

Study analyzes 2006 California heat wave's substantial effect on morbidity

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An extreme heat wave affected much of the state of California during mid- to late July 2006, breaking daily maximum temperature records in many regions of the State. A study conducted by researchers from the Mailman School of Public Health, the Natural Resources Defense Council, and the California Department of Public Health reports that the 2006 California heat wave had a substantial impact on morbidity throughout California, resulting in increased hospitalizations and emergency department (ED) visits.

By better understanding these impacts and population vulnerabilities, local communities can improve heat wave preparedness to cope with global warming in the future. Findings from the study, "The 2006 California Heat Wave: Impacts on Hospitalizations and Emergency Department Visits" are published in the January 2009 issue of *Environmental Health Perspectives*.

"In the 2006 California heat wave, we found dramatic increases across a wide range of morbidities statewide, with excess ED visits far outpacing excess hospitalizations," said Kim Knowlton, DrPH, assistant clinical professor of Environmental Health Sciences at the Mailman School of Public Health, and senior scientist in the Health & Environment Program at the Natural Resources Defense Council. It was reported that 501,951 ED visits were made during the 15 July to 1 August 2006 heat wave period compared with 485,785 visits over the same number of days in the non-heat-wave period. "The dramatic effect of the 2006 heat wave on ED visits suggests that advance preparedness efforts should be

undertaken to allow rapid adaptability when extreme weather events occur," suggests Dr. Knowlton.

While previous studies have reported different patterns of mortality, one of the goals of the Mailman School study was to learn if age or race/ethnicity played a role in morbidity and led people to seek medical attention, thus providing opportunities for early intervention and public education to prevent heat-related illness and death. The researchers also intended to learn which other illnesses were exacerbated by the California heat waves and found there were significant increases reported for acute renal failure, cardiovascular diseases, diabetes, electrolyte imbalance, and nephritis.

"Because the statewide heat wave exposed a very large population, these effects translate to a significant public health burden," observes Dr. Knowlton. "The present study offers information about the short-term increases in patient demand during heat waves as well as the range of illnesses that may arise, and shows substantial regional variability."

In addition to older residents with recognized heat vulnerabilities, children showed significant elevated risk for some morbidities.

"Strategies to prevent heat-related illness during extreme heat events should include messages and information dissemination targeted toward parents, caregivers, and other guardians of young children, continued outreach to the elderly and especially to socially isolated individuals, and geographically targeted messages about health risks of heat exposure and heat stress," notes Dr. Knowlton.

To reduce morbidity from some of the more severe heat-related conditions, interventions include increased fluid intake and advising temporarily decreased physical activity. "Culturally and socially appropriate messaging through public service announcements—for example, encouraging at-risk groups to access cooling centers, and

ensuring availability of transportation to those centers—before a heat wave starts can save lives," states Dr. Knowlton. "Expanded education of at-risk groups and their caregivers on how to detect signs and symptoms and prevent heat-related illness is also needed."

"This research sends a critical message that education needs to emphasize the importance of seeking immediate medical assistance for heat-related illness, because these conditions often progress very rapidly and therefore urgently require professional medical intervention," says Dr. Knowlton.

Source: Columbia University's Mailman School of Public Health

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