

# Diminishing health benefits of living in cities for children and teens

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The advantages of living in cities for children and adolescents' healthy growth and development are shrinking across much of the world, according to a new global analysis of trends in child and adolescent

height and body mass index (BMI). The study was led by researchers at Imperial College London and published in *Nature* under the title, "Diminishing benefits of urban living for children and adolescents' health."

The research, by a global consortium of more than 1,500 researchers and physicians, analyzed height and weight data from 71 million children and adolescents (aged five to 19 years) across urban and [rural areas](#) of 200 countries from 1990 to 2020.

Cities can provide a multitude of opportunities for better education, nutrition, sports and recreation, and health care that contributed to [school-aged children](#) and adolescents living in cities being taller than their rural counterparts in the 20th century in all but a few wealthy countries.

The new study found that in the 21st century, this urban height advantage shrank in most countries as a result of accelerating improvements in height for children and adolescents in rural areas.

The study also assessed children's BMI—an indicator of whether they have a healthy weight for their height. The researchers found that on average children living in cities had a slightly higher BMI than children in rural areas in 1990. By 2020, BMI averages rose for most countries, albeit faster for [urban children](#), except in sub-Saharan Africa and south Asia, where BMI rose faster in rural areas.

Nevertheless, over the 30-year period, the gap between urban and rural BMI remained small—less than 1.1kg/m<sup>2</sup> globally (less than 2kg in weight for a child who is 130cm tall or less than 3kg in weight for an adolescent who is 160cm tall).

Dr. Anu Mishra, lead author of the study, from Imperial College

London's School of Public Health, said, "Cities continue to provide considerable health benefits for children and adolescents. Fortunately, in most regions, rural areas are catching up to cities thanks to modern sanitation and improvements in nutrition and health care.

"The results of this large global study challenge the commonly held perceptions about the negative aspects of living in cities around nutrition and health."

While height and BMI has increased around the world since 1990, the researchers found that the degree of change between urban and rural areas varied greatly among different middle and [low-income countries](#), while small urban-rural differences remained stable across high-income countries.

Middle-income and emerging economies, such as Chile, Taiwan, and Brazil, have seen the biggest gains in rural children's height over the three decades, with children living in rural areas growing to similar heights as their urban counterparts.

Professor Majid Ezzati, senior author for the study, from Imperial College London's School of Public Health, said, "These countries have made great strides in leveling up. Using the resources of economic growth to fund nutrition and health programs, both through schools and in the community, was key to closing the gaps between different areas and social groups."

And contrary to the widespread assumption that urbanization is the main driver of the obesity epidemic, the study found that many high-income western countries have had very little difference in height and BMI over time—with the gap between urban and rural BMI differing by less than one unit in 2020 (close to 1.5kg of weight for a child of 130cm).

Professor Ezzati added, "The issue is not so much whether children live in cities or urban areas, but where the poor live, and whether governments are tackling growing inequalities with initiatives like supplementary incomes and free school meal programs."

The trend in sub-Saharan Africa is also a cause for concern, researchers say. Boys living in rural areas have plateaued in height or even become shorter over the three decades, in part because of the nutritional and health crises that followed the policy of structural adjustment in the 1980s.

Professor Andre Pascal Kengne, co-author for the study, from the South African Medical Research Council, said, "Rural sub-Saharan Africa is now the global epicenter of poor growth and development for children and adolescents. As the cost of food skyrockets and countries finances get worse due to the COVID-19 pandemic and the war in Ukraine, the rural poor in Africa are at risk of falling further behind."

Particularly large height gaps between urban and rural boys in 2020 were seen in Rwanda (around 4cm) and in the Democratic Republic of Congo, Ethiopia, and Mozambique—all by 2–3.5cm.

Over time, boys and girls in sub-Saharan Africa also gained weight more rapidly in rural areas than cities, which meant that in some countries they went from being underweight to gaining too much weight for healthy growth.

Professor Ezzati said, "This is a serious problem at every level, from individual to regional. Faltering growth in school-aged children and adolescents is strongly linked to poor health through life, lost educational attainment and the immense cost of unrealized human potential.

"Our findings should motivate policies that counter poverty and make

nutritious foods affordable to make sure that children and adolescents grow and develop into adults who have healthy and productive lives.

"Programs like healthy food vouchers for low-income families and free school meal programs can also provide lifelong benefits for children and adolescent's health and well-being."

**More information:** Rachel Heap & Conrad Duncan, Diminishing benefits of urban living for the health of children and adolescents, *Nature* (2023). [DOI: 10.1038/s41586-023-05772-8](https://doi.org/10.1038/s41586-023-05772-8).  
[www.nature.com/articles/s41586-023-05772-8](https://www.nature.com/articles/s41586-023-05772-8)

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