

## EDITORIAL



# Global climate change: the defining issue of our time for our children's health

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The United Nations recently stated that “climate change is the defining issue of our time, and we are at a defining moment” (<https://www.un.org/en/global-issues/climate-change>). This statement ended the political debate about the role of human activities in climate change. A display at the Center for Environmental Studies at the University of Maryland at Solomon's Island, Maryland clarifies this trend (Fig. 1). Ambient temperatures have been measured at this site beginning in the 1930s and the average yearly temperature calculated. In this display, the average yearly temperatures from 1938 to 2019 were averaged over all years, and then the difference between the overall average and the average yearly temperature was calculated and displayed as a color code in the figure. Basically, the blue bars represent years where the average yearly temperature was less than the composite average temperature, and red is where the difference was greater. The darker the color, the greater the difference. It becomes obvious that the yearly average temperatures have been increasing since the 1980s, and the difference is increasing. Similar striped depictions have been created for regions throughout the world and can be viewed at <https://showyourstripes.info/s/globe> and are consistent with the graph in Fig. 1. Global climate change is happening and it will have a profound effect on our children.

Here is a partial list of some of the ways global climate change will impact children:

1. Infectious diseases—vector-borne (e.g., Zika, malaria) and water-borne illnesses (e.g., due to lack of clean water).
2. Preterm birth—heat causes PTB and wildfires and air pollution cause PTB and gastroschisis.
3. Heat waves—ability to play outside, heat stroke, heat exhaustion, access to air conditioning, impact on ability to concentrate (e.g., learning, school assignments).
4. Food sources and nutrition—certain crops unsuited to previous areas due to climate change, loss of land mass with rising ocean levels—malnutrition and starvation.
5. Air quality—more forest fires, more volcanic activity, and more dust—asthma, dust allergy, heart disease, and lung cancer.
6. Displacement—increase in climate refugees due to uninhabitable conditions at home.
7. Safe water—access, quality, connection to soil health, and support of farming activities.
8. Inequities—inequitable impacts on children (especially to those of low wealth and BIPOC communities, loss of jobs, inability to evacuate, challenges with rising food costs, and ability to address/prevent negative health outcomes).

9. Conflict—internal and international conflict due to increased competition for scarce resources particularly in low-income countries.
10. Mental health, both parental and child—trauma from 1 to 7 above, stress, loss of loved ones from 1 to 7 above, inability to attend school during/after a major weather event, increase in violence, and both national and international conflicts.
11. Uncertainty in the future, climate anxiety.
12. Lifelong cumulative effects—effects with increasing exposures due to climate events over a lifetime.

While climate change is a major problem and may be the most pressing issue on children's health, very few research articles on this topic are submitted to *Pediatric Research*. The science and research may be outside the mainstream of research done in academic Pediatric Departments. However, we feel it is important to educate our readership on this issue, arm researchers with the tools to contribute to this field, and begin to craft and implement efforts to prepare for and manage the changes underway, and reduce greenhouse gas emissions from healthcare and biomedical research. To this end, we invited a series of papers on global climate change that will include an overview, a research toolbox, and the role that researchers can play in managing global climate change.

Some of what pediatric researchers can do is to practice energy efficiency and sustainability. Use products that require less transportation. Purchase from responsible companies. Turn out the lights in the lab when everyone is gone. Give talks on global climate change that touch on your research, whether its infectious disease, environmental pollutants, immunity, inflammation, or neurodevelopment. Additional actions by pediatricians to mitigate global climate change have been suggested including those put forward by the American Academy of Pediatrics (<https://www.aap.org/en/patient-care/climate-change/global-climate-change-and-childrens-health-aap-recommendations/>).

Pediatric researchers who frequently assume leadership positions can advocate for transportation reduction, energy efficiency, “just transition” (the principle that a healthy economy and clean environment can and should co-exist, <https://jtalliance.org/what-is-just-transition/>), regenerative agriculture (a conservation and rehabilitation approach to food and farming systems, [https://en.wikipedia.org/wiki/Regenerative\\_agriculture](https://en.wikipedia.org/wiki/Regenerative_agriculture)), and strategies to reduce fossil fuel consumption.

Critical partnerships are needed, including pediatric researchers and healthcare professionals. This is an all-hands-on-deck crisis and pediatricians are trusted messengers. Hence, we will be publishing this series on Global Climate Change.



**Fig. 1 Rising average temperatures over the past 80 years.** This is a picture of a display outside the University of Maryland Center for Environmental Science on Solomon’s Island, Maryland. The x-axis represents the years 1938–2019. Each bar represents the average temperature of that year compared to the average of the average temperature of all the years combined. Years where the average yearly temperature was the same as the combined average temperatures are in white. Years whose average temperatures were less than the combined average are blue, and years whose average temperatures were greater than the combined average are red. The color of the blue and the red becomes darker the greater the difference from the average.

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