STATE ENVIRONMENTAL HEALTH INDICATORS COLLABORATIVE (SEHIC)
AIR QUALITY INDICATORS

Indicator: **AQ2: Exceedances of Air Quality Indices and Standards**

Measure(s): **AQ2.3: Number of Days and Person-Days of Air Rated Unhealthy for Sensitive Groups or Unhealthy for All, by County and MSA**

MEASURE DESCRIPTION

AQ2.3: Number of Days and Person-Days of Air Rated Unhealthy for Sensitive Groups or Unhealthy for All, by County and MSA	
Last updated:	September 30, 2008
Geographic scale:	Counties and MSAs with monitors
Time scale:	Annual, 2000 through most recent year
Significance/background:	According to the published literature, air pollution has been associated with premature death; increased rates of hospitalization for respiratory and cardiovascular conditions; adverse birth outcomes; and lung cancer (Cannon 1990, Dockery and Pope 1994, Schwartz *1999).* Air pollution places a large economic burden on the country. In a report prepared for the American Lung Association, Cannon (1990) estimated that air pollution related illness costs approximately $100 billion dollars (1988 dollars) each year in the United States, with an estimated number of excess deaths ranging from 50,000 to 100,000 per year (Dockery and Pope 1994). Additionally, as much as five percent of all hospital admissions for heart disease can be attributed to exposure to air pollution, representing an enormous public health impact (Schwartz *1999).* More than half of the U.S. population, approximately 159 million Americans, live in counties with unhealthy levels of air pollution in the form of either ozone or particulate matter (American Lung Association 2004). The AQI incorporates all the pollutants which are monitored, so the specific health impacts associated with concentrations rated as unhealthy will vary depending on the responsible pollutant(s) or their interaction. Elevated pollution levels depend on sources, transport, the season, geography and atmospheric conditions. Each part of the country will have its own level of pollution concentrations which can be exacerbated by a multitude of conditions, including stagnation, fire, or wind. The seasons for peak concentrations also varies between geographical regions.
Rationale:	The Air Quality Index (AQI) was developed by the US EPA to simplify communication of air quality information to the public. It is useful in communicating the air quality in a specific area on a given day and the potential health effects and actions to avoid exposure and reduce harmful impacts. The number and percentage of days with AQI values in each of the categories gives a sense of the number of days that are potentially unhealthy for sensitive and all populations.
Limitations:	The data for this indicator only represents MSAs and counties that have air monitors and tends to reflect urban air quality. The total number of days in each category does not provide information regarding the severity (max concentrations) of potential exposures. This composite AQI indicator and

	reported totals do not identify the pollutants of concern–that is, it does not show which pollutant(s) are causing the days to be ranked in one of the unhealthy categories, or which ones have decreased and are responsible for an improvement in the AQI.
Data Resources:	EPA data : **http://www.epa.gov/air/data/geosel.html**
Limitations of Data Resources:	MSAs with populations > 350,000 are required to report the AQI; many smaller areas also report, however, the EPA MSA data is limited to pop. > 500,000. Data for $PM_{2.5}$ is unavailable prior to 1999. The relationship between ambient concentrations and personal exposure is largely unknown and variable depending upon pollutant, activity pattern, and microenvironments.
Related Sets of Data:	HP2010, Asthma Hospitalizations, % of Population in Counties and MSAs with monitors where concentrations of ozone and PM exceeded the EPA National Ambient Air Quality Standard and the CA Standards.
Appropriate Use of Indicator:	This indicator can be utilized to inform policy makers and the public regarding the number of days of unhealthy air pollution concentrations and the number of people potentially affected. Caution: This indicator is not a surrogate measure of exposure and therefore should not be linked with health data. Use of this indicator in such manner can lead to spurious results.

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HOW-TO GUIDE: AQ2.3

Obtain Data from the EPA Website:

1. Go to the EPA AirData Web Page: **http://www.epa.gov/air/data/geosel.html**
2. Select **State** option at the top of the map, click on your state on the map, select **Go** from the bottom of the menu to the right of the map.
3. Under **Reports** in the **Monitoring** section on the left side of the Table, select **Air Quality Index**.
4. Under **Year of Data**, select the year of interest.
5. Under **Summary Type**, select **County**, then select **Generate Report**.
6. On the report page, scroll down on the page and click on the **All Pages** button under the table to show all data.
7. Copy the entire table contents.
    a. Click in the upper left corner of the table, hold down and drag to the bottom right corner to highlight all of the table cells.
    b. On the drop down menu bar at the top of the page, click on **Edit** and **Copy**.

Create a SEHIC report in Excel:

8. Paste the table into a new Excel file:
    a. Open a new workbook in Excel, click in cell A1, and paste the contents in the worksheet (Contol+V, or go to **Edit** and then **Paste** on the menu at the top of the screen).
    b. Save the file as [state abbreviation]Data_AQ2.3. For example GAData_AQ2.3.
9. Open the Excel file SEHIC Indicator Report Template.xls. Copy and paste the county name column and the days unhealthy columns from your saved file from step 8 above into the **SEHIC Indicator Report Template.xls**, worksheet **AQ2.3**.
10. For MSAs, repeat beginning with step 1 above, and when you get to number 5, select **MSA** for the summary type.
11. Compute the person days for a county or MSA of air unhealthy for sensitive groups or unhealthy for all (note that person-days cannot be calculated separately for just the sensitive group because census data are not available for this group): For each county/MSA, multiply the number of days of AQI greater than 100 (the "days unhealthy" total) by the population of the county/MSA. Get county populations at **http://www.census.gov/popest/counties/CO-EST2006-01.html**, and MSA populations at **http://www.census.gov/population/www/estimates/CBSA-est2006-annual.html**. MSA definitions can be found at http://www.census.gov/population/estimates/metro_general/List1.txt
12. For total person-days in a state, add the person days for all counties for the AQI unhealthy category.