Op-Ed

Shelter in the Storm: Health Care Systems and Climate Change

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ON OCTOBER 29, 2012, THE MASSIVE RAINFALL BROUGHT ON by storm surges from Hurricane Sandy flooded New York City's streets and underground transit tunnels, cutting off power throughout the metropolis. In anticipation of the storm, New York University's Langone Medical Center activated its emergency preparedness plan. But the next day, the hospital's electricity went out and its backup generators failed. The staff, in partnership with local first responders, responded, transferring hundreds of patients, some in critical condition, to nearby hospitals. One news report described nurses carrying newborns that had been on respirators down 9 flights of stairs as they manually pumped oxygen into the babies' lungs.

The story is an example of the impact of severe storms on our health system. It is especially relevant today as the growing threat of climate change is expected to only increase the incidence of severe weather events like Hurricane Sandy.

But climate change is more than another underlying cause of poor health and injury. Preparing for and adapting to climate change is also an opportunity for health care systems to reexamine both their ability to remain resilient in a disaster and their role in mitigating climate-related disease burdens by reducing emissions that contribute to climate change. These systemic endeavors will require broad leadership and cooperation over many years. But through such systemic changes, health care systems can position themselves as leaders in helping our nation prepare for climate change as well as in protecting the most vulnerable among us.

Primary Prevention: First, Do No Harm

The US Department of Energy (DOE) reports that health care facilities are among the country's most energy-intensive buildings. Hospitals use

836 trillion BTUs of energy every year, have more than twice the energy intensity and carbon dioxide emissions of commercial office buildings, and produce more than 30 pounds of carbon dioxide emissions per square foot. We also know that the US health care sector accounts for nearly a tenth of the entire nation's carbon dioxide emissions.¹ Taking systemic steps to reduce emissions and become more energy efficient thus will have a triple impact by (1) reducing emissions that contribute to climate change, (2) lowering energy costs and freeing up funds for more pressing health care needs, and (3) contributing to healthier environmental conditions in the community.

Transforming energy use is an enormous undertaking, and health care systems have a moral obligation to apply a health-in-all-policies approach to energy, by using less energy, becoming more energy efficient, and purchasing energy from renewable sources. Efforts to help health care systems do this are well under way. For example, in 2009, the DOE launched the Hospital Energy Alliance to promote efficiency and reduce greenhouse gas emissions, and in 2012 the alliance's annual report documented that alliance members had cut energy consumption and improved energy efficiency by 25%, saving more than \$1 million a year on energy bills.²

Secondary Prevention: Be Resilient

Perhaps one of the greatest climate change–related risks that communities face is the loss of health care services. Scientists predict that climate change will result in more frequent and intense storms. And when these storms take place, residents expect that along with other first responders, their hospitals will still be available and ready to serve their needs. But our national experience is far different. For example, Hurricane Sandy caused the shutdown of 6 hospitals in 2 states. In New Jersey, Hoboken University Medical Center and Palisades Medical Center were evacuated. In New York City, the Manhattan campus of the Veterans Affairs New York Harbor Health System, Coney Island Hospital, and New York Downtown Hospital had to close, as did 26 additional residential care facilities, having to evacuate more than 6,400 patients. Farther away, in 2013, a Category EF 5 tornado ripped through Moore, Oklahoma, destroying the local medical center. This event resulted in 24 deaths, 377 injuries, and the relocation of 30 patients to hospitals in other cities.

Achieving climate resilience means addressing a wide range of vulnerabilities, such as loss of access to medical records, cutoffs in the supply chain, shortages of staff, and, of course, the loss of and damage to utilities and facilities. For residents who depend on local health care systems, any of these disruptions could be life threatening.

Hospital preparedness has improved significantly in the years following September 11, 2001, although serious challenges remain, especially in regard to health care facilities and their infrastructure. According to the US Energy Information Agency, the average age of an acute care hospital is about 31 years, and many of the nation's hospitals are situated near coastal waters and rivers, where they were originally built for easy access to water and sewage discharge. Today, many of these facilities face a heightened risk of climate-related flooding. In addition, a 2014 report by the US Department of Health and Human Services, "Primary Protection: Enhancing Health Care Resilience for a Changing Climate," noted that US health care has become a microcosm of the modern quest to increase efficiency and eliminate redundancy. It reported that "operable windows were eliminated once mechanical ventilation came into use; electrical lighting replaced daylight; and, ultimately, windows themselves were perceived as redundant. Now, a loss of backup emergency electrical power renders hospitals completely uninhabitable."³ These discoveries demonstrate that building climate-resilient facilities and systems needs to be a top priority of the health system.

Tertiary Prevention: Reduce Deaths and Disabilities in a Crisis

Reducing a system's carbon footprint and building resilient infrastructures, though important and necessary, do not fully leverage health systems' responses in an emergency. For this, we need tertiary prevention, which means adapting to the new environmental realities, preparing for their potential impacts on health and disease, and finding collaborative ways to alleviate the related health burden.

Physicians are currently witnessing the effects of climate change on their patients. The American Academy of Pediatrics warns that children are suffering disproportionately from climate-related health impacts, and in a survey of members of the American Thoracic Society, the majority of respondents reported that climate change is already affecting their

patients' health.⁴ We also know that disaster-related health needs persist long after the storm. For instance, the Sandy Child and Family Health Study found that years after Hurricane Sandy, many residents still were experiencing moderate or severe mental health distress.⁵

Critical to tertiary prevention is collaborating with public health agencies. For years, by working with the Centers for Disease Control and Prevention, state and local health departments have been preparing for climate change. Public health organizations like the American Public Health Association are partnering with climatologists and other professionals to better understand climate data and advocate for systems that localize possible threats; using social vulnerability mapping to pinpoint those populations most at risk; and tracking climate-related disease trends, such as heat illness and the spread of vector-borne disease into new territories. All this knowledge will be essential to shaping how health providers can optimize patient care and enhance public health protection.

Climate change is a serious problem that will have an enormous impact on the nation's health care delivery system and the public's health. The health system can play an important role in mitigating its impact on itself and on society as a whole. But this will require focus and the engagement of all health sectors as well as improvements in emergency preparedness.

References

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