

Socio-economic inequalities in child growth: Identifying orientation and forward-looking layout

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China has experienced huge economic development and demographic changes during the past three decades and is just like an epitome of the world with a large geographical and socio-economic variation within country. It witnesses a obvious change in child physical growth along with the rapid economic growth. In *The Lancet Regional Health – Western Pacific*, Gao and colleagues¹ link the socio-economic inequalities with the growth trajectories of Chinese children by using a longitudinal design and family-/community-level indicators to assess the socio-economic position (SEP), making it an important addition to the current evidence base.

Gao and colleagues¹ used data from the China Health and Nutrition Survey between 1991 and 2015 to extract four cohorts born in 1981–85, 1986–90, 1991–95 and 1996–2000. The study showed that growth trajectories for children with higher SEP were above those with lower SEP in the four cohorts. Socio-economic disparities in height trajectories with 3–5 cm difference have persisted in the last 25 years. In the same period, disparities in BMI have widened from <0.5 kg/m² to ~ 1 kg/m². Based on these findings, the authors thereby call for tailored public health intervention by SEP to improve children's health, including efforts to improve height growth of rural or low SEP children and reduce the risk of overnutrition especially among urban children of those with high SEP, which might work for policy-makers of China and other low-and-middle income countries undergoing rapid economic and social changes.

There is a two-way relationship between height and SEP. Lower family-/community-level SEP is associated with shorter height and increased stunting risk.¹ Meanwhile, childhood stunting is associated with worse general healthiness and schooling outcomes, leading to lower SEP in adulthood.² Therefore, improving the nutritional status of children with low SEP could help them to realize their potential and improve the population quality, which is of importance especially in the

background of low fertility and greatly reduced child population in China in the past three decades.^{3,4} Height difference during adolescence is partially driven by earlier onset of puberty in the high SEP group. The height in late adolescence, represented by the height in those aged 17 years in this study, might be more closely related with their final height and reveal the inequality that really matters. Researches have shown that final body height is largely determined by genetics but whether they can reach their potential final height is also impacted by environmental factors including diet and infection.⁵ A series of national policies including Action Plan for Healthy Children (2018–2020)⁶ and Advanced Action Plan for Healthy Children (2021–2025)⁷ in China have included items on strengthening child health in rural and poverty-stricken areas and reducing child health inequality. The effect of these policies on improving the physical growth of rural and low-SEP children need careful monitoring in the future.

Overnutrition in children and adolescents is a looming major public health concern in China accompanied by rapid economic and social changes in recent decades. According to a latest nationally representative data, the prevalence of overweight and obesity in Chinese children aged 7–18 years increased from 5.3% in 1995 to 24.2% in 2019, which means approximately one of four children in China were overweight or obese.^{8,9} Interventions including promotion of healthy diet and adequate physical activity should be in place to tackle this sharp increase in overnutrition although they are not enough and need further research and discussion. Children with high SEP are more likely to be overweight and obese as shown in this and previous studies,^{3,9} suggesting that urban and high-SEP children are key population when designing intervention policies. However, policy-makers should be more forward-looking and not neglect rural and low-SEP children. With future predictable economic growth and urbanization in China, the pattern of socio-economic inequality in overweight and obesity might follow that of economically advanced countries in which low-SEP children carry more burden of obesity.¹⁰ Preventive measures might give rural and low SEP children the last chance for not being obese. In terms of intervention strategies and actions, a recent cluster randomized clinical trial in China showed that multifaceted intervention targeting children, their family and the school effectively reduced the mean BMI and obesity

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prevalence for primary school children.¹¹ National implementation of such intervention strategy should be considered.

There are still several unanswered questions on the socio-economic inequality in child growth. As the economic development between regions is quite unbalanced in China, data are needed to explain if those inequalities differ by regional economic levels. The mechanism behind those inequalities needs to be further studied and thus the policy-makers could design more specific interventions to reduce those inequalities. Furthermore, more intervention strategies on child overweight and obesity, tailored by local conditions, need to be developed and assessed to tackle the surge in overweight and obesity in China and other low-and-middle income counties undergoing rapid economic and social changes. Research on child health inequality could help the policy-makers to identify the vulnerable groups and better allocate the limited health resources. More well-designed and fine studies are needed in this area to build a more healthy and equal future population.

Declaration of interests

The authors declared no conflict of interests.

Author contributions

DL and YS conceived the commentary. DL wrote the initial draft. YS significantly edited and critically reviewed the draft.

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