

CLIMATE CHANGE AND WORKERS' HEALTH

Multiple articles have been written about the effects of climate change on the health of the general population, particularly vulnerable populations¹. A recent document from the Council of State and Territorial Epidemiologists (CSTE) titled Occupational Health Surveillance for Tracking Climate Related Health Impacts on Workers: Heat, Wildfires & Floods discusses approaches for states to gather more data on how climate-related changes affect worker health².

Worker populations may be impacted both by ongoing incremental changes to the climate and by acute disasters. Acute disasters such as wildfires and floods can affect not only first responders involved in medical treatment response and recovery but those involved in clean-up and infrastructure restoration in the weeks, months, and years after an acute climate disaster; clearing trees, downed utility lines^{3,4}, or mold remediation after a hurricane⁵.

Incremental changes to the climate increase the frequency and intensity of hot days and heat waves. Outdoor workers such as agricultural, and construction workers need to be provided adequate rest time in the shade and access to hydration to avoid the acute health effects of heat rashes, heat cramps, heat exhaustion, and heat stroke as well as the development of chronic kidney disease. Workers need to become acclimatized to working in heat (see Figure 1).

Figure 1. 20% Rule for Heat Acclimatization.



(Source MIOSHA CET Program)

- New and returning workers need to build tolerance to heat (acclimatize) and take frequent breaks.
- Follow the 20% rule:
 - On Day 1, only work 20% of a shift at full intensity in the heat.
 - Increase the time working at full intensity by 20% a day.

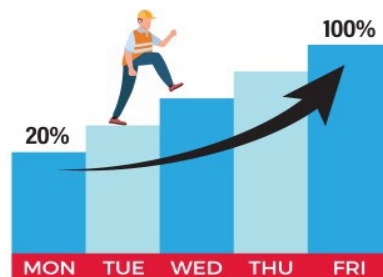


Figure 2. Shows recommendations from NIOSH for length of work and rest based on the ambient temperature and strenuousness of the work.

Chronic kidney disease from heat was initially recognized as endemic in agricultural workers in Central America⁶ and has now been seen in agricultural and construction workers in Asia and the US⁷(see case report).

Figure 2. Recommendation for length of work and rest based on the temperature and severity of the work.

Temperature (°F)	Light Work Minutes Work/Rest	Moderate Work Minutes Work/Rest	Heavy Work Minutes Work/Rest
90	Normal	Normal	Normal
91	Normal	Normal	Normal
92	Normal	Normal	Normal
93	Normal	Normal	Normal
94	Normal	Normal	Normal
95	Normal	Normal	45/15
96	Normal	Normal	45/15
97	Normal	Normal	40/20
98	Normal	Normal	35/25
99	Normal	Normal	35/25
100	Normal	45/15	30/30
101	Normal	40/20	30/30
102	Normal	35/25	25/35
103	Normal	30/30	20/40
104	Normal	30/30	20/40
105	Normal	25/35	15/45
106	45/15	20/40	Caution
107	40/20	15/45	Caution
108	35/25	Caution	Caution
109	30/30	Caution	Caution
110	15/45	Caution	Caution
111	Caution	Caution	Caution
112	Caution	Caution	Caution

Box 1 - Case Report – 39 year-old man, who came to work in Western Michigan as a H-2A* worker died in 2020 of acute renal failure of two months duration. Immediately prior to his arrival in the United States, he had the required medical exam for H-2A workers. The exam was normal, and no chronic conditions were noted. He lived in southern Mexico near the Guatemala border. He worked in an asparagus field for four days before becoming ill and when brought to the hospital was in renal failure. He had an arterio-venous fistula created and was begun on dialysis. He returned to Mexico but had inadequate access to dialysis and died. He did not receive workers’ compensation despite H-2A workers in Michigan being eligible for such benefits. The lack of his having prior medical conditions, working in a high temperature and coming from the geographic area where kidney disease is endemic in farm workers, his condition was consistent with the kidney disease that has been recognized among young male agricultural workers in regions of Mesoamerica⁸.
 (*The H-2A program allows U.S. employers or U.S. agents who meet specific regulatory requirements to bring foreign nationals to the United States to fill temporary agricultural jobs.)

Example
 A worker performing heavy work in 104 °F temperatures should work for 20 minutes and rest for 40 minutes.

Example
 A worker performing moderate work at 108 °F should use extreme caution! The risk for heat injury is high in this situation.

* From NIOSH Criteria for a Recommended Standard, Occupational Exposure to Heat and Hot Environments, <https://www.cdc.gov/niosh/docs/2016-106/pdfs/2016-106.pdf>.
Assumptions: workers are physically fit, well-rested, fully hydrated, under age 40, and the environment has 30% humidity and perceptible air movement.

Indoor workers such as in manufacturing or warehouses may lack air conditioning and although the workers will be out of direct sunlight, they will still be at risk of acute heat related effects.

An additional concern for working in heat is work-related injuries, particularly traumatic injuries, which increase with increasing temperature⁹.

There are no specific Michigan or Federal regulatory standards regarding heat. OSHA is still early in the process of developing regulations. Examples of guidelines and recommendations to prevent adverse health effects from heat are in Box 2.

If you become aware of any workers developing renal failure that you suspect may be heat related, that is a reportable occupational disease, and we would be interested in knowing about the illness.

Box 2 -Heat-Related Guidelines, Fact Sheets and Apps for Worker Education, Rest Periods & Hydration

Michigan OSHA. HEAT. <https://www.michigan.gov/leo/bureaus-agencies/miosha/topics/heat>
For employers to develop a heat prevention plan, resources for employees and a power point presentation.

NIOSH. HEAT STRESS. <https://www.cdc.gov/niosh/topics/heatstress/default.html>
For information about heat.

OSHA-NIOSH Heat Safety Tool App <https://www.cdc.gov/niosh/topics/heatstress/heatapp.html>
Smartphone application for planning outdoor work activities.

NIEHS. Building Blocks for a Heat Stress Prevention Training Program.
https://tools.niehs.nih.gov/wetp/public/hasl_get_blob.cfm?ID=14403. May 2024
Most up to date resource to reduce the risk of heat stress for workers both indoors and outdoors.

NIOSH Heat Stress Work/Rest Schedules. <https://www.cdc.gov/niosh/topics/heatstress/recommendations.html>
Recommendations for work and rest periods based on the temperature and strenuousness of work.

Prevention » Protecting New Workers <https://www.osha.gov/heat-exposure/protecting-new-workers>. Special recommendations for new workers who are not acclimatized to heat and are at increased risk of adverse effects.

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News

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In this issue: V35n3: Climate Change and Workers' Health

*PS Remember to report all cases of occupational disease!

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