Climate Change and Health in the Genesee-Finger Lakes Region

The relationship between the health care sector and climate change is complex. Burning fossil fuels to power our cars, homes, and businesses impacts human health – both directly, by releasing harmful air pollutants, and indirectly, through the social and environmental disruption of climate change. The health care sector itself is also a major contributor to global greenhouse gas (GHG) emissions, through its use of fossil fuel energy to power buildings and fleets and through supply chain emissions.

The Genesee-Finger Lakes Region is home to a large health care sector that employs 84,431 people, or 14.7% of the total working population.[1] As such, the reduction of greenhouse gas emissions in this sector is crucial to meeting the State of New York's climate and energy goals. This size and influence also comes with the opportunity to be a leader in transitioning the Region to a thriving, climate-friendly future. The health care sector can lead this transition by reducing its greenhouse gas emissions, educating the public on the linkages between climate change and health, and advocating for climate-smart policies that also improve public health.

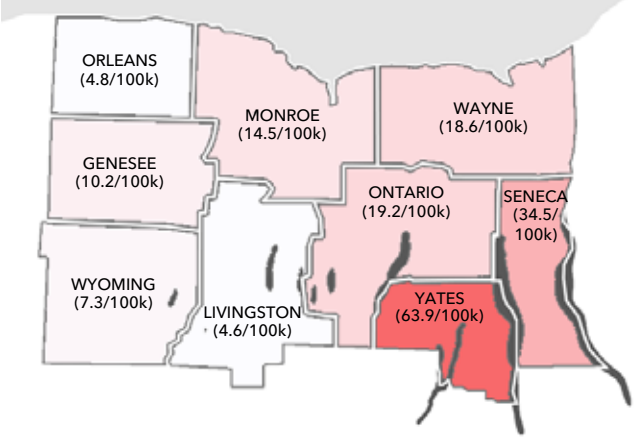
FIGURE 1. Impacts of Climate Change on Human Health in the Genesee-Finger Lakes Region
(adapted from U.S. Centers for Disease Control and Prevention)

How climate change impacts human health

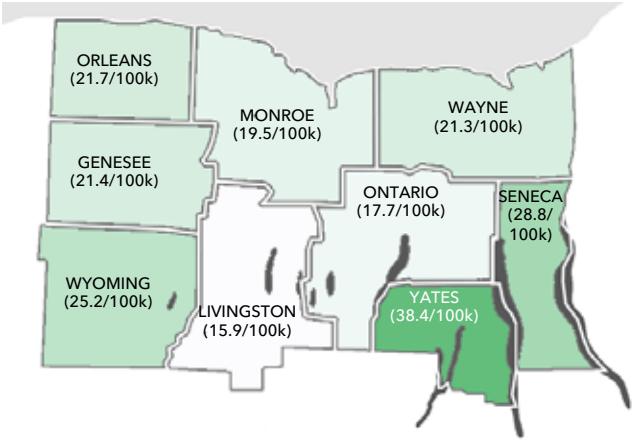
Climate change can both exacerbate existing health issues and lead to new health care concerns. Figure 1 shows some of the ways that climate change is already affecting the Genesee-Finger Lakes Region. For example, milder winters are leading to the northward and westward expansion of deer ticks, thereby increasing the incidence of Lyme disease[2]. Furthermore, as average temperatures increase, heat waves, and associated heat-related illnesses, are also increasing, which disproportionately impacts the elderly and those without access to air conditioning or cooling centers.

Low-income households and communities of color already carry a greater share of the health burden due to their proximity to industrial facilities[3], lack of access to fresh, nutritious food[4], and chronic stress[5]. According to a 2019 Common Ground Health study, these health inequities cost the Region $1 billion per year in increased health care costs and loss of economic productivity[6]. Nationwide, households in the lowest income quintile already spend 33.9% of their income on health expenditures[7]. Locally, many community members do not receive needed medical care because of the cost (see Figure 2, p. 2). Failure to take swift and bold climate action will only exacerbate the Region's existing illnesses and health inequities.

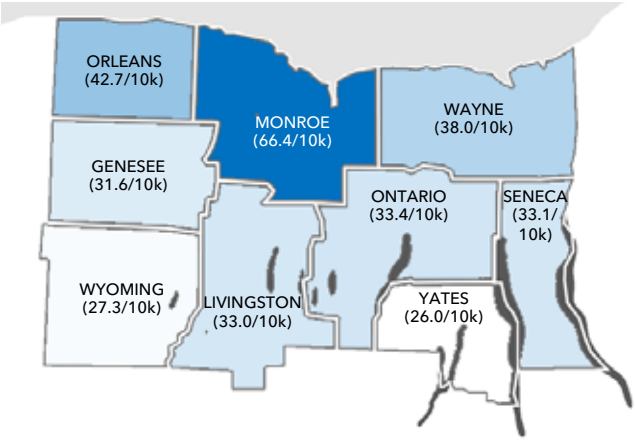
Rates of Lyme Disease per 100,000 (2014–2016)



Heat-related Illness, Hospitalizations, and Emergency Department Visit Rates per 100,000 (2016)



Asthma Emergency Department Visits per 10,000 (Age-adjusted)



Age-adjusted Percentage of Adults Who Did Not Receive Medical Care Because of Cost (2016)

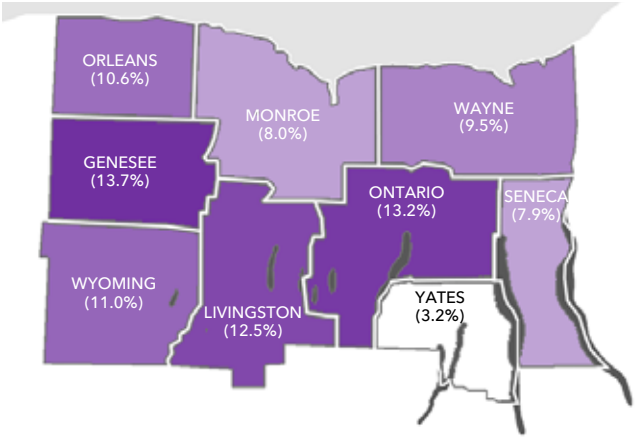


FIGURE 2. Climate-Related Health Concerns in the Genesee-Finger Lakes Region

Source for Lyme disease, heat-related illness, and asthma hospital vists: health.data.ny.gov
Source for health cost burdens, lower right: NYS Expanded Behavioral Risk Factor Surveillance System, 2019

Local Climate Action in the Health Care Sector

Nonprofit organizations like Practice Greenhealth[8] provide tools and resources for health care organizations across the U.S. to help them embed sustainability into their operations. Rochester Regional Health is a member of Practice Greenhealth and LEED-certified; among other actions, it has installed 18,000 solar panels on its buildings, and set a goal of sourcing all electricity from renewables by 2025. The organization has pointed to savings of over $920,000 per year from energy efficiency upgrades and a reduction of 12 million pounds of annual greenhouse gas emissions.

How the health sector impacts climate change

The health sector is a significant contributor to climate change; if health care were a country, it would be the fifth highest emitter in the world.[9] The U.S. leads the world in health sector GHG emissions, with a footprint equivalent to 141 coal-fired plants per year, or 7.6% of national emissions.[10] Most of the emissions come from the generation and distribution of energy for electricity, heating, and cooling. The supply chain is also emissions-intensive and contributes a significant amount of waste and non-GHG pollutant emissions.

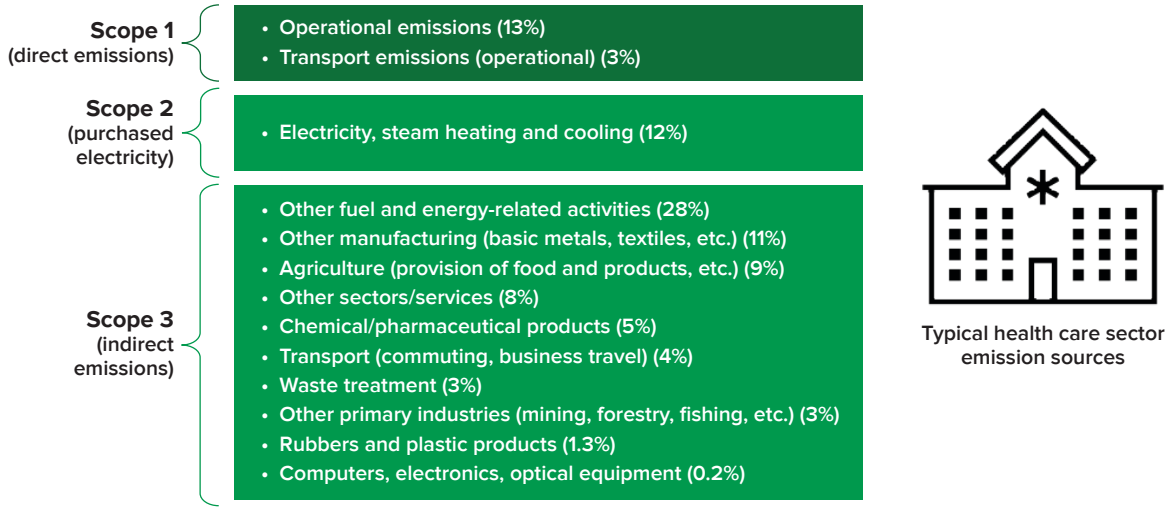


FIGURE 3. Typical health care sector activities contributing to greenhouse gas emissions by type[11]
(adapted from Karliner et al 2019 [12])

Climate action for the health care sector

Health care leaders can accelerate the Region's transition to a thriving, climate-friendly future that improves public health by: 1) raising awareness on climate and health linkages, 2) advocating for health care institutions to take climate action, and 3) championing climate-friendly policy change.

Cultivate health sector leadership

- **Educate your community:** Educate other health professionals and the public about the importance of climate change as a public health crisis. Nurses across the globe are already championing climate education and action. See, for example, https://us.nursesclimatechallenge.org/
- **Build climate-health coalitions:** Form a local climate-health coalition to share resources and best practices. See, for example, https://climateforhealth.org/.
- **Prescribe climate action:** Many view their health professional as a trusted source of information. Climate-related messaging and prescribed climate action, such as energy efficiency improvements, or adopting locally-sourced, plant-based diets, can reduce emissions and incentivize patients to take climate action that improves health.
- **Participate in community climate action plans:** Climate action plans are a necessary first step to address climate change. To ensure that public health is adequately addressed, and to maximize the co-benefits of climate solutions, the health sector should play an active role in community-based climate action plans.

Reduce on-site emissions

- **Procure renewable energy sources:** Procure renewable energy sources, either on-site (see Local Climate Action in the Health Care Sector sidebar) or from community-sourced renewable energy.

- **Electrify vehicle fleets:** Replace aging vehicles with hybrid or electric options.
- **Adopt clean heating and cooling technologies:** Implement clean heating and cooling technologies, such as geothermal, to heat and cool buildings.
- **Utilize sustainable alternatives for anesthetics:** Anesthetics are typically halogenated ethers and a potent greenhouse gas. Although they account for a small portion of institutional emissions, medical centers can reduce emissions by switching to intravenous anesthetics, employing gas capturing technologies, or utilizing Xenon, a modern anesthetic without the negative environmental impacts.[13]

Advocate for action

- **Promote healthy, sustainable homes:** Public health practitioners can advocate for local governments to invest in energy efficiency and renovation efforts that will reduce exposure to toxic chemicals and mold and improve ventilation in public housing, as well as advocate for programs and incentives to make low- and middleincome homes healthier and safer.
- **Promote sustainable land use and transportation:** Public health practitioners can advocate for land use plans that encourage more green space and multi-modal transportation options (e.g., walking and biking), as well as for incentives for clean energy vehicles. These policies will result in more walkable communities and reduce the number of cars on the road, thereby decreasing vehicular emissions that contribute to respiratory illnesses.
- **Promote beneficial electrification:** Public health practitioners can advocate for programs and incentives to increase the adoption of clean heating and cooling technologies and transition to efficient electric options for appliances. Beneficial electrification reduces greenhouse gas emissions and improves indoor air quality.

ENDNOTES

1 Health sector employment data from *Bureau of Labor Statistics, Quarterly Census of Employment and Wages, Annual Data*; total working population data from *American Community Survey*. Raw data available at http://www.gflrpc.org/covid19data.html

2 Coin, G. (2018). Which New York counties have highest rates of Lyme disease? (chart). NYUP.com. https://www.newyorkupstate.com/weather/2018/05/lyme_disease_new_york_state_deer_tick_rates.html

3 Mohai, P, Pellow, D., and Roberts, J.T. (2009). "Environmental Justice." *Annual Review of Environment and Resources* 34 (1): 405–30. https://doi.org/10.1146/annurev-environ-082508-094348.

4 Larson N.I., Story M.T., Nelson M.C. (2009). Neighborhood environments: disparities in access to healthy foods in the US. *Am J Prev Med*. 36(1):74–81

5 American Psychological Association (2018). Stress and Disparities Report. www.apa.org/pi/health-disparities/resources/stress-report

6 Common Ground Health (2019). Overloaded: the heavy toll of poverty on our Region's Health

7 Carman, K. G., Liu, J. and White, C. (2020). Accounting for the burden and redistribution of health care costs: who uses care and who pays for it. *Health Services Research*, 55(2). 224–31. DOI: https://doi.org/10.1111/1475-6773.13258

8 Practice Greenhealth website: https://practicegreenhealth.org/

9 Karliner J., Slotterback S., Boyd R., Ashby B., Steele K. (2019). Health Care's Climate Footprint: How the Health Sector Contributes to the Global Climate Crisis and Opportunities for Action. www.arup.com/perspectives/publications/research/section/healthcares-climate-footprint

10 Karliner et al (2019). Ibid

11 Direct GHG emissions are from sources that are owned or controlled by the healthcare entity. Indirect GHG emissions are a result of the activities of the healthcare sector, but the emissions themselves occur at sources owned or controlled by another entity.

12 Karliner et al (2019). Ibid

13 Gadani, H. and Vyas, A. (2011). Anesthetic gases and global warming: potentials, prevention and future of anesthesia. Anesthesia Essays and Researches. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4173371/

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