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# MCSP Nepal

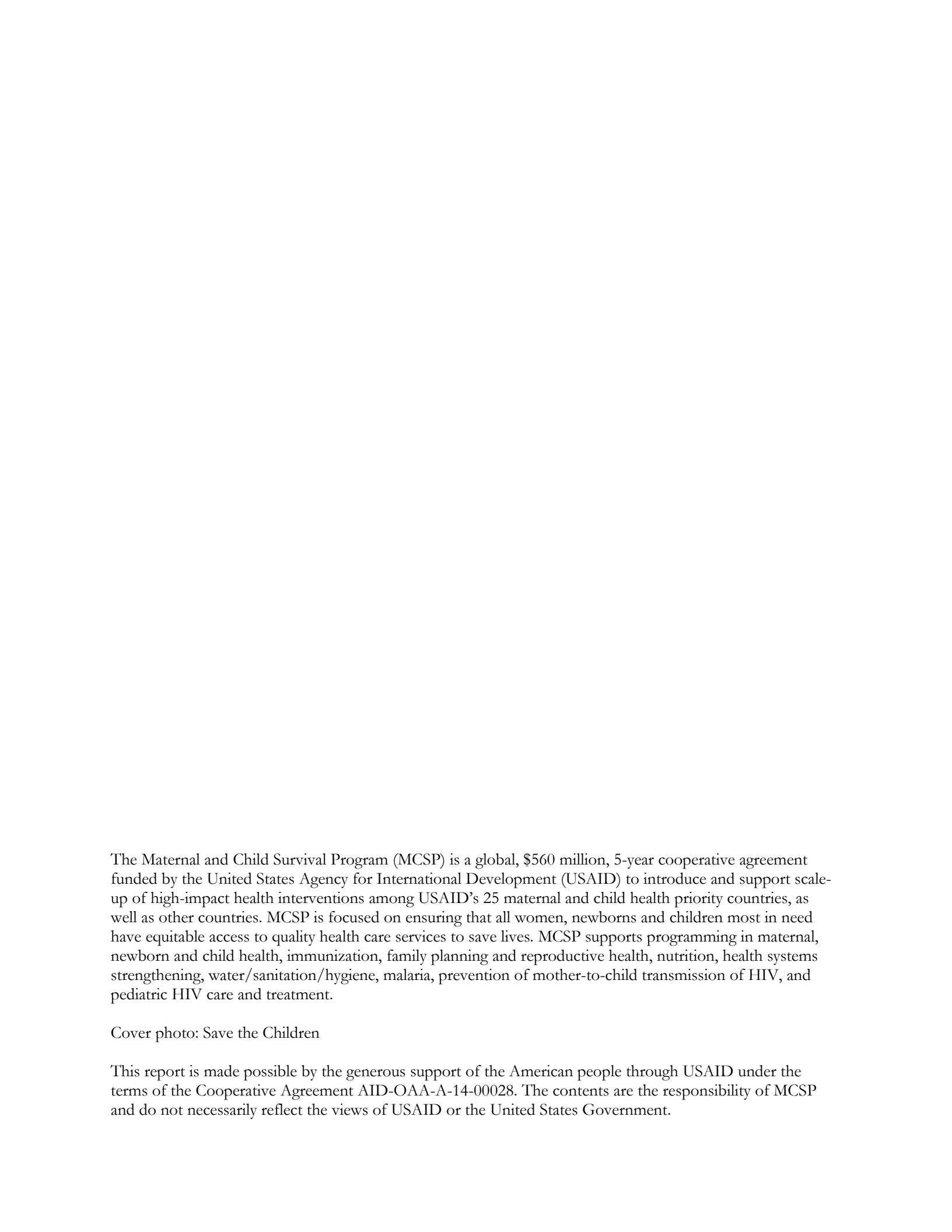
## End of Project Report

December 2016–June 2019

Submitted on:  
August 13, 2019

Submitted to:  
United States Agency for International Development  
Cooperative Agreement #AID-OAA-A-14-00028

Submitted by:  
Maternal and Child Survival Program



The Maternal and Child Survival Program (MCSP) is a global, \$560 million, 5-year cooperative agreement funded by the United States Agency for International Development (USAID) to introduce and support scale-up of high-impact health interventions among USAID's 25 maternal and child health priority countries, as well as other countries. MCSP is focused on ensuring that all women, newborns and children most in need have equitable access to quality health care services to save lives. MCSP supports programming in maternal, newborn and child health, immunization, family planning and reproductive health, nutrition, health systems strengthening, water/sanitation/hygiene, malaria, prevention of mother-to-child transmission of HIV, and pediatric HIV care and treatment.

Cover photo: Save the Children

This report is made possible by the generous support of the American people through USAID under the terms of the Cooperative Agreement AID-OAA-A-14-00028. The contents are the responsibility of MCSP and do not necessarily reflect the views of USAID or the United States Government.

# Acknowledgments

The MCSP Nepal work plan was revised in 2018 to include two MCSP Core-funded newborn health activities also being undertaken in Nepal, in addition to USAID Nepal's field-funded implementation activities. To adequately reflect progress against all three activities, this report has been divided into two key sections: the first one dedicated to the field-funded work on possible severe bacterial infection, and the second dedicated to the Core-funded activity streams included in the work plan.

For the field-funded stream, MCSP would like to thank Nepal's Ministry of Health and Population (MOHP), Family Welfare Division (FWD), Kavre District Health Office, IMNCI Technical Committee, and USAID for their invaluable support and guidance; New ERA for conducting the national survey; and Contraceptive Retail Sales for providing support with implementation of the pilot in Kavre district. We also thank the medicine shop providers and physicians for their participation, and the Nepal Chemists and Druggists Association (NCDA) for its support in providing a list of medicine shops for the survey and pilot. We are also grateful to Dhulikhel Hospital for its continued support as a referral center and as a technical advisory group member.

For the Core-funded stream, MCSP is grateful to Nepal's MOHP, FWD, and USAID for their invaluable support and guidance on both of the activities reported in this document. For the situation analysis of inpatient care, MCSP would like to specifically thank Dr. Dipendra Raman Singh (director of Quality Measurement and Regulation Division, MOHP), Dr. R.P. Bichha (director, FWD), Mr. Deepak Jha (senior public health officer, FWD), Lydia Wisner (study coordinator), technical advisory group members, and the data collectors and managers. MCSP also thanks Mr. Jhalak Sharma Paudel (director of the National Health Training Center) for his support.

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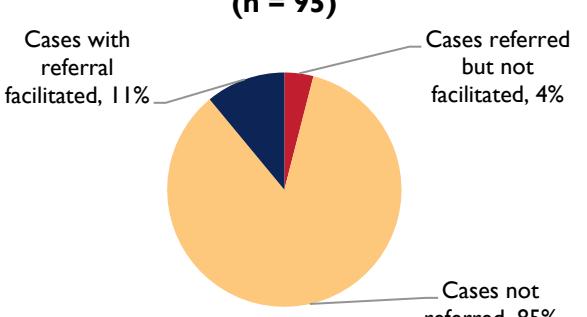
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# Abbreviations

BEmONC	basic emergency obstetric and newborn care
CHD	Child Health Division
CRS	Contraceptive Retail Sales
DDA	Department of Drug Administration
DoHS	Department of Health Services
ENAP	Every Newborn Action Plan
ENC	essential newborn care
FHD	Family Health Division
FWD	Family Welfare Division
IMNCI	integrated management of newborn and childhood illness
KMC	kangaroo mother care
MCSP	Maternal and Child Survival Program
MNH	maternal and child health
MOHP	Ministry of Health and Population
NDHS	Nepal Demographic and Health Survey
NHTC	National Health Training Center
NYI	newborn and young infant
PSBI	possible severe bacterial infection
SBA	skilled birth attendant
SNCU	Special Newborn Care Unit
SNL	Saving Newborn Lives
SSBH	Strengthening Systems for Better Health
USAID	US Agency for International Development
WHO	World Health Organization

# Country Summary

	<p><b>Geographic Implementation Areas</b></p> <p><b>Provinces</b></p> <ul style="list-style-type: none"> <li>1/7 (14.3%) Province 3</li> </ul> <p><b>Districts</b></p> <ul style="list-style-type: none"> <li>1/77 (1.3%) Kavre</li> </ul> <p><b>Facilities</b></p> <ul style="list-style-type: none"> <li>57/24,855 (0.2%) medicine shops</li> </ul>	<p><b>Population</b></p> <p><b>Country</b></p> <ul style="list-style-type: none"> <li>2,988,133</li> </ul> <p><b>MCSP supported areas</b></p> <ul style="list-style-type: none"> <li>395,124</li> </ul>																										
<b>Technical Areas</b> Newborn health																												
<p><b>Program Dates</b> December 2016–June 2019</p> <p><b>Cumulative Spending through Life of Project</b> Possible severe bacterial infection (PSBI): Field \$500,000 + Core \$55,376 = \$555,376 Newborn: Core \$72,311</p> <p><b>Demographic and Health Indicators</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; background-color: #002b36; color: white;">Indicator</th> <th style="text-align: left; background-color: #002b36; color: white;"># or %</th> </tr> </thead> <tbody> <tr> <td>TFR (births per woman)</td> <td>2.3</td> </tr> <tr> <td>MMR (per 100,000 live births)</td> <td>239</td> </tr> <tr> <td>NMR (per 1,000 live births)</td> <td>21</td> </tr> <tr> <td>U5MR (per 1,000 live births)</td> <td>39</td> </tr> <tr> <td>Percentage delivered in health facility</td> <td>57.4%</td> </tr> <tr> <td>Percentage delivered in private health facility</td> <td>10.2%</td> </tr> <tr> <td>Percentage of births with a postnatal check during the first 2 days after birth</td> <td>56.8%</td> </tr> <tr> <td>First PNC visit for newborn sought at private sector</td> <td>9.8%</td> </tr> </tbody> </table> <p>Source: Nepal Demographic Health Survey 2016</p>	Indicator	# or %	TFR (births per woman)	2.3	MMR (per 100,000 live births)	239	NMR (per 1,000 live births)	21	U5MR (per 1,000 live births)	39	Percentage delivered in health facility	57.4%	Percentage delivered in private health facility	10.2%	Percentage of births with a postnatal check during the first 2 days after birth	56.8%	First PNC visit for newborn sought at private sector	9.8%	<p><b>Strategic Objectives through the Life of Project</b></p> <ul style="list-style-type: none"> <li>Support the Government of Nepal to reduce newborn deaths from PSBI by documenting and disseminating key information on care practices in private-sector drug shops and clinics, and improving the quality of care for PSBI cases presenting to private medicine shops/clinics.</li> <li>Describe the national enabling environment for service implementation and quality of inpatient care for newborns and young infants, describe facility readiness to provide inpatient care for newborns and young infants, and describe issues related to WHO-defined indicators for quality of care for newborns and young infants.</li> <li>Audit the existing training modules available in Nepal that target improved care for women and newborns around the continuum of care, describe variations in the training content, and generate recommendations on strengthening integrated and standalone MNH training programs in Nepal.</li> </ul> <p><b>Highlights through the Life of Project</b></p> <ul style="list-style-type: none"> <li>Conducted a nationally representative survey providing, for the first time, a definitive picture of the current provision of outpatient PSBI care for newborns in the private sector.</li> <li>Completed a pilot to improve quality of care for PSBI among private-sector providers that was implemented with providers from 57 outlets in Kavre district.</li> <li>Supported the Ministry of Health and Population to conduct a situation analysis to understand the landscape of inpatient care currently provided for sick newborns and young infants in Nepal.</li> </ul>	<p><b>Cases of sick young infants ages 0–2 months identified as possible severe bacterial infection (n = 95)</b></p>  <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th>Category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Cases not referred</td> <td>85%</td> </tr> <tr> <td>Cases with referral facilitated</td> <td>11%</td> </tr> <tr> <td>Cases referred but not facilitated</td> <td>4%</td> </tr> </tbody> </table>	Category	Percentage	Cases not referred	85%	Cases with referral facilitated	11%	Cases referred but not facilitated	4%
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# Section I: Field-Funded Possible Severe Bacterial Infection Work

## Executive Summary

The Government of Nepal is committed to the global Every Newborn Action Plan agenda. Nepal's Every Newborn Action Plan 2015 aspires to reduce newborn deaths to 18.9 per 1,000 live births by 2020 and to 10.9 by 2035. To achieve these goals, Nepal needs to strengthen the community-based integrated management of neonatal and childhood illness (CB IMNCI) program and implement a package for newborn care to address the major causes of neonatal deaths, including proper care of the mother during pregnancy. Improving quality of care of sepsis management both in the public and private sectors requires more attention, given the burden of newborn deaths as a result of possible severe bacterial infection (PSBI).

From 2016 to 2019, MCSP Nepal collaborated with the Ministry of Health and Population (MOHP) to develop and test strategies to empower private providers to deliver high-quality care for sick newborns and young infants. This included exploring safety and quality of care, promoting access to and use of clinical protocols, and establishing functional mechanisms to facilitate timely and reliable referral for more critical cases.

In 2017, MCSP Nepal undertook a national survey of private medicine shops in 25 districts to examine the role of private medicine shops in treatment of sick young infants with PSBI. It identified several problems with quality of care. Survey findings indicated that a large proportion of private-sector providers were caring for sick young infants, nearly half of medicine shops were unregistered, a notable proportion of private providers surveyed had not been trained in the latest protocols for caring for sick young infants, and appropriate referral and follow-up were lacking. With many shop providers managing sick young infants with limited knowledge and skills, there was an urgent need for interventions aimed at improving quality of care in the private sector.

Thus, the MOHP Child Health Division<sup>1</sup> and other key stakeholders agreed that it would be worthwhile to develop an intervention to improve the quality of care for treatment of sick young infants and to test the intervention in a proof-of-concept approach within medicine shops and private clinics. The pilot was conducted from June 2018 through February 2019 among a sample of facilities in Kavrepalanchok (Kavre) district.

The findings and lessons learned from this activity are intended to help the government develop strategies for short- and long-term interventions for improving the management of sick young infants in the private sector.

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<sup>1</sup> The Child Health Division and Family Health Division merged in July 2018 to form the Family Welfare Division.

# Introduction

Nepal has made significant progress in reducing child mortality to 39 per 1,000 live births in 2016,<sup>2</sup> but despite this progress, the 2016 Nepal Demographic and Health Survey (NDHS) estimated that neonatal mortality contributed to 54% of under-5 mortality. Furthermore, one of the leading causes of newborn deaths in Nepal is neonatal infection (sepsis), which is preventable and treatable. Nepal's Every Newborn Action Plan (ENAP) aspires to reduce newborn deaths to 18.9 per 1,000 live births by 2020 and to 10.9 by 2035.<sup>3</sup> To do so, improving quality of infection management requires more attention, given the burden of newborn deaths resulting from PSBI.<sup>4</sup>

The private sector accounts for the largest proportion of PSBI cases treated in Nepal. According to the 2016 NDHS, 74% of caretakers who sought care for children under 5 years old with acute respiratory infection or diarrhea went to the private sector, mostly to private pharmacies or private clinics. However, nationally representative data on the quality and appropriateness of care for sick young infants provided in the private sector have been limited. In 2016, Save the Children's Saving Newborn Lives (SNL) program supported the Child Health Division (CHD) of the Department of Health Services (DoHS) to carry out a situation analysis of the management of PSBI cases in drug shops in six districts<sup>5</sup> of Nepal. The study identified several concerns related to quality of care (, such as inaccurate and potentially dangerous weighing/dosing, and use of steroids for treatment of sick young infants, but it also revealed promising opportunities for improvements.

USAID Nepal requested that MCSP build on the SNL situation analysis and coordinate a large, nationally representative survey to provide a more definitive picture of the current provision of outpatient PSBI care for newborns in the private sector. The survey was conducted in a representative sample of 25 districts between June and July 2017. Criteria for appropriate assessment, treatment, referral, and follow-up were defined in line with national guidelines to characterize management of sick young infants ages 0–2 months with PSBI. Ultimately, 400 shops that managed and treated sick young infants with antibiotics were interviewed, and 82 interviews were completed at physician-run private clinics. Implications and recommendations for the country were then identified by key stakeholders.

From these findings, MCSP Nepal developed an intervention for improving the quality of care for treatment of sick young infants and tested the intervention in a proof-of-concept approach within private medicine shops and clinics. Under leadership of the CHD and the district public health office in Kavre district, MCSP implemented a pilot that included training, provision of necessary equipment, and a strengthened referral system that links a provider with a practicing physician at the referral hospital and allows for mobile consultations (since the gold standard of care is referral). Providers should provide treatment only if referral is not possible or refused. During implementation from June 2018 through February 2019, 222 sick young infants were reported, of which 43% were identified with PSBI. Importantly, none of the medicine shops or clinics adhered to the complete protocol for treatment of the PSBI cases. However, several promising learnings emerged from the study related to how to better motivate, train, and support private providers to manage PSBI per national protocol. These results will enable the Ministry of Health and Population (MOHP) and the private sector to work together to provide lifesaving treatment for sick young infants at the points of care.

MCSP Nepal started in December 2016 and ended in June 2019. The goal of MCSP Nepal was to support the government to reduce newborn and young infant (NYI) deaths from PSBI by documenting and disseminating information on care practices in private-sector drug shops and clinics, then implementing a pilot to improve the quality of care for PSBI cases presenting to private medicine shops/clinics in Kavre district.

<sup>2</sup> MOHP, New ERA, ICF. 2017. *Nepal Demographic and Health Survey 2016*. Kathmandu: MOHP.

<sup>3</sup> MOHP. 2016. *Nepal's Every Newborn Action Plan*. Kathmandu: MOHP.

<sup>4</sup> The World Health Organization defines the clinical signs of PSBI as fast breathing (respiratory rate  $\geq 60$  breaths/minute), severe chest in-drawing, fever (temperature  $\geq 38$  °C), hypothermia (temperature  $< 35.5$  °C), no movement at all or movement only on stimulation, feeding poorly or not feeding at all, and convulsions.

<sup>5</sup> Sankhuwasabha, Kathmandu, Dailekh, Morang, Rautahat, and Kailali were the sic districts covered by the SNL study.

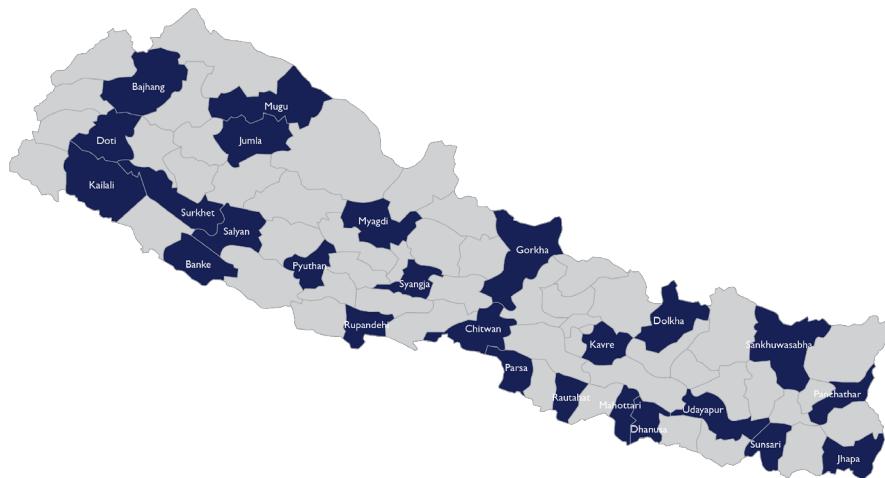
# Major Accomplishments

Data from the 2016 NDHS highlighted that health advice and/or treatment were sought from pharmacies and private clinics for 65% of sick children under age 5. There was a strong need to dig deeper on how these providers manage PSBI for NYIs. At the direction of USAID and the CHD, which later became the Family Welfare Division (FWD) after the 2018 transition to federalism, MCSP Nepal developed a program to generate evidence on care for sick young infants ages 0–2 months in the private sector.

## National Survey

A national survey was conducted in a representative sample of 25 districts to understand the practice of private-sector service providers for management of PSBI for children under 2 months (see Figure 1). This survey built upon the foundation of the six-district explorative study done through the SNL program and was conducted between June and July 2017. Private shops and clinics were oversampled in four districts<sup>6</sup> targeted for future work to improve quality of management of sick young infants in the private sector.

**Figure 1. Map of Nepal showing survey districts, June–July 2017**



## Methods

Multistage sampling was used to select medicine shops and physician-run private clinics. In partnership with CHD, 25 districts across the country were purposively selected. District distribution was considered to ensure representation from all ecological and developmental regions across the country. Lists of shops in each district were obtained from the Department of Drug Administration (DDA), the Nepal Chemists and Druggists Association, and Contraceptive Retail Sales (CRS). These lists were updated in collaboration with district public health offices and local key informants to triangulate information obtained on the number of private medicine shops in different locations. The final list, which included both registered and unregistered shops, was then clustered into proximal, semiproximal, and remote. In the second stage, clusters in each of the 25 districts were selected randomly, followed by the selection of medicine shops at the next stage.

In the final stage, the service provider most often providing service at the shop was selected for an interview.

### Box 1. Operational Definitions

#### Medicine shops:

- Sell medicine with/without prescription.
- Service providers may or may not examine/treat patient.
- Physician is not the main service provider.
- Physician may or may not be the owner of the shop.

#### Private clinics:

- May or may not be associated with a medical shop.
- Physician is the main service provider or visits the clinic at least 4 days/week.
- Physician examines and treats patients.

<sup>6</sup> Kavre, Rupandehi, Gorkha, and Chitwan were the four districts oversampled. MCSP had plans to conduct a small pilot in Kavre district with support from USAID to demonstrate proof of concept.

For private clinics, the sampling frame was constructed in each of the 25 districts using the records from district health offices and information from key informants.

Medicine shops in each district were then divided into three strata by closeness to a hospital: proximal (within 30 minutes from the identified referral hospital), semiproximal (30–60 minutes from the hospital), and remote (> 1 hour from the hospital). Ultimately, 400 shops that managed and treated sick young infants with antibiotics were interviewed and stratified (200 proximal, 100 semiproximal, and 100 remote). 82 interviews were completed at physician-run private clinics due to unexpected limited presence, particularly in the more rural hill and mountain districts, and refusal from some physicians to provide consent for an interview. Further information regarding sampling methodology can be found in the final program report [here](#).

## Analysis

Criteria for appropriate assessment, treatment, referral, and follow-up were defined to characterize management of sick young infants ages 0–2 months with PSBI (Table 1). Weights were applied in the analysis of medicine shops following the standard method to make it a nationally representative sample.

**Table 1. Criteria for appropriate management of sick young infants ages 0–2 months**

Domain	Criteria for assessing appropriateness
<b>Assessment</b>	<ol style="list-style-type: none"> <li>1. Assess for at least four signs of PSBI.</li> <li>2. Use appropriate equipment (timer/watch or stethoscope and thermometer).</li> <li>3. Cite at least four correct signs of PSBI to identify those who need injectable antibiotics.</li> </ol>
<b>Treatment</b>	<ol style="list-style-type: none"> <li>1. Use of appropriate first-line injectable antibiotic (gentamycin).</li> <li>2. Avoid using injectable steroid for PSBI cases.</li> <li>3. Use correct weighing and dosing method.</li> <li>4. Prescribe at least 7 days of injectable antibiotics.</li> </ol>
<b>Referral</b>	<ol style="list-style-type: none"> <li>1. Refer to a specific hospital.</li> <li>2. Pre-referral administration of appropriate injectable antibiotics</li> <li>3. Undertake referral facilitating acts (organizing transport, calling ahead to receiving facility, etc.).</li> </ol>
<b>Follow-up</b>	<ol style="list-style-type: none"> <li>1. Follow up nonreferred cases at least on day 3 and 5 of treatment.</li> <li>2. Give appropriate advice to parents or guardians before starting the treatment.</li> <li>3. Follow up on infants who do not return for treatment as expected.</li> </ol>

## Key Results from National Survey

**Provider demographics:** Most medicine shops (84%) were staffed by paramedics, and almost 70% had a community medical assistant or health assistant. Almost all medicine shops reported being open 7 days per week. The majority of medicine shops did not have a physician available at any time, and 10% had a visiting physician. Only 55% of medicine shops were registered with the DDA; in semiproximal and remote areas, the proportion registered was much lower (Table 2). About 15% of medicine shop providers and 34% of clinic physicians reported also working in public-sector health facilities.

**Table 2. Profile of medicine shops and clinics**

Variable	Medicine Shops				Clinics
	Proximal	Semiproximal	Remote	Total	
1. DDA registration	74%	36%	34%	55%	NA
2. Paramedics as service providers	82%	86%	84%	83%	NA
3. Open 7 days/week	98%	96%	90%	95%	83%
4. Training in IMNCI	33%	23%	20%	27%	49%

**Table 3. Composite index of key findings**

<b>Key Indicators from Survey</b>	<b>Shops (N = 400)</b>	<b>Clinics (N = 82)</b>
Correct indications of at least four signs of PSBI	72%	98%
Use IMNCI guideline	15%	46%
Use appropriate equipment	98%	99%
Assess at least four severe signs as per WHO	66%	71%
<i>Appropriate assessment</i>	10%	32%
	<b>Shops (N = 81)</b>	<b>Clinics (N = 38)</b>
Correct indication for injectable antibiotic	56%	100%
Use of appropriate injectable	66%	45%
Not using steroids	56%	71%
Correct weighing for dosing	2%	24%
Appropriate dose, frequency, and duration	11%	16%
<i>Appropriate treatment</i>	0%	5%
Correct indication of severe illness for referral	76%	89%
Facilitate during referral	73%	81%
Appropriate pre-referral injectable	4%	5%
<i>Appropriate referral</i>	0%	4%
Follow-up of nonreferred cases on at least day 3 and 5	53%	46%
Appropriate advice to parents	33%	70%
Follow-up of infants who do not return as expected	42%	33%
<i>Appropriate follow-up</i>	5%	15%

**Management of sick young infants:** Participation in integrated management of newborn and childhood illness (IMNCI) training was reported by 27% of medicine shop providers and 49% of clinic physicians; medicine shop providers in remote areas had less training than those in proximal areas. Both clinic physicians and medicine shop providers reported managing sick infants under 2 months old in the last 6 months, although caseloads were highly variable. The majority of sick infants seen in medicine shops and clinics were between four and eight weeks old.

**Assessment:** Both private clinics and medicine shops reported the use of reference materials for assessment, though clinic physicians more commonly reported use of IMNCI manuals. Most providers reported routinely assessing temperature, respiratory rate, and breathing. Overall, based on their responses, just 10% of medicine shop providers and 32% of clinic physicians met the criteria for appropriate assessment, with the largest performance gaps seen in use of the IMNCI guidelines and identifying at least four signs of PSBI.

**Treatment:** Almost all providers reported giving oral antibiotics for PSBI in the previous 6 months, and 20% of medicine shop providers and 46% of clinic physicians said they also used injectable antibiotics. IMNCI guidelines recommend gentamycin and ampicillin as first-line treatment, and amoxicillin and gentamycin for outpatient treatment where referral is not possible. The survey found that the majority of providers reported prescribing amoxicillin as the first-line treatment.

Of those that reported providing injectables, 66% of medicine shop providers and 45% of clinic physicians reported providing appropriate injectables. However, overall appropriate treatment practices (using injectable antibiotics; using appropriate first-line antibiotics; not using injectable steroids; correct weighing and dosing practices; appropriate dose, frequency, and duration) were reported by only 5% of clinic physicians and none of the medicine shop providers.

**Referral:** In general, more than three-quarters of both medicine shop providers and clinic physicians reported correct indications for determining the need for hospital referral. All providers identified a specific referral facility, usually a public hospital (68% of medicine shop providers and 62% of clinic physicians) or a private hospital (24% of medicine shop providers and 34% of clinic physicians). Overall, no medicine shop providers and only 4% of clinic physicians performed all recommended pre-referral activities (correct indication of severe illness, facilitation of referral, and appropriate pre-referral injectable).

Approximately one-half of providers reported routinely giving a pre-referral dose of oral antibiotics. Considerably fewer reported providing appropriate pre-referral injectable antibiotics (4% of medicine shop providers and 5% of clinic physicians). Many medicine shop providers in remote areas reported giving pre-referral injectable antibiotics, but only few of them reported facilitating the referral, particularly in terms of helping to arrange transport.

**Follow-up:** Appropriate follow-up practice consists of following up with nonreferred sick young infants on the third and fifth days, providing proper advice to parents or guardians before starting treatment, and following up on infants who do not return for treatment as expected. Around one-half of all providers reported that they followed up on nonreferred young infants on the recommended days. However, more than one-half of medicine shop providers and two-thirds of clinic physicians reported that they did not take any action to check on infants who did not return for follow-up. Overall, very few of the medicine shop providers (5%) and clinics (15%) practiced all appropriate measures of follow-up and counseling.

## Implications

A large proportion of private-sector providers in Nepal are caring for sick young infants, so there is an urgent need for interventions aimed at improving quality of care in the private sector. While half of physician-run clinics have trained providers, only a small proportion of medicine shops have providers trained on IMNCI protocol, so many shop providers with limited knowledge and skills are managing sick young infants. Orienting private-sector providers on national IMNCI guidelines could improve existing service delivery. In trainings, more emphasis should be placed on recognizing danger signs in young infants to ensure immediate referrals are made to appropriate facilities. Engaging the pharmaceutical industry will be critical to ensuring sustainable logistics and supply chains that guarantee availability of appropriate drugs, supplies, and commodities to provide care to sick young infants.

Key findings were shared with key stakeholders nationally and globally, allowing for stronger in-country support of implications, cross-country sharing of experiences, and identification of considerations for the pilot. These were included in a meeting with the IMNCI technical committee in October 2017, at a global Save the Children newborn health meeting in Indonesia in November 2017, in a Save the Children International Asia regional webinar in December 2017, and in a global webinar in Washington, DC, in August 2018 with USAID, MCSP partners, and colleagues.

In addition, in June 2018, the director of CHD chaired an event in Kathmandu, under the auspices of the director general of DoHS, the director of the Family Health Division (FHD), and USAID representatives, to discuss the results. Attendees acknowledged that the survey findings can serve as important reference material in relation to newborn health and the private sector. A few important next steps were identified by participants to further disseminate and improve uptake of results, including identifying other dissemination platforms, including technical groups and steering committees under the MOHP; sharing the findings with

the DDA; and, further refining the recommendations to reflect on the implications identified from the findings.

This survey helped fill the vacuum of information on PSBI management in the private sector. Survey data provided, for the first time, a comprehensive overview of demographics, skills, practices, and expectations of private medicine shop and clinic providers who are delivering critical treatment to sick infants. This information is important for government agencies, corporations, and implementing partners when looking to engage the private sector to improve newborn health, particularly the quality of care for sick young infants, and ultimately meet Nepal's ENAP and Sustainable Development Goal targets. In addition, in designing this survey, MCSP Nepal engaged a wide consortium of partners from across the nonprofit, government, and private sectors, ensuring their buy-in for future interventions from an early stage. Lastly, this survey suggests that other countries may wish to undertake similar work to assess private-sector management of PSBI to address a global knowledge and capacity gap.

## **PSBI Pilot in Kavre District**

The survey also provided an important benchmark against which to develop an intervention for improving management of sick young infants and to test the intervention in a proof-of-concept approach within facilities belonging to the existing CRS network. CRS was identified as a future implementing partner during many early discussions with USAID and CHD, largely due to the Sangini Network, a social franchising network of over 3,000 medicine shops across Nepal that is funded by USAID. Partnering with CRS granted MCSP access to this network of medicine shops in the pilot area.

From June 2018 through February 2019, MCSP Nepal piloted a training program to improve the clinical practice of individual private-sector service providers. As part of the pilot, a mapping exercise of all private-sector outlets in Kavre was completed. Sources of information for the mapping exercise included consultations held with district stakeholders, the list of Sangini Network outlets from CRS, and records of outlets from the national PSBI survey sample frame. Mapping these outlets in Kavre served as a crosscheck to ensure that the pilot did not miss any functional outlets within its inclusion criteria. The mapping identified 70 outlets, of which 62 met the pilot's inclusion criteria. Of these 62, five were excluded or dropped out. Therefore, over the course of 9 months, the pilot program engaged 57 outlets: 49 medicine shops and eight clinics.

The pilot began with a 2-day training in June 2018, in which 50 providers from 45 outlets in Kavre were trained on the management of PSBI in NYIs per national protocol using the *Private Service Provider on Management of PSBI Cases* training manual, which was adapted from the national CB-IMNCI protocol. The training focused on the four components of clinical practice on PSBI captured in the survey: assessment and classification, treatment, referral, and follow-up. Flip-chart job aids were designed and provided during training.

A total of 59 outlets (57 active outlets and two additional outlets that eventually dropped out) received a startup kit, which included a thermometer, respiratory timer, pan scale, and color-coded registers and referral slips. As necessary during the implementation period, the project team replaced or recalibrated faulty equipment and provided additional registers. During 9 months of implementation, two district coordinators, both of whom hold bachelor's degrees in health, provided onsite post-training follow-up support to private providers on adherence to national treatment protocol. They also reviewed data registers for accuracy and provided refresher training per protocol as required, referencing job aids and the training manual.

In addition, the project coordinated with the nearest referral hospitals from the beginning of the pilot. MCSP Nepal conducted a formal orientation of the program in Dhulikhel Hospital and found that ensuring that service providers at all levels of the hospital were informed and engaged resulted in stronger support for participating providers and a more comprehensive understanding of the referral system. In addition to sitting on the technical advisory group, partner pediatricians from these hospitals helped to oversee trainings, participated in review meetings, and provided mentoring support. The review meetings were overseen by

project staff and MOHP officials, and discussed challenges, solutions, lessons learned, and best practices, while also providing a technical refresher to the participants. Dhulikhel Hospital also gave its Paediatrics Unit's hotline numbers to providers so that it would be easier to call the hospital before referral.

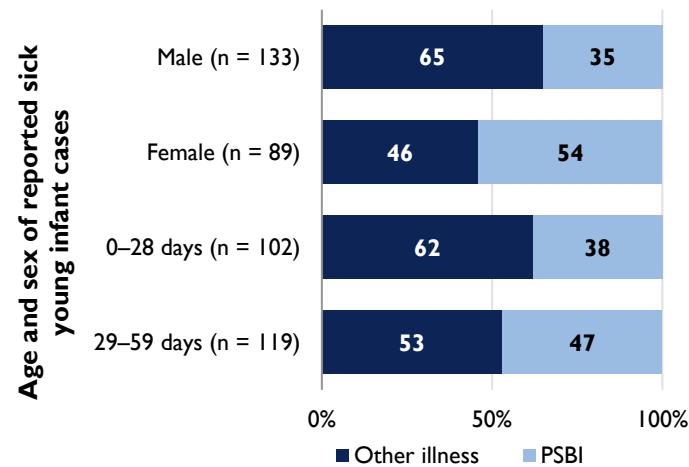
## Key Results from Pilot

During the study period, a total of 222 sick young infants were reported by 30 private providers; 80% of these were reported by medicine shops (Figure 2). Of the total reported sick young infants, 43% (95) were identified with PSBI (Figure 3); the majority were ages 29–59 days (59%), from remote areas (46%), and from medicine shops (86%). Only 14 cases were referred, mainly to Dhulikhel Hospital. Of 81 nonreferred cases, all received treatment, but only one received complete treatment of amoxicillin and gentamycin as per the protocol, and only 33% received at least one follow-up. During the 9 months of implementation, none of the medicine shops or clinics adhered to the complete protocol for treatment of the PSBI cases.

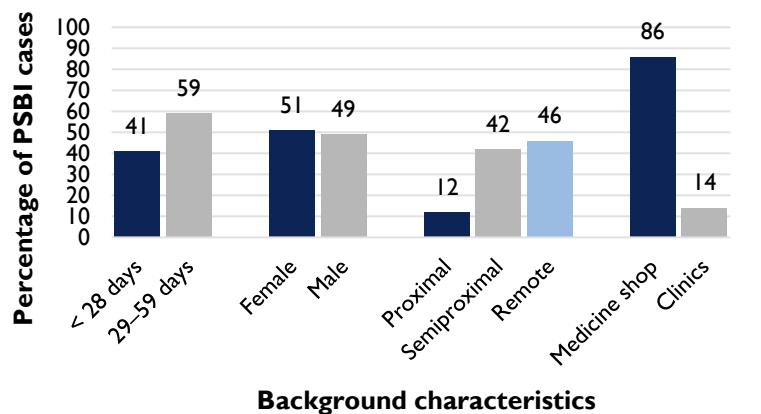
Of the 14 referred cases, none received ampicillin, and only two received gentamycin with amoxicillin. Many providers cited their lack of experience with injectable ampicillin as the main factor for not providing it. The evidence also suggested that distance from the referral center may not be the most important factor for referral. Of 11 PSBI cases classified by service providers within the proximal strata (i.e., within 30 minutes of the referral hospital), only three cases were referred. Through discussions, many providers stated that parents and guardians did not want to go to the hospital, but MCSP collected limited quantitative data to support this.

In addition to challenges with treating PSBI with injectable antibiotics, the data highlighted that treatment completion and appropriate follow-up are challenges. The prominent reasons cited by service providers for not completing the full 7 days of treatment were a lack of compliance from the parents or guardians and the perceived sense of recovery after a few days of treatment. This common perception of being “fully cured” when the child starts to show signs of recovery meant that many parents/guardians halted treatment partway through. Even when only oral drugs were provided and the child was advised to return after treatment completion on the third and fifth days for follow-up, parents seldom returned; only 5% completed at least one follow-up visit on at least the third or fifth day.

**Figure 2. Sick young infant cases (n = 222) disaggregated by demographic and diagnosis**



**Figure 3. Percentage of possible severe bacterial infection (PSBI) cases disaggregated by age group, sex, distance, and type of outlets**



Of the service providers who never reported a PSBI case, the most commonly cited reason for not doing so was a lack of care seeking from their outlets. Disconcertingly, the next reason was a lack of sufficient time to register cases in their service register when a child did seek care. Admittedly, the data captured by the pilot have several limitations: case numbers were fairly small, and the implementation period was brief. In addition, delays were faced with mapping providers and distributing startup kits, which may have negatively affected the length of time for which providers were implementing the protocol. That said, several promising learnings emerged:

- Many assume that private service providers are motivated by monetary profit, but the providers in this pilot were immensely motivated by their reach, the ability to provide lifesaving care to NYIs, and the professional linkages to pediatricians at the referral hospital.
- Flip chart job aids and color-coded service registers improved providers' abilities to identify danger signs and assess for PSBI.
- All providers reported a positive intention to continue with PSBI management per protocol.

**Table 4. Key findings from pilot indicators**

Key Pilot Indicators	Results
Percentage of participating outlets demonstrating adherence to the terms of commitment	0%
Percentage of private sector outlets who follow up at least once to the non-referred cases	50%
Percentage of PSBI cases referred by participating private sector outlets who complete referral	35.7%
Percentage of PSBI cases referred by participating private sector outlets in which the referral is facilitated	71.4%
Percentage of participating outlets who intend to continue in the PSBI management improvement initiative	100%

# Challenges

MCSP Nepal faced several challenges during the project period:

- The pilot's intention was to standardize protocol across all medicine shops and clinics that met the criteria and agreed to be in the pilot. Importantly, DDA registration was not a criterion, as survey findings demonstrated that families seek care for sick young infants from private providers irrespective of the outlets' registration status. MCSP therefore purposefully targeted registered and unregistered providers. Working with unregistered outlets posed some challenges with implementation. For example, during monitoring, one outlet was sealed by a DDA investigation team, which highlights the risk of engaging unregistered outlets in the project. In addition, discussions around if and how to regulate private-sector providers are occurring in many countries, and recommendations for future implementation may be dependent upon whether providers are willing to register with the government.
- Changing practice behaviors for providers during the pilot was a challenge. As one example, gentamycin use is reported to be quite low, as many providers are uncomfortable with administering injectables, and some clients are uncomfortable with their children receiving injectables. Since the pilot neither assessed provider competencies nor trained providers on clinical skills, such as injecting antibiotics, it cannot associate competencies around lack of pre-referral injections as evidence. However, the issue was discussed with providers during a review meeting. The proposed solution was to probe clients regarding their discomfort and then counsel them on the appropriate treatment accordingly. More work is needed at a national level to change client behavior regarding injectable antibiotics and referrals, as many providers noted that client refusal was a main barrier to adhering to protocol. Further communication and counseling to the communities and public may assist with that.
- Misconceptions among providers and clients regarding current policy were a challenge. Some providers reported that clients would not follow through with a referral due to assumptions about cost of care, despite the national protocol allowing for free health care for newborns in public hospitals and institutions. FWD officials were particularly helpful when this information needed to be better stressed to providers, doing so during the review meeting in December 2018. However, Dhulikhel Hospital, which is a private medical institution, was not part of the government-run free newborn care program, although it does have a social welfare scheme that waives many costs for poor patients. Hospital staff consistently stressed to program staff that they would do all they could to alleviate the costs for families, but reinforcing this message to the beneficiaries themselves was challenging. Recommendations to minimize this challenge include establishing more well-functioning government- or public-run hospitals where the cost of care for newborns is free. However, even if that happens, financial burdens will remain for infants 29–59 days old, who are not covered under the free newborn care program.

# Next Steps

MCSP Nepal used the findings from both the PSBI survey and pilot to advocate to and inform stakeholders on the importance and key considerations of working with Nepal's private sector to treat PSBI in NYIs. Through the national-level survey dissemination event and a separate meeting for sharing pilot findings, MCSP Nepal shared key PSBI pilot findings and recommendations with the USAID-funded Strengthening Systems for Better Health (SSBH) bilateral award. SSBH, which ends in 2022, is designed to improve health outcomes by increasing access to and quality of maternal, newborn, child, and reproductive health services. SSBH has a strong private-sector engagement component of its work plan, supporting the Government of Karnali province to develop or strengthen policies and guidelines on the capacity of the private sector. By sharing its methods, results, and learning, MCSP Nepal has informed SSBH and the FWD on potential approaches for future implementation of PSBI management in the private sector.

MCSP Nepal and partners also coordinated with FWD to consider how best to collaborate with private-sector providers in the context of federalism. Moving forward, this includes sharing implications and recommendations with the implementing partners of the IMNCI technical working group to scale current programming, providing technical support to the development of national newborn policies and guidelines, and working with Save the Children's SNL program to sensitize provincial-level officials on their respective private-sector providers (per the survey) and supporting provinces with the development of local health acts and annual budgets, reflecting upon the pilot's findings.

Finally, at global level, MCSP shared survey and pilot findings and results with relevant stakeholders. This includes the publication of peer-reviewed scientific papers describing the project's methodological approaches to identifying and reaching private-sector providers, which may be applicable to other countries. MCSP also leveraged existing global newborn health networks to disseminate knowledge and advocate for appropriate consideration of private-sector providers in PSBI care and management. In addition to conferences, webinars, and other scientific papers, dissemination opportunities following the end of MCSP Nepal may include the PSBI community of practice led by WHO, the Child Health Task Force's private-sector subgroup, and the development of small and sick newborn care guidelines by WHO.

# Recommendations and Way Forward

At the national level, MCSP identified numerous implications and recommendations for consideration by the MOHP and partners, including to undertake a multipartner effort, leveraging corporate support, to increase the safety and quality of care for sick young infants by private providers. Specific recommendations include:

## Quality of care:

- Conduct further exploratory work with stronger focuses on qualitative data and providers' clinical skills/training. Expand the scale of the PSBI pilot interventions to additional districts with a focus on high-volume outlets to ensure an efficient use of resources and time.
- Promote access to and use of relevant clinical protocols. Flip chart job aids and color-coded service registers improved providers' abilities to identify danger signs and assess for PSBI. These tools can be scaled for use in other provinces and districts.
- Develop or revise protocols and training programs to better reflect provider realities. Pre-referral injectable antibiotics were not used as recommended, with the most common reasons cited being guardian refusal or provider discomfort to administer injectables. To increase injectable utilization and adherence to protocol, more skills-based trainings are needed on counseling for and providing injections to small sick children by these providers.
- Establish functional mechanisms to facilitate timely and reliable referral/coordination of care for more critically ill cases for care at hospital level. A responsive referral center can greatly encourage service providers. Dhulikhel Hospital, one of the pilot's key referral hospitals, was very responsive to calls from providers, and this encouraged them to refer and follow up on cases.

## Behavior:

- Many assume that private-service providers are motivated by monetary profit, but the providers in this pilot were immensely motivated by their reach, the ability to provide lifesaving care to newborns, and the professional linkages to partner pediatricians at the referral hospital. Qualitative data indicated that providers wanted to counsel families to seek care from affordable facilities when cost of care was an impediment. In addition, the survey found that most medicine shop providers value clinical guidelines developed by the MOHP. These motivations should be prioritized when designing future service delivery programs.
- Training completion certificates were widely requested by pilot providers. While the program did not provide certificates due to concerns about appearing to encourage care seeking to private providers, it seemed that such certificates would have further motivated providers. When training on additional interventions or protocols in the future, the value of certificates should be considered.
- Further explore behaviors that influence service demand and care-seeking practices for clients. While the pilot did not incorporate demand-side interventions, as national policy does not encourage care seeking to private providers and is instead limited to focusing on improving quality at the point of care, it is important to learn more about client perspectives of quality of care and factors—both facilitators and barriers—that influence their care seeking.

## Registration:

- Design an approach that would facilitate registration of the medicine shops providing basic care to the community to better monitor practices and include providers/outlets in formal awareness or quality improvement initiatives.

The survey was necessary to convince stakeholders and government representatives of the need for and potential of the pilot. Despite the limitations of the pilot data, the learning generated and potential applicability, both within Nepal and globally, are promising. The data generated from both activities will be disseminated broadly to further inform current critical PSBI discussion regarding the role of private-sector providers in care for one of the leading causes of mortality in NYIs.

# Section 2: Core Newborn-Funded Work

## Introduction

The MCSP Nepal work plan was revised in 2018 to include two MCSP Core-funded newborn health activities that were also completed in the country: the situation analysis of inpatient care of NYIs, and the integrated maternal and newborn health (MNH) training study. A summary of the results, implications, and recommendations from these Core-funded activities in Nepal are presented in this report; additional details can be found in the global MCSP end-of-project report and study-specific dissemination products. For the situation analysis of inpatient care, the findings included in this report are preliminary in nature; at the time of this writing, MCSP was in the process of completing data analysis and reviewing the findings with the FWD.

### Situation Analysis of Inpatient Care

Improving the availability and quality of inpatient care for sick NYIs is critical to reducing newborn and child mortality and disability, and is a strategic priority for countries to achieve their Sustainable Development Goal targets. Although essential newborn care (ENC) has been a priority program and is relatively well established in terms of rolling out management protocols across Nepal through IMNCI and expanding Special Newborn Care Unit (SNCU) services, issues of coverage, equity, and quality of care still need to be addressed very systematically to achieve Sustainable Development Goal health targets. Moreover, inpatient care of NYIs is nascent and not standardized across all levels of care, which may pose a threat to the right to quality of care to which each citizen is constitutionally entitled. There is also an urgent priority to define, standardize, and mainstream these aspects of care, building on the ENC platform. A first step in the process of improving inpatient care of the NYI is to understand the landscape of care.

With this in mind, MCSP (with Core funds) supported the MOHP in Nepal to conduct a situation analysis to understand the landscape of inpatient care currently provided for sick NYIs (ages 0–59 days) in the country. This included assessing components of national and provincial policies and implementation strategies, service readiness, and systems in 17 facilities across the country to support high-quality services and clinical practices.

The NYI assessments conducted by MCSP in Nepal and Rwanda contributed to a broader multiagency endeavor with assessments conducted in several other countries, coordinated by USAID in collaboration with the Every Preemie–SCALE project, University Research Co./Applying Science to Strengthen and Improve Systems, MCSP, and UNICEF.

### Objectives

The overall objectives of the NYI assessment in Nepal were to inform reproductive, maternal, newborn, and child health thought leaders and to contribute to national/provincial and global dialog for improved strategies to strengthen inpatient care for NYIs.

The specific objectives of the assessment were to:

- Describe the national enabling environment for service implementation and quality of inpatient care for NYIs. The enabling environment includes political will; availability of strategic plans, policies, and guidelines; and national-level systems and resources to support services.
- Describe facility-level readiness to provide inpatient care for NYIs. Readiness is defined as the availability of the correct infrastructure, equipment, drugs, providers, and evidence-based guidelines implemented in the location where they are needed for high-quality services.

- Describe issues related to WHO-defined indicators for quality of care for the NYI. This includes eliciting information about effective communication with the parent/caregiver, including their integration into the care of the infant.
- Elicit program insights from program managers and implementers for inpatient care of these infants. This includes perceptions of issues that impact implementation of programs, with a focus on inpatient care of NYIs and the ability to provide high-quality care.

## Methods

The study was an exploratory study in 17 purposefully sampled hospitals across all provinces of the country (Table 5). The study aimed to understand the landscape of inpatient care for NYIs to document the readiness of the facility and its enabling environment in relation to inpatient care of this vulnerable group. MCSP worked with the MOHP to identify the national referral facility as well as facilities in each of the provinces. The facilities selected within each province included one with more developed inpatient services for infants and one representing what is considered the average level of inpatient services for these patients. The regional hospital in each of the selected provinces was also assessed. Data collection was performed using nine global validated tools (Appendix F), which were adapted to the country context.

**Table 5. Study sites for the situation analysis**

<b>Province 1</b>	Koshi Zonal Hospital
	Nobel Medical College Hospital (Private)
	Inaruwa District Hospital
<b>Province 2</b>	Janakpur Zonal Hospital
	Siraha District Hospital
<b>Province 3</b>	Kanti Children Hospital (Tertiary Hospital)
	Nepal Medical College Hospital (Private)
	Sindhuli District Hospital
<b>Province 4</b>	Gandaki Regional Hospital, Pokhara
	Syangja District Hospital
<b>Province 5</b>	Bheri Zonal Hospital, Banke
	Gulariya District Hospital Bardiya
	Nepalgunj Medical College Hospital (Private)
<b>Province 6</b>	Surkhet Regional Hospital
	Dailekh District Hospital, Dailekh
<b>Province 7</b>	Seti Zonal Hospital
	Bayalpata Hospital

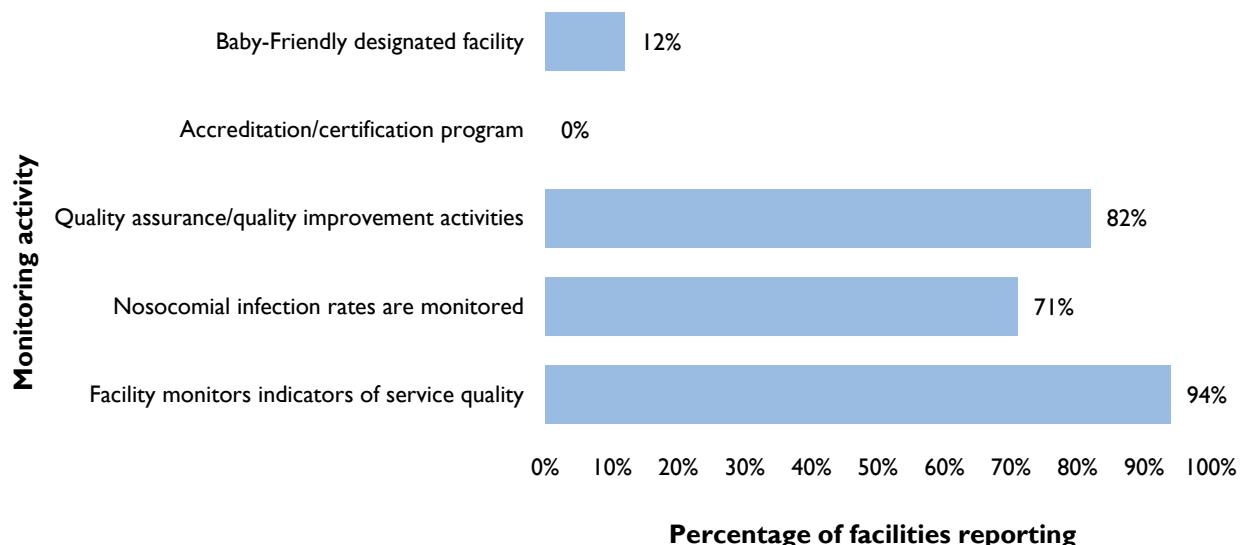
The secretary of health in the MOHP approved the study and identified the director of the curative division within the ministry as the principal investigator for the study. The MOHP principal investigator formed the technical advisory group for the study to provide expert inputs for the selection of study sites and work with the ministry to develop recommendations and action plans for strengthening inpatient care for NYIs in Nepal. Since establishment, the technical advisory group met a number of times and provided guidance on the design, site selection, and linkages with previous relevant studies conducted in-country. A research operation team comprising the MOHP principal investigator, USAID advisor, and MCSP staff members provided oversight to the implementation of the study. Local ethical approval was received from the Nepal Health Research Council. A local research firm assisted in hiring data collectors, including nurses and doctors with backgrounds working in clinical newborn settings and in other studies on newborn health. A 5-day

training was completed, and data collection went as planned. Following the completion of the first round of data collection in two provinces in the eastern part of the country, a preliminary data analysis workshop helped to identify any flaws in the data collected for correction and to further strengthen the data collectors' understanding of the data collection tools. Data from all 17 sites were analyzed, and data tables were created for MOHP, USAID, and MCSP use.

## Findings

The highest levels of care in the 17 facilities assessed included neonatal intensive care units (41%) and SNCUs (59%). None of the facilities had a kangaroo mother care (KMC) unit as reported by facilities' respondents. (For the purposes of this question about KMC, respondents included the facility in-charge or other person identified by the in-charge as being the most knowledgeable about newborn care services at that facility.) Almost all of the facilities reported monitoring indicators of service quality, and the majority noted including quality assurance/improvement activities to improve care. However, since there is no national accreditation/certification program, none were accredited externally; furthermore, few were Baby-Friendly Hospital Initiative-designated sites (Figure 4).

**Figure 4. Percentage of facilities (n = 17) reporting quality of care monitoring activities**



Most facilities had support mechanisms in place for parents of inpatient infants (Table 6). This included systems for receiving feedback from parents (94%), space for parents to sleep while their babies were hospitalized (88%), and funds from facility resources to support parents during their stay (71%).

**Table 6. Average percentage of facilities with feedback systems and support for parents of infants**

Facility has system for receiving feedback from parents	Types of support facility offers for parents staying with infants		
	Space to sleep	Space to cook	Funds from facility resources
94%	88%	35%	71%

While care in the facility is critical to improve survival outcomes for inpatient NYIs, these babies still require close attention and follow-up for their special needs after discharge. Over 85% of the 17 facilities noted there was a system for discharge planning; however, the support after discharge was not robust, with only 12% of facilities having linkages with community-based health workers and only 29% of the facilities having strategies to support adherence to postdischarge follow-up care (Table 7).

**Table 7. Average percentage of facilities reporting discharge planning and support for patient follow-up**

System for discharge planning	Linkages with community based health workers	Strategies for promoting adherence after infant discharge
88%	12%	29%

## Implications and Recommendations

The 2016 Nepal ENAP has been the principle policy document guiding the implementation of newborn health programs in the country. Inpatient care of small and sick newborns is an essential component of the overall strategic objective in the continuum of care and has led to the establishment of SNCUs and neonatal intensive care units at strategic locations in the country. By 2020, the country is expected to have fully established SNCUs in all district hospitals. The situation analysis led by the MOHP and supported by MCSP provided a landscape of the situation of care provision so far in Nepal. It also identified gaps in services and quality of care that will inform national and subnational dialog around further improving the strategies to strengthen inpatient care for NYIs. To support the FWD to utilize the findings and develop recommendations for actions, MCSP will support the dissemination of findings to in-country stakeholders and work with the FWD and partners to develop recommendations and actions plans for inclusion in future work plans of the MOHP.

# Integrated MNH Training Study

Training is an essential prerequisite for improving quality of care, but it is time-consuming and costly, both in terms of finances and human resources. Recommendations in support of or against integration of newborn care within basic emergency obstetric and newborn care (BEmONC) highlight that the same health workers are usually called multiple times from their work location to undergo repeated newborn and BEmONC trainings. The overall duration of BEmONC trainings tends to be longer if newborn health is adequately taught, so there is a tendency to minimize training content for newborn care in BEmONC trainings.

In the 1990s in Nepal, in response to the high volume of noninstitutional deliveries, efforts focused on community-based trainings to enhance the capacity of health workers in maternal and newborn care. There were limited in-service trainings available to facility-level staff. In 2006, the USAID-funded ACCESS program alongside the MOHP, FHD, and National Health Training Center (NHTC)-designed skilled birth attendant (SBA) training for health cadres in peripheral-level health facilities to enhance the skills required during pregnancy, delivery, and for the provision of ENC. This training supported the national SBA policy, which was framed in 2006. Since then, many other training packages have been developed with the intention of enhancing core competencies of health workers dedicated to MNH. The existing packages include the Advanced SBA package, MNH Update, Obstetric First Aid, Facility-Based IMNCI for Doctors and Nurses, Level 2 Newborn Care for Doctors and Nurses, and Pediatric Nursing Care. Many of these trainings include varying degrees of integrated maternal and newborn content.

## Objectives

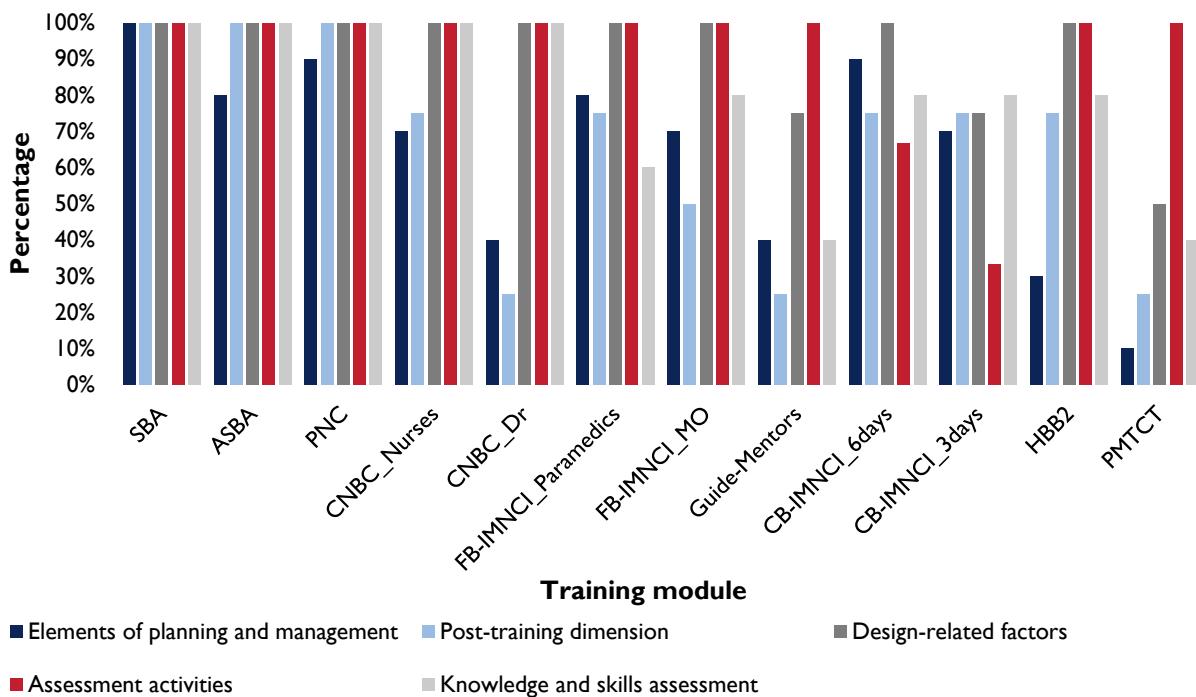
MCSP completed a mixed-methods study to assess integrated versus standalone MNH training and the effect of integration on the quality of training, health worker knowledge, and skill gains in Nepal and Ethiopia. Both countries were selected due to their high burden of maternal and child mortality, facility birth rates, and commitments to the global ENAP agenda. The first round of the study took place in Ethiopia in 2017, and the second round was completed in Nepal in 2018. The aims of this study were to generate evidence to inform MNH training programs and to assist the MOHP to use the evidence to strengthen the national training policies. This will be crucial as the country transitions to federal structures, as the central government requires evidence to support the guidance provided to the provincial and municipal levels. (Details on the study methodology are included in the study manuscript [forthcoming] and global MCSP reports.)

## Findings and Implications

The results of the study informed the ongoing debate regarding the value of integrated versus standalone MNH training with an evidence-based perspective. This is especially relevant to the possibility of redesigning existing training modalities as the MOHP finalizes the guidance it will provide to provincial and municipal levels on training program models. Key findings of the study in Nepal include gaps in the nonalignment of messages and clinical information, inadequate content and time for newborn health during theoretical and practical sessions, and differences in educational methodologies. Strengths of the Nepal system include the availability of certified training centers, a dedicated resource section within the NHTC, and standardized training curriculum for all trainings conducted through the NHTC.

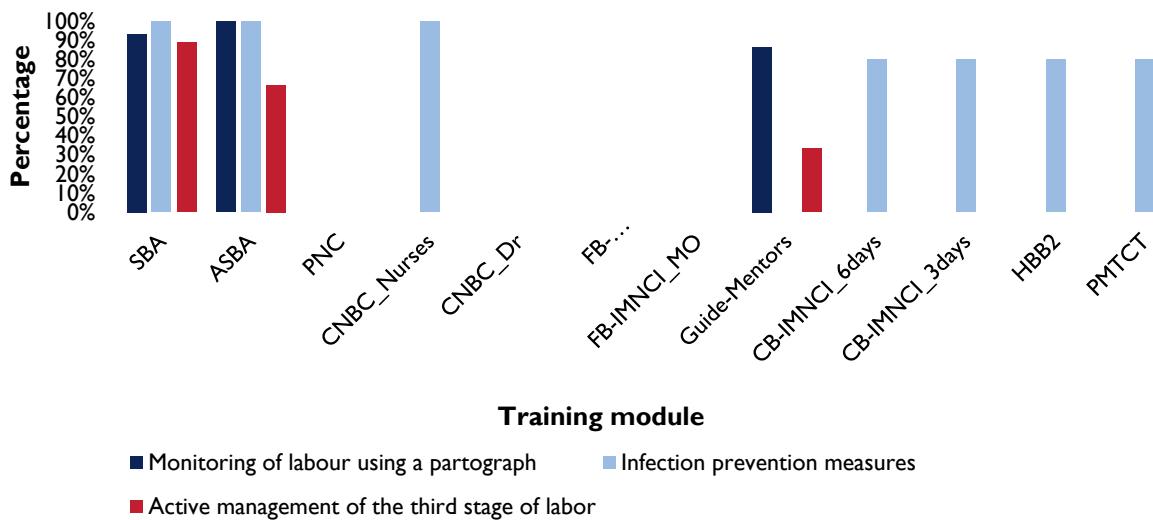
In Nepal, almost all of the nationally scaled-up modules for maternal, newborn, and child health training appear to have strong design-related factors. This speaks highly of the efforts made by the MOHP and partners to develop sound training materials. Training packages, however, were noted to follow varying formats and are not consistent in their inclusion of appropriate materials. For instance, some training packages include reference manuals, trainers' guides, and participants' handbooks, while others include combinations of reference manuals and trainers' guides or participants' handbook. This by itself may not be a shortcoming and might have been contextualized to the training program goal and objectives. Figure 5 displays the elements of training design that were included in the various training packages reviewed.

**Figure 5. Inclusion of training design elements in training modules**



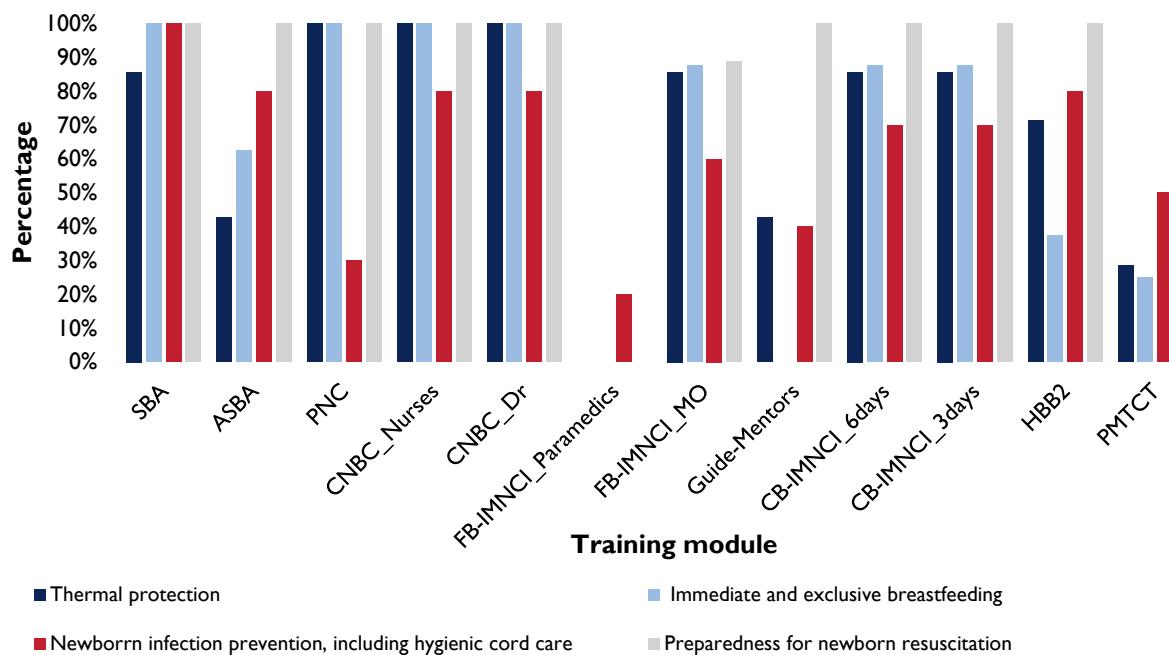
The audit analyzed three main elements of routine care for women in labor: labor monitoring using partograph infection prevention measures, and active management of the third stage of labor (Figure 6). As expected, labor monitoring using partograph and active management of the third stage of labor were elements captured only in modules on maternal care. However, infection prevention measures during labor and delivery are not included in some of the other modules, such as postnatal care, comprehensive newborn care for level 2 nurses and doctors, and the facility-based IMNCl packages. This practice would be captured through questions related to infection prevention practices, demonstration of appropriate hand hygiene practice, and use of personal protective equipment and antisepsis procedures. The lack of inclusion appears to be a shortcoming that might need to be further analyzed to understand whether these are not introduced and discussed during trainings or are covered through other means.

**Figure 6. Inclusion of routine care interventions for the mother in training modules**



All training modules were reviewed for elements of ENC at birth, including thermal care; immediate and early breastfeeding; prevention of newborn infections (including hygienic cord care), and preparedness for any event requiring the resuscitation of newborns at birth. Figure 7 illustrates the routine newborn care interventions included in the various training modules.

**Figure 7. Inclusion of routine care interventions for the newborn in training modules**



The key informant interviewees included nine respondents from the DoHS, CHD, FHD, NHTC, and partners working with the MOHP supporting maternal, newborn, and child health trainings and programs. Four focus group discussions were also conducted with postnatal care trainers and SBA and advanced SBA trainers and trainees at institutions in Kathmandu: three were conducted at maternity hospitals, and one was conducted at Kanti Children's Hospital. The pros and cons of integrated trainings were repeatedly raised during the interviews. The pros included integration being the right approach, as service providers provide care as a continuum, and cost efficiency. However, some respondents were not sure that all technical areas needed to be covered by one training package. For instance, the SBA package includes 23 core skills, but not all are used equally. Integrated trainings also cause a "dilution effect" when different technical content is brought together. The integration of Helping Babies Breathe within SBA modules was noted as an example by several respondents, since the integration resulted in reduced training time allocation and change in training methodology to meet the time limits. It was also noted that Helping Babies Breathe emphasizes the importance of immediate ENC as the first line of management for a baby not breathing or crying at birth, but when integrated, the emphasis was diminished. Another example was the integration of some aspects of KMC into the SBA training package, where the practice of binding the baby to the mother was the main focus, but all other key elements of KMC were overlooked.

Respondents noted that sometimes integrating multiple trainings into one package was more symbolic than practical and led to confusion. One such example quoted was the lack of clarity on coordinating timings to both inject the mother with oxytocin and resuscitate a nonbreathing newborn within the same first minute. Similarly, applying chlorhexidine within the immediate ENC period led to confusion on when to start immediate skin-to-skin contact.

Advocacy efforts by stakeholders from different technical areas resulted in content from existing training modules being added to session plans, which overstretched the training. For example, when the intrauterine

device was added to the SBA trainings, it took up the already limited space within a full schedule despite participants rarely using intrauterine device skills at their work sites. Such integration was referred to by a few respondents as the “dumping effect.” The FHD and NHTC acted on this testimony by removing the intrauterine device session from the SBA package and replacing it with postpartum intrauterine device insertion skills, which were considered more regularly required skills at work sites.

Respondents thought that trainings should be designed with service performance in mind to ensure that the skills taught are appropriately targeted, respond to identified gaps, and represent the required skill set of the trainees. Some respondents questioned the tendency to respond to training needs assessments and proposed responding instead to performance needs assessments. Training a provider on a service that they do not get to provide or are not responsible for in their role in a particular facility does not lead to results, and the training diverts the health worker’s time away from other important technical areas that they could have used and focused on.

Integrated trainings were noted to be influenced by the clinical background of the trainer. For example, if a maternal health expert led an integrated MNH training, there was a reduced focus on the newborn. Another example raised the issue of not having experts present during practice sessions. Though pediatricians are sought for sessions on newborn resuscitation, when available, they only participate in classroom sessions and may not be available during practice sessions in clinical sites. The findings from the assessment were presented at a workshop led by three main divisions of the then-DoHS: the CHD, FHD, and NHTC. The directors of all three divisions committed to utilize these results in the future design of MNH training materials and draw upon the strength of existing separate modules to address the gaps noted in the study.

MCSP is developing a manuscript to summarize and disseminate the findings from both countries (anticipated publication in late 2019).

# Appendix A. Program Monitoring Plan

The table below is the list of performance indicators and targets for the PSBI pilot. Note that baseline and target data collection methodologies differed. Data for the baseline (2017) were collected through service provider interviews, whereas the achievement being reported against the target was collected through routine program monitoring data.

SN	Indicator	Definition	Source	Baseline (2017)	Frequency	Target	Achievement
1	Number and percentage of eligible private sector outlets who successfully complete the PSBI management improvement training	N= Number of eligible private sector trainees who pass post-test of the PSBI management training D = Total number of eligible private sector trainees participating in the training	Training records/self-administered tool	N/A	One time, June 2018	100%	100%
2	Percentage of trained private sector trainees who voluntarily sign commitment letter	N= Number of eligible private sector trainees who voluntarily sign commitment letter D = Total number of eligible private sector trainees who participated in the training	Training records/ commitment letter	N/A	One time, June 2018	100%	100%
3	Percentage of participating sector service providers demonstrating adherence to the terms of commitment*	N= Number of eligible private sector trainees who adhere to the terms of commitment* D = Total number of eligible private sector trainees who sign commitment letter	Monitoring visits & case-record review	N/A	Quarterly	≥50%	0%
4	Percentage of private sector service providers who adhered to at	Numerator- Number of private sector trainees adhering to at	Supervision visit	N/A	Quarterly	70%	0%

<b>SN</b>	<b>Indicator</b>	<b>Definition</b>	<b>Source</b>	<b>Baseline (2017)</b>	<b>Frequency</b>	<b>Target</b>	<b>Achievement</b>
	least 80% IMNCI guideline to treat all PSBI cases**	least 80% IMNCI guideline to treat all PSBI cases Denominator: Total number of private sector trainees who provided PSBI treatment					
5	Percentage of the PSBI cases provided with gentamycin as pre referral antibiotic	N= Number of PSBI cases 0-2 months referred by participating sector trainees administering one dose of gentamycin D= Total Number of PSBI cases 0-2 months referred by participating sector trainees that provide injectable treatment to sick young infants	Supervision visit and baseline survey	7%	Quarterly	80%	14.3%
6	Percentage of private sector service providers who follow up at least once to the non-referred cases	N= Number of non-referred PSBI cases 0-2 months followed up by participating private sector service providers within 7 days D= Number of non-referred PSBI cases 0-2 months presented to the participating private sector service providers	Supervision visit	NA	Quarterly	≥85%	50%
7	Percentage of private sector service	N= Number of non-referred PSBI cases 0-2	Supervision visit and baseline survey	41%	Quarterly	≥65%	9.1%

<b>SN</b>	<b>Indicator</b>	<b>Definition</b>	<b>Source</b>	<b>Baseline (2017)</b>	<b>Frequency</b>	<b>Target</b>	<b>Achievement</b>
	providers who follow up all non-referred cases on at least Day 3 & 5	months followed up by participating private sector service providers at least on Day 3 & 5 D= Number of non-referred PSBI cases 0-2 months presented to the participating private sector service providers					
8	Percentage of PSBI cases referred by participating private sector service providers who complete referral***	N= Number of PSBI cases 0-2 months referred by participating sector service providers who complete referral D= Number of PSBI cases 0-2 months referred by participating sector service providers	Supervision visits & case-record review, Hospital records	N/A	Quarterly	>85%	35.7%
9	Percentage of PSBI cases referred by participating private sector service providers in which the referral is facilitated	N= Number of PSBI cases 0-2 months referred by participating sector service providers in which the referral was facilitated (e.g. made call ahead, arranged transport, etc.) D= Number of PSBI cases 0-2 months referred by participating sector service providers	Supervision visits & case-record review	N/A	Quarterly	>90%	71.4%

<b>SN</b>	<b>Indicator</b>	<b>Definition</b>	<b>Source</b>	<b>Baseline (2017)</b>	<b>Frequency</b>	<b>Target</b>	<b>Achievement</b>
10	Percentage of participating private sector service providers who intend to continue in the PSBI management pilot	N= Number of participating sector service providers who intend to continue in the PSBI management pilot D = Total number of participating private sector service providers	Interview with participating private sector outlets (part of supervision)	N/A	Quarterly (after at least 3 months of participation )	>90%	100%

\*Terms of commitment include using the IMNCI protocol for assessment and treatment of PSBI, complete recording of all cases, following up on treated cases, and facilitating caretakers when cases are referred.

\*\* IMNCI guideline to treat all PSBI cases: Assess PSBI signs, dosage, duration, and frequency for treatment of PSBI cases as mentioned in the IMNCI guideline; follow-up of cases at least on day 3 and 5.

\*\*\*Complete referral: PSBI cases who visit the referral hospital after the cases are referred from private medicine shops/clinics. These were verified using hospital records.

+ When setting targets for the pilot, there was limited knowledge in the health sector about how to encourage private sector providers to adhere to standard protocols. Therefore, many targets were overestimated.

Note: Key pilot indicators are shaded gray.

# Appendix B. Success stories

## Saved Life: Improving Management Practice of Medicine Shops<sup>7</sup>

It was Thursday morning in Bhakundebeshi when Sunita rushed to the medicine shop with her 16-day-old daughter. Her daughter had been suffering from a fever for 2 days, was having difficulty breastfeeding, and was constantly crying. With no signs of improvement, Sunita decided to seek care for her daughter.

Bhakundebeshi is a common site for care seeking for residents of Namobuddha Municipality in Kavre district, and Sunita undertook the 30-minute trip to seek care for her daughter. Upon reaching the medicine shop, the provider, who had recently received orientation on possible severe bacterial infection (PSBI) management, assessed the baby based on danger signs per the PSBI treatment protocol and quickly identified four: fast breathing, fever, nasal flaring, and jaundice. On further probing with Sunita, the provider also noted that the baby was not feeding well. Per his training, the provider quickly identified Sunita's daughter as a critical case, immediately provided a pre-referral antibiotic (gentamycin), and referred them to the nearest hospital, Scheer Memorial Hospital, along with a referral slip. He also recorded all necessary information in the service register.

"[The] baby had multiple signs of PSBI when she was brought here. I promptly referred her to the nearest hospital after the assessment," the provider at the medicine shop said. "I followed up with the mother [to ask] if she took her child to the hospital or not. I am glad that she followed my advice."

Unfortunately, Sunita had difficulty arranging transportation to the referral hospital, with ambulances hard to secure at times. Had she been able to secure one, the travel time would have been only 30–40 minutes, but Sunita had to travel via public transportation, and it ultimately took 2 hours for her to reach the hospital, at which point her daughter was immediately admitted to the neonatal intensive care unit. Fortunately, after 13 days in the neonatal intensive care unit, Sunita's daughter made a full recovery and was discharged from the hospital. The medicine shop provider's ability to properly diagnose the baby, provide a pre-referral antibiotic, and refer to the facility were the critical lifesaving steps for Sunita and her daughter.

**Figure 8. Service register of medicine shop**

The image shows a handwritten service register from a medicine shop. The header reads 'Service Register'. It contains sections for 'Patient Name', 'Date', 'Symptoms', 'Treatment Given', and 'Signature'. There are several rows of entries, each with a date and a list of symptoms like 'Fever', 'Cough', 'Runny nose', etc., followed by 'Treatment Given' (e.g., 'Gentamycin'). The bottom right has a large handwritten signature.

**Figure 9. Referral slip from medicine shop**

The image shows a handwritten referral slip from a medicine shop. The header reads 'Referral Slip'. It contains sections for 'Patient Name', 'Date', 'Symptoms', 'Treatment Given', and 'Signature'. There are several rows of entries, each with a date and a list of symptoms like 'Fever', 'Cough', 'Runny nose', etc., followed by 'Treatment Given' (e.g., 'Gentamycin'). The bottom right has a large handwritten signature.

<sup>7</sup> All names in the success story have been changed to protect the privacy of the individuals.

## **Appendix C. List of presentations at International Conferences and Publications**

#	Month, Year	Name of Conference	Presenter(s)	Presentation/Poster
I	March 2019	International Pediatrics Association Congress 2019	Deepak Joshi	Poster: Suboptimal Quality of Care for Possible Severe Bacterial Infection in Private-Sector Outlets of Nepal

## **Appendix D. List of possible severe bacterial infection materials and tools developed or adapted by the program**

#	Material or Tool Name	Technical Area
1.	Service Register	 Tool 1_Service Register.pptx
2.	Referral Slip	 Tool 2_Referral Slip.xlsx
3.	Monitoring Checklist	 Tool 4_Monitoring checklist.docx
4.	Client Interview Tool	 Tool 3_Client Interview_English.doc
5.	Training Manual – Facilitators' Guide (Adapted from Integrated Management of Newborn and Childhood Illness [IMNCI] Training Manual)	 Private sector_Facilitator's C
6.	Training Manual – Participants' Manual (Adapted from IMNCI Training Manual)	 Private sector_Participant m

## Appendix E. Learning Matrix

Learning Question	Funding Source	Key Results or Findings	Key Learning	Final Products and Dissemination
What are current practices for the management of possible severe bacterial infection (PSBI) among sick young infants 0–2 months in private drug shops and clinics in Nepal?	Field	<ul style="list-style-type: none"> <li>Findings reflected that nearly half of medicine shops were unregistered, a notable proportion of private providers surveyed had not been trained in the latest protocols for caring for sick young infants, and appropriate referral and follow-up were lacking.</li> <li>Medicine shop providers value clinical guidelines developed by the Ministry of Health and Population.</li> <li>The volume of sick young infants managed by medicine shops and clinics was highly variable, with a small number of providers managing relatively large volumes.</li> <li>The study identified several performance gaps that should be prioritized: inaccurate weighing and dosing of sick young infants; potentially dangerous practices, particularly use of corticosteroids for treating sick</li> </ul>	<ul style="list-style-type: none"> <li>Orientating private-sector providers on national integrated management of newborn and childhood illness (IMNCI) guidelines could improve existing service delivery.</li> <li>Considering that most medicine shops are providing treatment to sick young infants, there is an urgent need for interventions aimed at improving quality of care in the private sector, and more emphasis should be placed on recognizing danger signs to ensure immediate referrals are facilitated.</li> <li>Engaging the pharmaceutical industry will be critical to ensuring sustainable logistics and supply chains that guarantee availability of appropriate drugs, supplies, and commodities.</li> <li>This survey suggests that other countries may wish to undertake similar work to assess private-sector management of</li> </ul>	<ul style="list-style-type: none"> <li>Survey findings were shared with key stakeholders nationally and globally. These included:</li> <li>With the IMNCI technical committee in October 2017, at a global Save the Children newborn health meeting in Indonesia in November 2017, and in a Save the Children International Asia regional webinar in December 2017.</li> <li>In July 2018, a national dissemination workshop was hosted by the Child Health Division and the US Agency for International Development (USAID) in Kathmandu, allowing for stakeholders to learn about the findings and discuss implications for the country. In addition, a global webinar was held in Washington, DC, in August 2018 to share results and next steps with USAID, Maternal and Child Survival Program (MCSP) partners, and colleagues.</li> <li>Additionally, the MCSP Nepal team participated in a sharing exchange with the MCSP Nigeria child health team through a virtual community of practice network. Both teams are working with private providers, and the program offered an opportunity for cross-country learning.</li> <li>Survey recommendations formed the basis for MCSP and the Ministry of Health and Population</li> </ul>

<b>Learning Question</b>	<b>Funding Source</b>	<b>Key Results or Findings</b>	<b>Key Learning</b>	<b>Final Products and Dissemination</b>
		young infants; and inappropriate use of pre-referral injectable antibiotics and referral facilitation acts.	PSBI to address a global knowledge and capacity gap.	pilot intervention (2017–2019) to improve the quality of care provided to sick young infants by private medicine shops and clinics.

# **Appendix F. Tools for the situation analysis of inpatient care**

TOOL 1: National profile collection form: Tables with key newborn health indicators, completed from existing population-based surveys or other reports.

TOOL 2: National guidelines abstraction form: Forms used to purposefully review national documents, such as strategies, plans, clinical guidelines and standards, and clinical protocols for information relevant to inpatient care of newborns and young infants (NYIs).

TOOL 3: Structured interview guide for national-level people: This guide provides prompts to guide the conversation about different topics of interest.

TOOL 4: Structured interview guide for regional-level people: This was used as a subset of the national-level guide, with the objectives of understanding the regional status in the context of the national strategy for inpatient care of the NYI and understanding issues that impact the quantity and quality of those services.

TOOL 5: Structured facility assessment tool: This tool was used to assess readiness and systems in use to support quality services. The tool was adapted to capture country-specific elements relevant to achieving the objective being measured. The tool was translated into the language most commonly understood by health service providers.

TOOL 6: Patient record review: This tool was used to review patient records for routine information about inpatient NYIs, including birth information (gestational age, birthweight, physical assessment at birth) and information for routine monitoring (admission notes, medicines, vital signs, etc.).

TOOL 7: Facility-based health information reports review: This tool was used to collect information about inpatient NYIs from the previous 3 months. Information collected included number of live births, number of perinatal and newborn deaths, cause of death, and indicators related to newborn condition at birth (preterm, low birthweight, resuscitation).

TOOL 8: Structured interview guide for facility-level health care workers: This tool provided prompts to guide the conversation about experiences and opinions of health care workers about different topics related to inpatient services for NYI, including discharge planning for maintaining the health of the infant.

TOOL 9: Structured interview guide for parent/caregiver of current patients: This tool provided prompts to guide the conversation about experiences and opinions of parents/caregivers related to how they and their infant have been treated and their inclusion in the care process. The tool was translated into the common language of the parent/caretakers of inpatient NYIs in the study facility.