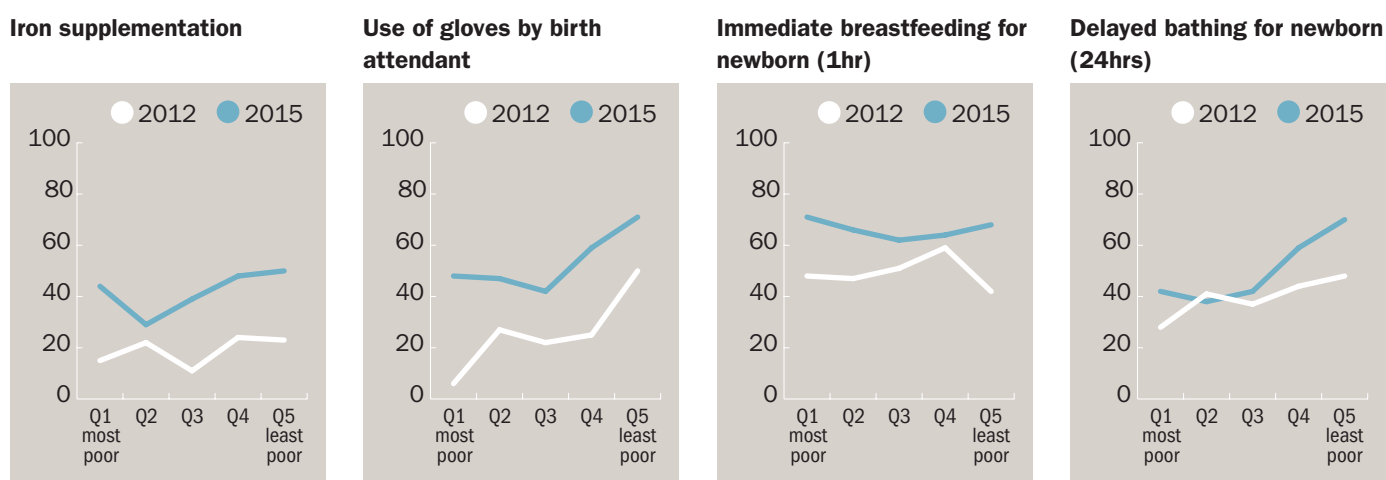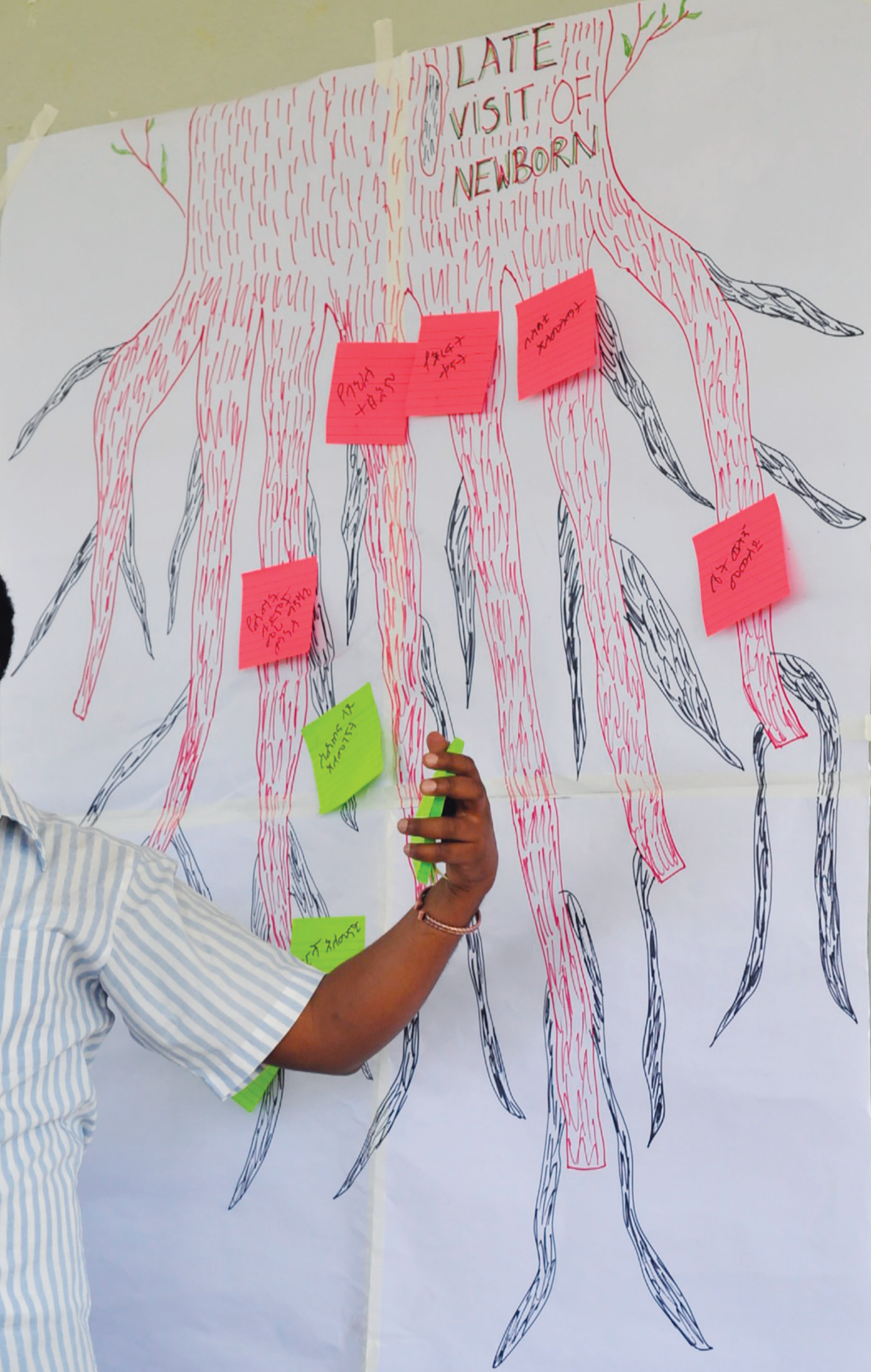

Figure 8: Coverage of interventions across the continuum of care in intervention areas, disaggregated by socio-economic status of households

Discussion

In summary, in both intervention and comparison areas we observed large improvements in coverage of contacts and life saving interventions for antenatal and delivery care, but less positive change for newborn care.

By 2015, half of women had at least one antenatal care visit with a skilled provider, and approximately 40% of women had the recommended four antenatal visits and had an institutional delivery, and there was some evidence that the quality of these contacts had also improved. But coverage of postnatal checks for the mother and the newborn remain extremely low and represent a problem needing urgent attention. Women are increasingly delivering in health facilities where they and their newborns should receive a thorough health check – but most do not remain in the facility long enough to benefit from this, and are likely not prioritised for a home visit once they return to the community (if the assumption is that a woman with a facility delivery has been checked already). But neither are postnatal care protocols working for women who deliver at home.

Across the continuum of care the coverage of some life saving interventions improved – iron supplementation during pregnancy (42%), prophylactic uterotonics immediately after delivery (35%) and use of gloves during delivery (54%), and initiation of breastfeeding within one hour of birth (66%). Other interventions had stable coverage between survey periods despite being targeted interventions for change.

In 2015 in both intervention and comparison areas women had good access to health workers. Approximately half lived in a kebele with a PHC that they could access within a median of 60 minutes walk from home. And 50% reported having visited a PHC in the previous six months (compared with 32% who reported this in 2012). Approximately 90% lived in a kebele with a health post and their nearest health post was within a median of 20 minutes walking distance. Forty percent had visited the health post in the last six months (compared with 26% in 2012).

Forty-six percent of women reported being visited at home by a Health Extension Worker in the previous six months, and 50% by a member of the Women's Development Army. The most frequently cited topics of conversation discussed during these visits were immunisation, latrines, hygiene and safe water, and family planning; then issues of maternal and newborn health care. It was notable that women recalled far fewer topics of conversation with Women's Development Army members than with Health Extension Workers.

> *"*
>
> *Coverage of postnatal checks for the mother and the newborn remain extremely low and represent a problem needing urgent attention.*
>
> *"*

In interpreting these results three important limitations must be considered.

First, survey data collection approaches to measure behaviours that occur during pregnancy, intrapartum and newborn periods may be susceptible both to recall and measurement bias. We tried to limit recall bias by only analysing data on births from the last 12 months in the household survey and the last birth attended by frontline workers. Measurement bias is harder to control (for example, a woman may have difficulty in accurately reporting the timing of events). However, there is no reason to expect that this bias would have a systematic effect on analysis of change between two survey points given that the same methods were applied each time.

Second, the data collection period coincided with a period of remarkable change in the Ethiopian health system, with government led health system strengthening innovations being implemented throughout the country. The L10K project was working to support the Government by providing rapid assessment of what worked, and how, so that promising innovations could be scaled-up beyond the project area without delay. As such, the comparison area underwent considerable change during the study period and it was an unusually challenging context in which to demonstrate a greater difference in intervention than comparison area.

Third, this study was not designed to reflect progress of the individual project but to explore relationships between interactions and coverage of life saving interventions in priority areas for the foundation. As such, the study was powered to detect changes of around 15-20 percentage points across a range of indicators but not smaller changes that the project itself may have been interested to detect. Related to this, the study setting for the work reflected only a sub-set of the innovations and implementation area of L10K and their own evaluation data presents evidence on the complete package of innovations. Because of this, and because of some differences in sampling methods, some point estimates reported here are lower than those estimated by L10K.

Despite these limitations a clear pattern of results has emerged. There is still a long way to go, but access to antenatal and intrapartum health care has improved on a large scale in Ethiopia. Simultaneously there have been improvements in the readiness of the health system to provide quality care. But care given to women and newborns immediately after delivery and during the first days of life – when their health is at most risk – has not yet changed and this problem requires urgent attention if the ambitious mortality targets for Ethiopia are to be addressed.

Long list of indicators for maternal and newborn health

Table A1.1: Household survey results on **pregnancy care** in four Regions of Ethiopia in 2012 and 2015, intervention areas (showing % and 95% confidence interval (CI))		
Expected improvement	**2012 % (95% CI)**	**2015 % (95% CI)**
Number of observations	277	404
Frequency of interactions		
Antenatal care with a skilled provider (≥ one visit)	32% (22-45)	50% (40-59)
Antenatal care (≥ four visits)	22% (14-33)	39% (31-47)
Quality of interactions		
Coverage of good quality antenatal care		
Blood pressure testing at least once	41% (33-50)	53% (44-61)
Blood sample taken	45% (35-56)	46% (37-55)
Urine sample taken	22% (16-30)	34% (26-44)
Counselled on birth preparedness	37% (28-47)	65% (57-73)
Counselled on danger signs	24% (18-32)	26% (20-33)
Coverage of any birth preparedness		
Finances	43% (36-51)	38% (30-46)
Transport	5% (2-12)	8% (5-12)
Identification of health facility	9% (6-13)	3% (1-6)
Identification of birth attendant	12% (7-18)	3% (1-6)
Food	78% (71-85)	72% (64-78)
Life saving interventions[1]		
Iron supplementation received	19% (14-26)	42% (34-52)
Tetanus toxoid protection	41% (34-49)	43% (34-52)
Syphilis prevention[2]	8% (5-13)	10% (7-16)

1 'Don't know' responses excluded from denominator

2 Syphilis test result received

Table A1.2: Household survey results on **intrapartum care** in four regions of Ethiopia in 2012 and 2015, intervention areas (showing % and 95% confidence interval (CI))		
	2012 % (95% CI)	**2015 % (95% CI)**
Number of observations	277	404
Frequency of interactions		
Institutional delivery (any facility)	15% (8-24)	43% (33-53)
Births attended by a skilled birth attendant	16% (10-26)	45% (35-55)
Births by caesarean section	2% (1-6)	2% (1-6)
Quality of interactions		
Mean number of intrapartum danger signs cited	2.0 (1.7-2.4)	1.9 (1.6-2.1)
Life saving interventions[1]		
Hand washing with soap by delivery attendant	81% (73-87)	72% (64-79)
Use of gloves by delivery attendant	25% (17-37)	54% (43-64)
Prophylactic uterotonics[2]	11% (6-15)	35% (27-43)

1 'Don't know' responses excluded from denominator

2 Calculated by linking reports from birth attendants about use of uterotonics at last birth attended to household survey reports on cadre of attendant at birth

Table A1.3: Household survey results on **postnatal care** in four regions of Ethiopia in 2012 and 2015, in intervention areas (showing % and 95% confidence interval (CI))

	2012 % (95% CI)	2015 % (95% CI)
Number of observations	277	404
Frequency of interactions		
Postnatal care for the mother (≥ once within 48hrs of birth)	4% (2-8)	4% (2-6)
Postnatal care for the newborn (≥ once within 48hrs of birth)	4% (2-7)	4% (2-7)
Quality of interactions		
Coverage of good quality postnatal care for mother		
Breasts checked	3% (1-6)	4% (3-8)
Bleeding checked	2% (1-5)	3% (1-5)
Counselled on nutrition	3% (1-6)	2% (1-5)
Counselled on family planning	3% (2-7)	2% (1-5)
Counselled on danger signs	2% (1-5)	2% (1-5)
Coverage of good quality postnatal care for newborn		
Newborn weighed	1% (0-4)	3% (1-6)
Newborn cord checked	4% (2-7)	4% (2-7)
Newborn checked for danger signs	2% (1-5)	2% (1-4)
Caregiver counselled on breastfeeding	3% (1-6)	4% (2-7)
Caregiver counselled on danger signs	2% (1-5)	2% (1-4)
Life saving interventions[1]		
Hygienic cord and skin care	43% (37-52)	42% (32-53)
Initiation of early breastfeeding	50% (42-57)	66% (59-72)
Immediate thermal care:		
Drying within 5 minutes of birth	19% (14-25)	22% (16-29)
Wrapping within 5 minutes of birth	28% (20-37)	35% (29-43)
Delayed bathing beyond 24 hours after birth	39% (30-49)	51% (42-59)

1 Don't know responses removed from denominator

Table A1.4: Essential equipment and supplies to provide basic maternal and newborn health care at **primary health centres**

Item	2012 PHC with item N=41 % (95% CI)	2015 PHC with item N=78 % (95% CI)	Item	2012 PHC with item N=41 % (95% CI)	2015 PHC with item N=78 % (95% CI)
General items for basic MNH			**Diagnostics for MNH**		
Soap	78% (63-88)	92% (84-97)	Pregnancy test kit	88% (74-95)	96% (88-99)
Single use syringes/needles	95% (82-99)	99% (91-100)	Malaria rapid test kits	95% (82-99)	83% (73-90)
Blood pressure cuff	95% (82-99)	99% (91-100)	Haemoglobin test	58% (41-72)	71% (59-80)
Thermometer	88% (74-95)	95% (87-98)	Urine dipstick	63% (48-77)	73% (62-82)
Sterile scissors or blade	98% (84-100)	99% (91-100)	Partographs	63% (48-77)	79% (69-87)
Disinfectant	78% (63-88)	94% (85-97)	Syphilis rapid test kit	46% (32-62)	85% (72-93)
Stethoscope	98% (84-100)	99% (91-100)	HIV rapid test kit	93% (79-98)	94% (85-97)
IV fluids with infusion set	98% (84-100)	99% (91-100)	**Medications for MNH**		
Suture material with needle	95% (82-99)	100%	IV gentamycin	93% (79-98)	87% (78-93)
Infant weighing scale	95% (82-99)	95% (87-98)	Ferrous sulphate/FA	93% (79-98)	100%
Disposable gloves	93% (79-98)	100%	Oral antibiotics	93% (79-98)	99% (91-100)
Needle holder	98% (84-100)	100%	IV metronidazole	28% (16-44)	46% (35-57)
Waste receptacle with lid	61% (44-76)	60% (49-71)	Cotrimoxizole	98% (84-100)	95% (87-98)
Watch/timing device	17% (8-33)	38% (28-50)	Uterotonics	95% (82-99)	99% (91-100)
Speculum	95% (82-99)	90% (81-95)	Corticosteroids	51% (36-66)	32% (22-43)
Bag and mask for resuscitation	73% (57-85)	92% (84-97)	IV ampicillin	70% (54-83)	81% (70-88)
Disposable clamp/umbilical tie	93% (79-98)	100%	Local anaesthetics	93% (79-98)	92% (84-97)
Oxygen	24% (12-39)	36% (26-47)	Diazepam	63% (48-77)	76% (65-84)
Sharps container	98% (84-100)	100%	Vitamin K	40% (26-56)	73% (62-82)
Blanket for newborn	10% (4-24)	17% (10-27)	Sulphadoxine pyrimethamine	40% (26-56)	18% (11-28)
Suction bulb for mucus extraction	39% (25-55)	82% (72-89)	Tetracycline/eye ointment	93% (78-98)	91% (82-96)
Disposable paper towels	15% (7-29)	31% (21-42)	**Vaccinations for MNH:**		
Vacuum extractor	51% (36-66)	64% (53-74)	Bacille Calmette-Guerin	83% (67-92)	96% (88-99)
Baby warmer	15% (7-29)	40% (29-51)	Tetanus toxoid vaccines	93% (79-98)	90% (81-95)
Fetal stethoscope	95% (82-99)	100%	Oral Polio Vaccine (OPV)	93% (79-98)	99% (91-100)
Manual vacuum aspirator	63% (48-77)	71% (59-80)			

Table A1.5: Essential equipment and supplies to provide basic maternal and newborn health care at **health posts**

Item	2012 HP with item N=37 % (95% CI)	2015 HP with item N=81 % (95% CI)	Item	2012 HP with item N=37 % (95% CI)	2015 HP with item N=81 % (95% CI)
General items for basic MNH			**Diagnostics for MNH**		
Soap	32% (19-50)	43% (33-54)	Pregnancy test kit	14% (6-30)	21% (13-32)
Single use syringes/needles	89% (74-96)	99% (91-100)	Malaria rapid test kits	69% (52-83)	58% (47-68)
Blood pressure cuff	78% (62-89)	99% (91-100)	Haemoglobin test	0	6% (3-14)
Thermometer	76% (59-87)	77% (66-85)	Urine dipstick	3% (0-18)	2% (1-9)
Sterile scissors or blade	70% (53-83)	53% (42-64)	Partographs	8% (3-23)	4% (1-11)
Disinfectant	32% (19-50)	56% (44-66)	Syphilis test kit	0	100%
Stethoscope	86% (71-94)	68% (57-77)	HIV rapid test kit	69% (52-83)	89% (49-99)
IV fluids with infusion set	0	6% (3-14)	**Medications for MNH**		
Suture material with needle	3% (0-18)	11% (6-20)	IV gentamycin	0	18% (12-30)
Infant weighing scale	73% (56-85)	69% (58-78)	Ferrous sulphate/FA	43% (28-60)	53% (42-64)
Disposable gloves	73% (56-85)	78% (67-86)	Oral antibiotics	27% (15-44)	43% (33-54)
Needle holder	24% (13-41)	20% (12-30)	IV metronidazole	0	1% (0-9)
Waste receptacle with lid	14% (6-30)	19% (11-29)	Cotrimoxizole	36% (22-54)	67% (56-76)
Watch/timing device	11% (4-26)	4% (1-11)	Uterotonics	3% (0-18)	20% (12-30)
Speculum	0	4% (1-11)	Corticosteroids	3% (0-18)	1% (0-9)
Bag and mask for resuscitation	16% (7-33)	17% (10-28)	IV ampicillin	0	4% (1-11)
Disposable clamp/umbilical tie	46% (30-63)	53% (42-64)	Local anaesthetics	14% (6-30)	47% (36-58)
Oxygen	0	2% (1-10)	Diazepam	3% (0-18)	2% (1-9)
Sharps container	89% (74-96)	84% (74-91)	Vitamin K	3% (0-18)	9% (4-17)
Blanket for newborn	3% (0-18)	1% (0-9)	Sulphadoxine pyrimethamine	5% (1-20)	0
Suction bulb for mucus extraction	5% (1-20)	14% (8-23)	Tetracycline/eye ointment	24% (12-39)	42% (32-53)
Disposable paper towels	5% (1-20)	21% (13-31)	**Vaccinations for MNH:**		
Vacuum extractor	5% (1-20)	9% (4-17)	Bacille Calmette-Guerin	50% (34-66)	27% (19-38)
Baby warmer	0	0	Tetanus toxoid vaccines	46% (30-63)	30% (21-41)
Fetal stethoscope	76% (59-87)	79% (69-87)	Oral Polio Vaccine (OPV)	50% (34-66)	25% (16-35)
Manual vacuum aspirator	0	1% (0-9)			

Equipment and supplies to provide basic maternal and newborn health care were checked for availability and functionality in the health facilities surveyed and are shown in table A1.4. The list of items recorded was synthesised from existing large-scale facility-based data collection tools including the Averting Maternal Disability and Death needs assessment,[6] the Measure Demographic and Health Survey Service Provision Assessment,[7] and the World Health Organization Safe Motherhood Needs Assessment.[8]

6 AMDD. *EmONC Needs Assessment*. Available from: http://www. amddprogram.org/d/content/needs-assessments

7 Measure-DHS. *SPA overview.* http://www.measuredhs.com/ aboutsurveys/spa/start.cfm.

8 WHO. *Safe Motherhood. Needs Assessment,* 2001; Available from: http://www.who.int/reproductivehealth/publications/maternal_ perinatal_health/rht_msm_96_18/en/index.html

IDEAS project

IDEAS (Informed Decisions for Action in Maternal and Newborn Health) aims to improve the health and survival of mothers and babies through generating evidence to inform policy and practice. Working in Ethiopia, North-Eastern Nigeria and the State of Uttar Pradesh in India, IDEAS uses measurement, learning and evaluation to find out what works, why, and how in maternal and newborn health programmes.

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Thank you to our partner

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