

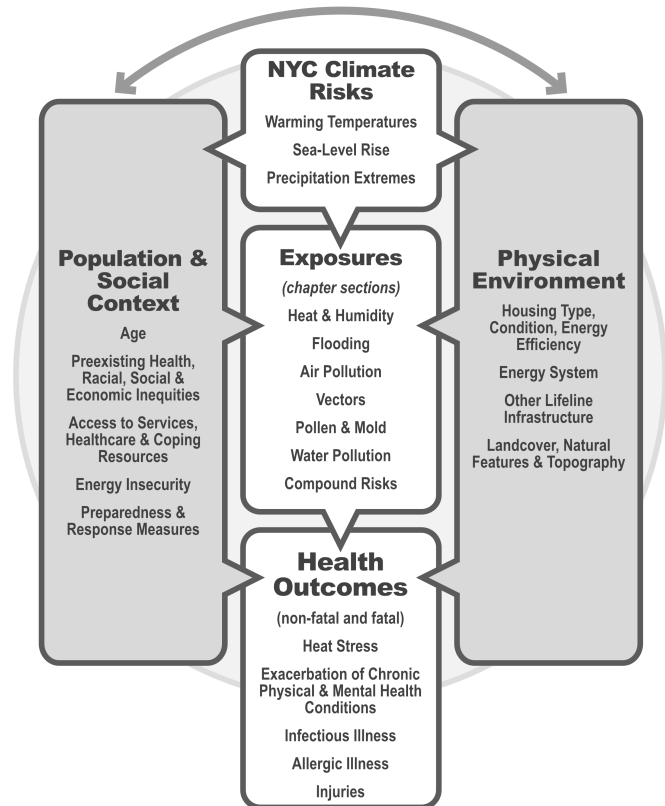


## Climate Change and New York City's Health - Summary

This chapter considers climate health risks, vulnerabilities, and resilience strategies in New York City's unique context and provides an update on evidence since the last New York City Panel on Climate Change (NPCC) health assessment in 2015 (NPCC2, Kinney et al., 2015). The chapter discusses health risks associated with flooding and heat in detail and provides an overview of health risks from air quality, insects that carry illnesses, water quality, and other public health emergencies (e.g., pandemics) that may worsen climate-related health risks.

*Highlights from this chapter include:*

- Climate change-related health risks are a threat to all New Yorkers, but especially those most vulnerable because of age, poor health, racial and social inequities, and social isolation.** Inequities in household and neighborhood physical environments also cause vulnerability to climate-health impacts. Addressing the key environmental and social drivers of this vulnerability is an essential climate adaptation strategy.
- Heat waves are, on average, the deadliest type of extreme weather in New York City and much of the U.S.** Even hot, but not extreme, summer weather can cause serious illness, death, and other harms to wellbeing. Most heat-related deaths are due to exacerbation of chronic health conditions (e.g., cardiovascular disease). Vulnerable people include those without air conditioning, who have one or more physical or mental health conditions, are energy insecure, are older adults, or have jobs exposing them to unsafe indoor or outdoor temperatures. Adaptive measures, such as increasing access to air conditioning among vulnerable populations, are needed to protect vulnerable populations from season-long heat-health risks.
- Public health can be impacted before, during, and after flooding, which exposes New Yorkers to risks of drowning and other injuries, stressful evacuation, short- or long-term displacement from homes, water contaminants and mold from water damage, and exposures to multiple hazards during clean up and repair.** Socioeconomic disadvantage, racial inequities, pre-existing health conditions, and flood-vulnerable housing and infrastructure amplify health impacts of flooding. Adaptation strategies that modify these factors, such as retrofitting residential buildings to protect occupants and building systems from flooding, can reduce future flooding impacts on health.
- Hotter weather can increase concentrations of harmful air pollutants, including fine particles and ground-level ozone, by increasing emissions of pollutants and speeding up chemical reactions in the atmosphere.** These pollutants are harmful to the health of all New Yorkers, but especially the very young and old, people with certain chronic health conditions, those without residential air conditioning, and those living where emissions from buildings and traffic are concentrated. Most of these factors that increase air pollution exposures and health impacts are more common among Black, Latino, and low-income households. The concentrations of harmful air pollutants in New York City have been decreasing despite climate change, but recent smoke plumes from wildfires worsened by climate change demonstrate the potential for this trend to be reversed. Efforts to further reduce emissions and exposures of vulnerable populations can prevent or reduce climate-related air quality impacts.
- Climate change is causing earlier, longer, and possibly more intense plant pollen production seasons. Within New York City, pollen from several common tree species, ragweed, and grasses contribute to seasonal allergies and worsening of asthma symptoms.** The burden of asthma is worse where communities have more exposure to household asthma triggers. Air conditioning and filtration can reduce indoor pollen exposure. Attention to local tree cover density and species composition along with improved access to health care, evidence-based asthma management, and patient education can reduce pollen exposure, vulnerability, and future allergic illnesses.



*Urban Climate Change Health Impact Framework. Sections of the health assessment correspond to exposures. Separate assessment reports cover the topics of racial, social, and economic inequities and energy (insecurity, system, and housing energy efficiency).*



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6. **The distribution of mosquitoes and ticks and potential for human infection and serious illness varies across the city, influenced by differences in the built environment, natural habitat and host animal abundance, human behaviors, and population vulnerability.** Older adults, those with chronic illnesses, and people who are homeless are more susceptible to complications from West Nile virus infection. Lyme disease risk among New Yorkers is increased among those engaged in outdoor activities mostly outside the city, but also in Staten Island and a limited area in the Bronx. Risk of other vector-borne diseases like dengue fever increased by international travel to and immigration from disease-endemic areas. Disease surveillance, vector monitoring and control, and public and clinician awareness can reduce future risks in a changing climate.
7. **Climate change may increase risks of exposure to water-borne pathogens in surface waters and wastewater in and around New York City, and to legionella bacteria from cooling towers and potable water systems.** Increased flooding can cause exposure to contaminants from household sewage backups, and in surface waters from combined sewer overflows (CSOs). Rising temperatures facilitate the growth and spread of pathogens (e.g., bacteria that cause gastrointestinal illness). Future climate change could affect the quality of New York City's drinking water supply. Continued maintenance and adaptation of infrastructure along with coordinated surveillance of water quality, human, and animal health can help prevent and control water quality impacts on health.
8. **Climate risks can be compounded when they disrupt infrastructure systems or overlap with non-climate public health emergencies (e.g., power outages during extreme heat events, and the COVID-19 pandemic).** The health risks from compound hazards can be reduced by investing in critical infrastructure essential for health and safety, like energy, water, wastewater, communications and transportation, and building mechanical systems that are extreme weather-adaptive, flexible, and equipped with backups. Rapid, resilient, and collaborative emergency networks are needed to respond to pandemics and other unanticipated compound hazards.

### Summary

*Climate Change and New York City's Health Risk* underscores that health risks from heat and flooding represent the largest present climate-related threats to public health in New York City. Without continued adaptation, climate change will exacerbate health risks from hotter summers and the increasing frequency and severity of flooding. Other climate-sensitive exposures harmful to human health include: 1) outdoor and indoor air pollution, including aero-allergens; 2) insect vectors of human illness; 3) waterborne infectious and chemical contaminants. We consider compound health risks from simultaneous extreme weather events, infrastructure failures, or other public health emergencies, such as the COVID-19 pandemic. We describe evidence-informed strategies to reduce risks to health from climate change.

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