NATIONAL-SCALE AIR TOXICS ASSESSMENT FOR 2005

FACT SHEET

ACTION

- On March 11, 2011, the Environmental Protection Agency (EPA), released the fourth version of the National Air Toxics Assessment (NATA), an analytical tool that helps federal, state, and local governments and other users better understand the potential health risks from breathing pollutants called air toxics.

- NATA is a prioritization tool used to identify geographic areas, pollutants and emission sources that should be evaluated further to gain a better understanding of health risks posed by air toxics. This update of the National Air Toxics Assessment tool is based on emissions for the 2005 Calendar Year. Emissions information from that year were the most complete and up-to-date at the time EPA developed this version of NATA.

- EPA developed NATA because there is not a large, nationwide monitoring network in place for the 187 pollutants identified as air toxics. To understand potential health risks from breathing air toxics, the Agency developed the model-based NATA.

- EPA uses NATA in many ways, including to:
  - work with communities in designing their own local-scale risk assessments,
  - set priorities for improving air emissions inventories,
  - help direct research on air toxics science issues, and
  - help direct priorities for expanding and improving the network of air toxics monitoring.

- NATA helps state, local and tribal air agencies focus resources on geographic areas, pollutants and types of emission sources for closer investigation. Once risks are further characterized, air agencies can determine steps to reduce air toxics emissions where necessary.

- State and local agencies collaborated with EPA to develop the information that is contained in the NATA tool.

- NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals. This is because NATA uses models to estimate risks; it is not designed to determine health risks for individual people.

- NATA is designed to prioritize pollutants and areas for further study, not to compare one area of the country's risk to another. This is because the emissions data underlying the assessment can vary in the level of detail from state to state.
  - For example, one state that reports very detailed emissions data could appear to have higher risks than another state that reports an emissions inventory that is less complete. In this case, a comparison would not be appropriate.

- Air toxics are pollutants known for, or suspected of, causing cancer or other serious health problems, such as asthma or birth defects. Studies show that children may be particularly susceptible to some air toxics such as formaldehyde and polycyclic organic matter.

- Much progress has been made in reducing air toxics emissions in the U.S. Between 1990 and 2005, air toxics emissions declined by approximately 42 percent from all sources. EPA continues to implement the Clean Air Act to achieve further reductions in air toxics.

NATA HIGHLIGHTS – National-Level

- Geographic Areas:

    - Urban areas tend to have higher estimates of cancer and non-cancer risks than rural areas. This is because in urban areas there are many emissions sources including mobile sources, and large and small industrial sources. Secondary formation (e.g. formaldehyde forming from other emitted pollutants) also tends to occur more in urban areas because of the complex mixture of emitted pollutants.

    - According to the 2000 census there are approximately 66,000 census tracts in the country. Based on the 2005 NATA, EPA estimates that there were about 3,100 tracts (5 percent) with cancer risks greater than 100 in a million. For most census tracts with risk greater than 100 in a million, the risks are due to the combined impacts of several sources: mobile sources, large and small industry, and secondary formation.

- Pollutants:

    - Nationwide, the key pollutants that contribute most to the overall cancer risks are formaldehyde and benzene.
    - Acrolein, which can affect the lungs, contributes the most to non-cancer risks, nationwide.

- Emission Sources:

    - NATA includes the following emissions sources:
        - **Stationary sources**, e.g., large industrial facilities such as coke ovens for the steel industry, refineries and smaller sources such as gasoline stations.
        - **Mobile sources,** e.g., cars, trucks, and off road vehicles like construction equipment and trains.
        - **Background,** e.g., long-range transport, emissions sources not included in the NATA emissions inventory, and natural emissions sources.
        - **Secondary formation,** i.e., pollutants formed from other pollutants emitted into the air.

- Secondary formation was the largest contributor to cancer risks, while stationary, mobile and background sources contribute almost equal portions of the remaining cancer risk.

- To obtain information about risks in specific geographic areas, use the interactive Google Earth maps and the information in the spreadsheets on the NATA website at http://www.epa.gov/nata2005. The website also contains detailed technical information about the assessment, answers to frequently asked questions about NATA and a technical support document which describes in detail how NATA was developed.

ABOUT THE ASSESSMENT

- This version of NATA is based on air toxics emissions information from the year 2005. Emissions information from that year were the most complete and up-to-date at the time EPA conducted the analysis. Working with industries and states, EPA updates information about air toxics emissions every three years. Once an inventory is complete, EPA conducts the analysis which is then reviewed by the states. Once the review is complete and the results are evaluated for accuracy, EPA makes the NATA tool available to the public.

- The 2005 NATA includes 178 air toxics, such as benzene, methylene chloride, acrolein, and diesel particulate matter (diesel PM). NATA includes diesel PM for non-cancer health effects only.

- NATA estimates risks from breathing air toxics that are emitted from large and small industrial sources, and from mobile sources such as cars, trucks and construction equipment.

- The 2005 NATA also estimates risks from secondary formation. Secondary formation occurs when a pollutant emitted into the air changes into another pollutant as a result of a chemical reaction in the atmosphere.

- NATA is a screening-level assessment. A screening-level assessment is performed with a limited amount of technical information and with several health-protective assumptions to identify exposures that should be evaluated more carefully with more technical information to gain a better understanding of risks. Also, given that NATA is a screening-level assessment, it is not designed to be used as the sole basis for regulatory action.

- The NATA assessment is generally performed using a four step process:

    1. Compile a national air toxics emissions inventory of outdoor stationary and mobile sources. The compiled information is called the National Emissions Inventory (NEI). In this case the 2005 NEI was then further refined by EPA, state, local and tribal review to produce a model ready inventory.

2. Estimate ambient concentrations of air toxics based on air dispersion and photochemical models.
3. Estimate population exposures based on a screening-level inhalation exposure model.
4. Characterize potential cancer and non-cancer public health risks due to inhaling air toxics.

- NATA results are used to target those geographical areas where more refined local-scale assessments or monitoring programs are needed to identify health risk hotspots.

  NATA also accounts for background concentrations of some air pollutants. These concentrations include contributions from long-range transport, emission sources not included in the NATA emissions inventory, and natural emission sources.

- NATA also estimates the secondary formation of some air pollutants. These added contributions, due to the chemical transformation of one air toxic to another, occur in the atmosphere after an air toxic has been emitted from its original source.

- The risks estimated in the assessment are associated with breathing the pollutants -- it does not address other methods of exposure such as eating or drinking. For the majority of air toxics, most exposures come from breathing. For some air toxics, however, a separate assessment of other exposure routes is important to be able to fully quantify health risks (e.g., ingestion of mercury).

- Because of improvements in EPA's NATA methodology, it is not meaningful to directly compare the results of the 2005 NATA to the NATA results from previous years. It is important to note that changes in emissions, ambient concentrations, or risks may be due to either improvements in the methodology or to actual changes in the level of air toxics emitted by sources.

- In this assessment, the potential cancer risk from diesel PM exhaust emissions is not calculated. This is because EPA's Science Advisory Board has advised that the health effects data are not sufficient to develop a quantitative estimate of the carcinogenic potency for this pollutant. However, EPA has concluded that diesel exhaust is among the substances that may pose the greatest risk to the US population.

- EPA plans to develop new national-scale assessments as inventory data from subsequent years become available. The next such analysis will focus on 2008 emissions inventory data.

- The Agency has published three previous national-scale air toxics assessments for the years 1996 (published in 2002), 1999 (published in 2006) and 2002 (published in 2009).

FOR MORE INFORMATION

The National-Scale Air Toxics Assessment website is available at http://www.epa.gov/nata2005.