

Review Article

Advancing emergency obstetric care in India: progress, challenges, and the road ahead

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ABSTRACT

One of the key strategies to reduce maternal and newborn mortality is to improve the availability, accessibility, and use of emergency obstetric and newborn care (EmONC) services. The emergency obstetric care (EmOC) and life-saving anesthetic skills (LSAS) training programs were initiated in the early 2000s in the country to tackle the shortage of skilled providers in critical care during childbirth in India. However, these training programs are still based on a curriculum developed around 15 years ago, which does not account for modern healthcare challenges, technological advancements, or the diverse conditions encountered in the field. A narrative review was conducted, and secondary data was analysed from the Government portal related to emergency obstetric care services in the States. Interviews were held with key stakeholders' expertise in policy from the National level and from the program implementation at the State level. Through a detailed examination, the article elucidates the evolution of this curriculum, transformative changes introduced, the recent developments and the technical changes incorporated in the revised EmOC and LSAS curriculum drafted in 2024, highlighting the need and importance of these trainings. The article also delves into the progress with respect to the Emergency Obstetric care services in India so far, the current challenges and bottlenecks in implementing this program over the States, and provides insights and suitable recommendations for further improving the emergency obstetric care services in the country.

Keywords: Emergency obstetric care services, Lifesaving anaesthesia skills, First referral units, Task shifting, Task sharing

INTRODUCTION

India has made significant progress in reducing the maternal mortality ratio (MMR) from 556 per lakh in 1990 to 97 per lakh live births in 2018-20 (a decline of 83% compared to the global decline of 45%) (Figure 1). The country is currently on track to achieve the Sustainable Development Goal 3 (SDG 3) target of an MMR below 70 by 2030 (Figure 2). Similarly, Infant Mortality Rate (IMR) has declined from 89/1000 live births in 1990 to 28/1000 live births in 2018-20 (a decline of 69% compared to the global decline of 55%) (Figure 3). Despite the one-third reduction in MMR, India still contributes 12% to global maternal deaths. Pregnancy-related mortality and morbidity continue to have huge

impact on the lives of Indian women and their newborns. Reducing maternal and child mortality is a key priority for improving population health outcomes, the provision of Universal Health Coverage and for achieving health-related targets of the Sustainable Development Goals (SDGs).

A key challenge that remains is to overcome the lack of comprehensive, high-quality obstetric care services across public health facilities, especially the chronic shortage of specialists (including Obstetricians and Anaesthesiologists). In consideration of the aforementioned points, the curriculum has been updated to reflect all recent developments and technical advancements that have occurred over the years. The article focuses on the process taken in revising the

existing curriculum, the progress made in the program so far, the current challenges and bottlenecks in implementing this program over the States and provides insights and suitable recommendations for further improving the emergency obstetric care services in the country. The program was redesigned keeping in view the recommendations and suggestions made by the experts.

The concept of “task shifting” and emergency obstetric care

All women need access to high-quality care in pregnancy, during and after childbirth. It is vital that every childbirth is overseen by a competent and trained healthcare professional, as prompt intervention and care can be decisive in preserving the lives of both the mother and the infant. As per WHO global recommendation task shifting has been one of the evidence-based strategies to ensure essential services in resource-constrained settings. Evidence from other regions of the country highlights the success of task shifting of doctors, paramedical staff, and nurse practitioners for surgical obstetric procedures and anaesthesia.¹ Global evidence and studies on task shifting suggest that for the provision of emergency obstetric care, task shifting led to an increase in services without a significant increase in adverse outcomes.^{2,4} Very recently the target 4 of the EPMM (Ending Preventable Maternal Mortality) strategy released by WHO also targets every pregnant woman with obstetric complications and emphasizes the importance of comprehensive maternal healthcare.

It aims to ensure that every woman receives essential maternal health services to reduce maternal mortality and improve maternal and newborn health outcomes. One of the important indicators on which this outcome can be measured is “proportion of the population covered by emergency obstetric care (EmOC) health facilities within 2 hours of travel time”. The global target for the same to be achieved by 2025 is that at least 60% of the population be able to access these facilities physically. India needs to achieve this target and need to take steps to make available the necessary services to its population. Government of India had started focusing on the concept of “task shifting” or “multitasking” since the inception of National Health Mission.

NHM supported advanced training of nurses, including multi skilling and task shifting to enable and empower them to take on newer service areas. They were also supported to obtain educational advancement through bridge courses and other trainings including SBA, EmOC and LSAS trainings. To ensure the same the government initiated the innovative CEmONC and LSAS trainings to overcome the shortage of doctors and specialists at the rural level and public health facilities and to expand the pool of trained health professional to provide high-quality care during obstetric emergencies. Multitasking along with multiskilling of MBBS doctors, would help in

operationalizing the FRUs thereby providing timely provision of care and treatment.

Evolution of the emergency obstetric training in India

The government of India had committed under NRHM/RCHII to operationalize first referral units (FRUs) for comprehensive obstetric care services. Besides strengthening these facilities for emergency obstetric services various skills-based trainings had also been initiated to address the shortage of specialist services in rural health services (Table 1).

Based on the recommendations of an expert group constituted under the tenth five-year plan, a 16-week EmOC training program was rolled out in 2003 to train MBBS doctors in providing comprehensive obstetric care services. Similarly, an 18 weeks lifesaving anaesthesia skill (LSAS) training program for in-service MBBS doctors was initiated in 2006 to empower MBBS doctors with anaesthesia skills that can be utilized during obstetric emergencies. The objective of these two training was to harness the services of the trained medical officers to operationalize CEmOC services at designated FRUs.^{5,6} The program was initiated to overcome the shortage of specialist manpower & operationalize First Referral Units (FRUs). The doctors trained in EmOC were able to manage complications and also undertake C-sections to save lives. In many of the far-flung districts, these trained doctors acted as lifesavers for the system in providing assured emergency obstetric care services. Further, in the subsequent years, an independent, external evaluation of these initiatives was conducted at the behest of MoHFW. The evaluation indicated that wherever the quality of training was good and trained personnel were immediately utilized; the training served its purpose. However, there were instances when the trained doctors couldn't perform well & to identify the bottlenecks, an independent evaluation of the program was conducted at the behest of MoHFW. The evaluation indicated that wherever the quality of training was good and trained personnel were immediately utilized; the training served its purpose.

However, certain programmatic gaps were also identified attributes like irrational posting, non-availability of Anaesthetists/LSAS trained doctor, lack of complementary facilities like OT/HDU, Blood bank/Blood storage unit etc for providing desired services. The quality of training at Medical Colleges was excellent but the same at the DH level wasn't adequate. Among others, the recommendations of this evaluation included increasing the duration of training, revision of the curriculum, strengthening of FRUs, rationalizing the posting of LSAS and CEmONC-trained doctors at public facilities, improved workforce management (including the introduction of financial and non-financial incentives) and more robust indemnity and medico-legal cover for LSAS and CEmONC trained doctors. Consequently, an expert committee was formed to revise the curriculum

and the operational guidelines. Moreover, after the launch of SUMAN Guarantee Package in the year 2019, the health facilities in India conducting deliveries have been designated as Basic, BEmONC and CEmONC type facility. The SUMAN (CEmONC) type of facility includes all BEmONC services along with the additional service for emergency obstetric surgery and a facility for blood transfusion. It is mandatory that all the minimum seven signal functions are available in a BEmONC Compliant facility and nine functions are available in a CEmONC Compliant facility. These signal functions (Table 2) are the key interventions for treating the vast majority of maternal complications and for resuscitation of the newborn after birth. These set of life-saving services defines a health facility in its capacity to treat obstetric and newborn emergencies and hence should have trained doctors in CEmONC and LSAS. Although these trainings have been ongoing for many years, there is limited evidence regarding the actual outcomes of training and the operationalization of FRUs through task shifting of trained medical officers.

LITERATURE REVIEW

There are limited evidence available on the evaluation of the CEmONC and LSAS training programs across India, particularly regarding how effectively trained doctors can apply their skills in real-world settings. However, some studies have been undertaken sporadically regarding evaluation of the program in the country. One study done in 2009⁷ evaluated the training program of general medical officers (MOs) in comprehensive emergency obstetric care (CEmONC), including caesarean delivery in India. Results revealed that the training increased the capacity for basic and comprehensive emergency obstetric care at rural facilities.

Significant barriers were being faced by the trainees after they were posted in their respective facilities including lack of infrastructural and equipment support, non-corporation from other health staff and seniors and inadequate anaesthesia support. The study also revealed that proper selection of motivated candidates and sufficient post training support was crucial for the successful running of the training program output. Another study done on similar lines particularly regarding anaesthesia services also showed similar findings.⁸ Results indicated that the program improved anaesthesia availability but faced challenges like inconsistent practical training and inadequate facility preparedness (e.g., lack of blood services). Collaboration with trained obstetricians and supportive environments enhanced MOs' performance. Many MOs struggled with confidence and skill application due to limited training duration and lack of regular case exposure. The general recommendation suggested was extending the training duration, offer refresher courses, ensuring better infrastructural support at facility level and establishing an effective monitoring system to sustain the impact. Another study evaluated the operationalization of

comprehensive emergency obstetric care (CEmOC) through task shifting of trained medical officers at 50 first referral units (FRUs) across seven states in India. It found that only 22% of FRUs were fully functional, with significant gaps in infrastructure and resources. Blood storage units were missing in 68% of facilities, and only 68% had both obstetricians or CEmOC-trained officers and anaesthetists or LSAS-trained personnel.

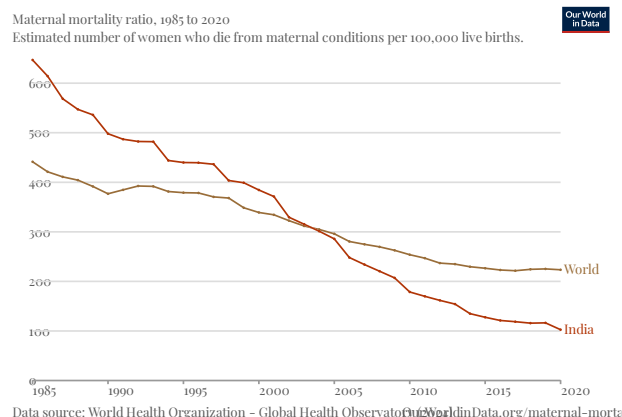


Figure 1: Comparison of the Global and India decline in MMR.

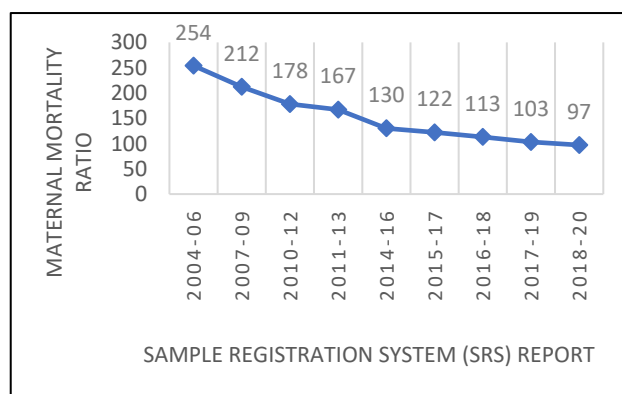


Figure 2: Trend in the maternal mortality ratio over the years.

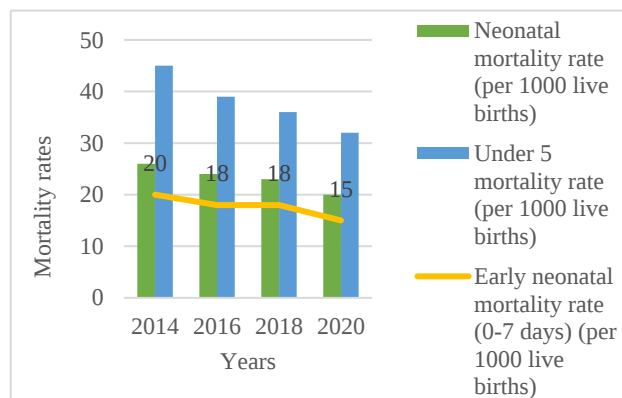


Figure 3: Trend in major mortality health indicators (India).

Despite round-the-clock referral transport being available in 86% of FRUs, operative facilities were absent in 36%. The study highlighted fragmented deployment of resources, inadequate infrastructure, and state-specific variations as key barriers, emphasizing the need for a holistic approach to improve FRU functionality and reduce maternal mortality.⁹

One of the recent studies done in the year 2019, highlighted the role of Emergency Obstetric Care (EmOC) training and its impact on healthcare delivery. It stressed that short competency-based training significantly enhances the knowledge and skills of healthcare providers, with a mean increase of 10.6% in knowledge and 29.8% in skills. The training positively influences clinical practices, including better adherence to protocols, improved resuscitation techniques, and enhanced teamwork and communication. Evidence suggested improved neonatal outcomes, such as reduced trauma and fewer cases of hypoxia and hypothermia. However, the study also identified the challenges like declining skills retention post-training, staff attrition, irregular supplies, and limited opportunities for practical application, emphasizing the need for sustained efforts in training and system support to maximize benefits.¹⁰ Experiences from the field and common review mission (CRM) visits also corroborate the fact that the CEmONC and LSAS-trained doctors grapple with the triple challenge of managing complex emergencies, working with limited resources, and struggling for professional recognition. With respect to training, the trained doctors face inconsistencies in the program implementation, including inadequate practical training, unclear administrative support and limited opportunities for supervised practice in real clinical settings. An outdated curriculum designed in 2005, not incorporating

advancements in obstetric care and simulation technologies, high attrition rate of trained personnel due to inadequate infrastructure, lack of incentives, and professional isolation and limited monitoring and evaluation mechanisms to ensure quality and retention of skills have been some of the other major challenges faced by the program. Thereby it becomes crucial for policy makers and researchers to examine how these healthcare providers are being utilized at FRUs for the provision of quality and comprehensive obstetric services and to understand the barriers they face in doing so.

The need for curriculum revision and program revamp

With all the findings and inputs, there was need felt to revise the curriculum along with the operational aspect of the training. It was required that the curriculum is aligned with the latest practices and protocols and incorporate the technical know-how for managing obstetric emergencies (e.g., WHO protocols). Strengthening infrastructure and support systems like equipping FRUs with functional operating rooms, reliable anesthesia equipment, and blood banks is required. Provision for a dedicated mentorship and continuous medical education opportunities for trainees is also required. Policies change for retention and motivation of the trained doctors also required attention. Considering the recommendations made by the experts, and taking learnings from the field both the LSAS and CEmONC curriculum were then revised. The revised curriculum takes into consideration all the relevant changes and programmatic updates that have evolved in the last decade. Some of the major recommendations as suggested by the expert group/committee members and which had been incorporated in the revised curriculum are as per the Table 3.

Table 1: Summary of the recommendations by expert group in the year (2003).

S. no.	Recommendations of expert group
1	A comprehensive approach with personnel, infrastructure and resources needs to be adopted. A shortage of anaesthetists and obstetricians was identified as an area of major concern.
2	To meet the challenge of shortage of anaesthetists the training of general medical practitioners (M.B.B.S) in anaesthesia for emergency obstetric care, particularly in rural/peri-urban areas should be taken up immediately. This course should also include developing skills in resuscitation and emergency care.
3	Training in resuscitation and emergency care for a limited period for all medical doctors posted from primary health centres and above in the country should become a regular feature in the public sector.
4	Steps should be initiated to Increase the number of postgraduate seats in anaesthesia as per the need of the country keeping the long-term perspective in mind.
5	Steps should be initiated to increase the number of postgraduate seats in anaesthesia as per the need of the country keeping the long-term perspective in mind.
6	Appropriate changes in the M.B.B.S curriculum to equip medical graduates to undertake emergency resuscitation and anaesthesia should be made.
7	Committee to be constituted for developing curriculum, guidelines, criterion for evaluation of competency, norms for selection of training institutes and criterion for evaluation for the training program etc.
8	The Government should take proactive steps to provide indemnity to the trained doctors which may include providing insurance cover etc.
9	It should be ensured that the personnel managing casualty/emergency rooms are adequately trained and equipped for resuscitation of emergencies

Table 2: Minimal "Signal functions" that health facilities should provide.

BEmONC services	CEmONC services
1. Administer parental antibiotics	1. Perform signal functions 1-7 (BEmOC services), plus
2. Administer uterotonic drugs (ie parental oxytocin)	2. Perform surgery (eg, Caesarean section)
3. Administer parental anticonvulsants for pre-eclampsia (ie magnesium sulfate)	3. Perform blood transfusion
4. Manual removal of placenta	
5. Remove retained products (eg manual vacuum extraction, dilatation, and curettage)	
6. Perform assisted vaginal delivery (eg vacuum extraction, forceps delivery)	
7. Perform basic neonatal resuscitation (eg with bag and mask)	

A bemonc facility is the one in which all functions 1-7 are performed. A cemonc facility is one in which all functions 1-9 are performed.

Table 3: Summary of the changes done in the revised curriculum 2024.

S. no.	Recommendations/changes
1	The care after birth including Essential New Born Care & Resuscitation has been emphasized and thus the name of the training was changed from Emergency Obstetric Care (EmOC) to Comprehensive Emergency Obstetric and Newborn Care (CEmONC).
2	The duration of the training has been increased from 16 to 24 weeks for CEmONC & from 18 to 24 weeks for LSAS to build confidence and quality of training.
3	Both the knowledge part and practical part of training will be imparted at Medical College and thereafter 6 weeks of hands-on training for practical experience to be imparted at District Hospital.
4	The curriculum has been made comprehensive, focusing on skills practice through video, manikins, and case studies including the latest evidence-based practice and skills.
5	Criteria for selection and checklists for monitoring the training sites have been added to the operational guidelines.
6	Only that training site is to be selected which is a SUMAN notified and Laqshya certified facility. More focus on respectful maternity care is being given.
7	The curriculum has been synchronized with the latest programs, and guidelines of GoI Eg LaQshya, SUMAN Initiatives, PMSMA, Midwifery program.
8	An undertaking from the State government (regarding post-training deployment of trainees) has been included in the operational guidelines.
9	There is the inclusion of newer and updated protocols like BMW Management Rules 2016, PPH management with inclusion of use of Tranexamic acid, the inclusion of Injection Td in place of Tt, anemia management etc. Separate and new chapters have been included like Counselling during pregnancy, Respectful maternity care, Rapid initial assessment (RIA), Records and registers/Health portals etc.

Table 4: Number of FRU facilities.

FRU type	Designated	Operational
FRU-DH	807	689
FRU-SDH	944	394
FRU-CHC	1808	394
FRU-Total	3559	1685

Source: HMIS Annual Report 2023.

DISCUSSION

Over the years about 2,518 doctors have been trained in Emergency Obstetric Care including C-sections and 2,683 doctors in LSAS.¹¹ Major achievements have been with regard to the improvement in emergency obstetric care delivery at designated first referral units (FRUs) and the reduction in the number of referrals for high-risk

pregnancies to tertiary centers. This number is not constant and dynamic as the number of trained doctors passing the exam and then actual practicing in the field varies. Additionally, the number of community health centre (CHC) first referral units (FRUs), which play a critical role in emergency and maternal care at the district level, rose from 940 in 2005 to 3,064 in 2022 in the country.¹² Not only the infrastructure, the total number of

specialists has also increased in all these years. The total number of specialists in CHCs (Surgeons, Obstetric & gynecologists, physicians and pediatricians) have increased from 3550 to 4413 from 2005 to 2023.¹² Undergraduate seats in medical colleges have increased from 51,348 in 2013-14 to 1,08,848 in 2023-24.

Correspondingly, the number of postgraduate seats including those for obstetricians and gynecologists have also increased from 31,185 in 2013-14 to 70,674 in 2023-24. Further, the number of medical colleges has increased from 387 in 2014 to 706 in 2023.¹³ These numbers translate to a doctor-population ratio of about 1:834, exceeding the World Health Organization's recommended ratio of 1:1000.

Still challenges continue to affect the provision of high-quality maternal, newborn, and emergency obstetric and neonatal care (EmONC) services in healthcare facilities. There is a dearth of specialists, especially at the level of rural CHC level in the country.

There are only 26% of obstetric and gynecologists, 19% pediatrician, and only 25% of anesthesiologist's doctors available in the country.¹⁴ Despite the increasing number of doctors and specialists graduating each year in India, first referral units (FRUs) in rural areas remain largely non-functional. Recent government data indicates that around 40% of FRUs in rural India are not fully operational, primarily due to inadequate staffing, lack of essential equipment, and poor infrastructure. The national health mission (NHM) reports that out of the over 3,000 FRUs needed nationwide, only about 2,000 are functional, with rural areas suffering the most from these deficiencies (Table 4). Additionally, a study by NITI Aayog highlights that while India has over 1 million registered doctors, only about 20% practice in rural areas, resulting in a significant shortage of healthcare services where they are most needed.

This disparity severely limits access to emergency obstetric care, critical newborn care, and other essential health services in rural regions, contributing to higher maternal and infant mortality rates compared to urban areas.

Driven by other Government programs like JSY, JSSK the number of deliveries has also risen exponentially in the last couple of years (from 38.7% to 88.6% from NFHS 3 to NFHS 4).¹⁵ The C-section rates have more than doubled. While this trend is uneven across States and more uneven amongst public and private facilities. The prevalence of C-sections across India increased from 17.2% to 21.5% in the five years leading up to 2021.

In the private sector, these numbers stand at 43.1% and 49.7%, meaning that nearly one in two deliveries in the private sector is a C-section.¹⁶ This trend shows a rising concern about over-medicalization in urban settings and private hospitals, while rural and underserved areas still

struggle with inadequate access to emergency obstetric care and a lack of adequately trained doctors.

Effective CEmONC and LSAS training should contribute to the strengthening of healthcare infrastructure, particularly in rural and underserved areas where access to emergency obstetric and anaesthesia services may be limited. By systematically evaluating these aspects, researchers and policymakers can gain a comprehensive understanding of the effectiveness of CEmONC and LSAS training programs and identify opportunities for further improvement in emergency obstetric and anaesthesia care.

Recommendations

There is a need for a holistic approach to improving emergency obstetric and newborn care (CEmONC and LSAS) in the country. Implementing structured mentorship and simulation-based training programs to enhance practical skills and confidence among healthcare providers, and forging partnerships with tertiary care centers to provide trainees exposure to diverse and complex cases are some of the recommendations. Addressing attrition through better work-life balance, career growth opportunities, and comprehensive indemnity coverage aims to retain skilled professionals.

Ensuring adequate infrastructure, regular audits, centralized procurement systems, and rational deployment policies will optimize the functionality of First Referral Units (FRUs).

Additionally, advanced qualifications, improved curricula, and regional disparity-focused strategies are essential for equitable healthcare delivery. The timely disbursement of performance incentives and the creation of a supportive and secure working environment further reinforce the sustainability and effectiveness of these initiatives.

CONCLUSION

The comprehensive emergency obstetric and newborn care (CEmONC) and lifesaving anaesthesia skills (LSAS) curriculum for in-service MBBS doctors stands as a pivotal stride towards enhancing healthcare delivery, particularly in resource-constrained settings. By equipping medical professionals with these crucial skills, we not only able to fortify the operationalization of first referral units (FRUs) but also significantly elevate the quality of emergency obstetric and anaesthesia care, consequently leading to improved health outcomes. Such initiatives are essential in our efforts to achieve sustainable development goal targets, particularly in relation to maternal and newborn health.

By training doctors in comprehensive emergency obstetric and newborn care (CEmONC) and life-saving anaesthesia skills (LSAS), we not only equip healthcare

providers with vital skills but also promote a healthcare system that guarantees timely and high-quality care for everyone. This ultimately contributes to the broader goals of global health equity and resilience.

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