Assessment of Service Readiness and Effective Coverage Using a Clinical Cascade Model for Emergency Newborn Services in Rural Ghana

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BACKGROUND

Neonatal deaths account for 47% of all under-five deaths. Globally, an estimated 2.4 million newborns died within the first month of life in 2019. Ghana experiences unacceptably high newborn mortality rates with an estimated 25 neonatal deaths per 1000 live-births. High quality of care has been associated with improved outcomes in the maternal and newborn population. Central to understanding and monitoring progress in newborn outcomes is measuring the quality of care available for vulnerable newborns.

This study evaluates the quality of care for small and sick newborns in rural Ghana by measuring service readiness for and effective coverage of emergency newborn signal functions in two districts in rural Ghana.

MATERIALS AND METHODS

This study combines cross-sectional health facility (n=39) and household (n=3158) surveys to assess the quality of care available for small and sick newborns in rural Ghana using two approaches.

First, **service readiness** is measured by evaluating health facilities across five standard quality dimensions (clinic infrastructure, equipment drugs and supplies, health worker knowledge scores, performance of signal functions and referral capacity.

Second, a **clinical readiness cascade** for emergency newborn care is used to assess facility readiness to i) identify, ii) treat complications and iii) modify the treatment plan to improve quality of care.

Effective coverage, defined as the proportion of newborns delivered in facilities that meet a minimum readiness threshold, is measured for each newborn quality dimension and for the identification and treatment stages for neonates born in the health facilities

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RESULTS

1) SERVICE READINESS

- Most facilities met minimum or higher quality criteria for the infrastructure and health worker knowledge dimensions.
- All district hospital met minimum or higher quality criteria for equipment, medications, and supplies, and two met minimum criteria for treating newborn emergencies.
- None of the lower-level facilities met minimum criteria for equipment, medications, and supplies or treating newborn emergencies, and few lower-level facilities met minimum criteria for referral capacity.
- There was a consistent drop between readiness to identify neonatal emergencies and readiness to treat those same emergencies.

2) EFFECTIVE COVERAGE

- Effective coverage in the treatment stage for newborn signal functions varied from 0% for neonatal seizures and neonatal jaundice to 41.3% for safe oxygen administration.
- 67.6% of all deliveries took place in facilities that did not meet minimum quality criteria in the domains of equipment, supplies and drugs.
- Only 21.4% of deliveries in sub-district facilities took place in facilities that met minimum quality criteria for referral.

3) READINESS CASCADE FOR NEWBORN EMERGENCIES

- Overall, most facilities had low service readiness for neonatal signal functions along the clinical cascade.
- Stage one (identification) readiness for neonatal signal functions ranged from 7.7 % (neonatal jaundice) to 84.6% (neonatal sepsis).
- Readiness in stage two (treatment) ranged from 0% for seizure management to 5.1% for management of neonatal sepsis, jaundice and oxygen administration.
- There was a consistent drop in readiness between identification and treatment for all neonatal signal functions. 48.9% of newborns were delivered in facilities that met low-quality criteria for equipment, drugs and supplies.

DISCUSSION

Low quality care has been associated with poor health outcomes in LMICs. Overall, this study found that effective coverage for small and sick newborns was poor in the two study districts. Sub-district facilities (CHPS & Health Centres) were least equipped to identify and treat small and sick newborns. Low readiness in the identification stage combined with readiness loss between clinical stages demonstrates the urgent need to empower subdistrict facilities to readily identify and triage emergencies, while simultaneously strengthening emergency referral pathways for small and sick newborns between subdistrict and district levels. Improving facility readiness for emergency newborn care in the Ghanaian context could begin with identifying and upgrading a subset of the basic EmONC facilities staffed by trained midwives and/or a community health nurse (CHN) with the requisite basic skill set to identify, temporize and refer newborns with complications; CHPS compounds that see large volumes of deliveries or are geographically inaccessible for timely referrals may be initially targeted for strengthening emergency newborn care provision.

CONCLUSION

Clinical cascades and effective coverage provide nuanced understanding of the mismatch between resource availability and care utilization, allowing for targeted interventions. Strategic investment in strengthening services and referral capacity could improve quality and coverage of key neonatal services in remote communities. Policymakers should carefully consider how best to leverage subdistrict facilities for emergency newborn services.

FIGURE 1. EFFECTIVE COVERAGE FOR EMERGENCY NEWBORN SIGNAL FUNCTIONS

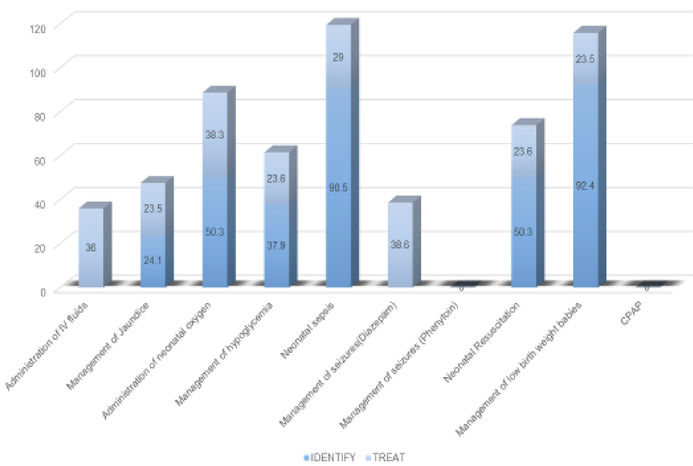

FIGURE 2. READINESS CASCADE FOR BIRTH ASPHYXIA