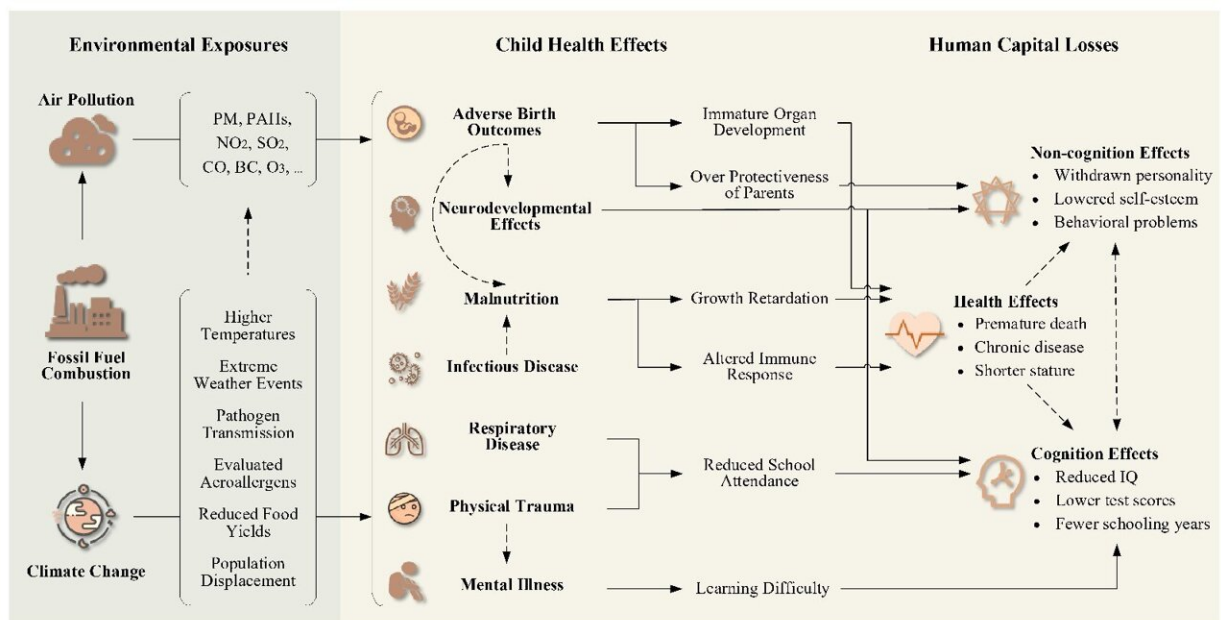


Examining the toll of fossil fuel combustion on children's health and subsequent human capital loss

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Pathways from fossil fuel combustion to the possible impacts on child health outcomes and associated human capital losses. Credit: Cunrui Huang

The impact of climate change and air pollution driven by fossil fuels poses a substantial and immediate threat to human health and overall well-being. Over the span of more than a century, the emission of fossil fuels has predominantly resulted in an approximate 1.1°C rise in the

Earth's average surface temperature compared to the pre-industrial era.

Although there has been a growing body of research examining the influence of [climate change](#) and [air pollution](#) on children's health in recent times, there remains a notable gap in addressing the intricate and cumulative health consequences for children, especially when viewed through a life course perspective.

In a review published in the journal *Global Transitions*, a team of Chinese researchers explored the effects of air pollution and climate change on children's developmental health, spanning from prenatal stages to adolescence. Additionally, they delved into the intricate and multi-faceted consequences of these health challenges on the development of human capital in later stages of life.

"When we investigate the influence of climate change and air pollution on [child development](#), it's crucial to thoroughly analyze it through the lens of a life course perspective," clarified lead author of the study Yali Zhang from Sun Yat-sen University.

"This perspective encompasses a range of effects, including adverse birth outcomes indicating damages to fetuses, impacts on the neural system which predominantly develops in the first year of life, malnutrition and infectious disease that occur in infancy, respiratory issues prevalent in young children, as well as the physical trauma and mental illness to which adolescents are more susceptible."

Human capital refers to the intangible resource a country's citizens possess, which encompass an individual's health, knowledge, skills, judgment, and other attributes. Many previous studies have used educational outcomes as proxies of human capital. These metrics include years of schooling, academic attainment, enrollment rate and illiteracy rate.

This review further summarizes the human capital effects due to climate change and air pollution, which are mainly mediated by [children's health](#) damages, in terms of three dimensions: health, cognitive ability and non-cognitive/socio-emotional ability.

Corresponding author Prof. Cunrui Huang from Tsinghua University, highlighted that a child born today will go through a series of vulnerable windows from the fetal period to childhood and beyond. These children may suffer from multiple health impacts during these periods as a result of air pollution and climate change.

"Consequently, we advocate for a comprehensive evaluation encompassing not only the direct repercussions of health impairments on children, but also the indirect ramifications on long-term [human capital](#) and the correlated economic toll," Prof. Huang urged. "This approach is vital to capture the profound impact of fossil fuel combustion on both the present and forthcoming generations."

More information: Yali Zhang et al, The impact of fossil fuel combustion on children's health and the associated losses of human capital, *Global Transitions* (2023). [DOI: 10.1016/j.glt.2023.07.001](https://doi.org/10.1016/j.glt.2023.07.001)

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