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IDSA Policy on Preparing for the Infectious Diseases Complications Related to Climate Change

The Infectious Diseases Society of America (IDSA) recognizes climate change as a health emergency requiring urgent action and supports policies to address climate change and its expected impacts on public health in the U.S. and globally. Recommended actions include:

- Supporting policies that decrease greenhouse gas emissions and promote adaptation and resilience for the anticipated impacts of climate change consistent with the goal of the United Nations Intergovernmental Panel on Climate Change.
- Enhanced investment in public health infrastructure and workforce to improve monitoring for and response to adverse health impacts of climate change, such as enhanced vector surveillance and human disease tracking for vector-borne diseases and other climate-related health impacts.
- Funding and research to develop and implement prevention strategies for waterborne, zoonotic, and vectorborne diseases.
- Inclusion of the infectious disease risks associated with natural disasters, extreme weather events, population displacement, and other climate change impacts in comprehensive disaster response plans.
- Long-term, fine-scale studies to assess the relationships among climate and infectious disease determinants.
- Multidisciplinary collaboration to develop predictive models of the impact of climate on the epidemiology of infectious diseases, with a focus on characteristics that can inform public health interventions (e.g. predicting seasonal onset of tick-borne illness).
- Patient education strategies to improve preparedness for the health impacts of climate change.
- Encouraging healthcare facilities to cut their greenhouse gas emissions and work toward carbon neutrality.
- Supporting policies to increase health care facilities' resilience to the effects of extreme weather and climate change.
- Encouraging individual lifestyle actions among IDSA members and the community to reduce our environmental footprint.

RATIONALE:

IDSA recognizes climate change and its impacts as a public health emergency in the United States and around the world.

Global temperatures have been rising over the past one hundred years. Over the past century, human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere. The majority of greenhouse gases come from burning fossil fuels to produce energy, although deforestation, industrial processes, and some agricultural practices also emit gases into the atmosphere. The U.S. ranks second in the world for carbon emissions from fossil fuel combustion.

Significant adverse heath impacts of climate change are already occurring and expected to worsen. The consensus of climate scientists is that these changes are the result of human activity. The United States Global Change Research Program's Fourth National Climate Assessment released in 2018 projects that if current trends continue, annual average global temperatures could warm by an additional 4.7 Centigrade degrees by the end of the century.

Many infectious diseases are likely to be affected by the changes in weather and geography that climate change brings, and current epidemiologic patterns may be altered. Some newer studies have also shown a link between temperature increases and higher rates of antimicrobial resistance. ***These changes could shift how infectious diseases (ID) physicians, researchers and the public health system evaluate and prepare for many infectious diseases.***

Waterborne Infectious Diseases

As sea levels rise and the frequency of severe and extreme weather events increases, the incidence of waterborne diseases are likely to increase. After Hurricane Maria crippled Puerto Rico in 2017 the sewer systems were overwhelmed, and regular overflows and flooding occurred for several weeks after the initial storms. This led to dozens of cases of leptospirosis with at least three confirmed deaths. Massive flooding can severely damage sanitation and water supply systems, which can jeopardize safe water supply and facilitate the transmission of waterborne infectious diseases. In Haiti, recent hurricanes have severely damaged infrastructure and led to a large outbreak of cholera. Other waterborne disease threats exacerbated by current and ongoing warming include non-cholera vibrio species and harmful algal blooms in US coastal waters. ***Better techniques to safeguard water supplies and improved disaster planning would greatly reduce the morbidity and mortality from these events.***

Zoonotic Infectious Diseases

Climate change affects the habitats and behaviors of many kinds of wildlife, with attendant implications for public health. For example, West Nile Virus (WNV) human disease rates are related to seasonal precipitation and temperature. Droughts have been associated with severe WNV seasons. While the nature of this relationship is not completely clear, during a drought Culex mosquito vectors and avian hosts may be brought into closer contact at remaining sources of standing water, leading to elevated mosquito WNV infection rates. Disruption of ecosystems can lead to the emergence or re-emergency of zoonotic diseases. ***Improved surveillance capacity in human and animal populations will allow scientists and health authorities better track and more rapidly respond to outbreaks which will be vital in containing emerging and re-emerging infections both in the US and globally.***

Vector-borne Diseases

As the planet warms, vectors such as ticks and mosquitos have the potential to spread and inhabit expanded geographic areas. This could place new populations at risk. One example of this vector spread is the migration of the *Aedes aegypti* mosquito. Originally located only in the Southeast portion of the United States, this vector for the chikungunya, dengue, yellow fever, and Zika viruses has had its habitat extended into most of the mid-Atlantic and Midwest due to climate and weather changes, putting a significantly larger portion of the US at risk for potential outbreaks of these diseases. Naïve populations are particularly at risk due to lack of immunity and local awareness of previously unencountered diseases. Some researchers have estimated that curbing climate change could decrease cases of dengue by as many as three million each year.

Lyme and other tickborne disease incidences have increased significantly since 2004, coinciding

with increases in the geographic range, abundance, and seasonal duration of various tick species in North America and Europe over the past two decades. This habitat expansion has followed steadily increasing ambient temperatures, including into far northern and high-altitude ecosystems.

Additional research is needed to address knowledge gaps regarding optimal prevention strategies for tickborne diseases. Further, increased funding is needed to implement proven techniques to prevent the further geographic spread of mosquito vectors.

Population Displacement

As climate change leads to increases in more frequent and severe storms in some areas, it also may decrease the availability of arable and pastoral lands, food supply and quality, and potable water elsewhere. These changes, and the ensuing conflicts over remaining resources, are likely to cause mass migrations and drive populations from rural into sprawling urban areas. Any time large populations are displaced and forced to migrate, either temporarily or permanently, the incidence of waterborne and respiratory infections increases dramatically. Densely-populated camps for internally displaced populations, refugees, or weather-related evacuees are at increased risk from epidemic disease, due to the vulnerability of temporary shelters to severe weather events, unreliable potable water supplies, inadequate sanitation, challenging hygiene promotion, and limited healthcare resources. Recent and ongoing cholera outbreaks in the Central African Republic, Cameroon, Niger, Nigeria, Ethiopia, Kenya, and the Democratic Republic of Congo underscore the vulnerability of displaced populations. In the U.S., over 1000 cases of diarrheal diseases were reported from 20 different outbreaks affecting evacuees from Hurricane Katrina. Climate change is likely to significantly contribute to population displacement caused by natural disasters and increasingly inhospitable environments. By considering and including climate change factors in disaster preparedness plans, government authorities and non-governmental organizations will be more capable of responding and adapting to these predictable new challenges.

Need for immediate and substantial global greenhouse gas emissions reductions, as well as regional adaptation effort.

The United Nations Intergovernmental Panel on Climate Change calls for “rapid and far reaching” transitions in land, energy, industry, buildings, transportation, and cities, with the aim of limiting global warming to 1.5 degrees Centigrade by reducing global net human-related emissions of carbon dioxide by approximately 45% from 2010 levels by 2030. Immediate and substantial reductions in global greenhouse gas emissions are necessary, as well as regional adaption efforts, to prevent calamitous effects on the environment and to avoid the most severe human health consequences.

In addition, the U.S. health care sector accounts for nearly 1/10th of U.S. greenhouse gas emissions. Health care professionals therefore have an important role to play in transforming the way our hospitals and clinics operate.

Healthcare facilities and manufacturers and suppliers of medications and other essential healthcare supplies should conduct vulnerability assessments and engage in adaptation planning to improve healthcare system and community resiliency.

Individual lifestyle actions (e.g., walking or cycling rather than driving, eating less meat, reducing food waste, and conserving energy) are the easiest for us to undertake, offer many benefits for

personal wellness, and should be encouraged to help reduce our environmental footprint. As educators, physicians and health institutions, we should raise awareness about the consequences of climate change and environmental degradation to infectious diseases through community-focused education and advocate for a low-carbon future. Finally, we should continue to generate research knowledge that elucidates the causal links between climate change and human health particularly in the area of infectious disease.

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