Association between economic growth and early childhood nutrition

Despite the use of similar source data,[1–4] studies[5–10] have yielded different conclusions about the association between economic growth and childhood undernutrition. Two groups[9,10] with particularly divergent perspectives engaged in an exchange of Correspondence (September issue)[11,12] debating whether the association exists at all.

Several differences in methods contribute to the disparity in estimates, but a simple difference explains much of the discrepancy: some authors express their results as absolute changes, whereas others report relative changes.

The closer the stunting prevalence is to 0%, the larger the gap between relative and absolute changes—eg, a prevalence decrease from 20% to 19% would be considered an absolute change of 1%, but a relative change of 5%. In the dataset by Vollmer and colleagues,[10] the average prevalence of stunting in countries was 35% when weighting all country-years equally, 37% weighting by the Demographic and Health Surveys' (DHS) sample size of children assessed for stunting, and 42% weighting by the total country population at the time of every survey. Thus, relative changes in prevalence would be about 2·4–2·9 times larger than absolute ones. Heltberg[5] noted that the coefficients of a regression using absolute units (prevalence *vs* log[GDP]) were three times larger than regressions using relative units (log[prevalence] *vs* log[GDP]).

By use of an assumption of a 37% stunting prevalence for all studies, we rescaled the relative measures to an absolute scale to show that the studies actually yield similar point estimates ranging from a 0·7%[6] to 2·2%[9] decrease in stunting prevalence per 10% GDP growth (figure).

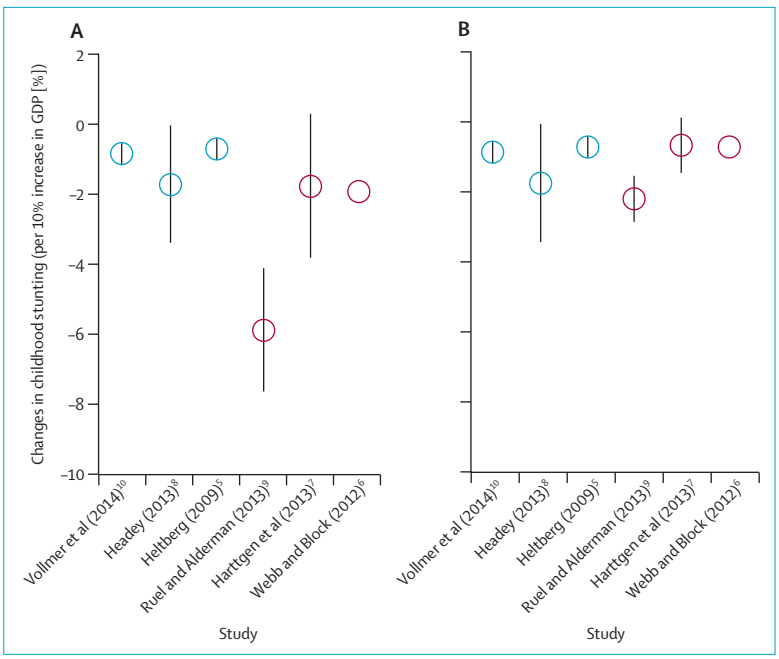

Figure: **Change in the prevalence of childhood stunting per 10% increase in per-capita gross domestic product**

(A) Coefficients reported in studies where log(GDP) was compared with the prevalence of stunting as an absolute change (blue circles) or log(prevalence) as a relative change (red circles). (B) Coefficients for relative change were scaled by the average prevalence of stunting (37%) to approximate the absolute change in stunting prevalence per 10% growth in per-capita GDP based on every study. Black vertical lines show the 95% CI for the studies that reported a confidence interval. GDP=gross domestic product.

Other differences in methods, including use of different subsets of available DHS surveys and different sources for GDP estimates, account for the remaining disparities, but their effect is slight. Ruel and Alderman[9] did their regression with only country fixed effects, not year fixed effects, whereas other studies controlled for the DHS survey year in addition to the country or geographical region. In our reanalysis, controlling for every calendar year dampened the effect of GDP growth by less than 50%, as did the variability arising from the functional form used to transform the data, choice of link function, and weighting of countries (equally, by population, or by DHS sample size). These different methods generated variability smaller than the triple difference due to relative scaling.

After scaling to absolute change, the studies had similar point estimates (figure), but different CIs. Reasons suggested for underestimation of CIs include the assumption that GDP was measured independently for every child in a survey and that GDP was measured without error.[11,12]

Reassuringly, analyses of the same data yield similar conclusions that economic growth is associated with decreases in childhood undernutrition, but the reductions are an order of magnitude smaller than the proportional growth in per-capita GDP.

We declare no competing interests.

*Anna Bershteyn, Hil M Lyons, Dhileep Sivam, *Nathan P Myhrvold*
nathan@nathanmyhrvold.com

Institute for Disease Modeling (AB, HML) and Intellectual Ventures (DS, NPM), Bellevue, WA 98005, USA

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