**Association of undernutrition and neonatal, infant and under-5 mortality: evidence from 62 low-income and middle-income countries**

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**Background**

During the Millennium Development Goals (MDG) era, many low and middle-income countries (LMICs) failed to achieve the MDG 4 goal of reducing neonatal, infant and under-5 mortality. In this study, we aimed to assess whether reductions in early childhood undernutrition is associated with a reduction in neonatal, infant and under-5 mortality rate in LMICs.

**Methods**

We analyzed demographic and health household survey data from 62 LMICs collected between Jan 1, 2006, and Dec 31, 2018. The sample consisted of nationally representative cross-sectional surveys of children aged 0–59 months, and the three outcome variables were a country-level neonatal, infant and under-5 mortality incidence. The independent variables were country-level percentages of stunting, wasting and underweight. We used multivariate Poisson regression models to estimate the association between change in child undernutrition and change in child mortality. Models were adjusted for the country-level mean duration of breastfeeding.

**Findings**

Overall, 28.4% (95% CI: 26.3%, 30.7%) of young children were stunted, 5.4% (95% CI: 4.5%, 6.6%) were wasted, 12.3% (95% CI: 10.4%, 14.6%) were underweight. Per 1,000 live births, neonatal mortality was 23.6 (95% CI: 19.3-27.1), infant mortality was 43.4 (95% CI: 30.2-50.1) and under-5 mortality was 61.6 (95% CI: 55.3- 68.3). At the country level, a 10-fold decrease in stunting was associated with a relative risk ratio (RR) of 0.81 (95% CI 0.66–0.98) for neonatal mortality, 0.66 (95% CI 0.55–0.80) for infant mortality, and 0.63 (95% CI 0.52–0.76) for under-5 mortality. No association was seen between wasting, underweight and child mortality. Breastfeeding was associated with lower rates of child mortality. A standard deviation (16 months) increase in breastfeeding was associated with a RR of 0.86 (95% CI 0.76–0.97; p=0.015) for neonatal mortality, 0.79 (95% CI 0.70–0.89; p<0.001) for infant mortality, and 0.75 (95% CI 0.67–0.85; p<0.001) for under-5 mortality.

**Interpretation**

An association was seen between decreases in stunting and reduction in child mortality. There is a need to emphasize improvement in the nutritional status of children in low-income and middle-income countries in order to achieve the Sustainable Development Goal 3.2 target: reducing neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births in all countries by 2030.