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## EDITORIAL

# Childhood health on a planet threatened by climate change

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1 The last decade, especially the year 2024, has imposed many  
2 challenges on the planet and human beings that used to be  
3 rare, such as heat waves, and floods in different parts of  
4 North America, South America, Europe, Asia, Africa, and  
5 Oceania,<sup>1</sup> forest fires, most of them anthropogenic, often in  
6 the same countries as those mentioned above and capable  
7 of devastating significant areas of vegetation and further  
8 compromising biodiversity, food production and life.<sup>2,3</sup>  
9 Added to this is the burning of fossil fuels, which leads to the  
10 worsening of air pollution with its well-known health conse-  
11 quences, especially among the most vulnerable age groups,  
12 namely children, the elderly, and the underprivileged.<sup>4</sup>

13 These changes were significant enough that The Lancet  
14 Countdown 2024 report indicates that the world is danger-  
15 ously close to violating the target of limiting the multi-  
16 annual global average warming of the Earth's surface to 1.5°  
17 C (Paris Agreement). By 2023, the average increase was  
18 1.45°C above the pre-industrial baseline, and new highs  
19 were recorded throughout 2024.<sup>5</sup>

20 Climate extremes take lives and livelihoods. The Lancet  
21 Countdown, drawing on the expertise of 122 leading  
22 researchers from United Nations agencies and academic  
23 institutions, reveals the findings of the most concern from  
24 the collaboration's eight years of monitoring.<sup>5</sup>

25 Heat-related mortality among people over 65 years has  
26 increased by 102%, above the 65% that would have been  
27 expected without the temperature rise, as well as impair-  
28 ments in physical activity and sleep quality, and conse-  
29 quently in physical and mental health. In 2023, exposure to

excessive heat put people engaged in outdoor physical activ- 30  
ity at risk of heat stress for 27.7% more hours than the aver- 31  
age in the 1990s and 6% more hours of sleep lost in 2023 than 32  
the average between 1986 and 2005.<sup>5</sup> 33

34 Since 1961, there has been an increase in the number of  
35 days of extreme rainfall across 61% of the global land area,  
36 which has increased the risk of flooding, the spread of infec-  
37 tious diseases, and water contamination. In parallel, 48% of  
38 the same area was affected by at least one month of  
39 extreme drought in 2023, the second-highest rate since  
40 1951. The increase in drought events and heatwaves means  
41 that more than 151 million people will be suffering from  
42 moderate or severe food insecurity in 124 countries assessed  
43 in 2022, the highest number on record, in addition to  
44 increasing exposure to dust storms.<sup>5</sup>

45 Weather extremes and their health impacts also affect  
46 labor productivity, with heat exposure accounting for a record  
47 loss of 512 billion potential working hours in 2023, at an esti-  
48 mated cost in lost income equivalent to US\$835 billion. Coun-  
49 tries with low and medium Human Development Indexes were  
50 the most affected by these losses, which amounted to 7.6%  
51 and 4.4% of their Gross Domestic Product, respectively.<sup>5</sup>

52 Changes in rainfall patterns and rising temperatures favor  
53 the transmission of lethal infectious diseases, such as den-  
54 gue, malaria, diseases related to the West Nile virus and vib-  
55 riosis, putting populations at risk of transmission in  
56 previously unaffected areas.<sup>5</sup>

57 Dependence on fossil fuels is increasingly threatening  
58 national economies. Replacing coal-based energy with clean  
59 energy will entail an additional cumulative cost of US\$164.5  
60 billion between 2025 and 2034, which reinforces the delay  
61 in the adoption of clean and renewable energy by the

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## References

1. Floodlist. 2024. [Accessed November 1, 2024]. Available from: <https://floodlist.com/>. 105
2. Copernicus, NASA. GeoSeasonal trends. GWIS Statistics Portal; 2024, [Accessed November 1]. Available from: <https://gwis.jrc.ec.europa.eu/apps/gwis.statistics/seasonaltrend>. 106
3. Samborska V, Ritchie H. Wildfires - Explore global and country-level data on the extent of wildfires and how they've changed over time. 2024. [Accessed November 1, 2024]. Available from: <https://ourworldindata.org/wildfires>. 107
4. World Health Organization. Health consequences of air pollution on populations. 2024. [Accessed November 1, 2024]. Available from: <https://www.who.int/news/item/25-06-2024-what-are-health-consequences-of-air-pollution-on-populations>. 108
5. Romanello M, Walawender M, Hsu SC, Moskeland A, Palmeiro-Silva Y, Scamman D, et al. The 2024 report of the Lancet Countdown on health and climate change: facing record-breaking threats from delayed action. *Lancet*. 2024;404:1847–96. 109
6. Bustamante MM. Climate change and children's health: resilience challenges for Brazil. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.11.002>. 110
7. Chong-Neto HJ, Rosário N. Como a qualidade do ar afeta a saúde de crianças e adolescentes. *J Pediatr (Rio J)*. 2025;101. 111
8. Veras MM, Saldiva PH. Impact of air pollution and climate change on maternal, fetal and postnatal health. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.10.006>. 112
9. Solé D, Urrutia M. Impacto das mudanças climáticas e poluição do ar na saúde respiratória na infância. *J Pediatr (Rio J)*. 2025;101. 113
10. Silva DB, Pianovski MA, Carvalho Filho NP. Environmental pollution and cancer. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.09.004>. 114
11. Nunes ML, da Cunha AJ. Neurodevelopment and climate change. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.10.005>. 115
12. Lopes MC. Climate change and its impact on children and adolescents' sleep. *J Pediatr (Rio J)*. 2025;101. 116
13. Chong Neto HJ, Rodrigues M, de Mello da Silva CA, Chong-Silva D. Agrotóxicos e a saúde humana. *J Pediatr (Rio J)*. 2025;101. 117
14. Urrutia-Pereira M, Camargos PA, Solé D. Microplastics: the hidden danger. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.10.004>. 118
15. de Paula Corrêa M. Heatwaves, biodiversity and health in times of climate change. *J Pediatr (Rio J)*. 2024. <https://doi.org/10.1016/j.jpmed.2024.10.002>. 119
16. Rizzo I, Rizzo MC. Wildfire smoke and health impacts: a narrative review. *J Pediatr (Rio J)*. 2025;101. 120

majority of disadvantaged countries, which remain exposed to the damage caused by the lack of this type of energy.

Governments, companies, and transnational corporations have clearly and rapidly aggravated environmental risks. Fueled by record profits, oil and gas giants have expanded their production plans and, as of March 2024, were on track to exceed their emissions compatible with a 1.5°C increase in average temperature by 2040, 16% higher than in 2023.

Moreover, as energy prices have soared and countries' energy systems remain dependent on fossil fuels in 2022, governments have allocated a record \$1.4 trillion in subsidies to them, dwarfing any commitments to support climate actions agreed at the 28th Conference of the Parties (COP28).

The immediate engagement of citizens, companies, scientists, and international organizations concerned with climate and health is urgent and indispensable, as it helps to nurture hope that a healthy and prosperous future may still be within humanity's reach.

Echoing this panorama and with the collaboration of renowned scholars, this Supplement of *Jornal de Pediatria* is dedicated to the analysis of these topics.

The articles by Bustamante<sup>6</sup> and Chong-Neto and Rosário<sup>7</sup> discuss the effects of air pollution and climate change on the health of Brazilian children and adolescents. While Veras and Saldiva<sup>8</sup> discuss this phenomenon in maternal, fetal, and postnatal health, Solé and Urrutia<sup>9</sup> analyze respiratory health in childhood in this context and Silva et al.<sup>10</sup> warn of these consequences in pediatric oncology. Neurological impairment is brought up in the texts by Nunes and da Cunha<sup>11</sup> and Lopes.<sup>12</sup> In addition to climate change and its consequences on biodiversity, pesticides are also part of the discussion in the article by Chong-Neto et al.,<sup>13</sup> microplastics in the article by Urrutia et al.,<sup>14</sup> heat waves in the article by Paula Corrêa<sup>15</sup> and forest fires in the article by Rizzo and Rizzo.<sup>16</sup>

The indisputable evidence is: there is no room for climate denial! However, to avoid a catastrophic increase in the number of deaths, diseases and destruction of forests, urgent and decisive measures are mandatory. Now!

Be aware and responsible. Sick earth, sick children. Not just them.

## Conflicts of interest

The authors declare no conflicts of interest.