

A Brief Discussion on Fossil-Fuel Combustion By-Products and Its Significant Threat to Children's Health

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Abstract

The most significant threat to children's health and future is the combustion byproducts of fossil fuels, which are also major contributors to environmental injustice and inequality worldwide. Numerous harmful air pollutants and carbon dioxide (CO₂), the most significant greenhouse gas produced by humans, are among the emissions. Children's harm may be exacerbated when air pollution and climate change work together. Impaired cognitive and behavioral development, respiratory illness, and other chronic diseases are among the effects. All of these conditions can be "seeded" in utero and have an immediate and lasting impact on health and functioning. Pollution and climate change make children less resilient and the communities in which they live less equitable by affecting their health, ability to learn, and potential to contribute to society.

Keywords: Carbon dioxide; Fossil fuels

Introduction

Due to their immature defense mechanisms and rapid development, the developing fetus and young child are disproportionately affected by these exposures, particularly in low- and middle-income countries, where poverty and lack of resources exacerbate the effects. However, no nation is spared: Even countries with high incomes, particularly those with low incomes and communities of color, are experiencing the effects of climate change, pollution caused by fossil fuels, and the resulting widening of inequality and environmental injustice. Without bold action, global pediatric health is at a tipping point with catastrophic repercussions. Fortunately, there are technologies and interventions available to reduce and prevent pollution and climate change, with substantial documented or anticipated economic benefits. Concern for the health and well-being of current and future children is shared by all cultures and communities: This common value serves as a powerful political lever for action. The purpose of this commentary is to briefly review the data on the health effects of pollution from fossil fuels, focusing on the effects on neurodevelopment, and to briefly describe the options for achieving a low-carbon economy as well as some examples of interventions that have helped the economy and health.

Due to the combustion of coal, oil, gasoline, diesel, and natural gas, children, particularly the poor, bear a disproportionate burden of disease and developmental impairment from both environmental pollution and climate change. Fragmented, published in specialized journals, and focusing on air pollution and climate change separately, assessments of the effects of fossil fuel combustion byproducts on children's health and economic costs have typically been performed. The development of adequately comprehensive policies to safeguard this vulnerable group has been hampered by this silo effect, which has prevented a comprehensive assessment of the harm that a carbon-based economy causes to children. A comprehensive assessment of the effects of burning fossil fuels is called for in this commentary. An accounting of this kind is required to encourage the necessary global mitigation and action to address the growing threat to future generations and reduce disparities between regions and socioeconomic classes [1-5].

Discussion

Our children and their children will inherit a world that cannot sustain itself without the necessary ecological resources and social

stability. A significant topic of this discourse is natural unfairness: the disproportionately high health and economic costs that are borne by the young, the poor, and some minorities, especially in developing nations, who are most susceptible to the effects of toxic air pollutants and CO₂-driven climate change caused by burning fossil fuels. Children and their offspring would benefit greatly and for a very long time if this burden was reduced. Pope Francis came to the conclusion in his encyclical *Laudate Si* that fossil-fuel-based global capitalism has led to unsustainable consumption and growing inequality. The Lancet Commission on Health and Climate Change's most recent report also issued this caution. According to the Lancet Commission, The greatest opportunity of this century to improve public health, redress inequality, and increase the resilience of individuals, communities, and society as a whole can be found in government policies and other strategies that reduce reliance on fossil fuels and build sustainable communities.

In a previous commentary, I compared fossil fuel to the many-headed Hydra of Greek mythology, which caused multiple health and developmental problems for children through its emissions of carbon dioxide (CO₂) and toxic pollutants. We would reap long-term benefits for children if we switched to sustainable and renewable energy sources for industry, transportation, and electricity generation. Children with cognitive and behavioral disorders, mental health issues, asthma and other respiratory illnesses, and possibly cardiovascular disease and cancer, all of which have been linked to toxic air pollutants, account for a significantly smaller percentage of these cases. Children would suffer less from heat-related diseases, malnutrition, infectious diseases, physical and psychological trauma, mental health issues, respiratory illnesses, and malnutrition if climate change were mitigated. Because early exposure-related damage, disease, or impairment can affect long-term health and functioning, all of these health benefits would occur

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immediately and persist throughout one's life. The negative effects on early brain development, which affect children's ability to learn and, as a result, their future economic productivity and ability to contribute ideas and energy to society, are becoming a growing cause for concern. They, their families, and the community as a whole are less resilient as a result capable of "surviving, adapting, and growing in the face of stress and shocks and transforming when conditions require" Because the poor and disadvantaged children are the ones most affected, society becomes even less fair.

This commentary updates a previous review by this author that had more information and references, adding more recent or additional scientific and economic data on the health effects of burning fossil fuels now and in the future. Because the effects on the developing brain have been less well-known than the other health effects of these exposures, this article focuses primarily on the neurodevelopmental effects of air toxics and climate change.

Compared to adults, the developing fetus and young child are more biologically and psychologically susceptible to the numerous negative effects of toxic air pollutants and climate change caused by combustion of fossil fuels. Their rapid growth, dynamic developmental programming, immature detoxification, immune, and thermoregulatory systems, and reliance on adult caregivers all contribute to this differential susceptibility. Early development's complexity makes it susceptible to disruption from a variety of toxic exposures, including stress and toxic pollutants. The brain, like the respiratory and immune systems, develops throughout infancy and childhood; however, the most dynamic period is the prenatal period. From the initial formation of the neural tube to the proliferation and migration of neurons, synaptogenesis, apoptosis, or "pruning" of synapses, and the early phase of myelination, the brain undergoes highly synchronized maturation between conception and birth. The majority of the mature brain's more than 86 billion neurons are formed during the prenatal period. Numerous studies indicate that stress and exposure to xenobiotics make the fetal and early childhood stages particularly susceptible to genetic damage and epigenetic dysregulation; These molecular effects may have consequences that last a lifetime and cross generations [6-10].

Conclusions

Additionally, children are more exposed to air and food pollutants because they consume three to four times as much food per kilogram of body weight as adults and breathe more air per kilogram of body weight. The World Health Organization (WHO) estimates that children under the age of 5 bear more than 88% of the burden of climate change and more than 40% of the burden of environmental-related diseases, despite the fact that this age group only makes up 10% of the global population. This demonstrates the distinct vulnerability of young people. In developing nations, the effects of climate change are most severe; however, everyone in the world is affected.

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