

Background

The [U.S. Environmental Protection Agency \(EPA\) on March 11, 2011](#), released the fourth update of its [National Air Toxics Assessment \(NATA\)](#). This assessment helps federal, state, local governments and other stakeholders better understand the potential health risks from exposure to air toxics.

NATA is a screening level assessment that estimates health risks from breathing 178 hazardous air pollutants (HAP), including diesel particulate matter. NATA is generated using computer models that analyze HAP distributions, types and locations of emission sources, and health hazard information. It estimates excess cancer incidence for cancer-causing air pollutants and computes a hazard index (HI) for those pollutants that do not cause cancer. Results are expressed as concentrations and population risk. States can use these data to: identify possible sources of pollution; develop response plans; determine where monitoring sites should be placed; and determine those pollutants upon which to focus monitoring efforts. The federal government can use these data to: identify communities where more detailed risk analyses are needed; improve emissions inventories; improve air toxic monitoring networks; and update the school monitoring program.

Data

Data used to estimate risk were obtained from the EPA National Emission Inventory (NEI), mobile source emission estimates, Residual Risk Rule reviews under the Clean Air Act, and pollutant concentrations from Urban Air Toxics (UAT) and other ambient monitoring. Population data were taken from the 2000 Census.

Results

Possible cancer risk and non-cancer health effects are characterized based on estimates of breathing HAPs. Cancer risk is the probability of developing cancer over a lifetime. Non-cancer hazard is based on chronic exposures and is expressed as a hazard index (HI). The lower the Hazard Index is, the more health protective it is. HIs greater than 1 are less health protective and the higher the HI is, the greater the risk of adverse health effects. NATA includes HIs for the respiratory and neurological systems. The cancer and non-cancer risks are estimated at county and census tract levels.

Cancer risk

The 2005 NATA evaluates risk for the 50 states, District of Columbia, Puerto Rico and the Virgin Islands. The average nationwide cancer incidence is about 50 cases per million people. According to NATA, cancer incidence in North Carolina is below the national average, at an incidence of about 39 per million population.

Only one county in North Carolina exceeded the nationwide average cancer risk. The excess cancer incidence in Mecklenburg County is projected to be approximately 56 per million population.

According to the 2005 NATA, the pollutants causing a majority of the risk in North Carolina are:

- Cancer: formaldehyde, benzene, acetaldehyde, and carbon tetrachloride
- Non-cancer: none (HI<1)

Formaldehyde contributes the most to statewide average cancer risk. However, the cancer risk values used by EPA are the subject of an ongoing scientific debate.

Uncertainty and Variability

NATA analysis provides a picture of how hazardous air pollutants, exposure, and risk vary throughout the United States. The study does not focus on individuals. NATA estimates variation between well-defined geographic areas, such as counties or states, based on projections of HAP concentrations, exposure, and risk in different census tracts. Since NATA is a screening tool, it is not appropriate to use it to compare risks between states because uncertainty exists in both the emissions estimates and models used. Evaluating exposure, which relies on everyday movement of people, affects the estimates of exposure. Uncertainty in risk estimates are also found in the methods used to estimate the toxicity of air pollutants.