# Climate Crisis and Public Health: Navigating Lebanon's Unique Challenges

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## Introduction

Lebanon, like many countries around the world, is experiencing the effects of climate change, which poses significant challenges to both the environment and public health. The changing climate has led to shifts in weather patterns, increased temperatures, and more frequent and severe weather events. These environmental changes have profound implications for public health, affecting everything from air quality to the availability of clean water and the prevalence of diseases.

The general impact of climate change on Lebanon's environment is evident in various ways. Increased temperatures and changing precipitation patterns are contributing to prolonged droughts, which in turn affect agriculture, water resources, and natural ecosystems. The country has also witnessed a rise in the frequency and intensity of extreme weather events such as storms and heatwaves. These environmental changes are not only detrimental to the natural and artificialized landscapes but also pose serious risks to human health.

## Public Health Impacts

Extreme climatic changes, as reported by the IPCC and WHO in 2021, pose significant direct and indirect threats to public health. Rising temperatures increase heat-related risks, such as the spread of infectious diseases and alterations in the distribution of disease vectors and waterborne pathogens. This exacerbation of disease incidence, compounded by deteriorating water quality and increased air pollution, places immense pressure on already fragile health systems.

The vulnerability of populations to environmental and climate changes is profoundly influenced by factors such as population density, economic development levels, food availability, income distribution, local environmental conditions, pre-existing health statuses, and the availability and quality of public health care. Particularly at risk are the elderly, the impoverished, those with chronic health conditions, displaced individuals, pregnant women, and infants—groups that suffer disproportionately due to inadequate access to shelter, clean water, energy, or food. Heatwaves, especially prevalent in densely populated urban areas, lead to high mortality rates, accounting for tens of thousands of premature deaths annually, predominantly among the elderly.

In Lebanon, the combination of high humidity during summer, prolonged effects of civil unrest, and infrastructural damages—including ongoing issues in the electricity sector exacerbating heat-related illnesses—further heightens these vulnerabilities.

One of the most impactful effects of climate change on public health is the increased frequency and intensity of extreme weather events. Lebanon has seen a notable rise in drought occurrences and high temperatures, which exacerbate disasters like wildfires and land degradation. These events can directly harm the health and safety of citizens. Additionally, the stress on water resources can lead to shortages of clean drinking water and impact sanitation, further endangering public health.

For instance, the unusually this year's dry winter in Lebanon is expected to negatively impact public health through several mechanisms. Reduced rainfall leads to higher levels of air pollution as atmospheric particles and pollutants remain suspended for longer periods without being washed away, exacerbating respiratory and cardiovascular conditions. The arid conditions also increase the amount of dust and allergens in the air, triggering asthma and allergies in vulnerable populations. Additionally, the lack of sufficient water resources can compromise sanitation, potentially leading to the spread of waterborne diseases. Dry weather can also contribute to an increased risk of wildfires, further deteriorating air quality and increasing exposure to harmful pollutants. Combined, these factors pose significant risks to public health, particularly for children, the elderly, and those with pre-existing health conditions.

## Climate projections for Lebanon

Climate projections for Lebanon highlight a rapidly evolving crisis with significant implications for key sectors and regions, particularly public health. By 2060, temperatures are expected to rise by up to 2.1°C in mountainous areas and between 1.8°C and 2.0°C in coastal and inland regions under high-emission scenarios. Seasonal changes will bring winter temperature increases of up to 2.7°C, reducing snow accumulation—a critical factor for water resources and tourism. Summers are expected to see temperature increases of up to 2.3°C, intensifying heatwaves and placing additional strain on energy systems.

Inland and southern regions could experience up to 19 additional days annually with temperatures exceeding 35°C by mid-century, significantly increasing risks to human health, including heat-related illnesses, cardiovascular stress, and respiratory issues. Rainfall trends indicate a decline of up to 7 mm per month between 2041 and 2060, especially in drought-prone southern and inland areas. Seasonal shifts in precipitation and reduced snowmelt will exacerbate water shortages, posing serious threats to drinking water supplies, and public sanitation, thereby heightening vulnerability to waterborne diseases and other health crises.

## Vulnerability and adaptation of health care service providers

Over the past decade, Lebanon has endured multiple crises, including political instability, a rapidly changing financial and economic situation, the COVID-19 outbreak, the Beirut Port explosions, the impact of the Syria crisis and the devastating 2024 war. These compounded crises have significantly worsened pre-existing development challenges in the country and contributed to the deterioration of an already vulnerable healthcare system. Since 2019, the immense added pressure on resources has further strained the healthcare infrastructure.

The Ministry of Environment (MoE), with support from the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF), has prepared

Suppressing a fire in the forest of Beit Meri East of Beirut (credit: George Mitri)

the report "Vulnerability and Adaptation of Health Care Service Providers and Lessons Learned from the COVID-19 Crisis."

This report aimed to consolidate, analyze, and present the latest available data on health sector vulnerabilities in Lebanon. It also helped identifying the most adaptive ways to mitigate and tackle these vulnerabilities.
In this context and in summary, climate change poses significant challenges to Lebanon's already burdened healthcare system, exacerbated by socio-economic and political factors. The impacts on healthcare facilities are multifaceted, including direct effects, and those mediated through natural and human systems.

The increased frequency and intensity of natural hazards not only impair healthcare facilities' functioning but also boost the demand for medical services. This impacts the delivery of healthcare across various settings, from large hospitals to small clinics, and in both high- and low-income areas. Climate change also threatens the infrastructure, support systems, supply chains, and workforce of healthcare facilities.
Facilities must contend with increased climate-related risks such as droughts, extreme temperatures, fires, and shifts in climate-sensitive diseases, all of which strain their physical and operational capacities.

## The role of COP28

The global community's response to climate change and its impact on public health has been a central topic at international fora such as the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). The 28th Conference of the Parties (COP28) emphasized the critical intersection of climate change and public health. The discussions and commitments made at COP28 provided valuable context and momentum for national efforts, including those in Lebanon, to integrate health considerations into climate action plans.

The involvement of Lebanon's Minister of Environment and his team showcased a comprehensive approach to climate action that reflected the country's specific challenges and its commitment to addressing global environmental problems. Lebanon's decision to join the Climate & Clean Air Coalition, an initiative by UNEP, underscored its dedication to tackling both air pollution and climate change—critical issues given the nation's struggles with waste management and ongoing financial crises. Joining the coalition provided Lebanon with access to global expertise and best practices, particularly in managing emissions from waste, which is crucial for developing effective waste management strategies that reduce air pollution and contribute to mitigating climate change. Furthermore, the integration of health issues into the COP agenda, with a designated day for health discussions, represented a significant step forward. Lebanon's engagement, prompted by an invitation from the World Health Organization (WHO), emphasized the critical link between climate change and public health.

## Future prospects

Moving forward, Lebanon must convert the COP28 discussions and outcomes into concrete strategies and robust health policies that are resilient to climate impacts. Lebanon's participation in COP28 also created avenues for Lebanon to seek international assistance in improving its healthcare infrastructure and services in the face of environmental challenges.

To confront Lebanon's numerous challenges, comprehensive strategies that integrate environmental conservation with the well-being of citizens are essential. This includes raising awareness about the impact of climate change on health and promoting sustainable behaviors. Developing climate-resilient infrastructure is crucial to withstand the effects of extreme weather events. Moreover, enhancing scientific research and fostering collaboration among government entities, academia, and civil society is vital to address climate change challenges and provide sustainable solutions.

Overall, by supporting green recovery agendas, advocating for climate-friendly adaptation measures, promoting equitable healthcare accessibility, and advancing towards the Sustainable Development Goals (SDGs), Lebanon can realize its climate ambitions. The combined efforts of the government, international organizations, and civil society are crucial in building a resilient future for Lebanon, where public health and the environment are protected and sustained.

In this context, the Ministry of Environment has mobilized $65 million in funding to implement climate change projects targeting critical sectors such as water management, agriculture, public health, energy, transportation, and climate governance, in partnership with 12 international and national organizations.

Additionally, the Ministry has prepared Lebanon's Country Program to the Green Climate Fund, which includes a portfolio of climate-related projects aiming to secure $327.5 million in grants and $50 million in loans. These projects focus on climate-vulnerable sectors, including water, food security, and public health, while also aiming to reduce emissions through renewable energy utilization and energy efficiency measures.

As a key initiative, the Ministry launched the National Adaptation Plan for Climate Change in Lebanon, a pivotal step toward enhancing the country's resilience to climate change impacts and mitigating its effects. This plan is part of ongoing national efforts to integrate climate adaptation into sectoral policies and strategies. It emphasizes strengthening the resilience of vital sectors such as water, agriculture, public health, energy, and infrastructure. The plan also seeks to foster collaboration between stakeholders at both national and local levels and ensure the efficient and sustainable use of natural resources, with a strong focus on public health outcomes in the face of climate-related challenges.

## Press Release

# Bellevue Medical Center Introduces EKOS™ Endovascular System for Advanced Clot Treatment

Bellevue Medical Center (BMC) proudly announces a major milestone in its commitment to delivering high-quality, innovative care. Healthcare experts from various specialties recently gathered at BMC for a scientific meeting on the EKOS™ Endovascular System, a technology designed for the treatment of pulmonary embolism (PE) and deep vein thrombosis (DVT).
The EKOS™ system is a minimally invasive technique that combines ultrasound energy with clot-dissolving medication, allowing for faster and more effective clot removal. This advanced approach improves patient outcomes by reducing treatment time and minimizing the risk of complications, offering a safer alternative to traditional methods.
BMC is honored to be recognized as a Center in Lebanon for this state-of-the-art system, reinforcing its position as a leader in cutting-edge technologies. By adopting the EKOS™ technology, BMC continues to push the boundaries of medical innovation, ensuring patients receive the most effective, safe, and modern treatments available.
This launch marks an important step in enhancing patient care, reflecting BMC's dedication to advancing medical excellence and improving lives through groundbreaking healthcare solutions.