

Executive Summary

PSR

PHYSICIANS FOR
SOCIAL RESPONSIBILITY

HEALTH THREATS OF
CLIMATE CHANGE IN
IOWA

DEATH BY **DEGREES**



A REPORT BY THE IOWA CHAPTER OF PHYSICIANS FOR SOCIAL RESPONSIBILITY

This report was prepared by the Iowa Chapter of Physicians for Social Responsibility (PSR/Iowa) to alert Iowans to the unfolding health effects of climate change in Iowa and to encourage all Iowans and elected leaders to make the changes needed to help halt and eventually reverse global warming's deadly course.

Physicians for Social Responsibility (PSR) works to protect life and health from the gravest threats to health and survival including climate change, environmental degradation and nuclear weapons.

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About Physicians for Social Responsibility

PSR has a long and respected history of physician-led activism to protect the public's health. Founded in 1961 by a group of physicians concerned about the impact of nuclear proliferation, PSR shared the 1985 Nobel Peace Prize with International Physicians for the Prevention of Nuclear War for building public pressure to end the nuclear arms race. Today, PSR's members, staff, and state and local chapters form a nationwide network of key contacts and trained medical spokespeople who can effectively target significant threats to global survival. Since 1991, when PSR formally expanded its work by creating its environment and health program, PSR has addressed the issues of global warming and the toxic degradation of our environment. PSR presses for policies to curb global warming, ensure clean air, generate a sustainable energy future, prevent human exposures to toxic substances, and minimize toxic pollution of air, food, and drinking water. Iowa PSR is a proud member of this esteemed family of physician and health professional activists.

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Dedication

To Iowans, friends, families & neighbors all around the globe seeking health and security in our rapidly changing world.

Time to Pay Attention

Climate Change is not a new concern, rather one that just keeps growing.

In 1995 Dr. Eric Chivian wrote:

Over the last several years, we have been deluged with reports from scientists worldwide, detailing the accumulation of greenhouse gases in the atmosphere, and warning us that unless we are able to reduce our emissions of these gases, we are likely to experience major changes in the world's climate, with consequences that could prove disastrous for human beings. . . it is essential that health be at the center of the global environmental debate, and that physicians and other health professionals take the lead in educating the public and informing policy-makers about the human dimensions of global environmental change.

Eric Chivian, MD
Director, Center For Health and the Global Environment
Harvard Medical School



CLIMATE CHANGE & IOWA HEALTH RISK

Executive Summary

GLOBAL WARMING IS UNEQUIVOCAL

Climate change is one of the greatest health threats facing humanity in the 21st century. As worldwide patterns of temperature, precipitation and weather events change, the delicate balance of climate and life is disrupted, with serious impacts on food and agriculture, water sources, and health.

-- PSR Climate Change, Environment Health Statement

The world, including Iowa, is warming at an unprecedented rate. The global temperature, including that of the world's oceans, has been increasing over the past 50 years due to emissions of heat trapping gases, primarily CO₂ released by burning fossil fuels, and the loss of natural carbon sinks. By April 2015, CO₂ in the atmosphere hit the highest level ever recorded: 409.44 ppm, and Arctic ice reached a record low. Fifteen of the warmest years on record have occurred since 2001. The year 2015 shattered all previous records by a wide margin. December 2015 was both record warmest and record wettest, the only month ever to break both records. The year 2016, at this writing appears to be on course to continue the trend. In the face of scientific evidence of a warming planet, public perceptions and responses remain minimal relative to the growing threats to health and other related dangers.

Accelerating climate change in a warming world is a complex process that does not manifest simultaneously and uniformly everywhere around the globe but largely in a pattern of intermittent local weather events. Public perception is confounded by intermittency and local variations. Still, the global trend is now unmistakable and as a doctor might put it, "clinically significant." While warming can be seen by some as a benefit, the long-term trend will become devastating for agriculture. In fact, Iowa's lengthening growing season can be recognized as the proverbial "lull before the storm." But the situation for Iowa's farmers today is only part of the Iowa climate story.

CLIMATE CHANGE AS THREAT MAGNIFIER

Climate change works in many ways to threaten Iowa's health and well-being. Consequences of climate change challenge social, environmental and economic health by exploiting existing weaknesses in infrastructure, air and water quality, and social cohesion.

Regardless of the relative invisibility of unfolding climate change, Iowa already faces challenges not only to the environment and economy, but also to health and human rights. Scientific consensus indicates that within years, not decades, higher temperatures and more violent storms with heavy precipitation will intensify. Intensified weather extremes will worsen Iowa's agriculture, water quality, food production, health, and economy. Iowa is challenged to change now, or pay dearly later.

This report reviews recent climate science, especially on associated health risks, in an effort to make recognition of climate change risks real, local and accessible. The elements addressed in this report are designed especially to encourage action from Iowa's decision makers, leaders in the health and business professions, and compel communities to accelerate the pace of climate mitigation and adaptation.

IOWA'S ALTERED ENVIRONMENT AND CHANGING CLIMATE



IOWA IS GETTING WARMER AND WETTER

Warmer air holds more moisture. Most Iowans already feel the impact of the changing climate through the evolving changes in precipitation cycles. Extreme precipitation events with attendant tornadoes, downpours, and floods, interspersed by severe drought, are expected to intensify in the coming years.

Iowans are accustomed to four-season weather with widely varying cycles of temperature, humidity, rain, and wind. While severe storms can occur in any season as the globe warms, Iowa can expect more chaotic, dangerously unpredictable weather with more severe or persistent extremes that have corresponding health impacts.

Iowa has experienced a sustained rise in number, range and severity of floods and storms. Precipitation across the U.S. has increased about five percent over the past 50 years. In Iowa, precipitation has increased over eight percent even as southern and western areas of the state become drier. Climate scientists predict the warming climate will produce flooding of the intensity of the 1993 & 2008 floods every 3 - 20 years.

Very little of Iowa's native protective natural environment remains intact. Most of Iowa's original wetlands, prairies and cooling forests are gone. Consequently, Iowa has lost its organic, nutrient and microbially rich topsoil at an unsustainable rate. Finally, due to the effect of Iowa's intensive agricultural industry, especially the extensive tiling system, many of Iowa's surface waters have been degraded. Iowa's water resources are imperiled by pesticides, fertilizer and manure that wash off the land during downpours. Heavier precipitation and flooding can be expected to progressively worsen these problems.

CLIMATE AND IOWA'S HEALTH

When determining health risks of climate change for Iowa, factors to consider include the state's aging water infrastructure and widespread water pollution; aging population; inadequate mental health resources; increasing intensity and duration of allergen producing plants; and the ever-present risk of animal to human transmission of difficult to contain microbial contaminants associated with confined livestock. Each of these risks grow in a warmer, wetter Iowa.

Over recent years, Iowa's growing season has lengthened, Iowa cities have become at least 1.0° F. warmer on average. More heat and heat waves are associated with degraded urban air quality; worsening urban heat islands; a wider array and penetrance of disease-carrying vectors; and rapid growth and spread of the infectious organisms that grow in food and imperiled water sources.

The most serious challenges to health associated with Iowa’s changing climate include worsened respiratory and cardiovascular diseases; injuries; altered infectious diseases; allergies; and death as a direct consequence of extreme storms and heat waves. Additionally, Iowans can expect to experience worsening mental health in the aftermath of increasingly extreme weather events.

Every Iowan is at some risk, but not all are at equal risk. Similar to health threats, climate change amplifies stress on social, physical infrastructure, and environment frailties. Vulnerability varies across age, gender, economic and occupational status, geographic residence, chronic illness, disability, and racial and ethnic status of individual Iowans.

HEAT WAVES AND DROUGHTS

Higher precipitation will be interspersed with more intense periods of desiccating heat that neither animals nor humans tolerate. In urban centers it creates dangerous “heat islands” because of building density, heat trapping surfaces (concrete and asphalt), roadways, and traffic congestion. Heat islands concentrate air pollutants like particulates, smog and ozone. Unrelieved extreme high temperatures contribute to neurologic impairment; respiratory distress; cardiovascular collapse and death, especially among infants, elders, those with pre-existing disease; and those who labor outdoors.

ALLERGENS

Allergenic flora such as poison ivy, and trees, grass and weed pollens are already increased due to longer, warmer, and wetter growing seasons in Iowa. Allergies cause misery, lost productivity at work or school, and need for costly medications. For those who experience allergy-induced breathing problems like asthma, these powerful allergens become life threatening, especially in concert with prolonged heat and air pollutants.

VECTORS ON THE MOVE



“...human-caused micro-perturbations in ecologic balance can cause innumerable slumbering infectious agents to emerge unexpectedly.”

-- Dr. Anthony Fauci



The number and variety of vector-borne diseases will increase. Infectious organisms constantly adapt and the vectors that carry them are on the move. Rising temperatures with movement northward of disease-carrying birds, bugs, and rodents increase the spread of vector-borne diseases. Lyme disease, West Nile virus, and Rocky Mountain spotted fever, are rapidly emerging vector-borne infectious diseases in Iowa.

AVIAN INFLUENZA AND CLIMATE CHANGE

The role of the changing climate and related environmental damage has altered the habits of wild birds. To date, avian influenza virus strains do not easily infect humans. Because of the lethality of the disease in birds and extensive damage done in 2015 to Iowa’s poultry industry, epidemiologists are closely tracking human/avian interactions.

MENTAL HEALTH

In 2016 Iowans face a severe shortage of mental health providers and mental health facilities. As flooding, tornadoes, and prolonged heat waves worsen in intensity and duration, symptoms such as anxiety, depression, social withdrawal, and incidence of post traumatic stress disorder and will all rise to further burden the weak mental health care system in Iowa.

IOWA'S VULNERABLE POPULATIONS

Iowans and Iowa's economy are healthier than many other areas in the U.S. Measures of inequality indicate a more equal distribution of income in Iowa relative to 45 other states. Yet, Iowa is home to significant vulnerable and impoverished populations.

Of Iowa's total population of just over 3 million, there are 560,000 elderly, disabled and low-income Iowans who rely on Medicaid—one out of six Iowans. And this statistic does not include the working poor who desperately struggle to survive catastrophic climate events and often lack the resiliency to ever completely recover.

Iowans are aging, and elders do not tolerate heat. Meeting elders' needs in a changing climate is of high priority but will strain existing social and health services in Iowa. For Iowa's African American and other minority communities, high unemployment and incarceration rates, worsening population health indicators, and a widening wealth gap combine to impair resiliency in the face of weather disasters.

Iowa's demographic mix is rapidly changing in part due to hosting increasing numbers of refugees who have escaped climate and environment related challenges in their native countries. Iowa also receives domestic U.S. "climate" refugees from coastal weather catastrophes.

Not to be overlooked, some of the nation's most dangerous and climate sensitive occupational settings are concentrated in Iowa including farming, confined animal feeding operations (CAFOs) and packing plants. All these demographic factors will become even more challenging to Iowa's vulnerable populations as heat waves and extreme weather increase in frequency and intensity.

TOWARD SOLUTIONS

THERMAL LAG, THRESHOLDS & TIPPING POINTS

Thermal lag, reflecting the long half-life of GHGs, means despite what is done today temperature increases are expected well into the next few decades. Continuing to allow levels of GHGs to rise, primarily from the burning of fossil fuels, will inevitably lead to points-of-no-return with irreversible and massive sea level rise with inundation of the world's coastal areas; more powerful and damaging super storms from which recovery is unlikely; dislocation of hundreds of millions of people; and massive loss of agricultural productivity and famine. Such a tipping point could arrive sooner than expected. The track record of climate science and modeling predictions have consistently underestimated the subsequently observed rate of temperature and sea level rise. In the simplest terms, future climate conditions will be determined by policies made and actions taken today to reduce current and future GHG emissions.

CLIMATE REALITY AND CALL TO ACTION

Climate realities and predictable health risks call for enhanced, coordinated, preventive and adaptive action on the part of all Iowans, especially healthcare, business and elected leaders. To minimize adverse health impacts, individuals, businesses, communities, and the State must work together to improve infrastructure and resilience within medical and public health sectors, including heightened surveillance, rapid response protocols, and upgraded mental health services. Iowa also needs to advance preventive and mitigation efforts in city planning; green building; structural design for improved survivability in storms; emergency response to heat waves; and energy efficiency in air conditioning. Infrastructure improvement is critically needed in water and sanitation, transportation, roads, and bridges. Farmers must continue to institute improved proven tilling practices; fertilizer management; and watershed catchment developments including restoring wetlands and riparian environments. Restoration of tree cover in both rural and urban areas will help mitigate climate change with co-benefits of improved air, water, and soil quality.

CLIMATE CHANGE AS OPPORTUNITY

Mitigating climate change can be both cost-effective and a boon for healthy people, communities, economies, and quality of life. Many Iowans already consider their personal carbon footprint and health and act accordingly. With looming global warming, several individual Iowa cities have already begun mitigation and adaptation. Elsewhere in Iowa, cities and counties have worked together, driven by economic reality in transitioning to locally produced wind and solar energy sources with the added benefit of critically reducing dependence on greenhouse gas emitting fossil fuels. Other cities have improved their tree cover, made their commercial centers more walkable, and improved energy efficiency of their buildings. Iowa's GHG emissions have, in fact, been decreasing. Iowa leads the country in wind energy production per capita, yet only exploits a fraction of this abundant Iowa resource. Solar electricity is now an economic sleeping giant with a solid potential in Iowa.

Nevertheless, there is still a big improvement gap if Iowa is to remain a leader.



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