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# New approach suggested for monitoring child health in developing countries

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In a paper published in the January issue of the journal *Economics and Human Biology*, a team of applied economists including William A. Masters, a professor at the Friedman School of Nutrition Science and Policy at Tufts University, suggests a new approach to monitoring the relationship between nutrition and child mortality in developing countries.

Based on dozens of surveys compiled over 20 years, changes in the number of mildly underweight children could be used as an early-warning signal of underlying public health threats that are difficult to monitor in other ways, such as disease epidemics or changes in child feeding practices.

"Low bodyweight, in which nutrition plays a key role, is a well known symptom and also a cause of ill-health and mortality for children in developing countries. Observers and clinicians usually focus on the most severe cases, but for public health, the extent of mild underweight could be even more meaningful," says William A. Masters, PhD, who co-authored the study while a professor at Purdue University. "One reason is that there are so few children at the extremes and they are difficult to measure. Mild under-nutrition, which affects a much greater number of children, could be a powerful predictor of population health."

Masters and colleagues examined 130 Demographic and Health Surveys (DHS) conducted in 53 African, Asian, and South American countries between 1986 and 2006. Their data cover thousands of children between

3 months and 3 years of age, classified by weight according to World Health Organization (WHO) standards. The study focused on children who are underweight in terms of their weight-for-height ratio, signaling that they have not recently absorbed enough nutrients to meet their growing needs, and compared the prevalence of severe underweight to the number of children who are only mildly malnourished.

"Controlling for other variables, our tests showed that changes in the number of mild cases were more closely linked to child mortality than changes in the number of extreme cases," Masters says. "Change in the number of mild cases was also more closely correlated with local agricultural output." Co-authors of the study were Susan Chen, PhD, now an assistant professor at the University of Alabama, and Dr. Priya Bhagowalia, PhD, now an associate professor at TERI University in New Dehli, India. The paper derives from Bhagowalia's PhD dissertation at Purdue University, where she was advised by Masters and Chen.

"Our results are getting at how child nutrition is linked to broader public health concerns," Masters says. "For an individual child, severe underweight is much worse than mild underweight. Mildly undernourished children face only a small increase in their own mortality risk. But when a lot of children fall behind, something dangerous could be happening, perhaps the spread of contagious disease, a worsening of water quality, or food shortages."

Masters stressed that these results are just the beginning to opening up a new avenue of research. "Our results are based on one kind of data from the DHS surveys," he says. "We need to test for this relationship in other settings. If changes in mild undernutrition remain a useful predictor of child mortality, then health authorities around the world could use it as an early-warning signal to guide intervention before much of the damage occurs."

**More information:** Priya Bhagowalia, Susan E. Chen and William A. Masters. *Economics and Human Biology*. 2011 (January); Vol. 9, Issue 1. pp. 66-77. Published online May 2, 2010. "Effects and determinants of mild underweight among preschool children across countries and over time."

Provided by Tufts University