Special Focus: Climate Change and Worker Health

FAST FACT:

Agricultural and landscape workers face increased risk for allergies from longer and more intense pollen seasons.

Workers in some occupations are especially vulnerable and at risk due to the impacts of climate change on health. In this brief, we focus on climate change and worker health in California and the U.S.

Heat and work[1]

- Outdoor workers (e.g. agriculture, landscaping, construction) are more vulnerable to heat-related illness, especially where jobs involve heavy exertion.
    - In addition to the direct impacts of heat and risks for heat illness, extreme heat may decrease vigilance and mental performance, increasing the risk for those who work on elevated structures or operate heavy machinery.
    - Lack of heat-illness-prevention programs in the workplace is strongly associated with extreme temperature-related death.
    - Recent studies suggest that labor productivity will decline significantly as rising temperatures reduce the capacity to work outside.
- Workers in hot indoor environments (e.g. steel mills, dry cleaners, restaurant kitchens, manufacturing facilities, warehouses, and other areas that lack air conditioning) are also at increased risk for extreme heat exposure and heat illness.
- Risk on top of risk: For migrant workers and day laborers working outdoors, these climate change impacts are compounded by other social and economic inequities, including poor housing and food access, stress and lack of preventive healthcare.

Air quality and allergens

- Outdoor workers experience degraded air quality as a result of heat waves that combine with ozone to create smog. Drought creates dry, dusty conditions that can exacerbate chronic respiratory conditions or expose workers to *Coccidioides immitis*, the fungal spore that causes Valley fever.[2]
- Agricultural and landscape workers in particular face increased risk for allergies from longer and more intense pollen seasons as a result of climate change.[3]
- Firefighters are on the front lines of climate change, as the increasing intensity and severity of wildfires increases exposure to particulate matter and other toxic chemicals in wildfire smoke. Other outdoor workers are also at risk of wildfire smoke exposure.[4]
- Efforts to increase energy efficiency can inadvertently lead to "tight building syndrome," where indoor workers are exposed to poor indoor air quality and increased concentrations of indoor chemicals, pollutants and microorganisms as a result of inadequate ventilation. Symptoms include respiratory problems, skin irritation and headaches. "Tight" buildings can also lead to higher concentrations of radon, an odorless, tasteless, colorless gas linked to lung cancer.[5]

From the latest Global Change Research Program Report:

From 2000 to 2013, almost 300 U.S. wildfire firefighters were killed while on duty. With the frequency and severity of wildfires projected to increase, more firefighters will be exposed. Common workplace hazards faced on the fire line include being overrun by fire (as happened during the Yarnell Hill Fire in Arizona in 2013 that killed 19 firefighters); heat-related illnesses and injuries; smoke inhalation; vehicle-related injuries (including aircraft); slips, trips, and falls; and exposure to particulate matter and other air pollutants in wildfire smoke. In addition, wild land firefighters are at risk of rhabdomyolysis (a breakdown of muscle tissue) that is associated with prolonged and intense physical exertion.

- As climate change increases the prevalence of some insects and weeds, pesticide and herbicide use is expected to rise, increasing agricultural workers' exposure to harmful chemicals in outdoor air or through direct skin contact.[6]

Vector-borne disease[8]

- Landscape designers or agriculture workers may come into close contact with mosquito and tick habitats as part of their work, exposing them to vector-borne diseases such as Lyme disease, West Nile Virus, Zika virus or Dengue.
- Anyone working outdoors in drought conditions is also susceptible to vector-borne disease as a result of drought impacts on insect habitats and reproduction cycles.

Extreme weather and natural disasters[9]

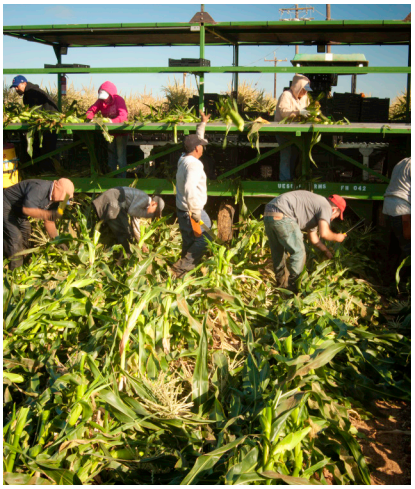
- Utility workers, emergency workers and first responders, including healthcare and public safety workers, are exposed to deaths, injuries, diseases and mental stress caused by climate and weather-related disasters.
    - Recovery and clean-up from disasters may include perilous physical conditions from infrastructure failure (roads, buildings, power grids and transportation systems) and social unrest or violence if food, water and shelter are compromised.
    - Workers may be out during a severe weather event, which increases risk for death or injury from lightning strikes, flooding, high winds or other conditions.
    - These workers are also more susceptible to experiencing negative mental health consequences, as the very nature of the work involves spending long hours in stressful and traumatic settings, often away from loved ones.

Job insecurity and job loss[10]

- Climate change impacts jobs, local economies and employment patterns. For example, thousands of agricultural workers lost their jobs as fields were fallowed as a result of California's drought. Extreme weather events may force places of employment to close for months, or permanently. While employment in renewable energy is growing rapidly, those who have lost their jobs in coal mining regions may not be able to obtain jobs in the new "green" economy.
- Low-wage workers and those without benefits often lack resources and capacity to respond to climate change impacts. Low wages make it difficult to absorb rising food prices; lack of paid sick leave limits the ability to properly recuperate from climate change-related illnesses; lack of disaster insurance prevents many from recouping property losses after extreme storms, wildfires or other climate change-related disasters.

DID YOU KNOW?

Agricultural workers should take steps to avoid bringing pesticide exposures home, including washing any exposed skin at the worksite and keeping work clothing and boots separate from other laundry.



The physician role in climate change and worker health

- Ask your patients about their work and provide appropriate referrals or information on workers' health and safety rights and on-the-job hazards.
    - Advise outdoor workers about their rights for heat illness prevention, including their right to adequate shade, rest periods and water. https://www.dir.ca.gov/Title8/3395.html.
    - Provide them with information such as the worker pocket guide on heat illness (English and Spanish): https://www.dir.ca.gov/dosh/dosh_publications/HeatIllnessEmployeeEngSpan.pdf
    - Advise outdoor workers to check the Air Quality Index http://airnow.gov/index.cfm?action=aqibasics.aqi for unsafe ozone and particulate levels.
    - Landscape and agriculture workers who spend time near heavy shrubs or woods should wear protective clothing such as long sleeves, pants, hats and gloves.
        - Lyme Disease factsheet for outdoor workers (English): http://www.cdc.gov/lyme/resources/toolkit/factsheets/10_508_lyme-disease_outdoorworkers_factsheet.pdf
        - Lyme Disease factsheet for outdoor workers (Spanish): http://www.cdc.gov/lyme/resources/toolkit/factsheets/10_508_lyme-disease_outdoorworkers_factsheet_spanish.pdf
    - Agricultural workers should take steps to avoid bringing pesticide exposures home, including washing any exposed skin at the worksite and keeping work clothing and boots separate from other laundry. https://www.epa.gov/pesticide-worker-safety/training-and-safety-materials-implementing-worker-protection-standard
        - Pesticide protection guidelines are difficult for low-literacy or low-income workers, such as migrant workers. Ask these patients about their social needs and consider a referral to social services.
- Advocate for policies and standards to protect workers in the face of a changing climate:
    - Encourage employers and occupational health agencies to assess emerging worker health and safety risks associated with climate change.
    - Support strengthening of existing standards and new standards to protect worker health and safety.
- Support policies for a just transition from fossil fuel-related jobs to jobs in the green economy, including efforts to retrain and hire displaced, low-income workers and people of color.

For More Information

- See the guide's sheets on specific climate impacts for more guidance on adaptation and mitigation strategies.
- National Institute for Occupational Health and Safety (NIOSH): Climate Change and Worker Health page: http://www.cdc.gov/niosh/topics/climate/how.html
- CDC Lyme Disease page: http://www.cdc.gov/lyme/index.html
- CDC Dengue page: http://www.cdc.gov/dengue/
- CDC West Nile Virus page: http://www.cdc.gov/westnile/index.html

Citations

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2 Ibid.

3 Ibid.

4 Ibid.

5 Letz, G.A. (1990). Sick building syndrome: acute illness among office workers—the role of building ventilation, airborne contaminants and work stress. *Allergy Proc, 11*(3): 109-116. Available at http://www.ncbi.nlm.nih.gov/pubmed/2196201

6 Gamble, J.L., J. Balbus, M. Berger, K. Bouye, V. Campbell, K. Chief, K. Conlon, A. Crimmins, B. Flanagan, C. Gonzalez-Maddux, E. Hallisey, S. Hutchins, L. Jantarasami, S. Khoury, M. Kiefer, J. Kolling, K. Lynn, A. Manangan, M. McDonald, R. Morello-Frosch, M.H. Redsteer, P. Sheffield, K. Thigpen Tart, J. Watson, K.P. Whyte, and A.F. Wolkin, 2016: Ch. 9: Populations of Concern. *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*. U.S. Global Change Research Program, Washington, DC, 247–286. Available at https://health2016.globalchange.gov/populations-concern

7 Ibid.

8 Ibid.

9 Ibid.

10 Roelofs, C & Wegman, D. (2014). Workers: the climate canaries. *American Journal of Public Health, 104* (10): 1799-1801. Available at http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4167120/

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