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One-third of children in low- and middle-income countries fail to reach developmental milestones

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In developing countries, one third of children 3 and 4 years old don't reach basic milestones in cognitive and/or socio-emotional growth, according to a new study from the Harvard T.H. Chan School of Public Health, funded by the Government of Canada through Grand Challenges Canada.

The study authors estimate that 80.8 million of the roughly 240 million preschool-aged children in the world's 132 low- and middle-income countries fail to develop a core set of age-appropriate skills that allow them to maintain attention, understand and follow simple directions, communicate and get along with others, control aggression, and solve progressively complex problems.

These early abilities are associated with subsequent development, mental and physical health, and ultimately, better learning in school and more productive lives as adults.

Published today by *PLoS Medicine*, the study draws on data provided by the caregivers of almost 100,000 children living in 35 low- and middle-income countries between 2005 and 2015. The data were collected as part of UNICEF's Multiple Indicator Cluster Survey program, Demographic and Health Surveys, and global data from the Nutrition Impact Model Study.

This is the first study to directly estimate the global extent of cognitive and/or socio-emotional development deficits; earlier estimates of this unmet potential globally were based on proxy measures of development including poor physical growth and exposure to poverty.

The researchers found that among 3 and 4 year olds in low- and middle-income countries, the problem is most acute in sub-Saharan Africa (29.4 million children not reaching developmental milestones; 44% of all 3 or 4 year olds), followed by South Asia (27.7 million; 38%) and the East Asia and Pacific region (15.1 million; 26%). A significant burden is also notable in Latin America/Caribbean (4.1 million, 19%) and North Africa, Middle East and Central Asia (4.5 million, 18%).

Low development scores were associated with stunting, poverty, male gender, rural residence, and lack of cognitive stimulation.

Says lead author Dana McCoy, Assistant Professor of Education at the Harvard Graduate School of Education: "In addition to the 33% of children overall who did not meet the selected cognitive and socio-emotional milestones, we estimate that 17% were physically stunted, meaning that approximately half of the children in these countries are developing poorly in one way or another."

The importance of children thriving, not just surviving, is emphasized in the United Nations Sustainable Development Goals and is central to the Every Woman Every Child Global Strategy for Women's, Children's and Adolescent's Health.

"Achieving optimal early child health and development is critical for attaining success in school, and has significant life-long implications for the health and economic wellbeing of individuals, families and communities," says the project's principal investigator, Wafaie Fawzi, Professor and Chair of the Department of Global Health and Population

at the Harvard T.H. Chan School of Public Health.

He added that quantifying the burden of failing to reach developmental milestones at national and global levels is important to monitoring progress towards the Sustainable Development Goals.

An estimate of the global economic cost of this unrealized human potential is the focus of a companion study conducted at Harvard, also funded by Grand Challenges Canada, with publication planned for later this year.

These studies are part of a larger project to estimate the epidemiologic and economic impacts of risk factors for child development, including a multi-disciplinary team of clinicians, economists, psychologists, epidemiologists, nutritional scientists, disease and risk factor modellers, and statisticians at the Harvard T. H. Chan School of Public Health, Imperial College London, Aga Khan University (Pakistan) and Ifakara Health Institute, Tanzania.

"When one in three children is failing to reach their full potential, we are looking at one of the world's grandest challenges. This research helps shine an ever brighter light on the value of investing in a child's earliest years - for the benefit of our children, our world and our future," said Dr. Peter A. Singer, Chief Executive Officer of Grand Challenges Canada.

More information: McCoy DC, Peet ED, Ezzati M, Danaei G, Black MM, Sudfeld CR, et al. (2016) Early Childhood Developmental Status in Low- and Middle-Income Countries: National, Regional, and Global Prevalence Estimates Using Predictive Modeling. *PLoS Med* 13(6): e1002034. DOI: 10.1371/journal.pmed.1002034

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