



Impact Evaluation of the Norway India Partnership Initiative Phase-II for Maternal and Child Health

Baseline Report 7/2014



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**Impact Evaluation of the Norway India
Partnership Initiative Phase-II
for Maternal and Child Health**

Baseline Report

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Oxford Policy Management Limited

Preface

This report presents baseline data for an impact evaluation of the Norway-India Partnership Initiative, also known as NIPI. NIPI is one of five bilateral partnerships initiated by Norway to help reduce child and maternal mortality and thereby contribute to the achievement of Millennium Development Goals 4 and 5.

Earlier studies have shown deficiencies with regard to how these partnerships were designed to demonstrate whether they are achieving their objectives. Furthermore, a process evaluation of the first phase of NIPI (2006–2012) shows that these problems continued to exist as the partnership entered its second phase (2013– 2018).

The ongoing impact evaluation is therefore an attempt to document whether health service activities supported through NIPI are contributing to improved health for mothers and children in the targeted districts of Bihar, Odisha, Madhya Pradesh and Rajasthan. More specifically, the evaluation will collect and compare before and after data from households in districts *with* and districts *without* access to NIPI's second phase activities. By comparing the changes in outcomes between these groups, the aim is to inform stakeholders about the impact of the health services provided during the second phase of the initiative.

Conducting an impact evaluation is a complex exercise. The challenges faced during the work on this baseline include late start-up of activities and uncertainty about future coverage and evolving activities –familiar issues in development cooperation, but matters that make impact evaluations challenging. A consequence of evolving activities is for example that this baseline cannot inform stakeholders about the impact of activities that have been added or changed since the data was collected. We hope, however, that the collected data will be sufficient to inform stakeholders whether or not NIPI activities are achieving their objectives.

The impact evaluation will be completed once the second round of data is collected and analysed. This is planned for 2016. In the meantime, we believe the baseline data is in itself an interesting read. This report provides useful information both with regard to the status of the health service delivery through NIPI as well as how mothers view their own and their children's health situation.

Oxford Policy Management Limited is carrying out the impact evaluation in collaboration with Sambodhi Research and Communications. The consultants are responsible for the content of the report, including the findings, conclusions and recommendations.

Oslo, November 2014



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Oxford Policy Management Limited along with Sambodhi Research and Communications is responsible for the compilation and completion of the report.

The team leader for the evaluation team is Dr Patrick Vaughan. The roles and responsibilities of the evaluation team members were as follows:

Team Members	Roles and Responsibilities
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Declaration: “This report is the product of its authors, and responsibility for the accuracy of data included in this report rests with the authors. The findings, interpretations, and conclusions presented in this report do not necessarily reflect the views of EVAL”.

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Acronyms and Abbreviations

ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ANMTC	Auxiliary Nurse Midwife Training Centre
ASHA	Accredited Social Health Activist
CAPI	Computer Assisted Personal Interviews
CBA	Cost-benefit Analysis
CEA	Cost Effectiveness Analysis
DFID	Department for International Development
DPT	Diphtheria, Pertussis (Whooping Cough), and Tetanus
EmOC	Emergency Obstetric Care
FP	Family Planning
GNM	General Nurse Midwife
GoI	Government of India
HBPNE	Home Based Post Natal Care
HBNC	Home Based New-born Care
IMNCI	Integrated Management of Neonatal & Childhood Illnesses
IMR	Infant Mortality Rate
IPGMER	Institute of Post Graduate Medical Education and Research
M&E	Monitoring and Evaluation
MDG	Millennium Development Goals
MFA	Ministry of Foreign Affairs
MH	Maternal Health
MMR	Maternal Mortality Ratio
MMT	Mobile Money Transfer
MCH	Maternal and Child Health
MP	Madhya Pradesh
NIPI	Norway-India Partnership Initiative
NMR	Neonatal Mortality Rate
NNC	National Nodal Centre
NOK	Norwegian Krone
Norad	Norwegian Agency for Development Cooperation
NRHM	National Rural Health Mission
OPM	Oxford Policy Management
PAPI	Pen and Paper Interviewing
PIP	Program Implementation Plan
PNC	Post-Natal Care
PPFP	Post-Partum Family Planning
PPIUCD	Post-Partum Intra Uterine Contraceptive Device
PSE	Pre-Service Education
QA	Quality Assurance
RCH	Reproductive and Child Health
SBA	Skilled Birth Attendant
SNC	State Nodal Centre
SNCU	Sick New-born Care Unit
TFR	Total Fertility Rate
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNOPS	United Nations Office for Project Services
WHO	World Health Organisation

Executive Summary

About the Norway-India Partnership Initiative

The Norway-India Partnership Initiative (NIPI) is a bilateral partnership between the Government of Norway and Government of India, with the intention to contribute to the achievement of the 4th and 5th Millennium Development Goals to reduce child mortality and improve maternal health, respectively.

The NIPI programme seeks to provide catalytic support to the Government of India's flagship National Rural Health Mission (NRHM) by piloting potential innovations in thirteen districts across four States (Madhya Pradesh, Bihar, Rajasthan and Odisha). The first phase of NIPI was completed in 2012 and several supported activities have been adopted and scaled up by the Government of India. The second phase (2013-2017) is additive and has three primary goals:

1. improving, scaling up and introducing new quality continuum of care interventions at community and facility level in the thirteen NIPI districts of the four focus states¹;
2. establishing a mechanism for sustainable institutional collaboration between Norwegian and Indian public and private institutions in areas related to women's and children's health; and
3. facilitating dialogue on global health between Norway and India

The implementing partners are the United Nations Development Programme (UNDP), whose umbrella of work is titled the "NIPI New Born Project", and Jhpiego.

About the Evaluation

The evaluation has been commissioned by Norad to evaluate the impact of the new interventions being implemented in NIPI Phase-II in the thirteen districts. The evaluation has three core components:

1. Helping NIPI and the Government of India to understand whether the new interventions "work" (an **evaluation of impact**)
2. Providing evidence to the Government on whether the interventions work well enough to be worth taking to scale i.e. comparing the extent to which they work to the scale-up costs (an evaluation of **cost effectiveness**)
3. Helping NIPI analyse the effectiveness of program operations, implementation and service delivery for interventions targeted at health systems strengthening (**qualitative evaluation**)

The evaluation will also help the Government of India answer a more fundamental question around the possibility of using existing frontline public health structures to deliver a more holistic service offering and better outcomes, using various supply side levers.

About the NIPI interventions

NIPI has a strong focus on using the service delivery structures set up under NRHM to deliver greater impact. One of the key aims was to reduce neonatal mortality (deaths in the first one month after birth), as this constituted 68 per cent of infant mortality (deaths in the first one year after birth) and reaching the Government of India's infant mortality targets were not possible

¹ The change in objectives of the first goal of improving and scaling up quality continuum care interventions has been limited to now exclude implementing interventions in non-NIPI districts. The Joint Steering Committee of NIPI Phase-II programme has agreed on this change.

without major reductions in the neonatal mortality rate. To this end, NIPI Phase-I with the help of National Health System Resource Centre (NHSRC) introduced various interventions in the 13 focus districts, including:

- Sick New Born Care Units (SNCUs) to provide facility based care for new-borns with infections and other problems
- A programme of Home Based New-born Care (HBNC), targeting the first six weeks after birth, including home visits by frontline community health workers i.e. Accredited Social Health Activists (ASHAs) for the promotion of essential home based neonatal care and diagnosis.

Many of the activities of NIPI Phase-II under the NIPI New Born Project are to improve and expand these interventions from Phase-I, including:

- Whole Facility Based New-born Care (FBNC) i.e. strengthening the systems behind SNCUs at all levels, including upgrading and strengthening some of the SNCUs at the district level to SNCU Training and Treatment Centres (TTCs).
- Introducing follow up home visits for children discharged from SNCUs, as this is believed to be a time of particularly high vulnerability (known as SNCU+)
- Expanding the home visits undertaken for Home Based New-born Care to cover the first year of a child's growth and development, not just the first six weeks (known as HBNC+)

These interventions are largely based on new-born care initiatives proven to have high levels of efficacy when implemented on a small scale by dedicated actors in high infant mortality settings. The assumption of the NIPI programme is that the effectiveness of these interventions when rolled out through Government systems on a very large scale, in a setting of lower mortality, will also be high.

The interventions being implemented by Jhpiego are also trying to improve the impact of existing public health structures and systems, through strengthening pre-service education for nursing and midwifery cadres, and promoting post-partum family planning (PPFP) both in the community (through ASHAs) and in facilities after birth, with a particular focus on post-partum Inter-Uterine Copper Devices (PPIUCDs).

Evaluation Methodology

The evaluation uses a **mixed-methods approach** (involving both quantitative and qualitative methods) to assess attributable levels of impact only for the three population level interventions – SNCU+, HBNC+ and PPFP. The nature of the other two interventions, SNCU systems strengthening and Pre-service education to the midwifery cadre, means that they will be assessed through qualitative methods only.

For the three population level interventions, the evaluation will attempt to assess how far each intervention reaches along the results chain model i.e. for inputs, processes, outputs, outcomes and impact indicators.

It is not always possible to causally link some impact indicators (such as fertility and mortality) to the project interventions as the possible changes could be small and because there are too many confounding factors in the transmission channels between the intervention inputs, outputs and their impact on health status. Furthermore, for some interventions, significant changes in impact indicators (concerning health status of the population) are not expected to be seen over the project lifetime. This is because of the relatively short time frame in between the baseline and end line. Finally, for some interventions, it is not practical to attempt to attribute changes in health impact indicators to the project outputs because of the requirement of large sample sizes to measure small changes with the requisite statistical significance.

For those interventions where a quantitative evaluation is suitable, the evaluation will use a **quasi-experimental design** involving **difference-in-differences analysis** to measure the changes in indicators in treatment and control districts between the baseline and end line. The evaluation design uses **repeated cross sectional data** for evaluation of effectiveness and the treatment and control groups have been matched at district and sub-district in order to minimise the bias arising from confounding factors. Primary Sampling Units (PSUs) have been selected for each sub-district according to Probability Proportional to Size (PPS) in order to improve the accuracy of the sample given that the sampling units vary considerably in size.

The evaluation design aims to use **Intention-to-Treat (ITT)** analysis to measure the impact that is based on the results of the assignment of the initial treatment and not on who actually ends up receiving the treatment.

If however, the implementation of NIPI Phase-I or Phase-II interventions do not happen as per expectations in a way that undermines the robustness of counterfactuals and the impact estimates, the evaluation design has been designed to mitigate these risks and still produce robust impact estimates. The evaluation design allows for measuring the Average Treatment Effect on the Treated (ATT). Other potential mitigation strategies, including reduced samples or ex-post propensity score matching based specifications, are also possible.

A **mid line assessment of the programme implementation** will be conducted to outline and detail out the final evaluation design based on a review of the implementation process to date.

Baseline Process

The **population survey** was conducted in December 2013 and January 2014. The sampling frame was mothers of children aged below 2 years. The sample size was 4,500 (which increased to 4620 during the fieldwork due to lower than expected non-response rates). A listing of all mothers in the target group was conducted and then a random sample of these mothers was selected. The sample size was set to ensure a Minimum Detectable Effect (MDE) of 5 percentage points or better for all headline indicators at the programme level based on values of indicators and their design effects taken from the National Family Health Survey-III (NFHS-III). This gives a Minimum Detectable Effect (MDE) of 10 per cent or better at the State level.

Most of the interventions aim at strengthening capacity, skills and knowledge of frontline health workers (at the community level) including ASHAs and in some cases Auxiliary Nurse Midwives (ANMs). Due to the importance of frontline workers in delivering some of the key interventions under NIPI a **health workers survey** was therefore applied to ASHAs in each of the 300 Primary Sampling Unit (PSUs).

In the case of SNCU+, a cross-sectional cohort study of new-borns admitted at SNCUs in the past 6 months preceding the survey, called the **SNCU+ Follow up Survey**, was undertaken to inform indicators related to the number and quality of follow-up visits by ASHAs as per the protocols. This was done separately because the case incidence was such that a population survey would not have been able to generate enough observations of children who had attended SNCUs. To measure changes in key indicators, it was calculated that at least 30 new-borns admitted at SNCUs needed to be sampled per district. The total sample size of the SNCU+ follow up survey is 449.

Qualitative work included 26 Focus Group Discussions with Mothers and 26 In Depth Interviews with ASHAs (which included one Direct Observation for each ASHA).

Key Baseline Findings

This section presents the baseline findings on each of the three interventions of HBNC+, SNCU+ and PFP services along with few insights on the interventions of HBNC and SNCU from NIPI Phase I that act as confounding factors for HBNC+ and SNCU+ respectively.

Insights on HBNC, SNCU and Status of ASHAs

The NIPI programme assumes that interventions of proven efficacy when tested on a small scale will also be effective when delivered through Government systems of frontline health workers and health facilities at a large scale.

The baseline survey's findings on the first phase interventions, in particular HBNC, suggests that ensuring uniform and high level of coverage of the intervention, delivered at high quality, is very challenging to achieve at a large scale through "business as usual" systems in a short time frame.

- **HBNC:** NIPI has delivered its programme inputs with 84 per cent of ASHAs receiving training on HBNC at programme level. However, approximately 22 per cent of the ASHAs were aware that at least seven visits had to be made to a household in the case of home delivery while none of the ASHAs reported being aware of six visits in the case of institutional delivery – an indication that a low proportion of ASHAs understood the delivery of the programme. Less than 10 per cent of the households reported getting visits from ASHAs as per the visits schedule in the HBNC guidelines.
- **SNCUs:** Although many sick new-borns are being treated at the SNCUs in the first few days of life (average age of admission to SNCUs being 1.1 days), sick new-borns born at home are not being mobilised to come to SNCUs for intensive care and treatment (96.2 per cent of the sampled new-borns were born in a health facility). Until now, SNCUs have been established in 11 out of 13 NIPI districts.

Home Based New-born Care Plus (HBNC+)

Home Based New-born Care Plus (HBNC+), is an intervention extending the coverage of HBNC (covering new-borns until 6 weeks of age) so that ASHAs conduct home visits to households with infants from three months of age until their first year. The key findings of the baseline survey for HBNC+ are:

- **Programme Coverage:** The baseline findings confirm the purity of the baseline in terms of there being no ASHAs who have received training on HBNC+; however, 29.3 per cent of the ASHAs are already making some home visits to households with infants of age more than 6 weeks of age in treatment districts.
- **Appropriate Infant Feeding Practices:** Awareness levels amongst ASHAs and mothers on the importance of exclusive breastfeeding were very high at 94 per cent and 80 per cent respectively at programme level. Eighty one per cent of the ASHAs at the programme level in their home visits gave advice on exclusive breastfeeding. Exclusive breastfeeding rates amongst the sampled children was at 74 per cent at programme level. Awareness levels amongst ASHAs of complementary feeding timing was low at 60 per cent and a low 48.5 per cent of mothers reported starting complementing feeding by the age of six months.

-
- **Iron and Folic Acid (IFA) Supplementation:** Less than 50 per cent of the ASHAs reported having stocks of IFA supplementation. The baseline survey did not measure the proportion of new-borns taking IFA supplementation, as this became part of the programme design after the baseline design was finalised.
 - **Regular Growth Monitoring:** Awareness amongst ASHAs and mothers about the importance of growth monitoring is very high at 97.5 per cent and 90.4 per cent, respectively, at programme level. However, only 38 per cent of the mothers at the programme level reported getting their child's weight monitored once every three months or more.
 - **Appropriate Hand Washing Practices:** Both awareness and practice rates of hand washing at the four critical times i.e. after defecation by the mother of child, after cleaning the baby after defecation, before eating and before feeding the child by mothers are high at 97 and 98 per cent, respectively. However, only 58 per cent of women reported using soap.
 - **Appropriate Treatment of Diarrhoea:** One-third of the ASHAs reported not having stocks of ORS. The rates of advice given by ASHAs to mothers for treatment of diarrhoea is low at 55 per cent. The practice of using ORS for its treatment by mothers is low at 47 per cent.
 - **Immunisation Practices:** The knowledge levels of ASHAs and mothers on the benefits of immunisation is very high at 86 per cent and 93 per cent respectively. However, less than one-fourth of mothers were aware of all of the vaccinations that an infant must receive i.e. (BCG, Polio, DPT, Measles, and Hepatitis). The immunisation rates for several vaccines were high except for Hepatitis B and Measles with rates of approximately 60 per cent rate.
 - **Regular Play and Communication for Early Childhood Development:** The awareness levels and practices of both ASHAs and mothers on regular communication with the child is very high at 85 per cent and 92 percent. However, only 59 per cent for mothers reported regular playing with the child.

Sick New-born Care Units Plus (SNCU+)

SNCU+ involves ASHAs and ANMs conducting follow up home visits to households with sick new-borns after they have been discharged from SNCUs to ensure compliance of discharge instructions and promote exclusive breastfeeding, kangaroo mother care and regular play and communication with child. The baseline suggests that:

- **Programme Coverage:** Forty four per cent of the ASHAs are aware of the presence of SNCUs. Fifty per cent of the ASHAs are aware of their responsibility for follow up visits and 49 per cent of the ASHAs conducted such home visits to households with sick new-borns.
- **Mortality among New-borns Discharged from SNCUs:** The death rate among sick new-borns at SNCUs itself and after discharge from SNCUs are 7 per cent and 6 per cent, respectively.
- **Compliance with Discharge Instructions:** Seventy four per cent of the primary care takers of the new-borns admitted to SNCUs received discharge instructions or counselling regarding new-born care after being discharged from SNCUs. The awareness levels and

practice of giving advice by ASHAs for the same was relatively low at 7 per cent and 25 per cent, respectively, at programme level.

- **Referral Rates:** Only 17 per cent of the ASHAs at the programme level gave advice on referrals to a sick new-born to be taken to a higher health facility for further treatment during their last visit to the household.
- **Exclusive Breastfeeding Practices:** Only 17 per cent of the ASHAs at the programme level gave advice on exclusive breastfeeding to mothers during their last home visit but mother's awareness levels and practices remain high.
- **Kangaroo Mother Care:** The knowledge and practice of mothers on kangaroo mother care is very high at 98.2 per cent but only a marginal 0.8 per cent of mothers practice kangaroo mother care for more than 60 minutes. The counselling practices of ASHAs are also low - 18.6 per cent of ASHAs gave advice on Kangaroo mother care in their last visit.
- **Regular Communication and Play with New-borns:** The awareness levels and practices of mothers on regular communication with the child is very high at 97 per cent except for playing with the child which is 77 per cent.

Post-Partum Family Planning (PPFP)

PPFP is the promotion of family planning in the months following childbirth, when there is believed to be a particularly high knowledge gap amongst mothers about the time it takes to return to fertility and a lack of focus on this period by health workers. The project trains ASHAs to deliver key messages around PPFP at the community level. There is a particular focus on providing Inter Uterine Copper Devices (IUCDs) services and PPFP counselling of mothers delivering at the health facility by facility staff. The baseline survey shows that:

- **Knowledge and Counselling Practices of ASHAs with regard to Family Planning:** ASHAs' awareness about appropriate birth spacing practices and different family planning methods are low at 31 per cent. Less than 50 per cent of mothers reported receiving any counselling on family planning.
- **Birth Spacing:** The awareness levels of mothers on birth spacing is high at 77 per cent but only 53 per cent of the mothers ensured a birth interval of at least two years between two consecutive births.
- **Family Planning – Methods and Unmet Need:** Approximately 99 per cent of the mothers were aware of any family planning method but the ever use rate of family planning method has been reported to be very low at 30 per cent. The unmet need for family planning is also low at 14 per cent. This suggests either that latent demand for family planning has not yet been realised or that people do not demand family planning services.
- **PPIUCD Services:** A marginal 0.2 per cent of the mothers got an IUCD inserted within 48 hours of last childbirth and only 64 per cent of the mothers received family planning counselling right after the childbirth in a health facility.

Key Conclusions for the Evaluation Design

The main conclusions for the evaluation design from the baseline findings are:

1. Matching of treatment and control areas is consistent and robust

Matching of treatment and control districts, sub-districts, and PSUs was undertaken before the baseline exercise to create counterfactuals that further form the basis for any robust estimation for difference-in-differences calculation. The summary matrices with the key indicators for the interventions clearly show that there is no statistically significant difference between treatment and control areas for the key indicators under evaluation. Furthermore, there is no statistically significant difference in the level of implementation of HBNC, a key confounding factor. Therefore, the matching exercise can be regarded to have been highly successful.

2. HBNC is potentially a strong confounding factor

HBNC is a major possible confounding factor on both HBNC+ (due to the overlap of key components targeted or promoted) and SNCU+ (due to the overlap in the new-born age group covered through follow up visits). The baseline data shows that coverage is low in both treatment and control groups and that there is no statistically significant difference in the levels of implementation of HBNC between these two areas. If the coverage of HBNC increases faster in the treatment area than in the control area, but HBNC+ is implemented at the same level in both treatment and control areas (or e.g. not at all), then it will be hard to attribute any measured difference in outcomes level to either HBNC or HBNC+. Various techniques have been outlined that could help mitigate this problem, as well as those of other confounding factors. The final evaluation design will be finalised based on the implementation status assessment to be conducted in the mid line.

3. Low coverage levels of Phase-I interventions raises concern for achievement of sufficient coverage for Phase-II interventions

The low levels of HBNC implementation across treatment and control districts and non-implementation of SNCU in two treatment districts at the end of NIPI Phase-I reinforce the complexities of undertaking an effectiveness evaluation for a large-scale intervention through Government systems before high levels of coverage have been established. Because the Phase-II interventions are using similar implementation modalities (e.g. promoting home visits through ASHAs) as Phase-I, there are legitimate concerns as to whether similar findings are likely to be repeated.

4. Focusing qualitative work on the health workers

As the baseline data highlights the difficulty of translating project inputs such as trainings and incentives into project outputs such as home visits, the end line qualitative work should focus more on understanding issues around the broader motivation and incentive framework facing frontline health workers, to enable better interpretation of results.

1 Introduction

1.1 Structure of the Report

This baseline report is outlined as follows: Sections 1.2 to 1.4 give an introduction to the evaluation, its aims and key users of the study and an introduction to NIPI Programme (both Phase-I and Phase-II) while Section 1.5 lays down the theory of change for the NIPI Phase-II programme as a whole. Chapter 2 presents an overview of the evaluation methodology and analytical framework for the assignment. This includes outlines of the evaluation methodology, assumptions, risks, and mitigation strategy along with the details on survey design, sampling, and qualitative and quantitative tools.

Chapter 3 presents the rationale and baseline findings for HBNC+ along with some insights on HBNC from the baseline data. Similarly, Chapter 4 presents the rationale and baseline findings for SNCU+ with insights on SNCU from the baseline data. Chapter 5 outlines the rationale and key baseline findings for the third intervention of PFP services. Chapter 6 then draws some conclusions on the evaluation design based on baseline findings.

The annexures of this baseline report include (in this order):

- glossary and definitions;
- detailed description of NIPI Phase-I and Phase-II and description of NIPI Phase-II interventions not included in the impact evaluation design;
- key impact indicators;
- baseline data collection details;
- NIPI State and District characteristics and sampled PSU, household, women and child profile from baseline data;
- baseline findings for HBNC+, SNCU+, PFP services and ASHAs;
- baseline data limitations and ethics protocol and data quality;
- Terms of Reference;
- state level baseline estimates of indicators; and
- final quantitative and qualitative tools used for baseline data collection

1.2 Aims of the Proposed Evaluation

This evaluation will focus on three core programmatic areas:

- 1) Helping NIPI and the Government of India to understand whether the new interventions implemented in NIPI Phase-II “work” (an **evaluation of impact**)
- 2) Providing evidence to the Government on whether the interventions work well enough to be worth taking to scale i.e. comparing the extent to which they work to the scale-up costs (an evaluation of **cost effectiveness**)
- 3) Helping NIPI analyse the effectiveness of program operations, implementation and service delivery for interventions targeted at health systems strengthening (**qualitative evaluation**)

The evaluation will also help the Government of India answer a more fundamental question around the possibility of using existing frontline public health structures to deliver a more holistic service offering and better outcomes, using various supply side levers.

Conducting a rigorous quantitative evaluation of effectiveness and cost-effectiveness for all the NIPI Phase-II interventions depend on the implementation plan and strategy of each and is not possible for every single intervention as outlined in the Terms of Reference and the Inception Report. The evaluation approach is been further outlined in Chapter 2.

The theory of change, together with associated indicators across the results cycle, has been developed as indicated in the conceptual framework outlined below. The evaluation framework is closely integrated with the routine monitoring systems of the implementing partners.

1.3 Key Users of the Evaluation Study

There are several key users of this evaluation study:

- The Government of India, at State and National level, who will use this evaluation both to decide on the scale-up potential of the NIPI evaluations, but also to inform this broader question of whether the kinds of levers used in the NIPI programme can improve frontline service delivery under the National Rural Health Mission
- The Government of Norway's Ministry of Foreign Affairs, who will use the evaluation both as an accountability function for the NIPI programme, but also to inform future programming in India and elsewhere
- The programme implementers of NIPI, who will use the information for mid-course corrections and inform future programming
- Other Donors in India (and elsewhere) who can learn about the relative effectiveness of this kind of model of technical assistance, particularly over how to provide technical assistance in a context whereby the host Government does not need financial assistance and there are no accompanying financial transfers

1.4 Introduction to NIPI Programme

The Norway-India Partnership Initiative (NIPI) is one out of five bilateral partnerships the Norwegian Government has entered into with the Government of India with the intention to contribute to the achievement of the 4th and 5th Millennium Development Goals to reduce child mortality and improve maternal health, respectively.

Underpinning NIPI activities is its catalytic support to create an independently managed enabling network to Government of India's own initiative – the National Rural Health Mission (NRHM). Activities undertaken during Phase-I of NIPI were implemented in thirteen districts (hereafter referred to as “NIPI districts”) across four focus states - Madhya Pradesh, Odisha, Rajasthan and Bihar. Phase-I came to close at the end of the year 2013.

Phase-II of NIPI programme, which started in 2013, has three primary goals:

1. Improving, scaling up and introducing new quality continuum of care interventions at community and facility level in NIPI districts;
2. Establishing a mechanism for sustainable institutional collaboration between Norwegian and Indian public and private institutions in areas related to women's and children's health; and
3. Facilitating dialogue on global health between Norway and India.

The main implementing partners in Phase-II will be United Nations Development Programme (UNDP) (since the official integration of United Nations Office for Project Services (UNOPS) within UNDP from 01.04.2013) and Jhpiego (an international, non-profit health organization affiliated with the Johns Hopkins University). The array of activities undertaken by UNDP comes under the umbrella project titled “NIPI New Born Project”. Both these partners will contribute towards achieving Goal # 1. While NIPI New Born Project mainly focuses on MDG-4 of reducing child mortality, Jhpiego focusses on MDG-5 of improving maternal health.

Other partners for achieving other primary goals will be identified through competitive bidding processes, as per identified need as the initiative evolves. From Phase-I, UNICEF and United Nations Office for Project Services (UNOPS) (now UNDP) will complete their activities by the end of the year 2013. NIPI Phase-II will continue in the thirteen “NIPI districts” (continuing from Phase-1) in the four focus states of Bihar, Madhya Pradesh (MP), Orissa, and Rajasthan (see Table 1.1).

States	Bihar	Odisha	Madhya Pradesh	Rajasthan
Districts	Jehanabad	Angul	Hoshangabad	Alwar
	Nalanda	Jharsugada	Betul	Bharatpur
	Sheikhpura	Sambalpur	Narsingpur	Dausa
			Raisen	

The interventions carried out by the implementing partners in Phase-II are summarised in Table 1.2.

Implementing Partner	Intervention	Geographic Focus
NIPI New Born Project (UNDP)	Home Based New-born Care (HBNC) and Home Based New-born Care (HBNC) plus (extension of home visits till the child is 1 year old)	NIPI districts of focus states
	Special New-born Care Unit (SNCU) and Special New-born Care Unit (SNCU) plus (care and follow-ups of new-borns after discharge from SNCUs)	NIPI districts of focus states
	SNCU systems related: Upgrade select SNCUs at district level to SNCU Training & Treatment Centres (TTC)	Pan-state coverage for focus states
Jhpiego	Strengthening of pre-service education (PSE) for nursing and midwifery cadre	Pan-state coverage for focus states
	Revitalize and scale up Post-partum Family Planning (PPFP)/ Post-partum Intra Uterine Contraceptive Device (PPIUCD) services	Select CHCs or Block PHCs in NIPI districts of focus states

1.5 Theory of Change for NIPI Phase-II Programme

This section outlines a broad theory of change for the NIPI Phase-II programme as a whole, with a particular focus on the headline interventions of HBNC+, SNCU+ and revitalisation of post-partum family planning services, the interventions being considered for the impact evaluation exercise.

National Rural Health Mission (NRHM) and Frontline Health Workers and Targeted Health Facilities

Since its inception in 2005, NRHM has focused on delivering accessible, affordable, and quality health care to the rural population especially the vulnerable sections of the society. NRHM, now under the umbrella of National Health Mission (NHM), is committed to making the public health delivery system fully functional, accessible, and accountable to the community by (NHM, 2011):

- ensuring management of human resources;
- rigorous and routine monitoring and evaluation of systems against standards;
- involvement of the larger community;
- decentralisation;
- building in innovations and flexibilities for health financing;
- implementing interventions targeted at improving health outcome and impact indicators, and
- convergence of health and related programmes at all levels of delivery system including the community

Under NRHM, a trained female community health activist (ASHA) has been recruited at the village level (1 each for a population of 1000) for mobilising the community to access health services and providing basic awareness generation. Above the ASHA is an Auxiliary Nurse Midwife (ANM), at the sub-centre level, who provides basic promotive and protective health services and covers multiple villages. The ANM does not actually provide midwifery services, focusing more on community-based services such as routine immunisation, visiting villages on monthly Village Health Sanitation and Nutrition Days (VHSNDs). The health facilities at the block, district, or higher level are in progressive nature of provision of complexities and range of health services including curative care and childbirth support.

However, there are some **operational challenges that limit the achievements of NRHM** (NRHM SIPs, 2013):

- lack of recruitment of technical and clinical labour force at all levels,
- weak supervision and monitoring,
- poor quality training, and
- a lack of clinical infrastructure and resource centres

Transmission Channels under NIPI Phase-II Programme

NIPI as a bilateral partnership programme aims at strengthening the health systems established under NRHM through various channels:

- Increasing the impact of ASHAs through:
 - supporting them to strengthen their awareness generation roles, especially on the topics of neonatal health and post-partum family planning
 - evolve their roles to cover basic diagnosis and referrals for new-borns, delivered

through increased home visits, with a particular focus on sick new-borns discharged from Sick New Born Care Units (SNCUs) to prevent relapse and ensure compliance with discharge instructions

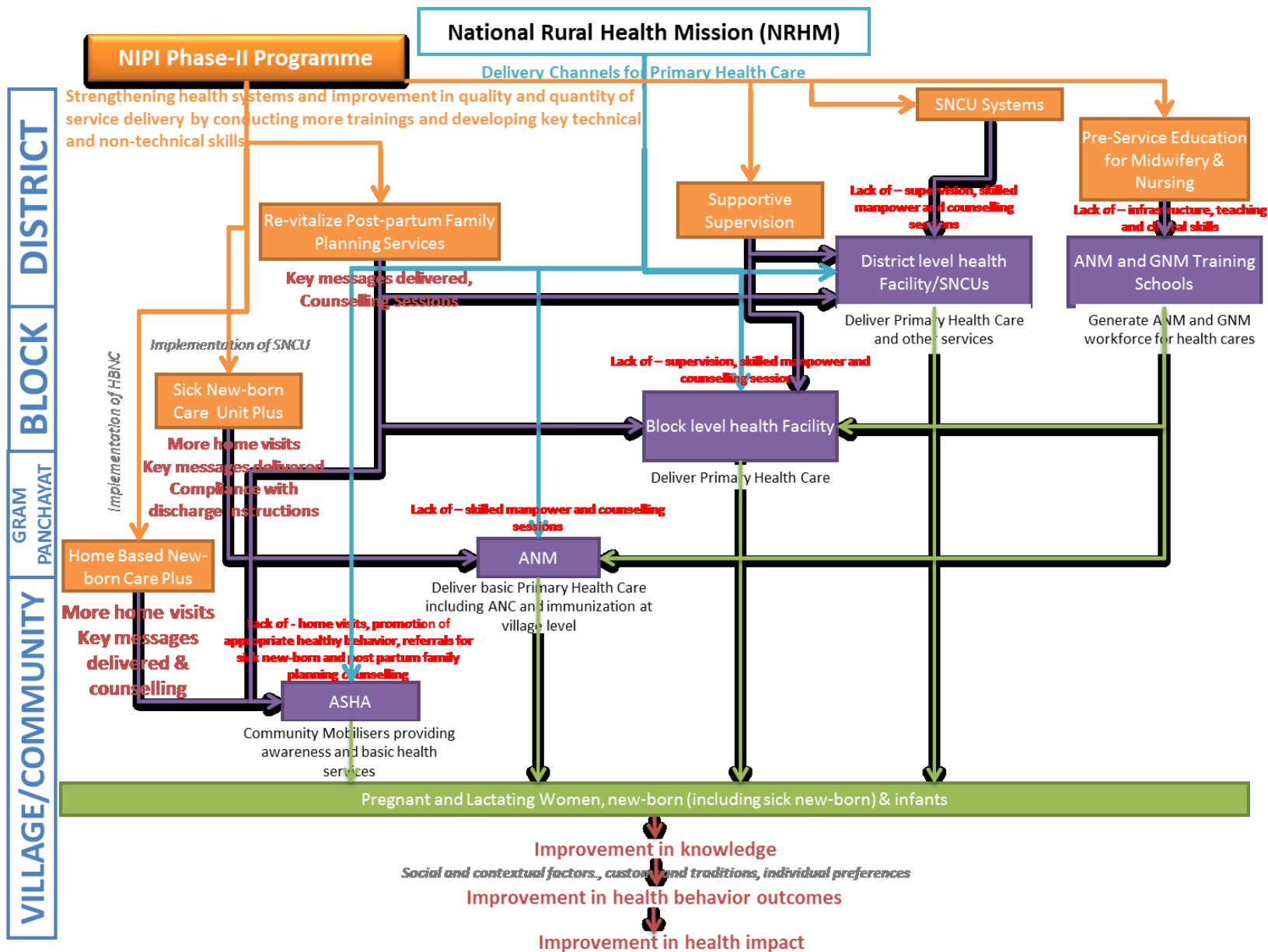
- Supporting ANMs through
 - strengthening supervisory and support structures for interventions related to Reproductive Maternal New-born Child Health and Adolescent Health (RMNCH+A) interventions
- Supporting block and above level health facilities through:
 - Providing clinical skills and counselling training to health facility doctors and nurses at block or higher level health facility for increasing uptake of PFP and PPIUCD services by providing counselling to women who deliver in these health facilities
 - Strengthening one SNCU in each state to SNCU Training and Treatment Centre (TTC) which will provide training and supportive supervision to Facility New-born Care Units (FNCUs) established under NRHM at various levels
 - Strengthening the quality of nursing and midwifery pre-service education in the existing institutions of training schools and hence, aiming at improving the quality of clinical skills provided by the cadre.

Assumptions Underlying the Transmission Channels of NIPI Phase-II Programme

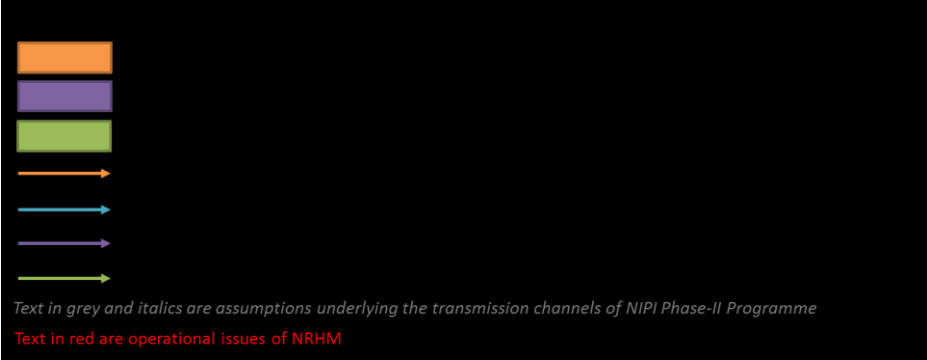
Several underlying assumptions that guide the transmission channels of NIPI Phase-II programme to have the desired improvement in health outcome and impact indicators are:

- Frontline health workers i.e. ASHAs (given low literacy levels amongst health workers) are capable of providing advice and counselling to mothers for new-born and infant care with training (assuming complete and high quality coverage of trainings)
- The ASHAs and ANMs either have appropriate incentive and motivation structure or this structure can be realistically achieved through the project interventions to take further workload on making the scheduled visits for older age group of infants and follow up with sick new-borns after discharge
- Delivery of key health behaviour messages by ASHAs, ANMs and other facility staff will translate to improvement in knowledge of mothers and women
- Community members act upon the messages and instructions of public health staff overcoming contextual and social constraints, customs and traditions and other individual and social determinants of attitudes
- The supply side is able to deliver services at an appropriate quality in an affordable manner that will enable demand to be realised
- The activities selected under the NIPI programme, when delivered, are relevant and significant to improving desired improvements in health outcomes

These assumptions will be tested as part of the evaluation. The overall design of NIPI Phase II is shown in the following diagram:



The legend below describes the various linkages for the programme as a whole and its interplay with the NRHM components of frontline health workers, staff and facilities in the diagram above.



2 Methodology and Analytical Framework

This section outlines the conceptual framework underpinning the evaluation strategy and approach, including the detailed quantitative, qualitative, and cost effectiveness methodology, as well as use of data from secondary sources and the project monitoring system.

2.1 Conceptual Framework

The conceptual framework used for this evaluation has been adapted from the joint recommendations on an operational framework for monitoring and evaluating health systems strengthening (WHO et al, 2010 and The Global Fund, 2009). This framework focuses on monitoring and evaluation of health system reforms. The five major domains for indicators considered in this framework are: 1) system inputs, 2) processes, 3) outputs, 4) outcomes, and 5) health impact. The framework presented in Annex E.1 outlines the importance of using different data sources, evaluation methods and the dissemination of the recommendations.

While the framework in Annex E.1 refers to the health system as a whole, it will form the basis of evaluation approach of NIPI's support in Phase-II. Using this framework requires that the system inputs need to be reflected in outputs and eventually outcomes and impact including use of services and better health status. For the NIPI Phase-II interventions, this framework has been modified to further include the following categories within the five major domains of system inputs, processes, outputs, outcomes, and health impact:

- Collection of **cost** data preceded by **system input indicators** (for cost-effectiveness analysis)
- **Process indicators**, refers to sub-activities and fidelity of the interventions (whether the intervention was implemented as expected)
- **Output indicators**, refers to the reach of the activities (e.g. number of health workers trained as against the target) and the quality of the activities implemented (e.g. knowledge levels of frontline workers who had received training compared to those who did not) as NIPI Phase-II interventions focus directly on training the health workers and strengthening the health system.
- **Outcome indicators:**
 - **Intervention-specific outcome indicators** – refers to how the outputs of each of the intervention translated into appropriate action given the health system infrastructure and processes, and which can be directly linked to the intervention (e.g. the proportion of children receiving the correct number of home visits under the HBNC plus guidelines). These indicators cover outcomes related to knowledge levels and healthy behaviour or practices of the population achieved through the programme outputs of trained health workers.
 - **Programme outcome indicators** – which cannot be linked to individual interventions but rather serve as a “proxy” for the effectiveness of NIPI as an overall package e.g. appropriate breastfeeding behaviours achieved by both HBNC+ and SNCU+ or uptake of post-partum family planning (PPFP) methods
- **Health Impact indicators:** These relate to health status of the population, such as mortality, morbidity, and fertility.

This approach integrates the monitoring system with the evaluation process and allows examination of the **theory of change** of each intervention. The examination of the theory of

change, based on an adapted ROACH (Results Oriented Approach to Capacity Change) model², identifies which inputs appears to be most important in producing any identified changes in the observed output and intervention-specific outcome indicators. We will attempt to go as far down the results chain as would be possible given the implementation coverage and quality of the interventions and the data available in the next three years.

For example:

- Process and output indicators will help NIPI understand whether trainings proceeded as planned and covered as many health workers as targeted across treatment districts.
- Output indicators will help understand whether the training was effective in improving the knowledge levels of those health workers who participated.
- Intervention-specific outcome indicators will help understand whether this change in knowledge had an impact on the behaviour and skills of the targeted population.

Examination of theory of change of each intervention and the programme as a whole will assist the decision makers in understanding the transmission channels especially the knowledge-behaviour link and the fidelity or the quality of implementation of the intervention (e.g. do trainings lead to increase in knowledge and skills?). Examination of these transmission channels will help overcome some of the attribution issues discussed later.

2.2 Clarifications to Terms used in the Baseline Report

NIPI Phase-II interventions aim to directly improve the outputs of knowledge, skills, and practices of counselling and advice of frontline health workers and indirectly improve the outcomes of knowledge, behaviour, and attitude of the population especially the mothers of infants. Hence, it is important to understand the distinction between the former direct programme outputs to understand the transmission channels or theory of change.

Knowledge of a health worker relates to her awareness about concepts such as pregnancy care, new-born care, as well as programme guidelines through trainings conducted under each intervention (for e.g. health worker's awareness about the number of visits and schedule of visits, etc.)

Skills of a health worker relates to her ability to transform knowledge into key messages or services, delivered to the targeted population under this programme (for e.g. communication skills) and also refers to semi-clinical skills on counselling and advice (for e.g. advice and counselling on breastfeeding practices).

Practice of a health worker relates to actual delivery of messages or services by the health worker (for e.g. referrals of infants to health facilities).

2.3 Evaluation Approach

2.3.1 Overview

In the impact evaluation of NIPI Phase-II programme, we will assess the effectiveness of the

² "A Results-Oriented Approach to Capacity Change", N. Boesen and O. Therkildsen, Ministry of Foreign Affairs, Danida, February 2005

specific interventions of HBNC+, SNCU+ and revitalisation of post-partum family planning services separately. For example,

- Effectiveness of HBNC+ in terms of infant rearing practices, growth and development including continued exclusive breastfeeding and hand washing practices,
- Effectiveness of SNCU+ in terms of improved care and practices towards sick new-borns. However, both HBNC+ and SNCU+ have an impact on infant and neo-natal mortality.
- Effectiveness of PFP/PPIUCD services on post-partum contraceptive usage among couples, especially IUCD insertions, and ultimately on maternal and reproductive health. Such variations in health outcomes achieved by different interventions does not allow for bundling of interventions for evaluation.

The evaluation will go as far down the results chain as is possible for each intervention, and will use a combination of quantitative and qualitative techniques in an attempt to assess the overall impact of NIPI Phase-II programme in the study period. The evaluation will also include the following four main steps:

1. *Identification of changes in outputs and outcomes and assessment of impact:* The evaluation will attempt to identify trends for any changes in the quantity (for e.g. number of frontline health workers trained), quality (for e.g. skills and knowledge of frontline health workers) and coverage (for e.g. number of children reached by these health workers through home visitation).
2. *Explaining the observed changes:* The evaluation will also attempt to uncover the factors and linkages between NIPI Phase-II's support and that made by other organisations, together with the importance of specific linkages between both phases of both programmes and NIPI Phase-II's contributions and modes of funding at national and sub-national levels
3. *Assessment of NIPI Phase-II's contribution and influence:* The evaluation will attempt to identify and assess the contribution and influence of NIPI Phase-II against achievements; though there exists many challenges to attribution (as discussed in Section 2.3.2) including for how national and district level health system capacity can be maintained and developed further.
4. *Assessment of prospects for sustainability:* The sustainability of NIPI Phase-II's support to any identified changes will be examined along with the financial implications for NIPI, including evidence for the probable requirements for future sustainability of district health systems.

2.3.2 Results Chain and Attribution - Challenges

3ie defines an impact evaluation as the attribution of changes in outcomes due to the interventions to impact (3ie, 2012). In this model, impact evaluation links directly changes in output, outcome or impact indicators (as outlined in the conceptual framework) to programme interventions. In a robust impact evaluation, the attribution and causal links need to be strong.

For the evaluation, an assessment was made on how far down the results chain can any changes be attributed to the interventions. There are several challenges for implementation that make the attribution difficult, as highlighted below.

- **Project time frame:** In NIPI Phase-II the present absolute levels of some of the impact level indicators are already low and consequently any potential changes would be small,

especially over the relatively short NIPI period (as per the Terms of reference a follow-up (end line) survey should be conducted in 2015). These indicators tend to only change over longer periods of time. To measure such changes requires large sample sizes to detect statistically significant changes in the indicators. For example, the latest measure of NMR in India is 35/1000 and it has fallen by only 2/1000 in four years (SRS 2011).

- **Operationalization of interventions:** The NIPI Phase-II interventions have been chosen for their efficacy in some cases (Bhutta et al, 2008 and Ekman et al 2008) and based on the programme experience and evidence presented by the implementing partners in Phase-I. However, these interventions need to achieve high levels of quality and coverage if the average treatment effect (averages across the whole population) is to suffice as a good measure of effectiveness³. Efficacy differs from effectiveness in terms of the impact of the intervention being evaluated in ideal or best circumstances or conditions. Hence, measurement of effectiveness requires that sufficient time be allowed before the evaluation can make precise estimates about any changes in indicators. The operationalization of the individual interventions will have different implications in terms of the time allowed before we conduct the evaluation and for how far we can go down the results chain towards achieving improved outcomes and impacts. If programme implementation has not sufficiently advanced before the follow-up survey, calculating average treatment effect on the treated (averages for just those who have received the treatment) will be a more robust measure of impact. The issue of average treatment effect has been discussed in detail in Section 2.4.3
- **Multiple service providers:** NIPI programmes essentially rely on working through the Government health system and by strengthening their technical and managerial capacity. The speed of implementation of interventions may differ between different districts and states, depending on the State or district administrations. This will be dealt with by measuring changes in intensity of treatment over time to increase the precision of the difference in difference approach.
- **Presence of other similar or related interventions:** Other Development Partners are also working in the same States on similar issues of neonatal care and maternal health. For instance, DFID's Bihar Technical Assistance Support Team are managing a 1.3 billion NOK programme in Bihar alone over five years (\$220.5 million). This means that the relative size of the NIPI Phase-II programme compared to Government resources and other Development Partners reinforces the limited extent to which NIPI will directly affect health outcome level indicators compared to other initiatives. As far as possible, these will be dealt with through the difference-in-differences approach (which removes the impact of time invariant confounding factors) as well as measuring as many other time variant confounding factors as possible at household and community level and controlling for these in the analysis. The approach and underlying assumptions for difference-in-differences analysis has been discussed in detail in Section 2.4. An account of different interventions being implemented in both the treatment and control areas will be detailed and factored in while conducting final data analysis to better qualify the results.

The evaluation of NIPI Phase-II programme would involve a **mixed-methods approach**, hence includes both quantitative and qualitative methodology along with **cost-effectiveness**

³ Efficacy of an intervention means that it has shown to be very effective when implemented under best conditions and evaluated with randomised controlled trials or its variant.

analysis detailed in the sections below.

2.4 Quantitative Methodology

2.4.1 Overview

The “gold standard” evaluation approach would have been Randomised Controlled Trials (RCTs), an experimental evaluation design which entails random assignment of either individuals or groups to either a treatment (receiving the intervention) or control group (not receiving the intervention) and measuring the change in outcomes between treatment and control groups over time. However, this approach is not feasible because the design and implementation of NIPI Phase-II interventions were adopted prior to this proposed evaluation and were universally rolled out across treatment districts. The interventions follow a deliberate targeting pattern in terms of both location and type of beneficiaries hence, undermining any possibility of introducing randomness in the assignment of intervention and control groups.

Hence, the second best option to evaluation approach given the absence of random assignment of interventions was a **quasi-experimental evaluation design** that gives robust estimates if rigorously constructed (ensuring internal and external validity of the design). This evaluation design will also compare treatment districts (i.e. NIPI districts) with control districts (i.e. non-NIPI districts within the same state) using **difference-in-differences method** to produce impact estimates of NIPI Phase-II programme. This quasi-experimental design will compare the average values of our outcomes of interest between the two periods included in the evaluation (baseline and end line) across the treatment and control groups. The recommendations outlined above are similar to the ones proposed earlier by the Evaluation Department of Norad (Norad, 2010).

The effectiveness of NIPI Phase-II programme will be measured using **repeated cross-sectional data**. Given the limitations related to tracking the treated population particularly potential pregnant mothers for the evaluation of effectiveness of revitalisation of PFP services, drop-out probabilities of baseline observations at the end line stage due to age-range criteria and high costs of panel data collection, repeated cross-sectional data has been chosen over panel data as the basis of measurement of effectiveness.

2.4.2 Measurement of Average Effect

More specifically, difference-in-differences analysis can be used to evaluate the impact of the intervention in terms of average treatment effect (ATE) or average treatment effect on the treated (ATT)⁴ subjects. These two measures diverge when coverage is not complete across the treatment area and/or the quality of the interventions is inadequate. For example, delayed or incomplete implementation, low take-up or coverage rates, and poor quality can all reduce the effectiveness.

In order to measure the average effect, it becomes very important to clearly choose and define

⁴ ATT is defined as the average gain from treatment for those who actually were treated while ATE is defined as the average gain from treatment for a population.

$$ATT = E[Y(1) - Y(0) | T=1]$$

$$ATE = E[Y(1) - Y(0)]$$

Here, T is a binary variable for treatment where T=1 denotes treatment. Y(0) denotes outcome without treatment and Y(1) denotes outcome with treatment. Y(1) - Y(0) denotes the gain from treatment and E[Y(1) - Y(0) | T=1] denotes the expected gain from treatment on the population that were actually treated.

who the treated actually are in the evaluation purposes. The “**treated**” for the purpose of evaluation would be the infants between 3 months until 1 year of age (for HBNC+), new-borns discharged from SNCUs (for SNCU+), and pregnant mothers (revitalisation of PFPF services). Even though the direct recipients of the intervention or the actual treated for NIPI Phase-II programme are the frontline health workers, medical staff and nurses; for the purpose of the evaluation of the effectiveness of the programme, the eventual beneficiaries i.e. infants, new-borns discharged from SNCUs and pregnant mothers will be regarded and analysed as the treated.

The difference-in-differences analysis planned for this evaluation uses **Intention-to-Treat (ITT)** analysis to measure the impact through the ATE measure. ITT analysis is based on the results of the assignment of the initial treatment and not on who actually ends up receiving the treatment. This measure deals with any potential complications in the rollout of the programme by focusing on the individuals that were supposed to benefit from the treatment, regardless of whether they were actually reached by the intervention itself. However, this approach will be severely undermined if the coverage and uptake of intervention is non-uniform and low as the programme impact in such a case would be conservative making interpretation of results difficult.

If however, the programme implementation is non-uniform, the difference-in-differences analysis could be used to measure **Average Treatment Effect on the Treated (ATT)**. The decision to measure ITT or ATT is therefore highly dependent on the underlying assumptions determining the validity of the evaluation, the challenges, or constraints undermining these assumptions and the baseline survey estimates.

2.4.3 The Quasi-Experimental Design: Assumptions, Limitations and Mitigation Strategies

The core assumption to undertake difference-in-differences analysis is the **Parallel Paths assumption**, namely that the average change in outcome for the treated in the absence of treatment (or intervention) will equal the average change in outcome for the non-treated.

One key ex-ante measure to ensure that the assumption of parallel paths holds true is to ensure that the control areas are adequately matched with the treatment areas so that they are not statistically different from each other, hence similar. The matching approach to create robust counterfactuals has been further detailed in Section 2.4.5. The baseline data findings as described in subsequent chapters suggests that the matching exercise was highly successful.

However, there are two potential scenarios concerning the programme implementation where this assumption of parallel paths can be undermined leading to loss of validity of evaluation design. These uncertainties around programme implementation along with the mitigation strategy are described below:

1. Non-uniform implementation of confounding factors across the treatment and control areas

Limitation: If there are confounding factors that also affect the evaluation indicators but are not implemented evenly across the treatment and control areas, this will bias the results of the evaluation.

Confounding factors could be external, such as interventions initiated by other Donor Partners or the Government (for example, the Government's recent New-born Action Plan), which could be piloted in only a few districts. They could also be internal, and relate to NIPI Phase-I. The later sections show that the average implementation levels of NIPI Phase-I interventions (in terms of project outputs) were similar across treatment and control areas. It may be the case that implementation of the NIPI Phase-I intervention ramps up in the treatment areas during the course of NIPI Phase-II, which would be a major confounding factor.

Mitigation Strategy: The first step to mitigating confounding factors requires their identification. The data from the quantitative tool of PSU questionnaire, and associated qualitative research and key informant interviews, will try to ascertain the presence of external confounding factors. The data collection will also measure changes in the implementation of NIPI Phase-I interventions.

If confounding factors are identified to be an issue, it will affect the interpretation of the results. It may also be possible to mitigate those using different analytical techniques.

- a) If the confounding factors happen in only a portion of the surveyed area, it is still possible to conduct difference-in-differences analysis by dropping the observations influenced by confounding factors and those of their matched area. This will increase the minimum detectable effect of the evaluation due to the smaller sample size.
- b) If there are confounding factors across a large scale (e.g. a considerable increase in the coverage of NIPI Phase-I interventions) then a "third best" evaluation strategy solution would be to use propensity score matching between treatment and control areas as an ex-post evaluation strategy only, without using the difference-in-differences method. However, this evaluation strategy is weak since the time invariant observables and unobservables are then not dealt with but is the best remaining evaluation strategy if the implementation evolves in this way.

2. Dynamic nature of the implementation of NIPI Phase-II interventions

Limitation: The evaluation design is based on the proposed implementation plan. However, it may be possible for the actual implementation to deviate from plan in the following ways:

- a) Implementation also occurs in the control districts
- b) Implementation does not happen at all in some of the treatment areas
- c) Implementation of inputs in the treatment areas is not converted into relevant programme outputs

Mitigation Strategies: In the first scenario, if the implementation of NIPI Phase-II interventions extent to the control areas, there will be a loss of counterfactuals making the difference-in-differences model no longer be valid. Depending on the exact implementation path, mitigation measures could include:

- Ensuring the end line survey is undertaken before implementation is scaled up to control areas
- If the implementation of the intervention is limited to few control areas, then those units can be dropped from the control groups along with the dropping of their corresponding matched treatment groups. This would increase the minimum detectable effect of the evaluation but provide estimates that are no longer robust.
- Sampling and surveying a new control area and using ex-post propensity score matching

rather than difference-in-differences method.

In the second scenario, if the implementation of NIPI Phase-II interventions are non-uniform with few treatment areas never receiving the treatment, then these areas can be dropped from the sample, along with the corresponding matched control areas. However, this will increase the minimum detectable effect of the evaluation and the estimates will no longer be robust.

The third scenario, whereby project inputs (e.g. training of frontline workers) are not systematically converted into project outputs (e.g. home visits), then the planned specification, of using Intention-To-Treat (ITT), will differ from the Average Treatment Effect on the Treated (ATT) because some of the sample in the treatment area will not have actually received treatment. The findings in this report on NIPI Phase-I interventions suggests that this could be probable.

However, if ASHAs are not able to translate training into home visits under HBNC+, then to an extent, ITT measure is the true measure of programme effectiveness, making it an important finding of the evaluation.

However, measuring ATT is also important for the evaluation because it measures the extent to which project outputs translate into desired outcomes when the outputs are delivered (i.e. it is a measure of efficacy). This can be done by restricting the sample to those Primary Sampling Units where project outputs are delivered, along with their matched control Primary Sampling Units. However, this while increasing the minimum detectable effect of the evaluation will reduce the robustness of the estimates, as the sample will no longer be representative.

2.4.4 Role of Mid-term Programme Implementation Assessment

A mid-term assessment of the programme implementation, using the MIS of the project-implementing partners, will happen before the end of the implementation phase. The assessment will include reviewing the implementation status of both the NIPI Phases in the treatment and control areas. This mid-line assessment will also help revisit the evaluation methodology including the status of counterfactuals, level of non-uniformity in programme implementation (if any) and decide on an appropriate time for a follow up survey to the baseline given the programme implementation status as well as allowing for resampling of treatment and control areas to mitigate changes in the implementation plan.

Since this evaluation is not an efficacy study but a study of effectiveness of interventions and hence, uniform, high coverage and high quality programme implementation are essential for any estimation of effectiveness of interventions. The details on the evaluation and sampling strategy will be discussed after the mid-line assessment. The decision about whether to apply additional analysis to mitigate some of the issues raised above (for example, performing an ex-post propensity score matching technique, or attempting to measure ATT) will be taken based on the end line survey results.

2.4.5 Construction of Control Groups or Counterfactuals

Carefully chosen control groups or counterfactuals are the key to determine and attribute effectiveness of the treatment. The evaluation team believes that control groups outside NIPI states would not be sufficiently robust due to the importance of state level confounding factors, including the decentralisation of implementation of health services, differences in

administrative structures and other contextual factors. Therefore, treatment districts have been individually matched with control districts within the same NIPI states.

2.4.5.1 Matching Treatment and Control Groups

To enable difference-in-difference calculations the treatment districts have to be matched with the control districts. The matched districts then need to be “paired” in order to minimise the impact of confounding factors on evaluation indicators. The matching exercise will be undertaken in steps that are as follows:

- Step 1: Selection of factors on which the matching will be based and their data source
- Step 2: Matching treatment districts with control districts
- Step 3: Matching sub-districts in treatment district with sub-districts in matched control district
- Step 4: Selection of PSUs within the sub-districts across treatment and control districts

Step 1: Selection of Factors for Matching Purposes

The districts have been matched based on factors that may act as confounders on the evaluation indicators while not selecting the health evaluation indicators themselves for matching. Some of the factors related to health facilities were considered for matching but were dropped due to reasons such as reliability and non-uniformity of data sources across districts and states. The factors chosen below are more contextually relevant affecting the service delivery of health services at all levels.

The number of factors chosen for the matching purpose was limited to avoid over-specification or the “curse of dimensionality”. Continuous scale variables were chosen as factors for matching purposes, namely:

1. Levels of literacy
2. Population density
3. Level of urbanisation (proxy for socio-economic development)
4. Proportion of socially excluded groups (i.e. Scheduled Castes) – who may face differential access to services due to discrimination and hence, can lead to reduction in potential impact of NIPI.

Secondary data used for the matching exercise were taken from the District Annual NRHM Action Plans, supplemented by data from the Annual Health Survey and the 2011 Census.

Step 2: Matching a Treatment District with a Control District within the Same State

Within the same state, a treatment district was matched with a non-NIPI district i.e. a control district. This matching of districts within the same state had the following steps:

- Best possible matches for treatment districts were derived based on the deviation across factors with respect to the treatment district.
- Out of the best possible options, district with the minimum difference across indicators from the treatment district was chosen as the matched district for each of the treatment district ensuring a unique match for each treatment district has a unique match.

Table 2.1 Results of Matching Treatment District with Other Districts	
Treatment Districts	Uniquely Matched District
Bihar	
Jehanabad	Samastipur
Nalanda	Bhojpur
Sheikhpura	Lakhisarai
Madhya Pradesh	
Narsimhapur	Mandsaur
Hoshangabad	Dewas
Raisen	Harda
Betul	Vidisha
Odisha	
Anagul	Dhenkanal
Jharsuguda	Balangir
Sambalpur	Debagarh
Rajasthan	
Alwar	Dhaulpur
Bharatpur	Jaipur
Dausa	Dungarpur

Step 3: Matching sub-districts in a treatment district with sub-districts in a control district

To enable robust difference-in-difference calculations, matching was undertaken at lower levels of sampling as well to minimise the impact of confounding factors. After district, the lower level of sampling is block; however, block level data for the four NIPI states were not uniform, not readily available, and unreliable. For this purpose, lower level of sampling was chosen to be sub-district, comprising of more than one block, which is not an administrative unit but is a lower level of aggregation for census level data. Census level data (2011) at the sub-district level gives reliable data for three out of four indicators. The data for the fourth factor – population density was not available at sub-district level and hence, dropped from the matching exercise at the sub-district level.

To match sub-districts as closely the following factors were taken into account:

- Levels of literacy
- Levels of socio-economic development
- Proportion of socially excluded groups (i.e. Scheduled Castes), who may face differential access to services due to discrimination

The following steps were taken to match sub-districts in treatment districts with sub-districts in control-matched districts:

- Within the treatment district, two sub-districts were chosen randomly.
- Two sub-districts were matched within the control-matched district with the two randomly chosen sub-districts one by one based on the minimum difference across indicators.

This also ensures that each sub-district has a unique match.

Table 2.2 Results of matching sub-districts within matched districts

State	Treatment District	Randomly Selected Sub-district	Control (Matched) District	Matched Sub-district	
Bihar	Jehanabad	Jehanabad	Samastipur	Samastipur	
		Makhdumpur		Dalsinghsarai	
	Nalanda	Chandi	Bhojpur	Charpokhari	
		Islampur		Behea	
	Sheikhpura	Sheikhpura	Lakhisarai	Lakhisarai	
		Ghat Kusumbha		Chanan*	
Madhya Pradesh (MP)	Narsimhapur	Narsimhapur	Mandsaur	Bhanpura	
		Kareli		Mandsaur	
	Hoshangabad	Babai	Dewas	Khategaon	
		Bankhedi		Tonk Khurd	
	Raisen	Badi	Harda	Khirkiya	
		Baraily		Timarni	
	Betul	Amla	Vidisha	Gyaraspur	
		Athner		Shamshabad	
	Odisha	Anagul	Chhendipada	Dhenkanal	Nihalprasad
			Kiakata		Gandia
Jharsuguda		Brajarajnagar	Balangir	Balangir	
		Laikera		Loisinga	
Sambalpur		Hirakud	Debagarh	Debagarh	
		Naktideul		Barkot	
Rajasthan	Alwar	Kotkasim	Dhaulpur	Sepau	
		Rajgarh		Baseri	
	Bharatpur	Pahari	Jaipur	Jamwa Ramgarh	
		Rupbas		Phagi	
	Dausa	Lalsot	Dungarpur	Sagwara	
		Mahwa		Aspur	

Step 4: Selection of PSUs within treatment and control districts

In accordance with the sample size calculations, 12 Primary Sampling Units (PSUs) i.e. villages were selected for each treatment or control district. To ensure variance across districts and within sub-districts, the optimal number of PSUs per sub-district to measure variance is 6. Increasing the number of selected sub-districts would mean that PSU level estimation per sub-district would not be representative, and there would be a smaller area of common support upon which to match villages if necessary.

The sampled Primary Sampling Units (PSUs) i.e. villages within each sub-district were chosen using **Probability Proportional-to-Size (PPS) method**. PPS is a simple sampling technique whereby the probability of selection of a unit is proportional to its size. PPS greatly improves the representativeness of the sample considerably if the sampling units vary in size. Within each sub-district, six PSUs were selected as per PPS, hence 12 PSUs in each treatment or control district.

For the purpose of analysis, PSU is defined by the geographical boundaries of a village that was sampled in this process. While analysing baseline data, appropriate sampling weights were added to the data to facilitate analysis across different areas of treatment and control and to make the data representative of the population. This has been further detailed in Annex E.

2.4.6 Quantitative Data Collection

This section details the different quantitative primary data collection methods used for the impact evaluation; namely a population survey, SNCU+ follow up survey and frontline health workers (ASHA) survey.

2.4.6.1 Population Survey

The population survey was conducted between December 2013 and January 2014. The sampling frame was mothers of children aged below 2 years. The sample size was 4,500 (which increased to 4620 during the fieldwork due to lower than expected non-response rates). A listing of all mothers in the target group was conducted and then a random sample of these mothers was selected. The sample size was set to ensure a Minimum Detectable Effect of 5 percentage points or better for all headline indicators at the programme level based on values of indicators and their design effects taken from the NFHS III. This gives a MDE of 10 per cent or better at the State level. For more information on the sampling calculations, please refer to the inception report.

2.4.6.2 SNCU+ Follow Up Survey

In the case of SNCU+, a cross-sectional cohort study of new-borns admitted to SNCUs in the past 6 months was undertaken to inform indicators related to the number and quality of follow-up visits by ASHAs as per the protocols. The SNCU+ follow up survey was done separately along with a population survey because in a population survey, the case incidence of children who had been admitted to SNCUs would not have been able to generate enough observations. To measure changes in key indicators it was calculated that at least 30 new-borns admitted to SNCUs needed to be sampled per district. The total sample size for the SNCU+ follow up survey is 449.

2.4.6.3 Health Workers Survey

Most of the interventions aim at strengthening capacity, skills, and knowledge of frontline health workers (at the community level) including ASHAs and in some cases ANMs. With their importance in delivery some of the key interventions under NIPI, primary data was collected from the frontline health workers based at the community level i.e. ASHAs separately. ANMs were not sampled separately as the sample within the data collection areas would have been too small to infer valid conclusions.

2.4.7 Sub-Group Analysis

Sub-group analysis amongst the sample population will be conducted to assess the estimates of key indicators across marginalised groups based on caste, religion, education, and wealth quintiles. However, it has to be noted that since the sample size is only representative at the programme level hence, the estimates presented for such sub-group or sub-population analysis will only be an indication of variation across these groups and not representative of the population for either treatment or control groups.

2.5 Qualitative Methodology

Qualitative studies undertaken for this evaluation complement the quantitative approach adopted for some interventions (namely, HBNC+, SNCU+, revitalisation of PFP and PPIUCD services and Pre-Service Education (PSE) to midwives) to enable contextual understanding and interpretation and also to triangulate the findings from the quantitative evaluation study.

For baseline, in-depth qualitative study was conducted only for HBNC+ and PFP/PPIUCD interventions. For HBNC+ and PFP interventions, qualitative studies will be conducted both at the baseline and end line and only in treatment districts.

The qualitative research methods used for the assignment are:

1. **Direct and participant observation** - This refers to gathering data, documenting, and understanding by carefully observing service delivery agents and beneficiaries and their behaviour and actions and interactions.
2. **Focus group discussions** - Focus group discussions are organised discussions with a group of similar participants belong to either the same socially excluded group or gender or some other category on a subject of interest. The discussions are usually open-ended but can be semi-structured to put some quantitative scores in place as well using community scorecards and other instruments.
3. **In-depth interviews** - In-depth interviews with beneficiaries and key stakeholders such as frontline health workers is a highly interactive interview to get an in-depth information and analysis on various aspects of services delivered and conducted.

The details on the qualitative research methods used for this assignment are in Annex E. For the purposes of the baseline, the results of the qualitative data analysis are restricted to the annexes, but in the end line report, the results will be fully integrated and triangulated with the quantitative findings and estimates.

2.6 Cost-Effectiveness Analysis (CEA)

It was originally intended that a cost effectiveness analysis (CEA) would be integrated into the evaluation strategy in order to:

- Document unit costs of the outcomes resulting from the interventions (costs/outcomes) where feasible
- Provide evidence about the cost effectiveness of the interventions, to help inform the Government of India and the State Governments when deciding on adopting and scaling up these interventions.

This required reporting on expenditures by the implementing partners, and data collection tools were finalised for this purpose. However, the implementing partners and the Embassy of the Government of Norway have decided that this data cannot be made available for reasons of commercial confidentiality. Therefore, the CEA component of the evaluation strategy cannot proceed as originally designed. However, retrospective analysis could still be undertaken at the end line if approvals for sharing of financial data were forthcoming.

2.7 Secondary data – Data sources

Secondary data will be used to inform health impact indicators of fertility and mortality rates and help in triangulation of results for programme and intervention-specific outcomes in some interventions. The various secondary data sources used for the evaluation assignment are: Sample Registration Survey (SRS); Annual Health Survey (AHS); District Level Household and Facility Survey (DLHS); and National Family Health Survey (NFHS).

The results of Annual Health Survey 2012 are likely to be published in May 2015 and will be compared to the baseline findings later.

Table 2.3 Summary of various indicators, their sources and further details

Broad Indicators	Sources of information	Disaggregation	Related Indicators
Reduction in Infant Mortality Rate (IMR)	AHS ⁵ , SRS ⁶	<u>AHS</u> : Rural/Urban; Male/female; District level <u>SRS</u> : Rural/Urban; Sex of child; state level	
Reduction in Neonatal Mortality Rate (NMR)	AHS, SRS	<u>AHS</u> : Rural/Urban; District level <u>SRS</u> : Rural/Urban; Sex of child; state level	AHS: Post Neo-natal mortality rate/ Under-5 Mortality Rate
Reduction in Maternal Mortality Rates (MMR)	AHS, SRS	AHS: Select sub-divisions within a district <u>SRS</u> : Rural/Urban; state level	
Increase in ante-natal care coverage	AHS, DLHS ⁷	<u>AHS</u> : Rural/Urban; District level <u>DLHS</u> : Rural/Urban; Age group; no. of living children; education; religion; castes/tribes; wealth index; District level	<u>AHS</u> : Registered for Ante-Natal Care/ Received any ANC/ ANC in 1 st trimester/ 3 or more ANC/ At least 1 Tetanus Toxoid (TT) injection/ IFA tablets for 100 days or more/ Full ANC check-up/ from govt. source/ BP checked/ Hemoglobin checked/ Ultrasound <u>DLHS</u> : Any ANC/ at govt./ at private health facility/ community based services/ components checked under ANC
Increase in proportion of births attended by skilled personnel	AHS, DLHS	<u>AHS</u> : Rural/Urban; District level <u>DLHS</u> : Rural/Urban; Age group; no. of living children; education; religion; castes/tribes; wealth index; District level	<u>AHS</u> : Institutional delivery/ Delivery at Govt. Institution/ Delivery at Private Institution/ at home/ at home conducted by skilled personnel/ safe delivery/ caesarean at govt. and private hospitals <u>DLHS</u> : Institutional delivery/ at home/ at home conducted by skilled personnel/ safe delivery
Increase in children fully immunized	AHS, DLHS	<u>AHS</u> : Rural/Urban; District level <u>DLHS</u> : Rural/Urban; Age group; sex of child; mother's education; religion; castes/tribes;	<u>AHS & DLHS</u> : Having immunisation card/ BCG/ 3 doses of Polio/ 3 doses of DPT vaccine/ Measles vaccine/ fully immunised (12-23 months)/ polio dose at birth/ not receive any vaccination/ 6-35 months children –

⁵ AHS = Annual Health Survey. Latest is 2010-11

⁶ SRS = Sample Registration Survey. Latest is 2010

⁷ DLHS = District level Household and facility Survey. Latest is Round 3 (2007-08)

Table 2.3 Summary of various indicators, their sources and further details

Broad Indicators	Sources of information	Disaggregation	Related Indicators
		wealth index; District level	at least 1 dose of Vitamin A
Reduction in Total Fertility Rate (TFR)	AHS, SRS	<u>AHS</u> : Rural/Urban; District level <u>SRS</u> : Rural/Urban; state level	
Reduction in unmet need for family planning	AHS, DLHS	<u>AHS</u> : Rural/Urban; District level <u>DLHS</u> : Rural/Urban; Age group; no. of living children; education; religion; castes/tribes; wealth index; District level	<u>AHS & DLHS</u> : Unmet need for limiting/ Unmet need for spacing

2.8 Routine Monitoring Systems

The system inputs, process and output indicators will be sought from the NIPI Monitoring and Evaluation system along with the routine monitoring reports from the implementing partners. Since these indicators relate to interventions and the inputs and resources used, along with the progress on the implementation of the interventions, it is expected that the implementing partners would be collecting the same information to track their programmes.

2.9 Notes to Reading Tables in the Baseline Report

This section explains how to read the table contents and format presented in the baseline report and its annexures. Sample weights were calculated for the entire baseline data analysis for both household and PSU level (described in Annex E.3), and were added for the baseline data analysis.

The headings for the baseline survey tables refer to - ‘Overall’ means a programme level estimate of the indicator across the 4 NIPI states including treatment and control areas. The statistics are further disaggregated between 13 ‘Treatment’ and 13 ‘Control’ districts, respectively, across these four NIPI states.

The column labelled ‘Mean’ represents the mean value of the indicator, while ‘n’ represents the sample size.

The figures in parentheses below the mean value of the indicator are robust standard errors clustered at PSU level. For PSU level indicators and estimates, the standard errors represented in parentheses below the mean value of the PSU level indicators are robust standard errors.

The mean value of the indicator between control and treatment groups was tested for their significance level and is represented alongside the indicator mean value in the ‘Mean’ column for the Control area⁸. The significance levels are depicted as follows: *** significant at 1 per cent, ** significant at 5 per cent and * significant at 10 per cent.

⁸ The difference value of the mean values of the indicator between control and treatment group is not presented in the table.

The table also highlights the source of data either one of the secondary data sources outlined above or the baseline survey (primary data source).

Note on standard errors: *For some of the indicators, standard errors have not reported in the table either because they have reported to be zero or very low or missing.*

A standard error could be zero because the statistic has no random error i.e. there is no variance in the estimate. Where the estimate is 0% or 100%, standard errors reported in such cases is zero. In some cases, the standard error reported is very low, hence rounds off to zero when reported in four decimal points. Very low (0 up to four decimal points) or zero standard errors have not been reported in the report.

For some of the statistics, the standard error is missing and hence, not reported. This is because some variables have enough missing values that causes the lonely PSU problem i.e. it causes entire sampling units to be dropped from the analysis, possibly leaving a single sampling unit in the estimation sample. This is usually the issue when conducting sub-group or sub-population analysis.

Note on sample size variation: *The total sample size for household data is 4680, for SNCU+ follow up survey is 449 and ASHA or health worker survey is 300. The sample size differs across tables and indicators depending on the source of baseline data – whether household survey, SNCU+ follow up survey or health worker survey and also on the derivation of the statistic. Not every respondent will answer every question, either because the question is not relevant to them, or because of non-response. The restrictions on the sample for derivation of a statistic or indicator has been laid out in the description of the statistic or indicator.*

3 Home Based New-born Care Plus (HBNC+)

This chapter concerns Home Based New-born Care Plus (HBNC+), one of the key interventions being implemented in the NIPI Phase-II programme, extending continuum of care new-borns until they are one year old. This chapter presents the rationale and theory of change for HBNC+ along with the key baseline findings. The chapter also presents the reflections on Home Based New-born Care (HBNC), a key intervention from the Phase-I programme and confounding factor for HBNC+.

3.1 Rationale for Home Based New-born Care (HBNC)

The Home Based New-born Care Plus (HBNC+) intervention builds upon the Home Based New-born Care (HBNC) intervention that was a part of NIPI Phase-I. In this section, the concept and rationale of HBNC is introduced, before the design of HBNC+ is explained and the baseline findings for the same presented.

HBNC, introduced during NIPI Phase-I, aims to contribute towards a reduction in the Infant Mortality Rate (IMR). The IMR in India had fallen to 50 per 1000 births in 2009, of which 34 occurred during the first one month of life (neo-natal mortality rate, NMR) (SRS 2011). Therefore, further improvement towards the Government of India's target of reducing the Infant Mortality Rate (IMR) to 28, under the eleventh five-year plan, would need to be driven by reducing the NMR (HBNC Guidelines, 2011). Out of the NMR of 34, 74.1 per cent die in the first week and 39.3 per cent in the first day. The main causes of deaths being infections (including sepsis, pneumonia, diarrhoea, and tetanus), preterm and low birth weights, and birth asphyxia (Lancet, 2010).

In limited resource settings with poor access to health facility-based care, it is believed that community based continuum of care approaches for new-borns and infants can be a cost-effective solution for addressing the main drivers of neo-natal mortality (Gogia & Sachdev, 2010). This includes:

- Home visits for the promotion of comprehensive neonatal care including rearing practices
- Home based management of neonatal infections and other neonatal problems arising after birth

Based on the evidence and experience of a controlled trial of delivering a set of home based new-born care package in Gadchiroli District in Maharashtra (Bang et al, 1999), the design of HBNC for the first phase of NIPI aimed to reduce neonatal mortality and morbidity through:

- Home visits in the first six weeks of life by ASHAs
- Extra home visits for preterm and low birth weight babies by the ASHA or ANM, and referred for appropriate care
- Provision of information and skills to the mother and family of every new-born to ensure better health outcomes
- Early identification of illness in the new-born and provision of appropriate care at home or referral as defined in the protocols
- Counselling the mother on postpartum care, recognition of postpartum complications and enabling referral

To be equipped to deliver on this responsibility, ASHAs were to receive training (Modules 6 and 7) through four rounds of training of five days each. Further, the ASHA was to be incentivised by a sum of Rs.250 per month for the delivery of six home visits in the case of institutional delivery (days 3, 7, 14, 21, 28 and 42) and seven in the case of home delivery (an

additional visit on day 1). The incentive payment is conditional on ensuring that the birth weight is recorded in the Maternal and Child Protection (MCP) Card, that the new-born receives various vaccinations, that the birth is registered and that both the mother and new-born are safe until the 42nd day after delivery. The ASHA was expected to be supported in the field by facilitators providing on the job mentoring, monitoring and support; receive frequent refresher training; be equipped with a communication package to enable health education to mothers and the community; and be supported by a functional Village Health, Sanitation, and Nutrition Committee and by the ANM to ensure responsive referral.

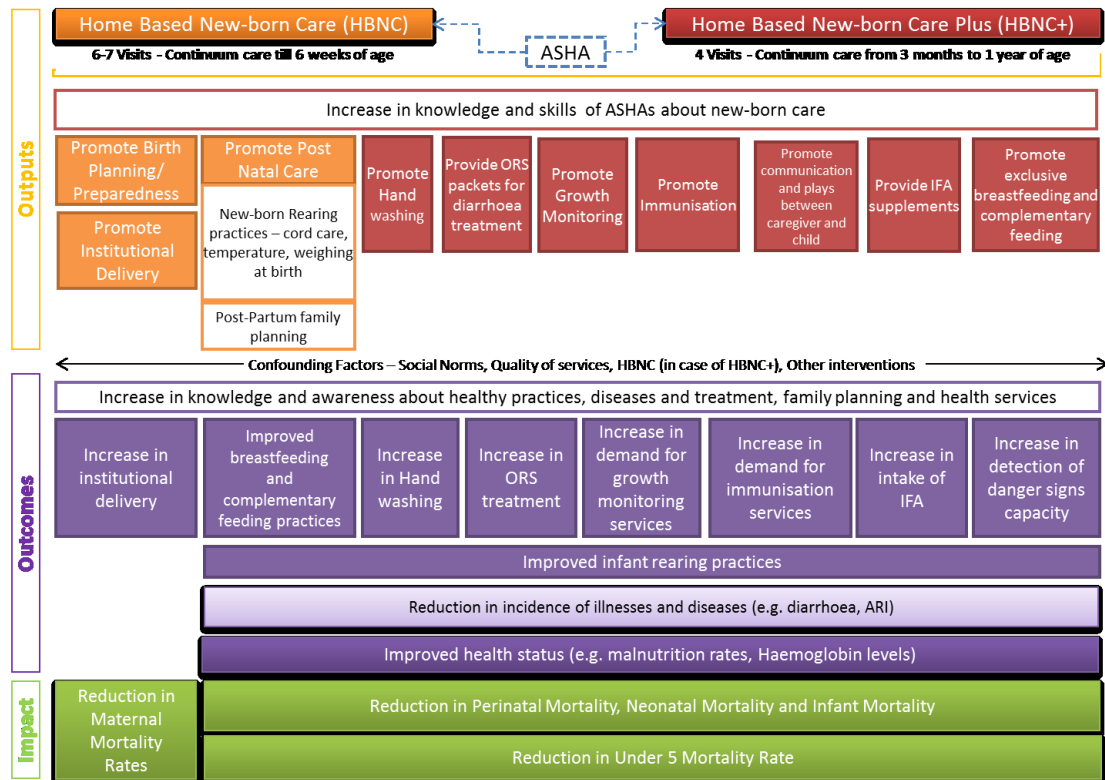
3.2 Design of Home Based New-born Care Plus (HBNC+)

Home Based New-born Care Plus (HBNC+) is the extension of HBNC, with the addition of four home visits by ASHAs between three months of age and one year (at 3, 6, 9 and 12 months). Therefore, it focusses on reducing post-neonatal mortality. The intervention seeks to build the skills of ASHAs, incentivise them, and provide supportive supervision by the ASHA facilitators and the ANM.

The main targets of the HBNC+ visits are the promotion of:

- Appropriate infant feeding practices
- Prophylactic iron supplementation
- Regular growth monitoring
- Appropriate hand-washing practices
- Improved ORS use rate for the treatment of diarrhoea
- Full immunisation
- Appropriate play and communication for early childhood development

The broad theory of change for HBNC+ is that the home visits provided by the ASHAs increase the awareness of mothers about appropriate care practices, and this leads to changes in healthy behaviour (e.g. hand-washing) and an increase in the uptake of available frontline services. The behaviours and services promoted are proven efficacious at reducing infant mortality (Lancet, 2014).



This theory of change contains several underlying assumptions that will be tested in the evaluation:

- The HBNC+ trainings are sufficient to ensure the ASHA has the requisite knowledge and skills on the thematic issues
- The ASHA has the requisite motivation and incentive structure to undertake home visits and counsel mothers on HBNC+ messages during these home visits
- Delivery of key messages by ASHAs will translate to improvements in the knowledge of mothers
- Mothers act upon the messages and instructions of ASHAs overcoming contextual and social constraints, customs and traditions and other individual and social determinants of attitudes
- The supply side is able to deliver services at an appropriate quality in an affordable manner that will enable demand to be realised, both in terms of services and products (e.g. soap)
- The activities selected under the NIPI programme, when delivered, are relevant and significant to improving desired improvements in health outcome

The design of HBNC+ has undergone few changes since the baseline survey was conducted in September 2013, which are:

1. The target population of infants under HBNC+ has changed from 6 weeks until 1 year of age to 3 months until 1 year of age.
2. HBNC+ now also focusses on awareness, availability and usage of Iron and Folic Acid (IFA) supplementation and knowledge of ORS preparation and ensuring availability of ORS within households.

3.3 Limitations to Baseline Data Analysis of Key Indicators for HBNC+

The design of the HBNC+ intervention outlined above evolved after the execution of the baseline survey. Therefore, the data collected reflects a previous design and cannot be used to calculate all of the indicators in the updated project log frame. The key limitations include the following:

1. Since HBNC+ now also focusses on awareness, availability, and usage of Iron and Folic Acid (IFA) supplementation within households, the baseline data cannot provide estimates for these key indicators.
2. HBNC+ has evolved to focus on knowledge of ORS preparation and ensuring availability of ORS within households. These intermediate indicators were not captured during the baseline.
3. The baseline data also does not provide estimates for availability of soap and water in the households – which are also the new focal points under the revised HBNC+ programme.

Other limitations to the baseline survey are detailed in Annex M.

3.4 Key Baseline Findings

In this section, we outline the key baseline findings as they relate to project outputs, the key target areas of HBNC+ and the health outcomes. Population Survey with a sample of households with children below 2 years of age and Health workers Survey have been used to inform the baseline status of HBNC+ components with respect to mothers of infants and ASHAs, respectively.

3.4.1 Programme Coverage

The baseline data shows that no ASHAs had been trained in HBNC+ at the time of the baseline, which validates the purity of the baseline. However, even without the project intervention, ASHAs were making some home visits to mothers of children aged between six weeks and one year old – with an average of 1.4 visits per household. Thirty per cent of the households were receiving at least three visits during this period (Table 3.1).

Table 3.1. HBNC+: Programme Coverage

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
% of ASHAs trained with HBNC+ protocol	0.0%	144	0.0%	156	0.0%	300
Households where ASHA conducted home visits at least 3 times when the child was between 6 weeks and 1 year of age (%)	29.3%	1038	31.1%	1084	30.3%	2122
Mean number of home visits made by an ASHA to a household when the child was between 6 weeks and 1 year of age	1.4	1038	1.3	1084	1.4	2122

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;

** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

3.4.2 Appropriate Infant Feeding Practices

Appropriate infant and young children feeding practices include the promotion of exclusive breastfeeding until children are six months of age, and then appropriate complementary feeding practices after this age.

3.4.2.1 Exclusive breastfeeding

Infants who are not breastfed are 15 times more likely to die from pneumonia and 11 times more likely to die from diarrhoea than those who are exclusively breastfed for the first six months of life (Save the Children, 2013).

Table 3.2 below shows that rates of awareness amongst ASHAs on the importance of exclusive breastfeeding were very high, and that this was being transmitted to mothers when ASHAs made home visits. However, knowledge of ASHAs on the need for continued breastfeeding even when children were sick was substantially lower.

Rates of awareness of mothers about the need for exclusive breastfeeding for six months were also high (78 per cent in the treatment areas and 81 per cent in the control areas).

This translated into practice, with rates of exclusive breastfeeding were also quite high at over 70 per cent. The average number of months that a child was exclusively breastfed for was 5.8 in the treatment area and 5.9 in the control area. Breastfeeding during sickness was very high, despite the low level of knowledge of ASHAs.

The main reasons for not exclusively breastfeeding children were mothers not having enough milk to breastfeed their children, not being aware of the benefits of exclusive breastfeeding followed by objections from family (Table 3.2).

Table 3.2. HBNC+: Exclusive Breastfeeding Practices

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHA Aware that until 6 months of age the child should receive only breast milk (%)	96.4%	144	92.2%	156	94.1%	300
ASHAs give Advice on exclusive breastfeeding on last home visit (%)	82.5%	144	80.9%	156	81.6%	300
ASHAs aware that a baby must be breastfed, even when the child gets sick (%)	40.3%	144	44.9%	156	42.8%	300
Women who are aware that a child must be exclusively breastfed for first 6 months after birth (%)	77.9%	2340	81.3%	2340	79.7%	4680
Proportion of children (of age six months or older) who were exclusively fed breast milk for at least six months (%)	71.8%	1583	74.9%*	1620	73.5%	3203
Average number of months for which a woman exclusively breastfed her child (if child is 6 months of age, or older)	5.8	1549	5.7	1560	5.7	3109
Women who breastfed their child while he/she was sick or ill the last time (if the child had ever fallen ill) (%)	88.1%	2181	89.2%	2173	88.6%	4354

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;

** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

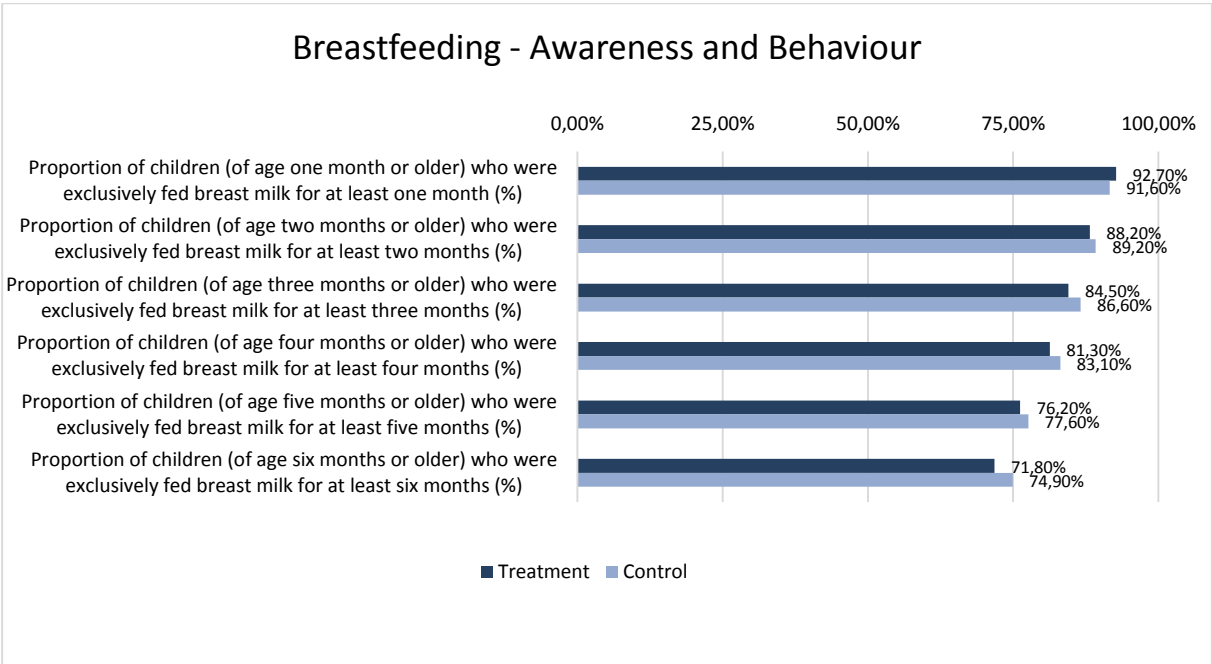
The programme aims at promoting continued exclusive breastfeeding practices especially after the child turns 3 months of age, as it is believed that the discontinuity in exclusive breastfeeding is highest for children of this age range. Table 3.3 shows the age specific exclusive breastfeeding rates. It shows that the decline between months is relatively stable, and there are no major discontinuities in excluding breastfeeding practices.

Table 3.3. HBNC+: Age-specific Exclusive Breastfeeding Rates

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
Proportion of children (of age one month or older) who were exclusively fed breast milk for at least one month (%)	92.7%	2253	91.6%	2248	92.1%	4501
Proportion of children (of age two months or older) who were exclusively fed breast milk for at least two months (%)	88.2%	2100	89.2%	2120	88.7%	4220
Proportion of children (of age three months or older) who were exclusively fed breast milk for at least three months (%)	84.5%	1948	86.6%	1987	85.6%	3935
Proportion of children (of age four months or older) who were exclusively fed breast milk for at least four months (%)	81.3%	1823	83.1%	1853	82.2%	3676
Proportion of children (of age five months or older) who were exclusively fed breast milk for at least five months (%)	76.2%	1687	77.6%	1733	77.0%	3420
Proportion of children (of age six months or older) who were exclusively fed breast milk for at least six months (%)	71.8%	1583	74.9%*	1620	73.5%	3203

Note:
 'Mean' represents the mean value of the indicator.
 'n' represents the sample size.
 Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;
 ** significant at 5%; *** significant at 1%.
 Sample weights have been used to calculate the mean value of the indicator.
 Source: NIPi Phase-II Baseline Survey 2013

The chart below illustrates the age-specific exclusive breastfeeding rates further.



3.4.2.2 Complementary Feeding Practices

Table 3.4 below shows that ASHAs also have high awareness about the appropriate timing for complementary feeding to start, and were giving advice on this during their home visits. However, counselling rates are significantly lower on visits during the actual time when mothers should be starting complementary feeding, a key component of home visits to be conducted under HBNC+.

The table also shows that only approximately half of mothers started complementary feeding at the appropriate time, suggesting that the translation of counselling into behaviour has considerable scope for improvement. Furthermore, the proportion of children receiving a minimum acceptable diet is lower still, suggesting that whilst complementary feeding may be happening, it does not always ensure an adequate diet, which may be a reflection on the content of the counselling messages. The estimates are statistically different between treatment and control districts at 1 per cent level of significance. The minimum acceptable diet being a multidimensional indicator captures both minimum dietary diversity and minimal feeding/meal frequency standards (WHO 2010).

Table 3.4. HBNC+: Complementary Feeding Practices

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHA Aware that complementary feeding for a child must start after 6 months of age (%)	65.8%	144	54.7%*	156	59.7%	300
ASHA gave Advice on when to start complementary feeding in last home visit	88.7%	144	89.9%	156	89.3%	300
ASHAs who told the mother to start complementary feeding at 6 months of age in her most recent visit to a HH with a 5-7 month old child (%)	59.6%	144	55.7%	156	57.5%	300
Women who started complementary feeding of their child when the child reached 6 months of age (%) --(if child is 6 months and above)	45.4%	1583	51.1%*	1620	48.5%	3203
Children between 6-23 months of age, who receive a minimum acceptable diet	23.1%	1586	31.9%***	1620	27.8%	3206

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

3.4.3 Iron and Folic Acid (IFA) Supplementation

The sub-intervention of promoting iron supplementation for children was not part of the original intervention design, and was therefore not included in the baseline. The only data that was collected was on the availability Iron and Folic Acid (IFA) tablets, and syrup bottles with ASHAs, which was low, although with relatively better status in the control areas. The difference in the stocks of IFA tablets are statistically different between treatment and control groups at 5 per cent level of significance (see Table 3.5).

Table 3.5. HBNC+: Iron and Folic Acid (IFA) Supplementation

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHAs reporting not having any (%)						
<i>ORS packets</i>	33.9%	144	36.4%	156	35.3%	300
<i>IFA tablets</i>	55.3%	144	39.6%**	156	46.7%	300
<i>IFA syrup bottles</i>	85.0%	144	74.7%**	156	79.3%	300

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;

** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

3.4.4 Regular Growth Monitoring

The Anganwadi Worker provides growth monitoring services and counselling at the Village Health, Sanitation and Nutrition Days (VHSNDs) held every month. The role of the ASHA is to motivate mothers on the importance of attending VHNDs and having their child's growth monitored. Table 3.6 shows that awareness amongst ASHAs and mothers about the importance of growth monitoring is very high.

Table 3.6. HBNC+: Regular Growth Monitoring

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
% of ASHAs who knew they had to give advice on growth monitoring of the baby	96.7%	144	98.2%	156	97.5%	300
Women who think that monitoring the growth (height and weight) of a child for first few years is important (%)	89.7%	2340	91.1%	2340	90.4%	4680
Women who get their baby 's weight measured (%) - <i>Every month</i>	25.1%	2340	31.5%***	2340	28.5%	4680
Women who get their baby 's weight measured (%) - <i>at least once in three months</i>	12.9%	2340	12.3%	2340	12.6%	4680
Women who received counselling for baby's weight and nutrition status from an AWW/ICDS Worker/ANM, if child was ever weighed (%)	48.0%	1584	52.4%	1539	50.4%	3123
Women who can identify whether a child is severely or moderately malnourished (%)	27.8%	2340	33.0%**	2340		

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;

** significant at 5%; *** significant at 1%.

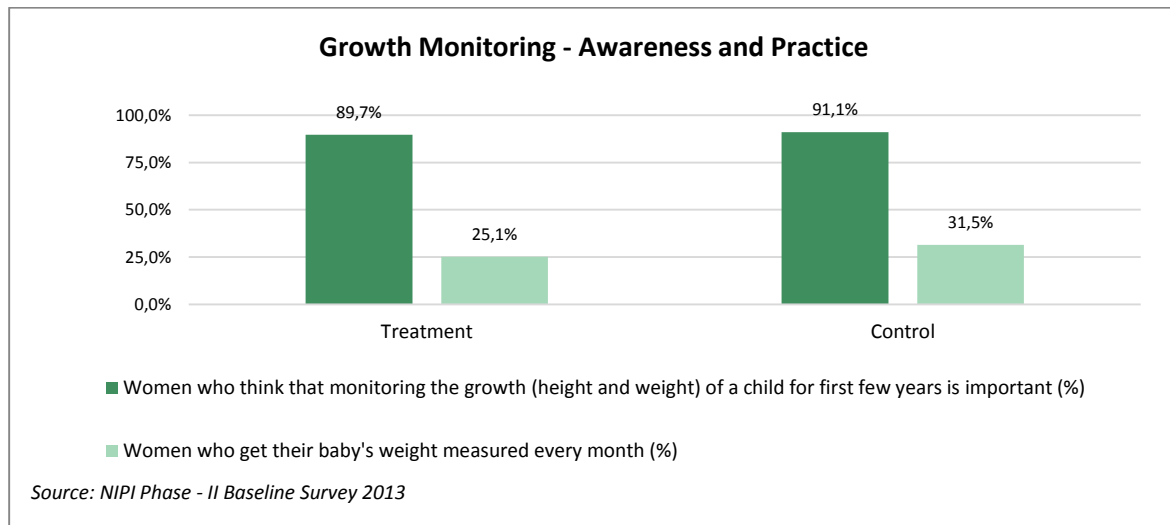
Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

However, the high awareness levels of ASHAs and mothers was not being translated into practice. While only 25 per cent of mothers in treatment areas and 32 percent in control areas having their baby's weight measured every month, 13 per cent of mothers in treatment areas and 12 per cent of mothers in control areas get their baby's weight monitored at least once every month (Table 3.6). This still implies that either less than half of the mothers do not get their growth monitored or it happens irregularly. The estimate for the former indicator on getting

weight monitored every month is statistically different between treatment and control areas at 1 per cent level of significance.

This finding has been further illustrated in the following graph:



The baseline data also shows that limited counselling is provided at the time of weighing of child, which may limit the impact of this focus area. Further, the proportion of women who can identify whether a child is severely or moderately malnourished remains very low (28 per cent and 33 per cent in the treatment and control areas respectively) (Table 3.6). Their confidence to understand whether their child is severely or moderately malnourished does not increase significantly even with the help of a growth chart and with the health worker monitoring the growth of her child (37 per cent). Less than half of the women reported that they would take their child to Nutrition Rehabilitation Centre (NRC) or any other facility followed by improving their quality of diet and then quantity if their child was found to be severely or moderately malnourished (Table J.6).

3.4.5 Appropriate Hand Washing Practices

Hand washing at critical times by mothers and counselling by ASHAs to reinforce such sanitary and hygienic behaviour is the first step towards creating a disease free environment for newborns and infants. Table 3.7 below summarises the main findings related to knowledge and practices of ASHAs and mothers regarding the hand washing practices. The baseline data suggests that rates of hand washing by mothers are very high (96 per cent in the treatment area) and that mothers are aware of its importance.

However, hand washing does not always happen at the four critical times i.e. after defecation by the mother of child, after cleaning child after defecation, before eating and before feeding the child (only 56 per cent in the treatment area). Rates of knowledge of these critical times is exceptionally low at around 2 per cent of mothers. Furthermore, only 58 per cent of mothers in the treatment areas, and 60 per cent in the control areas, wash their hands with soap. This seems to be partly driven by a lack of counselling by ASHAs during home visits (under 14 per cent of home visits in the treatment areas).

Table 3.7. HBNC+: Appropriate Hand Washing Practices

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
% of ASHAs who reported that they mentioned at least 3 critical times (i.e. after defecation by self and child and before eating and feeding the child) of hand washing in their last visit to a pregnant woman	13.6%	144	8.4%	156	10.7%	300
Women who think washing hands before handling new-borns and small children is important (%)	97.0%	2340	96.3%	2340	96.6%	4680
% of mothers reported correct knowledge of at least 3 critical times (i.e. after defecation by self and child and before eating and feeding the child) of hand washing	2.3%	2340	2.2%	2340	2.2%	4680
Women who wash their hands at least 3-4 times during the day (%)	96.3%	2340	94.7%	2340	95.4%	4680
Women who reported that they wash their hands at critical times (after defecation by self, after cleaning child after defecation, before eating, and before feeding the child)	97.4%	2340	97.8%	2340	97.6%	4680
Women who use soap and water to wash their hands (%)	57.9%	2340	60.2%	2340	59.1%	4680
Note:						
'Mean' represents the mean value of the indicator.						
'n' represents the sample size.						
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.						
Sample weights have been used to calculate the mean value of the indicator.						
Source: NIPI Phase-II Baseline Survey 2013						

3.4.6 Appropriate Treatment of Diarrhoea

Table 3.8 shows the counselling provided by ASHAs to mothers on treatment of diarrhoea. Only 63 per cent of ASHAs in the treatment area (and 65 per cent in the control area) gave advice to mothers on treating diarrhoea in the last home visit. When they gave advice, the proportion giving advice on just ORS was 55 per cent while ASHAs who gave advice on both Zinc and ORS was approximately 59 per cent at programme level. Approximately one third of ASHAs reported not having Oral Rehydration Salt (ORS) packets available.

Table 3.8. HBNC+: Counselling on Treatment of Diarrhoea by ASHAs

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHAs Gave advice to the mother during the last home visit (%):						
<i>Advice on treatment of diarrhoea in their most recent home visit to a new mother</i>	63.0%	144	65.0%	156	64.1%	300
<i>Advice on treatment for diarrhoea with ORS, if they discussed the treatment of diarrhoea</i>	45.9%	84	61.2%	99	54.5%	183
<i>Advice on treatment for diarrhoea with ORS and Zinc, if they discussed the treatment of diarrhoea</i>	61.6%	84	56.8%	99	58.9%	183
<i>Advice on treatment for diarrhoea with salt and sugar, if they discussed the treatment of diarrhoea</i>	25.1%	84	37.9%	99	32.2%	183
<i>Plenty of fluids</i>	5.2%	84	9.5%	99	7.6%	183
<i>Continuing normal food</i>	3.2%	84	8.0%	99	5.9%	183

Table 3.8. HBNC+: Counselling on Treatment of Diarrhoea by ASHAs

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
<i>Continuing breastfeeding</i>	32.9%	84	19.0%	99	25.1%	183
<i>Consulting a doctor and eating the medicine prescribed</i>	16.6%	84	17.3%	99	17.0%	183
ASHAs reporting not having any ORS packets	33.9%	144	36.4%	156	35.3%	300

Note:
'Mean' represents the mean value of the indicator.
'n' represents the sample size.
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;
** significant at 5%; *** significant at 1%.
Sample weights have been used to calculate the mean value of the indicator.
Source: NIPI Phase-II Baseline Survey 2013

This key component of HBNC+ focusses on encouraging mothers to stock Oral Rehydration Salt (ORS) at home, and to know how to prepare and administer the solution for treatment of diarrhoea of their children. Table 3.9 summarises the key findings for knowledge and behaviour of mothers in terms of treatment of diarrhoea and use of Home Available Fluids (HAF), Oral Rehydration Salt (ORS) Solution or Oral Rehydration Therapy (ORT).

Table 3.9. HBNC+: Appropriate Treatment of Diarrhoea by Mothers

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
Women whose children suffered from diarrhoea in the last 2 weeks	2.5%	2340	2.2%	2340	2.3%	4680
Women who sought treatment or advice for diarrhoea for their child (%) ⁹	75.6%	69	88.9%	52	82.3%	121
Mothers whose child had diarrhoea in the past 2 months, and who know that the treatment is ORS and Zinc solution	17.4%	69	22.1%	52	19.7%	121
Women whose children have had diarrhoea, and who are aware that the treatment for diarrhoea is ORS (%)	18.4%	69	32.1%	52	25.3%	121
Treatment that was given to the child suffering from diarrhoea (%) - ORS	41.0%	69	51.8%	52	46.4%	121
Children who were given the following when the child had diarrhoea (%)						
<i>Same/more than usual to eat</i>	29.9%	69	14.6%	52	22.2%	121
<i>Same/more than usual to drink</i>	43.8%	69	22.0%	52	32.9%	121
<i>Same/more than usual breastfeed</i>	53.3%	69	47.1%	52	50.2%	121
Children aged 6-12 months who suffered from diarrhoea during the last 2 weeks, sought treatment from the ASHA, and gave their child ORS treatment.	0.0%	69	5.2%	52	2.6%	121

Note:
'Mean' represents the mean value of the indicator.
'n' represents the sample size.
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%;
** significant at 5%; *** significant at 1%.

⁹ The indicator was assessed only for children who suffered from diarrhoea in the past 2 weeks preceding the survey.

Table 3.9. HBNC+: Appropriate Treatment of Diarrhoea by Mothers

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
Sample weights have been used to calculate the mean value of the indicator. Source: NIPI Phase-II Baseline Survey 2013						

Incidence of diarrhoea was reported to be low – 2.3 per cent of the children were reported to be suffering from diarrhoea in the last 2 weeks preceding the survey. This severely restricted the sample size for the follow-up questions on effective practices for treatment and management of diarrhoea by mothers. More than 80 per cent of the mothers reported seeking treatment or advice for their child suffering from diarrhoea.

At the household level, 19.7 of the mothers of children who had diarrhoea in the last two weeks preceding the survey in the treatment areas knew that ORS and Zinc should be taken, and only 25.3 per cent knew that ORS should be taken. The corresponding figures for the control area are higher¹⁰.

However, despite these low levels of knowledge by mothers, appropriate treatment rates were substantially higher. Forty six per cent of the mothers reported giving ORS solution to their child suffering from diarrhoea, with common treatments also including gruel made from rice, pills or syrups and injections (Table J.20). The proportion of children who were given same or more than usual to eat or drink was approximately 22-33 per cent while 50.2 per cent of the children were breastfed same number of times or more than usual when they suffered from diarrhoea (Table J.20). This reflects that the awareness on effective treatment procedures and general awareness on how to manage them within households including feeding behaviours is still substantially sub-optimal.

A marginal 2.6 per cent of the mothers reported to have sought treatment from ASHA and gave their child ORS treatment when their children suffered from diarrhoea (Table J.20). This is predominantly because ASHAs were not the main source of seeking treatment by the households.

3.4.7 Immunisation Practices

HBNC+ is focused on identifying vaccination dropouts (through the home visits at 3, 6, 9 and 12 months). With regular counselling, ASHAs are meant to counsel on age-appropriate necessary immunisations for children and mobilise them to attend Village Health, Sanitation, and Nutrition Days (VHSNDs) to avail immunisation services. Mobilisation and reminders to mothers reduces dropouts of children from necessary immunisation stemming mostly from low awareness levels of necessary immunisations required for a child. However, the project is not making a complementary investment in the vaccination supply chain, as the ASHA is not the service provider, hence, concentrating on the demand side not the supply side.

Table 3.10 below shows that the vast majority of ASHAs counsel on the benefits of immunisation, and that over 90 per cent of mothers think that getting their child immunised is important. However, rates of awareness on all of the correct vaccinations are low amongst both ASHAs and mothers. Only 29.4 per cent of the ASHAs were aware of all the necessary

¹⁰ Mother's knowledge of procedures for treatment of diarrhoea was assessed only if her child suffered from diarrhoea in the past 2 weeks preceding the survey.

vaccines that a child must receive in the first 6 months of age. Less than 5 per cent of mothers were aware of all of the basic vaccinations that a child must receive¹¹.

Table 3.10. HBNC+: Knowledge and Practices of Immunisation

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHAs Aware that a baby must be given all the necessary vaccinations within first 6 months of birth (%)	24.0%	144	33.8%	156	29.4%	300
ASHAs counsel on the benefits of immunisation	83.2%	144	89.0%	156	86.4%	300
Women who think that getting a child immunised or vaccinated is important (%)	92.6%	2340	93.8%	2340	93.2%	4680
Women who are aware of all basic vaccinations that a child must receive (BCG, Polio, DPT, Measles, Hepatitis) (%)	4.4%	2340	5.4%	2340	24.4%	4680
Children who have a vaccination card, if the child has ever been immunized (%)	67.2%	2239	70.8%	2245	69.1%	4484
Note:						
'Mean' represents the mean value of the indicator.						
'n' represents the sample size.						
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.						
Sample weights have been used to calculate the mean value of the indicator.						
Source: NIPI Phase-II Baseline Survey 2013						

Coverage rates of immunisation were variable, with some such as Oral Polio Vaccine achieving over 90 per cent coverage while others such as Hepatitis B and Measles vaccines achieving approximately 60 per cent coverage. As a result, full immunisation rates of children aged 13 months to 24 months was low with only 23 per cent in the treatment area and 25 per cent in the control area (Table 3.11).

HBNC+ focusses on particularly on counselling to reduce dropout rates between immunisation practices. The dropout rates¹² in immunisation practices especially between BCG and DPT-1 and DPT-3 and Measles vaccine, respectively are 5 per cent and 7.3 per cent, respectively.

Table 3.11. HBNC+: Immunisation Rates

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
Rates of immunisation by age-group (%)						
<i>Hepatitis B 0</i>	59.8%	2239	60.9%	2245	60.4%	4484
<i>Oral Polio Vaccine 0</i>	91.2%	2239	88.3%*	2245	89.6%	4484
<i>BCG Vaccine</i>	97.6%	2239	97.1%	2245	97.4%	4484

¹¹ The women were asked to list all the basic vaccinations that a child must receive. These basic vaccinations include BCG, Polio, DPT, Measles and Hepatitis.

¹² The dropout rates are calculated using the definition promoted by the Department of Health and Family Welfare, Government of India. The definition entails that dropout rate as the children who receive one or more vaccination but do not return for subsequent immunization (Immunisation Handbook for Medical Officers, 2008). The dropout rates are calculated in the following manner:

- $(\text{Children received BCG} - \text{Children received DPT1}) / (\text{Children received BCG}) \times 100$
- $(\text{Children received DPT-3} - \text{Measles cumulative total}) / (\text{Children received DPT-3}) \times 100$

This definition of indicator was taken from UNHCR Health Information System (HIS) – Module 7 – EPI and Vitamin A (<http://www.unhcr.org/46385d392.pdf>)

Table 3.11. HBNC+: Immunisation Rates

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
<i>DPT 1 (if child is greater than or equal to 6 weeks of age)</i>	86.1%	2119	86.7%	2124	86.4%	4243
<i>Oral Polio Vaccine 1 (if child is greater than or equal to 6 weeks of age)</i>	89.0%	2119	88.7%	2124	88.8%	4243
<i>Hepatitis B 1 (if child is greater than or equal to 6 weeks of age)</i>	74.5%	2119	74.9%	2124	74.7%	4243
<i>DPT 2 (if child is greater than or equal to 10 weeks of age)</i>	89.2%	1989	88.9%	2031	89.1%	4020
<i>Oral Polio Vaccine 2 (if child is greater than or equal to 10 weeks of age)</i>	91.9%	1989	90.6%	2031	91.2%	4020
<i>Hepatitis B 2 (if child is greater than or equal to 10 weeks of age)</i>	77.2%	1989	76.7%	2031	76.9%	4020
<i>DPT 3 (if child is greater than or equal to 14 weeks of age)</i>	75.6%	1874	75.7%	1906	75.6%	3780
<i>Oral Polio Vaccine 3 (if child is greater than or equal to 14 weeks of age)</i>	77.3%	1874	76.3%	1906	76.8%	3780
<i>Hepatitis B 3 (if child is greater than or equal to 14 weeks of age)</i>	63.6%	1874	64.2%	1906	63.9%	3780
<i>Measles (if child is greater than or equal to 9 months of age)</i>	52.8%	2024	53.0%	2052	52.9%	4076
<i>Vitamin A (at least 1 dose) (if child is greater than or equal to 9 months of age)</i>	44.1%	2024	44.2%	2052	44.2%	4076
<i>Vitamin A (at least 2 doses) - (if child is greater than or equal to 9 months of age)</i>	18.7%	2024	16.3%	2052	17.4%	4076
% of full immunization coverage in children aged between 12-23 month (had received BCG, all three doses of DPT/OPV and measles)	23.4%	2340	25.2%	2340	24.4%	4680
Drop-out rate between BCG and DPT1	3.6%	989	6.2%	1037	5.0%	2026
Drop-out rate between DPT3 and Measles	8.5%	885	6.4%	914	7.3%	1799
Note: 'Mean' represents the mean value of the indicator. 'n' represents the sample size. Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%. Sample weights have been used to calculate the mean value of the indicator. Source: NIPi Phase-II Baseline Survey 2013						

The majority of the immunisation services are received at the Anganwadi centre by ANMs. Immunisation service not being available was the main reason for not getting their child vaccinated (Table J.17).

3.4.8 Regular Play and Communication for Early Childhood Development

As shown in Table 3.12, the vast majority of ASHAs were aware that they had to give advice on child communication and play to mothers and its benefits, to promote the cognitive and physical development of children. Such counselling practices was observed for 85 per cent of the home visits at programme level. Though the advice on interacting and talking to the children was high in the last home visit, approximately only half of the ASHAs reported giving advice on playing with children to the mothers (Table M.9).

Awareness amongst mothers on the importance of regular play and communication was also very high at over 90 per cent however, similar to ASHA’s counselling practices, less than 60 per cent of the mothers at the programme level played with their child compared to talking and interacting with their child (Table 3.12). Hence, the project can benefit on focussing on different modes of playing and communicating with the children as the awareness levels on its benefits are already very high.

Table 3.12. HBNC+: Regular Play and Communication for Early Childhood Development

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	N
ASHAs who knew they had to give advice on child communication and play (%)	86.4%	144	93.5%*	156	90.3%	300
ASHAs who reported that they gave advice on benefits of communicating and playing with children in their last home visit	85.1%	144	85.0%	156	85.3%	300
ASHA gave advice to the mother on <u>advice of playing</u> with the child as a way to interact or communicate with the child during the last home visit (%)	47.5%	144	58.8%	156	53.7%	300
Women who think that regular play and communication with child is important (%)	91.3%	2340	92.8%	2340	92.1%	4680
Women <u>who play with their child</u> as the main mode of communicating or interacting with their child (%)	55.7%	2340	61.8%*	2340	58.9%	4680

Note:
 'Mean' represents the mean value of the indicator.
 'n' represents the sample size.
 Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.
 Sample weights have been used to calculate the mean value of the indicator.
 Source: NIPi Phase-II Baseline Survey 2013

3.5 Reflections on Home Based New-born Care (HBNC)

As outlined above, HBNC+ is an extension of the earlier HBNC intervention that was part of NIPi Phase-I. The baseline survey assessed the coverage of the Phase-I interventions as they could potentially be a confounding factor the evaluation. Evaluating the impact of the Phase-I interventions is beyond the scope of work for this assignment. However, insights are drawn from the baseline data, which may be relevant for the theory of change of HBNC+.

3.5.1 Training on HBNC and Visits Schedule

Table 3.13 shows that 83 per cent of ASHAs in the treatment areas, and 84 per cent in the control areas, had received training in HBNC. However, knowledge levels of ASHAs of the mechanics of HBNC were limited; no single ASHA surveyed was aware that six home visits were required before the child is six weeks of age after institutional delivery, and just over one in five were aware of the need for seven visits after home delivery.

These estimates prove to be a serious concern for Phase-II programme, which also involves training ASHAs on visits schedule and key components to be promoted during home visits in HBNC+. The translation of training inputs into improved knowledge of ASHAs is key to this programme coverage and hence, effectiveness.

Table 3.13. HBNC: Training of ASHAs on HBNC and Visits Schedule

Indicator	Treatment		Control		Overall	
	Mean	n	Mean	N	Mean	n
ASHAs trained in HBNC (%)	83.0%	144	84.4%	156	83.8%	300
Aware that at least 6 visits have to be made to a household before the child is 6 weeks of age, in the case of institutional delivery (%)	0.0%	144	0.0%	156	0.0%	300
Aware that at least 7 visits have to be made to a household before the child is 6 weeks of age, in the case of home delivery (%)	21.5%	144	22.5%	156	22.0%	300

Note:
'Mean' represents the mean value of the indicator.
'n' represents the sample size.
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.
Sample weights have been used to calculate the mean value of the indicator.
Source: NIPi Phase-II Baseline Survey 2013

3.5.2 Coverage of Home Visits by ASHAs

Table 3.14 shows that very few ASHAs were following the HBNC visits schedule, despite being trained on it. Nearly two thirds of children were visited at least once, and the average number of home visits received was 1.9 in both treatment and control areas. Only 6 per cent of children born in an institution received at least six home visits until they were 6 weeks of age while the estimate was much lower, at 2 per cent at programme level, for children born at home.

Table 3.14. HBNC: Coverage of Home Visits by ASHAs

Indicator	Treatment		Control		Overall	
	Mean	n	Mean	N	Mean	n
Households who ever received home visits from ASHA after child birth (%)	61.6%	2340	65.5%	2340	63.7%	4680
Households where ASHA conducted home visits at least 6 times until the child reached 6 weeks of age, in case of institutional delivery (%)	6.5%	1886	5.4%	1926	5.9%	3812
Households where ASHA conducted home visits at least 7 times till the child reached 6 weeks of age, in case of delivery at home (%)	3.8%	306	1.1%	265	2.4%	571
Mean number of home visits made by an ASHA to a household till the child reached 6 weeks of age	1.9	2147	1.9	2113	1.9	4260

Note:
'Mean' represents the mean value of the indicator.
'n' represents the sample size.
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.
Sample weights have been used to calculate the mean value of the indicator.
Source: NIPi Phase-II Baseline Survey 2013

Annex J and Annex M present the detailed findings on the knowledge and behaviour of mothers and ASHs, respectively with respect to the key components promoted under HBNC. These findings are not discussed in detail in this section as this is beyond the scope of this

assignment.

3.5.3 Implications of HBNC Implementation on HBNC+

From the above baseline findings, it is clear that HBNC has not been implemented uniformly:

- HBNC has not achieved full coverage in either treatment or control districts in terms of trainings of ASHAs, and
- The project inputs (training of ASHAs on home visits and HBNC components) translated into project outputs of (home visits conducted by ASHAs).

These findings raise serious concerns on other transmission channels and undermines the theory of change for the intervention as well as those for HBNC+. HBNC acts as a major confounding factor for effectiveness of HBNC+ since both the interventions use the same combination of project inputs and outputs using ASHA as the main service delivery channel to achieve the objectives and to focus on few overlapping focal components however, targeting different population groups of infants. These findings are very important for the implementing partners to ensure that effectiveness of any of the interventions particularly HBNC+, that is being evaluated, by strengthening programme delivery channels and outputs.

ASHAs – Programme Delivery Channels for HBNC and HBNC+

These findings also point towards another aspect of the programme delivery channel i.e. motivation and incentives of ASHAs. It is unclear whether the lack of outputs is entirely due to the low quality of the training, or whether there are broader issues with the motivation and incentive framework facing ASHAs (upon which there is a relatively well developed literature, see e.g. Rahman et al 2010, Haines et al 2007). Annex M summarises the available baseline data on ASHAs. Some of the key baseline findings that can explain the low coverage of HBNC include:

- **Low incentive payments:** ASHAs do not receive a salary and their entire income is in the form of incentive payments from several programmes delivered by her at the community level including mobilisation activities. ASHAs reported receiving an average last payment of Rs.1523 on an average 2.6 months before the time of survey. This implies approximately Rs.586 per month (less than US\$10).
- **Delayed payments received:** Thirty nine per cent of ASHAs reported receiving incentive payments after a delay.
- **High Workload:** Each ASHA has an average caseload of 9.4 pregnant women and 22.1 children under 1 year of age in her catchment area. She is expected to mobilise the community to achieve several NRHM objectives from immunisation, sanitation to institutional delivery and now under HBNC and HBNC+, infant rearing practices.

The issues listed above will have to be carefully investigated to estimate the effectiveness of HBNC+ in the end line and progress of implementation of HBNC assesses in mid line.

4 Sick New-born Care Unit Plus (SNCU+)

This chapter concerns Sick New-born Care Unit Plus (SNCU+), one of the key interventions being implemented in NIPI Phase-II programme, extending continuum of care from facility to community for new-borns. This chapter presents the rationale and theory of change for SNCU+ along with the key baseline findings concerning the focal components of SNCU+. The chapter also presents the reflections on Sick New-born Care Units (SNCUs), a key intervention from Phase-I programme.

4.1 Rationale for Sick New-born Care Unit (SNCU) and Sick New-born Care Unit Plus (SNCU+)

Approximately 4 million neonatal deaths occur due to an illness that needs emergency care or soon after birth due to complications such as pre-term birth, low birth weight and asphyxia or other infections acquired from the wider community such as neo-natal tetanus (Kerber et al, 2007). Approximately 15 per cent of new-born population falls sick (according to global reviews) and require facility based intensive care with 50 per cent of them (AHS 2010) seek care from private facilities within days of institutional delivery.

For such clinical care of new-borns, either there is a lack of availability and access to these health facilities or case management is usually delegated to less-skilled community health workers. With a rationale of providing primary level clinical care, Sick New-born Care Units (SNCUs) were established in NIPI focus states at district level in Phase-1.

SNCUs cater to sick new-borns primarily delivered at health institutions and to those delivered at home and referred appropriately by the community health workers. The sick new-borns after identification of their diseases and danger signs are kept at the SNCUs for at least a week and appropriately discharged and followed up for care and compliance with discharge instructions by ANMs and ASHAs.

4.2 Design of Sick New-born Care Unit Plus (SNCU+)

Many of the new-borns saved with the intensive resources at the SNCUs succumb to death or continue to remain vulnerable within few weeks of their treatment at these intensive care units because either they are not fully cured with the existing ailment or suffer from new ailments or need repeated follow-up visits. This makes it essential for a health worker to visit the discharged new-born within the first 45 days.

Sick New-born Care Unit Plus (SNCU+), the new intervention in NIPI Phase-II, is an extension of the Sick New-born Care Unit (SNCU) programme which was part of Phase-I. The intervention essentially extends the continuum of care to sick new-borns at their homes after they are discharged from receiving treatment from SNCUs up till 6 weeks of age compared to Phase-I norms of limiting the follow-up care to the facility till they the time they are discharged.

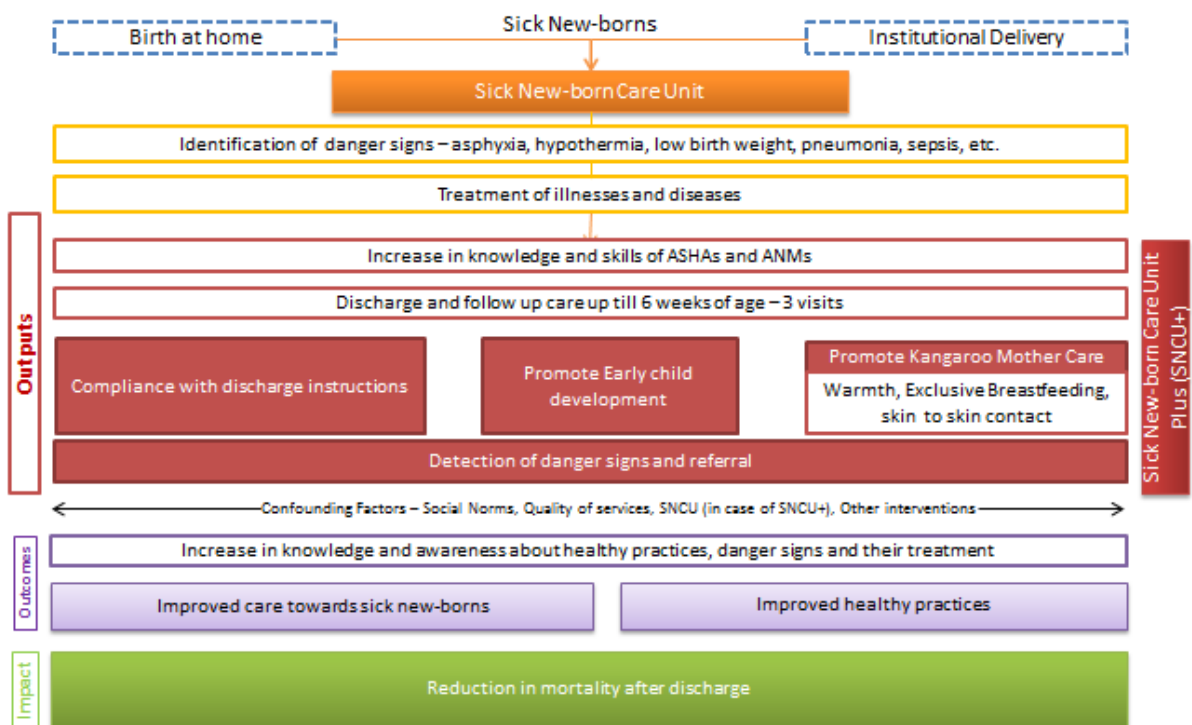
SNCU+ is expected to be implemented in thirteen NIPI districts of four focus States uniformly. However, SNCUs are still not operational in the Sheikhpura and Jehanabad districts of Bihar and plan on their expected operationalization is not yet known.

SNCU+ includes the following four key components:

- Improving and ensuring compliance with discharge instructions at both facility and community level;
- Improving continued Kangaroo Mother Care of new-borns discharged from SNCUs and initiation of play and communication;
- Improving breastfeeding practices and promoting exclusive breastfeeding; and,
- Referrals of sick new-borns to higher health facilities for further treatment upon detection of danger signs.

The follow up care will mainly be provided by ANMs since these sick new-borns need special care and counselling (in some cases by ASHAs). This will be achieved through appropriate training and provision of guidelines to ANMs and ASHAs and by establishing a monitoring and supervision system to efficiently track and follow up with the discharged sick new-borns.

This intervention by first increasing the knowledge and skills of ANMs and ASHAs, also promotes Kangaroo mother care, early child development and breastfeeding practices. This leads to improved care towards sick new-borns and healthy practices after discharge. The ultimate health impact of SNCU+ is to reduce mortality among discharged new-borns.



The evaluation assesses several underlying assumptions in the transmission channels for SNCU+:

1. Since the new-borns are still vulnerable after discharge from SNCUs, mortality among them tend to be higher, compounded by non-compliance of discharge instructions.
2. Instructions and guidance is provided at the time of discharge from SNCUs.
3. An ASHA is able to delivery key messages including compliance with key discharge instructions and danger signs and breastfeeding with her follow up visits.
4. A mother is able to translate this improved knowledge into healthy behaviour and practices.
5. ASHAs and mothers are willing and able to refer their children after diagnosis of a danger sign
6. All these help in reducing the mortality rates among discharged new-borns and have peer

learning effects in seeking intensive clinical care for new-borns.

4.3 Note for SNCU+ and SNCU Data Analysis

Baseline data regarding the primary care takers of the new-borns discharged from SNCUs was analysed with the help of data from SNCU+ Follow up survey. The follow-up survey sampled new-borns who were admitted to SNCU and discharged in the last 6 months preceding the date of survey. The total sample size for the survey was 449 sick new-borns, admitted across 11 SNCUs operational in 13 NIPI districts. The survey is limited to the treatment districts; hence, the state level indicators presented in the table above are for the treatment districts. Overall represents the programme level indicators.

Management Information System created under the SNCU programme by the implementing partners was used to identify a sample of new-borns discharged in the last six months preceding the date of survey. Out of this roster of discharged new-borns, at least 30 new-borns were selected and interviewed randomly. SNCU+ Follow up survey collected data for both the status of SNCU and components as promoted under SNCU+.

Baseline data regarding the knowledge and practices of ASHAs were analysed with the help of data from health workers survey.

Programme level indicator is available from both health worker and SNCU+ Follow up survey; however, state level overall indicator is not available for the health worker survey.

4.4 Baseline Findings for SNCU+

The section below presents the key findings, analysed from the data collected via the SNCU+ Follow up survey and the health workers survey for the key components promoted under SNCU+.

4.4.1 Programme Coverage

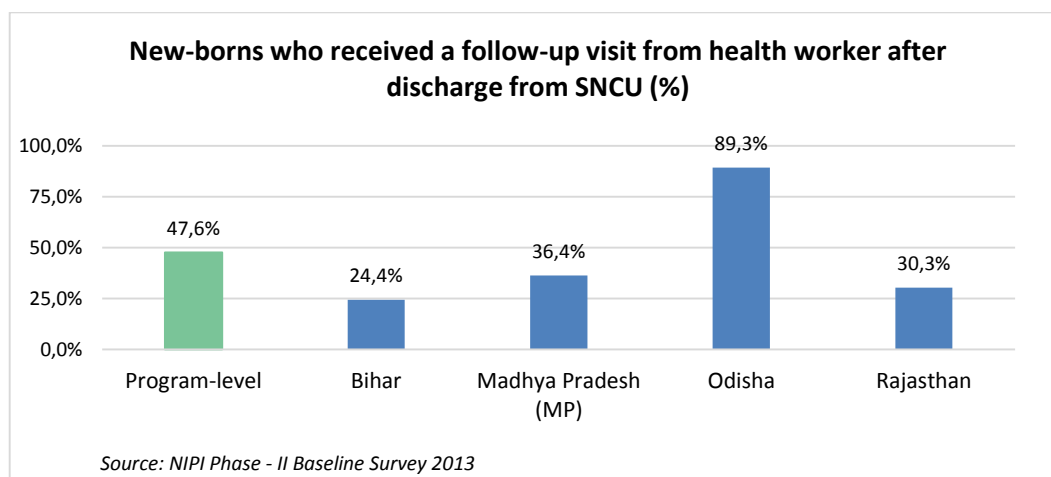
Table 4.1 below shows that less than half of the ASHAs are aware of the presence of SNCUs. This implies that the first step to making SNCU+ effective would be to increase awareness about SNCUs. However, this also implies that if ASHAs are not aware of SNCUs then the mobilisation of communities to send sick new-borns within the first few days of life especially in the case of home delivery is not effective, undermining the effectiveness and objectives of SNCUs.

Table 4.1. SNCU+ : Programme Coverage

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
% of ASHAs aware of the presence of a Sick New-born Care Unit	43.80%	300	--	--	--	--	--	--	--	--
% of ASHAs aware of follow-up visits to sick new-borns discharged from SNCUs	57.20%	137	--	--	--	--	--	--	--	--

% of ASHAs who visit sick new-borns after discharge from SNCUs	48.70%	137	--	--	--	--	--	--	--	--
% of new-borns who received a follow up visit from health worker after discharge from SNCU	47.60%	418	24.40%	41	36.40%	143	89.30%	112	30.30%	122
% of new-borns discharged from SNCU who are 6 weeks old or more, who received at least three follow up visits by 6 weeks of age	25.70%	288	0.00%	10	24.20%	124	53.60%	69	8.20%	85
Note:										
'Mean' represents the mean value of the indicator.										
'n' represents the sample size.										
Source: NIPI Phase-II Baseline Survey 2013										

Though the coverage of follow up visits to households with sick new-borns is not entirely null even though this is the baseline, this can also imply the effect of HBNC, an intervention (described in Chapter 3) from Phase-I. Less than 50 per cent of the ASHAs are aware of the follow up visits and conduct such home visits to households with sick new-borns (Table 4.1).



4.4.2 Mortality among New-borns Discharged from SNCUs

Given that SNCU+ is aimed at reducing mortality among new-borns discharged from SNCUs, the baseline data suggests that the mortality of new-borns discharged from SNCUs are low. The death rate among the new-borns who were discharged from SNCUs was 5.7 per cent. Mortality among the discharged new-borns who were not fully treated as reported by primary care givers was 16.2 per cent (Table 4.2).

Table 4.2. SNCU+ : Mortality Among Discharged New-borns

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	N	Mean	n	Mean	N	Mean	n
% of new-borns who died at the SNCU itself	6.90%	449	8.90%	45	10.10%	159	8.20%	122	0.80%	123
% of new-borns who died after discharge from SNCUs	5.70%	418	4.90%	41	10.5%	143	1.8%	112	4.1%	122

Table 4.2. SNCU+ : Mortality Among Discharged New-borns

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	N	Mean	n	Mean	N	Mean	n
Mean age at which a sick new-born died (in days)	12.2	55	7.2	6	13.1	31	7.4	12	22.2	6

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Source: NIPi Phase-II Baseline Survey 2013

4.4.3 Compliance with Discharge Instructions

Since this is the baseline for SNCU+, a significantly lower proportion of ASHAs are aware of ensuring compliance with discharge instructions for sick new-borns at programme level and gave similar advice when visiting a household with sick new-born (Table 4.3).

As shown in Table 4.3, at programme level, approximately three-fourths of the primary care takers of the new-borns admitted to SNCUs received discharge instructions or counselling regarding new-born care after being discharged from SNCUs. The estimates were significantly lower for the state of Bihar. Most of these discharge instructions or counselling for new-born care was given by the nurse at these SNCUs (50 per cent) (Table K.4).

Table 4.3. SNCU+ : Compliance with Discharge Instructions

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
% of ASHAs aware of ensuring compliance with discharge instructions for sick new-borns	7.10%	137	--	--	--	--	--	--	--	--
% of ASHAs gave advice on following the discharge instructions given by the doctor during her last visit to a household with sick new-born	24.80%	137	--	--	--	--	--	--	--	--
% of mothers who received instructions/counselling regarding care of new-born during discharge at the SNCU itself	73.70%	418	41.50%	41	75.50%	143	91.10%	112	66.40%	122

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Source: NIPi Phase-II Baseline Survey 2013

4.4.4 Danger Signs and Referral Rates

High referral rates for new-borns requiring referrals to seek further treatment on identification of illness or disease is important to reduce new-born's vulnerability to household and environmental conditions and hence, improving neo-natal mortality. Baseline data suggests that less than 20 per cent of the ASHAs at the programme level referred a sick new-born to a

higher health facility for further treatment during their last visit to the household (Table 4.4). This highlights the importance of focussing on referral components of scheduled home visits by ASHAs to sick new-borns.

Table 4.4. SNCU+ : Danger Signs and Referral Rates

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
ASHAs who knew all the danger signs ¹³ (%)	63.2%	300	--	--	--	--	--	--	--	--
% of ASHAs aware of detecting danger signs on new-borns and referring them to SNCUs	31.80%	74	--	--	--	--	--	--	--	--
% of ASHAs gave advice on danger signs in new-borns during her last visit to a household with sick new-born	14.10%	74	--	--	--	--	--	--	--	--
% of ASHAs gave advice on referrals in case of recurrence of illness symptoms during her last visit to a household with sick new-born	17.30%	74	--	--	--	--	--	--	--	--
ASHAs who knew all the danger signs mentioned above (%)	63.20%	300	--	--	--	--	--	--	--	--
% of sick new borns discharged from SNCU and referred to other health facilities for treatment	53.50%	43	88.90%	9	52.40%	21	25.00%	8	40.00%	5
New-borns who were not fully treated ¹⁴ at the SNCU, and were taken to other/higher facilities after discharge from SNCU	74.4%	43	88.9%	9	81.0%	21	37.5%	8	80.0%	6
Currently alive new-borns who were discharged from SNCUs and were referred back to government hospitals when identified with danger signs (%)	40.5%	89	7.7%	13	51.7%	29	55.6%	9	39.5%	38
Mothers who knew which facility to go to upon detection of a danger sign (%)	98.5%	394	97.4%	39	100.0%	128	97.3%	110	98.3%	117

¹³ The danger signs include baby's eyes are swollen or with pus, yellowness in the skin or eye or jaundice, cracks or redness or skin folds, pus filled pustules, very high or very low body temperature, all limbs limp, less feeding or feeding stopped, cry is weak or has stopped, distended abdomen or vomiting, pus on umbilicus and chest in drawing,

¹⁴ The new-born's mother or primary care-giver reported that the baby was 'fully treated' at the SNCU. This was not an assessment given by the SNCU staff.

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Source: NIPi Phase-II Baseline Survey 2013

4.4.5 Exclusive Breastfeeding Practices

At the programme level, a significantly lower proportion (less than 20 per cent) of the ASHAs who visited a household with sick new-born gave advice on continuing breastfeeding to mothers (Table 4.5).

The incidence of ever breastfed and exclusively being breastfed while the new-born was admitted at SNCU was very high at 97.9 per cent and 91.2 per cent respectively at programme level. However, a significantly lower proportion of the mothers immediately breastfed their infants since their birth. The high levels of practices for exclusively breastfeeding and low levels of practices for immediately breastfeeding of mothers of sick new-borns is partially explained by the respective high and low knowledge levels (Table 4.5).

The main reasons for never breastfeeding the new-born were either that the new-born was sick to take breastfeed or the mother was too sick to feed the new-born followed by mothers reporting that breast milk was not being produced by them for one or the other reason (Table K.7).

Table 4.5. SNCU+ : Exclusive Breastfeeding Practices

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
% of ASHAs gave advice on continuing breastfeeding during her last visit to a household with sick new-born	17.10%	137	--	--	--	--	--	--	--	--
Mothers who are aware of the need for exclusive breastfeeding for first six months (%)	89.1 %	394	84.6 %	39	93.8 %	128	85.5 %	110	88.9 %	117
Mothers who know that new-born should be put to breast immediately/within half an hour of birth for breastfeeding (%)	38.8%	394	0.00%	39	40.6%	128	61.8%	110	28.2 %	33
Mothers who have ever breastfed their new-born (%)	97.90%	418	92.70%	41	97.90%	143	100.00%	112	97.50%	122
Mothers who breastfed their new-born immediately/ within half an hour of birth (%)	20.30%	418	0.00%	41	22.40%	143	39.30%	112	7.40%	122
Mothers who exclusively breastfed new-born when they were admitted to SNCU (%)	91.20%	351	41.70%	24	93.10%	131	97.80%	92	95.20%	104

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Source: NIPI Phase-II Baseline Survey 2013

4.4.6 Kangaroo Mother Care

Table 4.6 below summarises the knowledge and practices of ASHAs and mothers regarding kangaroo mother care. A significantly lower proportion of ASHAs gave advice on kangaroo mother care to a mother during her last visit to a household with sick new-born. The knowledge and practice of mothers on kangaroo mother care i.e. holding new-borns between breasts in an upright position, chest to chest is very high for the programme area - both at 98.2 per cent. However, only a marginal 0.8 per cent of the women reported having practiced kangaroo mother care for at least 60 minutes in one session.

This highlights that within kangaroo mother care – the timing and the guidelines – could be stressed upon by the ASHAs during her home visits.

Table 4.6. SNCU+ : Kangaroo Mother Care

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
% of ASHAs who gave advice on kangaroo mother care during her last visit to a household with sick new-born	18.60%	137	--	--	--	--	--	--	--	--
% of mothers who think that holding baby chest to chest in an upright position is important	98.2%	394	89.7 %	39	97.7%	128	100.0%	110	100.0%	117
Mothers who held the baby between breasts in an upright position, chest-to-chest (%)	98.2%	394	89.7%	39	99.2%	128	100.0%	110	98.3%	117
Mothers who hold their baby in an upright position, between breasts, for 60 minutes or more in one session (%)	0.8%	394	2.6%	39	0.8%	128	0.9%	110	0.0%	117

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Source: NIPI Phase-II Baseline Survey 2013

4.4.7 Regular Communication and Play with New-borns

The knowledge levels of mothers on regularly playing and communicating with their children is very high at 97 per cent at the programme level. While a very high proportion of mothers talk to their children (97 per cent), nearly three-fourths of the mothers play with their children (Table 4.7).

Table 4.7. SNCU+ : Regular Communication and Play with New-borns

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
Mothers who think that regular play and communication with child is important (%):	97.00%	394	94.90%	39	99.20%	128	98.20%	110	94.00%	117
Mothers who interact with their baby in certain ways (%)										
<i>Talk to the child</i>	97.0%	394	92.3%	39	96.9%	128	97.3%	110	98.3%	117
<i>Play with the child</i>	76.7%	394	76.9%	39	80.5%	128	68.2%	110	80.3%	117

Note:
 'Mean' represents the mean value of the indicator.
 'n' represents the sample size.
 Source: NIPi Phase-II Baseline Survey 2013

4.5 Reflections on SNCUs

Table 4.8 below summarises the key findings for SNCU that data for which was collected as a part of the SNCU+ Follow up survey.

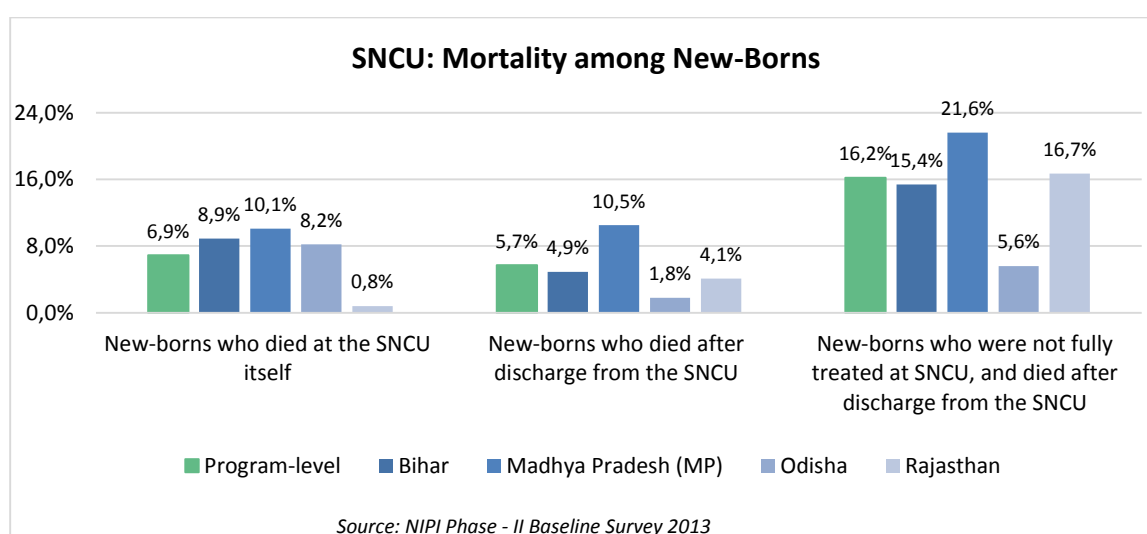
Table 4.8. SNCU: Summary of Key Findings

Indicator	Program-level		Bihar		Madhya Pradesh (MP)		Odisha		Rajasthan	
	Mean	N	Mean	n	Mean	n	Mean	N	Mean	n
Mothers who delivered at a health facility (%)	96.2%	394	97.4%	39	94.5%	128	95.5%	110	98.3%	117
New-borns who died at the SNCU itself (%)	6.9%	449	8.9%	45	10.1%	159	8.2%	122	0.8%	123
Mean age at which new-born was taken to the SNCU for treatment (in days)	1.1	449	0.4	45	1.5	159	1.2	122	0.8	123
Mean time for which new-born was admitted to the SNCU for treatment (in days)	4.2	448	5.2	45	4.7	159	3.4	122	3.9	122
New-borns who required resuscitation at birth and received it (%)	94.0%	100	83.3%	12	95.8%	24	92.9%	42	100.0%	22
New-borns admitted to the SNCU for jaundice, who received phototherapy at birth (%)	88.5%	96	100.0%	10	85.7%	35	90.5%	21	86.7%	30
New-borns who were fully treated at SNCU (%)	83.5%	449	71.1%	45	76.7%	159	85.3%	122	95.1%	123
Main reasons for discharge from SNCU, if new-born was not fully treated at SNCU (%)										
<i>Referred to other health facility for treatment</i>	53.5%	43	88.9%	9	52.4%	21	25.0%	8	40.0%	5
<i>Not fully treated but discharged on family/caretaker's request</i>	25.6%	43	11.1%	9	28.6%	21	50.0%	8	0.0%	5

<i>without referral (seek no treatment)</i>										
<i>Not fully treated but discharged by SNCU without referral</i>	20.9%	43	0.0%	9	19.1%	21	25.0%	8	60.0%	5
New-borns who were not fully treated at the SNCU were taken to Private Hospitals for advice/treatment after discharge from SNCU (%)	74.4%	43	88.9%	9	81.0%	21	37.5%	8	80.0%	6
Note: 'Mean' represents the mean value of the indicator. 'n' represents the sample size. Source: NIPI Phase-II Baseline Survey 2013										

The baseline data from SNCU+ Follow up survey suggests that facility based new-born care via SNCU has met the programme objectives to a large extent. The key findings from the baseline survey has been summarised below:

1. SNCUs are operational in 11 out of 13 NIPI districts across the four states. As per NIPI Phase-I objectives, one SNCU was to be established in each of the NIPI districts. In Bihar, SNCU is operational in only one district of Nalanda while it has yet not been established in other focus districts of Sheikhpura and Jehanabad.
2. SNCUs are established with variable quality of data records that facilitate follow-up of discharged new-borns from the SNCUs. The record keeping needs to be strengthened up to ensure new-borns are tracked easily and their records updated.
3. SNCUs were established with the rationale of providing intensive care to sick new-borns within the first few days of life and hence, reduce neonatal mortality. The death rate among new-borns admitted to SNCU is low i.e. 6.9 per cent of the sampled new-borns died at the SNCU itself. The mean age at which the new-borns were admitted to a SNCU was 1-2 days (Table K.2). A new-born was admitted to a SNCU for an average of 4-5 days (Table K.2) and then was either discharged or referred to higher health facilities for further treatment. This finding is further illustrated with the help of a chart.



4. Ninety six per cent of the new-borns who were admitted to the SNCUs for treatment were born at a health facility. This figure suggests that the targeting and mobilising of communities to bring their sick new-borns to the health facilities has not yet been achieved.

The population level data suggests that 12.2 per cent of the childbirths still take place at home where the risk of new-borns succumbing to illnesses or diseases are much higher as compared to these health facilities.

5. The main reasons¹⁵ for a new-born to be admitted to a SNCU was low birth weight i.e. weight less than 2.5 kilograms followed by asphyxia or baby not crying (Table K.3). This finding highlights the importance of mother's diet and nutrition in ensuring new-born's health in its first few days.

¹⁵ The respondents were asked to report all the main reasons i.e. illnesses or diseases upon detection of which the new-born was admitted to the SNCU for intensive care. The reasons were reported by the primary caregiver of the sampled new-born – either diagnosed by the primary caregiver or health facility provider i.e. doctors, ANMs or ASHAs.

5 Re-vitalisation of Post-Partum Family Planning (PPFP) Services

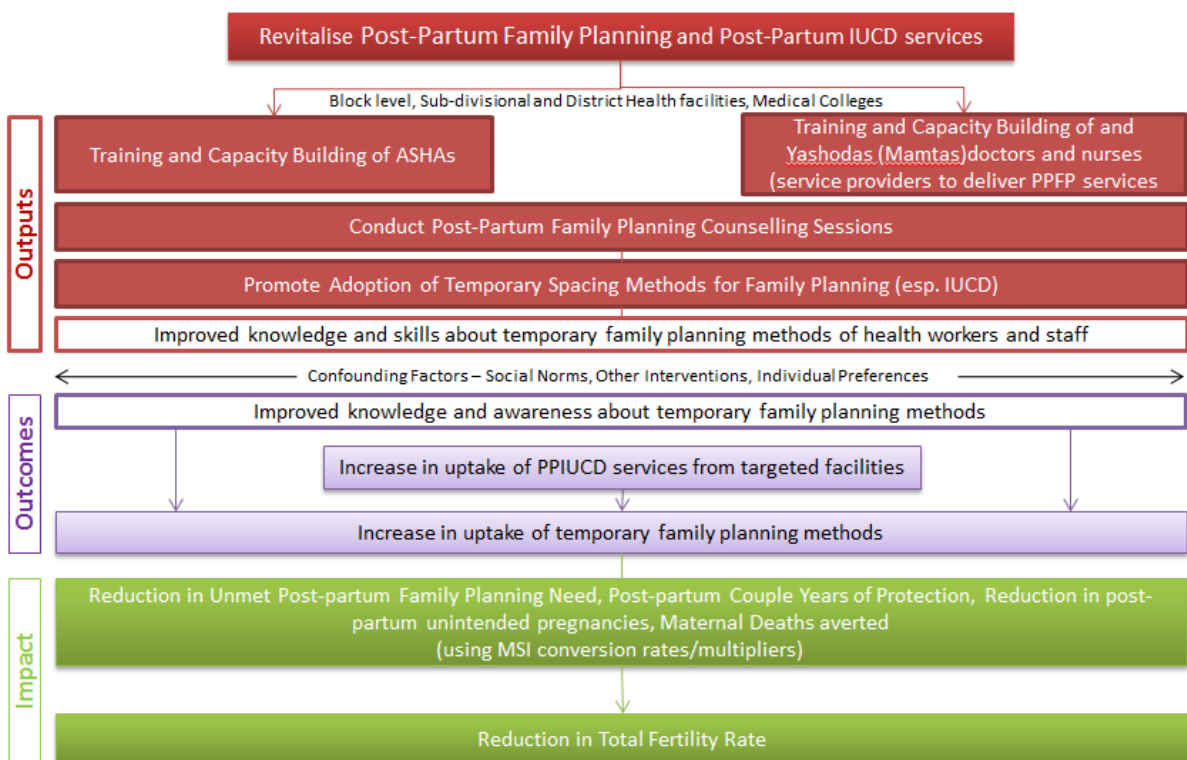
This chapter is concerned with NIPI Phase-II intervention promoting Post-Partum Family Planning methods among mothers especially the use of Post-Partum Intra-Uterine Copper Devices (PPIUCDs). This chapter presents the rationale and theory of change for revitalisation of PPFP services along with the key baseline findings.

5.1 Rationale for Re-vitalisation of Post-Partum Family Planning (PPFP) Services

NIPI has a particular focus on Post-Partum Family Planning (PPFP); i.e. family planning in the months following childbirth. This is an area of focus because there exists a particularly large knowledge gap amongst mothers about the time it takes to return to fertility and a lack of focus on this period by health workers. It is also a key period in terms of affecting health outcomes; adequate birth spacing is very important for maternal and new-born health.

With the present low uptake of post-partum family planning (PPFP) by recently delivered mothers, there is a very high unmet need for family planning along with low access to family planning methods.

The intervention aims at improving maternal health and reducing the TFR by revitalising the delivery of PPFP services at the facility level and through some key messages delivered by the community health workers. The outcomes that will be evaluated through this assignment will focus on increased awareness, knowledge, and uptake of PPFP services especially at the facility level.



5.2 Details of PFP Services

The intervention will be delivered in two main ways:

- At the facility level, delivery of PFP services (mainly involving PPIUCD, Lactational Amenorrhea Method (LAM), condoms and limiting methods of sterilisation) will be strengthened and medical staff and health workers i.e. doctors, nurses and Yashodas (Mamtas) (facility based health mobilisers) will be also be trained to deliver the services and conduct family planning counselling sessions, and
- At the community level, where ASHAs will be trained to deliver some key messages around PFP and raise awareness about availability of such PFP services at health facilities.

The intervention is, mainly focussed at the facility level, involving block level health facilities, sub-divisional, district hospitals, and medical colleges with a high delivery caseload. The key health messages are centred on the importance of birth spacing, the return to fertility and different family planning methods.

It will be implemented in thirteen NIPI districts of four focus states. Catalytic and strategic support will also be provided to the state to strengthen and scale up PFP (especially PPIUCD services) beyond the NIPI districts.

NIPI's main lever is to promote PFP among women who come to give birth in a public health facility, incentivised by the NRHM's conditional maternity benefit, Janani Suraksha Yojana (JSY). This is an example of NIPI attempting to add value to existing NRHM initiatives.

There are various assumptions in the transmission channels for this intervention that are and will be further tested during the evaluation process:

1. There is currently a lack of awareness about issues around return to fertility i.e. physiological timing of return to fertility, family planning and methods and birth spacing amongst community members
2. ASHAs and Yashodas/Mamtas have the right level of knowledge and skills to deliver appropriate counselling and awareness, and have the right motivation and incentive structure to achieve this
3. This counselling and awareness generation is sufficient to overcome the existing information deficiencies
4. There are not individual and social barriers to behavioural change that prevent changes in knowledge from translating into changes in behaviour (e.g. attitudes and norms)
5. The supply side exists so that changes in intentions can translate into changes in practices (e.g. IUCDs are available and the facilities have adequate technically skilled manpower to ensure safe and proper insertion of PPIUCD)

5.3 Baseline Findings for Re-vitalisation of Post-Partum Family Planning (PFP) Services

This section presents the baseline findings for the intervention of re-vitalisation of Post-Partum Family Planning (PFP) Services especially PPIUCD services.

5.3.1 Knowledge and Counselling Practices of ASHAs with regard to Family Planning

Table 5.1 summarises the key findings for knowledge of ASHAs in terms of family planning. A very low percentage of ASHAs are aware of the ideal gap of 2 years between two consecutive births (30.9 per cent) and duration for which a mother cannot get pregnant after delivery due to postpartum amenorrhoea (13.5 per cent said exact 6 months).

Table 5.1. PFP: Knowledge and Practices of ASHAs with regard to Family Planning

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	n
Aware of an ideal gap of at least 2 years between two consecutive births to be pregnant again (%)	25.4%	144	35.4%	156	30.9%	300
% of ASHAs who said that a woman can get pregnant exactly 6 months after their delivery	15.9%	144	11.5%	156	13.5%	300
ASHA gave advice to the mother on the use of IUCD as a post-partum family planning method during last home visit	54.6%	144	60.5%	156	57.8%	300
% of ASHAs who discuss birth spacing when they discuss family planning with women	5.6%	144	8.0%	156	6.9%	300
Mothers reporting that the motivation to use current family planning method came from ASHA (%)	31.8%	560	36.0%	617	34.2%	1177
Women reporting no post-partum family planning counselling was provided right after childbirth at the facility (%)	36.2%	2340	36.7%	2340	36.4%	4680

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

Figures reported in parentheses under the mean values of the indicators are robust standard errors clustered at PSU level.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPI Phase-II Baseline Survey 2013

Approximately half of the ASHAs ever gave advice on use of IUCD and its side-effects to a mother in her last visit. A marginal 7 per cent of the ASHAs discuss birth spacing and its benefits when they discussed family planning with the mother in her last visit (Table M.13).

Current rates of family planning counselling could be significantly improved; only 34.2 per cent of the women currently using any family planning method received any family planning advice or counselling. 63.6 per cent of women received any family planning advice or counselling right after their child was born at the facility (Table 5.1).

5.3.2 Birth Spacing

Despite the relatively low rates of counselling, levels of awareness of appropriate birth spacing were high. Nearly three-fourths of the sampled women reported that there should be at least 2 years gap between two consecutive births (although only 56.1 per cent of the women reported that there should be at least 6 months gap between an abortion and next pregnancy)

(Table 5.2). However, this high knowledge about birth spacing and its benefits of mothers is not being reflected in the birth spacing practices as only 53.1 per cent of the population reported a time gap of more than or equal to 24 months (Table 5.2).

Table 5.2. PFP: Birth Spacing

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	n
Women who reported that there should be at least 2 years gap between two consecutive births (%)	76.8%	2340	77.1%	2340	76.9%	4680
Women who reported that there should be at least 6 months gap after an abortion and before trying for next pregnancy (%)	58.3%	2340	54.2%	2340	56.1%	4680
Birth Intervals i.e. Months since preceding birth (%) ¹⁶						
7-17 months	24.7%	1440	23.5%	1384	24.1%	2824
18-23 months	22.2%	1440	20.0%	1384	21.1%	2824
24-35 months	34.0%	1440	37.5%	1384	35.8%	2824
36-47 months	9.1%	1440	10.0%	1384	9.6%	2824
48-59 months	0.5%	1440	0.5%	1384	0.5%	2824
60 months	24.7%	1440	23.5%	1384	24.1%	2824

Note:

'Mean' represents the mean value of the indicator.

'n' represents the sample size.

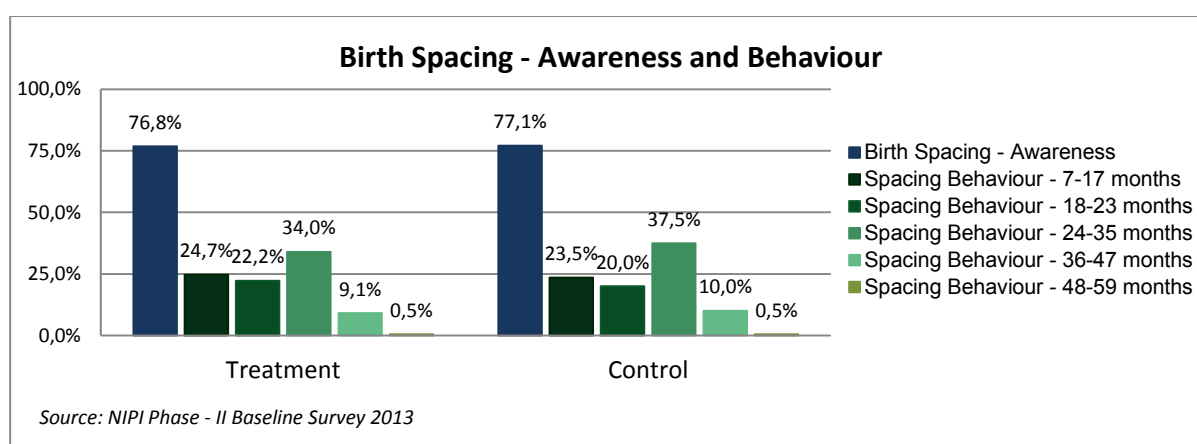
Figures reported in parentheses under the mean values of the indicators are robust standard errors clustered at PSU level.

Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.

Sample weights have been used to calculate the mean value of the indicator.

Source: NIPi Phase-II Baseline Survey 2013

The finding is further illustrated with the help of a chart below.



¹⁶ The sample size consists of total number of children of all respondents who are included in the baseline survey.

5.3.3 Family Planning – Methods and Unmet Need

The baseline survey estimates indicate that although the knowledge and awareness about family planning methods is high, use rates are considerably lower. Approximately 98.5 per cent of the sampled women are aware of any family planning method (both temporary and permanent methods). The awareness level for female sterilisation was the highest at 96.3 per cent while awareness level for Oral Contraceptive Pills (OCPs) was at 83.2 per cent, 75.6 percent for male condom, and 73.4 per cent for IUCD. However, only 29.8 per cent of the total sampled women reported ever use of any family planning method (Table 5.3). The most commonly used temporary Family Planning method is condoms (*or nirodh*) with 6.3 per cent users followed by OCPs (5.6 per cent) while use of IUCD is low at 0.7 per cent. 10.1 per cent of the women have undergone sterilisation procedure for family planning (Table 5.3).

Table 5.3. PFP: Family Planning – Methods and Unmet Need

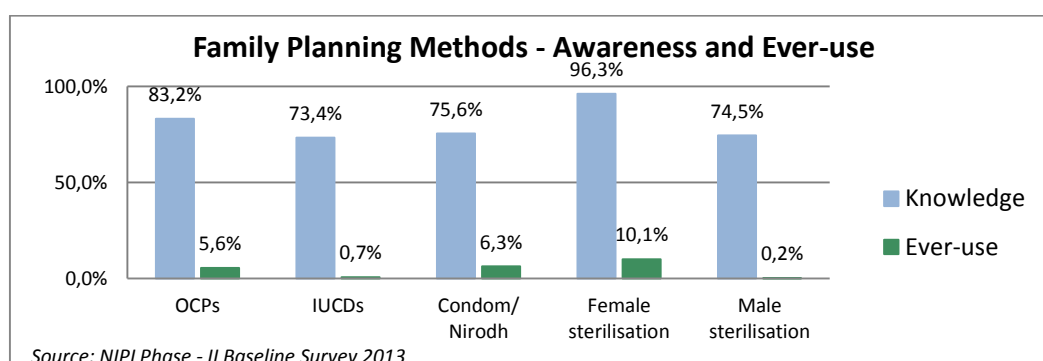
Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	n
Women who were aware of any family planning methods (%)	98.3%	2340	98.7%	2340	98.5%	4680
Women who were aware of at least three modern family planning methods (%)	88.6%	2340	89.0%	2340	88.8%	4680
Temporary family planning methods that women are aware of (%)						
<i>Oral contraceptive daily or weekly pills</i>	82.6%	2340	83.8%	2340	83.2%	4680
<i>Intrauterine contraceptive device</i>	74.8%	2340	72.1%	2340	73.4%	4680
<i>Injectable</i>	65.3%	2340	62.6%	2340	63.8%	4680
<i>Male condoms</i>	75.3%	2340	75.9%	2340	75.6%	4680
Limiting family planning methods that women are aware of (%)						
<i>Female sterilisation</i>	96.1%	2340	96.5%	2340	96.3%	4680
<i>Male sterilisation</i>	74.7%	2340	74.3%	2340	74.5%	4680
Women/their husband who have ever used any family planning methods (%)	25.9%	2340	33.3%	2340	29.8%	4680
Temporary family planning methods that women/their husband have ever used (%)						
<i>Condom/ Nirodh</i>	6.4%	2340	6.2%	2340	6.3%	4680
<i>Oral contraceptive daily or weekly pills</i>	3.3%	2340	7.6%	2340	5.6%	4680
<i>Withdrawal</i>	2.8%	2340	4.4%	2340	3.6%	4680
<i>Rhythm Method</i>	2.6%	2340	3.8%	2340	3.3%	4680
<i>Intrauterine contraceptive device</i>	0.7%	2340	0.8%	2340	0.7%	4680
Limiting family planning methods that women/their husband have ever used (%)						
<i>Female sterilisation</i>	9.5%	2340	10.6%	2340	10.1%	4680
<i>Male sterilisation</i>	0.1%	2340	0.2%	2340	0.2%	4680
Unmet need for family planning ¹⁷	14.7%	4680	15.9%	2340	13.7%	2340

¹⁷ For the calculation of the indicator 'Unmet need for family planning', the numerator constitutes women who are 'currently' (that is, at the time of the survey) not using any family planning method. The numerator would include women who are neither pregnant nor less than 6 months post-partum amenorrhic and say they want to wait at least two years for their next birth, or say they do not know whether they want another child or when they want the next child. It also includes women who are pregnant and who say that the current pregnancy was wanted later, as well as women who are less than six months postpartum amenorrhic and who say that the last birth was wanted later. The denominator used for this indicator is 'currently married women'.

Table 5.3. PFP: Family Planning – Methods and Unmet Need

Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	n
Note:						
'Mean' represents the mean value of the indicator.						
'n' represents the sample size.						
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.						
Sample weights have been used to calculate the mean value of the indicator.						
Source: NIPI Phase-II Baseline Survey 2013						

It is important to investigate this difference between knowledge and practice. Two of the possible reasons as to this difference exists are; either people do not demand family planning products and services, or they are unable to realise demand. The difference between knowledge level and practice of family planning methods is further illustrated in the chart below.



The latter – those who are unable to realise demand – is measured by unmet need. The baseline shows that unmet need is 13.7 per cent that varies little across social group or wealth quintile (Table D.4). The baseline data suggests that 36.9 per cent of the sampled population are aware of family planning but neither use a method or express that they have unmet need – i.e. they do not want to use a family planning method. This may be because they have a latent demand for child bearing, or because of other demand side barriers such as fertility preferences, fear of side effects, cultural or religious norms and gender-based barriers (Visaria et al (1999)).

The NIPI programme will both be trying to reduce the level of unmet need and increase effective demand, by changing underlying preferences and attitudes. This could be seen as realising the latent demand. There is hence, a need to focus on helping and motivating mothers and their families to realise the benefits for small and healthy family planning, overcoming social, cultural and individual barriers and tapping the latent demand for family planning and hence, increasing demand for contraceptives use by the health workers and facility staff.

There is also a need to recognise several supply side constraints such as lack of access to health facilities and contraceptive choice and demand side constraints such as cultural, social and familial barriers, lack of privacy, lack of empowerment and decision making power which limit this transfer of knowledge to behaviour and practices. The lack of female autonomy and decision-making power within a household compounded by marginal interest, involvement, and responsibility of the husband in family planning, sexual and reproductive health matters

further lead to non-realisation of family planning needs (Pachauri, 2004). These raises few questions for the design and implementation of the programme:

- If the knowledge levels of mothers are not being reflected in their behaviour and practices, then will the intervention of PFP services through counselling sessions have an impact on the outcome levels? Does this pose a question on the theory of change of this intervention?
- What could be improved in the current transmission mechanisms to ensure that the mothers adopt and translate this high knowledge into practices?

Bang et al (1999) suggests that adult males do not consider family planning as a high priority and hence, a wider consultation with the community members including women must be considered to sensitise the wider community towards the need for such preventive and promotive family planning. The key messages for ASHAs and health staff must go beyond contraceptive choice and options to benefits of family size and its implications on household poverty and other aspects.

5.3.4 PPIUCD Services

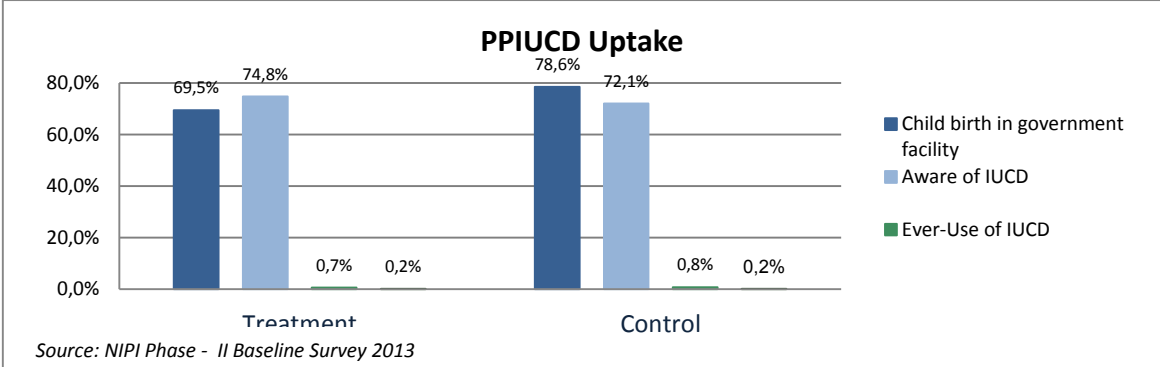
NIPi gives a major focus to promoting the uptake of IUCDs in the post-partum period. This is predominantly targeted at women who have given birth in public facilities. The baseline suggests that 74.3 per cent of women in the sample give birth in a public facility (Table J.12) validating the potential efficacy of this approach.

Seventy three per cent of sampled women report being aware of IUCD, but only 0.7 per cent of them report ever using it. Only 0.2 per cent report having received an IUCD inserted within 24 hours of the last childbirth (Table 5.4).

Table 5.4. PFP: PPIUCD Services						
Indicator	Treatment		Control		Overall	
	Mean	N	Mean	N	Mean	n
Women who gave birth to a baby in a government health facility (%)	69.5%	2340	78.6%***	2340	74.3%	4680
Women who got IUCD inserted within 48 hours of last child birth	0.2%	2340	0.2%	2340	0.2%	4680
Women who faced any side effect after insertion of IUCD to avoid pregnancy (%) ¹⁸	23.0%	4	14.8%	3	18.7%	7
Side effects faced by a woman after insertion of IUCD to avoid pregnancy (%)						
<i>Pain during intercourse</i>	18.7%	7	23.0%	4	14.8%	3
<i>Excessive vaginal bleeding</i>	23.0%	4	0.0%	3	10.9%	7
Note:						
'Mean' represents the mean value of the indicator.						
'n' represents the sample size.						
Control - Treatment Difference are represented in the 'mean' column for control area with: *significant at 10%; ** significant at 5%; *** significant at 1%.						
Sample weights have been used to calculate the mean value of the indicator.						
Source: NIPi Phase-II Baseline Survey 2013						

¹⁸ The sample size is restricted to those respondents who had IUCD inserted within 48 hours of last child birth. If a respondent had IUCD inserted beyond 48 hours, it's not considered as PPIUCD and therefore excluded from the sample size.

This gap between knowledge and practice suggests that this is a potential area where NIPI can have considerable impact, but also suggests that there are substantial barriers to uptake that are not simply solved through awareness generation. This may also be related to issues of side-effects; the sample suggests that nearly one fourth of women who used IUCD within 24 hours experienced side effects, including excessive vaginal bleeding and pain during bleeding, although the sample sizes are negligible.



6 Conclusions for Evaluation Design

Chapter two presents the evaluation approach along with the mitigation strategy given that the coverage, quality, and roll out of NIPI Phase-II interventions are unpredictable for both treatment and control areas. The mid-term assessment of the programme implementation of NIPI interventions will help finalise the evaluation design.

In this chapter, we summarise some of the key implications from the baseline findings for the evaluation design.

1. Matching of treatment and control areas is consistent and robust

Matching of treatment and control districts, sub-districts, and PSUs was undertaken before the baseline exercise to create robust counterfactuals that further form the basis for any robust estimation for difference-in-differences calculation. This becomes even more important in relation to presence of confounding factors such as HBNC in the case of evaluation of HBNC+ in both treatment and control areas. The mitigation strategy to deal with these confounding factors has been detailed in Section 2.4.3.

Conclusion: The summary matrices with the key indicators for the interventions presented in Chapter 3 and 4 (and in Annex D) clearly show that there is no statistically significant difference between treatment and control areas for the key indicators under evaluation. The few indicators with significant differences tend to be for sub-indicators (e.g. sources of money to pay for delivery) or issues tangentially related to the programme (e.g. specific sources of information provided during antenatal check-ups), but not for composite or key programme indicators. Furthermore, there is no statistically significant difference in the level of implementation of HBNC, the key confounding factor. Therefore, the matching exercise can be deemed to have been highly successful.

2. HBNC is potentially a strong confounding factor

HBNC is a major possible confounding factor on both HBNC+ (due to the overlap of targeted issues) and SNCU+ (due to the overlap in time period covered). The baseline data shows that there is no significant difference in the levels of implementation of HBNC between the treatment and control areas. However, the coverage in both areas is very low. It may be possible that the coverage increases during the NIPI Phase-II period, in a way that is not even across the treatment and control areas. If the change in coverage of HBNC is statistically different between treatment and control districts, then the interpretation and attribution of effectiveness to HBNC and HBNC+ individually will be less precise.

If the coverage of HBNC increases faster in the treatment area than in the control area, but HBNC+ is implemented at the same level in both treatment and control areas (or e.g. not at all), then it will be hard to attribute any measured difference in outcomes level to neither HBNC nor HBNC+.

In chapter 2, different techniques were outlined that could help mitigate this problem, and that of other confounding factors. These included:

- a) If the confounding factors happen in only a portion of the surveyed area, it is still possible to conduct difference-in-differences analysis by dropping the observations influenced by confounding factors and those of their matched area. This will increase the minimum

detectable effect of the evaluation but the estimates will not be representative of the whole programme area.

- b) If there are confounding factors across a large scale (e.g. a considerable increase in the coverage of NIPI Phase-I interventions) then a “third best” evaluation strategy solution would be to use propensity score matching between treatment and control areas as an ex-post evaluation strategy only, without using the difference-in-differences method. However, this evaluation strategy is weak since the time invariant observables and unobservables are then not dealt with but is the best remaining evaluation strategy if the implementation evolves in this way.

3. *Low coverage levels of Phase-I interventions raises concern for achievement of sufficient coverage for Phase-II interventions*

The low levels of HBNC implementation and non-implementation of SNCU in two treatment districts at the end of NIPI Phase-I reinforce the complexities of undertaking an effectiveness evaluation for a large-scale intervention through Government systems before high levels of coverage have been established. Because the Phase-II interventions are using similar implementation modalities (e.g. promoting home visits through ASHAs) than Phase I, there are legitimate concerns as to whether similar findings are likely to be repeated.

Chapter 2 outlined some of the ways in which the evaluation design can be amended if actual implementation diverges from planned implementation.

These include:

- Being strategic about the timing of the end line survey; making use of routine monitoring data to assess implementation coverage, intensity and duration, and potential plans to scale-up in control areas
- Using Average Treatment Effect on the Treated (ATT) estimates rather than Average Treatment Effect (ATE) estimates based on the Intention to Treat (ITT)
- Restricting the sample to areas where implementation has proceeded as planned
- Using ex-post propensity score matching rather than the difference in differences method

The midterm assessment assumes greater importance as the main opportunity to assess these issues before the end line is executed.

4. *Focusing the qualitative work more on the health workers*

As the baseline data highlights the difficulty of translating project inputs such as trainings and incentives into project outputs such as home visits, the end line qualitative work should focus more on understanding issues around the broader motivation and incentive framework facing frontline health workers, to enable better interpretation if findings are replicated at the end line.

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Annex A Glossary and Definitions

Terms	Definitions
Contraceptive Prevalence Rate	Contraceptive prevalence rate is the proportion of women of reproductive age who are using (or whose partner is using) a contraceptive method at a given point in time. (<i>Source: WHO</i>)
Couple Years of Protection (CYP)	CYP is the estimated protection provided by contraceptive methods during a one-year period, based upon the volume of all contraceptives sold or distributed free of charge to clients during that period. (<i>Source: USAID</i>)
Infant Mortality Rate (IMR)	Number of deaths occurring in the in the first 11 months per 1000 live births (<i>Source: DHS</i>)
Neonatal Mortality Rate (NMR)	Number of deaths occurring in the first 30 days per 1000 live births (<i>Source: DHS</i>)
Perinatal period	The perinatal period commences at 22 completed weeks (154 days) of gestation and ends seven completed days after birth. (<i>Source: WHO</i>)
Perinatal Mortality	Perinatal mortality refers to the number of stillbirths and deaths in the first week of life (<i>Source: WHO</i>)
Post-partum Amenorrhea	Waiting time till the resumption of menstruation, after child birth (<i>Source: Centre for Demography and Ecology, University of Wisconsin-Madison</i>)
Postpartum family planning (PPFP)	The prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth (<i>Source: WHO</i>)
Total Demand for Family Planning	The sum of contraceptive prevalence and unmet need (<i>Source: UN</i>)
Under five Mortality Rate	Number of deaths at age 0-5 years per 1000 live births (<i>Source: DHS</i>)
Unmet Need for Family Planning	Women with unmet need are those who are fecund and sexually active but are not using any method of contraception, and report not wanting any more children or wanting to delay the next child. (<i>Source: WHO</i>)

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