STATE ENVIRONMENTAL HEALTH INDICATORS COLLABORATIVE (SEHIC)
CLIMATE CHANGE INDICATORS

Indicator: **CC1: Heat related health outcomes**

Measure(s): **CC1.3: Annual number and rate of heat related emergency department (ED) visits**

MEASURE DESCRIPTION

CC1.3: Annual number and rate of heat related ED visits	
Last updated:	June 18, 2009
Measurement units:	Number and rate per 100,000 population
Geographic scale:	Statewide
Time scale:	Annual, 1999-2005
Significance/background:	According to the published literature, climate change is projected to increase the number of heat related deaths between 47 and 95% in NY by 2050 and 2-7 fold for California by 2090 with partial reduction in out years due to adaptation (Knowlton 2007, Hayhoe 2004). The projections cited are for mortality only however one would expect that heat-related emergency department visits where the patient is not hospitalized would also increase. Additionally while the projections are specific to certain locales, it is reasonable to expect other regions to incur similar climate penalties. Further, the U.S. population over age 65 is projected to be 20% by 2030 (over 50 million people) (Day 1996). Older adults are physiologically and socially more vulnerable (Khosla and Guntupalli, 1999; Klinenberg, 2002) to hot weather and heat waves. The actual emergency department visits will vary by region as climate and population characteristics vary.
Rationale:	Tracking the number of heat related emergency department visits may assist public health professionals to design targeted adaptation and response options for their specific regional requirements.
Data resources:	Agency for Healthcare Research and Quality (AHRQ) HCUPnet: http://hcupnet.ahrq.gov/
Limitations:	Annual counts for many states are too small for producing stable rate calculations. Other options for presenting rates are to combine years or states (for example, by region). The first-listed diagnosis is the diagnosis that appears first on the record. For ED visits that result in hospital admission, this is the principal diagnosis (see below). For ED visits that result in discharge (no hospital admission), it may not be the principal diagnosis but may simply be the diagnosis that appears first on the record. All-listed diagnoses include the first-listed diagnosis plus additional conditions that coexist at the time of admission, or that develop during

	the stay, and which have an effect on the treatment or length of stay in the hospital.
Related indicators (from other projects):	
Recommendations:	

References

Day, J.C., 1996: *Population Projections of the United States by Age, Sex, Race, and Hispanic Origin: 1995- 2050.* U.S. Bureau of the Census, Current Poulation Reports, P25-1130, U.S. Government Printing Office, Washington, D.C.

Hayhoe, K. D. Cayan, C.B. Field, P.C. Frumhoff, E.P Maurer, N.L. Miller, *et al.*, 2004: Emissions pathways, climate change and impacts on California. *Proceedings of the National Academy of Sciences of the United States of America,* **101(34)**, 12,422-12,427.

Khosla, R. and K.K. Guntupalli, 1999: Heat-related illnesses. *Critical Care Clinics,* **15(2)**, 251-263.

Klinenberg, E., 2002: *Heat Wave: A Social Autopsy of Disaster in Chicago.* The University of Chicago Press, Chicago.

Knowlton, K., B. Lynn, R. Goldberg, C. Rosenzweig, C. Hogrefe, J. Rosenthal, *et al.*,2007: Projecting heat-related mortality impacts under a changing climate in the New York City region. *American Journal of Public Health,* **97(11)**, 2028-2034.

HOW-TO GUIDE: CC1.3 Annual number and rate of heat related ED visits

1. Go to the AHRQ web site: **http://hcupnet.ahrq.gov/**
2. On this first screen, select **State Statistics on All ED Visits** under the section **Statistics on Emergency Department Use**.
3. On the next screen, select **All ED Visits** for the type of visits/stays you are interested in.
4. On the next screen, click on the arrow under 2005 for your state (if it is one of the states with ED data on HCUPnet).
5. On the next screen, click on the third option **Specific diagnoses by ICD-9-CM**.
6. On the next screen, select **All-listed diagnoses**.
7. On the next screen, you will see a box for entering specific codes. In this box, type **992.0-992.9** and check the option for statistics for **All codes combined**.
8. For the outcome options on the next screen, choose **Number of discharges**.
9. For patient and hospital characteristics on the next screen, select **All patients in all facilities**.
10. The next screen is the results screen. This screen shows the total number of heat hospitalizations for the year you selected for your state.
11. To calculate the annual rates per 100,000 population, obtain the total population for your state for the year of interest from census data. Divide the number of heat related hospitalizations by the total population and then multiply by 100,000.