Title:

Tackling Post-discharge Mortality in Children Living in Low- and Middle-Income Countries to Meet Sustainable Development Goals on Child Mortality

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COMMENTARY

The Sustainable Development Goals (SDG) aim to end preventable deaths in children aged less than 5 years by the year 2030. However, in 2020 over 5 million deaths occurred in children aged under 5 years, mostly from preventable causes and mainly in sub-Saharan Africa (54%) and Southern Asia (26%) [1]. As increasing numbers of children with life-threatening illnesses seek care from hospitals, the role of high-quality facility-based care is increasingly recognized as critical to efforts in achieving the SDG target[2]. However, a growing body of evidence points to a previously under-recognized contributor to child mortality: deaths after hospital discharge. Recent studies show that approximately half of all deaths among children admitted to hospitals in low- and middle-income countries (LMICs) occur within 6 months of discharge. Of additional concern, half of these post-discharge deaths occur at home. These facts indicate that children who are discharged from hospital remain highly vulnerable in the immediate post-discharge period. The reasons for this vulnerability are undeniably complex and may be related to many interacting factors such as premature discharge, residual underlying conditions, risky home environments, poor health seeking and weak health systems [3-5]. What is clear from these data is that achieving the SDG targets on child morality is not possible without concerted efforts to address post-discharge mortality and hospitals are additional points in the health system to identify the most vulnerable.

For in-hospital care, the World Health Organization (WHO) guidelines for common childhood illnesses and the Emergency Triage Assessment and Treatment (ETAT) guidance are recommended for use in LMICs. Currently, no similar comprehensive guidance for post-discharge care exists. How then can post-discharge mortality be addressed in LMICs? The first step is to better define the burden and factors associated with post-discharge mortality and build this into routine community surveillance linked to health-facility records, which can also measure impact of any intervention. Studies have identified risk factors for post-discharge mortality, including moderate and severe malnutrition, HIV infection, leaving hospital against medical advice (sometimes associated with inability to pay), prior admission (revolving door syndrome), bacteraemia, anaemia, and severity of illness at admission[4]. Malnutrition is an important predictor but not all malnourished children are at high risk and some children with normal anthropometry remain at significant risk of mortality after discharge, highlighting complex underlying mechanisms that need to be understood and addressed[5]. The recent CHAIN study showed that child-, parental- and home-level exposures underlie the clinical features above. At healthcare-level, a lack of continuity of care, ineffective communication and negative caregiver experiences during admission also underlie post-discharge mortality[5].

What interventions will have the greatest impact in reducing post-discharge deaths? The UNICEF and CHAIN conceptual frameworks provide logical comprehensive overviews of what needs to be considered when addressing post-discharge mortality and highlight the importance of addressing underlying factors [6]. It also recognizes that a child-centred approach to post-discharge care must account for the wide distribution of risk among discharged children, thus focusing the limited resources on those at highest risk. Children at risk of death after discharge can be identified from clinical signs and history collected at admission and prediction models have been developed and implemented for risk-stratification and targeted follow-up, such as those developed by the Smart Discharges research group [5,7,8]. However, the models are better when social and household factors are included. Identifying children at risk of mortality for targeted post-discharge follow-up and care avoids increasing workload of healthcare workers, who are often in limited supply in LMICs.

Vulnerable children often have challenges with geographical and financial access to care or come from disenabling home environments and therefore more likely to miss hospital follow-up visits and so other strategies are needed. Importantly, prioritisation will be needed to focus appropriate resources to the highest-risk groups. Developing ETAT-like guidance which could be implemented at discharge to identify children at risk of death for targeted care should be a priority. How post-discharge care is organised within an already fragile, overwhelmed health system in LMICs needs formative research that will inevitably be country and condition specific. Returning children to primary care providers needs to ensure these community-based health workers are not overwhelmed with additional responsibilities. There will be instances where special follow-up clinics must be managed at hospital levels. However, post-discharge follow-up alone will not address underlying biological or complex social mechanisms and research to understand these are required.

Post-discharge interventions that are beneficial such as post-discharge malaria chemoprevention (PDMC) to reduce mortality a nd readmission in children with all-cause severe anaemia in areas with ongoing malaria transmission is now recommend by WHO and should be implemented at scale[9]. Context-appropriate post-discharge follow-up interventions, risk based or for all admissions, are required for provision of care following hospitalisation. However, a full range of interventions can only be developed after understanding the social and biological mechanisms that predispose children to admission and post-discharge mortality[10].

What is emerging in this previously hidden problem is both its complexity and the need to carefully develop and evaluate the impact of context-appropriate solutions. Furthermore, the issue of post-discharge mortality also highlights that hospital care is critically linked with community-level care. Rather than a unidirectional linkage through an upward referral system, a properly linked system ought to facilitate integrated care throughout the full journey of an ill child from community, to facility and then back to the community. It will be critical to determine what hospital-led and community-led responsibilities are feasible and appropriate in different settings.

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