

# Assessment of Implementation of CB-IMNCI Program at Primary Health Care Centers and Health Posts

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## ABSTRACT

**Background:** Community-based integrated management of neonatal and childhood illness (CB-IMNCI) is a government-run priority one program aimed to decrease neonatal and childhood morbidity and mortality. The objective of our study was to identify the CB-IMNCI implementation gap in terms of health care providers' training status, availability of medicines, follow-up visits and clinical outcome at Primary Health Care Centers and Health Posts of Morang district of Nepal.

**Methods:** We conducted a community based cross-sectional study in Morang district of Nepal from 25 Oct 2021 to 25 Jan 2022. Ethical approval was taken from ethical review board of the Nepal Health Research Council. We enrolled 9 (53%) out of 17 local governments of Morang district of Nepal by simple random sampling. The collected data was entered in MS Excel and analyzed by SPSS version 23.

**Results:** The majority of healthcare workers were in their early age of 26-35 years (57.2%), male (85.7%) and Auxiliary Health Workers (78.6%). The mean duration of practice was 15.1 years. Only 46.5% of healthcare providers were trained for the CB-IMNCI program. The availability of medicine as per CB-IMNCI guideline was 52.9%. There was no record available for total number of required follow up, total number of actual follow up and clinical outcome in last 6 months.

**Conclusions:** About half of the human resources were trained with the availability of only half of the required medicines. We also found a lack of adequate record-keeping of follow up of patients and their clinical outcomes.

**Keywords:** CB-IMNCI, Health Post, Implementation, Nepal, Primary Health Care Center

## INTRODUCTION

Community-based integrated management of neonatal and childhood illness (CB-IMNCI) is Nepal government-run priority one program with technical support from World Health Organisation (WHO) with support from different national and international partners to decrease the morbidities and mortalities of under-five children.<sup>1-3</sup> CB-IMNCI contributed to achieving Millennium Development Goal (MDG)-4 and is crucial for achieving Sustainable Development Goal (SDG)-3 in Nepal.<sup>4</sup> District public health office (DPHO) and district health office (DHO) were implementers of this program but after promulgation of new constitution, three-tier governments (federal, provincial, and local) exist leading to change in health

governance of Nepal.<sup>5</sup> Now, local governments are responsible to implement CB-IMNCI program through their health centres. Through this changing landscape of health governance, we aimed to identify CB-IMNCI implementation gap in terms of healthcare providers' training status, availability of medicines, follow-up visits and clinical outcome at Primary Health Care Centers and Health Posts of Morang district of Nepal.

## METHODS

We conducted a community based cross-sectional study at Morang district of Province 1 of Nepal from 25 Oct 2021-25 Jan 2022. Morang district has more than one million population with 17 local governments (1 metropolis, 8

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municipalities, 8 rural municipalities).<sup>6,7</sup> We enrolled 9 (53%) of local governments consisting of 14 health centres (Primary Health Care Centre and Health Post). We used a simple random sampling technique through computer-generated random numbers using a random integer set generator ([www.random.org/integer-sets](http://www.random.org/integer-sets)). The health centre was a sampling unit. Ethical approval was taken from the ethical review board (ERB) of Nepal Health Research Council (NHRC) (ERB Protocol Registration Number: 14212021P). The permission for collection of data was obtained from the District Health Office (DHO), Morang and selected Primary Health Care Centres and Health Posts. Informed written consent was taken from the implementer of CB-IMNCI of each health centre. The focal person for CB-IMNCI was recognized after conducting a meeting with the healthcare team of the concerned health centre. Health Assistant (HA) and Auxiliary Health Worker (AHW) are the focal persons. The total duration of data collection was 1-2 hours. Data was collected using specifically designed proforma by face-to-face interviews and relevant documents of the CB-IMNCI were reviewed.

We calculated the percentage of healthcare providers trained for CB-IMNCI (number of CB-IMNCI trained healthcare providers X 100/ total number of healthcare providers eligible for CB-IMNCI training); percentage of availability of medicine as per CB-IMNCI (CB-IMNCI related medicine available in all centres x 100/ total number of medicines required as per CB-IMNCI in all selected health centres); percentage of required follow-up (total number of actual follow up in last 6 months X 100/ total number of required follow up in last 6 months) and percentage of clinical outcome (total number of clinical outcome as cured in last 6 months X 100/total number of actual follow up in last 6 months).

After every visit, the completeness of data was verified by the principal investigator. Confidentiality and anonymity of data were maintained. The collected data was entered in MS Excel version 2019 and analysed by SPSS version 23.

## RESULTS

The majority of a healthcare workers are in their early career health professional (26-35 years) (57.2%), male (85.7%) and Auxiliary Health Worker (78.6%). The mean duration practiced as a healthcare provider was 15.1 years (minimum 5 years, maximum 30 years). The mean

duration practiced as a healthcare provider in the current institution is 3.9 years with a range from 0.5 years to 13 years (Table 1).

**Table 1. Baseline characteristics of informants (n=14).**

Characteristics	n (%)
<b>Age (years)</b>	
26-35	8 (57.2)
36-45	3 (21.4)
46-55	2 (14.3)
56-65	1 (7.1)
Mean ± SD	37.7 ± 8.8
<b>Sex</b>	
Male	12 (85.7)
Female	2 (14.3)
<b>Type of healthcare provider</b>	
Auxiliary Health Worker (AHW)	11 (78.6)
Health Assistant (HA)	3 (21.4)
<b>Type of work</b>	
Permanent	14 (100)
<b>Total duration of work as a healthcare provider (Year)</b>	
Mean ± SD	15.1 ± 8.9
Median	11
Range	5-30
<b>Total duration of work as a healthcare provider in current health center (Year)</b>	
Mean ± SD	3.9 ± 3.9
Median	2
Range	0.5-13

The overall percentage of healthcare providers trained for the CB-IMNCI program is 46.5 percent with minimum of 11.1% and maximum of 80% (Table 2).

As per the CB-IMNCI guideline, there should be 24 items of medicine in each health centre. The overall percentage of availability of medicine as per the CB-IMNCI guideline is 52.9% percent. It ranges from 33.3% to 75% (Table 3).

Table 2. Healthcare providers trained for the CB-IMNCI program (n=14).

Health Institution Code	Total number of healthcare providers	Total number of healthcare providers eligible for CB-IMNCI training	Total number of eligible healthcare providers trained for CB-IMNCI	Percentage of healthcare providers trained for the CB-IMNCI program
1	9	3	2	66.6
2	15	8	4	50.0
3	21	18	11	61.1
4	8	7	5	71.4
5	10	7	1	14.2
6	22	16	11	68.7
7	20	15	3	20.0
8	18	13	2	15.3
9	10	9	1	11.1
10	8	7	5	71.4
11	9	7	4	57.1
12	6	5	4	80.0
13	7	6	3	50.0
14	8	6	3	50.0
Total	171	127	59	46.5

Table 3. Availability of medicine under CB-IMNCI guideline (n=14).

Health Institution Code	Number of medicines required as per CB-IMNCI guideline	CB-IMNCI related medicine available in centres	Percentage of availability of medicine as per CB-IMNCI guideline
1	24	8	33.3
2	24	9	37.5
3	24	15	62.5
4	24	9	37.5
5	24	12	50.0
6	24	12	50.0
7	24	16	66.6
8	24	18	75.0
9	24	16	66.6
10	24	15	62.5
11	24	17	70.8
12	24	11	45.8
13	24	11	45.8
14	24	9	37.5
Total	336	178	52.9

**Table 4. Availability of each medicine (item wise) in all centres (n=14).**

Name of Medicine	Number of health centres where medicine available	Percentage
I.V Ampicillin	2	14.3
I.V Amoxicillin	0	0
Oral Amoxicillin	13	92.9
I.M gentamicin	8	57.1
Erythromycin	0	0
Azithromycin	8	57.1
Cotrimoxazole	7	50.0
Clotrimazole mouth paint	0	0
Ciprofloxacin eye/ear drop	11	78.6
Ciprofloxacin tablet	14	100.0
Zinc Tablet	12	85.7
Iron Tablet	13	92.9
Vitamin A	13	92.9
Diazepam	13	92.9
Salbutamol	11	78.6
Artesunate	0	0
Artemisinin based combination therapy	0	0
Chloroquine	4	28.6
Primaquine	3	21.4
Paracetamol	12	85.7
TB drugs (H,R,Z,E,S)	14	100.0
Albendazole	14	100.0
Glucose	7	50.0
I.V Fluid (Ringer Lactate)	11	78.6

Further assessing the availability of each medicine, the most commonly (100%) available medicine was ciprofloxacin tablet, TB drugs and albendazole. IV Amoxicillin, Erythromycin, Clotrimazole mouth paint, Artesunate, Artemisinin-based combination therapy were not available at any centres during our study visit (Table 4).

In the last 6 months prior to the day of data collection, a total number of cases enrolled in the CB-IMNCI program were recorded but there was no record for a total number of required follow up and a total number of actual follow up (Table 5).

**Table 5. Required follow up as per CB-IMNCI guideline in the last 6 months. (n=14)**

Health Institution Code	Number of cases enrolled	Number of required follow up	Number of actual follow up	Percentage of required follow up
1	91	Not recorded	Not recorded	Not applicable
2	160	Not recorded	Not recorded	Not applicable
3	130	Not recorded	Not recorded	Not applicable
4	42	Not recorded	Not recorded	Not applicable
5	113	Not recorded	Not recorded	Not applicable
6	230	Not recorded	Not recorded	Not applicable
7	0	Not recorded	Not recorded	Not applicable
8	99	Not recorded	Not recorded	Not applicable
9	137	Not recorded	Not recorded	Not applicable
10	334	Not recorded	Not recorded	Not applicable
11	231	Not recorded	Not recorded	Not applicable
12	87	Not recorded	Not recorded	Not applicable
13	35	Not recorded	Not recorded	Not applicable
14	183	Not recorded	Not recorded	Not applicable
Total	1872	Not recorded	Not recorded	Not applicable

**Table 6. Clinical outcome during follow up as per CB-IMNCI guideline in the last 6 months. (n=14)**

Health Institution Code	Number of actual follow up	Number of clinical outcome	Percentage of clinical outcome
1	Not recorded	Not recorded	Not applicable
2	Not recorded	Not recorded	Not applicable
3	Not recorded	Not recorded	Not applicable
4	Not recorded	Not recorded	Not applicable
5	Not recorded	Not recorded	Not applicable
6	Not recorded	Not recorded	Not applicable

7	Not recorded	Not recorded	Not applicable
8	Not recorded	Not recorded	Not applicable
9	Not recorded	Not recorded	Not applicable
10	Not recorded	Not recorded	Not applicable
11	Not recorded	Not recorded	Not applicable
12	Not recorded	Not recorded	Not applicable
13	Not recorded	Not recorded	Not applicable
14	Not recorded	Not recorded	Not applicable
Total	Not recorded	Not recorded	Not applicable

There was no record of a total number of actual follow up and a total number of clinical outcomes in the last 6 months (table 6).

## DISCUSSION

Health system needs to be continuously monitored through effective tools. WHO analytical framework includes six blocks viz. Leadership and governance, Service delivery, Health system financing, Health workforce, Medical products, vaccines and technologies and Health information systems which can be used as a basis to assess health system function.<sup>8</sup> We attempt to analyze the implementation gap of the CB-IMNCI program in terms of healthcare providers' training status, availability of medicines, follow-up and clinical outcomes at Primary Health Care Centers and Health Posts.

Our study found less than half of healthcare providers (46.5%) trained for CB-IMNCI program which varies in each health institution ranging from 11.1 to 80 percent. In previous research, it was found that 64.7 percent had actually received training on CB-IMNCI.<sup>9</sup> The low percentage of the trained health workforce in our study might be due to the new uptake of healthcare providers by local governments however failed to provide them the required training. WHO framework for health workforce building blocks emphasize on availability of trained health personnel at service sites for quality service but our study found lack in such trained personnel which indicate the failures of implementation of the program. It is also essential to measure the quality of training and the outcome of training through regular outcome monitoring programs. The availability of trained health

manpower directly impacts on quality care of under-five children. The morbidities and mortalities of under-five children can be effectively reduced by effective implementation of the CB-IMNCI program for that health workforce training is vital. The MDG goal 4 we achieved in the past may not follow the same track for achieving SDG goal 3. The local government seems to be less concerned about this issue. It shows their negligence on the part of training the health personnel. The wide variation in the percentage of health workforce trained for CB-IMNCI program in our study might be due to resettlement of health workforce after a new system of health governance after having the implementation of "The Ordinance on Integration of Civil Servants- 2075, Nepal".<sup>10</sup> This implies poor leadership and governance with inadequate decentralization of health system at local level. This further had effect on the health centres under the local government indirectly affecting the quality of life of under-five children. However, concrete actions bring concrete results. This indirect effect on morbidity and mortality can be effectively reduced by effective implementation of the CB-IMNCI program. The mismatch of trained manpower after resettlement needs to be considered and immediate action for training should be initiated. CB-IMNCI section of the Department of Health Services of Nepal Government needs continuous monitoring and supportive supervision to strengthen the program and onsite coaching to enhance the clinical skill among health workers.<sup>9</sup> Further facility-Based Integrated Management of Neonatal and Childhood Illnesses (FB-IMNCI) package should be strengthened. The package is expected to bridge the existing gap in the management of complicated neonatal and childhood illnesses and conditions.<sup>11</sup> CB-IMNCI or FB-IMNCI or both training opportunities should be available for all the concerned health workforce.

The other important block of the WHO health system is medical products, vaccines and technologies. As per the CB-IMNCI guideline, there should be 24 different medicines in each health centre but we found a wide variation in the availability of medicines among the centres. Some health centres had only 8 medicines available while some had 12 at maximum. Medicines such as IV Amoxicillin, Erythromycin, Clotrimazole mouth paint, Artesunate, Artemisinin-based combination therapy were not available at any centres during our study visit. A previous study reported more than 30% of health facilities experienced stock out in the last 3 months for essential CB-IMNCI drugs. Similarly, more than 20% of health facilities did not have Inj. gentamycin, Cotrim P and Amoxicillin.<sup>9</sup> This reflects the issue of stock out is a chronic problem of CB-IMNCI program implementation.

The unavailability of half of the required medicine indicates a lack of effective implementation of the CB-IMNCI program which needs to be answered with a clear structure and guidelines. The timely availability of medicine is vital for treating under-five children. It has a direct impact on reducing morbidity and mortality of children of this age group. This unavailability creates unnecessary referrals of the under-five children. It represents a negative influence on the image of health centres. It also creates an extra burden to the family to pay for treatment. As per the constitution of Nepal, the availability of essential medicine is a constitutional right.<sup>12</sup> Inadequate treatment by the unavailability of medicine is the failure of the government to provide its citizen with a basic human right. The wide range of variations in the availability of medicine across the health centres from our study is notable. Some of the local governments are more concerned about this issue and their advocacy for medicines availability is better in that particular centres. Service delivery and health information systems are important for the CB-IMNCI program to evaluate the program effectiveness.

Although the last 6 months of data enrolled in the CB-IMNCI program was recorded, there was no record for a total number of required follow up, actual follow up and cured clinical outcomes. The previous study also reported inadequate and improper recording and reporting of these data.<sup>9</sup> It indicates the negligence of health care providers in record reporting. Or it also signifies that despite knowing the importance of record-keeping health care providers seem to procrastinate such tasks in expectation of getting training and incentives. Complete record reporting is vital for future planning. Without such data, it is not possible to monitor and evaluate the implementation of the program. The Department of Health Services, Government of Nepal has developed a health management information system (HMIS) for proper record keeping yet there exists a gap in program implementation. Hence, exploration of these issues is paramount.

On parts of training status for CB-IMNCI, we included participants receiving at least one training and excluded the details on the number of training and any refresher training received. The Nepal government is constantly adding new programs and approaches to get rid of these implementation gaps. It has made provisions on treating sick newborns free of cost through all tiers of its health care delivery outlets.<sup>13</sup> However a recent study found no benefit of reduced cost or out of pocket expenditure (OOP).<sup>14</sup> However, the package should be revised taking into consideration the appropriate reimbursement

and extra staff to provide these services.<sup>11</sup> The level I care was provided at health posts and primary health centres.<sup>11</sup> However, referral case management at the higher centres (Level II and above) was always a problem that was addressed to some extent by the government through the new FB-IMNCI program.<sup>11</sup> Improving the quality of maternal and newborn care is one of the strategic pillars of the Global Every Newborn Action Plan.<sup>13,15</sup> This should be well addressed by the quality of care through system strengthening and referral services for specialized care.<sup>13</sup> The capacity building of frontline health workers and volunteers needs to be focused on.<sup>13</sup> Promoting decentralized and evidence-based planning and programming with regular monitoring is important for better management of the program.

## CONCLUSIONS

About half of the human resources were trained and all health centres lack complete availability of listed medicines. We also found a lack of adequate record-keeping of follow up of patients and their clinical outcomes. CB-IMNCI register need to be revised.

## ACKNOWLEDGEMENTS

We would like to acknowledge in charge of the health centres of the Morang district.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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