

# MEDICAL ALERT!

## Climate Change Is Harming Our Health



The Medical  
Society Consortium  
ON CLIMATE & HEALTH



# EXECUTIVE SUMMARY

Most Americans understand that climate change is real and are concerned about it.<sup>1</sup> But most still see climate change as a faraway threat, in both time and place, and as something that threatens the future of polar bears but not necessarily people. **The reality, however, is starkly different: climate change is already causing problems in communities in every region of our nation, and from a doctor's perspective, *it's harming our health.***<sup>2,3,4,5,6,7,8,9,10,11</sup>

Most Americans are not aware of the health harms of climate change. A recent survey showed that most Americans have not considered how global warming might affect people's health, and few (32%) can name a specific way in which climate change is harming our health. Few are aware that some groups of Americans—including our children, our elders, the sick and the poor—are most likely to be harmed by climate change.<sup>12,13</sup> None of these survey findings is surprising. There has been relatively little public discussion of the health harms of climate change. But we also know people are eager to hear from us. Most survey respondents said, in fact, that their primary care physician is a trusted source for information about this topic.<sup>14,15,16,17</sup>

**We—physicians in medical societies representing over half of the nation's doctors—see a need to share our growing understanding and concern about the health consequences of climate change with all Americans. We believe all Americans should know the following:**

**1. There is a scientific consensus about human-caused climate change.** The reality of human-caused climate change is no longer a matter of debate. Based on the evidence, more than 97 percent of climate scientists have concluded that human-caused climate change is happening. Many studies have proven this fact.<sup>18</sup>

**2. In communities across the nation, climate change is harming our health now.** Doctors know this because they're seeing the health of their patients being harmed. Public health professionals know this too, because they're seeing increasing rates of health problems associated with climate change in their communities. These harms include heat-related illness, worsening chronic illnesses, injuries and deaths from dangerous weather events, infectious diseases spread by mosquitoes and ticks, illnesses from contaminated food and water, and mental health problems.<sup>19</sup>

### 3. The health of any American can be harmed by climate change, but some of us face greater risk than others.

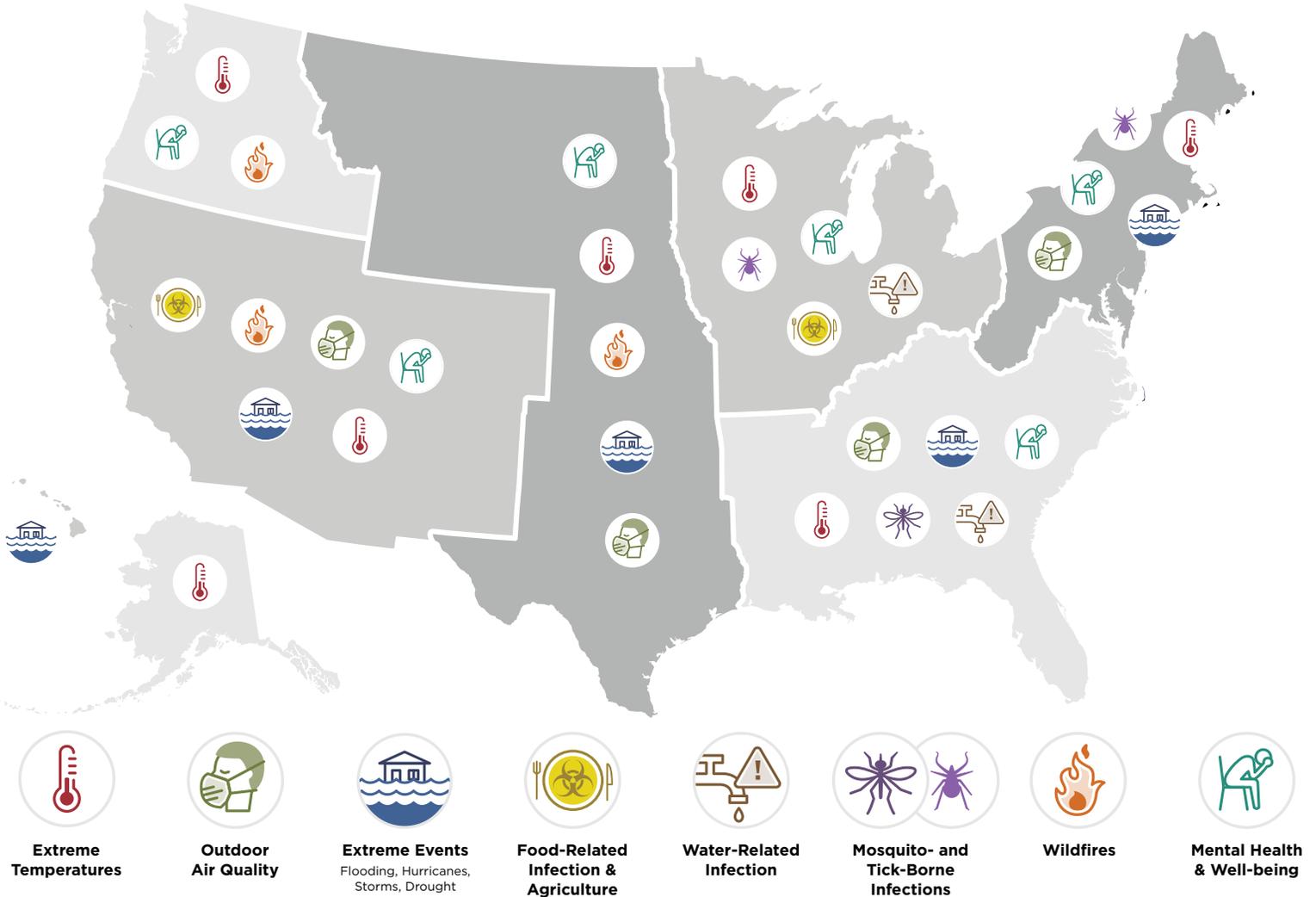
Children, student athletes, pregnant women, the elderly, people with chronic illnesses and allergies, and the poor are more likely to be harmed.<sup>20,21</sup>

### 4. Unless we take concerted action, these harms to our health are going to get much worse.

The sooner we take action, the more harm we can prevent, and the more we can protect the health of all Americans.<sup>22</sup>

## HOW OUR HEALTH IS HARMED BY CLIMATE CHANGE

Impacts Differ by Geographic Region



This graphic illustrates key impacts of climate change on health and is based on reports from the U.S. Global Change Research Program. For more information, visit [www.globalchange.gov](http://www.globalchange.gov).

**5. The most important action we can take to protect our health is to reduce heat-trapping pollution by reducing energy waste and accelerating the inevitable transition to clean renewable energy.** It is well within our power to accomplish this. Efficient buildings, neighborhoods that support not just automobiles but many ways of getting around, and smart energy policies are all essential and achievable. In addition to limiting climate change, accelerating a transition to clean energy has the added benefit of immediately cleaning up our air and our water so that we can all *immediately* enjoy better health. Everybody wants clean air and water, and better health.<sup>23,24,25</sup>

This report will serve as a basis for our efforts to educate the public and policymakers in government and industry about the ways climate change is harming our health. In particular, this report—along with other materials produced by our Medical Society Consortium on Climate & Health and others—will highlight the urgency of this challenge and provide direction on how to respond to climate change to improve the health of Americans today and in the future. The health harms and risks from climate change vary from region to region, but all regions of the country are affected. As doctors, we have a unique role to play in issuing this alert and closing the gap in public recognition of this danger. Doctors and medical professionals are trusted voices on this issue, and we must do everything we can to make sure the public is aware.

**In sum, we are sounding the alarm that the ultimate danger of climate change is that it poses a danger to the health of every American now and in the future.**

# CLIMATE CHANGE IS HARMING THE HEALTH OF AMERICANS ACROSS THE NATION

## The Health Harms of Climate Change

Some of the physical changes in our climate—such as the increased frequency of extreme heat events, extreme weather events, and air pollution—are causing direct **harms to health**. The big physical changes in our climate are also contributing to the spread of disease and threats to our nutrition and mental health.

While these effects are experienced around the world, in the sections ahead we summarize what is happening to our climate, describe how these changes are harming our health, and identify the groups of Americans who are most likely to experience the harm.



## **Extreme Heat**

### **WHAT IS HAPPENING?**

Climate change is causing more very hot days; greater humidity; and longer, hotter, and more frequent heat waves.

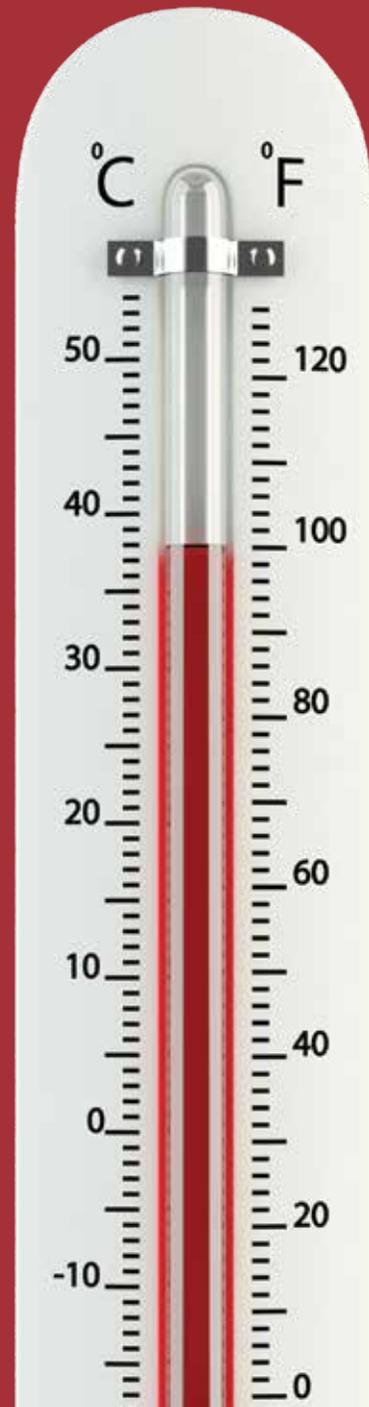
### **HOW DOES THAT HARM OUR HEALTH?**

Extreme heat can lead to heat-related illness and death from heat stroke and dehydration. It also can make some chronic diseases worse.

### **WHO IS BEING HARMED?**

Anyone can be harmed by extreme heat, but some people face greater risk. For example, outdoor workers, student athletes, city dwellers, and people who lack air conditioning (or who lose it during an extended power outage) face greater risk because they are more exposed to extreme heat. People with chronic conditions such as cardiovascular and respiratory diseases, and those who work or play outside, are especially vulnerable to extreme heat. Young children, older adults, and people taking certain medications are also more vulnerable because they are less able to regulate their body temperature. Pregnant women are vulnerable too, as extreme heat can cause premature birth.

*Children bear a greater burden of climate-associated health impacts—and they have the most at stake as temperatures continue rising.*





## Isaac's Story

By Dr. Samantha Ahdoot, Lead Author, American Academy of Pediatrics' Policy on Climate Change; Pediatric Associates of Alexandria

My nine-year-old son Isaac was attending his last day of band camp when I received a call from the emergency room. He had collapsed in the heat, and was rushed to the emergency room. When my husband arrived at the hospital, Isaac was on a gurney with an IV in his arm, recovering under the watchful eyes of nurses and doctors. It was a terrifying experience for him.

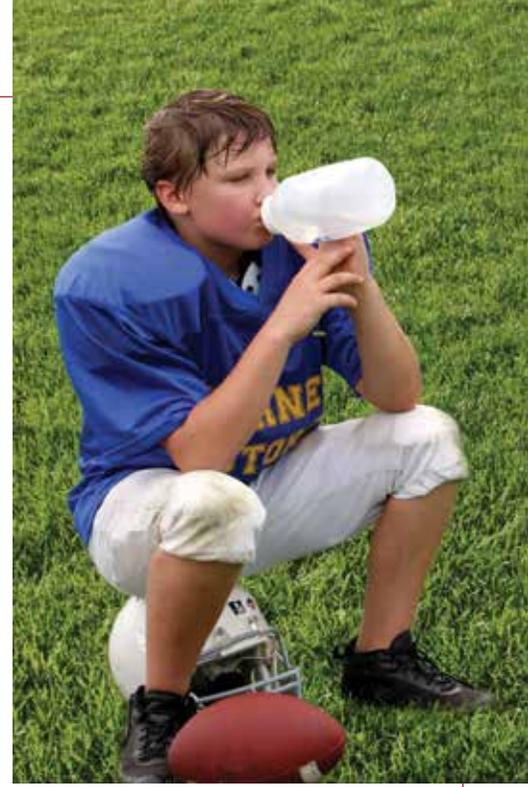
That day was part of a record-setting heatwave in Washington, DC, one of several days that summer when the heat index reached over 120 degrees.

As a pediatrician, I know that Isaac is not alone in his vulnerability to the heat. Emergency room visits for heat illnesses increased by 133 percent between 1997 and 2006. Almost half of these patients were children and adolescents.

In August 2010, another record hot summer, a colleague treated Logan, a young football player, in Arkansas. He showed initial signs of heat illness—weakness and fatigue—during practice in his un-air-conditioned gym, but he wasn't treated right away. He subsequently developed heat stroke, kidney failure and pulmonary edema. Fortunately, kidney dialysis saved him, but it was a close call.

Every summer, I see the impacts of increasing temperature and heat waves on children like Logan, and warn parents of the dangers of increasing heat waves.

I believe it's imperative that pediatricians on the frontlines of this urgent problem speak out for children on issues that will harm the health and prosperity of our youngest generations.



**FACT** Heat illnesses are a leading cause of death and disability in young athletes. Every year, some 9,000 high school athletes are treated for heat-related illnesses.

**FACT** Young men make up a third of all heat-related emergency room visits in the US.

**FACT** Football players may feel the most heat. They are 11 times more likely to suffer exertional heat illnesses than players of all other high school sports combined.



## **Extreme Weather**

### **WHAT IS HAPPENING?**

Climate change is causing increases in the frequency and severity of some extreme weather events such as heavy downpours, floods, droughts, and major storms.

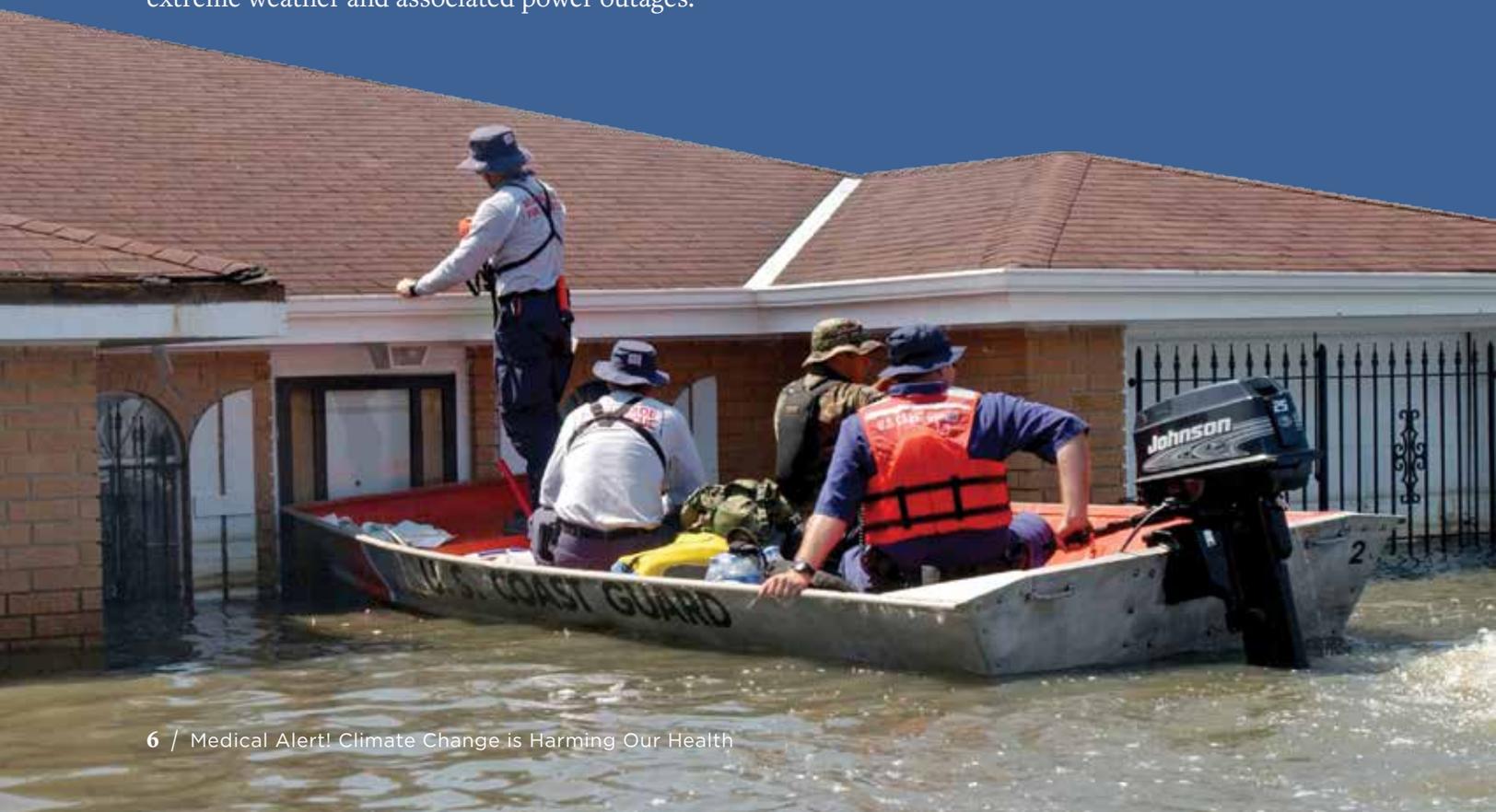
### **HOW DOES THAT HARM OUR HEALTH?**

Extreme weather events can cause injury, displacement, and death. Extreme weather events can knock out power and phone lines, damage or destroy homes, and reduce the availability of safe food and water. They also can damage roads and bridges, impeding access to medical care and separating people from their medicines. Stomach and intestinal illnesses tend to increase following extreme weather and associated power outages.

### **WHO IS BEING HARMED?**

Anyone can be harmed by extreme weather events, but emergency evacuations pose extra health risks to children, older adults, the poor, and those with disabilities (if they are unable to access elevators and evacuation routes).

*When Baton Rouge was hit with a “thousand year flood,” it rained in sheets for days.*





## A Battered City

By Dr. Claude Tellis, Vice Chairman, Commission on Environmental Health, National Medical Association (NMA); Retired Pulmonologist

The damage from the deadly Louisiana flood of 2016, which struck my hometown of Baton Rouge and surrounding parishes in August, was still visible long after the rains stopped. Months later, homes were still gutted, and refrigerators, washing machines and armchairs remained piled high on roadsides.

When Baton Rouge was hit with this “thousand year flood”—a storm that has only a one-tenth of one percent chance of occurring in any given year—it rained in sheets for days. In the worst natural disaster since Hurricane Sandy, 13 people died, the coast guard rescued 30,000 people, and 10,000 people ended up in shelters. Some 180,000 homes and buildings were damaged.<sup>26</sup>

The storm also unleashed a health crisis on survivors. Some fleeing their flooding homes lost their medications for hypertension, diabetes, and heart problems. Others reported stress, depression and anxiety in the weeks and months that followed. And long after the storm passed, some teachers reported children who felt so anxious and afraid when it rained that they needed counseling.

In the weeks following the storm, pools of standing water provided the perfect breeding ground for mold and mosquitoes. This was a problem because mosquito born illnesses like West Nile Virus were already found in the area. In some homes, mold from water damage still makes the air less healthy. We continue to struggle with the aftermath of this historic flood.

I believe our lives in Louisiana may never be the same because we will see continued suffering from the physical and mental damage of extreme weather—which is happening more often and with greater strength due to climate change.



▼ 22 Louisiana parishes were designated as federal disaster areas by FEMA in the aftermath of the floods of 2016.



Source: <https://www.fema.gov/disaster/4277>.



## **Air Pollution**

### **WHAT IS HAPPENING?**

Climate change reduces air quality because heat increases smog, wildfires, and pollen production.

### **HOW DOES THAT HARM OUR HEALTH?**

Poor air quality increases asthma and allergy attacks, and can lead to other illnesses, hospitalizations, and deaths. For example, warmer and drier conditions lead to an increase in wildfires. Fire smoke, which can travel hundreds of miles downwind, exposes people to harmful pollutants and increases emergency room visits, hospitalizations, and treatments for asthma, bronchitis, chest pain, and other heart and lung conditions. Warmer temperatures lead to a longer pollen season, and increased carbon dioxide in the air leads to higher pollen levels and more potent pollen. These factors make allergies and asthma worse and more common. Higher humidity and flooding from heavy downpours can lead to dampness and growth of mold indoors, increasing allergies and worsening asthma.

### **WHO IS BEING HARMED?**

Anyone can be harmed by poor air quality, but people with preexisting respiratory conditions such as asthma or chronic lung disease are most vulnerable.

### **AIR POLLUTION GLOBALLY**

Health problems stemming from air pollution are a global problem, and the burning of coal and other fossil fuels is making it worse. Some seven million people worldwide die early from lung and heart disease and cancer due to pollution.<sup>27</sup> That's more people than the population of Arizona or Massachusetts. This air pollution crisis, made worse by climate change, isn't limited to foreign countries. The United States, especially the east coast and greater Los Angeles-area, has dangerously high levels of pollution, which leads to premature death, disability, and disease.





## Fire, Lungs and Hearts

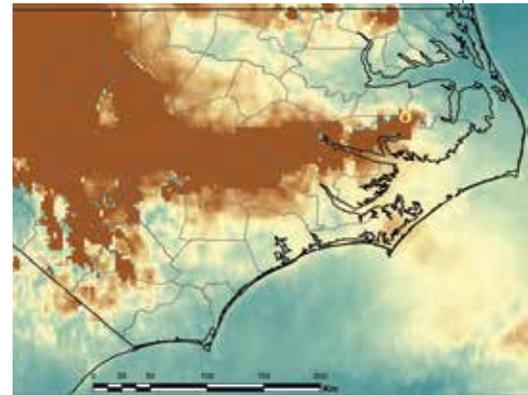
By Dr. John Meredith, Emergency Room Physician,  
East Carolina University

In June 2008, a wildfire devastated eastern North Carolina. The Evans Road Wildfire, which burned more than 45,000 acres and cost \$20 million to battle, started in the midst of the state's worst drought. As the fire burned for three long months that summer, plumes of smoke carrying dangerous particles covered the eastern side of the state and beyond.

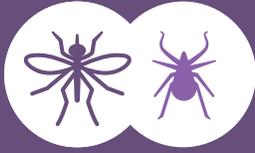
Researchers saw this fire as an opportunity to learn more about the harms to our health from air pollution resulting from wildfires. They studied two sets of counties in North Carolina: those that were affected by the smoke and those that were not. They tallied respiratory conditions, including asthma, pneumonia, and common respiratory infections, as well heart attacks and other cardiac conditions.

Here's what they found: Those living in counties affected by the plume had a 50 percent increase in the trips to emergency departments from respiratory illness like Chronic Obstructive Pulmonary Disease (COPD), pneumonia and bronchitis while the other counties did not. The smoke also caused a spike in emergency department visits for heart disease not seen in the other counties. People with heart disease are exceptionally sensitive to the particles from wildfires.

Blazing forests are just as damaging to human health as they are to homes and neighborhoods. Increasing temperatures and more frequent droughts caused by climate change are set to increase the number of wildfires in the US—and worldwide. It's clear that not only our lungs, but also our hearts, are at serious risk.



▲ Aerial map showing counties impacted by the Evans Road Fire at the Pocosin Lakes National Wildlife Refuge, North Carolina on June 10–12, 2008.



## Ticks and Mosquitoes

### WHAT IS HAPPENING?

Climate change is causing increasing temperatures, too much or too little rain, and severe weather events.

### HOW DOES THAT HARM OUR HEALTH?

Along with the direct harms we've described above, these changes can lead to an increase in the number and geographic range of disease-carrying mosquitoes, fleas, ticks.<sup>28</sup> Mosquitoes that carry diseases like West Nile virus and dengue fever thrive in conditions that are becoming more common, and there is concern that malaria could reemerge in the United States. Ticks that carry Lyme disease have become more numerous in many areas and have expanded their range northward and westward.<sup>29</sup> The tick that carries Lyme Disease is reported in 45.7% of U.S. counties, up from 30% in 1998.<sup>30</sup> As these insect carriers of infection move to new areas, diseases not normally found in those areas can spread.

### WHO IS BEING HARMED?

Anyone can be harmed by these diseases, but people who spend more time outdoors—where these insects and other disease-carriers live—are most vulnerable.





## Four Seasons of Ticks and Mosquitoes—and Their Diseases

By Dr. Nitin Damle, President, American College of Physicians (ACP); Founder, South County Internal Medicine, Inc.

It's not a surprise that over the past five years, my practice has seen a rise in the incidence of tick-borne diseases, including Lyme disease and other infections. My physician colleagues used to treat two or three cases a month during tick season; now each of us sees 40 to 50 new cases during each tick season.

Those blacklegged ticks, the carriers of Lyme disease, thrive in warm, muggy weather. In my home state of Rhode Island, where winters have gotten warmer and shorter, these tiny, sesame seed-sized insects have more time to bite humans and spread Lyme disease. Tick season used to be relegated to summer; it now spans spring and autumn. And this isn't limited to the typical tick hotspot states.

Across the country, doctors are seeing more patients struck ill by serious diseases like Lyme disease and West Nile fever. Because of the changing climate and the spread of vectors, we expect that Americans will continue to face new diseases and familiar diseases in new places. I know that doctors need to be ready for this and patients need to understand these dangers.

*Because of the changing climate and the spread of disease vectors, we expect that Americans will continue to face new diseases and familiar diseases in new places.*

*Doctors need to be ready for this and patients need to understand these dangers.*



▲ A bull's eye rash is characteristic of Lyme Disease.



## Contaminated Water

### WHAT IS HAPPENING?

Climate change is causing higher water temperatures, heavier downpours, rising sea levels, and more flooding because of sea level rise and heavy downpours.

### HOW DOES THAT HARM OUR HEALTH?

Each of these conditions can lead to contamination of drinking water, recreational waters, fish, and shellfish—all of which can make people sick. For example, heavy rains can cause fertilizers and animal waste from farms to be flushed into rivers, lakes, and oceans. There, the excess nutrients and warm waters promote the growth of algae, viruses, parasites, and bacteria such as *Salmonella*, *E. coli* and *Vibrio*. People get exposed to these pathogens by drinking or swimming in contaminated water, or by eating contaminated fish and shellfish. This can cause diarrhea and vomiting and, in severe cases, paralysis, organ failure, and death.<sup>31</sup> A 1993 *Cryptosporidium* outbreak in Milwaukee, which sickened more than 400,000 people, coincided with record high flows in the Milwaukee River, a reflection of the amount of rainfall in the watershed.<sup>32</sup> The toxic algae bloom in Lake Erie that required shutting down the water supply in Toledo, Ohio, in 2014 is another example.

### WHO IS BEING HARMED?

Anyone can be harmed by contaminated water, but some people—especially children, the elderly, people with weakened immune systems, people in remote or low-income communities with inadequate water systems, and people in communities that are dependent on fish and shellfish—are at higher risk.



▲ A couple paddle surfs as algae surfaces on Lake Erie in August 2014. Health officials sent samples to several laboratories for testing after finding Lake Erie was affected by a “harmful algal bloom.” The lake provides the bulk of the area’s drinking water.

▶ *E. Coli* bacteria.



## Contaminated Food

### WHAT IS HAPPENING?

Climate change is causing increases in temperature, humidity, and extreme weather events like heavy downpours and flooding.

### HOW DOES THAT HARM OUR HEALTH?

Each of these conditions can lead to food becoming contaminated by bacteria and toxins. For example, heavy downpours and flooding can spread fecal bacteria and viruses into fields where food is growing. Higher sea surface temperatures can lead to more pathogens and greater accumulation of mercury and other heavy metals in seafood. Foodborne illness has long been known to peak in summer due to the heat. Because pests, parasites, and bacteria thrive in warmer temperatures, farmers are using more pesticides on crops and drugs in livestock, which can cause health problems. The geographic range of mold and associated toxins is also expanding, affecting corn, peanuts, cereal grains, and fruit.<sup>33</sup>

▼ A flooded cornfield in Gladstone, Illinois.



### WHO IS BEING HARMED?

Anyone can be harmed by contaminated food, but infants, young children, pregnant women, the elderly, the poor, agricultural workers, and those with weakened immune systems are more susceptible.





## Threats to Mental Health

### WHAT IS HAPPENING?

Climate change is causing increases in the frequency and severity of some extreme weather events such as heavy downpours, floods, droughts, and major storms. These events and other changes are creating the direct and indirect physical harms we've described above.

### HOW DOES THAT HARM OUR MENTAL HEALTH?

Many people exposed to the worst extreme weather events experience stress and serious mental health consequences including depression, anxiety, post-traumatic stress disorder (PTSD), and increases in suicidal thoughts and behavior. Such disasters are also associated with increases in alcohol or drug abuse. Children may also experience prolonged separation from their parents. Beyond the well-known risks specific disasters pose to our mental health, the physical, social, and economic stresses created by climate change all increase our risk of mental health problems.<sup>35</sup>

### WHO IS BEING HARMED?

Anyone's mental health can be harmed by a disaster, but people at higher risk include children, the elderly, pregnant women and women in general, those with preexisting mental illness, the poor, homeless, and first responders. Farmers and other people who rely on the natural environment for their livelihoods are also at higher risk.



► Neighbors embrace after looking through the wreckage of their homes devastated by fire and the effects of Hurricane Sandy in Queens, NY on October 31, 2012.



▲ A woman shops for food in a shelter during Hurricane Sandy.

## What the Public and Doctors Think about Climate Change and Health

**FACT** Only about one in three Americans are aware that people in the US are being harmed “right now” by climate change.

**FACT** Yet, based on several surveys, two out of every three doctors think climate change has direct relevance right now to patient care.<sup>36,37,38</sup>

**FACT** Physicians say the most common ways in which climate change is harming their patients’ health are through poor air quality, worsening allergies, injuries due to storms, heat-related illness, and infections spread by mosquitoes and ticks.

Physicians in three medical societies\* were asked the following question: In which of the following ways, if any, do you think your patients are currently being affected by climate change? (N=1868-1908)<sup>39,40,41</sup>

Health Harms	Responded “Yes”
Air pollution-related	76%
Allergic symptoms	63%
Injuries due to storms, etc.	57%
Heat effects	45%
Vector-borne infections (e.g., infections spread by mosquitoes or ticks)	40%
Diarrhea from food or water infections	29%
Mental health**	40%

\* The societies are the American Academy of Allergy, Asthma, Immunology; the American Thoracic Society; and the National Medical Association.

\*\* Results from one medical society only.



## Threats to Nutrition

### WHAT IS HAPPENING?

The level of carbon dioxide in our air is increasing, and the resulting climate change is causing increases in temperature, drought, and extreme weather events like heavy downpours and flooding.

### HOW DOES THAT HARM OUR HEALTH?

Rising levels of carbon dioxide in the air decrease the nutritional value of important food crops such as wheat, rice, barley, and potatoes. This happens because in the presence of more carbon dioxide, these plants produce less protein and more starch and sugar, and they take in fewer essential minerals. Higher temperatures can also result in more food spoiling. Drought can damage or destroy crops, and extreme weather events can disrupt food production and distribution by knocking out power, damaging infrastructure, and delaying food shipments. As a result, food can be damaged, spoiled or contaminated, reducing the availability of and access to safe and nutritious food.<sup>35</sup>

### WHO IS BEING HARMED?

Anyone can be harmed by lack of food or malnutrition, but infants, young children, pregnant women, the elderly, and the poor are particularly vulnerable.



# RISK: THE CLIMATE FUTURE DOCTORS WORRY ABOUT

In the report *What We Know*, provided by the American Association for the Advancement of Science (the largest scientist organization in the US), climate scientists concluded:

*We are at risk of pushing our climate system toward abrupt, unpredictable, and potentially irreversible changes with highly damaging impacts.<sup>4</sup>*

The scientists tell us that, even if we somehow stopped adding greenhouse gases to our atmosphere tomorrow, more warming is now “baked in” to our climate. But the greatest risk is that at some point, warming will set abrupt and irreversible changes in motion. Such scenarios include the large-scale collapse of ice sheets in Antarctica, creating the potential for 23 feet of rise in sea level.<sup>5</sup> The truly disturbing thing is that scientists cannot tell us how much warming it would take to trigger such scenarios.

As one of our doctors put it, “Even our ‘best-case scenario’ means we’re going to be seeing more with demanding health problems. But the worst-case scenarios of climate change really worry me. It would mean a level of human suffering we can barely contemplate, much less respond to.”<sup>42,43</sup>



Wall Street, NYC after 4°C of warming

Wall Street, NYC after 2°C of warming

# WHAT WE CAN DO: PREPARE AND PREVENT

One of the key findings in the 2014 National Climate Assessment—the most comprehensive assessment to date of the impacts of climate change in the US—was the following:

*Public health actions, especially preparedness and prevention, can do much to protect people from some of the impacts of climate change. Early action provides the largest health benefits. As threats increase, our ability to adapt to future changes may be limited.*

*Prevention is a central tenet of public health. Many conditions that are difficult and costly to treat when a patient gets to the doctor could be prevented before they occur at a fraction of the cost. Similarly, many of the larger health impacts associated with climate change can be prevented through early action at significantly lower cost than dealing with them after they occur.<sup>44</sup>*

Doctors agree with climate scientists: the sooner we take action, the more harm we can prevent, and the more we can protect the health of all Americans.<sup>45</sup>

**We believe the most important action we can take to protect our health is to accelerate the inevitable transition to clean renewable energy. As explained in the 2014 National Climate Assessment:**

*Activities that reduce carbon pollution often also provide co-benefits in the form of preventive health measures. For example, reliance on cleaner energy sources for electricity production and more efficient and active transport, like biking or walking, can have immediate public health benefits, through improved air quality and lowered rates of obesity, diabetes, and heart disease. Reducing carbon pollution also reduces long-term adverse climate-health impacts, thus producing cost savings in the near and longer term.*

In addition to limiting climate change, accelerating the transition to clean energy has the added benefit of rapidly cleaning up our air and our water so that we can all enjoy better health. Who among us doesn't want clean air and water, and better health?

There are economic benefits that flow from better health. These are discussed in the next section on health benefits.

In response to this Medical Alert, there are many actions that can be taken. Below are specific actions that can be taken by different groups.

**DOCTORS** First and foremost, physicians need to provide care to patients who are experiencing climate-related health effects. Beyond this, doctors can educate the public and policymakers to assure they understand the importance of action. Reducing heat trapping pollution is a priority, and vital health infrastructure must be prepared so health is protected from the risks of climate change including floods and storms. Health institutions should focus on reducing energy use, relying on clean energy to the extent possible, and avoiding negative impacts on the environment. Doctors can also encourage medical education at all levels to incorporate climate change-related coursework into curricula.

**BUSINESS LEADERS** Business leaders can take this opportunity to transition their businesses to renewable energy. Many businesses that are already engaged in this transformative change are reaping benefits in cost savings, job creation, and enhanced reputation. They can share their successful experience with other businesses and governmental officials at the federal and state levels.

**PUBLIC HEALTH AND THEIR PARTNERS** Public health professionals are leaders in monitoring, prevention, preparedness, and public education on health issues. Climate change creates the imperative to do all of these. Examples include crafting early warning systems for heat and extreme weather events, advising hospitals and health system on preparedness, and collaborating with research institutions to enhance surveillance and community resilience in the face of inevitable climate-related disasters. Public health leaders collect the data and create the analyses and reports that keep other stakeholders apprised of how well we're doing, collectively, to prevent and respond effectively to the health harms of climate change.

**GOVERNMENT LEADERS** Leaders in local, state, and federal government should immediately begin focusing on preparedness, providing the support needed to build resilience against damaging climate change impacts. Government leaders must also take ambitious steps to prevent the worst health impacts of climate change, including fully embracing clean energy, walkable communities, public transportation, and green building design. In doing so, they will deliver immediate health benefits for their constituents.

**ALL OF US** We all should know our risks, especially if we live in areas that are particularly vulnerable to disastrous fires, floods, storms, and extreme weather events. Beyond that, we all have the opportunity to be part of the solution. We can reduce our emissions by reducing automobile use in favor of walking and cycling, taking steps toward a more plant-based healthy diet, reducing our energy consumption, and, as it rapidly becomes more affordable, opting for clean energy from state and local utilities. The good news is that taking such steps will improve our health and everyone else's. The final message for "all of us" is to get involved, not just as consumers, but also as citizens. Our health depends on it.

*We believe the most important action we can take to protect our health is to accelerate the inevitable transition to clean renewable energy.*



# THE HEALTH BENEFITS OF ACTING NOW

## Success: Reducing Air Pollution in the Northeastern States

In 2009, nine states in the northeast came together to reduce CO<sub>2</sub> emissions from fossil fuel power. They agreed to the Regional Greenhouse Gas Initiative (RGGI), which places a regional limit on the amount of carbon dioxide that power plants can emit and institutes a cap and trade policy.

In addition to reducing carbon dioxide emissions from fossil fuel use, the RGGI also reduces fossil fuels' well-known disease-causing pollutants: carbon monoxide, lead, ground-level ozone, nitrogen oxides, particulate matter, and sulfur dioxide.

A January 2017 study by Abt Associates looking at the environmental and public health impact of the RGGI found it “*created major benefits to public health and productivity, including avoiding hundreds of premature deaths and tens of thousands of lost work days.*”<sup>46</sup> Specifically, this report found that RGGI prevented the following:

- 300–830 early deaths among adults
- 39,000–47,000 lost work days
- 35–390 non-fatal heart attacks
- 8,200–9,900 asthma flare-ups
- 180–220 hospital admissions
- 200–230 asthma ER visits

**The total health cost savings from the Regional Greenhouse Gas Initiative to date is estimated to be \$5.7 billion.**

This is what US doctors want: fewer people going to hospitals, fewer people missing work, fewer people coming to our offices suffering from serious health conditions, and, of course, fewer people dying prematurely.

Along with reducing the health risks of future climate change, these are the immediate health dividends—including lower health costs—that moving quickly toward renewable energy will bring.

## ENDNOTES

1. Leiserowitz, A., Maibach, E., Roser-Renouf, C., Rosenthal, S., & Cutler, M. (2017). Climate change in the American mind: November 2016. Yale University and George Mason University. New Haven, CT: Yale Program on Climate Change Communication.
2. Sarfaty M, Kreslake J, Casale T, Maibach E. Views of AAAAI members on climate change and health. Journal of Allergy and Clinical Immunology-In Practice. Published online December 16, 2015. DOI: <http://dx.doi.org/10.1016/j.jaip.2015.09.018>
3. Koh H. Communicating the Health Effects of Climate Change. JAMA. 2016;315(3):239-240. doi:10.1001/jama.2015.18271
4. Sarfaty M, Bloodhart B, Ewart G, Thurston GD, Balmes J, Guidotti TL, Maibach E. American Thoracic Society Member Survey on Climate Change and Health. Annals of the American Thoracic Society. Feb 2015; 12(2): 274-278.
5. USGCRP, 2016: The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. Crimmins, A., J. Balbus, J.L. Gamble, et.al. Global Change Research Program, Washington, DC, 312 pp. <http://dx.doi.org/10.7930/JOR49NQX>
6. Wellbery C, Sarfaty M. The Health Hazards of Air Pollution-Implications for Your Patients. American Family Physician. Feb 1, 2017.
7. Crowley RA. [Climate Change and Health: A Position Paper of the American College of Physicians](#). Health and Public Policy Committee of the American College of Physicians. Ann Intern Med. 2016 May 3;164(9):608-10. doi: 10.7326/M15-2766. Epub 2016 Apr 19.
8. Ahdoot S, Pacheco SE.; Council on Environmental Health. [Global Climate Change and Children's Health](#). Pediatrics. 2015 Nov;136(5):e1468-84. doi: 10.1542/peds.2015-3233. Epub 2015 Oct 26.
9. Sarfaty M, Mitchell M, Bloodhart B, Maibach E. A Survey of African American Physicians on the Health Effects of Climate Change. Int. J. Environ. Res. Public Health 2014, 11(12). 12473-12485.
10. Policy of the American Medical Association, 2008 reaffirmed 2014; H-135.938 Global Climate Change and Human Health; <https://searchpf.ama-assn.org/SearchML/policyFinderPages/search.action>
11. Policy of the American Medical Association, 2016; H-135.923; AMA Advocacy for Environmental Sustainability and Climate; <https://searchpf.ama-assn.org/SearchML/searchDetails.action?uri=%2FAMADoc%2FHOD-135.923.xml>
12. Gamble JL, Balbus J, Berger K, et. al. Ch. 9: Populations of Concern. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 247-286. <http://dx.doi.org/10.7930/J0Q81B0T>
13. <http://climatecommunication.yale.edu/publications/public-perceptions-of-the-health-consequences-of-global-warming/> Accessed February 19, 2017.
14. Leiserowitz, A., et al. "Public perceptions of the health consequences of global warming: October, 2014." New Haven: Yale Project on Climate Change Communication (2014).
15. Leiserowitz, A., et al. Climate Change in the American Mind. November, 2011. Yale Program on Climate Communication and George Mason University Center for Climate Change Communication
16. Gallup Poll 2014.
17. Krygsman, K., Speiser, M., Lake, C., and Voss, J. (2017). American Climate Metrics Survey 2016: National. ecoAmerica and Lake Research Partners. Washington, D.C.
18. Cook, J. et al. (2016). Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. Environmental Research Letters, 11(4), 048002.
19. USGCRP, 2016: The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. Crimmins, A., J. Balbus, J.L. Gamble, et.al. Global Change Research Program, Washington, DC, 312 pp. <http://dx.doi.org/10.7930/JOR49NQX>
20. Ibid.
21. Gamble JL, Balbus J, Berger K, et. al. Ch. 9: Populations of Concern. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 247-286. <http://dx.doi.org/10.7930/J0Q81B0T>
22. American Association for the Advancement of Science. What We Know: The Risks, Reality, and Responses to Climate Change. Page 8. [http://whatweknow.aaas.org/wp-content/uploads/2014/07/whatweknow\\_website.pdf](http://whatweknow.aaas.org/wp-content/uploads/2014/07/whatweknow_website.pdf) Accessed February 19, 2017.
23. Nick Watts, et. al. Health and climate change: policy responses to protect public health. The Lancet, Vol. 386, No. 10006, <http://www.thelancet.com/climate-and-health>
24. Climate Change in the United States: Benefits of Global Action. United States Environmental Protection Agency, Office of Atmospheric Programs, EPA 430-R-15-001.
25. Helena Wang, Richard Horton. Tackling climate change: the greatest opportunity for global health. The Lancet; 22 June 2015.
26. [https://en.wikipedia.org/wiki/2016\\_Louisiana\\_floods](https://en.wikipedia.org/wiki/2016_Louisiana_floods) Accessed February 20, 2017.
27. <http://www.who.int/mediacentre/news/releases/2014/air-pollution/en/> Accessed February 20, 2017
28. Beard CB, Eisen RJ, Barker CM, et.al. Ch. 5: Vectorborne Diseases. The Impacts of Climate Change on Human Health in the United States 2016: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 129-156. <http://dx.doi.org/10.7930/J0765C7V> [https://s3.amazonaws.com/climatehealth2016/low/ClimateHealth2016\\_05\\_Vector\\_small.pdf](https://s3.amazonaws.com/climatehealth2016/low/ClimateHealth2016_05_Vector_small.pdf) Accessed February 24, 2017.
29. <https://www.lymediseaseassociation.org/resources/cases-a-other-statistics>. Accessed February 24, 2017
30. Eisen R, Eisen L, Beard CB. County-Scale Distribution of Ixodes scapularis and Ixodes pacificus (Acari: Ixodidae) in the Continental United States. J Med Entomol (2016) 53 (2): 349-386.
31. Trtanj J, Jantarasami L, et. al. Climate Impacts on Water Related Illness Chapter in Impacts of Climate Change in the United States: A Scientific Assessment. 2016. Global Change Research Program. [https://s3.amazonaws.com/climatehealth2016/low/ClimateHealth2016\\_06\\_Water\\_small.pdf](https://s3.amazonaws.com/climatehealth2016/low/ClimateHealth2016_06_Water_small.pdf) Accessed February 24, 2017
32. Patz, J.A., S.J. Vavrus, C.K. Uejio, and S.L. McLellan, 2008: Climate change and waterborne disease risk in the Great Lakes region of the US. American Journal of Preventive Medicine, 35, 451-458.
33. Ziska L, Crimmins A., Auclair A, et. al. Ch. 7: Food Safety, Nutrition, and Distribution. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 189-216.
34. Ibid.

35. Dodgen, D, Donato D, Kelly N, et.al. Ch. 8: Mental Health and Well-Being. The Impacts of Climate Change on Human Health in the United States 2016: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 217-246. <http://dx.doi.org/10.7930/JOTX3C9H>
36. Sarfaty M, Kreslake J, Casale T, Maibach E. Views of AAAAI members on climate change and health. *Journal of Allergy and Clinical Immunology-In Practice*. Published online December 16, 2015. <http://dx.doi.org/10.1016/j.jaip.2015.09.018>
37. Sarfaty M, Bloodhart B, Ewart G, Thurston GD, Balmes J, Guidotti TL, Maibach E. American Thoracic Society Member Survey on Climate Change and Health. *Annals of the American Thoracic Society*. Feb 2015; 12(2): 274-278.
38. Sarfaty M, Mitchell M, Bloodhart B, Maibach E. A Survey of African American Physicians on the Health Effects of Climate Change. *Int. J. Environ. Res. Public Health* 2014, 11(12). 12473-12485.
39. Sarfaty M, Kreslake J, Casale T, Maibach E. Views of AAAAI members on climate change and health. *Journal of Allergy and Clinical Immunology-In Practice*. Published online December 16, 2015. <http://dx.doi.org/10.1016/j.jaip.2015.09.018>
40. Sarfaty M, Bloodhart B, Ewart G, Thurston GD, Balmes J, Guidotti TL, Maibach E. American Thoracic Society Member Survey on Climate Change and Health. *Annals of the American Thoracic Society*. Feb 2015; 12(2): 274-278.
41. Sarfaty M, Mitchell M, Bloodhart B, Maibach E. A Survey of African American Physicians on the Health Effects of Climate Change. *Int. J. Environ. Res. Public Health* 2014, 11(12). 12473-12485.
42. <http://nca2014.globalchange.gov/report/sectors/human-health#statement-16522>
43. American Association for the Advancement of Science. What We Know: The Risks, Reality, and Responses to Climate Change. Page 8. [http://whatweknow.aas.org/wp-content/uploads/2014/07/whatweknow\\_website.pdf](http://whatweknow.aas.org/wp-content/uploads/2014/07/whatweknow_website.pdf) Accessed February 19, 2017.
44. 2014 National Climate Assessment. Global Change Research Program. <http://nca2014.globalchange.gov/report>
45. American Association for the Advancement of Science. What We Know: The Risks, Reality, and Responses to Climate Change. Page 8. [http://whatweknow.aas.org/wp-content/uploads/2014/07/whatweknow\\_website.pdf](http://whatweknow.aas.org/wp-content/uploads/2014/07/whatweknow_website.pdf) Accessed February 19, 2017.
46. Abt Associates. Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative, 2009-2014. <http://abtassociates.com/AbtAssociates/files/7e/7e38e795-aba2-4756-ab72-ba7ae7f53f16.pdf> Accessed February 20, 2017.

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*We are sounding the alarm that  
climate change poses a risk to the  
health of every American.*



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