## Hospitalizations Attributable to Alcohol

<table>
<thead>
<tr>
<th>Demographic Group</th>
<th>All state/jurisdiction residents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Numerator</strong></td>
<td>Hospitalizations for which either the principal diagnosis or the first-listed external cause of injury code (E-code) represents acute or chronic conditions considered 100% attributable to alcohol consumption according to CDC’s Alcohol-Related Disease Impact (ARDI) application.</td>
</tr>
<tr>
<td><strong>Denominator</strong></td>
<td>State/jurisdiction midyear population estimate</td>
</tr>
</tbody>
</table>
| **Measures**     | 1. Annual number of hospitalizations  
2. Annual crude hospitalization rate (hospitalizations per 100,000 residents)  
3. Annual age-adjusted hospitalization rate (hospitalizations per 100,000 residents) |
| **Time Period**  | Calendar year of discharge from a hospital |
| **Significance & Background** | Each year in the U.S., excessive alcohol consumption results in approximately 88,000 deaths (Stahre et al, 2014). In 2007 in the U.S., there were more than 2.7 million emergency department visits for alcohol-related conditions (Owens et al, 2010). Routine monitoring of alcohol-attributable hospitalizations may be used to support planning and implementation of evidence-based prevention strategies recommended by the Community Preventive Services Task Force to reduce excessive drinking and related harms. These strategies include increasing the price of alcohol, limiting alcohol outlet density, and holding alcohol retailers liable for harms related to the sale of alcoholic beverages to minors and intoxicated patrons (Community Preventive Services Task Force, 2005). |
| **Data Sources** | Inpatient hospital discharge data (numerator)  
Population estimates from the U.S. Bureau of the Census (denominator)  
Year 2000 U.S. Standard Population (for age-standardization) |
| **Limitations of Indicator** | This indicator only includes codes for conditions that are 100% alcohol-attributable, therefore, calculated numbers and rates of alcohol-attributable hospitalizations will grossly underestimate the true impact of alcohol use for the following reasons: (1) Cases are identified using the principal diagnosis or first-listed E-code. For some alcohol-attributable cases, the identifying code could be listed in a non-principal location. (2) The codes used for case-finding are limited to conditions that... |
are 100% alcohol-attributable. The majority of alcohol-attributable conditions (e.g., injuries caused by traffic crashes) are partially (i.e., have an alcohol-attributable fraction < 1.0) attributable to alcohol. An analysis of mortality data (Stahre et al, 2014) may provide some indication of the potential underestimate. Of the 87,798 average annual alcohol-attributable deaths in the U.S. during 2006-2010, only 23,221 (26%) were due to conditions considered 100% alcohol-attributable. (3) State residents who are hospitalized in another state are excluded. (4) Those hospitalized at Veteran’s Affairs, Indian Health Service, or non-acute care hospitals are excluded.

Limitations of Data Sources
Counts are hospitalizations, not individuals. Thus, someone hospitalized multiple times for the same condition may be counted more than once. Practice patterns and payment mechanisms may affect decisions by health care providers to hospitalize patients, to diagnose an alcohol-attributable condition, or to list an alcohol-attributable condition as a principal diagnosis. These patterns may differ among states, thereby affecting the validity of state-to-state comparisons.

Related Healthy People 2020 Objectives
None

Other Available Data Elements
Age, sex, race/ethnicity, and zip code can be examined to better define the pattern of hospitalizations.

References


HOW-TO GUIDE
HOSPITALIZATIONS ATTRIBUTABLE TO ALCOHOL

Case Definition
A hospitalization that is attributable to alcohol excluding substances that cause adverse effects in therapeutic use. A case may be identified using either the principal (i.e., first-listed) diagnosis code (specific diagnosis codes are listed in Table 1) or the principal/first-listed valid cause of injury code (Table 2).

SAS Programming
A generic SAS program has been developed that will identify the first-listed valid E-code and generate counts for the indicator. The program notes where users must make minor modifications (e.g., state-specific variable names and values). Two versions of the program are provided in the Appendices because states differ in how E-codes are listed within hospital discharge data.

Steps Required to Generate the Indicator
I. Obtain a hospital discharge (i.e., inpatient) dataset that meets the following criteria:
   - State of residence = <your state>
   - Ages 0 - 115
   - Both sexes
   - All races
   - In-state acute care hospitals
   - Discharge date between January 1 – December 31, <year>
   - All discharge dispositions (e.g., transfer to another hospital, inhospital death)
   - All admission types (e.g., readmission, transfer from another hospital)
   - Exclude:
     - Inpatients with unknown age
     - Out-of-state residents
     - Unknown state of residence
     - Out-of-state hospitals
     - Non-acute care hospitals
     - Federal hospitals (e.g., VA)
     - “Short stays” and “observation visits” that do not result in hospital admission

1 Some state hospital discharge data include a field that allows these types of hospital visits to be identified. States for which this is not true should assume that these types of visits have been excluded from their dataset.

For the calculation of counts, crude rates and age-adjusted rates, use the Excel spreadsheet at:
http://www.cste.org/resource/resmgr/AOD/age_adjustment_table_for_alc.xls
This spreadsheet has been pre-designed to perform the appropriate calculations and display the results once the necessary data have been entered.
The datafile must include the following fields/variables:
- Patient age
- Principal (i.e., first-listed) diagnosis code
- All cause of injury codes ("E-codes"). In some states, E-codes are listed among the fields designated as discharge diagnoses. In other states, there are separate fields containing only E-codes. In the first case, obtain all discharge diagnosis fields. In the latter case, select all E-code fields. Regardless of how E-codes are stored, run a program to identify the first-listed valid E-code (see SAS programming code provided in Appendix 1 if E-codes are embedded within discharge diagnosis fields; see SAS programming code provided in Appendix 2 if there are separate fields for E-codes).
- Other variables may be retained to allow additional analyses (e.g., sex, race/ethnicity, county of residence, source of payment).

II. Hospitalizations Attributable to Alcohol
A) From the datafile described in Step I, select hospital discharges for which:
   1) a. the principal (first-listed) diagnosis contains an ICD9CM code listed in Table 1 and
      b. the principal (first-listed) E-code is not in the range E930-E949 ("Drugs, medicinal and biological substances causing adverse effects in therapeutic use")
   OR
   2) the principal (first-listed) valid E-code is listed in Table 2.
B) Categorize these hospital discharges into the age groups displayed in Figure 1. Enter the results into the Excel spreadsheet. The spreadsheet will display the number of hospitalizations attributable to alcohol.
C) Follow these steps to populate the Excel spreadsheet with your state’s population.
   1) Go to: [http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml?_ts=440355717799](http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml?_ts=440355717799) (if necessary, turn off Pop-up Blockers for this website).
   2) Click on Advanced Search. Next click on “Show Me All.”
   3) For Step 1, enter the following in the box titled ‘topic or table name’: PEPAGESEX. Then enter your state name in the box titled ‘state, county or place (optional).’ After you enter your state, click on your state name again in the screen that pops up. Click on Go.
   4) On the resulting page, click on the box on the left corresponding to the year of interest. Next, click on View.
   5) You should now see population figures for age groups for your state for both sexes, males, and females for various years. Click on Download.
   6) In the Download box that pops up, select Microsoft Excel as the format. Click on OK.
   7) Once the next pop-up box indicates that your file is complete, click on Download, then open.
8) Use the figures under Both Sexes for the year of interest to populate the Excel spreadsheet you will use to perform age-adjusting. While the spreadsheet does not provide a population for ages 15-17, it does provide it for ages 18-24. So you can complete all of the age groups but 15-17, then figure out the population for 15-17 by subtracting your subtotal from the overall state population.

D) The spreadsheet will display:
   a. Crude rate of hospitalizations attributable to alcohol per 100,000 residents;
   b. Age-standardized rate of hospitalizations attributable to alcohol per 100,000 residents.
### Table 1
**ICD9CM codes and corresponding diagnoses for hospitalizations attributable to alcohol**

<table>
<thead>
<tr>
<th>ICD9CM Code</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>291.0</td>
<td>Alcohol withdrawal delirium</td>
</tr>
<tr>
<td>291.1</td>
<td>Alcohol amnestic syndrome</td>
</tr>
<tr>
<td>291.2</td>
<td>Other alcohol dementia</td>
</tr>
<tr>
<td>291.3</td>
<td>Alcohol withdrawal hallucinosis</td>
</tr>
<tr>
<td>291.4</td>
<td>Idiosyncratic alcohol intoxication</td>
</tr>
<tr>
<td>291.5</td>
<td>Alcoholic jealousy</td>
</tr>
<tr>
<td>291.81</td>
<td>Alcohol withdrawal</td>
</tr>
<tr>
<td>291.89</td>
<td>Other specified alcoholic psychosis</td>
</tr>
<tr>
<td>291.9</td>
<td>Unspecified alcoholic psychosis</td>
</tr>
<tr>
<td>303[.00-.93]</td>
<td>Alcohol dependence syndrome</td>
</tr>
<tr>
<td>305[.00-.03]</td>
<td>Nondependent abuse of drugs – alcohol abuse</td>
</tr>
<tr>
<td>357.5</td>
<td>Alcoholic polyneuropathy</td>
</tr>
<tr>
<td>425.5</td>
<td>Alcoholic cardiomyopathy</td>
</tr>
<tr>
<td>535.3[0,1]</td>
<td>Alcoholic gastritis</td>
</tr>
<tr>
<td>571.0</td>
<td>Alcoholic fatty liver</td>
</tr>
<tr>
<td>571.1</td>
<td>Acute alcoholic hepatitis</td>
</tr>
<tr>
<td>571.2</td>
<td>Alcoholic cirrhosis of liver</td>
</tr>
<tr>
<td>571.3</td>
<td>Alcoholic liver damage, unspecified</td>
</tr>
<tr>
<td>760.71</td>
<td>Fetal alcohol syndrome</td>
</tr>
<tr>
<td>790.3</td>
<td>Excessive blood level of alcohol</td>
</tr>
<tr>
<td>980.0</td>
<td>Toxic effect of ethyl alcohol</td>
</tr>
<tr>
<td>980.1</td>
<td>Toxic effect of methyl alcohol</td>
</tr>
</tbody>
</table>

### Table 2
**External cause of injury codes (E-codes) and corresponding causes for hospitalizations attributable to alcohol**

<table>
<thead>
<tr>
<th>E-code</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>E860.0</td>
<td>Accidental poisoning by alcoholic beverages</td>
</tr>
<tr>
<td>E860.1</td>
<td>Accidental poisoning by other and unspecified ethyl alcohol and its products</td>
</tr>
<tr>
<td>E860.2</td>
<td>Accidental poisoning by methyl alcohol</td>
</tr>
<tr>
<td>E860.9</td>
<td>Accidental poisoning by unspecified alcohol</td>
</tr>
</tbody>
</table>
### Figure 1

**Spreadsheet for calculating age-adjusted hospitalization rates**

<table>
<thead>
<tr>
<th>Row #</th>
<th>Age Group</th>
<th>Column B</th>
<th>Column C</th>
<th>Column D</th>
<th>Column E</th>
<th>Column F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-4</td>
<td>B1/C1</td>
<td></td>
<td>18,987,000</td>
<td>D1*E1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5-9</td>
<td>B2/C2</td>
<td></td>
<td>19,920,000</td>
<td>D2*E2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10-14</td>
<td>B3/C3</td>
<td></td>
<td>20,057,000</td>
<td>D3*E3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>15-17</td>
<td>B4/C4</td>
<td></td>
<td>11,819,000</td>
<td>D4*E4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>18-24</td>
<td>B5/C5</td>
<td></td>
<td>26,258,000</td>
<td>D5*E5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>25-29</td>
<td>B6/C6</td>
<td></td>
<td>17,722,000</td>
<td>D6*E6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>30-34</td>
<td>B7/C7</td>
<td></td>
<td>19,511,000</td>
<td>D7*E7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>35-39</td>
<td>B8/C8</td>
<td></td>
<td>22,180,000</td>
<td>D8*E8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>40-44</td>
<td>B9/C9</td>
<td></td>
<td>22,479,000</td>
<td>D9*E9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>45-49</td>
<td>B10/C10</td>
<td></td>
<td>19,806,000</td>
<td>D10*E10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>50-54</td>
<td>B11/C11</td>
<td></td>
<td>17,224,000</td>
<td>D11*E11</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>55-59</td>
<td>B12/C12</td>
<td></td>
<td>13,307,000</td>
<td>D12*E12</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>60-64</td>
<td>B13/C13</td>
<td></td>
<td>10,654,000</td>
<td>D13*E13</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>65-69</td>
<td>B14/C14</td>
<td></td>
<td>9,410,000</td>
<td>D14*E14</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>70-74</td>
<td>B15/C15</td>
<td></td>
<td>8,726,000</td>
<td>D15*E15</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>75-79</td>
<td>B16/C16</td>
<td></td>
<td>7,415,000</td>
<td>D16*E16</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>80-84</td>
<td>B17/C17</td>
<td></td>
<td>4,900,000</td>
<td>D17*E17</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>85-115</td>
<td>B18/C18</td>
<td></td>
<td>4,259,000</td>
<td>D18*E18</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Total</td>
<td>B19/C19</td>
<td></td>
<td>274,634,000</td>
<td>Σ(F1:F18)</td>
<td></td>
</tr>
</tbody>
</table>

An Excel version of this spreadsheet can be found on the CSTE website. The URL of this site is: [http://www.cste.org/resource/resmgr/AOD/age_adjustment_table_for_alc.xls](http://www.cste.org/resource/resmgr/AOD/age_adjustment_table_for_alc.xls).

Number of hospitalizations: B19
Crude rate: (B19/C19) x 100,000
Age-adjusted rate: (F19/E19) x 100,000

---

2 This US 2000 Standard Population distribution was derived from the master list of 2000 U.S. projected population (Table 1 in the document found at: [http://www.cdc.gov/nchs/data/statnt/statnt20.pdf](http://www.cdc.gov/nchs/data/statnt/statnt20.pdf)).
APPENDIX 1

Generic SAS Programming for Generating Indicator Where E-codes are Embedded within Discharge Diagnosis Fields
Program name: alchosp_generic.sas
Purpose: Generate the Alcohol Hospitalization indicator
Note: Read through all of the following program and modify according to your state hospital discharge datafile

options linesize = 100 pagesize = 50 center errors=3;
libname hdd '< location of your hospital discharge data >';

****Create the basic dataset - residents of your state, instate/acute care hospitals, age=known****;
****In the example below, the hospital discharge dataset has 34 fields for discharge diagnoses****;

data temp1 (keep=age DX1-DX34);  *other variables such as sex, race, county may be kept if additional analyses are desired;
set hdd.hdd2013;     *'hdd2013' is your complete hospital discharge dataset;
if < State of Residence=Your State >
and
hosp_id in < List of in-state acute care hospitals >
and
age in < age range excluding unknown age >; *note that there may be special codes for newborns (and newborns are to be included);
run;

************************* Identify first-listed valid E-code****************************;
*** Note that this program categorizes E-codes E930-E949 as 'valid' ***;
*** because codes in this range subsequently will be used to exclude cases. ***;
*** Modify depending on the number of diagnosis fields that are available in your state***;

data temp2;
set temp1;
Ecode1st='     ';  * make sure there are five spaces within the quotes to initialize Ecode1st with length 5;
E967=0;
E8694=0;
array ecod {34} $5 DX1-DX34 ;
do jj=1 to 34;
if "E800"<=substr(ecod{jj},1,4)<="E848" or
 "E850"<=substr(ecod{jj},1,4)<="E868" or
 "E8690"<= substr(ecod{jj},1,5) <="E8693" or
 "E8695"<= substr(ecod{jj},1,5) <="E8699" or
 "E880"<=substr(ecod{jj},1,4)<="E966" or
 "E968"<=substr(ecod{jj},1,4)<="E999"
then Ecode1st= ecod{jj};
if Ecode1st ne " then leave;
if substr(ecod{jj},1,4)="E967" then E967=1;
if substr(ecod{jj},1,5)="E8694" then E8694=1;
end;
if Ecode1st=" and E967=1 then Ecode1st="E967";
else if Ecode1st=" and E8694=1 then Ecode1st="E8694";
run;
****Remove all hospitalizations for which Ecode1st is in the range E930 - E949****;  
****("Drugs, medicinal and biological substances causing adverse effects in therapeutic use")****;  

```sas
data temp3;
   set temp2;
   if substr(Ecode1st,1,3) notin ('E93','E94');
run;
```

********** Create an alcohol hospitalization datafile with the appropriate agegroups **********;  
```
data hdd.alc;       *this creates a permanent SAS dataset;
   set temp3;
   alc_dx=2;
   if substr(DX1,1,4) in ('2910','2911','2912','2913','2914','2915','3575','4255','5710','
   '5711','5712','5713','7903','9800','9801') or
   substr(DX1,1,5) in ('29181','29189','30500','30501','30502','30503','53530','53531','76071')  or
   (substr(DX1,1,3) eq '303' and (substr(DX1,4,2) ge '00' and substr(DX1,4,2) le '93'))
      then alc_dx=1;      * Alcohol as Principal DX;
   alc_ecode=2;
   if substr(Ecode1st,1,5) in ('E8600','E8601','E8602','E8609')
      then alc_ecode=1; * Alcohol as first-listed Ecode;
   agegroup='      ';     * make sure there are six spaces within the quotes to initialize agegroup with length 6;
   if age ge 0 and age le 4 then  agegroup='  0-4 ';
   if age ge 5 and age le 9 then  agegroup='  5-9 ';
   if age ge 10 and age le 14 then agegroup='10-14 ';
   if age ge 15 and age le 17 then agegroup='15-17 ';
   if age ge 18 and age le 24 then agegroup='18-24 ';
   if age ge 25 and age le 29 then agegroup='25-29 ';
   if age ge 30 and age le 34 then agegroup='30-34 ';
   if age ge 35 and age le 39 then agegroup='35-39 ';
   if age ge 40 and age le 44 then agegroup='40-44 ';
   if age ge 45 and age le 49 then agegroup='45-49 ';
   if age ge 50 and age le 54 then agegroup='50-54 ';
   if age ge 55 and age le 59 then agegroup='55-59 ';
   if age ge 60 and age le 64 then agegroup='60-64 ';
   if age ge 65 and age le 69 then agegroup='65-69 ';
   if age ge 70 and age le 74 then agegroup='70-74 ';
   if age ge 75 and age le 79 then agegroup='75-79 ';
   if age ge 80 and age le 84 then agegroup='80-84 ';
   if age ge 85 and age le 115 then agegroup='85-115 ';
run;
```

```sas
data new;
   set hdd.alc;
   alcohol=2;
   if alc_dx=1 or alc_ecode=1 then alcohol=1;
```

* alcohol=1 represents those cases for which either the principal diagnosis or *
* the first-listed valid E-code is among the Alcohol codes in Tables 1 and 2 in the How-to Guide *;

```
proc freq data=new;
   tables agegroup / nopercent;
   where alcohol=1;
   title1 'Hospitalizations Attributable to Alcohol';
run;
```
APPENDIX 2

Generic SAS Programming for
Generating Indicator
Where there are Separate Fields for E-codes
/***************************************************************************
Program name: alchosp_generic.sas
Purpose: Generate the Alcohol Hospitalization indicator
Notes: This programming is specifically written for hospital discharge data
that has separate fields for E-codes.
Read through all of the following program and modify
according to your state hospital discharge datafile.
***************************************************************************/

options linesize = 100 pagesize = 50 center errors=3;
libname hdd '< location of your hospital discharge data >';

****Create the basic dataset - residents of your state, instate/acute care hospitals, age=known****;
****In the example below, the hospital discharge dataset has 6 fields for E-codes****;

data temp1 (keep=age DX1 Ecode1-Ecode6);   *other variables such as sex, race, county may be kept if additional analyses are desired;
  set hdd.hdd2013;       *'hdd2013' is your complete hospital discharge dataset;
  if < State of Residence=Your State >
  and
  hosp_id in < List of in-state acute care hospitals >
  and
  age in < age range excluding unknown age >;   *note that there may be special codes for newborns (and newborns are to be included);
  run;

**************************** Identify first-listed valid E-code*********************************;
*** Note that this program categorizes E-codes E930-E949 as ‘valid’ ***;
*** because codes in this range subsequently will be used to exclude cases. ***;
*** Modify depending on the number of E-code fields that are available in your state***;

data temp2;
  set temp1;
  Ecode1st='     ';  * make sure there are five spaces within the quotes to initialize Ecode1st with length 5;
  E967=0;
  E8694=0;
  array ecod  {6} $5 Ecode1-Ecode6 ;
  do jj=1 to 6;
    if "E800"<=substr(ecod{jj},1,4)<="E848" or
       "E850"<=substr(ecod{jj},1,4)<="E868" or
       "E8690"<= substr(ecod{jj},1,5) <="E8693" or
       "E8695"< substr(ecod{jj},1,5) <="E8699" or
       "E880"<=substr(ecod{jj},1,4)<="E966" or
       "E968"<substr(ecod{jj},1,4)<="E999"
      then Ecode1st= ecod{jj};
      if Ecode1st ne " then leave;
      if substr(ecod{jj},1,4)='E967' then E967=1;
      if substr(ecod{jj},1,5)='E8694' then E8694=1;
      end;
  if Ecode1st='' and E967=1 then Ecode1st='E967';
  else if Ecode1st='' and E8694=1 then Ecode1st='E8694';
  run;
****Remove all hospitalizations for which Ecode1st is in the range E930 - E949****;
****("Drugs, medicinal and biological substances causing adverse effects in therapeutic use")****;

```
data temp3;
  set temp2;
  if substr(Ecode1st,1,3) notin ('E93','E94');
run;
```

********** Create an alcohol hospitalization datafile with the appropriate agegroups **********;
```
data hdd.alc;       *this creates a permanent SAS dataset;
  set temp3;
  alc_dx=2;
  if substr(DX1,1,4) in ('2910','2911','2912','2913','2914','2915','2919','3575','4255','5710',
                        '5711','5712','5713','7903','9800','9801') or
  substr(DX1,1,5) in ('29181','29189','30500','30501','30502','30503','53530','53531','76071')  or
  (substr(DX1,1,3) eq '303' and (substr(DX1,4,2) ge '00' and substr(DX1,4,2) le '93'))
  then alc_dx=1;      * Alcohol as Principal DX;
  alc_ecode=2;
  if substr(ECODE1st,1,5) in ('E8600','E8601','E8602','E8609')
  then alc_ecode=1; * Alcohol as first-listed Ecode;

  agegroup=' ';     * make sure there are six spaces within the quotes to initialize agegroup with length 6;
  if age ge 0 and age le 4 then  agegroup='  0-4  ';
  if age ge 5 and age le 9 then  agegroup='  5-9  ';
  if age ge 10 and age le 14 then agegroup=' 10-14  ';
  if age ge 15 and age le 17 then agegroup=' 15-17  ';
  if age ge 18 and age le 24 then agegroup='18-24  ';
  if age ge 25 and age le 29 then agegroup='25-29  ';
  if age ge 30 and age le 34 then agegroup='30-34  ';
  if age ge 35 and age le 39 then agegroup='35-39  ';
  if age ge 40 and age le 44 then agegroup='40-44  ';
  if age ge 45 and age le 49 then agegroup='45-49  ';
  if age ge 50 and age le 54 then agegroup='50-54  ';
  if age ge 55 and age le 59 then agegroup='55-59  ';
  if age ge 60 and age le 64 then agegroup='60-64  ';
  if age ge 65 and age le 69 then agegroup='65-69  ';
  if age ge 70 and age le 74 then agegroup='70-74  ';
  if age ge 75 and age le 79 then agegroup='75-79  ';
  if age ge 80 and age le 84 then agegroup='80-84  ';
  if age ge 85 and age le 115 then agegroup='85-115  ';
run;
```

```
data new;
  set hdd.alc;
  alcohol=2;
  if alc_dx=1 or alc_ecode=1 then alcohol=1;

* alcohol=1 represents those cases for which either the principal diagnosis or *
* the first-listed valid E-code is among the Alcohol codes in Tables 1 and 2 in the How-to Guide *;
run;
```

****************************Alcohol Hospitalization Indicator****************************;
```
proc freq data=new;
  tables agegroup / nopercent;
  where alcohol=1;
  title1 'Hospitalizations Attributable to Alcohol';
run;
```