The Curious Case of CAR (Cordillera Administrative Region): Healthcare Workers are Key to Improving Maternal Health Outcomes

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ABSTRACT

Introduction. Understaffed and underfunded Rural Health Units (RHUs) in Luzon struggle to provide Basic Emergency Obstetric and Newborn Care (BEmONC) services, resulting in high rates of maternal morbidity and mortality. The Cordillera Administrative Region (CAR) is different. Despite limited BEmONC-capable facilities, the region has maintained excellent maternal health outcomes.

Objectives. This study describes the status of BEmONC-capable RHUs in CAR and how these relate to the maternal and child health outcomes in the region.

Methods. This study uses the BEmONC Survey Toolkit to determine facility functionality based on the three categories of institutional capacity, service capacity, and personnel capacity. Focused Group Discussions were conducted to gather insights from community members, health personnel, and local stakeholders.

Results. The study evaluated 31 facilities; only one was adequately functional. The service capacity of BEmONC RHUs in CAR (7.19) was significantly lower than that of Luzon (14.16). The overall functionality score of CAR (58.10) was also slightly lower compared to that of Luzon (60.42). Yet CAR still had some of the best outcomes in terms of maternal and child health. Maternal mortality from 2000 (23 deaths) to 2018 (13 deaths) was consistently low.

Conclusion. The case of CAR reiterates the importance of having health personnel on the ground, maintaining the trust of the populace for health promotion to increase health awareness, and timely intervention in difficult situations. These directly impact health service delivery and improve health outcomes.

Keywords: maternal, mortality, prevention, outcomes

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INTRODUCTION

High rates of maternal mortality remain a major global health issue. Since the time of Primary Health Care in Alma Ata in 1978 to the Millennium and Sustainable Development Goals today, improving women's health and maternal and child care has been a cornerstone of health outcomes. Presently, Sustainable Development Goal 3 envisions universal access to services for sexual and reproductive health care by implementing national programs like family planning and education.[1,2]

The Philippine government implemented the Basic Emergency Obstetric and Newborn Care (BEmONC) services through the rural health units (RHUs) in 2010. These signal functions are basic life-saving interventions for emergency obstetric complications[3] that improve outcomes in low- to middle-income countries. Tiruned et al. reported a two-fold increase in health center delivery rates and follow-up rates at the health facility.[4] Southwest Ethiopia likewise reported a 64% decrease in their Maternal Mortality Ratio (MMR), a higher percentage of mothers with at least four ante-natal check-ups, and a decrease in home delivery rates.[5]

The Cordillera Administrative Region (CAR) found in central northern Luzon was established on July 15, 1987, through Executive Order No. 220 by late former President Corazon C. Aquino. CAR is the country's only land-locked region and is composed of the provinces of Abra, Apayao, Benguet, Ifugao, Kalinga, and Mt. Province, and the chartered city of Baguio. Abra is the largest province by land area while Mountain Province is the smallest, excluding Baguio City.[6] The region has a total land area of 18,293.68 square kilometers. Its rugged terrain and mountainous topography produce a climate distinct from the country's lowland regions.

CAR boasts one of the lowest maternal mortality rates, with only 25 maternal deaths in 2019. These deaths were distributed among Abra (seven), Apayao (three), Benguet (five), Kalinga (two), Ifugao and Mt. Province (one each), and Baguio City (six). There were 30,355 live births in CAR and only 101 fetal deaths in the same year.[7]

As of August 1, 2015, the population of CAR was 1,722,006, accounting for 1.7% of the total Philippine population based on the 2015 Census of Population. This number increased by 1.21% annually from 2010 to 2015. The average household size was 4.3 persons, lower than the reported 4.6 persons in 2010.[8] The maternal mortality ratio improved from 65 to 45 per 100,000 live births from 2010 to 2015.[9]

This case report discusses the status of BEmONC-capable RHUs in CAR and how these relate to the maternal and child health outcomes in the region.

METHODS

Study Design and Population

This report is taken from a larger study entitled "Assessment of the Philippine Emergency Obstetric and Newborn Care (EmONC) Initiative" by Cagayan et al. in 2021[10] which determined the functionality of 245 BEmONC-capable RHUs in Luzon using both quantitative and qualitative data. The study sampled at least 30% of the facilities in the largest area. The study included 245 BEmONC RHUs in Luzon, allowing ≥6% difference from 4% of BEMONC facilities able to perform all signal functions at 80% power and an alpha of 0.05.[11] Specifically for CAR, this case study focused on 10 BEmONC RHUs in Mt. Province, seven in Benguet, six in Abra, five in Apayao, and three in Baguio City (Figure 1).

Data Collection and Tools

A BEmONC Survey Toolkit consisting of a facility survey form and a score card was used to determine the functionality of a BEmONC RHU in three components: (1) institutional capacity: protocols, infrastructure, and supplies; (2) service capacity: human resources and training; and (3) personnel capacity: performance of signal functions.

For qualitative data, two focus group discussions (FGDs) were conducted through purposive sampling. One FGD involved the BEmONC RHU staff as healthcare providers. The other FGD involved patients and community representatives as stakeholders who availed of the healthcare services. For CAR, 11 healthcare providers, two patients/ community representatives, and eight mothers participated in the two FGDs. Minimum standards per IATF rules were followed for the FGD (i.e., 1-2 meters distance per person was maintained, masks were worn all the time, and antigen test or PCR was done for outsiders coming into the community).

Data Analysis

Quantitative Data

Functionality score was summarized in means (± SD) for normally distributed data or in median (and IQR) for non-normally distributed data. A facility was considered adequately functioning if the score was ≥ 60 and with no score <20 in any category) and inadequately functioning if the score was <60 or a score <20 in any category. Differences between regions were tested using the two-way ANOVA for continuous data and Pearson's chi squared test for categorical data.

Qualitative Data

The FGDs were recorded, compiled, and analyzed thematically using NVivo 12. The two independent transcribers had an 80% concurrence for finality. Recordings in Tagalog and other dialects were translated to English and back-translated for consistency. Themes were assigned codes and arranged according to the categories and themes based on similarities.

Ethical Considerations

This study was registered with the Philippine Health Research Registry (ID number PHRR201127-003171) and approved by the Single Joint Research Ethics Board (registration code SJREB-2020-75). All of the study participants provided written informed consent.

RESULTS

Quantitative Data

Of the 31 CAR facilities included in the study, only one (3.23%) was adequately functional (compared with a 35% functionality rate for Luzon).

Figure 1. Examples of facilities visited in CAR.

In terms of personnel capacity, CAR had the lowest performance compared to the other Luzon regions. It had the lowest rate of administering parenteral antibiotics and uterotonics. Only one facility (3.23%) administered anti-convulsants in CAR as compared to 34.29% in the entire Luzon. Only one facility (3.23%) in CAR performed assisted imminent breech delivery, the least in Luzon. Newborn resuscitation and partograph review were least done in CAR.

The mean institutional capacity and service capacity of BEmONC RHUs in CAR (24.94 and 25.97, respectively) were comparable to those of Luzon (23.42 and 22.84, respectively). However, the mean personnel capacity of BEmONC RHUs in CAR (7.19) was significantly lower than that of Luzon (14.16) ($p<0.001$).

Some RHUs were not accredited or re-accredited because of structural factors. Much equipment was outdated but could not be replaced or repaired because of insufficient funding to replace them or get newer ones. There was always a lack of personnel: doctors, midwives, or nurses would retire; doctors would leave to specialize; deployed personnel from the DOH central office was not yet BEmONC-certified; and staff members who were BEmONC-trained needed to renew Basic Life Support (BLS) Training.

Overall, the functionality score of CAR (58.10±15.39) was slightly lower than that of Luzon (60.42±25.27).

Qualitative Data

Results of the FGDs were grouped into subthemes.

Processes

Few teenage pregnancies were identified, suggesting that there was a good implementation of family planning programs. The facilities had good pregnancy tracking; semi-annual maternal death reviews were conducted to assess the common causes of death.

Inability to access e-forms prevented the facility from sending online requirements for the past two years. Most facilities mentioned that reimbursements from PhilHealth took a long time to be processed.

In terms of geographically isolated and difficult areas (GIDAs), problems involved the lack of transportation, lack of doctors, and sporadic supply of medicines from the LGU. In some cases, the personal vehicles of the nurses were used to transport the patient to referring facilities for emergency cases.

Pregnant women were listed in the RHU. They were monitored monthly by barangay health workers and midwives and were brought regularly to the local hospital for an ultrasound if needed. Breech mothers, first-time mothers, and those with a history of difficult pregnancy and delivery were advised early to go straight to the district hospital for monthly prenatal follow-up until delivery.

Human Resources

All levels of professionals were respected equally. Midwives and nurses were seen as medical authority figures. Also, nurses and midwives were provided by DOH to augment the lack of plantilla positions. This allowed for at least one midwife and one nurse to be distributed to satellite birthing centers in each barangay to track pregnancies.

Some doctors were introduced to the concept of BEmONC early in their training. However, their training differed from that of nurses and midwives, causing conflict. Some midwives and nurses felt disempowered from lack of confidence, opting to refer to other centers rather than managing the patients in the RHU.

Some expressed that having staff dedicated to the BEmONC facility would help them concentrate on their duties and responsibilities. Several facilities lacked doctors, pharmacists, and medical technologists, especially in GIDAs.

Health workers, especially midwives and nurses, were active and valued at the grassroots level. RHU staff and community members were primary sources of information on BEmONC services. Patients were generally aware of the presence of trained health workers and were familiar with the maternal services offered in the RHU (such as ante-natal care, post-natal care, and free medications).

Supply and demand differed per RHU. Some RHUs experienced high demand and overuse of the facility and equipment. Others had fewer patients, leading to medication expiry.

Birthing units in CAR are sought-after because of midwives' personalized care of midwives and fewer restrictions. Mothers and patients had more confidence when receiving services from health workers. Lectures and lay fora were also imparted to the community for health education.

Training

No BEmONC training evaluation is currently available. There was also no training conducted since 2020 due to the COVID-19 pandemic. Deployed midwives and nurses from the DOH were considered fixed employees and were not included. Most of the candidates for training were older health workers with permanent positions, but who also had other tasks for the RHU.

Culture

Cultural practices emerged as a significant factor in BEmONC utilization — such as whether to practice family planning and avail of free health services. In CAR, pregnancy was seen as something physiologic or normal, not a medical condition. Pregnant mothers tended to only go to medical professionals when they were already in labor. Being seen by a medical professional had also become a socioeconomic symbol.

Stakeholders in CAR were described as cooperative. Community members helped one another to reach the facility.

> *"The concept of Bayanihan is present in the community. Community members with the means for transportation assist those in need so that they can reach the doctor."*

Politics

Political issues were identified in CAR as a barrier to the utilization of maternal care services. One facility faced political unwillingness from the local government unit (LGU) in the construction of a BEmONC facility despite the availability of trained personnel. In another province, the concern was with the lack of initiative from the municipal council to hire needed staff, despite continued recommendations from both the provincial and the municipal health offices. LGUs also neglected the BEmONC initiative for other programs like the COVID-19 response and vaccinations.

DISCUSSION

CAR has the fewest functional BEmONC RHUs in Luzon. Facilities are understaffed and underfunded, and transportation is difficult. Despite these, CAR still has some of the best outcomes in terms of maternal and child health. The MMR from the years 2000 to 2018 in CAR was consistently the lowest in Luzon. In a tally by the Department of Health-Epidemiology Bureau in 2019, the MMR was 0.8, and the fetal death rate was 3.3% (Figures 2 and 3).[12]

Importance of Health Workers in the Communities

Despite the lack of functional BEmONC facilities, women of the Cordilleras understand the importance of maternal and child health. Based on the FGD results, one factor may be the presence of health workers at the grassroots level. Health workers sensitize communities,[13] promote health "at a level understood by mothers,"[14] increase the number of perinatal household visits, and improve recall of key health promotion messages.[15] However, sustained quality supervision and training are necessary.

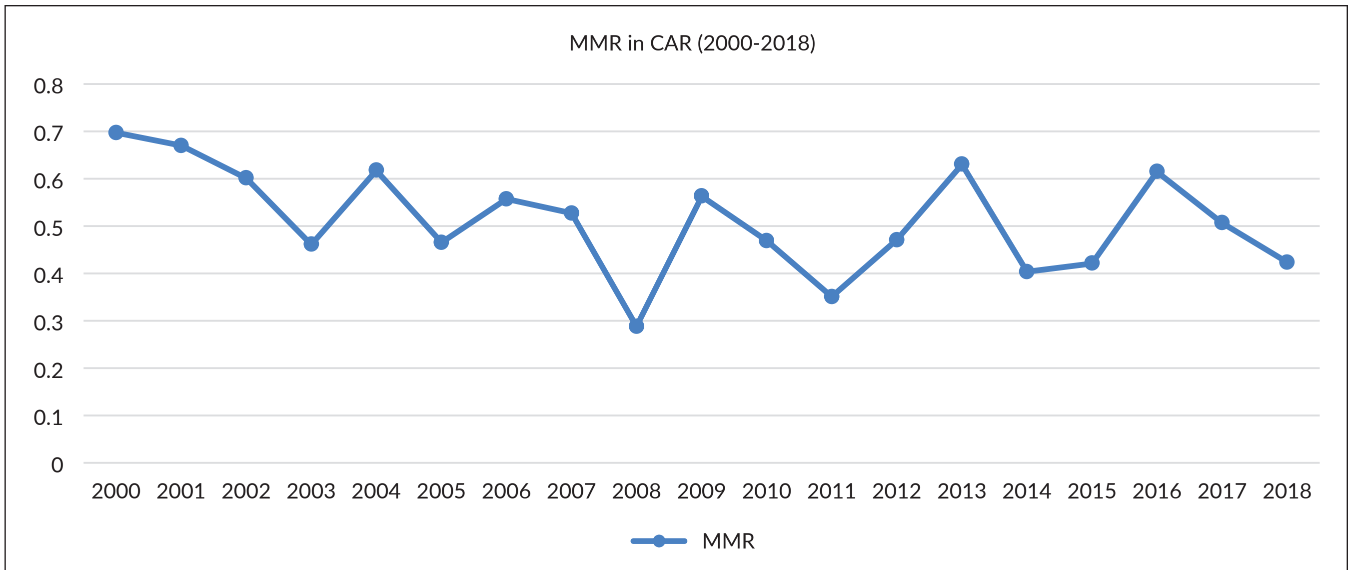

Figure 2. Maternal Mortality Rate (MMR) per 1000 livebirths in CAR, 2000-2018.

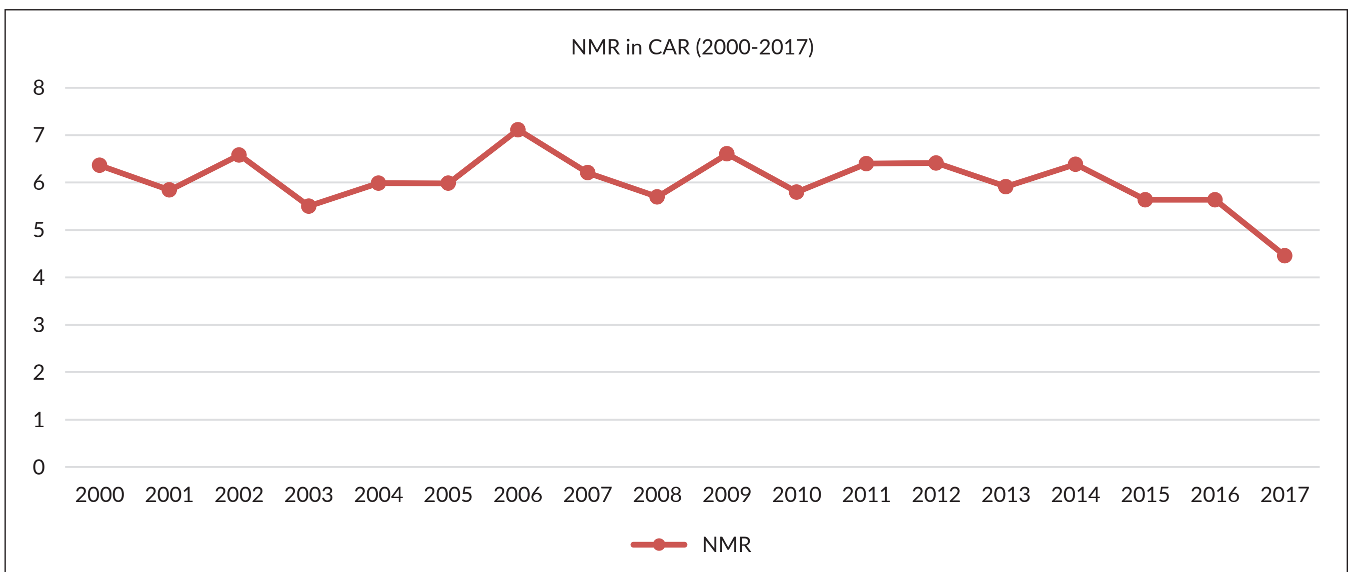

Figure 3. Neonatal Mortality Rate (NMR) per 1000 livebirths in CAR, 2000-2017.

The indigenous peoples are knowledgeable through studying modern medical practices and through attending barangay medical missions. These findings from the FGDs point to a high level of health literacy in CAR regarding women's health, contributing to fewer complications.

Socioeconomic status mitigates how antenatal care affects skilled birth attendance. Woldegiorgis concludes that "empowering women through economic strengthening schemes and education may also improve maternal health service utilization."[16]

Trust is Essential Among Stakeholders

Trust is essential between health workers and patients to ensure adequacy and access to care, cooperation to meet health objectives, and implementation of health programs to achieve better health outcomes. In CAR, people look up to their barangay health workers and midwives with respect; these are the people who they see often taking care of them. Such regard makes it easier to send them to the hospital when needed.

Maternal health involves multiple sectors (such as government, private sectors, and civic society) and stakeholders.[17] Grant states that "developing relationships of trust requires collaborative teamwork at a system level and

depends on good communication between all members of the health team."[18] "Fostering relationships of trust between CHWs, community members, and the personnel at facilities in the health system is vital in improving service delivery and uptake of services."[18,19] Bain et al. similarly suggest community-based health planning and services (CHPS) "to facilitate supervised and emergency skill delivery at the community level" to improve skilled birth attendance.[17,20]

Culturally, people of the Cordilleras believed in home deliveries and traditional healers. However, the study result showed that most mothers preferred being treated by doctors, nurses, or midwives. The FGD participants viewed nurses and midwives as equal to doctors in knowledge on skill. They also believed that being treated by a medical professional is a social status symbol. Zhou et al. found that maternal health services were more utilized by richer and better-educated patients living in urban areas.[21] Even younger generations living in GIDAs pursue health and science careers then return to their locale and provide medical assistance. This helps improve health information and promotion, and consequently, health outcomes.

Timely and Appropriate Risk Assessment and Referral to Higher-Level Centers

BEmONC facilities refer critical cases and complications to higher-level facilities. These include first-time mothers, patients with hypertension, patients at risk for premature labor, and patients in breech. Health care workers in the RHUs were able to identify and refer these patients to nearby hospitals. This improves the survival of mothers and newborns.[22,23] Improved communications between referring centers, improved transportation services (vehicles and roads), and increased number of facilities with maternity rooms are the next steps in improvement.[22]

Frequent referral can lead to deterioration of BEmONC skills and congestion in higher-level facilities. One reason for referring to tertiary hospitals is the lack of human resources and equipment to properly cater to patients.[24] These conditions are compounded by the lack of confidence of health personnel in performing signal functions.[25] As articulated by the health personnel themselves, regular training and adequate facilities and equipment are needed for better maternal health services in the RHUs.

CONCLUSION

CAR exhibits good maternal and newborn health outcomes despite problems that plague resource-poor provinces. While not all BEmONC-capable facilities were functional, the region maintained very low maternal morbidity and mortality rates. This case report reiterates the importance of having health personnel on the ground, maintaining the trust of the populace, improving health awareness, and taking appropriate action for high-risk cases. These all directly impact health service delivery and improve health outcomes.

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Statement of Authorship

All authors contributed in the conceptualization of work, acquisition and analysis of data, drafting and revising, and approved the final version submitted.

Author Disclosure

All authors declared no conflicts of interest.

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