Heat-related Illness & Death in Construction

CPWR Webinar, June 29th, 2021

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Image: Iron worker using a thermic lance and a supplied air respirator.
Courtesy: Mount Sinai/CHEP.

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According to the National Weather Service, what is the leading cause of weather-related deaths?


Photo by Cody Goodin

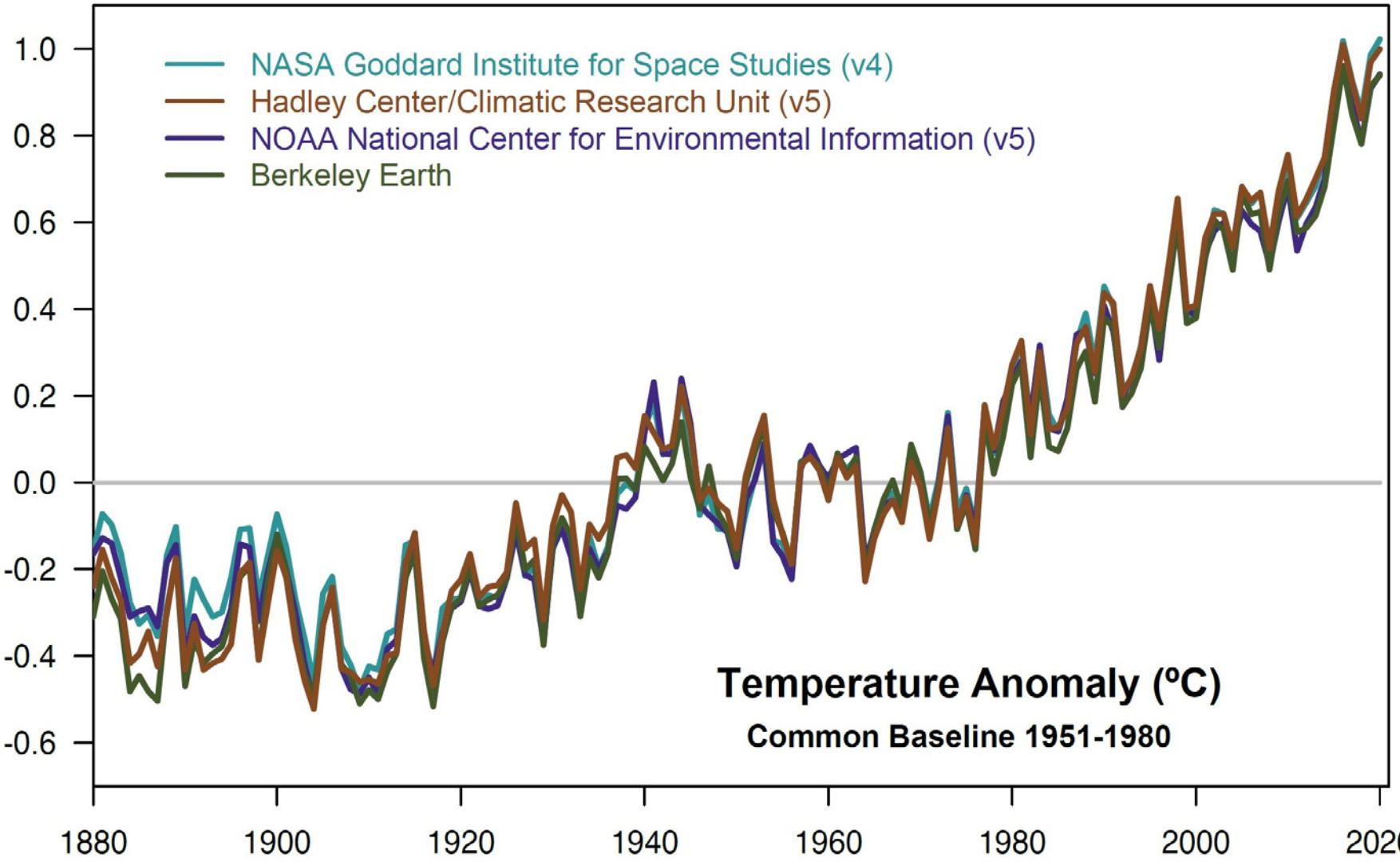

Photo by Justin Hobson via Wikimedia Commons


U.S. Air Force photo by Edward Aspera Jr.


Photo by NASA via Wikimedia Commons

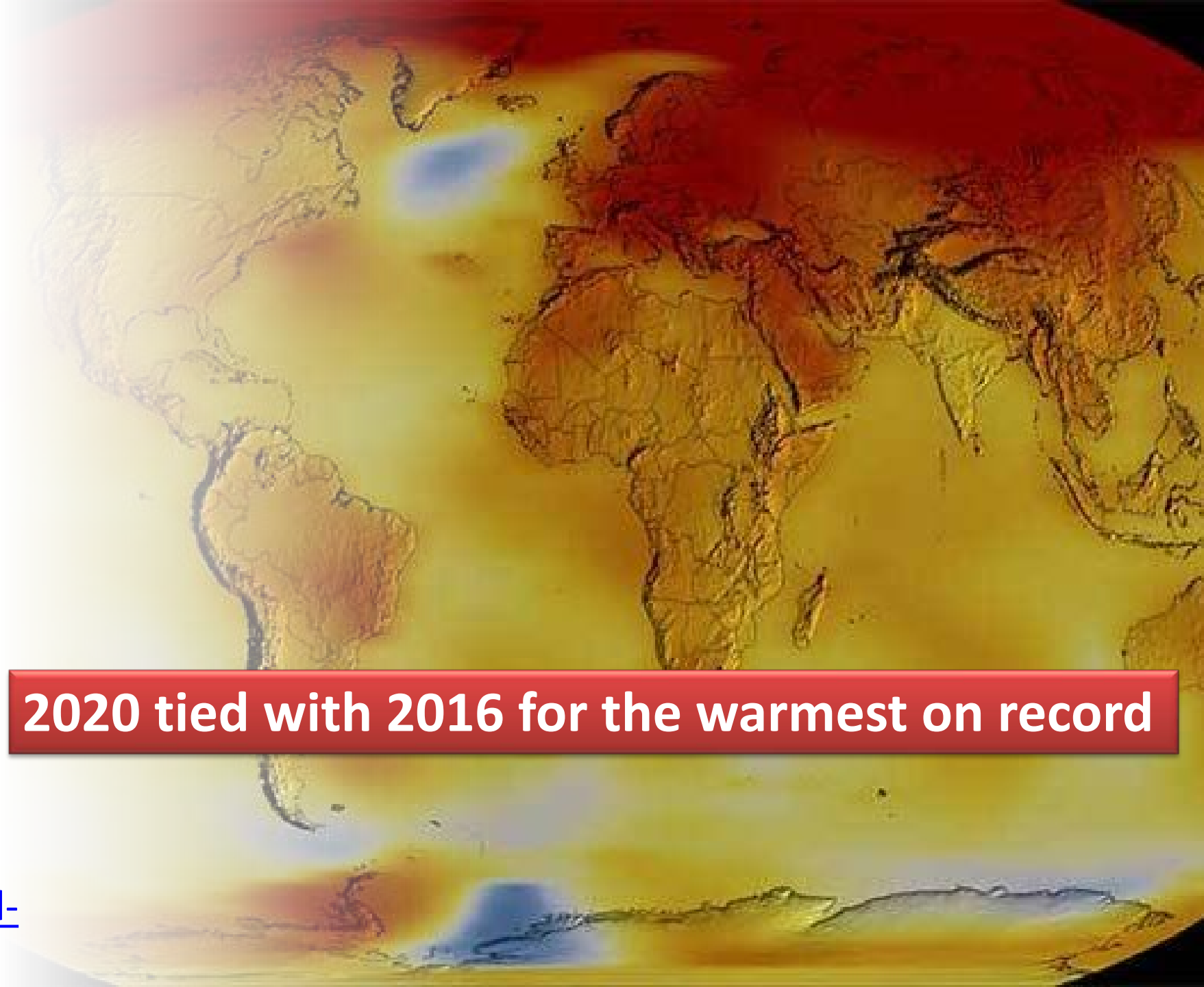
The answer is HEAT

Heat has always been an occupational hazard but data show that global temperatures are rising



Credits: NASA GISS/ Gavin Schmidt

Nineteen of the warmest years on record have occurred since 2000



Source: NASA/GISS
https://climate.nasa.gov/vital-signs/global-temperature/

Rising temps threaten worker health and productivity

The most recent National Climate Assessment predicts $160 billion in lost wages annually in the USA this century

Construction can involve serious hazards, and heat exposure is one of them

Symptoms of heat-related illnesses include:

- Dizziness
- Light-headedness
- Fainting
- Altered mental state
- Confusion
- Muscle cramps
- Seizures

CPWR researchers and colleagues published a study on heat-related deaths in construction

CPWR KEY FINDINGS FROM RESEARCH

Heat-related deaths among construction workers

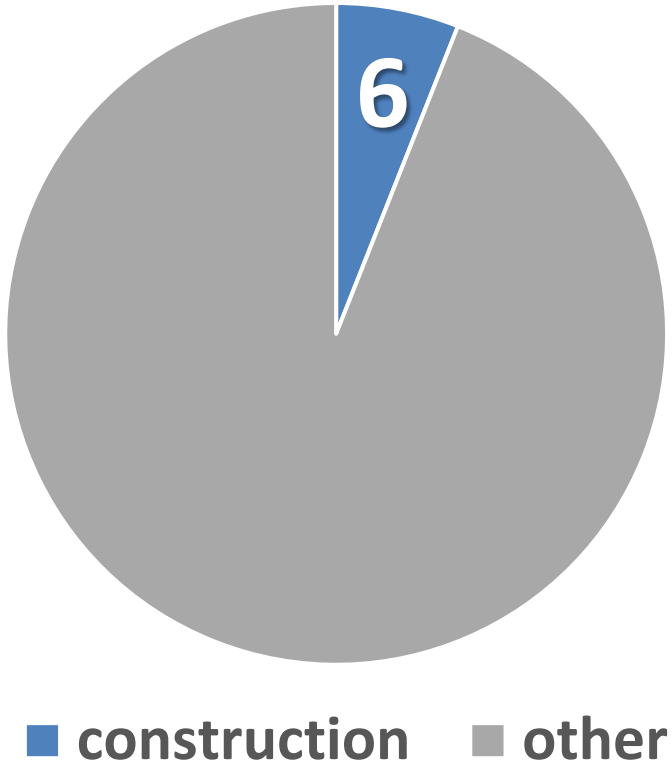
Heat-related deaths among construction workers in the United States

Xiuwen Sue Dong, Gavin H. West, Alfreda Holloway-Beth, Xuanwen Wang, and Rosemary K. Sokas. American Journal of Industrial Medicine, 2019.

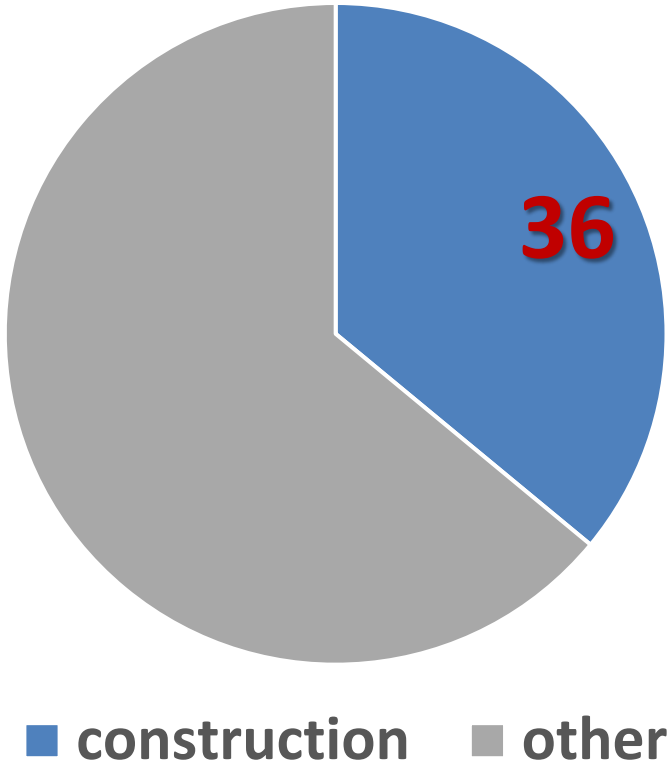
Source: Fatal injury data were generated by the CPWR Data Center with restricted access to BLS CFOI micro data. The views expressed here do not necessarily reflect the views of the BLS. Employment data were from the Current Population Survey. Calculations by the authors.

Construction workers had a disproportionate risk of heat-related death (HRD)

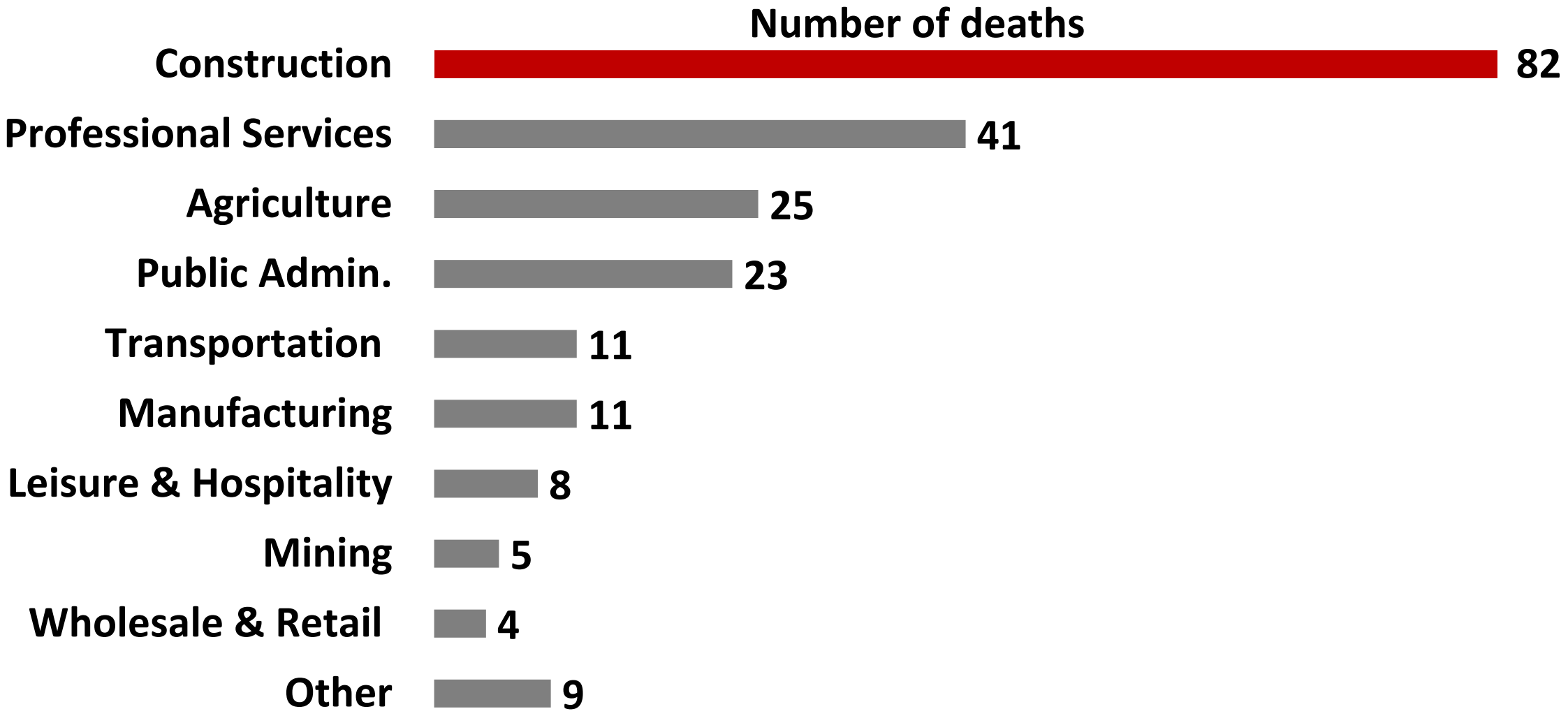
% of US workforce



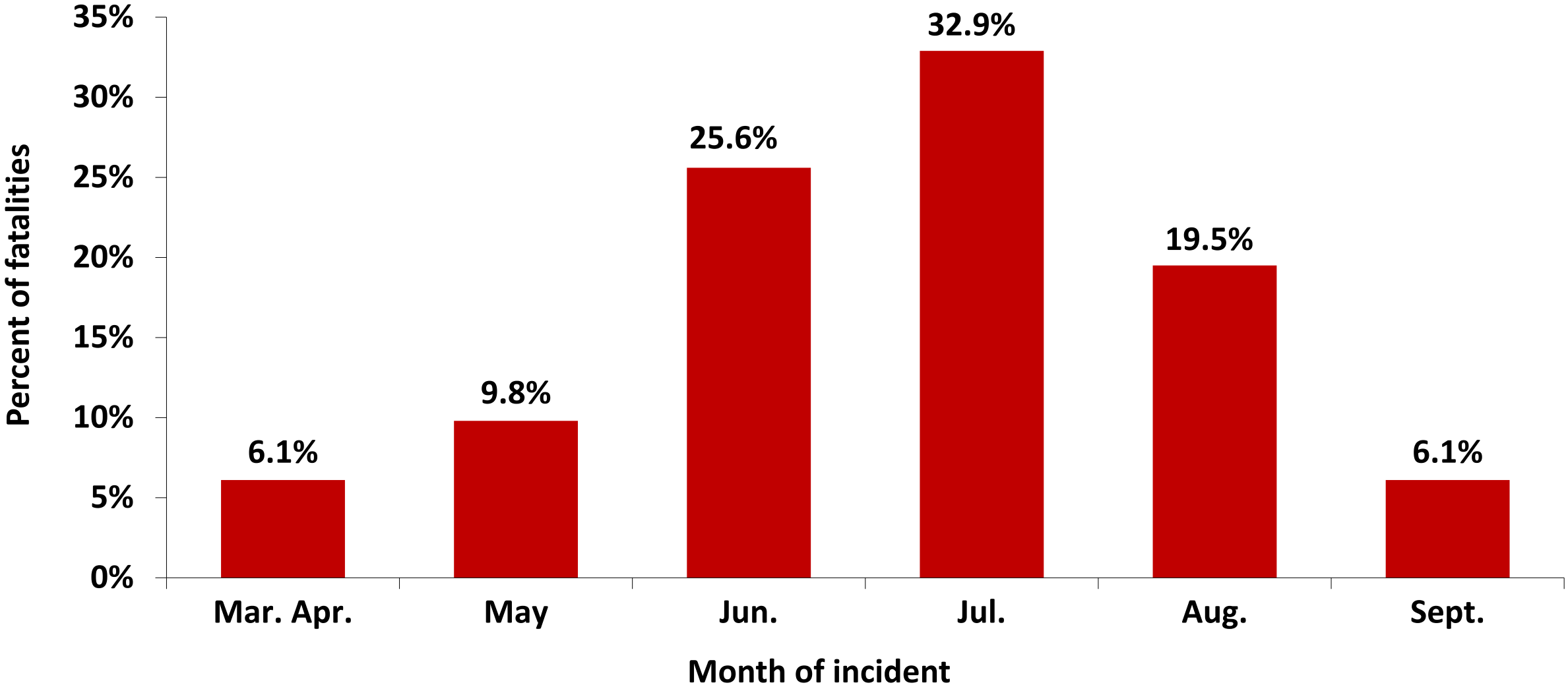
% of HRD (1992-2016)



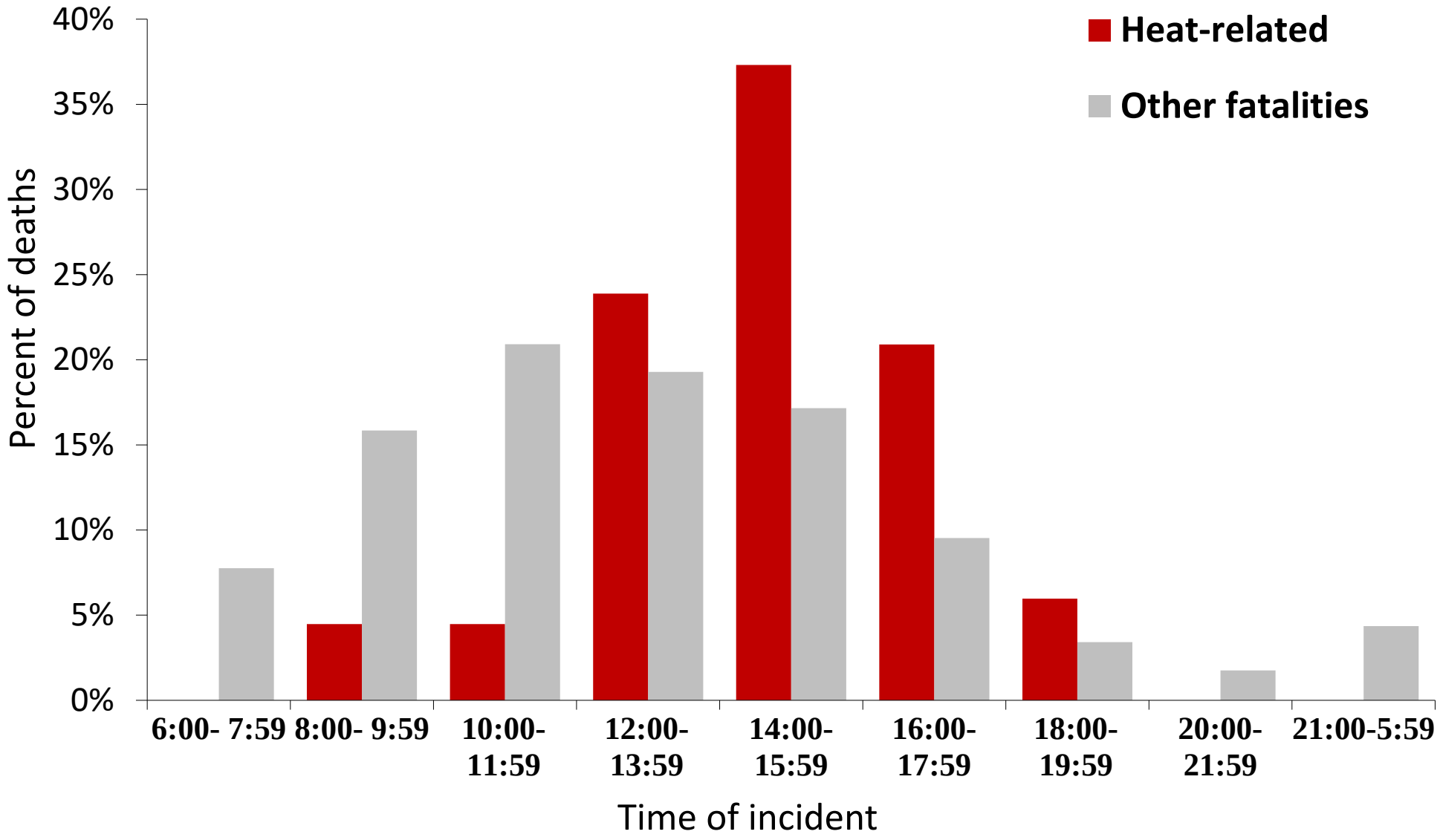
Over 80 US construction workers suffered heat-related deaths from 2011-2016



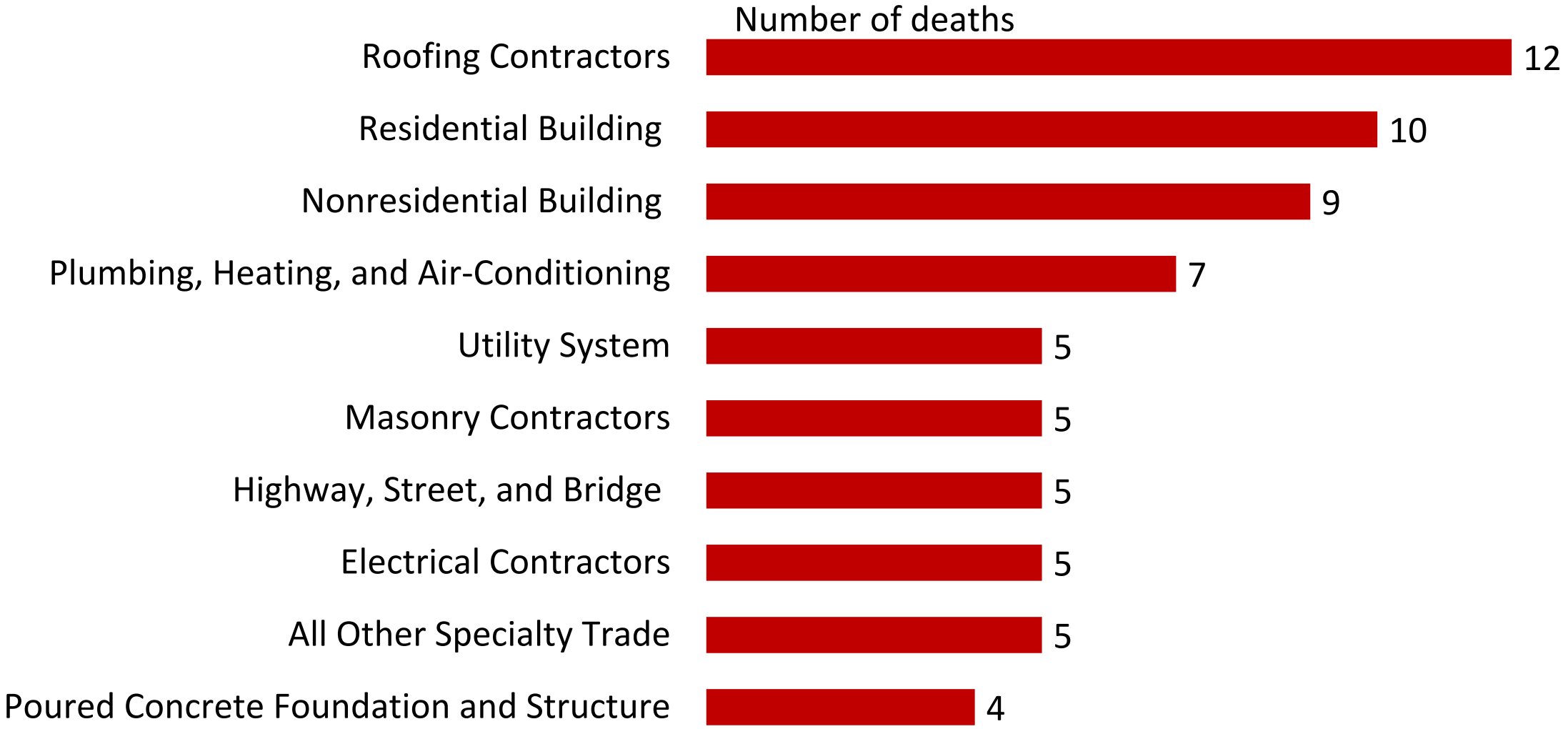
Most of the deaths in that time period occurred during the warmest months of the year, as expected



And in the afternoon, especially 2 to 4 p.m.



The deaths occurred in multiple subsectors



We've looked at frequencies, but rates tell us more about risk

The following 3 tables show:

- Rates per 100,000 full-time construction workers
- A risk index using the average risk of heat-related deaths from 2011-2016 as the reference category (risk = 1)
- Significantly elevated risks ($p < 0.05$) denoted by *

Foreign born workers and races/ethnicities other than white, non-Hispanic were higher risk groups for HRD

	Number of heat-related deaths		Incidence rate of heat-related deaths			
	2011-2016 total	%	2011-2016 average rate [a]	95% Confidence Interval		Risk index [b]
				Lower	Upper	
Race/Ethnicity						
Hispanic	26	31.7%	0.18	0.17	0.18	1.21*
White, non-Hispanic	46	56.1%	0.12	0.12	0.13	0.85
Black, non-Hispanic	6	7.3%	0.22	0.20	0.24	1.51*
Other	4	4.9%	0.21	0.19	0.24	1.46*
Birth place						
Non-US born	26	31.7%	0.19	0.19	0.20	1.33*
US born	56	68.3%	0.13	0.13	0.13	0.90

Construction workers in the south also had a higher risk

	Number of heat-related deaths		Incidence rate of heat-related deaths			
	2011-2016 total	%	2011-2016 average rate [a]	95% Confidence Interval		Risk index [b]
				Lower	Upper	
Region						
Northeast	9	11.0%	0.10	0.09	0.10	0.66
Midwest	13	15.9%	0.12	0.11	0.12	0.81
South	51	62.2%	0.22	0.21	0.23	1.53*
West	9	11.0%	0.07	0.07	0.07	0.48

The biggest differences in risk were related to occupation

Any guesses why?

	Number of heat-related deaths		Incidence rate of heat-related deaths			
	2011-2016 total	%	2011-2016 average rate [a]	95% Confidence Interval		Risk index [b]
				Lower	Upper	
Occupation						
Laborer	24	29.3%	0.29	0.27	0.30	1.93*
Roofer	11	13.4%	1.04	0.90	1.23	6.93*
Carpenter	8	9.8%	0.13	0.12	0.13	0.87
Cement mason	5	6.1%	1.62	1.27	2.24	10.80*
Brick mason	4	4.9%	0.50	0.43	0.62	3.33*
Electrician	4	4.9%	0.13	0.12	0.14	0.87
Plumber	4	4.9%	0.15	0.14	0.17	1.00
Foreman	4	4.9%	0.11	0.10	0.12	0.73
Heating A/C mech	3	3.7%	0.18	0.16	0.20	1.20*
Helper	3	3.7%	1.03	0.79	1.48	6.87*
All construction	82	100.0%	0.15	0.14	0.15	1.00

The answer is we really don't know, but we can make educated guesses

- Study wasn't designed to tell us why risks exist
- Could risks be interrelated?
- Are foreign born workers more likely to:

  work in hotter southern states,

  perform physically demanding jobs,

  work for smaller firms with fewer H&S resources,

  and be unaware of basic rights?
- The large differences by occupation suggest something about the work itself

Image by: Cement Masons/Washington State Department of Labor and Industries

Heavy workloads can increase core temps and cause electrolyte imbalance and dehydration through sweat loss

Machinery and power tools can generate radiant heat

Many jobs involve exposure to direct sunlight

Image by: Mount Sinai/ CHEP

Heavy PPE can interfere with the body's ability to cool itself

Access to water, shade, and cooled spaces varies by jobsite

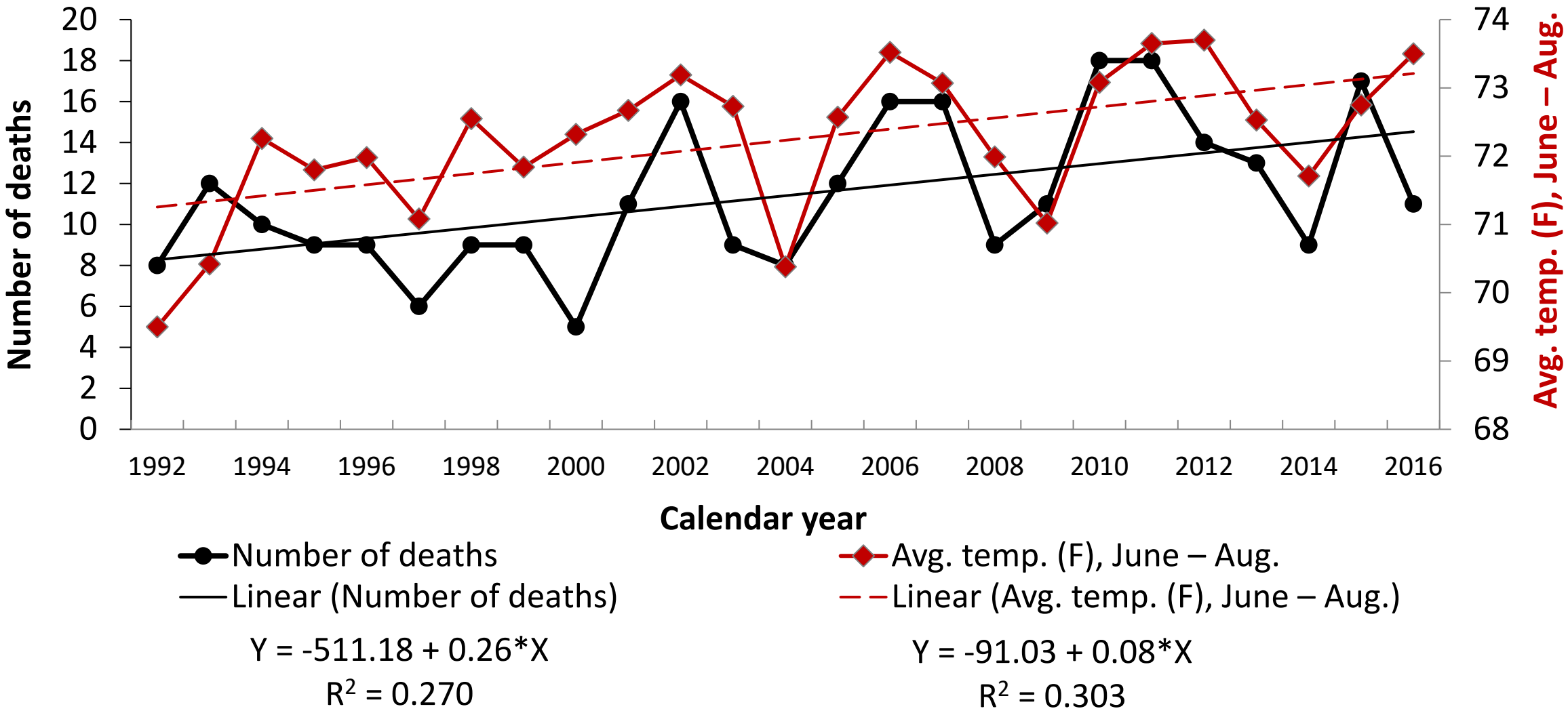
Image credit: Kiewit Power Constructors

Temporary employment in construction can complicate training and prevention efforts

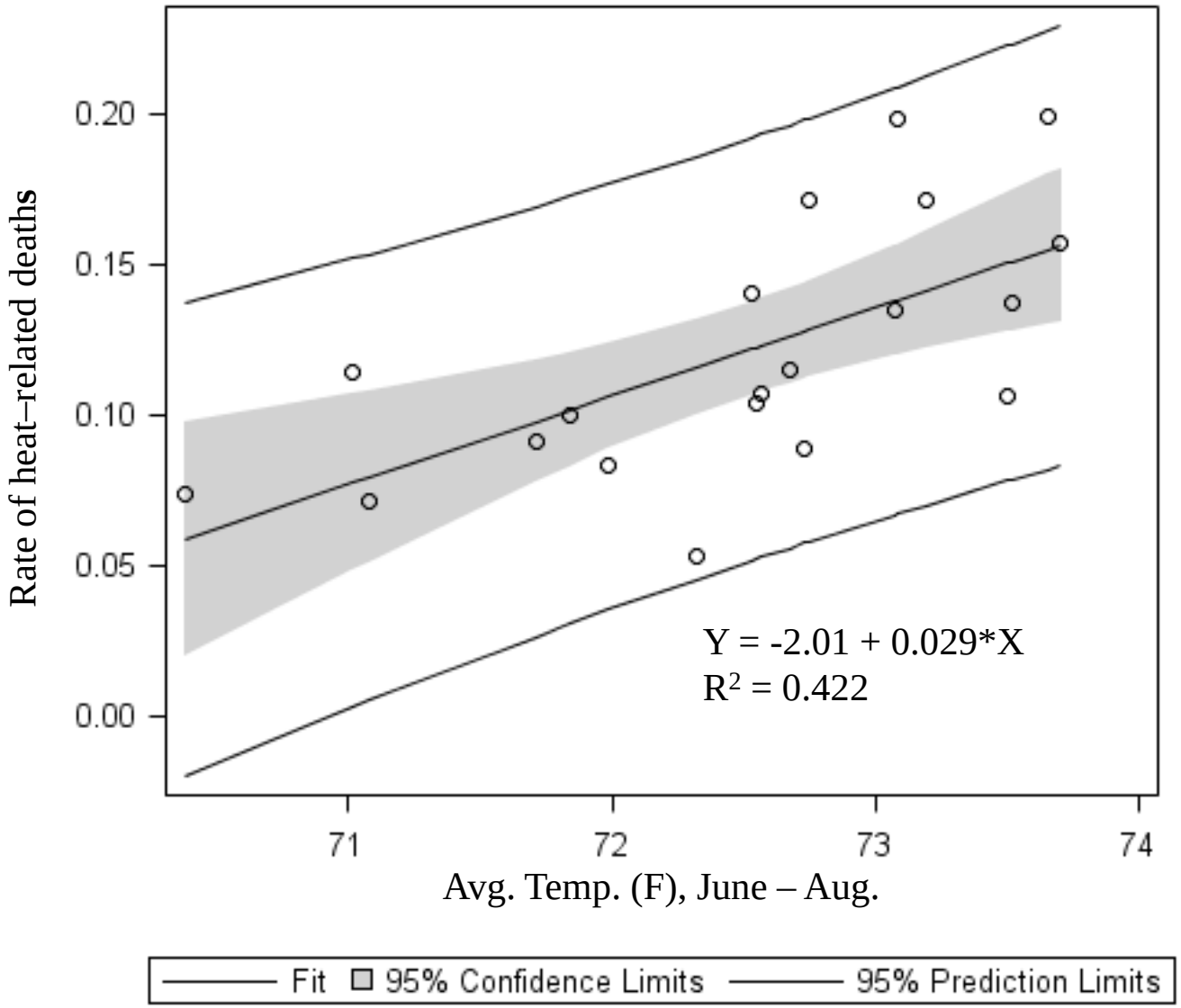
Going back to our study, relationships between increasing temps and HRD were statistically significant

"Over the entire duration of the study period, increasing summer temperatures in the contiguous United States correlated positively with the annual number of heat-related deaths in construction (r=0.609; 95% CI: 0.282, 0.810) and with the rate of heat-related death (r=0.414; 95% CI: 0.022, 0.695)."

This chart shows rising temperatures and heat-related construction deaths over time



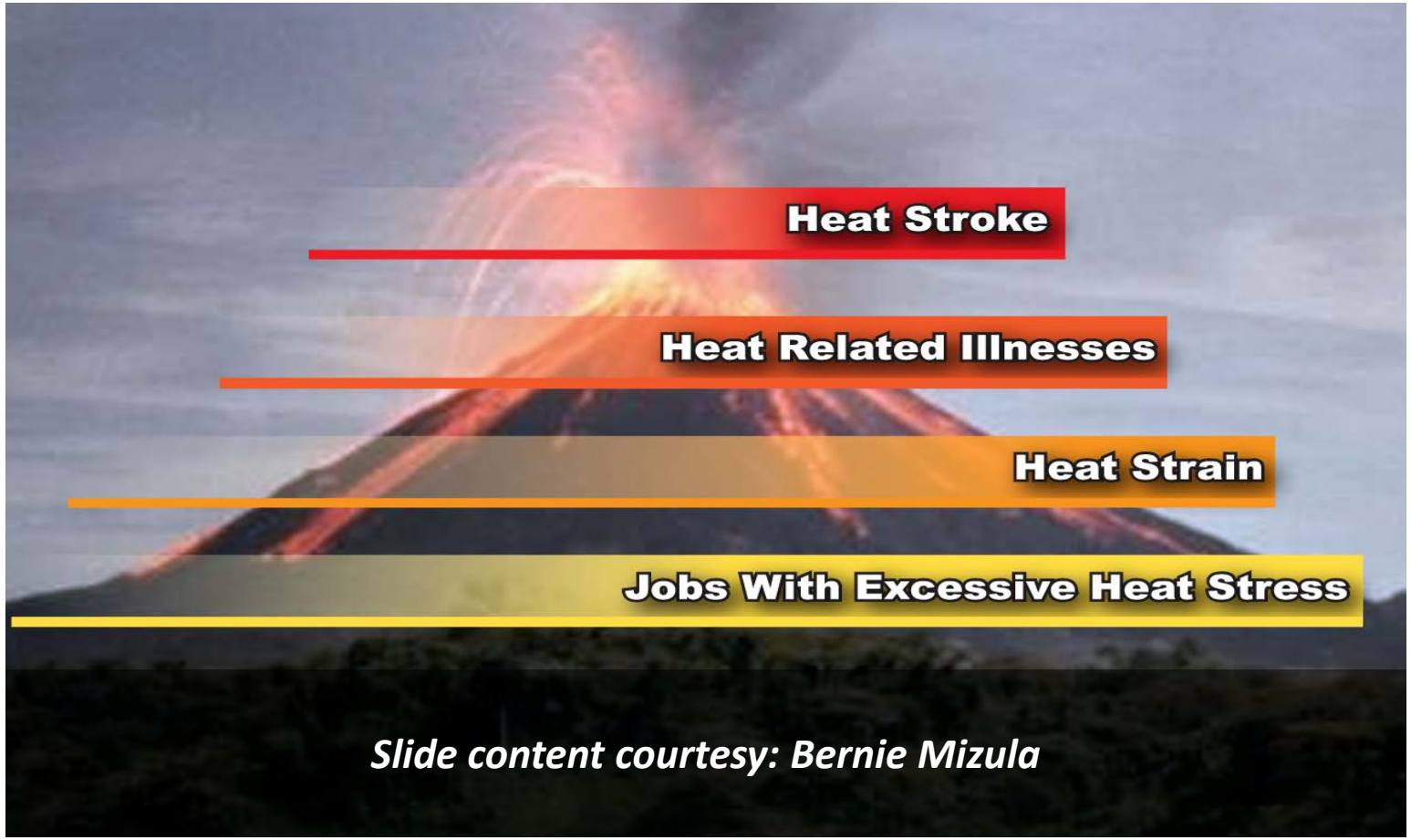
Increases in average summer temps within a narrow range were associated with higher rates of HRD



Some takeaways from the CPWR study

- Heat is a serious hazard for construction workers
- The threat it poses appears to be getting worse
- Cement masons were 10 times more likely to die from heat than the average construction worker
- Roofers and helpers were 7 times more likely
- Interventions are needed to protect the health and productivity of all construction workers, especially those in the highest risk groups
- Further research is warranted (e.g. non-fatal illness)

Heat Stress can be like a volcano - explosive and deadly



"The incidence of occupational heat-related disorders in the US is not known although millions of workers have some level of exposure to hot environments."

Gubernot, D.M., Anderson, G.B. & Hunting, K.L. The epidemiology of occupational heat exposure in the United States: a review of the literature and assessment of research needs in a changing climate. Int J Biometeorol (2014) 58: 1779. https://doi.org/10.1007/s00484-013-0752-x

The Asuncion Valdivia Heat Illness and Fatality Prevention Act was introduced by congress this year

- The bill notes that:
- “Between 1992 and 2017, 815 United States workers died from heat and almost 70,000 were seriously injured.”
- “These numbers are generally understood to be gross undercounts because many heat-related illnesses and deaths are blamed on natural causes.”

Heat-Related Solutions

Chris Le, MPH

Program Manager, Construction Solutions Database

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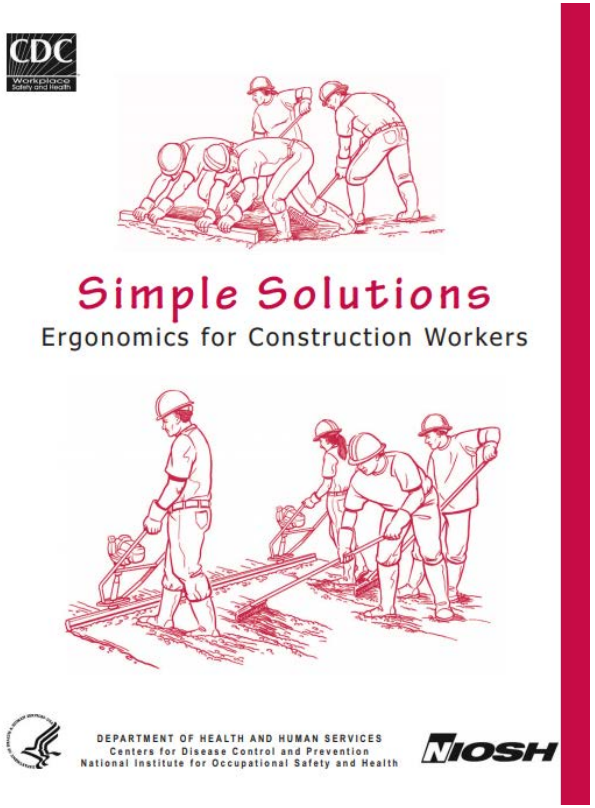
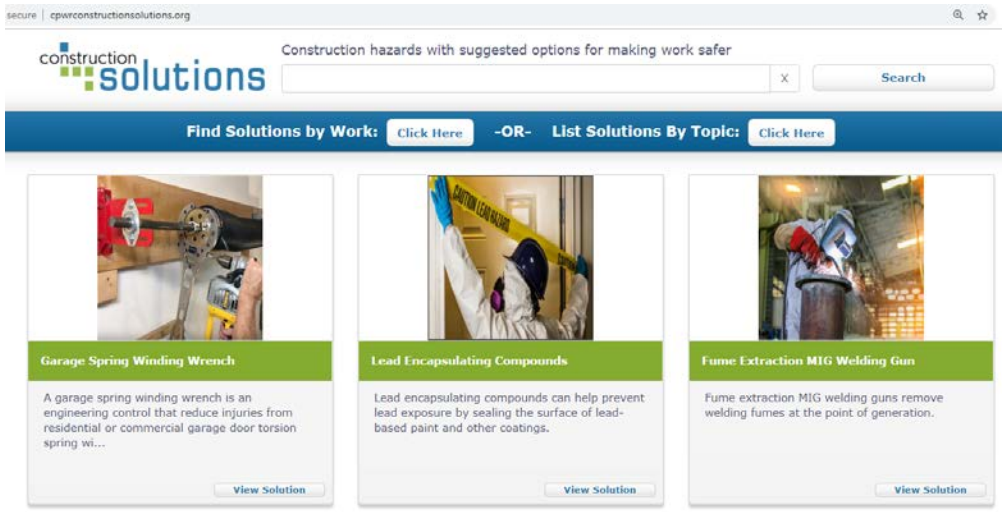
Construction Solutions Overview





Background

- Three states with standards for heat exposure:

- Federal OSHA does not have a specific heat standard
  - They launched a OSHA's Heat Illness Prevention Campaign in 2011

https://www.cpwrconstructionsolutions.org/solution/778/heat-stress-program.html

State Heat Plans VS OSHA Guidance

California

- *"… when the outdoor **temperature** in the work area exceeds 80 degrees Fahrenheit, the employer shall…"*

Minnesota

- Uses WBGT for measuring climate which also measures effect of humidity… but it is **indoor only**

Washington

- "apply to outdoor work environments … at or above an applicable **temperature**…"

TABLE 1. Two-hour time-weighted average permissible heat exposure limits.	
WORK ACTIVITY	**WBGT, °F**
Heavy work	77
Moderate work	80
Light work	86

Minnesota's Work Activity Factor Table

TABLE 1. Outdoor Temperature Action Levels	
Type of clothing	**Outdoor Temperature Action Level**
Nonbreathing clothing, including vapor barrier clothing or PPE such as chemical-resistant suits	52 °F
Double-layer woven clothing including coveralls, jackets, and sweatshirts	77 °F
All other clothing	89 °F

Washington's Clothing Factor Table

https://www.cpwrconstructionsolutions.org/solution/778/heat-stress-program.html

State Heat Plans VS OSHA Guidance

OSHA Guidance

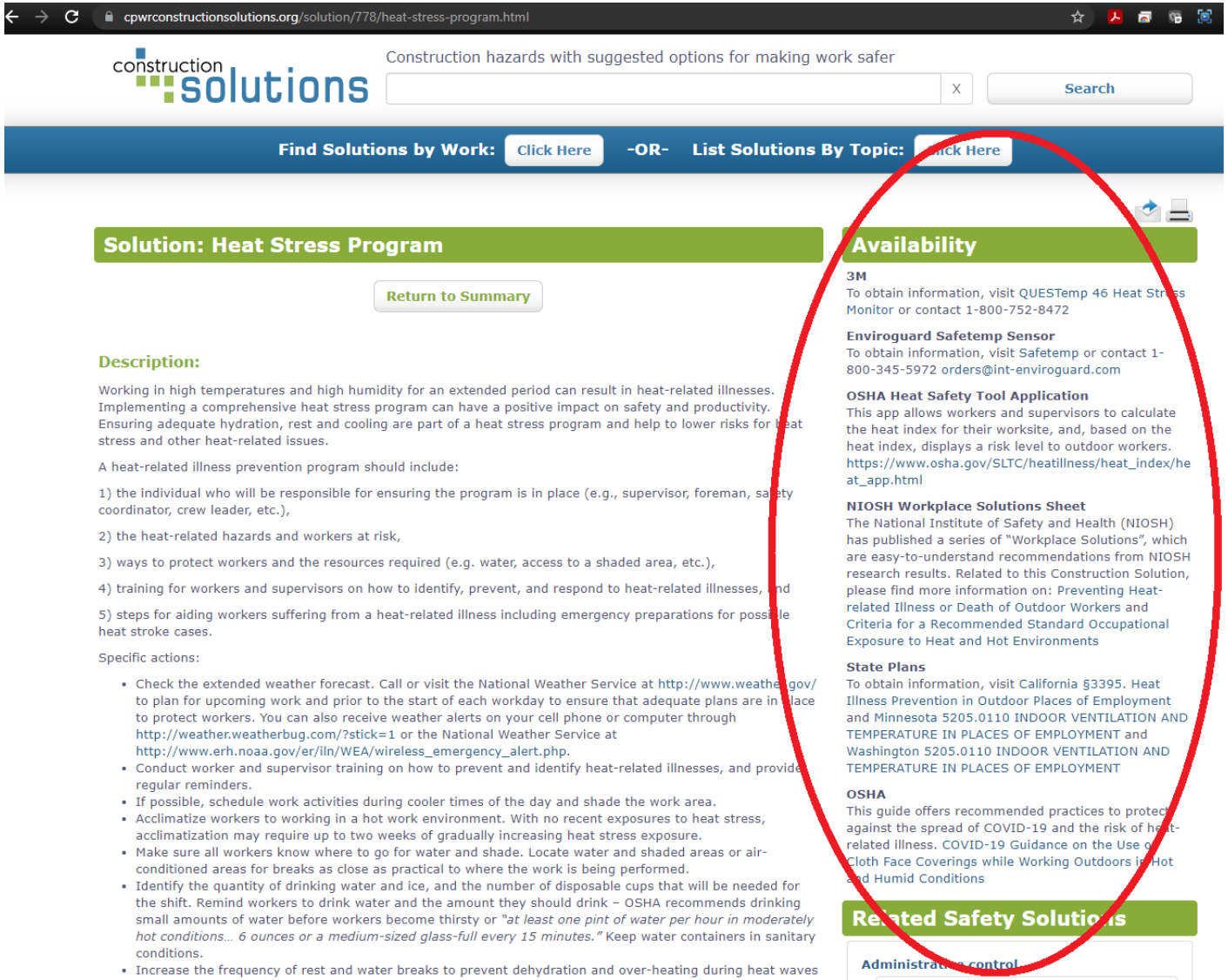
- **Heat Index** combines both air temperature and relative humidity (moisture in air) into a single value.

Heat Index	Risk Level	Protective Measures
Less than 91°F	Lower (Caution)	Basic heat safety and planning
91°F to 103°F	Moderate	Implement precautions and heighten awareness
103°F to 115°F	High	Additional precautions to protect workers
Greater than 115°F	Very High to Extreme	Triggers even more aggressive protective measures

Heat Index Table (photo credit: OSHA)

Heat Index	Risk Level	Protective Measures
<91°F	Lower (Caution)	▪ Provide drinking water ▪ Ensure that adequate medical services are available ▪ Plan ahead for times when heat index is higher, including worker heat safety training ▪ Encourage workers to wear sunscreen ▪ Acclimatize workers **If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.***
91°F to 103°F	Moderate	In addition to the steps listed above: ▪ Remind workers to drink water often (about 4 cups/hour)** ▪ Review heat-related illness topics with workers: how to recognize heat-related illness, how to prevent it, and what to do if someone gets sick ▪ Schedule frequent breaks in a cool, shaded area ▪ Acclimatize workers ▪ Set up buddy system/instruct supervisors to watch workers for signs of heat-related illness **If workers must wear heavy protective clothing, perform strenuous activity or work in the direct sun, additional precautions are recommended to protect workers from heat-related illness.*** ▪ **Schedule activities at a time when the heat index is lower** ▪ **Develop work/rest schedules** ▪ **Monitor workers closely**
103°F to 115°F	High	In addition to the steps listed above: ▪ Alert workers of high risk conditions

https://www.osha.gov/heat/heat-index/protective-measures



cpwrconstructionsolutions.org/solution/778/heat-stress-program.html

construction solutions

Construction hazards with suggested options for making work safer

Search

Find Solutions by Work: Click Here -OR- List Solutions By Topic: Click Here

Solution: Heat Stress Program

Return to Summary

Description:

Working in high temperatures and high humidity for an extended period can result in heat-related illnesses. Implementing a comprehensive heat stress program can have a positive impact on safety and productivity. Ensuring adequate hydration, rest and cooling are part of a heat stress program and help to lower risks for heat stress and other heat-related issues.

A heat-related illness prevention program should include:

1) the individual who will be responsible for ensuring the program is in place (e.g., supervisor, foreman, safety coordinator, crew leader, etc.),

2) the heat-related hazards and workers at risk,

3) ways to protect workers and the resources required (e.g. water, access to a shaded area, etc.),

4) training for workers and supervisors on how to identify, prevent, and respond to heat-related illnesses, and

5) steps for aiding workers suffering from a heat-related illness including emergency preparations for possible heat stroke cases.

Specific actions:

- Check the extended weather forecast. Call or visit the National Weather Service at http://www.weather.gov/ to plan for upcoming work and prior to the start of each workday to ensure that adequate plans are in place to protect workers. You can also receive weather alerts on your cell phone or computer through http://weather.weatherbug.com/?stick=1 or the National Weather Service at http://www.erh.noaa.gov/er/iln/WEA/wireless_emergency_alert.php.
- Conduct worker and supervisor training on how to prevent and identify heat-related illnesses, and provide regular reminders.
- If possible, schedule work activities during cooler times of the day and shade the work area.
- Acclimatize workers to working in a hot work environment. With no recent exposures to heat stress, acclimatization may require up to two weeks of gradually increasing heat stress exposure.
- Make sure all workers know where to go for water and shade. Locate water and shaded areas or air-conditioned areas for breaks as close as practical to where the work is being performed.
- Identify the quantity of drinking water and ice, and the number of disposable cups that will be needed for the shift. Remind workers to drink water and the amount they should drink – OSHA recommends drinking small amounts of water before workers become thirsty or *"at least one pint of water per hour in moderately hot conditions… 6 ounces or a medium-sized glass-full every 15 minutes."* Keep water containers in sanitary conditions.
- Increase the frequency of rest and water breaks to prevent dehydration and over-heating during heat waves

Availability

3M
To obtain information, visit QUESTemp 46 Heat Stress Monitor or contact 1-800-752-8472

Enviroguard Safetemp Sensor
To obtain information, visit Safetemp or contact 1-800-345-5972 orders@int-enviroguard.com

OSHA Heat Safety Tool Application
This app allows workers and supervisors to calculate the heat index for their worksite, and, based on the heat index, displays a risk level to outdoor workers. https://www.osha.gov/SLTC/heatillness/heat_index/heat_app.html

NIOSH Workplace Solutions Sheet
The National Institute of Safety and Health (NIOSH) has published a series of "Workplace Solutions", which are easy-to-understand recommendations from NIOSH research results. Related to this Construction Solution, please find more information on: Preventing Heat-related Illness or Death of Outdoor Workers and Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments

State Plans
To obtain information, visit California §3395. Heat Illness Prevention in Outdoor Places of Employment and Minnesota 5205.0110 INDOOR VENTILATION AND TEMPERATURE IN PLACES OF EMPLOYMENT and Washington 5205.0110 INDOOR VENTILATION AND TEMPERATURE IN PLACES OF EMPLOYMENT

OSHA
This guide offers recommended practices to protect against the spread of COVID-19 and the risk of heat-related illness. COVID-19 Guidance on the Use of Cloth Face Coverings while Working Outdoors in Hot and Humid Conditions

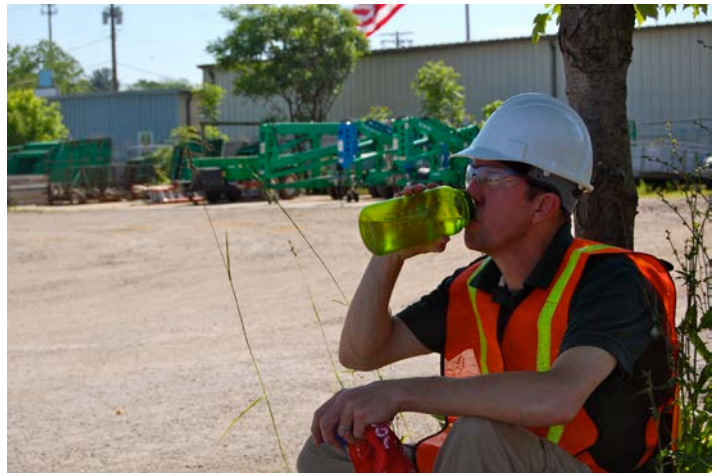
Related Safety Solutions

Administrative control

https://www.cpwrconstructionsolutions.org/solution/778/heat-stress-program.html

Some Key Points to Consider

- Identifying responsible individual for ensuring program is in place.
- Training for workers and supervisors on how to identify, prevent, and respond to heat-related illnesses
- Track the worksite heat conditions daily
- Evaluate work activities and implement plan when conditions trigger
- Steps for aiding workers suffering from a heat-related illness including emergency preparations for possible heat stroke cases



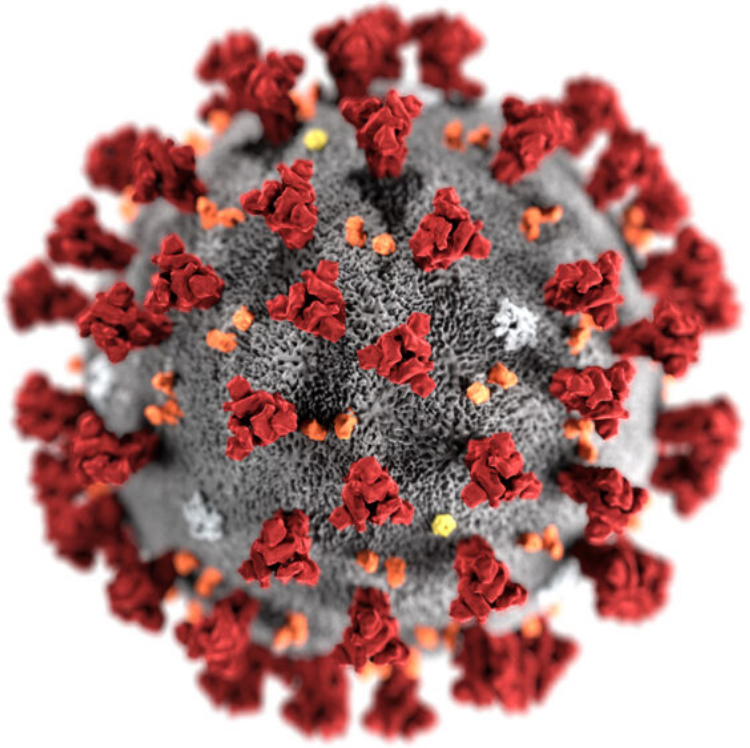
Worker hydrating under shade(photo credit: ELCOSH)

Area Heat Stress Monitor (photo credit: 3M Corporation)

https://www.cpwrconstructionsolutions.org/solution/778/heat-stress-program.html

COVID-19 Impact: Face Coverings in Hot Conditions

- Face coverings (FC) can be uncomfortable during strenuous construction activities
- Some recommended practices can include:
  - Acclimatize while wearing FC
  - Allow workers to remove cloth FC when safe
  - Evaluate face coverings for each worker and consider alternatives
  - Increase frequency of water and rest breaks
  - Use moisture-wicking, materials or light colors FC when working in direct sunlight



https://www.osha.gov/sites/default/files/covid-19-cloth-coverings-outdoor-heat.pdf

How it works

- Per manufacturer, most effective when users' forearms and hands are fully submerged in ice water.

- Lowers
  - Core temperature
  - Heart rate
  - Blood pressure

TEMPERATURE (°F)	IMMERSION TIME (MINUTES)
35° - 44°	2 - 5
45° - 54°	5 - 8
55° - 70°	8 - 12
71° - 80°	12 - 15
80° +	*Add Ice*

Immersion Cooling Equipment (ICE) (photo credit: First Line Technologies)

https://www.cpwrconstructionsolutions.org/solution/989/arm-immersion-cooling-system.html

Efficacy and Potential Application

DeGroot DW, Gallimore RP, Thompson SM, Kenefick RW: Extremity cooling for heat stress mitigation in military and occupational settings. J Therm Biol 2013; 38(6): 305–10

DeGroot DW, Kenefic RW, Sawka, MN: Impact of Arm Immersion Cooling During Ranger Training on Exertional Heat Illness and Treatment Costs. Military Med 2015; 180: 1178-1183

Workers working in hot asphalt conditions (photo credit: ELCOSH)

Real-time Monitoring Through A Connected Jobsite Platform

- Spot-R is a mesh network system for monitoring worker location, equipment utilization and safety incidents
- Proprietary technology for better location accuracy
- Provides real-time data that can improve safety through preliminary risk identification.

Spot-R Mesh Network System (photo credit: Triax Technologies)

https://www.cpwrconstructionsolutions.org/solution/1028/real-time-monitoring-through-a-connected-jobsite-platform.html

Safety Applications for Lone Workers

- **Lone workers** are those who work by themselves without close or direct supervision

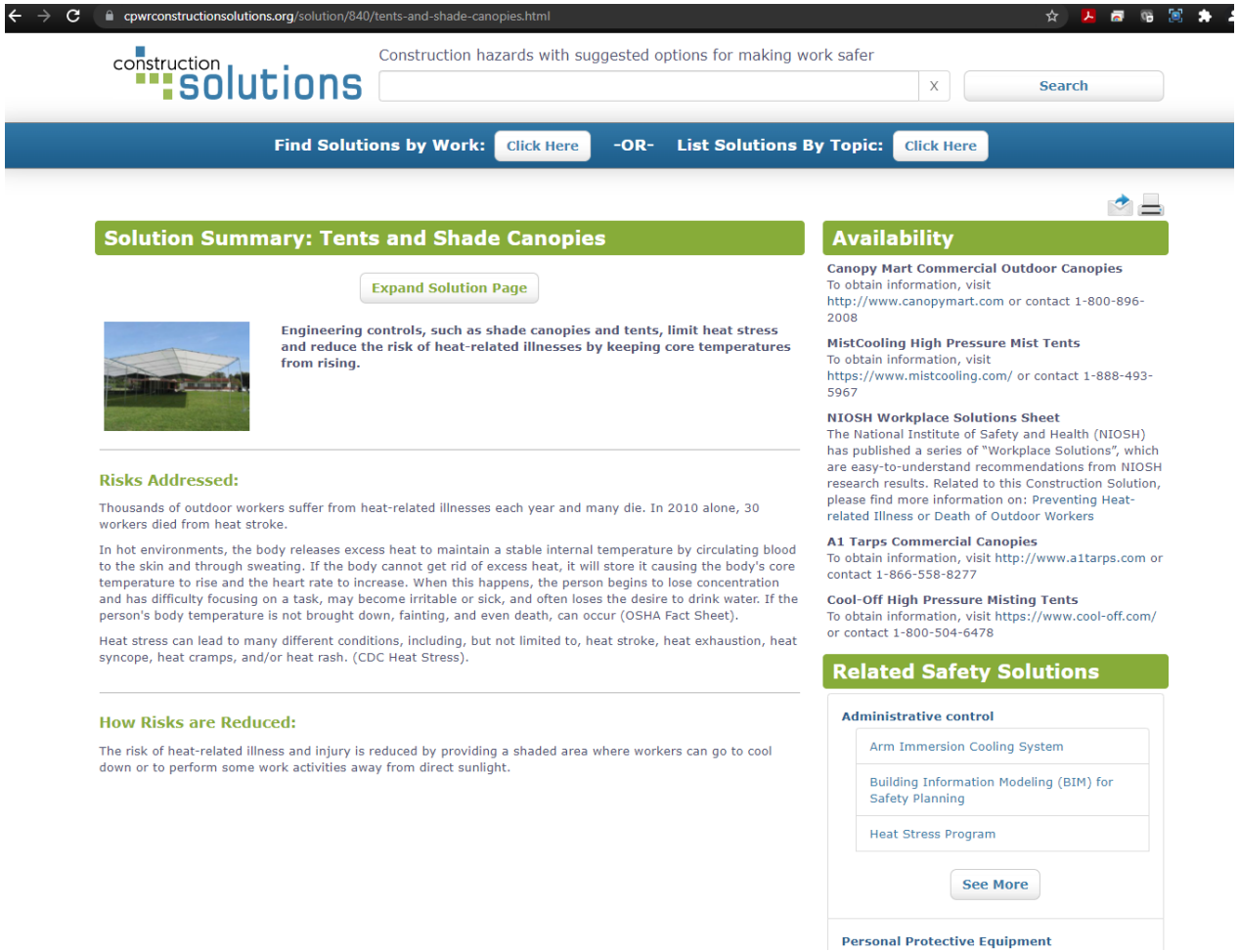
- Risks for lone workers include
  - Lack of communication with supervisors and coworkers
  - Inadequate provision of first aid arising from emergency accidents
  - Sudden illness
  - Inadequate provision of rest, hygiene, and welfare facilities

- OSHA states that employers should check on lone workers “at regular intervals”
  - Safety applications can help with check-in procedures between lone workers and supervisors

(photo credit: ELCOSH)

https://www.cpwrconstructionsolutions.org/solution/1009/safety-applications-for-lone-workers.html

Tents, Shades and Canopies



https://www.cpwrconstructionsolutions.org/solution/840/tents-and-shade-canopies.html
https://www.cpwrconstructionsolutions.org/solution/841/fans-misters-and-air-conditioning-units.html
https://www.cpwrconstructionsolutions.org/solution/823/cooling-clothing-and-personal-protective-equipment.html

Fans, Misters and Air Conditioning Units

Misting Fan (photo credit: Big Fogg)

A portable AC unit (photo credit: MovinCool)

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https://www.cpwrconstructionsolutions.org/solution/823/cooling-clothing-and-personal-protective-equipment.html

Cooling Clothing and PPE

Cooling Vest accommodating female anthropometry (photo credit: Glacier Tek)

Neck Tie and Neck Wrap (photo credit: Arctic Heat USA)

High Visibility Cooling Vest (photo credit: Glacier Tek)

https://www.cpwrconstructionsolutions.org/solution/840/tents-and-shade-canopies.html
https://www.cpwrconstructionsolutions.org/solution/841/fans-misters-and-air-conditioning-units.html
https://www.cpwrconstructionsolutions.org/solution/823/cooling-clothing-and-personal-protective-equipment.html

CPWR Research to Practice (r2p) Resources on Working in Hot Weather

Rosa Greenberg, MPH

Research Assistant, r2p

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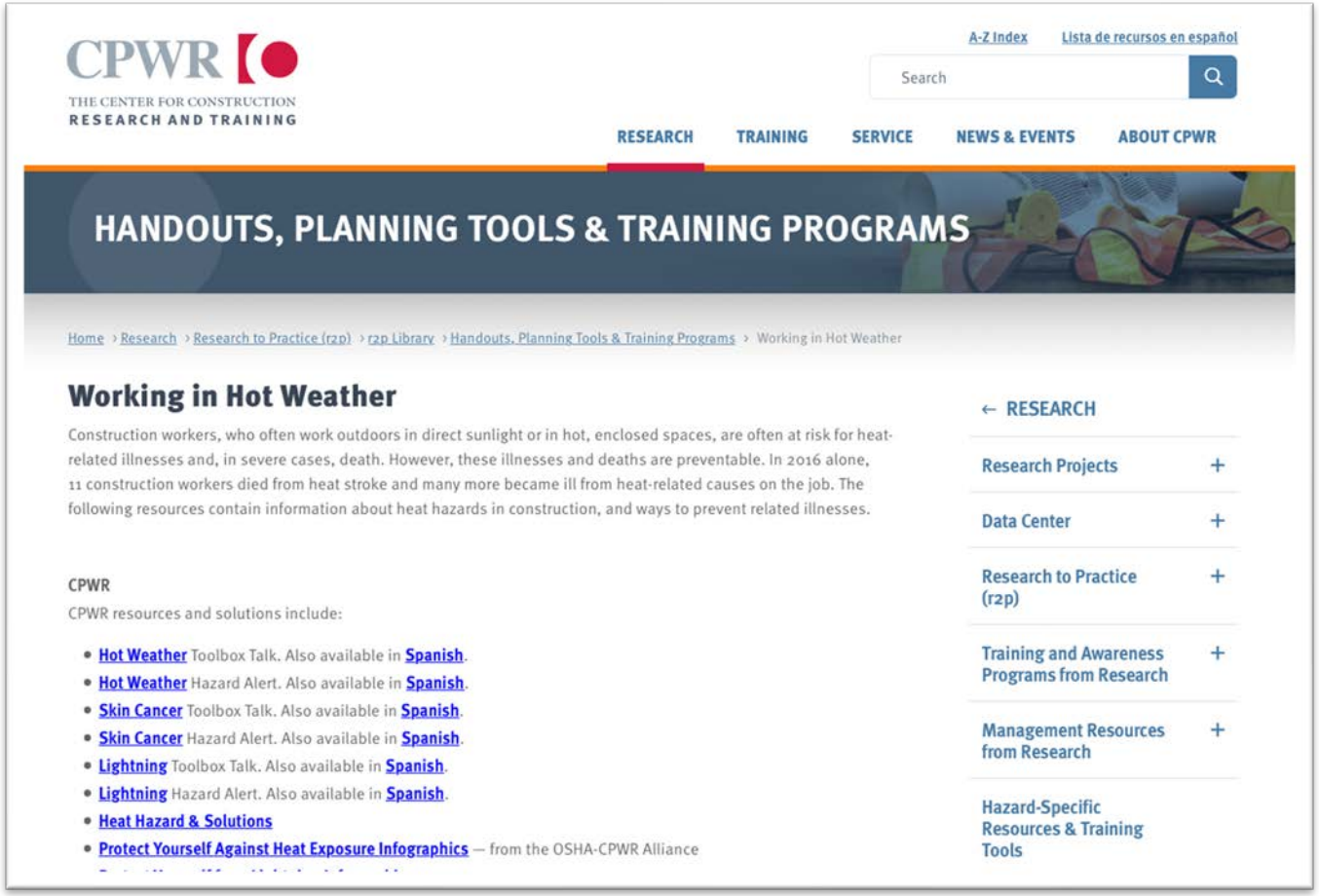
CPWR Resources on Working in Hot Weather

- Key topics
  - Hot environments
  - Skin cancer
  - Lightning
  - Disaster preparedness
- Formats
  - Toolbox talks
  - Hazard alert cards
  - Infographics
  - Phone-based apps
  - Training materials
- Language access
  - English and Spanish



https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/working-in-hot-weather/

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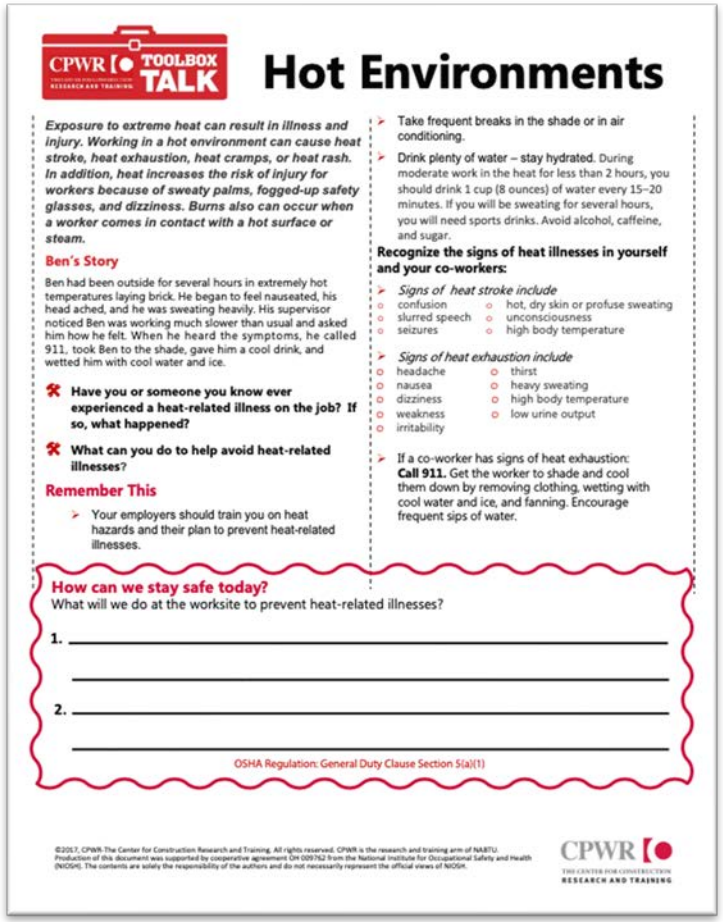
Toolbox Talks



Hot Environments

Exposure to extreme heat can result in illness and injury. Working in a hot environment can cause heat stroke, heat exhaustion, heat cramps, or heat rash. In addition, heat increases the risk of injury for workers because of sweaty palms, fogged-up safety glasses, and dizziness. Burns also can occur when a worker comes in contact with a hot surface or steam.

Ben's Story

Ben had been outside for several hours in extremely hot temperatures laying brick. He began to feel nauseated, his head ached, and he was sweating heavily. His supervisor noticed Ben was working much slower than usual and asked him how he felt. When he heard the symptoms, he called 911, took Ben to the shade, gave him a cool drink, and wetted him with cool water and ice.

- **Have you or someone you know ever experienced a heat-related illness on the job? If so, what happened?**
- **What can you do to help avoid heat-related illnesses?**

Remember This

- Your employers should train you on heat hazards and their plan to prevent heat-related illnesses.
- Take frequent breaks in the shade or in air conditioning.
- Drink plenty of water – stay hydrated. During moderate work in the heat for less than 2 hours, you should drink 1 cup (8 ounces) of water every 15–20 minutes. If you will be sweating for several hours, you will need sports drinks. Avoid alcohol, caffeine, and sugar.

Recognize the signs of heat illnesses in yourself and your co-workers:

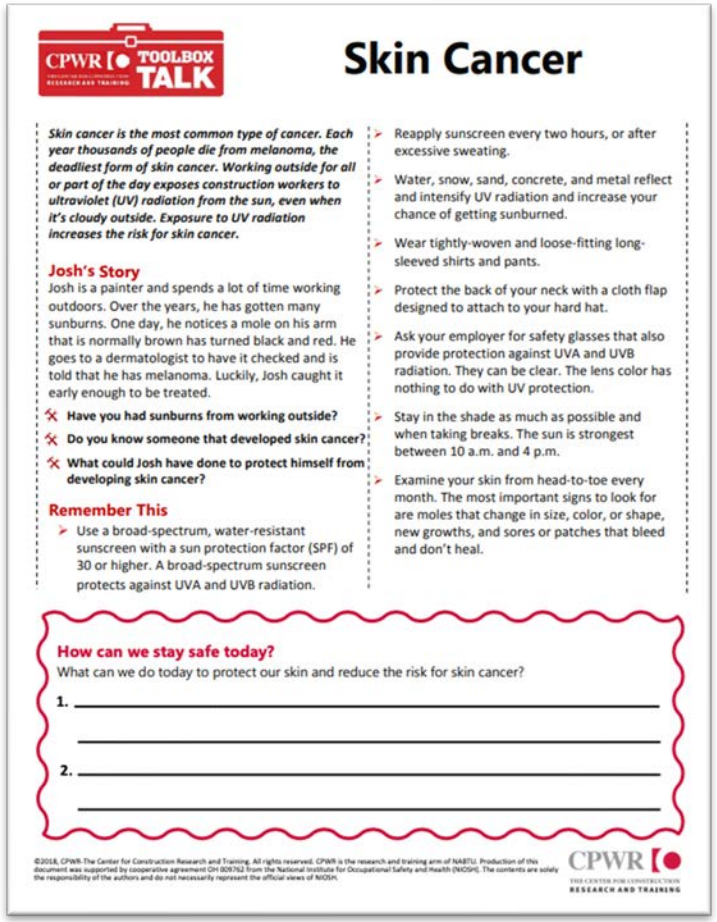
- *Signs of heat stroke include*
  - confusion
  - slurred speech
  - seizures
  - hot, dry skin or profuse sweating
  - unconsciousness
  - high body temperature
- *Signs of heat exhaustion include*
  - headache
  - nausea
  - dizziness
  - weakness
  - irritability
  - thirst
  - heavy sweating
  - high body temperature
  - low urine output
- If a co-worker has signs of heat exhaustion: **Call 911.** Get the worker to shade and cool them down by removing clothing, wetting with cool water and ice, and fanning. Encourage frequent sips of water.

How can we stay safe today?

What will we do at the worksite to prevent heat-related illnesses?

1. _____
2. _____

OSHA Regulation: General Duty Clause Section 5(a)(1)



Skin Cancer

Skin cancer is the most common type of cancer. Each year thousands of people die from melanoma, the deadliest form of skin cancer. Working outside for all or part of the day exposes construction workers to ultraviolet (UV) radiation from the sun, even when it's cloudy outside. Exposure to UV radiation increases the risk for skin cancer.

Josh's Story

Josh is a painter and spends a lot of time working outdoors. Over the years, he has gotten many sunburns. One day, he notices a mole on his arm that is normally brown has turned black and red. He goes to a dermatologist to have it checked and is told that he has melanoma. Luckily, Josh caught it early enough to be treated.

- **Have you had sunburns from working outside?**
- **Do you know someone that developed skin cancer?**
- **What could Josh have done to protect himself from developing skin cancer?**

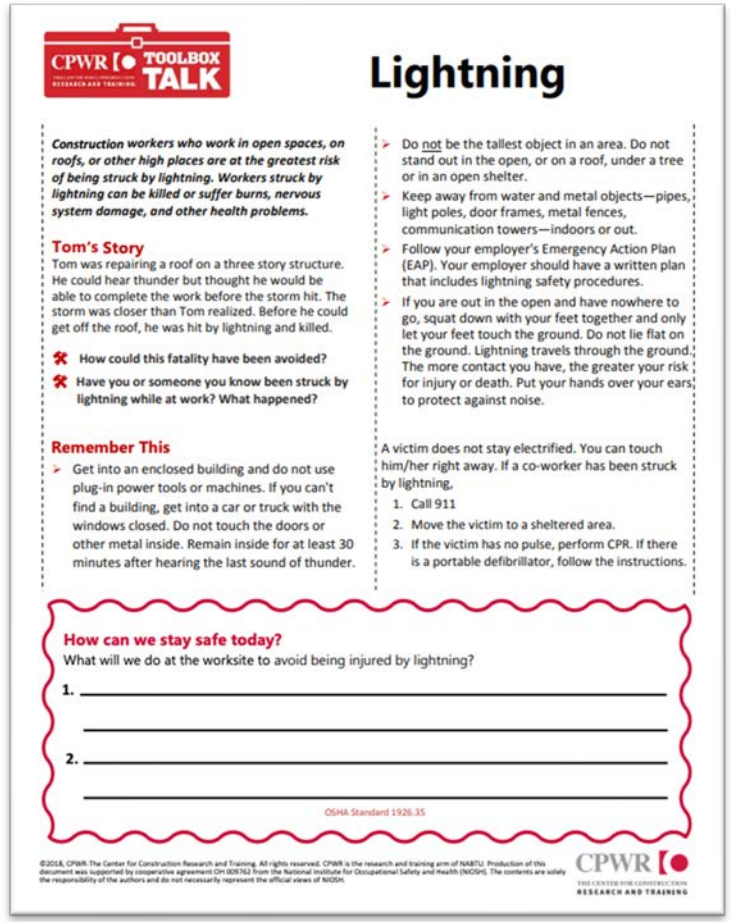
Remember This

- Use a broad-spectrum, water-resistant sunscreen with a sun protection factor (SPF) of 30 or higher. A broad-spectrum sunscreen protects against UVA and UVB radiation.
- Reapply sunscreen every two hours, or after excessive sweating.
- Water, snow, sand, concrete, and metal reflect and intensify UV radiation and increase your chance of getting sunburned.
- Wear tightly-woven and loose-fitting long-sleeved shirts and pants.
- Protect the back of your neck with a cloth flap designed to attach to your hard hat.
- Ask your employer for safety glasses that also provide protection against UVA and UVB radiation. They can be clear. The lens color has nothing to do with UV protection.
- Stay in the shade as much as possible and when taking breaks. The sun is strongest between 10 a.m. and 4 p.m.
- Examine your skin from head-to-toe every month. The most important signs to look for are moles that change in size, color, or shape, new growths, and sores or patches that bleed and don't heal.

How can we stay safe today?

What can we do today to protect our skin and reduce the risk for skin cancer?

1. _____
2. _____



Lightning

Construction workers who work in open spaces, on roofs, or other high places are at the greatest risk of being struck by lightning. Workers struck by lightning can be killed or suffer burns, nervous system damage, and other health problems.

Tom's Story

Tom was repairing a roof on a three story structure. He could hear thunder but thought he would be able to complete the work before the storm hit. The storm was closer than Tom realized. Before he could get off the roof, he was hit by lightning and killed.

- **How could this fatality have been avoided?**
- **Have you or someone you know been struck by lightning while at work? What happened?**

Remember This

- Get into an enclosed building and do not use plug-in power tools or machines. If you can't find a building, get into a car or truck with the windows closed. Do not touch the doors or other metal inside. Remain inside for at least 30 minutes after hearing the last sound of thunder.
- Do not be the tallest object in an area. Do not stand out in the open, or on a roof, under a tree or in an open shelter.
- Keep away from water and metal objects—pipes, light poles, door frames, metal fences, communication towers—indoors or out.
- Follow your employer's Emergency Action Plan (EAP). Your employer should have a written plan that includes lightning safety procedures.
- If you are out in the open and have nowhere to go, squat down with your feet together and only let your feet touch the ground. Do not lie flat on the ground. Lightning travels through the ground. The more contact you have, the greater your risk for injury or death. Put your hands over your ears to protect against noise.

A victim does not stay electrified. You can touch him/her right away. If a co-worker has been struck by lightning,

1. Call 911
2. Move the victim to a sheltered area.
3. If the victim has no pulse, perform CPR. If there is a portable defibrillator, follow the instructions.

How can we stay safe today?

What will we do at the worksite to avoid being injured by lightning?

1. _____
2. _____

OSHA Standard 1926.35

https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/toolbox-talks/

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Hazard Alert Cards

- Available for online download (PDF format) or print- to-order
- Printed cards are folded to be pocket-sized (3.5” by 5.5”). They are water-resistant and made to last
- Order cards here: https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/hazard-alert-cards/

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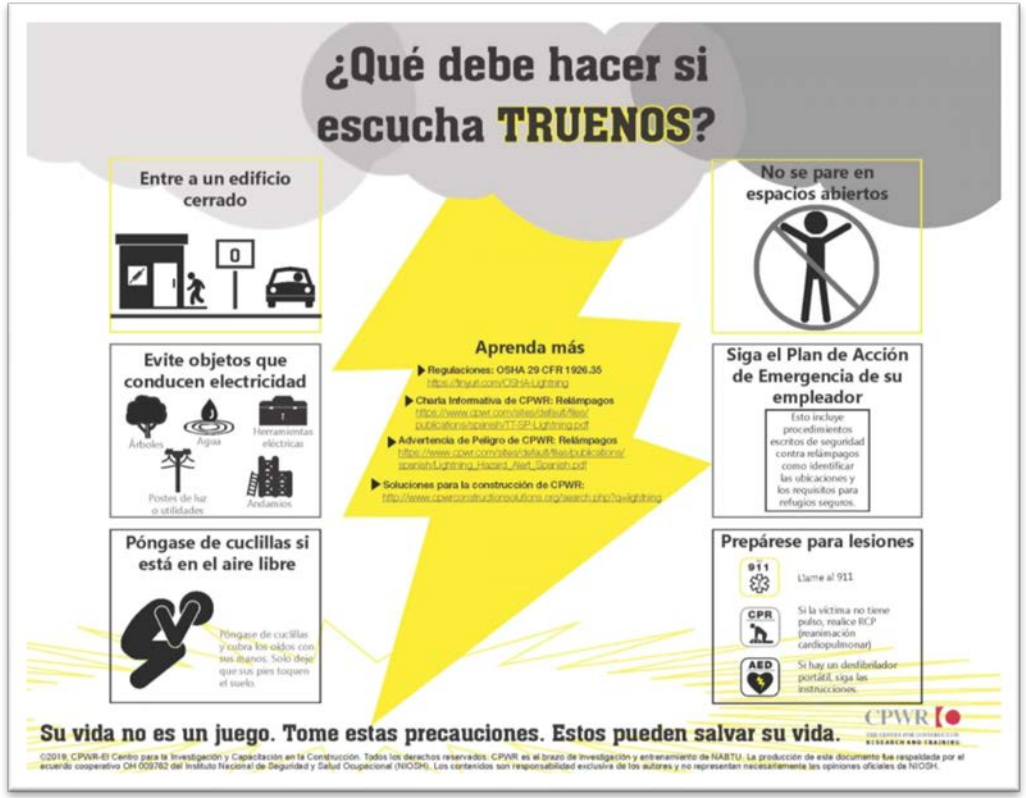
CPWR Lighting Infographics



https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/working-in-hot-weather/protect-yourself-against-heat-exposure/

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CPWR-NIOSH-NORA Heat and Falls Infographic

https://stopconstructionfalls.com/infographics/

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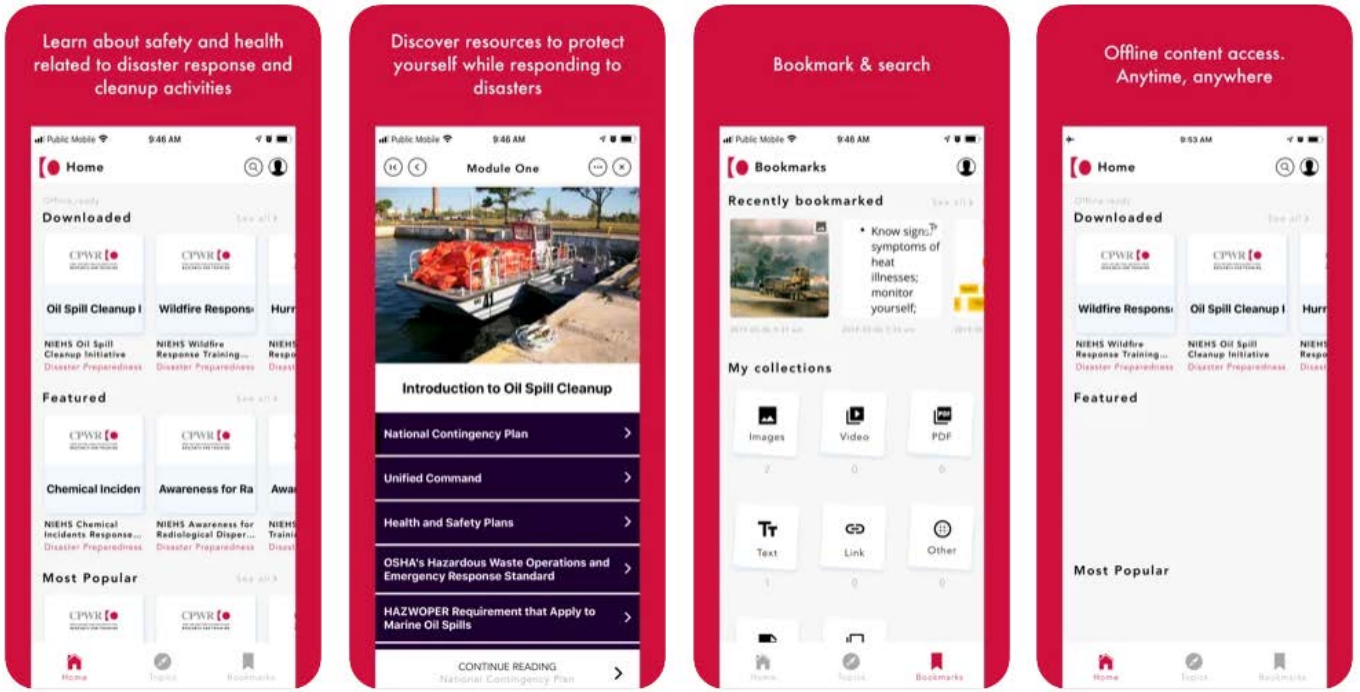
CPWR-NIEHS Disaster Preparedness App

- Phone-based, interactive mobile application that provides tailored awareness-level resources on disasters and related topics
- Available for iOS and Android
- Download here: https://tools.niehs.nih.gov/wetp/index.cfm?id=2536



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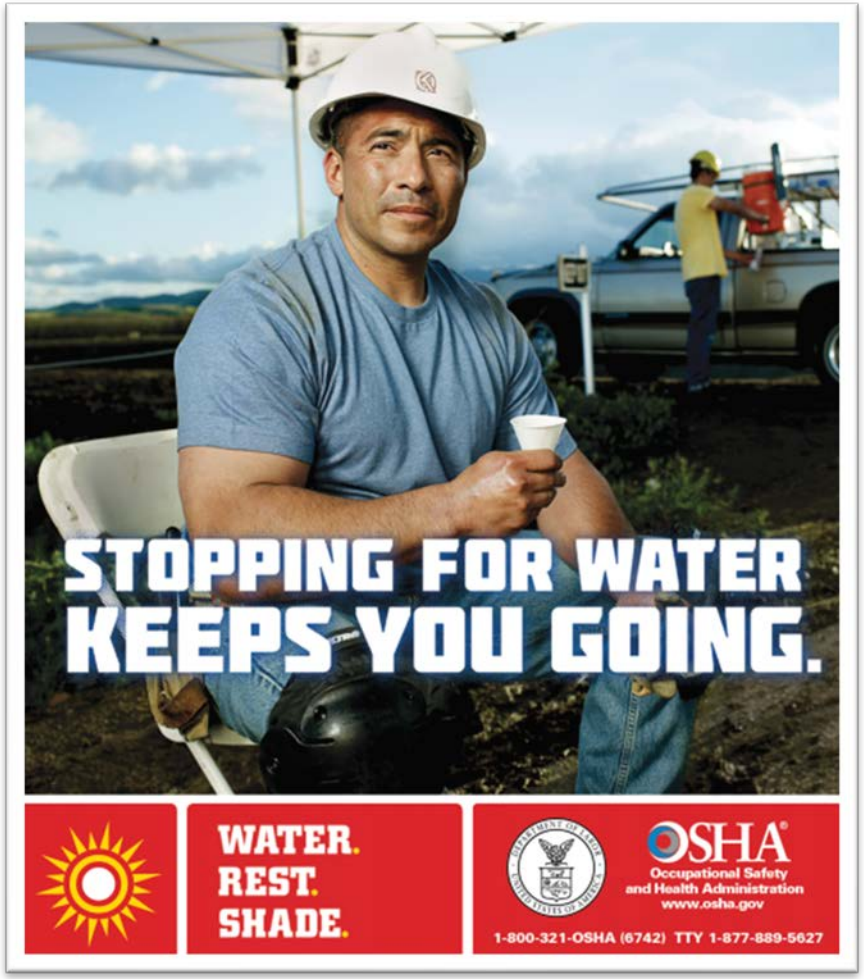
OSHA's Heat Illness Prevention Campaign

- Goal is to educate employers and workers on the dangers of working in the heat
- Launched in 2011
- Provides training guides, outreach, informational sessions, publications, social media campaigns, media appearances
- Learn more and access resources: https://www.osha.gov/heat



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OSHA-CPWR Alliance Heat Exposure Infographics

https://www.cpwr.com/research/research-to-practice-r2p/r2p-library/other-resources-for-stakeholders/working-in-hot-weather/protect-yourself-against-heat-exposure/

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Thank you! Questions?

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