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Effect of the Work Week on Demographics of Heat-Related Illness Patients in Syndromic Surveillance

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Objective

To describe the differences in patient populations between those who seek care for heat exposure during the work week and those who seek care during the weekend.

Introduction

As global temperatures increase, so too does interest in the effect of climate change on the population's health. 2016 represented the hottest year on record globally and well above the 20th century average in Virginia.[1,2] With large-scale climate change comes an increase in severe weather patterns, including heat waves.[3] Heat waves can have immense health impacts on a community, including heat stroke, heat exhaustion, and dehydration.

Previous analyses of emergency department (ED) data indicate that certain populations – specifically males and rural residents – are more at risk for heat-related illness.[4,5] None of these studies, however, looked for temporal relationships between the population seeking care and the day of the week. Syndromic surveillance data can be used to further describe those communities affected by heat exposure as well as identify any temporal patterns in visits.

Methods

The Virginia Department of Health (VDH) receives data from 148 EDs and urgent care centers (UCCs) as part of its syndromic surveillance program. During regular surveillance of a heat wave, it was observed that males made up a larger proportion of heat-related visits during the week than they did over the weekend. Data received on visits between January 1, 2015 and July 31, 2017 were used for a retrospective, cross-sectional analysis of demographic risk factors for heat-related illness. During this time frame, 6,739 visits were identified using the September 2016 Council for State and Territorial Epidemiologists (CSTE) syndrome definition for heat-related illness.[6]

The effect of various demographics and visit factors on weekday heat exposure was measured using chi-squared tests. The variables in question included sex, race, ethnicity, rural vs. urban residence, and age group. Odds ratios, 95% confidence intervals, and *p*-values were reported for these analyses. Analyses were conducted using SAS 9.3 with a significance level of 0.05.

Results

Of the total 6,739 visits identified for heat-related illness, 4,782 (71.0%) occurred during the work week and 1,957 (29.0%) occurred on the weekend. The odds of seeking care for heat-related illness on a weekday were 1.84 times higher for males than for females, $p < 0.001$, 95% CI [1.65, 2.06]. Blacks or African Americans were more likely to seek care than whites during the work week with an odds ratio of 1.38, $p < 0.001$. 95% CI [1.20, 1.57]. Adults aged 18-64 years were more likely to seek care during the work week than both children aged 0-17 years (OR = 1.61, $p < 0.001$, 95% CI [1.37, 1.89]) and adults aged 65 years or older (OR = 1.36, $p < 0.001$, 95% CI [1.17, 1.58]). No significant relationship between ethnicity or rural vs. urban residence and work week visits for heat-related illness was observed.

Conclusions

The patient population that seeks care for heat-related illness differs between the work week and the weekend. These data suggest the presence of potential mediators or confounders that make males, blacks or African Americans, and adults aged 18-64 more likely to suffer from heat-related illness during the week. Collecting data on patients' health behaviors, risk factors, and occupation could further elucidate this relationship. Syndromic surveillance, however, does not include the level of detail needed to investigate anything beyond basic demographics.

With an increase in the intensity and frequency of heat waves on the horizon, the issue of heat-related illness is one of growing public health concern. Syndromic surveillance data can be used to describe patterns in the patient population most at risk. Public health action is then needed to protect these communities while further research explores the relationships in greater depth.

Keywords

Heat-related illness; Syndromic Surveillance; Temporal; Work week

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