State of Alaska Epidemiology **Bulletin**

Department of Health
Heidi Hedberg, Commissioner
Robert Lawrence, MD, Chief Medical Officer

3601 C Street, Suite 540
Anchorage, Alaska 99503

Division of Public Health
Lindsey Kato, MPH, Director

https://health.alaska.gov/dph/Epi
24 Hour Emergency (800) 478-0084
Local (907) 269-8000

Editors:
Joe McLaughlin, MD, MPH
Jared Parrish, PhD, MS

Bulletin No. 12
October 14, 2024

Cold Exposure Injuries among People without Housing — Alaska, 2012–2021

Background

Alaska's climate poses considerable risk for cold-induced injuries. Hypothermia, resulting from prolonged cold exposure, can lead to systemic dysfunction and death. Frostbite, a localized injury from freezing skin, can result in tissue damage and necrosis.[1] People without housing (PWH) are particularly vulnerable to cold exposure injuries and associated complications.[2] This *Bulletin* describes the rate of cold exposure injuries among PWH, compares their risk to that of the housed population, and estimates the percentage of cold exposure injuries connected to being unhoused.

Methods

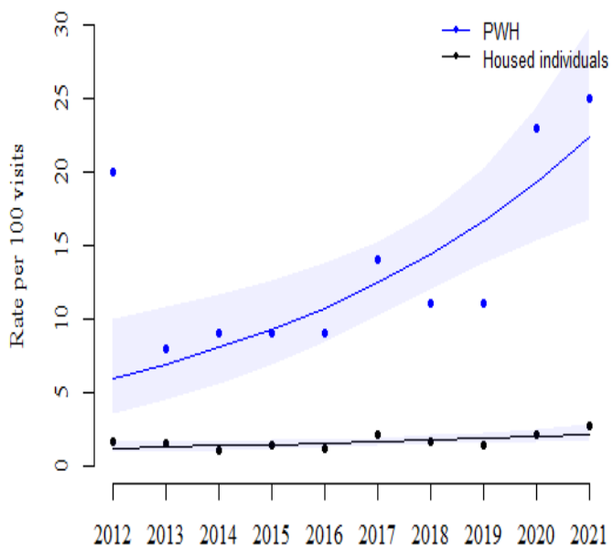
Alaska Trauma Registry (ATR) data from 2012–2021 were used to identify cold exposure injuries and housing status among injury hospitalizations. Rates of cold exposure injuries per 100 injury hospitalizations were calculated and stratified by housing status. Trends in the rate of cold exposure injuries over the 10-year-period were assessed with quasi-Poisson regression. Cold exposure injuries were compared between PWH and housed individuals, controlling for year, age, race, gender, and substance/alcohol use, through logistic regression with results presented as odds ratios (OR).

Injury epidemiologists reviewed medical record notes of cold exposure injuries in the ATR to identify and extract contributing factors. They assessed whether being unhoused was the principle underlying factor in the cold exposure injury or if the injury was associated with recreation, subsistence, or other activities.

Results

Relative to housed individuals, PWH experienced cold exposure injuries at a progressively higher rate from 2012–2021 (Figure 1).

Figure 1. Annual Rates of Cold Exposure Injuries per 100 Visits, and Quasi-Poisson Regression Estimates — Alaska, 2012–2021



During 2012–2021, the rate of cold exposure injuries among PWH was 13.8 per 100 injury hospitalizations (147 / 1,062), and the rate of cold exposure injuries among housed individuals was 1.6 per 100 visits (576 / 35,294). Among hospitalizations resulting from injuries recorded in the ATR, after controlling for year of injury, age, race, gender, and substance/alcohol use, the odds of a cold exposure injury among PWH were 8.3 times those of housed individuals.

After review of ATR medical record notes, being unhoused was identified as the principle underlying factor in 23.3% (132/566) of all cold exposure injuries.

Discussion

After controlling for known risk factors, the odds of sustaining a cold exposure injury during 2012–2021 were significantly higher among PWH compared to housed individuals. Furthermore, the principle underlying factor that contributed to nearly a quarter of all cold exposure injuries resulting in hospitalization was from being unhoused. Lastly, the rate of cold exposure injuries among PWH has increased in recent years. Possible contributors to this increase include colder than average winters, increased snowfall (particularly during 2020 and 2021), and improved case detection.[3]

This analysis might have undercounted the number of PWH in the ATR, as some people might be disinclined to disclose their housing status.

Preventing cold-induced injuries among PWH includes a combination of long-term support, sustained community outreach, and proactive emergency measures during cold winter weather. Such measures include shelter capacity (and access), public warming centers, street outreach programs to distribute warm clothes and sleeping bags, mobile health clinics, transportation assistance, education (raising awareness about prevention, signs/symptoms, and first aid), mental health and substance use services, preventive health care (including vaccination against pathogens that might exacerbate injury risk), and long-term housing solutions. These interventions may help decrease cold exposure morbidity among PWH, who are at elevated risk due to their living conditions.[4]

References

1. Persitz, J., Essa, A., Ner, E. B., Assaraf, E., & Avisar, E. (2022). Frostbite of the extremities – Recognition, evaluation and treatment. Injury, 53(10), 3088–3093. https://doi.org/10.1016/j.injury.2022.07.040
2. Endorf, F. W., & Nygaard, R. M. (2021). Social determinants of poor outcomes following frostbite injury: A study of the National Inpatient sample. Journal of Burn Care & Research, 42(6), 1261–1265.
3. *Anchorage AK Recent annual temperatures, rain, snow - current results*. (n.d.). https://www.currentresults.com/Yearly-Weather/USA/AK/Anchorage/recent-annual-anchorage-temperature-precipitation.php
4. Zhang, P., Bassil, K., Gower, S., Katic, M., Kiss, A., Gogosis, E., & Hwang, S. W. (2018). Cold-related injuries in a cohort of homeless adults. *Journal of Social Distress and Homelessness*, *28*(1), 85–89. https://doi.org/10.1080/10530789.2018.1523103

(Contributed by: Riley Fitting, MPH, Alaska Section of Chronic Disease Prevention and Health Promotion; Julie Morris, Ph.D., Alaska Native Tribal Health Consortium)