



The Health Benefits of the Clean Power Plan: A Toolkit for Health Professionals

Updated: June 1, 2016

Executive summary

Introduction

Climate change is already affecting the health of Americans throughout the country. Key climate change-induced drivers of health impacts include changes in heat, air pollution, precipitation, sea level rise and pollen producing plants. There are some aspects of climate change we should be prepared for:

- Increasing frequency and intensity of periods of extreme heat
 - This not only has a negative health impact (e.g., heatstroke, aggression) it also increases the risk of drought and wildfire.
- Increases in air pollution
 - Heat increases ozone formation and reliance on air conditioning leading to use of more carbon polluting electric power.
- Increasingly frequent extreme precipitation, intense storms, and changes in precipitation patterns
 - These can lead to flooding, population displacement, growth of mold and other allergens, and have impacts on the water and food supply.
- Rising sea levels
 - This can intensify coastal flooding with the tides and storm surges that cause displacement and exposure to mold.
- Increasing extent of growth of pollen producing plants and longer pollen seasons
 - This can cause more allergenic pollen related to carbon dioxide enrichment.

Objective

The objective of this toolkit is to highlight how climate change is currently affecting health and what prevention/preparedness actions we can take to help mitigate the negative health outcomes associated with it. Actions to reduce emissions of carbon pollution and other greenhouse gases that accelerate climate change will protect human health in both the short and long term. In 2015, the Environmental Protection Agency (EPA) required every state to reduce the output of carbon pollution (carbon dioxide) that results from the generation of electric power within the state by about 30% by 2030. States are required to develop their own plans and must have a mechanism to consider public input as part of the process (EPA, 2015). This Toolkit is a guide for clinicians and health professionals who wish to inform policy makers in their state about the adverse health implications of fossil fuels and the more healthful alternative—clean renewable power sources—and improved efficiency, which can reduce power production and extend its use.

When the new regulation was finalized, about 19 states sought legal action to try to stop its implementation. In early 2016, the Supreme Court put on hold the implementation requirement pending the decision of a lower court. While 19 states are moving forward with plans anyway, another 19 are on hold, and 8 states are deciding what to do. (Note that several states are exempt because they are already under the limits.) Physicians can be especially helpful if they inform policy makers during 2016 in states that *are* moving forward—and in those that *are deciding* whether to go forward at this time. The EPA firmly believes the Clean Power Plan will be upheld for all states when the merits are considered because the rule rests on strong scientific and legal foundations. If this is so, the remaining states will also greatly benefit from input.

In this toolkit, you will find:

- A background summary on the health effects of climate change
 - Vulnerable populations and heat
 - Vulnerable populations and respiratory issues
 - Vulnerable populations and severe weather
 - Vulnerable populations and vector-borne diseases
- A background summary on the Clean Power Plan
- A draft letter to use for writing your concerns to state policy makers
- An information sheet to offer policy makers
- Messaging to use for oral testimony and in-person discussions
- Dates of scheduled state hearings and meetings for selected states*
- Interactive maps

*Information on other states can be found through each state's Departments of the Environment or Natural Resources by searching for the Clean Power Plan.

Conclusion

There are many vulnerable groups who will feel the negative health effects of climate change. Prevention and preparedness are appropriate ways to mitigate the effects and supporting the Clean Power Plan is a great place to start. Predicted benefits of the Clean Power Plan are numerous and include less premature death from ozone and particle pollution as well as less hospital admissions, heart attacks, and asthma attacks.²

More information:

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Purpose of Toolkit

Actions to reduce emissions of carbon pollution and other greenhouse gases that accelerate climate change will protect human health in both the short and long term. In 2015, the Environmental Protection Agency (EPA) required every state to reduce the output of carbon pollution (carbon dioxide) that results from the generation of electric power within the state by about 30% by 2030. States are required to develop their own plans and must have a mechanism to consider public input as part of the process (EPA, 2015). This Toolkit is a guide for health professionals who wish to inform policy makers in their state about the adverse health implications of fossil fuels and the more healthful alternative—clean renewable power sources—and improved efficiency, which can reduce power production and extend its use.

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Interactive maps and state-by-state facts:

- A. How each state generates electricity (gas, coal, renewable) by the Washington Post
<https://www.washingtonpost.com/graphics/national/power-plants/>
- B. State of the Air in Your County/State from the American Lung Association
<http://www.stateoftheair.org/>
- C. Climate Opinion & Policy Solution Map: state, county, congressional district
<http://environment.yale.edu/poe/v2014/>
- D. Carbon Dioxide Reduction Goals for your State: state targets and politics
http://www.eenews.net/interactive/clean_power_plan

Health Impacts of Climate Change

This information is adapted from the following reports: Impacts of Climate Change on Health in the United States (Crimmins et al., 2016) and the National Climate Assessment (Mellilo, 2014), which summarize the impacts of climate change in the United States now and in the future. Both reports were produced by teams of experts and extensively reviewed. The material presented here and the references are found in the health sector report at: <http://nca2014.globalchange.gov/report> & in the newest health impact report, <http://Health2016.globalchange.gov>

Climate change (along with other natural and human-made health stressors) influences human health and disease in numerous ways. Some existing health threats will intensify (e.g., COPD and asthma) and new health threats will emerge (e.g., the spread of vector-borne diseases to areas where this is not commonly seen). Not everyone is equally at risk. Important considerations include age, economic resources, and location. Preventive and adaptive actions (such as reducing the sources of global warming, setting up extreme weather early warning systems, or improving water infrastructure) can reduce the severity of these impacts. Health effects of the disruption to the climate include exacerbations of respiratory and cardiovascular disease, injuries and premature deaths related to extreme weather, more widespread allergy symptoms, changes in the prevalence and geographical distribution of foodborne, waterborne and vector-borne illnesses and diseases, and threats to mental health.

Key climate change-induced drivers of health impacts include:

- Increasing frequency of intense and longer-lasting periods of extreme heat, (which is a direct threat to health, worsens drought, and increases wildfire risk);
- Air pollution risks (because heat increases ozone formation and reliance on air conditioning leading to use of more carbon polluting electric power);
- Increasingly frequent extreme precipitation, intense storms, and changes in precipitation patterns that lead to flooding with population displacement, growth of mold and other allergenic plants, and impacts the food supply;
- Rising sea levels that intensify coastal flooding with the tides and storm surges that cause displacement and exposure to mold;
- Increasing extent of growth of pollen producing plants and longer pollen seasons and more allergenic pollen related to carbon dioxide enrichment.

Examples of Climate Impacts on Human Health








	Climate Driver	Exposure	Health Outcome	Impact
 Extreme Heat	More frequent, severe, prolonged heat events	Elevated temperatures	Heat-related death and illness	Rising temperatures will lead to an increase in heat-related deaths and illnesses.
 Outdoor Air Quality	Increasing temperatures and changing precipitation patterns	Worsened air quality (ozone, particulate matter, and higher pollen counts)	Premature death, acute and chronic cardiovascular and respiratory illnesses	Rising temperatures and wildfires and decreasing precipitation will lead to increases in ozone and particulate matter, elevating the risks of cardiovascular and respiratory illnesses and death.
 Flooding	Rising sea level and more frequent or intense extreme precipitation, hurricanes, and storm surge events	Contaminated water, debris, and disruptions to essential infrastructure	Drowning, injuries, mental health consequences, gastrointestinal and other illness	Increased coastal and inland flooding exposes populations to a range of negative health impacts before, during, and after events.
 Vector-Borne Infection (Lyme Disease)	Changes in temperature extremes and seasonal weather patterns	Earlier and geographically expanded tick activity	Lyme disease	Ticks will show earlier seasonal activity and a generally northward range expansion, increasing risk of human exposure to Lyme disease-causing bacteria.
 Water-Related Infection (<i>Vibrio vulnificus</i>)	Rising sea surface temperature, changes in precipitation and runoff affecting coastal salinity	Recreational water or shellfish contaminated with <i>Vibrio vulnificus</i>	<i>Vibrio vulnificus</i> induced diarrhea & intestinal illness, wound and bloodstream infections, death	Increases in water temperatures will alter timing and location of <i>Vibrio vulnificus</i> growth, increasing exposure and risk of water-borne illness.
 Food-Related Infection (<i>Salmonella</i>)	Increases in temperature, humidity, and season length	Increased growth of pathogens, seasonal shifts in incidence of <i>Salmonella</i> exposure	<i>Salmonella</i> infection, gastrointestinal outbreaks	Rising temperatures increase <i>Salmonella</i> prevalence in food; longer seasons and warming winters increase risk of exposure and infection.
 Mental Health and Well-Being	Climate change impacts, especially extreme weather	Level of exposure to traumatic events, like disasters	Distress, grief, behavioral health disorders, social impacts, resilience	Changes in exposure to climate- or weather-related disasters cause or exacerbate stress and mental health consequences, with greater risk for certain populations.

Figure 1 Examples of Climate Impacts on Human Health (Figure Source: Crimmins, et al. 2016)

Drivers of vulnerability include the attributes of certain groups including:

- Age,
- Socioeconomic status,
- Race,
- Current health
- Location (floodplains, coastal zones, latitude, and urban areas),
- Public health infrastructure (warnings systems, Multi-stressor situations, disaster preparedness)
- Home environments (with mold, water damage or temperature controls)
- Social and physical infrastructure (could affect mental and physical health including injuries and disease)

These factors are particularly important to consider when preparing for the impacts of climate change on human health.

Determinants of Vulnerability

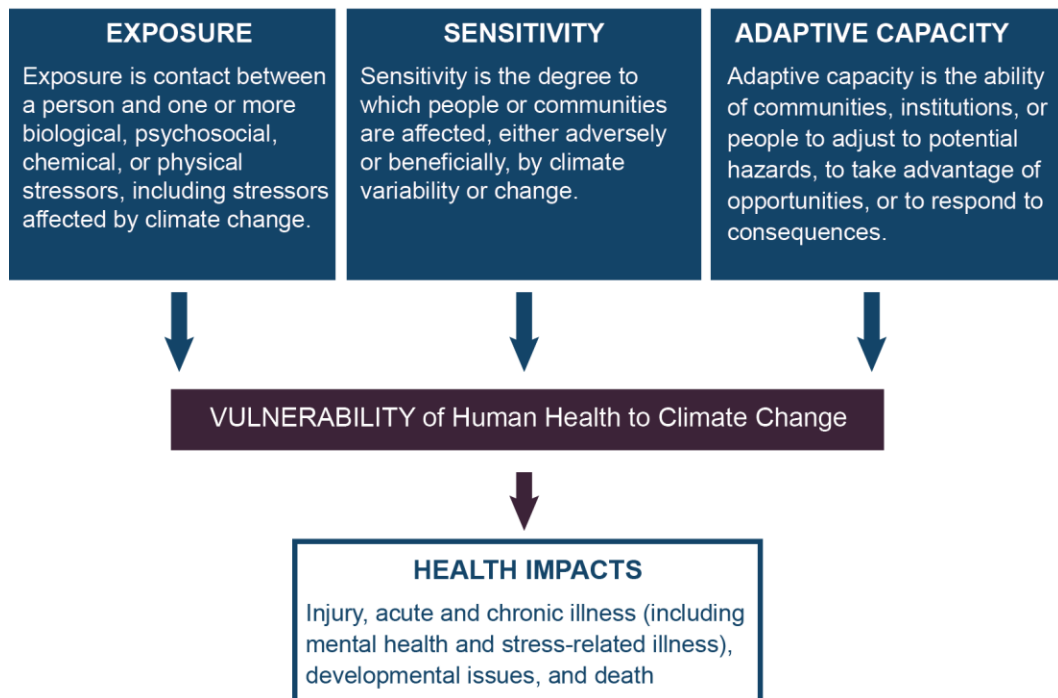


Figure 2 Determinants of Vulnerability (Figure source: Crimmins et al. 2016)

Vulnerable Populations and Heat

Extreme heat is the leading cause of death related to the extreme weather and is expected to increase in the coming years (Centers for Disease Control and Prevention, n.d.). Increased use of emergency rooms and hospitalizations resulting from heat waves are documented. Extreme heat can lead to heat stress, heat exhaustion, and heat stroke. Certain populations are more vulnerable to extreme heat and heat waves. The number of categories is lengthy. It includes people with chronic health conditions (especially, cardiac, respiratory, and renal conditions), people with mental health conditions, those with limited mobility, the very young (under 4) or those over age 65. Also at risk are people who exert themselves outdoors, people lacking access to air conditioning, homeless individuals, people with underlying causes of dehydration (vomiting, diarrhea, etc.), and people on certain medications that may reduce sweating (antipsychotics, neurologic meds, antihistamines, anticholinergics) (Becker, 2011; Centers for Disease Control and Prevention, 2013a, 2013b; Stafoggia, 2006). The mortality and morbidity caused by prolonged heat waves can have effects that last up to five days after the heat wave has ended (Bobb, 2014).

Several mental health issues have been associated with extreme heat including aggression, criminal behavior, suicide, dementia, mood disorders, anxiety, and other mental disorders (Berry, 2010; Nurse, 2010). Heat waves have been associated with increased hospital admissions for suicide and other psychiatric issues (Berry, 2010). Existing mental health issues during a heat wave tripled the risk of mortality for any cause (Berry, 2010).

People who live in urban areas may be at even greater risk of suffering negative health outcomes associated with heat. The term “Urban Heat Island” has been coined because the temperature in cities is often higher than surrounding suburban or rural areas. The urban heat island effect can cause a 1-6 degree Fahrenheit or greater difference in temperature between an urban area and its surrounding area (Luber, 2008). This urban heat island effect causes higher temperatures during both the day and night. The factors that cause this include concrete and asphalt which retain and then re-radiate heat, tall buildings that obstruct air flow, and the lack of cooling green spaces (Luber, 2008).

Vulnerable Populations and Respiratory Problems

People who live in areas with air pollution or rising pollen counts, and those who have allergies and/or respiratory issues such as asthma, COPD, or reduced lung function are at highest risk of suffering from environmental changes associated with climate change. Air pollutants and allergens are overlapping causes of distress for these individuals. CO₂ and higher temperatures are increasing the duration and severity of the allergy season by increasing the number of plants that produce allergens and by lengthening the allergy season; higher CO₂ concentration makes some pollen more allergenic. (Ziska, 2011) Ragweed is a notable source since it is widespread along the East Coast, the South, Mid-Atlantic, and Mid-West. Grasses and other sources of plant allergies also now persist in the environment with prolonged growing seasons. Extreme rainfall and higher temperatures are causing increases in indoor air allergens such as fungi and mold. There is the potential for a 30% increase in the prevalence of allergic disease if greenhouse gases in the atmosphere continue to accumulate at the same rate, increasing the impact of climate change; this increase in allergic disease prevalence will impact the pediatric and geriatric populations the most (Bielory, 2012).

At the same time, air pollutants increase the risk of allergies because they cause inflammatory effects in the airways (Peden, 2016). The effects of decreased air quality on human health are well known. The pollutants that pose the greatest risk to human health are *ozone* and *particulate matter*. Higher temperatures lead to more ground level ozone formation, and ozone directly irritates the airways; thus rising temperatures cause symptoms, emergency room visits and hospitalizations. Particulate matter is a direct cause of inflammation and adversely affects the cardiorespiratory system. Children who live near high traffic roadways are more vulnerable due to the fact that diesel exhaust particles increase the onset of allergen sensitization and symptoms in atopic patients (Bielory, 2012). Pollution also affects the eyes. Pollutants [ground level ozone (O₃), nitrogen dioxide (NO₂), and coarse particulate matter (PM₁₀)] have an immediate effect on the eyes causing increased prevalence of allergic eye disease (Bielory, 2012). Other climate related impacts affect these scenarios: power generation (from fossil fuel sources) to support higher demand for air conditioning and wildfires (enhanced by drought) produce notable increases in

particulate matter. <http://nca2014.globalchange.gov/report/sectors/human-health-fn:c681c3c2-48a8-4fe6-8e91-86db5bff7fa3>

Vulnerable Populations and Severe Weather

Severe weather events, such as hurricanes, tornados, and heavy downpours, can cause bodily injury and disrupt people's normal lives through injury, displacement, decreased social support, and economic stress, and lead to mental health issues. Severe anxiety disorders (including PTSD) are associated with acute weather events and can lead to chronic severe mental health issues (Berry, 2010). Many people are at increased risk of being exposed to extreme weather events, depending on their region. People in the South and Southeast are at greater risk of hurricanes, while people in the Midwest are at greater risk of increased precipitation and flooding.

Heavy precipitation has contributed to increases in severe flooding events in certain regions. Floods are one of the deadliest of all weather-related hazards in the United States. Furthermore, elevated waterborne disease outbreaks have been reported in the weeks following heavy rainfall.

Floods

Floods are expected to increase due to increased precipitation in many regions as well as from sea-level rise in coastal areas (Melillo, 2014). Many people are at increased risk of mental and physical health issues due to flooding, especially those who live in areas prone to flooding. Populations living in damp indoor environments experience increased prevalence of asthma and other upper respiratory tract symptoms. Physical illness after a flooding event may increase risk of psychological distress in children and adults (Nurse, 2010). Flooding can lead to chronic mental health issues for entire communities (Nurse, 2010).

Droughts

Increased heat and drought are predicted in many areas of the country (Melillo, 2014). This may increase the number of people who are forced to leave their homes who depend on farming for their livelihood. These displaced people may experience reduced quality of life and increase tendencies toward helplessness, distress, depression and trauma (Berry, 2010). Anyone who suffers socioeconomic hardship from droughts (including agricultural workers and local

business workers) is at increased risk for physical and mental health problems during a drought.

Forest Fires

Forest fires damage property and possessions and can harm the people living in the fire zones. The effects of wildfire on human health are generally acute. Wildfire smoke contains large amounts of particulate matter, which can travel hundreds of miles. Particulates have negative impact on lung health and cardiac conditions. Increases in wildfire frequency and extent are causing negative health impacts in the Western and Mountain states. Not only causing respiratory issues and increased mortality, forest fires can increase the incidence of depression, acute stress disorder, and PTSD (Caamano-Isorna, 2011). The risk of forest fire is highest for people living in the Southwest, Northwest, and Alaska. The incidence of drought can increase the risk of forest fires.

Sea Level Rise

Sea level rise is a concern for many people living along the coast, especially those who live closest to the areas where the sea level will flood their homes and businesses. Coastal erosion and sea level rise is expected to negatively impact storm surge protection during hurricanes (Melillo, 2014). All people living in coastal areas are at increased risk of physical and mental health issues from sea level rise.

Vulnerable Populations and Vector-Borne Diseases

Climate is a factor that influences the range of disease vectors; a shift in the current range may increase vector interaction with people and affect human health (Githeko, 2000). All people are currently at risk from a number of vector-borne diseases (varying by region throughout the world). There are some ambiguities on the relative role and contribution of climate change among the range of factors that affect disease transmission dynamics. Climate change may have contributed to the expanded range of disease vectors, including Ixodes ticks, which are vectors for Lyme disease (Githeko, 2000). People may be at increased risk of coming in contact with a vector-borne disease and not be aware of it. The areas of many vectors have shifted due to changes in temperature and precipitation and could lead to increased instances of vector-borne illnesses in our communities and also abroad. While climate change is associated with

increased instances of dengue, Hantavirus, and Saint Louis encephalitis (to name a few) it is also associated with the reduction in Rocky Mountain spotted fever due to the tick's intolerance of high temperatures (Githeko, 2000).

Changes in Lyme Disease Case Report Distribution

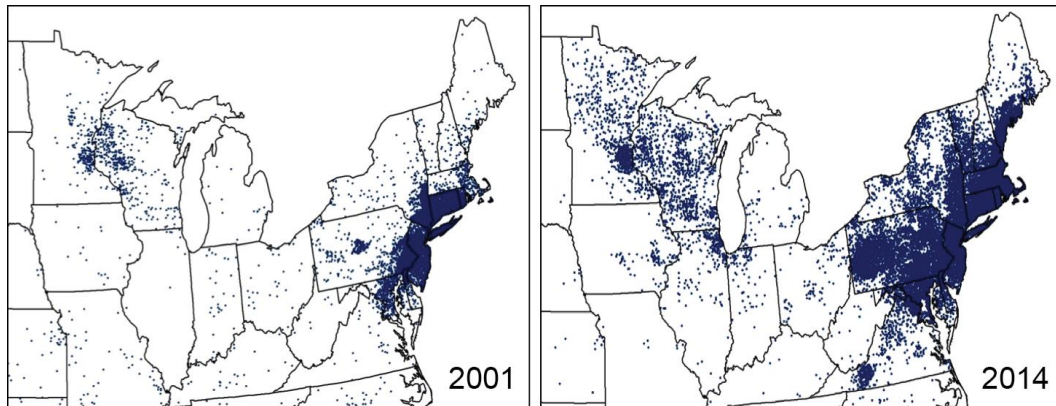


Figure 3 Changes in Lyme Disease Case Report Distribution (Figure source: Crimmins et al. 2016)

Vulnerable Populations and Waterborne Disease

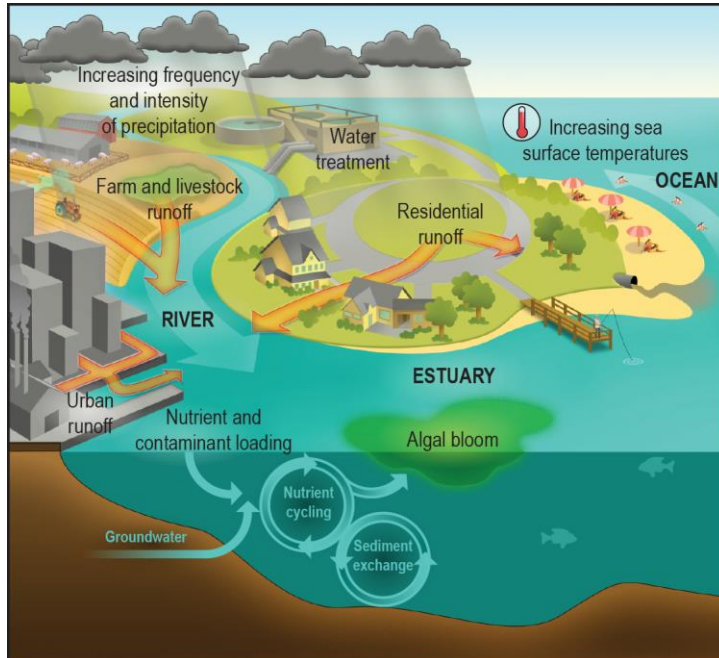


Figure 4 Links between Climate Change, Water Quantity and Quality, and Human Exposure to Water-Related Illness (Figure source: Crimmins et al. 2016)

Waterborne diarrheal disease outbreaks are both seasonal and sensitive to climate variability (Levy, 2016). Extreme precipitation events can lead to waterborne disease outbreaks. As temperatures increase and extreme precipitation events increase in frequency and severity, there will be significant impact on waterborne disease. This threat may be greater for those who cannot obtain access to medical care and/or have greater susceptibility to other infections and chronic diseases (Levy, 2016). Many people will be at increased risk of experiencing a waterborne disease following a severe weather event as access to clean food and water may be compromised. Those communities without emergency preparedness programs and those with poor public health infrastructure (i.e., sanitation, drinking water treatment, access to healthcare, etc.) may be at increased risk of water-borne disease outbreaks following an extreme weather event (Levy, 2016).

Vulnerable Populations and Harmful Algal Blooms

Harmful algal blooms (HABs), also commonly referred to as red tides, can cause fish kills, contaminate seafood, form scum on the water, and alter ecosystems (Gilbert, 2014). HABs have been increasing in frequency, size, and longevity worldwide (Gilbert, 2014). The human health impact of red tides is rare but can lead to illness or death (NOAA, 2016). Algal blooms are closely related to climate factors, projected changes in climate could affect algal blooms and lead to increases in food- and waterborne exposures and cases of illness. Harmful algae blooms have led to beach closures off the coasts of Florida and Texas. Red tides also threaten the beaches of Louisiana, Alabama, and Mississippi. Higher ocean temperatures are also associated with presence of the bacterium *vibrio vulnificus* that blooms in the ocean in Florida (May to October) (NOAA, 2016).

Those most at risk of being exposed to HABs are individuals and families who live along the gulf coast (who could breathe in the toxins in the air) and may be exposed through contaminated seafood. Also, HABs have occurred in the great lakes regions and communities around there may not be aware of the harmful effects of red tide and therefore should be educated.

Vulnerable Populations and Food Security

Climate change is expected to have global impacts on food production and certain aspects of food quality. The impact of temperature extremes, changes in precipitation, elevated atmospheric CO₂, and increasing competition from

weeds and pests on crops are areas of needed research. Production of U.S. wheat and other crops has declined in areas of drought. The most vulnerable include those dependent on subsistence lifestyles and low-income populations whom may confront shortages of key foods or food insecurity.

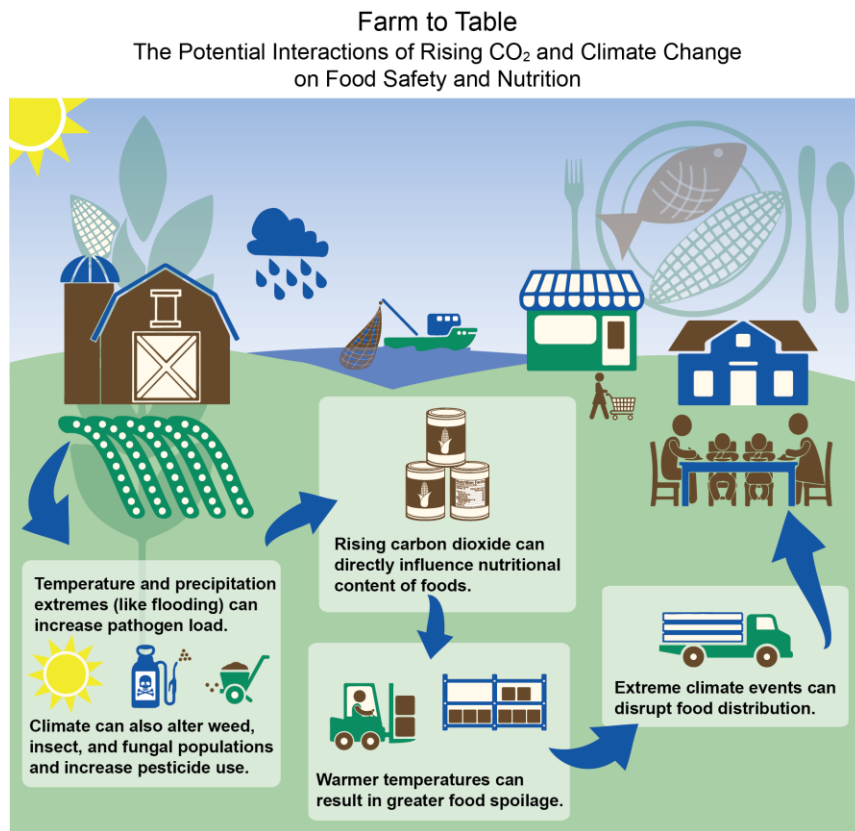


Figure 5 Farm to Table (figure source: Crimmins et al. 2016)

Vulnerable Populations and Mental Health Issues

Many people may experience mental health problems after disasters. Extreme events like Hurricane Katrina and Super Storm Sandy are recent examples of how extreme weather can impact communities. As previously mentioned, Several mental health issues have been associated with extreme heat including aggression, criminal behavior, suicide, dementia, mood disorders, anxiety, and other mental disorders (Berry, 2010; Nurse, 2010). Other extreme weather events that can affect mental health are floods, droughts, and wildfires.

Some people with mental illnesses are more vulnerable to heat. Suicide rates vary with weather; dementia is a risk factor for hospitalization and death during heat waves. Medications for schizophrenia may interfere with temperature regulation or directly cause hyperthermia. Other mental health impacts include distress associated with environmental degradation, displacement, and the knowledge of climate change (Crimmins et al., 2016).

Impact of Climate Change on Physical, Mental, and Community Health

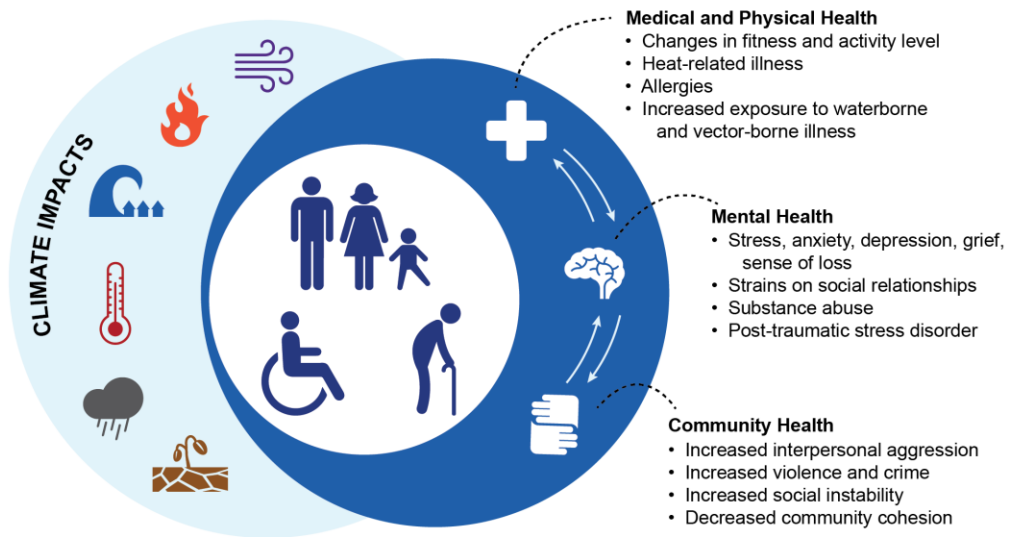


Figure 6 Impact of Climate Change on Physical, Mental, and Community Health (figure source: Crimmins et al. 2016)

Vulnerable Populations and Regional Variation

Regional Vulnerabilities from the National Climate Assessment (Melillo, 2014)

Region	Changing climate
Northeast	<ul style="list-style-type: none"> • Extreme heat • Flooding • Heavy downpours • Sea level rise
Southeast and the Caribbean	<ul style="list-style-type: none"> • Extreme heat • Sea level rise
Midwest	<ul style="list-style-type: none"> • Extreme heat • Flooding • Heavy downpours
Great Plains	<ul style="list-style-type: none"> • Extreme heat
Southwest	<ul style="list-style-type: none"> • Drought • Extreme heat • Flooding and erosion in coastal areas • Insect outbreaks • Wildfires
Northwest	<ul style="list-style-type: none"> • Changes in the timing of stream flow • Coastal erosion • Flooding • Increased tree diseases • Increasing ocean acidity • Insect outbreaks • Sea level rise • Wildfire
Alaska	<ul style="list-style-type: none"> • Extreme heat • Increasing ocean acidity • Receding sea ice • Rising ocean temperatures • Shrinking glaciers • Thawing permafrost • Wildfires
Hawaii and Pacific Islands	<ul style="list-style-type: none"> • Coastal erosion • Coral bleaching • Flooding • Marine disease outbreaks • Rising ocean temperatures

Prevention Provides Protection (Melillo, 2014)

Public health actions, especially preparedness and prevention, can protect people from some of the impacts of climate change. One form of primary prevention is to reduce greenhouse gas emissions. Worsening air quality associated with climate change may be preventable with the reduction of greenhouse gas emissions. As the source of electric power generation converts from that derived from fossil fuels to that derived from clean renewable sources, air quality may improve dramatically and quickly, thus preventing exacerbations of chronic lung disease, asthma or cardiac symptoms. The EPA estimates that \$1 spent on clean renewable energy saves \$4-7 in medical care. Children who are growing up with cleaner air may develop improved lung capacity and ill health may be prevented (Gauderman, 2015). That is why public health and medical organizations should advocate for the Clean Power Plan.

Secondary prevention is possible by reducing the worst effect of illness or unhealthy conditions. In the context of climate change, it is about adapting to the adverse impact of the unhealthy conditions associated with climate change. There are many routes to secondary prevention or *adaptation*. Staying within air-conditioned locations can help those with lung conditions when heat rises and air quality deteriorates. Seeking cooling locations or staying well hydrated will help those who are vulnerable to heat because of social determinants and/or underlying chronic conditions. Patient education to achieve secondary prevention can be undertaken in the clinical environment. Adaptation may also include community or individual level preparations for extreme weather (i.e., cooling centers, city or county emergency preparedness plans, evacuation, use of generators for power, stocking up on dry food and clean water, etc.).

Health impacts associated with climate change can be prevented through early preventive action at lower cost than dealing with them after they occur. Actions to prevent heat injury, protect the food supply, ensure clean drinking water, and protect the power grid require coordination across sectors with government involvement. Reducing localized ambient temperature may be beyond the capability of individuals and may require large-scale community or government participation (i.e., regulations). Tree planting, green rooftops, or white rooftop initiatives on a large scale may be able to counteract the urban heat island effect (see vulnerable populations and heat section above)(Luber, 2008). Public health

initiatives such as heat wave early warning systems have been shown to reduce the amount of predicted illnesses related to extreme weather (Stafoggia, 2006).

Preventive measures individuals can take to reduce their own carbon-output, such as active-transportation through biking or walking, lead to public health benefits by increasing healthful physical activity and offsetting health effects associated with obesity and inactivity. When such approaches to travel are utilized instead of automobile transport, carbon pollution is reduced and air quality improves. Such dual advantages for people and the environment are often referred to as *co-benefits*. These can improve quality of life and promote health.

Responding to climate change provides opportunities to improve human health and wellbeing across many sectors, including energy, agriculture, and transportation. Walk-able communities with shopping amenities closer to residential areas support this model of active living. Fresh locally grown foods require less fuel for long distance transportation (and thus less emissions) and provide access to more healthful fruits and vegetables and less fat and salt. Reducing consumption of beef and other red meats reduces emissions of methane, a potent greenhouse gas. Many of these strategies offer a variety of co-benefits.

Public health actions can do much to protect people from extreme events, and early action provides the largest health benefits. Two extreme events, Hurricane Katrina and the European heat wave of 2003, illustrate how many people suffered from the lack of adaptive measures. Extreme events interact with social vulnerability to produce extreme impacts on infrastructure and social cohesion. The increasing frequency of extreme events associated with climate change is prompting concern that these impacts may overwhelm adaptive capacity. This is equally true of the public health sector as our ability to adapt to future changes may be limited.

Health and the Clean Power Plan: for Clinical Care Providers

Adapted for clinicians from:

<https://www3.epa.gov/airquality/nitrogenoxides/health.html>

Key Points

- Climate change is a health threat in the U.S. affecting people's lives and health. We are already feeling the dangerous and costly effects of a changing climate.
- Electric power generation is the largest single source of carbon pollution emitted into the atmosphere.
- In 2015, the EPA took 3 actions to reduce carbon pollution from the electric power sector, the largest source of U.S. carbon pollution. EPA:
 - Addressed existing electricity sources
 - Addressed new or modified sources of electric power
 - Required that states reduce carbon output (Clean Power Plan)
- The EPA Clean Power Plan is described below. (The Supreme Court stayed the plan in 2016 pending the outcome of a court case. The outcome of the case will be appealed to the Supreme Court. Results expected in 2017. Many states are moving forward anyway.) The Plan is designed to:
 - Achieve significant pollution reductions by or before 2030
 - Be implemented at the state level and gives each state ample time to develop and preserve reliable affordable power
 - Spur investment in clean, renewable energy
 - Make sure that every state solicits public input

Goal of the Clean Power Plan

- Carbon and air pollution are already decreasing, and improving public health every year. The Clean Power Plan accelerates this momentum, putting the U.S. on pace to cut this pollution to historically low levels in the future.
- When the Clean Power Plan is fully in place in 2030, carbon pollution from the power sector will be 32 percent below 2005 levels, securing progress and making sure it continues.

The EPA Has Taken Legal Action

- EPA has the legal authority to regulate greenhouse gases under the Clean Air Act.
- The courts have upheld the EPA finding that greenhouse gas concentrations in the atmosphere endanger public health and the environment, and the courts have also affirmed EPA's prior rules limiting greenhouse gases from cars and trucks.
- The EPA promulgated regulations in 2015 that require every state to reduce the output of carbon pollution that comes from power plants within its borders; however, this has been stayed by the Supreme Court, which means that active enforcement is on hold while the rule is considered by a lower court. Twenty states are moving forward with the plan despite the stay.
- EPA regulation of power plant mercury and air toxics pollution does not preclude EPA from regulating power plant carbon pollution.

Implementing the Clean Power Plan at the State Level

- Policy makers should be urged to continue development of state plans. Improved air quality is a popular objective and the plan will achieve this.
- Emission reduction to be implemented at the state level may be based on various approaches. The state may choose to use energy efficiency as a strategy.
- Every state must seek public input before it finalizes its plan.
- Initial plans were due in September 6, 2016 but states may apply for an extension until September 2018. This may be changed as a result of court consideration.
- The EPA created a unique goal for each state based on the state's mix of power plants in 2012 and potential for alternatives.

- Many states are discussing plans that would enable them to collaborate with other states to trade carbon reductions (i.e., trading ready)
 - Trading-ready mechanisms allow states or powerplants to use creditable, out-of-state reductions to meet goals. This eases administrative burdens and reduces the cost to consumers and utilities. Examples of successful trading exist in several regional greenhouse-trading systems around the country that have reduced carbon dioxide output, generated revenue for building resilience, and saved money for consumers.¹

Incentives for Clean Renewable Power

- EPA is providing the Clean Energy Incentive Program (CEIP) to incentivize early investments that generate wind and solar power or reduce end-use energy demand during 2020 and 2021
- The CEIP is an optional, “matching fund” program states may choose to use to incentivize early investments in wind or solar power, as well as demand-side energy efficiency measures that are implemented in low-income communities
- The CEIP will help ensure that momentum to no-carbon energy continues and give states a jumpstart on their compliance programs

Better Air Due to the Clean Power Plan

- By 2030, emissions of SO₂ from power plants will be 90% lower compared to 2005 levels
- Emissions of NO_x (oxides of nitrogen) will be 72% lower.
- Because these pollutants can create dangerous soot and smog, the historically low levels mean we will avoid thousands of premature deaths and have thousands fewer asthma attacks and hospitalizations in 2030 and every year beyond.
- Expected reductions in mercury pollution, coal ash disposal, coal mining will also markedly reduce health threats.

¹ The Regional Greenhouse Gas Initiative on the East Coast and the California System created by state legislation AB 32 are two examples.

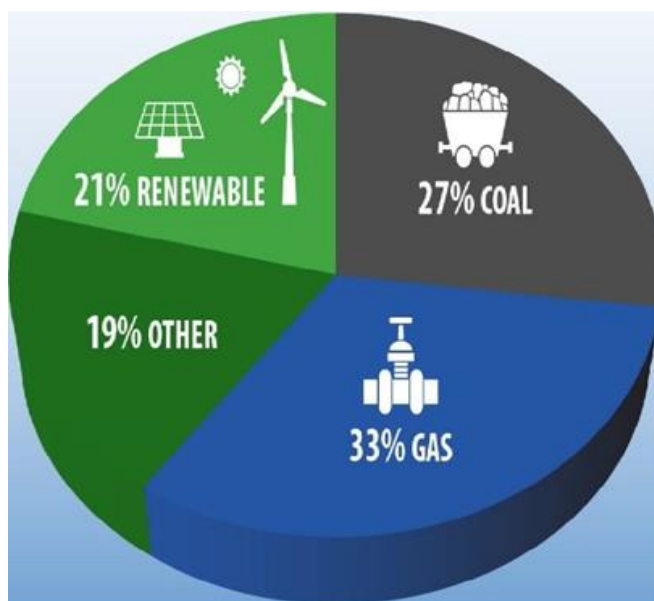
Annual Health Benefits of the Clean Power Plan by 2030²

[Due only to Decrease in Ozone and Particle Pollution]

- 1,500-3,600 premature deaths
- 90,000 asthma attacks in children
- 180-1,700 heart attacks
- 1,700 hospital admissions
- 300,000 missed school and work days

The Total Value of These Benefits is \$34-54 billion

The EPA Anticipates the Following Energy Mix in 2030³



² Estimates calculated by the EPA. Reference page contains resources regarding reduction of other pollutants.

³ EPA estimates that the entire pie could shrink by 7% due to greater energy efficiency. Some forecasts are for higher percentages of renewables; some states have already far surpassed the renewables piece of the pie depicted above. Iowa gets 31% of its energy from wind; South Dakota and Kansas both get 20% from wind.

Nuclear power: Not a Healthy or Safe Option

Threats from Radiation Exposure

Radiation exposure threats¹ include cancers of many types, immune system suppression, birth defects, miscarriage, cataracts, and mental health disorders, to name only a few. Ingested radionuclides: Uranium- 237 can cause kidney disease; cesium-127 can harm muscle tissue, potentially causing cardiac disease.

Nuclear reactors have an operational history of disasters and close calls, including Fukushima Daiichi (Japan), Chernobyl (Ukraine) and Three Mile Island (U.S.). In Japan, over 110,000 people were forced off their land with only modest compensation. Estimates are as high as \$250-500 billion for total costs, with cleanup anticipated to take decades.² An estimated 220,000 people were forced to leave their homes and may not return, after the meltdown and explosion at Chernobyl, and the radioactive fallout from the accident made 11,260 square kilometers of agricultural land and forests in Belarus and Ukraine unusable and uninhabitable.³

Nuclear Waste: no permanent plan

Each year, the U.S. nuclear reactors create 2,000 metric tons of high-level radioactive waste and 12 million cubic feet of low-level radioactive waste.⁴ Each individual reactor produces on average 25–30 metric tons of spent fuel a year. About 65,000 metric tons of highly radioactive spent fuel already has accumulated at U.S. reactor sites. Plans for the only proposed permanent U.S. repository site, Yucca Mountain in Nevada, have been cancelled, as it could not safely contain the radioactivity and protect the public. Even if Yucca Mountain were to open, by 2010, the U.S. had already created enough spent fuel to fill up the costly site.⁵ No other alternative sites exist.

1. Centers for Disease Control and Prevention. Acute Radiation Syndrome: A Fact Sheet for Physicians. <http://www.bt.cdc.gov/radiation/pdf/arsphysicianfactsheet.pdf>

2. Costs and Consequences of Fukushima Daichi, Steven Starr. bit.ly/1s30HrE

3. Chornobyl.info. "Overview of health consequences". Swiss Agency for Development and Cooperation.

<http://www.Chornobyl.info/index.php?userhash=10786534&navID=21&IID=2#Sources>

4. Statement of Michael Hertz, Deputy Assistant Attorney General Civil Division before Blue Ribbon Commission on America's Nuclear Future (February 2, 2011).

5. Mark Holt, Congressional Research Service, "Nuclear Waste Policy: How We Got Here" before the Blue Ribbon Commission on America's Nuclear Future (March 25, 2010)

Model Letter #1 to Policymakers on the State Clean Power Plan

Title First Name Last Name

Address 1

Address 2

City, State Zip

Date

Dear [Title Last Name],

I am writing to express my support for reducing carbon pollution in our state through developing a highly effective state Clean Power Plan that contributes greatly to the health of *[name your state]* residents. Currently, electric power production is the largest single source of carbon pollution in the air.

As a *[physician/ nurse/health professional]*, I recognize the importance of clean air to ensure and protect healthy growth and development of children and support cardiorespiratory health throughout the life cycle. All of our citizens need access to clean air, but many are breathing unhealthy air on too many days. The increase in annual temperatures (resulting from climate change) poses a particular risk to clean air. People with chronic lung disease (e.g., asthma and COPD), representing 10-20% of the population or more, have greater difficulty breathing under these conditions. Very young children, the elderly, and lower-income and/or vulnerable individuals also face greater direct risk from the heat itself. Increases in pollen levels generated by longer plant growing seasons are stressing many people with lung conditions and causing more symptoms for the 30% of the population who have hay fever. This causes more reliance on medications, less productivity in the workplace, more absenteeism in schools, and more medical visits for many.

I urge you to continue to develop *[insert state]*'s plan to comply with the Clean Power Plan's standards. The Clean Power Plan's requirement that states reduce carbon pollution provides an opportunity to address these situations, reduce

immediate risks, and protect the health of state residents into the future. Reducing dependence on coal-fired power plants will bring immediate health benefits by reducing other dangerous air pollutants emitted by coal combustion, such as toxic metals, nitrogen oxides, sulfur dioxide, and particulate matter. In contrast, energy derived from clean renewable sources is the healthiest way to generate power. The Clean Power Plan offers incentives to expand the renewable sector in our state that we should use to the greatest extent possible. Improved efficiency of electric energy production is a safe and effective way to generate more electricity with less carbon pollution. In addition, adapting our homes, offices, and industries to be highly energy-efficient will allow us to make the most of the electricity that is generated. These are common-sense approaches that I believe we must use to the maximum extent possible.

The flexible approach provided to states by the Clean Power Plan is an opportunity to customize our energy portfolio, expand clean energy solutions for better health, build new industries and generate good jobs in the state. I support timely finalization of our state implementation plan and offer my support for *[specify types of clean energy that could best be applied in your state: solar power, wind energy, geothermal energy]* and energy efficiency solutions. Thank you for your leadership.

Sincerely,

Note: This handout is useful to give to policymakers at the time of a visit

Cool Climate and Clean Air are Health Imperatives:

The Perspective from Health Professionals

A cool, livable climate and clean air are essential to health.

Human health is put at risk by the extremes associated with climate change. Heat waves are already the leading cause of weather-related deaths in the U.S. Flooding, drought, wildfires, expanded disease ranges, and damage to food crops, water resources and health infrastructure endanger health. Everyone needs clean air to breathe – yet many Americans live where air pollutants from coal-burning power plants make them sick, miss days from work/school, and contributing to premature deaths.

As health professionals, we endorse policies that reduce air pollutants and climate change.

The Clean Power Plan will tackle a major threat to the nation's health: climate change.

Burning fossil fuels produces heat-trapping gases that contribute to increased temperatures and climate change. Reducing carbon pollution through the Clean Power Plan is a significant and feasible step to help protect state residents from heat waves, extreme weather, infectious diseases, and other climate change-induced outcomes. By transitioning from coal to clean energy, we can cut carbon pollution at the source.

Cutting carbon pollution will reduce other pollutants to protect health.

Coal-fired power plants emit pollutants that contribute to diseases and premature death: sulfur dioxide (permanent lung damage), nitrogen oxides (lung damage, ground-level ozone precursor), mercury (known brain toxin), and fine-particulate pollution (heart disease, respiratory disease, cancer). As we replace coal plants with clean renewable energy through the Clean Power Plan, every \$1 invested can generate up to \$4 in health benefits. By 2030, the Clean Power will prevent up to 3,600 premature deaths, 1,700 heart attacks, 90,000 asthma attacks and 300,000 missed work and school days each year. These protections will benefit communities throughout our state.

Clean Power Plan supports state-based initiative and economic development.

The Clean Power Plan is a flexible approach, allowing states to write their own plans for reducing carbon emissions. When we invest in clean, carbon-free options like solar and wind energy plus energy efficiency, we provide healthy, well-paid jobs located here.

We need to implement America's CLEAN POWER PLAN to create immediate health benefits by reducing soot- and smog-causing pollution. It will reduce heat-trapping gases and help limit climate change. Health professionals strongly support this opportunity to protect our citizens' health.

INSERT YOUR ORGANIZATION'S NAME & CONTACT INFORMATION.

Communications and Messaging in Brief

Problem: Burning dirty fossil fuels is polluting our air and our water, and dangerously destabilizing our climate. Air pollution, water pollution and climate change are harming our health now – through asthma, lung and heart disease, heat waves, violent storms, droughts, wildfires, and infectious diseases. It will worsen if we don't take effective steps to <u>protect</u> ourselves.	So what? Anyone and everyone's health can be harmed by climate change. But the people whose health is likely to be hurt first, and worst, are our nation's infants and children, older adults, people who already have a chronic health condition, people who work outdoors, and the poorest Americans.
Issue: More than 97% of climate scientists have concluded that human-caused climate change is happening, and research has proven that it is already harming the health of many of us. As a health professional, I have a <u>duty to protect</u> people from further harm by taking steps to address climate change.	
Benefits? The sooner we take steps to <u>protect</u> ourselves, the sooner every U.S. family, community and business will benefit from cleaner air & water, better health, lower health care costs, and stronger communities. A useful way to think about it: What's good for our climate is good for our health, and what's good for our health is good for our climate.	Solutions? The two most important steps we can take are to stop needlessly wasting energy, and to replace dirty fuels – especially coal – with clean renewable fuels like solar, wind and geothermal. Every American family, community, business, and state can take these steps – or at least support them. <u>Protecting</u> ourselves from the health effects of climate change is the right thing to do – and the smart thing to do.

Climate Health Impacts and Solutions Climate Nexus/George Mason

IMPACTS:

- **Evidence:** In a [landmark survey](#) from the National Medical Association (NMA) found that 88% of NMA physicians think climate change is relevant to direct patient care, and almost two-thirds of doctors said their own patients' health has been affected by climate change.⁴
- **Heat-Related Illness:** Heat is already the [leading cause](#) of direct weather-related deaths in the United States, and the average number of heat-related fatalities will continue to rise, especially among vulnerable populations like the poor and elderly.⁵
- **Heart Disease:** Climate change is strongly linked to heart-related diseases, which have been found to rise in tandem with [extreme heat](#), increasing levels of [ground-level ozone](#), [particulate matter from coal burning power plants](#), and [stress and anxiety](#) brought on by extreme weather events.^{6,7,8,9}
- **Asthma:** High levels of [ground-level ozone](#), are [strongly linked to a rise](#) in asthma attacks.^{10,11}
- **Allergies:** Allergies, which affect 10 to 30% of people worldwide, are also getting worse as the climate continues changing and emissions continue to rise. Last month, a study found that air pollution makes pollen [more potent](#); studies also show that warming is contributing to an [earlier and longer pollen season](#) and rising carbon dioxide in the atmosphere results in [more pollen per plant](#).^{12,13,14}

⁴ Center for Climate Change Communication <http://goo.gl/j4S3Jj>. Accessed March 26, 2016.

⁵ National Oceanic & Atmospheric Administration. <http://www.nws.noaa.gov/os/hazstats.shtml>. Accessed March 26, 2016.

⁷ Ambient Temperature & Biomarkers of Heart Failure: A Repeated Measures Analysis. National Library of Medicine. <http://goo.gl/nJagnZ>. Accessed March 26, 2015.

⁷ Research Brief: Ozone linked to heart disease deaths (*Am J of Respiratory Critical Care Medicine*.) <http://news.berkeley.edu/2013/09/05/ozone-heart-disease-deaths/> Accessed March 26, 2016

⁸ Air Pollution, Climate and Heart Disease. *American Heart Association*. <http://circ.ahajournals.org/content/128/21/e411.full> Accessed March 26, 2016

⁹ National Institute of Environmental Health Sciences. <http://goo.gl/NxOF7F> http://www.niehs.nih.gov/research/programs/geh/climatechange/health_impacts/cardiovascular_diseases/index.cfm Accessed March 26, 2016

¹⁰ Environmental Protection Agency: Ozone Pollution <https://www.epa.gov/ozone-pollution> Accessed March 28, 2016

¹¹ Modeling of Regional Climate Change Effects on Ground-Level Ozone and Childhood Asthma. *Am J Prev Med*. 2011 Sep; 41(3): 251–257.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3160600/> Accessed March 28, 2016

¹² Air pollutants could boost potency of common airborne allergens. <https://www.sciencedaily.com/releases/2015/03/150322080208.htm> Accessed March 28, 2016

- **Aggression:** A [recent meta-analysis](#) found that the results of 56 separate studies link climate change to a rise in violence and aggression, with an expected 20% rise in conflict in Africa for every increase of 1°C. A study [linked the civil war in Syria](#) to an extreme drought driven by human-caused climate change.^{15,16}
- **Suicide:** A 2012 study that looked at suicide over 37 years in Australia found that an increase in suicide among rural men was [strongly correlated](#) to a rising drought index—findings that were echoed earlier this year in [skyrocketing suicide rates](#) in drought-stricken states in India.^{17,18}
- **Post-Traumatic Stress Disorder (PTSD):** Communities affected by [wildfires](#), [tsunamis](#), [hurricanes](#), or other disasters experience high rates of PTSD and other psychopathologies, case studies show, especially in those more directly exposed to the threat.^{19,20, 21}

Infectious Diseases

- **Lyme Disease:** The number of reported cases of Lyme disease in the United States has [doubled since 1991](#), partly because warming temperatures facilitate the spread

¹³ Possible role of climate changes in variations in pollen seasons and allergic sensitizations during 27 years. *Ann Allergy Asthma Immunol.* 2010 Mar;104(3):215-22.

<http://www.ncbi.nlm.nih.gov/pubmed/20377111> Accessed March 28, 2016

¹⁴ Rising CO₂ and pollen production of common ragweed (*Ambrosia artemisiifolia* L.), a known allergy-inducing species: implications for public health. *Australian Journal of Plant Physiology*

<http://www.publish.csiro.au/?paper=PP00032> Accessed March 28, 2016

¹⁵ Climate and Conflict. NBER Working Paper No. 20598 <http://www.nber.org/papers/w20598> Accessed March 28, 2016

¹⁶ Climate Change a 'Contributing Factor' in Syrian Conflict.

<http://www.climatecentral.org/news/climate-change-contributing-factor-syrian-conflict-18718>

Accessed March 28, 2016

¹⁷ Suicide and drought in New South Wales, Australia, 1970–2007.

<http://www.pnas.org/content/109/35/13950.short> Accessed March 28, 2016

¹⁸ In worst drought year, Marathwada emerges new suicide region.

<http://indianexpress.com/article/cities/mumbai/in-worst-drought-year-marathwada-emerges-new-suicide-region/> Accessed March 28, 2016

¹⁹ Posttraumatic stress disorder and general psychopathology in children and adolescents. *Can J Psychiatry.* 2005 Mar;50(3):137-43. <http://www.ncbi.nlm.nih.gov/pubmed/15830823> Accessed March 28, 2016

²⁰ Post-traumatic stress disorder in children after the tsunami disaster in Thailand: a 5-year follow-up. *J Med Assoc Thai.* 2011 Aug;94 Suppl 3:S138-44.

<http://www.ncbi.nlm.nih.gov/pubmed/22043767>. Accessed March 28, 2016

²¹ The Impact of Hurricane Katrina on the Mental and Physical Health of Low-Income Parents in New Orleans. *Am J Orthopsychiatry.* 2010 Apr; 80(2): 237–247.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3276074/> Accessed March 28, 2016

of the ticks that carry the disease. Deer ticks [prefer conditions](#) where temperatures are above 45°F with humidity over 85%, and many parts of the U.S. are expected to get warmer (and some wetter) as climate change continues.^{22, 23}

- **Mosquito-Borne Diseases:** [Malaria](#) and [dengue fever](#) are two examples of diseases transmitted by mosquitoes that are on the rise as temperatures warm. Floods can also [increase the incidence](#) of mosquito-borne illnesses, as mosquitoes depend on standing water for breeding.^{24, 25, 26}
- **Waterborne Parasitic Diseases:** [Cholera](#), giardia, and other diarrheal illnesses are expected to [pose a greater threat](#) to humans as temperatures warm. Both increased drought and rain can challenge the capabilities of water filtration plants and create more standing water, which both expose people to higher levels of disease.^{27, 28}

²² Climate Change Indicators in the United States. EPA.

<http://www.epa.gov/climatechange/science/indicators/health-society/lyme.html> Accessed March 28, 2016

²³ What Makes Ticks Tick? Climate Change, Ticks, and Tick-Borne Diseases. *Journal of Travel Medicine*. <http://onlinelibrary.wiley.com/doi/10.1111/j.1708-8305.2007.00176.x/abstract> Accessed March 28, 2016

²⁴ Downscaling reveals diverse effects of anthropogenic climate warming on the potential for local environments to support malaria transmission. *Climate Change*. <http://link.springer.com/article/10.1007%2Fs10584-014-1172-6> Accessed March 28, 2016

²⁵ Vulnerability to Dengue Virus: First Global Maps Published by UN University <http://inweh.unu.edu/mapping-dengue-virus/> Accessed March 28, 2016

²⁶ Vector-Borne Diseases: Understanding the Environmental, Human Health, and Ecological Connections. Institute of Medicine (US) Forum on Microbial Threats. Washington (DC): National Academies Press (US); 2008 <http://www.ncbi.nlm.nih.gov/books/NBK52939/> Accessed March 28, 2016

²⁷ Cholera and Climate: A Demonstrated Relationship. *Trans Am Clin Climatol Assoc*. 2009; 120: 119–128. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2744514/> Accessed March 28, 2016

²⁸ NIH: Waterborne Diseases Health Impacts of Climate Change. http://www.niehs.nih.gov/research/programs/geh/climatechange/health_impacts/waterborne_diseases/ Accessed March 28, 2016

Extreme Weather

- Extreme weather events can contribute to global war, conflict, and migration. For example, a persistent and extreme drought that has been linked to human-caused climate change destabilized Syria and contributed to the ongoing civil conflict and humanitarian disaster. ([Source: PNAS](#))²⁹
- Sea level rise and flooding are affecting millions of people around the world. In the Sundarbans, a group of islands off the coast of Bangladesh, sea level rise and saltwater intrusion are threatening the livelihood and health of [over ten million people](#).³⁰
- Climate-related disasters include storms, floods, extreme temperatures, drought and wildfires. From 1994 to 2013, the US was affected by more climate-related disasters than any other country, and in 2014, 87% of all disasters worldwide were related to climatological processes. In total, the frequency of global climate-related disasters has [doubled since the 1980s](#).³¹
- Between 1994 and 2013, floods accounted for 43% of all recorded disasters and affected [nearly 2.5 billion people](#). In 2014, hydrological disasters like floods and landslides were responsible for 71% of disaster-related deaths worldwide.³²
- More than [one billion people](#) were affected by droughts over the past twenty years. Droughts contribute to malnutrition, disease, and displacement, so direct deaths from drought are harder to quantify.³³

²⁹ Climate change in the Fertile Crescent and implications of the recent Syrian drought. *PNAS*. <http://www.pnas.org/content/112/11/3241.abstract> Accessed March 28, 2016

³⁰ Building Resilience for Sustainable Development of the Sundarbans through Estuary Management, Poverty Reduction, and Biodiversity Conservation: Strategy Report <https://openknowledge.worldbank.org/bitstream/handle/10986/20116/880610REVISED00ns000StrategyOReport.pdf?sequence=1> Accessed March 28, 2016

³¹ The Human Cost of Natural Disasters (2015): A global perspective. Centre for Research on the Epidemiology of Disasters (CRED) http://reliefweb.int/sites/reliefweb.int/files/resources/PAND_report.pdf Accessed March 28, 2016

³² The Human Cost of Natural Disasters (2015): A global perspective. Centre for Research on the Epidemiology of Disasters (CRED) http://reliefweb.int/sites/reliefweb.int/files/resources/PAND_report.pdf Accessed March 28, 2016

³³ The Human Cost of Natural Disasters (2015): A global perspective. Centre for Research on the Epidemiology of Disasters (CRED) http://reliefweb.int/sites/reliefweb.int/files/resources/PAND_report.pdf Accessed March 28, 2016

Global instability

- Extreme weather events can contribute to global war, conflict, and migration. For example, a persistent and extreme drought that has been linked to human-caused climate change destabilized Syria and [contributed to the ongoing civil conflict](#) and resulting humanitarian disaster. Sea level rise and flooding are affecting millions of people around the world. In the Sundarbans, a group of islands off the coast of Bangladesh, sea level rise and saltwater intrusion are threatening the livelihood and health of [over ten million people](#).^{34, 35}

Solutions: The two most important steps we can take are to stop needlessly wasting energy, and to replace dirty fuels – especially coal – with clean renewable fuels like solar, wind and geothermal. Every American family, community, business, and state can take these steps – or at least support them. Protecting ourselves from the health effects of climate change is the right thing to do – and the smart thing to do.

[Every/Our] state should be taking the opportunity to protect our citizens' health by replacing fossil fuels with clean renewable energy and energy efficiency. Protecting ourselves from the health effects of climate change is the right thing to do—and the smart thing to do.

Benefits

- The sooner we take steps to protect ourselves, the sooner every U.S. family, community and business will benefit from cleaner air & water, better health, lower health care costs, and stronger communities.
- A useful way to think about it: What's good for our climate is good for our health, and what's good for our health is good for our climate

³⁴ Climate change in the Fertile Crescent and implications of the recent Syrian drought. *PNAS*. <http://www.pnas.org/content/112/11/3241.abstract> Accessed March 28, 2016

³⁵ Building Resilience for Sustainable Development of the Sundarbans through Estuary Management, Poverty Reduction, and Biodiversity Conservation: Strategy Report <https://openknowledge.worldbank.org/bitstream/handle/10986/20116/880610REVISED00ns000Strategy0Report.pdf?sequence=1> Accessed March 28, 2016

Dates of Public Sessions in Selected States

[For information on timelines in your state, visit the website of your Department of Environmental Quality or Natural Resources; search for “Clean Power Plan.”]

Arizona

Arizona Department of Environmental Quality, Room 3175
1110 West Washington Street, Phoenix, 85007
Phone participants: call 1-877-820-7829/passcode 228497#

(Please note the April 5, 2016 meeting has been canceled.)

Tuesday, June 14, 2016 9:30-11:30 a.m.

Tuesday, September 6, 2016 9:30-11:30 a.m.

Tuesday, December 6, 2016 9:30-11:30 a.m.

To find more information on Clean Power Plan Stakeholder meetings go to:

<https://www.azdeq.gov/environ/air/phasethree.html>

Arkansas

On February 9, 2016, the Supreme Court of the United States issued an order staying the EPA’s Clean Power Plan (CPP). As a result, the Arkansas Department of Environmental Quality and Arkansas Public Service Commission (the Agencies) will not hold the CPP Stakeholder meeting previously planned for March 2016.

California

The State of California is beginning to draft its plan to comply with the Clean Power Plan and has begun engaging with stakeholders. California’s Air Resources Board (ARB) is leading the state’s efforts to develop its plan. ARB maintains a website with information and the ability to sign up for an email listserv to be alerted to future public meetings/workshops. <http://www.arb.ca.gov/cc/powerplants/powerplants.htm>

The most recent workshop was December 14, 2015. However, the comment period for the December 14th workshop is now closed. There will be additional workshops and opportunities for public comments on the plan approach. A date has not been announced for the next workshop.

Here is the link to sign up for the Listserv:

http://www.arb.ca.gov/listserv/listserv_ind.php?listname=cc This listserv (as well as the website) is used to announce all upcoming meeting and notice of material availability.

Colorado

Colorado statement regarding the Supreme Court decision can be found here:

<https://www.colorado.gov/pacific/cdphe/news/clean-power-plan>

Upcoming meetings:

March 2016

Pueblo, CO (Postponed)

Potential Focus: Trading, allowances, set asides, emission reduction credits, and other mechanisms needed to comply

April 2016

Craig, CO (Details Pending)

Potential Focus: Costs, demand growth and reliability

Florida

No listening sessions have been scheduled. The Florida Department of Environmental Protection is reviewing the Final Rule, released in August 2015 and published in the Federal Register on October 23, 2015. Once its review is complete, the Department will begin work on a status report for submittal to EPA in September 2016. A final plan is due in September of 2018. The Department is still considering all compliance options.

Illinois

Not yet scheduled

Iowa

For information about past meetings please go to:

<http://www.iowadnr.gov/Environmental-Protection/Air-Quality/Greenhouse-Gas-Emissions/Carbon-Pollution-Stnds-111d>

Minnesota

Not scheduled yet

A series of listening sessions are planned throughout Minnesota, but the team is still working to book dates and venues. The best resource for staying informed when we do is GovDelivery list

(https://public.govdelivery.com/accounts/MNPCA/subscriber/new?topic_id=MNPCA_234)—if you sign up to receive bulletins on the Clean Power Plan topic, you'll be notified as soon as they post the meeting schedule and any other developments.

Missouri

Not scheduled yet

The Missouri Department of Natural Resources' has held two public stakeholder meeting since EPA signed the final Clean Power Plan rule. Information about those two meetings can be found on the Department's Clean Power Plan webpage: <http://dnr.mo.gov/env/apcp/cpp/index.html>

The Department is planning to continue conducting outreach for the Clean Power Plan and intends to hold additional stakeholder meetings. They are working to develop a schedule for the stakeholder meetings and once developed, they will be posted on the Department's Clean Power Plan webpage.

Montana

The 111d Subcommittee will not meet March 10. On Feb. 9, the U.S. Supreme Court granted a stay of the U.S. Environmental Protection Agency's Clean Power Plan until the U.S. Court of Appeals for the D.C. Circuit rules on the CPP's legality. Subcommittee Chairman Senator Keane and Vice-Chairman Representative Keith Regier agreed that the subcommittee's work should be on-hold until the courts make a decision. For more information go to: <http://www.leg.mt.gov/css/Committees/Interim/2015-2016/EQC/111d-Subcom/default.asp>

Nevada

No additional meetings are scheduled.

NDEP will accept written comments on Nevada's planning and implementation of the Clean Power Plan through the plan development period. Email comments to NVCPP@ndep.nv.gov. You may also submit comments by mail to the Carson City office at:

NVCPP Comments

NDEP BAQP

901 S. Stewart St., Suite 4001

Carson City, NV 89701

New Mexico

Up-to-date information on these meetings and the New Mexico's response to the Clean Power Plan is available online at <https://www.env.nm.gov/aqb/CPP.htm>.

The public involvement meeting series (<https://www.env.nm.gov/aqb/CPPPublicOutreach.htm>) was intended to provide opportunity for questions and public comment regarding New Mexico's State Plan development. For further questions or comments regarding the Clean Power Plan and New Mexico's compliance planning efforts, email NMENV-NMCPP@state.nm.us or call (505) 476-4300. For email announcements, sign up for email alerts: <https://public.govdelivery.com/accounts/NMED/subscriber/new>

Ohio

Not scheduled yet

Regional Listening Sessions will be held in early 2016

They are looking at early to mid-March for listening sessions. In the meantime, you can see what Ohio's working on in regards to the Clean Power Plan here: <http://www.epa.ohio.gov/dapc/111drule.aspx>

Pennsylvania – process completed

The 14 listening sessions for the Clean Power Plan began on September 15th and concluded on November 4th. The public comment period closed on November 12, 2015. You can view the submitted comments on the website:

www.ahs.dep.pa.gov/eComment/ViewComments.aspx?enc=8YWleHIdijzUAfiG53EkjflnP%2fXgFr0fA3HnfGi1I5Y%3d

South Carolina

Several public engagement sessions have taken place throughout the state to provide information on the final rule and future opportunities. Comment period closed December 2014.

For more information go to:

<http://www.scdhec.gov/HomeAndEnvironment/Air/cleanpower/>

Tennessee

TDEC had planned to host public education and listening sessions regarding the Clean Power Plan and its implementation in Tennessee at a number of locations across the state in Spring 2016. However, in light of the U.S. Supreme Court decision to stay the rule and in an effort to utilize state resources efficiently, TDEC is postponing these public education and listening sessions until a later date. Dates, times, and locations of any future sessions will be posted on this page. In the interim, TDEC encourages the submission of comments via the Clean Power Plan Comments page. - See more at:

<http://www.tn.gov/environment/article/policy-clean-power-plan-public-participation#sthash.Ofi4eLNC.dpuf>

Virginia – process completed

Listening sessions were conducted in September & October of 2015

<http://www.deq.virginia.gov/Portals/0/DEQ/Air/Planning/listening%20session%20notice.pdf>

Written comments were accepted from August 13 to October 13, 2015.

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