## MEASURE DESCRIPTION

<table>
<thead>
<tr>
<th>Last updated:</th>
<th>January 17, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time scale:</td>
<td>Summer (May – September); 2000-present</td>
</tr>
<tr>
<td>Measurement unit:</td>
<td>Annual</td>
</tr>
<tr>
<td>Geographic scale:</td>
<td>County, State, &amp; Multi-state</td>
</tr>
<tr>
<td>Background and significance:</td>
<td>Over the past century, the overall global surface temperature has increased by 0.7–1.4°F(^1). The IPCC projects with “virtual certainty” that climate change will cause more frequent, more intense, and longer heat waves. It also notes with “medium confidence” that the number of heat wave deaths will increase (medium confidence arose because of uncertainty regarding physiologic and societal adaptation).(^2) All heat wave deaths are preventable. Deaths due to heat make up the largest number of deaths due to extreme weather events. Very few studies or surveillance systems have tracked morbidity events due to heat waves.</td>
</tr>
<tr>
<td>Rationale:</td>
<td>Any individual can develop heat illness if engaged in intense physical activity or exposed to environmental heat or humidity. Physiological mechanisms maintain the body core temperature in a narrow optimum range around 37 degrees C (98.6 degrees F). When core body temperature rises, the physiological response is to sweat and circulate blood closer to skin’s surface to assist in cooling. Adequate hydration is critical in avoiding heat-related illness. If heat exposure exceeds the physiological capacity to cool, then a range of heat-related symptoms and conditions can develop, including heat stress, heat cramps, and heat stroke. Although excess mortality and morbidity are the best methods to track the full public health effects of a heat wave, tracking rates of heat deaths and emergency room and hospitalization visits due to heat during summer months are useful indicators of summertime heat burden.</td>
</tr>
<tr>
<td>Limitations of measure:</td>
<td>Heat deaths are difficult to identify because few deaths are recorded as heat-related during a heat wave. Heat illness is under-reported as a primary cause of death on death certificates for deaths that occur in hospitals or emergency rooms (ERs). For instance, heart failure or respiratory conditions may be listed as the primary cause, with heat illness as a contributing factor.</td>
</tr>
<tr>
<td>Data source:</td>
<td>Vital Records, Hospital Admission Records (SPARCS), Emergency Discharge Data</td>
</tr>
<tr>
<td><strong>Limitations of data source:</strong></td>
<td>Some states will not have emergency discharge data. Furthermore, hospitalization data is typically released annually, after a preparation period, which can be a few years. This will delay the calculation of these indicators. To minimize confusion, it is important to note that data sources use different codes (ICD-9 or ICD-10) depending on the state, and that, within a state, data sources may use different codes as well.</td>
</tr>
<tr>
<td><strong>Related datasets:</strong></td>
<td>Census data from U.S. Bureau of the Censuses, historic average temperature data, and AQS air quality data for particulate matter and ozone, NCDC daily weather conditions (temperature, humidity, etc.)</td>
</tr>
<tr>
<td><strong>Additional data elements:</strong></td>
<td>Month of year, seasonality, age, gender, race, ethnicity</td>
</tr>
</tbody>
</table>

**References:**


How-To Guide: Deaths, hospital admissions, and emergency discharges due to heat

I. Deaths due to Heat

1. Calculate Number of Deaths due to Heat
   a. From the statewide death file (from State Health Department, etc.) obtain the number of deaths with ICD-10 codes X30 or T67.0 – T67.9, EXCLUDING cases having ICD-10 code W92 (man-made source of heat) in any cause of death from May to September, 2000-present. Sum the number of deaths by year, state, county, sex, and age in 5-year groups (i.e., 0-4, 5-9, etc). Note: County-level and age-specific counts will likely require aggregation of years due to small numbers.

   • Exclude deaths of:
     o Out-of-state residents and unknown residence
     o Out-of-state deaths

2. Calculate Rate of Deaths due to Heat

   Use the Census 2010 county population or best county population estimate to calculate the rates per 100,000 residents for each year. Note: County-level measures will likely require aggregation of years due to small numbers. Rates should also be adjusted by age, using the 2010 U.S. population as a reference. Please also compute an annual statewide rate. Census 2010 population estimates are available at http://www.census.gov/popfinder/ and http://www.census.gov/popest/data/index.html

II. Hospitalizations due to Heat

1. Data Source: Background on Working with Hospitalization Data

   Use the hospital discharge data for the State¹ health department jurisdiction. In some jurisdictions, the state health department (or other state agency) owns and maintains the State’s hospital discharge data; in others these data are owned and managed by another entity, such as a nonprofit organization or hospital association. In the latter case, health departments are encouraged to work with their local hospital discharge data stewards to obtain the data. States may also contact the National Association of Health Data Organizations (NAHDO) and/or their local affiliate for assistance in working with these data. Contact information for NAHDO and its affiliates is available on the Internet at: http://www.nahdo.org/memberlist.aspx.

   Data from federal facilities, such as Veteran’s Administration hospitals, are not included in these datasets. State hospital discharge databases vary as to the inclusion of state residents hospitalized in another state.

¹ Instructions are written assuming the population of interest is at the state level. If another population is the focus (e.g., municipality), simply substitute where applicable.
Although hospital discharge data are collected using a standard format (UB-92) across states, there are considerable differences in the variable attributes; for example, response categories may differ between states for “source of admission” and “disposition” variables. These differences may reflect how certain variables are collected, whether the reporting of a variable (for example patient name or race) is mandatory, and/or differences in data availability and access agreements. The number of diagnosis fields available in the discharge data also varies by state, ranging from nine to an unlimited number. As well, the data vary by state in regard to data quality such as the validity or completeness of specific fields. Coding of external cause of injury (E-code) specifically may vary between or within states by whether it is mandated, by how many fields are permitted to contain E-codes, as well as by validity or completeness of the coding.

In all cases, the data analyst should work closely with the data managers in order to understand the nuances of the data.

2. Selecting Records

Note: A sample SAS program is attached in Appendix 1.

2.1 Diagnosis

Restrict the dataset to patients having any of the following ICD-9 diagnoses for heat illness (hyperthermia), in any diagnosis field including Injury Cause (E-Code).

Table of ICD-9-CM Codes for Heat Illness

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>992.0</td>
<td>Heat stroke and sunstroke</td>
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<td>992.1</td>
<td>Heat syncope</td>
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<tr>
<td>992.2</td>
<td>Heat cramps</td>
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<tr>
<td>992.3</td>
<td>Heat exhaustion from water depletion</td>
</tr>
<tr>
<td>992.4</td>
<td>Heat exhaustion from salt depletion</td>
</tr>
<tr>
<td>992.5</td>
<td>Heat exhaustion, unspecified</td>
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<tr>
<td>992.6</td>
<td>Heat fatigue, transient</td>
</tr>
<tr>
<td>992.7</td>
<td>Heat edema</td>
</tr>
<tr>
<td>992.8</td>
<td>Other specified heat effects</td>
</tr>
<tr>
<td>992.9</td>
<td>Unspecified effects of heat and light</td>
</tr>
<tr>
<td>E900.0</td>
<td>Event caused by excessive heat due to weather conditions (e.g., sunstroke, ictus solaris/heat stroke)</td>
</tr>
<tr>
<td>E900.9</td>
<td>Effect from unknown cause of excessive heat</td>
</tr>
</tbody>
</table>

Remove any patients having ICD-9 code E900.1 (man-made source of heat) as a cause of injury or other diagnosis.

2.2 Time Period
Season: Include patients admitted in the months of May through (and including) September.

Year: Include patients admitted in the year 2000 or later.

Most datasets are organized by year of discharge. Some admissions, especially towards the end of the calendar year, will appear in the subsequent discharge dataset or in even later years, in rare cases.

Annual counts/rates for this indicator will be grouped by year of admission.

Example: Cases admitted in September 2000 and discharged in January 2001 should be grouped with admissions in the year 2000.

The latest year of admission that should be included when aggregating counts/rates is n-1, where n is the most recent year of discharge data.

Example: You have discharge data for the years 2000-2005, in 6 annual datasets. Include cases admitted from 2000-2004 (note: there will be some 2004 admissions in the 2005 discharge data, which should be included). Do not include 2005 admissions, since the 2005 dataset may be missing a proportion of cases, which were discharged in 2006.

2.3 Residency

Restrict the dataset to cases who are State residents.

2.4 A word about de-duplication of cases:

To the extent possible, a case should be counted once per hospitalization; de-duplication of records to achieve this goal should be conducted at the discretion of the data owners, managers and/or analysts.

Appendix 1. Sample SAS Code

/************************************************************************
Hospitalizations for Heat Illness - SAS Program

READ THESE INSTRUCTIONS FIRST!!!

Copy and paste this entire document into a new SAS editor window.

This program requires the user to replace and enter information, such as variable names, that are unique to the user's state. Items to be replaced are given in placeholders: <>

Be sure to remove the <> after entering the required information.
* Section 1. Select Data Source;

* Create a library called "in," pointing to where the hospital discharge data are stored;

* Example code:

  libname in 'C:\Source Data\Hospitalizations\SAS Data';

* Section 2. Select cases;

  data cases (keep = <STATE FIELD> <COUNTY FIELD> YEAR AGEGROUP <UNIQUE ID FIELD>) ;
  set in.<SAS DATA SET NAME>;
  /* Enter the file name of the hospitalization data set (do not include the .sas7bdat extension). Be sure to remove the <> placeholders. */
  YEAR = year(<ADMISSION DATE>);
  MONTH = month(<ADMISSION DATE>);
  /* These variables extract the month/year from date of admission*/
  /* If your date field is recorded as text, you will need to abstract year/month from the text field using "substrn" */
  array diag (<NUMBER OF DIAGNOSTIC FIELDS>) < NAMES OF DIAGNOSTIC FIELDS INCLUDING INJURY CAUSE FIELD, IF IT IS AVAILABLE>;
  /* Enter your state's total number of diagnosis fields in parentheses, then list the field name for each diagnosis field. */
  do i = 1 to dim(diag);
    if substrn(diag(i), 1, 3) = '992'
      or substrn(diag(i), 1, 5) = 'E9000'
      then case = 1;
  end;
  if case ne 1 then delete;
  drop case;
  /* This step identifies cases based on the ICD-9-CM codes listed, and then drops all observations that do not meet the case definition. */
  if 0 le <AGE> le 4 then AGEGROUP = 1;
  else if <AGE> le 9 then AGEGROUP = 2;
else if <AGE> le 14 then AGEGROUP = 3;
else if <AGE> le 19 then AGEGROUP = 4;
else if <AGE> le 24 then AGEGROUP = 5;
else if <AGE> le 29 then AGEGROUP = 6;
else if <AGE> le 34 then AGEGROUP = 7;
else if <AGE> le 39 then AGEGROUP = 8;
else if <AGE> le 44 then AGEGROUP = 9;
else if <AGE> le 49 then AGEGROUP = 10;
else if <AGE> le 54 then AGEGROUP = 11;
else if <AGE> le 59 then AGEGROUP = 12;
else if <AGE> le 64 then AGEGROUP = 13;
else if <AGE> le 69 then AGEGROUP = 14;
else if <AGE> le 74 then AGEGROUP = 15;
else if <AGE> le 79 then AGEGROUP = 16;
else if <AGE> le 84 then AGEGROUP = 17;
else if <AGE> > 84 then AGEGROUP = 18;
else AGEGROUP = 19;
/*Above "IF, ELSE IF" statements create seventeen 5-year age
categories through 84 years, and an additional category for 85
and older */

if <STATE> = '<YOUR STATE>'
/* Depending on your data set, you may need to enter text for
your state name, or a code value, such as FIPS code. */

and ( 5 <= month <= 9 )
/* Month of admission from May-Sep*/

and ( 2000 <= year <= <END YEAR> );
/* End Year should be the nth-1 year of hospital discharge data
available. See Section 2.2 for an explanation. */
run;

/*******************************************
* Section 3. Create the data-delivery table;
* Counts by state, county, year, age group;

proc sql;
create table HeatHA as
select
    <STATE FIELD>,
    <COUNTY FIELD>,
    YEAR,
    AGEGROUP,
    Count(<UNIQUE IDENTIFIER FIELD>)
from cases
order by
    <STATE FIELD>,
    <COUNTY FIELD>,
    YEAR
    AGEGROUP;
quit;

PROC EXPORT DATA= HeatHA
    DBMS=csv
    REPLACE
Calculate Rate of Hospitalizations due to Heat
a. Stratify into the correct geographic scale by using the county or ZIP fields from the hospitalization records
b. Sum the number of hospitalizations by year, state, county, sex, and age in 5-year groups (i.e., 0-4, 5-9, etc). Note: County-level and age-specific counts will likely require aggregation of years due to small numbers
c. Calculate annual warm-season rates per 100,000 residents (advanced option: age/sex specific rates) by state. Note: County-level measures will likely require aggregation of years due to small numbers. Use the Census 2010 county population or best county population estimate to calculate the rate for each year. Please also compute an annual statewide rate. Census 2010 population estimates are available at http://www.census.gov/popest/eval-estimates/eval-est2010.html
d. Calculate annual warm-season rates per 100,000 residents, adjusted for age. Note: County-level measures will likely require aggregation of years due to small numbers.

III. Emergency Department Visits due to Heat

1. Data Source: Background on Working with Emergency Dept. Data

Please refer to the Implementation Guide, “Hospitalizations for Heat Illness (Hyperthermia),” which provides a background on working with hospital discharge data. Emergency department (ED) visit data are commonly collected and maintained by the same agency or organization, and share many common attributes (e.g., Veteran’s hospitals are not included).

Emergency department visits include both patients who are admitted (inpatients) and those who are treated and released (outpatients); therefore, both hospital discharge data and emergency department outpatient data are required for this indicator.

2. Selecting Records

Note: A sample SAS program is attached in Appendix 1.

2.A Patients Admitted from an Emergency Department

Apply the following selection criteria to your hospital discharge (inpatient) data. Note: this is identical to the “Hospitalizations for Heat Illness (Hyperthermia)” case selection, but restricts the inpatient cases to those admitted from an ED in step 2.A.4.
2.A.1 Diagnosis

Restrict the dataset to patients treated in an ED having any ICD-9 code in the range of 992.0-992.9, or cause of injury code E900.0 or E900.9, EXCLUDING cases with a code of E900.1 (man-made source or heat) anywhere in the record.

Table of ICD-9-CM Codes for Heat Illness

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Heat exhaustion from water depletion</td>
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<tr>
<td>992.4</td>
<td>Heat exhaustion from salt depletion</td>
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<td>992.5</td>
<td>Heat exhaustion, unspecified</td>
</tr>
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<td>Heat fatigue, transient</td>
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<tr>
<td>992.9</td>
<td>Unspecified effects of heat and light</td>
</tr>
<tr>
<td>E900.0</td>
<td>Event caused by excessive heat due to weather conditions (e.g., sunstroke, ictus solaris/heat stroke)</td>
</tr>
<tr>
<td>E900.9</td>
<td>Effect from unknown cause of excessive heat</td>
</tr>
</tbody>
</table>

2.A.2 Time Period

Season: Include patients admitted in the months of May through (and including) September.

Year: Include patients admitted in the year 2000 or later.

Most datasets are organized by year of discharge. Some admissions, especially towards the end of the calendar year, will appear in the subsequent discharge dataset or in even later years, in rare cases.

Annual counts/rates for this indicator will be grouped by year of admission.

Example: Cases admitted in September 2000 and discharged in January 2001 should be grouped with admissions in the year 2000.

The latest year of admission that should be included when aggregating counts/rates is n-1, where n is the most recent year of discharge data.

Example: You have discharge data for the years 2000-2005, in 6 annual datasets. Include cases admitted from 2000-2004 (note: there will be some 2004 admissions in the 2005 discharge data, which should be included). Do not include 2005 admissions, since the 2005 dataset may be missing a proportion of cases, which were discharged in 2006.
2.A.3 Residency
Restrict the dataset to cases who are State residents.

2.A.4 Admission Source
Restrict the dataset to cases who were admitted from an emergency room / emergency department.

2.A.5 A word about de-duplication of cases:
To the extent possible, a case should be counted once per hospitalization; de-duplication of records to achieve this goal should be conducted at the discretion of the data owners, managers and/or analysts.

2.B. Patients Treated and Released from an Emergency Department
Apply the following selection criteria to outpatient cases treated and released from an emergency department / emergency room.

2.B.1 Diagnosis
Restrict the dataset to patients having any of the following ICD-9 diagnoses for heat illness (hyperthermia), in any diagnosis field including Injury Cause (E-Code).

Table of ICD-9-CM Codes for Heat Illness

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
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<td>Event caused by excessive heat due to weather conditions (e.g., sunstroke, ictus solaris/heat stroke)</td>
</tr>
<tr>
<td>E900.9</td>
<td>Effect from unknown cause of excessive heat</td>
</tr>
</tbody>
</table>
**2.B.2 Time Period**

Season: Include patients treated in the months of May through (and including) September.

Year: Include patients treated in the year 2000 or later.

The latest year of data that should be included when aggregating counts/rates is n-1, where n is the most recent year of discharge data (see 2.A.2). The years for both datasets should match since the cases will be combined.

**2.B.3 Residency**

Restrict the dataset to cases who are State residents.

**2.B.4 A word about de-duplication of cases:**

To the extent possible, a case should be counted once per visit; de-duplication of records to achieve this goal should be conducted at the discretion of the data owners, managers and/or analysts.

**3. Concatenate the Inpatient and Outpatient Datasets**

Combine the resultant datasets from 2A and 2B by year of admission or treatment.

**Appendix 1. Sample SAS Code**

```
READ THESE INSTRUCTIONS FIRST!!!

Copy and paste this entire document into a new SAS editor window.

This program requires the user to replace and enter information, such as variable names, that are unique to the user's state. Items to be replaced are given in placeholders: <>

Be sure to remove the <> after entering the required information.

******************************************************************************

ED Visits for Heat Illness - SAS Program

******************************************************************************

* Section 1. Select Data Source;

* Create a library called "in," pointing to where the inpatient data are stored;

* Example code:
```
libname in 'C:\Source Data\Hospitalizations\SAS Data';

* Create a library called "out," pointing to where the outpatient data are stored;

* Example code:

libname out 'C:\Source Data\ED Visits\SAS Data';

/************************************************************************* 
/*************************************************************************/

/************************************************************************* 
* Section 2A. Select inpatient cases admitted from ED; 
/*************************************************************************/

data inpat_cases (keep = <STATE FIELD> <COUNTY FIELD> YEAR AGEGROUP <UNIQUE ID FIELD>) ;
set in.<SAS DATA SET NAME>;
/* Enter the file name of the hospitalization data set (do not include the .sas7bdat extension). Be sure to remove the <> placeholders. */

YEAR = year(<ADMISSION DATE>);
/* This variable extracts the year from the date of admission*/
/* If your date field is recorded as text, you will need to abstract year from the text field using "substrn" */

array diag (<ENTER THE NUMBER OF DIAGNOSTIC FIELDS>) < NAMES OF DIAGNOSTIC FIELDS INCLUDING INJURY CAUSE FIELD, IF IT IS AVAILABLE>;
/* Enter your state's total number of diagnosis fields in parentheses, then list the field name for each diagnosis field. */

do i = 1 to dim(diag);
if substrn(diag(i), 1, 3) = '992'
or substrn(diag(i), 1, 5) = 'E9000'
then case = 1;
end;
if case ne 1 then delete;
drop case;
/* This step identifies cases based on the ICD-9-CM codes listed, and then drops all observations that do not meet the case definition. */

if 0 le <AGE> le 4 then AGEGROUP = 1;
else if <AGE> le 9 then AGEGROUP = 2;
else if <AGE> le 14 then AGEGROUP = 3;
else if <AGE> le 19 then AGEGROUP = 4;
else if <AGE> le 24 then AGEGROUP = 5;
else if <AGE> le 29 then AGEGROUP = 6;
else if <AGE> le 34 then AGEGROUP = 7;
else if <AGE> le 39 then AGEGROUP = 8;
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else if <AGE> le 49 then AGEGROUP = 10;
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else if <AGE> le 59 then AGEGROUP = 12;
else if <AGE> le 64 then AGEGROUP = 13;
else if <AGE> le 69 then AGEGROUP = 14;
else if <AGE> le 74 then AGEGROUP = 15;
else if <AGE> le 79 then AGEGROUP = 16;
else if <AGE> le 84 then AGEGROUP = 17;
else if <AGE> > 84 then AGEGROUP = 18;
else AGEGROUP = 19;
/*Above "IF, ELSE IF" statements create seventeen 5-year age
categories through 84 years, and an additional category for 85
and older */
if <STATE> = '<ENTER YOUR STATE>'
/* Depending on your data set, you may need to enter text for
your state name, or a code value, such as FIPS code. */
and ( 5 <= month <= 9 )
/* Month of admission from May-Sep*/
and 2000 <= year <= <ENTER END YEAR>
/* End Year should be the nth-1 year of hospital discharge data
available. See Section 2.A.2 for an explanation. */
and <ADMISSION SOURCE> = <ENTER CODE FOR EMERGENCY DEPT/ROOM>;
/* Consult the data dictionary for your inpatient data for the
correct field name and code signifying admission from an
emergency room /dept. */
run;
/******************************************************************************/
/******************************************************************************/
* Section 2B. Select outpatient cases treated and released from ED;

data outpat_cases (keep = <STATE FIELD> <COUNTY FIELD> YEAR
AGEGROUP <UNIQUE ID FIELD>) ;

set out.<SAS DATA SET NAME>;
/* Enter the file name of the hospitalization data set (do not
include the .sas7bdat extension). Be sure to remove the <>
placeholders. */

YEAR = year(<VISIT DATE>);
/* This variable extracts the year from the date of treatment*/
/* If your date field is recorded as text, you will need to
abstract year from the text field using "substrn" */

array diag (<NUMBER OF DIAGNOSTIC FIELDS>)
< NAMES OF DIAGNOSTIC FIELDS INCLUDING INJURY CAUSE FIELD, IF IT IS AVAILABLE>
/* Enter your state's total number of diagnosis fields in parentheses, then list the field name for each diagnosis field.*/

do i = 1 to dim(diag);
if substrn(diag(i), 1, 3) = '992'
  or substrn(diag(i), 1, 5) = 'E9000'
then case = 1;
end;

if case ne 1 then delete;
drop case;
/* This step identifies cases based on the ICD-9-CM codes listed, and then drops all observations that do not meet the case definition.*/

if 0 le <AGE> le 4 then AGEGROUP = 1;
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else if <AGE> > 84 then AGEGROUP = 18;
else AGEGROUP = 19;
/*Above "IF, ELSE IF" statements create seventeen 5-year age categories through 84 years, and an additional category for 85 and older */

if <STATE> = '<ENTER YOUR STATE>'
/* Depending on your data set, you may need to enter text for your state name, or a code value, such as FIPS code. */

and ( 5 <= month <= 9 )
/* Month of visit from May-Sep*/

and 2000 <= year <= <ENTER END YEAR>;
/* End Year should correspond to the nth-1 year of hospital discharge data available. See Section 2.A.2 for a full explanation. */

run;

******************************************************************************
* Section 4. Concatenate the inpatient and outpatient datasets:

```r
data cases;
set inpat_cases outpat_cases;
run;
```

* Section 5. Create the data-delivery table;

* Counts by state, county, year, age group:

```r
proc sql;
create table HeatED as
select
    <STATE FIELD>,
    <COUNTY FIELD>,
    YEAR,
    AGEGROUP,
    Count(<UNIQUE IDENTIFIER FIELD>)
from cases
order by
    <STATE FIELD>,
    <COUNTY FIELD>,
    YEAR
    AGEGROUP;
quit;

PROC EXPORT DATA= HeatED
    DBMS=csv
    REPLACE
    OUTFILE=<<"<FOLDER LOCATION\HeatED.csv">>;
RUN;
```

/* Make sure to replace STATE, COUNTY and UNIQUE ID fields with corresponding variable names from your data set, and chose a FOLDER LOCATION to save the output CSV file */

**Calculate Rate of ER visits due to Heat**

a. Stratify into the correct geographic scale by using the county or ZIP fields from the ER records
b. Use the Census 2000 aggregated block population that fits within the boundary of your chosen area as the denominator to calculate the rate.
c. Sum the number of ED visits by year, state, county, sex, and age in 5-year groups (i.e., 0-4, 5-9, etc). Note: County-level and age-specific counts will likely require aggregation of years due to small numbers.
d. Calculate annual warm-season rates per 100,000 residents (advanced option: age/sex specific rates) by state.
   **Note:** County-level measures will likely require aggregation of years due to small numbers

e. Calculate annual warm-season rates pet 100,000 residents, adjusted for age.
   **Note:** County-level measures will likely require aggregation of years due to small numbers.