September 2018

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

The Infectious Diseases Society of America (IDSA) supports policies to address the projected impact of climate change on public health in the U.S. and globally. Recommended policies include:

- Enhanced investment in public health infrastructure and workforce.
- 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, population displacement, and climate change in comprehensive disaster response plans.
- Enhanced vector surveillance and human disease tracking for vector-borne diseases.
- Long-term, fine-scale studies to assess the relationships among weather variables 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.

RATIONALE:

IDSA is concerned about the impact of climate change on public health in the United States and globally. 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 several types of infectious diseases.

Waterborne Infectious Diseases

If 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. Conditions such as massive flooding or severely damaged sewer systems also jeopardize safe water supply and facilitate the transmission of waterborne infectious diseases. In Haiti, climate change has limited the safe water supply and, combined with recent hurricanes have led to large numbers of cases of cholera. Better prevention techniques for waterborne infections and disaster planning would greatly help reduce the morbidity and mortality from these types of events.

Zoonotic Infectious Diseases

Climate change affects the habitats and behaviors of many kinds of wildlife. As animals adapt to changing environments, they may interact with other species and ecosystems they had not previously. For example, interaction between different species carrying different strains of influenza virus has led to the development of many emerging strains of avian influenza in Asia and the novel H1N1 Influenza virus which caused the 2009 pandemic. Disruption of ecosystems can be associated with the emergence or re-emergency of zoonotic diseases. Increasing capacity to perform surveillance and epidemiology to better track and more rapidly respond to outbreaks 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 areas that previously would not have supported them. This could expand the geographic range of vectorborne diseases and put immunologically naive 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. Other vectorborne diseases like Lyme disease were once confined to mostly the Northeast, but the CDC has found that cases have tripled since 2004 and are being reported in all 48 contiguous states, with high infection rates throughout the Midwest and Northeastern US. There are still significant knowledge gaps regarding optimal prevention strategies for tickborne illnesses for which research is necessary. Further, increased funding is needed to deploy proven prevention techniques for many mosquito-borne diseases in growing areas that need them.

Population Displacement

Any time large populations are displaced and forced to migrate either temporarily or permanently, risks for infections are increased dramatically. In addition, large sites used to house people displaced by storms necessitate infection prevention and control efforts. The large numbers of people, tight quarters, and unsanitary conditions often seen in temporary housing facilities elevate the risk for infectious diseases. Over 40 Congolese nationals died of cholera and over 2,000 more were infected in 2018 after ethnic violence in the Democratic Republic of Congo has caused tens of thousands to flee to refugee camps. In the US, there were over 1000 cases of diarrheal diseases reported from 20 different outbreaks in evacuees from Hurricane Katrina. Climate change is likely to increasingly contribute to population displacement, as a result of natural disasters and increasingly inhospitable environments. Including climate change factors into disaster preparedness plans is vital to ensure there is adequate ability to respond to these occurrences.

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