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Climate Change and Public Health in Underdeveloped Countries of Latin America: Impacts, Inequalities, and Challenges for Health Systems

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Abstract

Climate change constitutes one of the greatest global threats to public health in the 21st century, due to its capacity to alter the social, environmental, and biological determinants of human health. This phenomenon intensifies existing risks and generates new health challenges, especially in developing countries where health systems have significant structural gaps. In Latin America and the Caribbean, regions characterized by social inequalities, fragile health systems, and high exposure to extreme weather events, the impact on public health is particularly pronounced. The objective was to analyze how climate change affects public health in the region, deepening pre-existing inequalities and challenging health systems to respond effectively and equitably. The findings indicate that climate change represents a multifaceted challenge to public health in developing countries in Latin America and other parts of the world.

Introduction

Rising temperatures and changes in precipitation patterns alter the habitats of disease vectors, favoring the spread of infections transmitted by mosquitoes and other vectors. For example, recent waves of dengue and yellow fever cases in South America have been linked to warmer weather conditions and abundant rainfall that favor the proliferation of Aedes mosquitoes, complicating the management of these outbreaks in countries with limited health capacities (Guardian, 2025).

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Climate change also exacerbates the burden of non-communicable diseases such as cardiovascular and respiratory diseases (Roa et al., 2020). Exposure to high temperatures and high levels of air pollution, common in many Latin American cities, is associated with a significant increase in disability-adjusted life years, particularly affecting socioeconomically vulnerable groups (Nasution et al., 2021).

In this context, there are increases in diarrheal and gastrointestinal diseases due to floods, droughts, and the contamination of drinking water sources. Climate change also exacerbates respiratory illnesses, such as asthma and bronchitis, related to heat waves, wildfires, and higher concentrations of air pollutants. Taken together, these impacts disproportionately affect vulnerable populations, deepening public health inequalities in the region (Damage, 2025).

Analysis and Discussion of the Results

Global warming is considered one of the greatest threats to human health, as it causes an increase in the frequency and severity of extreme weather events, such as heat waves, droughts, floods, and cyclones, which directly impact the physical and mental well-being of individuals. Rising temperatures facilitate the spread of insect-borne diseases, such as dengue fever, Zika virus, and malaria, and also worsen respiratory and cardiac problems due to poor air quality. Furthermore, the lack of access to food and the scarcity of clean water caused by climate change increase the risk of malnutrition and intestinal diseases, particularly affecting vulnerable groups such as children, the elderly, and low-income communities (Zhou et al., 2018).

Extreme weather events, such as droughts and heavy rains, reduce agricultural productivity and disrupt local food systems, leading to food insecurity and exacerbating malnutrition. In Latin America, approximately 74% of the region's countries face high exposure to extreme weather events, which directly impact the availability of and access to nutritious food, increasing the health vulnerability of poor communities (Scidev, 2021).

Extreme events and heat-related mortality

The increased frequency and intensity of heat waves are linked to a significant rise in heat-related mortality, particularly among the elderly and those with chronic health conditions. According to the Pan American Health Organization, global warming will lead to an increase in deaths due to heat and other extreme weather events in the coming years, placing severe strain on health systems (PAHO, 2025).

Social inequalities and public health

Pre-existing inequalities in Latin America are exacerbated by the effects of climate change (Pais, 2025). Rural and indigenous populations, low-income individuals, and peri-urban settlements face greater exposure to climate risks and have less capacity to adapt. These inequalities translate into marked differences in mortality, access to health services, and recovery from climate disasters.

Furthermore, climate change can deepen equity gaps in access to already fragmented health systems, exacerbating the vulnerability of marginalized groups and limiting the effective coverage of preventive and medical care interventions. Figure 1 shows the main health impacts in Latin American countries.

Figure 1. Main impacts of climate change on health in Latin American countries

As observed, dengue, Zika, and Chikungunya are currently affecting several countries, primarily Cuba, which is located in the Caribbean (Pazmiño, 2024). These represent a challenge for health systems.

One of the areas that needs attention is strengthening the resilience of Latin American health systems, as they lack the resources and infrastructure necessary to adapt to the growing impacts of climate change. This includes a lack of climate monitoring mechanisms, preparedness for emergencies related to extreme weather events, and the logistical capacity to ensure the continuity of basic health services during severe weather phenomena (Seneviratne et al., 2010).

Evidence suggests that investments in health systems must be climate-resilient to reduce disparities and strengthen health responses. Regional organizations such as the Economic Commission for Latin America and the Caribbean (ECLAC) and PAHO have advocated prioritizing investment in health to address inequalities and advance the Sustainable Development Goals (ECLAC, 2024).

An effective response to climate change must be developed, and this requires integrating public health policies with sectors such as agriculture, water and sanitation, urban planning, transport, and energy. Without intersectoral approaches, health systems will not be able to adequately address the structural determinants that link climate to health (Zwaans et al., 2014).

Conclusions

The spread of infectious diseases, food insecurity, and extreme weather events requires a robust and coordinated response that strengthens the resilience of health systems through strategic investments, integrated public policies, and equity-based approaches. This will enable regions to mitigate these impacts and move toward more equitable and sustainable health systems in relation to one of the greatest global challenges of the 21st century.

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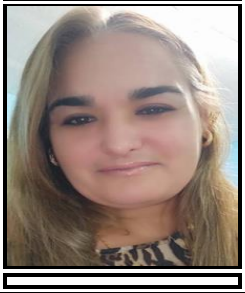

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