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A Scoping Review of the Effects of Climate Drivers on Maternal and Child Health: Current Evidence and Future Implications

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ADMINISTRATIVE INFORMATION

Support - N/A.

Review Stage at time of this submission - Data extraction.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 January 2024 and was last updated on 03 January 2024.

INTRODUCTION

Review question / Objective Our scoping review will assess the impact of several environmental climate drivers on the health outcomes of pregnant people and children (<5).

Background Climate change caused by human activities is our greatest global health threat, and its detriment on human health will disproportionately harm the most vulnerable groups. Climate drivers such as heatwaves, heavy precipitation, droughts, and tropical cyclones are expected to intensify and continue to cause harm to health and well-being through both direct and indirect pathways. Pregnant people and young children will face the greatest risk of the impact of climate change, due to several biological and socioenvironmental factors.

The physiologic and anatomical changes that occur during pregnancy increase risk of harm due to climate change. This vulnerability can be attributed to changes in thermoregulation and metabolism, as well as the cardiovascular, respiratory, and immune systems. The health challenges that arise from the climate crisis, including increase in vector-borne diseases, respiratory illness, and malnutrition, will adversely impact pregnancy outcomes. Several epidemiological studies clearly link heat and adverse pregnancy outcomes, including preterm birth, low birthweight, congenital anomaly, stillbirth, and preeclampsia.

Young children, which we define as children aged less than 5 years old, are at an increased risk of facing harm from climate change. Due to their immature thermoregulation and changes in physiologic development, children are vulnerable to health outcomes impacted by climate change. These environmental climate drivers, such as extreme heat, increased air pollution from fossil fuel combustion, and severe storms, impact child health outcomes such as heat illness, asthma, allergies, and infectious disease. These pathways can be linked to climate change and will increase in severity as the climate crisis worsens. Although we recognize that there have been previous literature or narrative reviews on the intersections

of climate change and maternal health, or climate change and children's health, this scoping review aims to fill the gap by reviewing empirical papers at the intersection of climate, maternal, and child health, and tailoring our findings to a predominantly clinical audience, who may be less aware of these broader risk factors and their current and ongoing impact on outcomes.

Rationale We will examine articles for relevance based on title and abstract, then full-text articles will be assessed for inclusion. Reference lists of screened articles and previous reviews will be examined for additional eligible articles. Inclusion criteria were: empirical studies published in peer-reviewed journals; assessment of associations between select climate drivers and adverse maternal, birth, and child outcomes; studies written in the English language. Climate drivers to be included: heat, wildfires, storms, sea level rise, and flooding. Each climate driver will be included as their respective impact on maternal, birth, and child health remains unclear. Air pollution as a climate driver was not included in the present paper as this area has been well-researched. Adverse birth outcomes included but were not limited to preterm birth, low birth weight, eclampsia, and stillbirth.

METHODS

Strategy of data synthesis Data will be extracted from eligible studies in the PubMed Database. Dimensions collected included study design, location, climate driver, sample size, ethnic/racial distribution, data collection, and study outcomes. The studies will be systematically evaluated for bias to determine the overall quality and reliability of the evidence.

Eligibility criteria Our review will be limited to studies on populations including pregnant people and children under 5. Inclusion criteria will include: empirical studies published in peer-reviewed journals; assessment of associations between select climate drivers and adverse maternal, birth, and child outcomes; studies written in the English language. Climate drivers included: heat, wildfires, storms, sea level rise, and flooding.

Source of evidence screening and selection We will conduct a scoping review of articles published in PubMed from 2010 through December 31, 2023.

Data management Study data will be stored on an excel spreadsheet, shared via a secure web platform that required multi-factor authentication.

Language restriction English language only.

Country(ies) involved United States.

Keywords climate change; maternal health; child health; outcomes.

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