



# Healthcare Provider's Guide to Climate Change and Health

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## How to use this guide

New Orleans is arguably one of the most vulnerable U.S. cities to climate change due to its close proximity to the Gulf of Mexico, geographic features such as being below sea level, sub-tropical weather patterns and vulnerable populations. Climate change is not just a projection for the future, but causes weather changes today that are impacting the health of New Orleanians.

This guide is meant to provide healthcare providers with an overview of how climate change will impact health outcomes. It will examine the impacts related to rising temperatures, extreme heat, increasing precipitation, extreme weather events, sea level rise, worsening air quality, and increasing mosquito populations. On each page, you will find a blue box on the right hand side of the page that contains action steps you can take to protect the health of your patients.

The goal of this guide is to provide a high level overview with action steps you can take. For a full report on how climate change will impact health in New Orleans, please find the New Orleans Health Department's Climate & Health Report at [www.nola.gov/health](http://www.nola.gov/health).

The New Orleans Health Department can also provide brochures and other educational materials for your patients. Please email [healthdepartment@nola.gov](mailto:healthdepartment@nola.gov) or visit [www.nola.gov/health](http://www.nola.gov/health) to request these free materials.

For more information on emergency preparedness and how to sign up for severe weather alerts or receive assistance during emergencies visit [ready.nola.gov](http://ready.nola.gov).

## WHAT IS MY ROLE?

As a healthcare provider, you play a vital role in protecting the health of patients and communities, especially in the era of climate change. There are many ways that you can act as a Climate and Health Champion at home, in your practice, in your local community and more widely. While action at all levels is important – from you own home to advocacy for national action – healthcare providers have an especially important role to play in influencing community leaders and policy makers who make decisions with larger impacts. In addition to advocating for action, you can provide guidance to your patients many of whom are the individuals most impacted by the health effects of climate change.

## Introduction to Climate Change

“Climate change” is defined as the global climate pattern changes that have been taken place over the years. Over the past century, the climate pattern has including increasing temperatures which is called “global warming.” According to the Environmental Protection Agency (EPA), the earth’s average temperature has risen by 1.5°F over the past 100 years and projected to rise 0.5°F to 8.6°F over the next century. A rise of 1°F seems undetectable to the human body but to the earth’s surface, the effects of even a 1°F change would have detrimental effects to the environment. With a two degree warming, the sea level will rise up to five to seven meters swallowing major coastal cities including Miami, Manhattan, and New Orleans.

Climate change and increasing temperatures are not only causing sea level rise, but changing many of the weather patterns and impacting the health of our most vulnerable residents. Rising temperatures have resulted in changes in weather; such as more rainfall, droughts, severe storms and heat waves. In addition to changing weather patterns, New Orleans is faced with worsening air quality and increasing vector populations, particularly mosquitoes.<sup>1</sup>

Each of these environmental changes will directly impact the health of New Orleanians. The following pages break down some of the connections between climate change and health and provide guidance on how to educate your patients to protect themselves and improve health outcomes.

## PATIENT CARE

Place climate change educational materials in your office including brochures, factsheets and posters.

Look for appropriate ways to incorporate climate change and health into patient education materials (e.g., disease management plans, discharge materials, medication sheets, etc.). Materials are available by emailing [healthdepartment@nola.gov](mailto:healthdepartment@nola.gov).

Make sure climate change impacts are addressed in disease management and care protocols.

Incorporate a climate change assessment into home visits or home environment assessments.

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<sup>1</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

## Rising Temperatures and Extreme Heat

Heat is the number one weather related killer in the United States.<sup>2</sup> Average temperatures are predicted to increase with a substantial increase in summer and a minor increase in winter due to climate change. Especially in New Orleans, the urban heat-island effect may impact the metro and surrounding areas. The urban heat-island effect occurs when metropolitan communities experience a peak in raising temperatures due to an increase in built structures, pavement, impermeable surfaces, pollution, overcrowding, overproduction of waste heat and chemicals, and decreased vegetation that would normally absorb heat.<sup>3</sup>

According to the Centers for Disease Control and Prevention (CDC), an extreme heat event is “an extended period of time (several days or more) with unusually hot weather conditions that potentially can harm human health.” These are predicted to last longer (by 10 to 20 more days), be more severe, and happen more frequently. Extreme heat events that have previously occurred once every 20 years are now predicted to occur every two to four years. Extreme heat events with unusually hot weather conditions are also predicted to increase in duration, frequency, and intensity.<sup>4</sup> These effects can further harm human health in various ways. Rising temperatures and extreme heat events will directly affect human health by increasing the frequency of heat-related syndromes and mortality.

Warm daytime temperatures can lead to heat stress and heat stroke, while warm night time temperatures can cause the

## EXTREME HEAT

Talk with patients about the risks and dangers of extreme heat and how to prevent heat-related health impacts such as heat stress and heat stroke.

Educate patients on the side effects of medications that may alter the ability to regulate temperatures.

Promote mitigation and adaptation strategies such as:

- Keep blinds or curtains, doors, and windows closed during the hottest part of the day
- Set your ceiling fan to a counterclockwise setting during the summer
- Limit use of stove or oven to cook
- Drink plenty of water, even if you aren't thirsty

<sup>2</sup> Anderson H, et al. BRACE Midwest and Southeast Community of Practice. 2017. Climate and Health Intervention Assessment: Evidence on Public Health Interventions to Prevent the Negative Health Effects of Climate Change. Climate and Health Technical Report Series. Climate and Health Program, Centers for Disease Control and Prevention.

<sup>3</sup> US EPA. Heat Island Effect. <https://www.epa.gov/heat-islands>. September 28, 2017.

<sup>4</sup> Needham, H., Shafer, M., Dobson, J. (2013, January). NOAA Technical Report NESDIS 142-2, *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 2. Climate of the Southeast U.S.* Retrieved from [http://www.nesdis.noaa.gov/technical\\_reports/NOAA\\_NESDIS\\_Tech\\_Report\\_142-2-Climate\\_of\\_the\\_Southeast\\_U.S.pdf](http://www.nesdis.noaa.gov/technical_reports/NOAA_NESDIS_Tech_Report_142-2-Climate_of_the_Southeast_U.S.pdf)

body to not be able to self-regulate and can worsen chronic illnesses particularly on the elderly or individuals on medications.<sup>5</sup>

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<sup>5</sup> CDC. Climate Change and Extreme Heat Events.  
<https://www.cdc.gov/climateandhealth/pubs/ClimateChangeandExtremeHeatEvents.pdf>

## Precipitation, Extreme Weather & Sea Level Rise

Increasing temperatures will cause changes in weather patterns and sea level rise for coastal Louisiana. New Orleans is located in a transition zone between wetter climates to the Northeast and drier climates to the Southwest which will create periods of drought and periods of increased precipitation over time.<sup>6</sup> Increased precipitation, either annually or during extreme single-day precipitation events are likely to result in either localized flooding from direct rainfall or aerial flooding caused by the overtopping of rivers and waterways. Severe thunderstorms and hurricanes will become more common and these storms may be stronger than what New Orleans has seen historically. These storms may include tornados or high winds that can cause infrastructure damage such as power outages in addition to flooding.

Sea levels are predicted to rise between two to six feet over the next 100 years.<sup>7</sup> This rise will reduce coastal wetlands area that protect New Orleans against flooding and help lessen the intensity of hurricanes. The loss of these wetlands will make the city more vulnerable to the impacts of tropical weather.

Flooding, power outages, and mold are the most serious threats that New Orleanians will face due to the increase of precipitation and extreme weather. Individuals who have electrically dependent medical equipment or who live in areas prone to flooding should be provided with guidance on how to stay safe during weather events. Mold is a common problem in New Orleans and will worsen with increased flooding events which poses a health risk particularly to those with asthma and other respiratory illnesses.

## PRECIPITATION, EXTREME WEATHER & SEA LEVEL RISE

Talk with patients about the health risks of extreme precipitation, floods, and storms.

Discuss how patients will shelter in place or evacuate. Find out if their home is prone to flooding and how to remove mold if necessary.

Enroll patients with medical or mobility needs in the Special Needs Registry for assistance during emergencies at [ready.nola.gov](http://ready.nola.gov) or by calling 3-1-1.

Provide patients with information regarding your facilities emergency operations plans and where they can receive care if your facility is closed.

<sup>6</sup> Needham, H., Shafer, M., Dobson, J. (2013, January). *NOAA Technical Report NESDIS 142-2, Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 2. Climate of the Southeast U.S.* Retrieved from [http://www.nesdis.noaa.gov/technical\\_reports/NOAA\\_NESDIS\\_Tech\\_Report\\_142-2-Climate\\_of\\_the\\_Southeast\\_U.S.pdf](http://www.nesdis.noaa.gov/technical_reports/NOAA_NESDIS_Tech_Report_142-2-Climate_of_the_Southeast_U.S.pdf)

<sup>7</sup> Carbonell, A., Meffert, D. (2009). *Climate Change and the Resilience of New Orleans: the Adaptation of Deltaic Urban Form.* Retrieved from <http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1342044185050/8756911-1342044630817/V2Chap18.pdf>

## Vectors

A vector is an organism that can transmit a disease from one animal or plant to another; such as ticks, rodents, and mosquitoes. For southeast Louisiana, the mosquito is one of the most important and prevalent vectors. Mosquitoes thrive in warm, humid weather and can transmit many illnesses; such as dengue fever, West Nile fever, and Zika virus disease. Higher temperatures and wetter climates will create more favorable living and breeding conditions for mosquitoes resulting in not only an increase in the population but lengthen the reproductive cycle to include the winter months.<sup>8</sup>

The increase in population and lengthening of mosquito season will increase the likelihood of mosquito-borne illnesses. This includes the spread of endemic illnesses such as West Nile virus or the potential for travel-related illnesses like Zika virus or dengue fever to be transmitted to local mosquitoes.

While there are a number of mosquito-borne illnesses, in New Orleans the most common is West Nile virus which causes fever, headache, body aches, joint pain, vomiting, diarrhea, or rash. While most cases are mild, the elderly and those with existing medical conditions can develop neuroinvasive disease which typically manifests as meningitis, encephalitis, or acute flaccid paralysis.<sup>9</sup> In 2002, 329 cases of West Nile illness were reported in Louisiana, including 204 cases of West Nile meningoencephalitis and 125 cases of West Nile fever. Clinical presentation of meningoencephalitis or of West Nile fever was confirmed serologically. There were 24 deaths. Age group distribution showed predominance among persons aged 45 years or older.<sup>10</sup>

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<sup>8</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

<sup>9</sup> CDC. West Nile Clinical Evaluation and Disease.

<https://www.cdc.gov/westnile/healthcareproviders/healthCareProviders-ClinLabEval.html>. Feb 12, 2015.

<sup>10</sup> Balsamo G, Michaels S, Sokol T, et al. West Nile Epidemic in Louisiana in 2002. *The Ochsner Journal*. 2003;5(3):13-15.

## VECTORS

Ask patients about travel history and exposure to mosquitoes.

Educate pregnant patients about Zika & travel precautions.

Promote mitigation & adaptation strategies to reduce mosquito exposure such as:

- Wear EPA-registered insect repellent
- Wear long sleeves and pants or stay indoors around dawn and dusk
- Remove sources of standing water around the home
- Repair holes in window and door screens or keep windows and doors closed



Zika virus is not endemic in the United States, but a recent outbreak in South America and the Caribbean could cause travel cases in New Orleans or local transmission if a traveler transmits the virus to a local mosquito. The symptoms of Zika are mild and include fever, rash, joint pain, and conjunctivitis. Zika can cause a variety of birth defects, so pregnant women are advised not to travel to countries impacted by Zika.<sup>11</sup>

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<sup>11</sup> CDC. Zika Virus Symptoms, Testing, & Treatment. <https://www.cdc.gov/zika/symptoms/index.html>. Jun 21, 2016.

## Air Quality

Air quality is predicted to worsen in New Orleans with rising temperatures and increase of air pollution, causing and worsening chronic health conditions and respiratory illnesses. Rising temperatures will make organic compounds more volatile and will react with oxides of nitrogen to create conditions for ozone formation and greater air stagnation periods. Ground level ozone pollution is one of the major triggers that worsens the symptoms of asthma and chronic obstructive pulmonary disease (COPD). More people seek emergency department treatment for asthma and COPD on days with high ozone levels compared to days with low ozone levels.<sup>12</sup>

Particulate matter (PM) is a mixture of small solid and liquid particles from different compounds within the environment. PM levels rise with air stagnation episodes that accompany periods of heat.<sup>13</sup> Other factors that are conducive to particulate matter presence include a high concentration of industrial manufacturing areas, proximity to oil refining, combustion, and diesel vehicle traffic. Wildfires, which are more likely with higher temperatures and periods of drought, also release particulate matter into the air.

Another side effect of global warming involves the early arrival of spring and delayed arrival of winter. This shift in seasons lengthens the pollen season from as much as two weeks before spring and up to four weeks into the fall leading to worsening and lengthening of allergy season.<sup>14</sup>

## AIR QUALITY

Talk to patients about how climate change is increasing exposure to allergens.

Advise patients with asthma and other respiratory illnesses to sign up for Air Quality Index alerts at [airnow.gov](http://airnow.gov).

Promote mitigation and adaptation strategies such as:

- Change air filters and run air conditioning in “recirculating mode”
- Limit physical activity outdoors and in high traffic areas on poor air quality days.

<sup>12</sup> Anderson H, et al. BRACE Midwest and Southeast Community of Practice. 2017. Climate and Health Intervention Assessment: Evidence on Public Health Interventions to Prevent the Negative Health Effects of Climate Change. Climate and Health Technical Report Series. Climate and Health Program, Centers for Disease Control and Prevention.

<sup>13</sup> Luber, G., K. Knowlton, J. Balbus, H. Frumkin, M. Hayden, J. Hess, M. McGeehin, N. Sheats, L. Backer, C. B. Beard, K. L. Ebi, E. Maibach, R. S. Ostfeld, C. Wiedinmyer, E. Zielinski-Gutiérrez, and L. Ziska, 2014: Ch. 9: Human Health. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 220-256. doi:10.7930/JOPN93H5.

<sup>14</sup> Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, Eds., 2014: Climate Change Impacts in the United States: The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.

The EPA's Air Quality Index alert system and the NOLA Ready alert system will notify individuals on poor air quality days and provide them with tips on how to protect themselves. Studies have shown that individuals diagnosed with asthma whose physician had advised them to avoid outdoor activities on poor air quality days were 26% more likely to change their behavior when receiving these alerts compared to individuals diagnosed with asthma that had not discussed these tips with their physician.<sup>15</sup>

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<sup>15</sup> Anderson H, et al. BRACE Midwest and Southeast Community of Practice. 2017. Climate and Health Intervention Assessment: Evidence on Public Health Interventions to Prevent the Negative Health Effects of Climate Change. Climate and Health Technical Report Series. Climate and Health Program, Centers for Disease Control and Prevention.



CITY OF NEW ORLEANS

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