Testimony on S.185 Christine Vatovec, PhD, University of Vermont

Thank you for inviting me to contribute testimony on "An act relating to the adoption of a climate change response plan." My name is Christine Vatovec and I teach two courses at the University of Vermont that are related to this bill (Human Health & the Environment, and Climate Change and Human Health), and conduct related research as a Fellow at UVM's Gund Institute for Environment and Adjunct Research Assistant Professor at UVM's Larner College of Medicine.

Climate change has been described as the biggest public health emergency of our time because of the several risks it poses to human health. The Intergovernmental Panel on Climate Change (IPCC), World Health Organization, U.S. Centers for Disease Control and Prevention (CDC), and our own Vermont Department of Health, in turn, provide overviews and analysis of the specific climate-related health threats posed globally, nationally, and locally. At the same time, preeminent climate and health scholars have very astutely argued that addressing climate change provides one of the greatest public health opportunities of our time. Many of the actions that can be taken to mitigate climate change are expected to have positive health and economic benefits, thereby offering "win-win" strategies – for example, increasing active transportation such as walking and biking will reduce air pollution and greenhouse gas emissions, improve health by reducing the risk of cardiovascular disease, diabetes, and cancer, and provide cost savings from avoided emergency room visits, hospitalizations, and lost worker productivity associated with these diseases (e.g. the cost of diabetes treatment alone is estimated at $327 billion each year in the U.S.).

The CDC has identified eight primary impacts of climate change on human health in the U.S. (see "Resources" below), and from this list the Vermont Department of Health's Climate and Health Program has identified seven key impacts of climate change on the health of Vermonters. These include:

Mental health: The impacts of climate change can affect mental health in several ways ranging from PTSD associated with extreme events such as flooding, to anxiety related to fear and uncertainty about how climate change will impact everyday life in the future. In a recent study led by my postdoctoral research fellow at UVM, Christine Carmichael, 92% of Vermonters who were interviewed reported being concerned about climate-related mental health impacts. This made mental health the number one climate-related health concern among Vermonters in our study.

Vector-borne diseases: Tick-borne diseases such as Lyme disease and anaplasmosis, and mosquito-borne diseases including West Nile Virus and Eastern Equine Encephalitis are both expected to increase in prevalence in Vermont since a warmer climate increases the survival of both the vectors (ticks and mosquitoes) and the pathogens they carry. In addition, we expect to see the ranges of different tick species (e.g. Lone star tick) that carry different pathogens move into Vermont as the climate warms.

Water and foodborne diseases: Heavy rainfall events, which are expected to increase in frequency and severity with climate change, can lead to contaminants and infectious diseases entering agricultural fields, private wells, and drinking water systems.

Hot weather: In Vermont, we observe a significant increase in emergency department visits when ambient air temperatures rise above 87 degrees Fahrenheit. The number of days above 87 degrees is expected to double by 2050.

Cyanobacteria: Warmer lake temperatures combined with increased heavy rainfall events are expected to increase the severity and duration of blue-green algae blooms. Health effects of exposure to cyanobacteria can range from skin irritation to diarrhea, vomiting, and liver damage.

Extreme storm events: The direct health effects of heavy rain events can range from injuries in the short term, to illness related to mold growth or contaminated food and water in the longer term.

Air pollution and pollen: Rising global temperatures are associated with increases in air pollutants such as ground-level ozone, wildfire smoke, and pollen that causes allergies. These pollutants can harm respiratory health, particularly among those Vermonters with asthma, which according to the Vermont Department of Health includes 57,000 adults and 9,600 children.

In conclusion, each of these climate-related health impacts will benefit from a coordinated response across all Vermont state agencies, and as I stated earlier, many solutions will have co-benefits that can both minimize the harms posed by climate change and improve the health of Vermonters. Thank you for allowing me the opportunity to testify regarding S.185. I am happy answer any questions, and I hope my statement opens the door to further dialog as you move forward through the legislative process.

Additional Resources:

CDC Climate and Health Program: Impacts of climate change on human health
https://www.cdc.gov/climateandhealth/default.htm

- Severe weather: injuries, fatalities, mental health impacts
- Air pollution: asthma, cardiovascular disease
- Changes in disease vector ecology (e.g. ticks, mosquitoes): Lyme disease, West Nile, etc.
- Increasing allergens: respiratory allergies, asthma
- Water quality impacts: cholera, cryptosporidiosis, campylobacter, leptospirosis, cyanobacteria
- Water and food supply impacts: malnutrition, diarrheal disease
- Environmental degradation: forced migration, civil conflict, mental health impacts
- Extreme heat: heat-related illness and death, cardiovascular failure

Vermont Department of Health Climate & Health Program
https://www.healthvermont.gov/environment/climate

Patz, Jonathan A., Valerie J. Stull, and Vijay S. Limaye. "A Low-Carbon Future Could Improve Global Health and Achieve Economic Benefits." *Journal of the American Medical Association* (2020). Available at: https://jamanetwork.com/journals/jama/fullarticle/2762321