

An Overlooked Crisis: Extreme Temperature Exposures in Incarceration Settings

Exposure to extreme heat and cold increases mortality. Events such as the 1995 Chicago, Illinois, heat wave caused nearly 700 extra deaths over a 50-day period¹ and the Centers for Disease Control and Prevention² determined that excessive cold in the United States causes a minimum of 1200 deaths yearly. Susceptibility to the health effects of extreme temperature is greater in subpopulations such as older adults, people with neurologic or mental disorders and certain health comorbidities, and people who are socially isolated, bed-bound, or lack mobility.^{1,3}

There is a knowledge gap on the impact of extreme temperatures on incarcerated people and their health. Incarcerated people are classified as a vulnerable population because of the social and economic disenfranchisement caused by mass incarceration, which may increase their susceptibility to adverse health outcomes. They have limited mobility and suffer from a disproportionate amount of mental health and medical comorbidities that are exacerbated by exposure to extreme temperatures.⁴ Furthermore, because extreme temperatures are a hallmark of climate change, we expect this vulnerable population's exposure to only increase. However, there is very little evidence on the health

effects of extreme temperature exposure in incarcerated populations held in the United States. We summarize the literature and call for more research in this area.

EXISTING RESEARCH

Although we found no original research articles on the impact of extreme temperature exposure on the health of incarcerated persons, Motanya and Valera⁵ published a descriptive review on climate change and incarceration. They discussed the fatalities from heat in the Texas prison system attributable to lack of indoor temperature regulation (numbering at least 14). They also detailed how exposure to extreme heat increased in prison populations in New Orleans, Louisiana, after Hurricane Katrina. They concluded that incarcerated populations are affected by climate change yet are not being considered in policy planning.

Because the research literature is so scant, we also searched stakeholder organizations' Web sites and identified 13 related articles (see the Appendix, available as a supplement to the online version of this article at <http://www.ajph.org>). Two reports specifically focused on heat exposure in Texas Department of Criminal Justice–run facilities

owing to the absence of air conditioning. The authors documented a heat index temperature of 150°F in July 2011 inside one of these facilities. Other stakeholder articles showed case examples of mortality from extreme cold exposure inside facilities, inadequate emergency management planning following natural disasters that increased exposure to heat, ongoing extreme temperature related lawsuits, and suggested temperature guidelines.

Finally, we searched the Westlaw law database for legal cases related to Eighth Amendment right violations from temperature conditions from 1980 to 2019. This search returned more than 1200 cases. We evaluated a random sample of 100 of these cases to determine themes (see the Appendix). The cases covered 29 states, with the majority of cases occurring after the year 2000 (75%). There were 61 cases related to cold exposure, 32 related to heat exposure, and 7 related to both.

Sixteen of the cases documented plaintiffs held in solitary confinement or punitive isolation.

In the heat-related cases, plaintiffs gave examples of temperatures exceeding 100°F, broken or lack of air conditioning, sealed windows, faulty ventilation systems, and limited cooling resources such as water and access to fans. In four cases, plaintiffs were exposed to extreme heat while being transported in vehicles without air conditioning or open windows. Four heat-related deaths were documented in Arkansas, Virginia, Tennessee, and Texas.

In the cold-related cases, plaintiff briefs mentioned cells with broken heating systems, temperatures below freezing, ice forming on the walls and in toilet bowls, and frost on metal. More than 30% of the cold-related cases specified inadequate clothing or blankets. Resulting health problems included constant flu-like symptoms, joint swelling and pain, and frostbite.

VULNERABLE POPULATIONS ON THE INSIDE

Although we identified limited research on the impact of

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extreme temperature exposure on the health of incarcerated persons, there are reasons to believe this population may be particularly at risk beyond the legal briefs. A disproportionate number of the subpopulations with increased vulnerability to the effects of extreme temperature exposure pass through the US criminal justice system. Compared with a standardized age-adjusted noninstitutionalized US population, people in prison facilities were 3.4 times more likely to report having heart-related problems and 1.5 times more likely to report having diabetes or asthma.⁴ In the 2011–12 National Inmate Survey, 66% of people held in state and federal prisons reported taking prescription medication⁴ that could affect body temperature regulation and sensitivity to heat and cold.

Older adults are particularly vulnerable to the effects of extreme temperatures³ and are also a growing percentage of the incarcerated population (<https://bit.ly/33U7GsW>). Furthermore, because incarceration may accelerate aging owing to excessive stresses on daily life, the National Institute of Corrections uses a cutoff age of 50 years to determine older adults. In 2014, people aged 55 years and older made up just 10% of the US state and federal prison population (<https://bit.ly/2Ne9UwN>) but accounted for more than 55% of the deaths that occurred that year.⁶

ELEVATED TEMPERATURE EXPOSURE

Incarceration facilities also may affect temperature exposures. As of 2015, 22 states lacked policies on temperature

regulation in prison facilities.⁷ Of the 28 states with policies, only 17 states specified allowable temperature ranges and even fewer specified how these ranges would be enforced.⁷ Policies in jails and privately run facilities may be even more variable.⁷ Furthermore, federal facilities are also increasingly overpopulated. Half of high- and medium-security male facilities are operating above rated capacity (<https://bit.ly/2p2cgH0>). Crowded conditions may make spaces hotter, as each individual generates body heat.

Overcrowding stresses facility infrastructure, which may also prevent proper temperature regulation. Additionally, aging correctional facilities may not have adequate ventilation. Poor ventilation leads to the spread of communicable illnesses, and it could also exacerbate extreme temperature exposure. Temperature exposure may be different for people held in solitary confinement because of the size and conditions of the cell. Incarcerated people may also not have access to water or blankets when needed or desired. Finally, exposure to extreme temperatures may occur indirectly from inadequate emergency management after power outages from natural disasters such as storms and wildfires. Overall, there may be increased exposure to extreme temperatures while in incarceration settings that would affect the health risks of this vulnerable population.

INVESTIGATION OF THIS CRISIS

Existing legal cases indicate that incarcerated populations may have high exposure and susceptibility to extreme temperatures. However, because of

the lack of epidemiological evidence, we may not understand the full magnitude of the health effects caused by this exposure. Each year, roughly 5000 people die while being held in the US incarceration system with state, local jail, and federal facilities accounting for approximately 70%, 20%, and 10% of the deaths, respectively.⁶

Almost 90% of the deaths in state facilities are illness related, with the two leading reported causes being cancer (30%) and heart disease (26%),⁶ both of which are affected by extreme temperature exposure.³ We need dedicated federal grants to fund original epidemiological research on the health impacts of extreme temperatures in incarceration settings and to define which populations are most vulnerable. The intersection of incarceration and extreme temperature exposure is thus far being overlooked—yet, amid the extremity of climate change, this vulnerable population may be the most affected. **AJPH**

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CONFLICTS OF INTEREST

The authors have no conflicts of interest to declare.

REFERENCES

1. Kaiser R, Le Tertre A, Schwartz J, Gotway CA, Daley WR, Rubin CH. The effect of the 1995 heat wave in Chicago on all-cause and cause-specific mortality. *Am J Public Health*. 2007;97(suppl 1):S158–S162.

2. Berko J, Ingram DD, Saha S, Parker JD. Deaths attributed to heat, cold, and other weather events in the United States, 2006–2010. *Natl Health Stat Rep*. 2014(76):1–15.
3. Vandentorren S, Bretin P, Zeghnoun A, et al. August 2003 heat wave in France: risk factors for death of elderly people living at home. *Eur J Public Health*. 2006;16(6):583–591.
4. Maruschak LM, Berzofsky M, Unangst J; US Bureau of Justice Statistics. Medical problems of state and federal prisoners and jail inmates, 2011–12. 2016. Available at: <https://www.bjs.gov/content/pub/pdf/mpsfj1112.pdf>. Accessed October 23, 2019.
5. Motanya NC, Valera P. Climate change and its impact on the incarcerated population: a descriptive review. *Soc Work Public Health*. 2016;31(5):348–357.
6. Noonan ME. Mortality in state prisons, 2001–2014—statistical tables. Available at: <https://www.bjs.gov/content/pub/pdf/msp0114st.pdf>. Accessed October 23, 2019.
7. Holt DWE. Heat in US prisons and jails: corrections and the challenge of climate change. 2015. Available at: https://web.law.columbia.edu/sites/default/files/microsites/climate-change/holt_-_heat_in_us_prisons_and_jails.pdf. Accessed October 23, 2019.