Provider-mother communication and the misclassification of neonatal death in Guinea Bissau

BACKGROUND: Accurate estimates of neonatal mortality rate (NMR) are essential for tracking countries' progress toward achieving the global development targets, such as the Sustainable Development Goals 3 of reducing NMR to no more than 12 per 1000 livebirths by 2030,[1] and for informing global, national and subnational policy-making and resource allocation to improve newborn survival.[2] This is especially critical in low-and-middle-income countries, where 98.4% of neonatal deaths occur.[2] In these areas, estimates of NMR are computed using periodically conducted population surveys, such as the Demographic and Health Surveys and the Multiple Indicator Cluster Surveys, that ask women to self-report all live-born children or all pregnancies using tools called full birth history or full pregnancy history, respectively.

However, these survey-based self-reports are prone to measurement errors such as underreporting, misreporting and misclassification. [3-7] Underreporting and misreporting have been more extensively studied, yet misclassification between stillbirths (SB) and early neonatal deaths (ENND) has only recently gained attention. For example, a study in Malawi found that 20.5% of ENND reported in a full birth history based population survey were actually misclassified SB after comparison to a verbal autopsy social autopsy study. [8] In Guinea Bissau, misclassification contributed 43.4% to false negatives and 62.7% to false positives in NMR, which was more than the measurement errors due to underreporting or misreporting. [9]

Factors contributing to the misclassifications could be multifaceted. First, SB/ENND have many causes in common, so the two types of vital status are sometimes hard to distinguish.[5,10-11] Second, mothers or providers may misreport the birth outcomes deliberately to avoid stigma, blame, or extra work. [11-12] Third, cultural context could also contribute to the misclassifications, such as when phrases from the local language map onto both SB and ENND.[11,13] Lastly, our field experience in Guinea-Bissau suggests that a lack of or inadequate communication between providers and mothers on newborn vital status may also contribute to misclassification, an association that to our knowledge has yet to be examined.

OBJECTIVE: In order to investigate provider-patient communication as a potential factor of misclassification between SB/ENND, we implement a mixed-methods study in Guinea-Bissau to 1) understand the presence and quality dimensions of the communication related to newborn vital status; 2) quantify the association between the communication of newborn vital status and self-reported misclassification; and 3) explore the facilitators and barriers that affect the communication of newborn vital status from the perspectives of providers and mothers.

METHOD: The study has three phases:

1) We directly observe about 40 deliveries at Hospital National Simao Mendes in Bissau and conduct post-delivery surveys with mothers to understand the presence of

communication on newborn vital status between providers and mothers, and the dimensions of the communication, such as context, content, timeliness, amount, tone, and function.

2) Using a case-control study design, we use the Bandim Health Demographic Surveillance Site records of SB/ENND as reference and compare them to the records from the Every Newborn Action Plan population survey in 2018[14] to identify 108 mothers who self-reported misclassified SB/ENND (cases) and 348 mothers who correctly reported their newborn's vital status (controls) in the survey. We interview mothers using a structured questionnaire to quantify the association between misclassification and the communication on newborn vital status such as when and how it was communicated, by whom, and whether it was timely, explicit, and easy to understand. We also collect data on potential confounders such as demographics and birth-related characteristics.

3) We conduct 7 focus group discussions with various cadres of health providers and 14 in-depth interviews with women with misclassified SB/ENND to understand the facilitators and barriers that affect the communication of vital status, such as respondent and health system characteristics, and social norms.

We use an inductive thematic iterative analysis approach to qualitatively analyze the presence of communication, its selected dimensions, and its facilitators and barriers in the event of SB/ENND. We also use logistic and multinomial regressions to investigate the association between misclassification and the presence and dimensions of communication, respectively, while controlling for confounding respondent characteristics. Qualitative analyses are performed in Atlas.ti and quantitative analyses in Stata using a significance level of $p \leq 0.05$.

RESULTS: We anticipate unpacking how different dimensions, facilitators, and barriers of communication are associated with the extent of misclassification. We also anticipate quantifying how absent or inadequate provider communication about newborn vital status may lead to higher odds of misclassification between SB and ENND.

CONCLUSION: These findings on misclassification may inform and identify pathways for patient care and self-report interventions that could ultimately lead to more accurate measurement of SB, ENND, and NMR in population-based surveys.

KEYWORDS: neonatal mortality rate, stillbirth, population survey, provider communication, misclassification

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