

Climate Change and Health Impacts in Chicago

In July of 1995, Chicago experienced a heat wave that was unprecedented in the 123-year-old weather records of the city (Figure 1).

Heat waves are known to cause higher rates of illness and death. Prolonged heat waves also worsen cardiovascular, respiratory, and other conditions. Children, seniors, and people with pre-existing health conditions are particularly at risk.

Over the coming century, climate change is expected to increase the frequency of heat wave events. Even though the people of Chicago will probably become used to higher temperatures over time, the city needs to consider significant changes to prevent increases in heat-related illnesses and deaths.

Changes in climate also affect our health indirectly. A warming climate may cause disease-carrying insects and animals to change their territory, or to increase in number. Plants that cause allergies may also increase in number and in their ability to produce pollen.

Heat Waves

Over the next century, researchers expect increases in extreme temperatures. We can also expect to see longer, more frequent, and more intense summer heat waves. Without preventive measures, these heat waves could cause increases in heat-related illnesses and deaths. Even if humans mitigated for climate change by a variety of actions including building retrofits, switching to clean and renewable power, increasing transit options, and reducing waste and pollution (a “lower” emissions scenario), heat waves as extreme as the 1995 event could occur every other year by the end of the century. If we continue to rely on fossil fuels (a “higher” emissions scenario), events like the 1995 heat wave could occur several times each summer. Figure 2 shows the projected increase for Chicago in the number of years per decade with a heat wave similar to the 1995 heat wave.

Many adaptations can help prevent heat-



Figure 1 This picture was taken during the 1995 heat wave in Chicago. (©Gary Braasch)

related illness and death. Examples include effective early warning systems, public education, air conditioning, and having “cooling centers” available during heat waves.

The population of Chicago is expected to increase. The city’s demographic profile is also expected to shift, with an increasingly aging population. These changes make it even more urgent that we take measures to protect the population during heat waves. Several U.S.

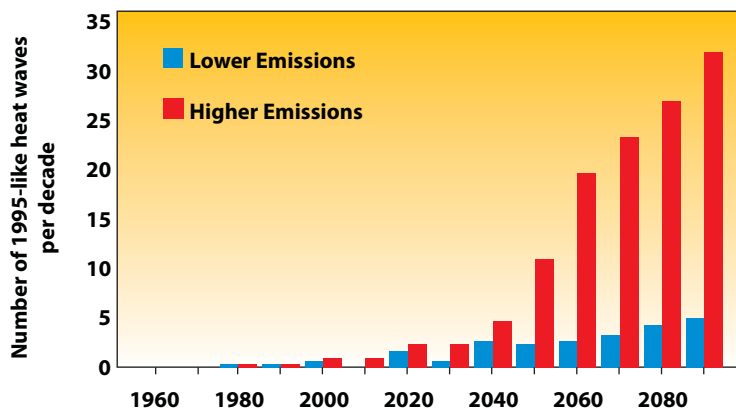


Figure 2 Average number of summers per decade with a Chicago heat wave similar to the 1995 heat wave.

cities are already using heat watch warning systems, along with intervention plans. These systems have been shown to save lives.

Changes in Air Quality

Climate experts say that an increase in ground-level ozone is one of the top five global health impacts expected from climate change. Ozone is a toxic gas that causes respiratory health problems. In Chicago, summer ozone levels have significantly decreased since the late 1970s. However, Chicago has never been able to consistently meet the ozone standards set by the Environmental Protection Agency to protect public health.

The production of ground-level ozone is linked to human combustion of fossil fuels such as burning coal for power or driving cars. Air quality is measured mainly through ground-level ozone. High ozone levels indicate poor air quality, while low ozone levels indicate acceptable air quality. Ozone production tends to increase as temperatures warm. As a result, air quality in the Chicago area would likely get worse as the climate warms and air circulation patterns change. Under the lower emissions scenario, summer ozone

Chicago and Cleveland were the first U.S. cities to pass municipal air quality regulation in the 1880s.

Protecting Human Health

The City of Chicago is updating its heat response plan using a new heat-watch warning system, and implementing plans for cooling buildings, reducing summer energy use, reducing air pollution, and preparing for flooding. Chicago's plans to reduce emissions of pollutants from power plants and from driving will both help to protect air quality and reduce greenhouse gas emissions. Individuals can help, too, by driving less and buying energy-efficient appliances.

levels in the city could increase by about 10% by 2100. Under higher emissions, summer ozone levels could increase by as much as 50% by 2100.

This analysis assumes that emissions of pollutants remain the same as they are today. However, it is possible to reduce ozone levels even while the temperature continues to warm. Cutting down on local emissions of nitrogen oxides, volatile organic compounds, and other pollutants could reduce production of ground-level ozone.

Disease Outbreaks

Northern areas of the U.S. could soon become warm enough for plants and animals that usually live further south. Unfortunately, this means that many disease-carrying insects and other animals would be able to move farther north. In Illinois, the two most common animal-borne diseases are West Nile Virus (WNV) illness, carried by mosquitoes, and Lyme disease, carried by ticks.

Today, animal-borne diseases are an ongoing health concern in the Chicago area. Since 2002, the counties of Cook and DuPage have reported almost 1200 cases of human illness from WNV. The bacteria that cause Lyme disease have also been found in the Chicago region.

As the climate warms and precipitation patterns change, researchers expect the following changes:

The risk of exposure to West Nile Virus (WNV)

could increase rapidly. Warmer summers mean a longer mosquito season, and higher temperatures allow mosquitoes to develop faster. Heat waves increase the risk further. Past outbreaks of WNV have been linked with very warm temperatures and very dry conditions.

There may be a change to the risk of Lyme disease.

Lyme disease has only recently arrived in the Chicago area. Studies show that the deer ticks carrying the disease may be more active during warmer weather. However, the ticks may decrease in number during dry periods. It is not yet clear how a change in climate could affect the risk of this disease. However, it is important to monitor any changes.



Climate Change and Chicago: Projections and Potential Impacts

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