Prioritising health-care strategies to reduce childhood mortality, insights from Child Health and Mortality Prevention Surveillance (CHAMPS): a longitudinal study


Abstract

Background Globally, mortality in children younger than 5 years has been decreasing over the past few decades, but high under-5 mortality persists across regions of sub-Saharan Africa and southern Asia. Interventions—such as improved quality of clinical and antenatal care, better access to emergency obstetrical procedures, better triage and risk stratification, better immunisation coverage, or infection control measures—could substantially reduce deaths, but it is unclear which strategies could save the most lives. We aimed to use data from the Child Health and Mortality Prevention Surveillance (CHAMPS) network to examine which health-care and public health improvements could have prevented the most deaths.

Methods We used standardised, population-based, mortality surveillance data collected by CHAMPS from seven sites (Bangladesh, Ethiopia, Kenya, Mali, Mozambique, Sierra Leone, and South Africa) to understand preventable causes of death in children younger than 5 years. Deaths were investigated with minimally invasive tissue sampling, a post-mortem approach using biopsy needles for sampling key organs and body fluids. For each death, an expert panel reviewed case data to determine whether the death was preventable and if preventable provided recommendations as to how the death could have been avoided. We evaluated which health system improvements could have prevented the most deaths among those who underwent minimally invasive tissue sampling for each age group: stillbirths, neonatal deaths (aged <28 days), and infant or child deaths (aged 1 month to <5 years).

Findings We included 1982 eligible deaths (with minimally invasive tissue sampling performed) that occurred between Dec 9, 2016, and Feb 29, 2020, including 556 stillbirths, 828 neonatal deaths, and 598 child deaths. Of these 1982 deaths across all seven CHAMPS sites, 393 (71%) stillbirths, 583 (70%) neonatal deaths, and 487 (81%) child deaths were deemed preventable. The most recommended measures to prevent deaths were improvements in antenatal or obstetric care (recommended for 44% of stillbirths and 31% of neonatal deaths), clinical management and quality of care (stillbirths 26%, neonates 32%, children 46%), health-seeking behaviour (children 24%), and health education (children 22%). Given that 70% of under-5 deaths are stillbirths and neonatal deaths, an intervention that focuses on these age groups (eg, improved antenatal care) could prevent the most under-5 deaths.

Interpretation These data indicate areas in which greater focus on improving existing systems could prevent the most deaths. Investments in interventions such as better access to antenatal care, improvements in clinical practice, and public health campaigns could substantially reduce child mortality.

Funding Bill & Melinda Gates Foundation (OPP1126780).

Copyright © 2022 The Author(s). Published by Elsevier Ltd. This is an Open Access article under the CC BY 4.0 license.

Contributors ZJM, DMB, and CGW drafted and revised the abstract. ZJM conducted the analysis. DMB, NA, QB, SEA, ESG, AJ, KLK, SAM, IM, IUO, DO, JAGS, SOS, and BATB participated in protocol development and coordinated the clinical and diagnostic data collection. All authors reviewed the draft and approved the decision to submit for publication.

Declaration of interests We declare no competing interests.

Acknowledgments CHAMPS would like to extend its sincerest thanks to all the families who participated in this study.

Kisumu, Kenya (O Onyango MD); Department of Infectious Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK (J A G Scott FMedSci); Ministère de la Santé, Centre pour le Développement des Vaccins, Bamako, Mali (S O Sow MD); Centers for Disease Control and Prevention Kenya, Kisumu, Kenya (B A Tippett Barr DrPH)

Correspondence to: Dr Zachary J Madewell, Center for Global Health, Centers for Disease Control and Prevention, Atlanta, GA 30329, USA ock0@cdc.gov