Introduction to Environments and Contaminants Topics

Why is EPA tracking levels of contaminants and other aspects of children's environments in *America's Children and the Environment*?

Pollutants or contaminants that can affect the health of children can be found in air, water, food, and soil. Furthermore, characteristics of children's environments, such as unusually high temperatures, can also have adverse health effects. This section addresses contaminants in the air children breathe, the water they drink, and the food they eat, and also addresses the conditions of important children's environments by considering indoor environments, contaminated lands, and climate change. Trends over time can indicate the successes and shortcomings of efforts to protect children's health, and also identify opportunities for future action. Differences between demographic groups can identify groups of children whose health may be particularly at risk.

What environment and contaminant topics are included in the draft indicators for *America's Children and the Environment, Third Edition (ACE3)*?

Environment and contaminant topics were selected for ACE3 based on: (1) research findings identifying environmental contaminants or characteristics that may have adverse effects on children's health; and (2) the availability of nationally representative data suitable for constructing an indicator. EPA obtained input from its Children's Health Protection Advisory Committee to assist in selecting topics from among the many contaminants and other aspects of the environment that affect children. The ACE3 environment and contaminant indicators address the following topics:

- Criteria air pollutants
- Hazardous air pollutants
- Indoor environments
- Drinking water contaminants
- Food contaminants
- Contaminated lands
- Climate change

What data sources were used to develop the environment and contaminant indicators?

Data for all of the environment and contaminant indicators were obtained from surveys and databases conducted/maintained by various U.S. government agencies. These include the Air Quality System (Environmental Protection Agency, EPA), National Air Toxics Assessment (EPA), National Health Interview Survey (Centers for Disease Control and Prevention), American Healthy Homes Survey (Housing and Urban Development, HUD), National Survey of Lead and Allergens in Housing (HUD), Safe Drinking Water Information System (EPA), Pesticide Data Program (U.S. Department of Agriculture), Comprehensive Environmental Response, Compensation, and Liability Information System (EPA), Resource Conservation and

Recovery Act Information dataset (EPA), and the U.S. Cooperative Summary of the Day dataset (National Climatic Data Center).

What can we learn from the environment and contaminant indicators?

For some of the selected environment and contaminant topics, health-based standards have been established. By comparing data on contaminant levels against these standards, it is possible to determine the percentage of children living in areas where standards or targeted levels have been exceeded. For other topics, a health-based standard does not exist. In these cases, it is still possible to look at the data to determine whether conditions are improving over time, or to determine whether there may be differences in potential exposure among groups of children (e.g., those of different race/ethnicity or income level).

It is important to realize that children may be exposed to the same contaminant through a variety of sources and pathways. For example, children can be exposed to lead by inhaling air as well as by ingesting dust and drinking water. The environment and contaminant indicators consider each of these issues separately, and thus cannot represent multi-pathway exposures. A separate section of ACE3 presents biomonitoring indicators, which report levels of selected chemicals measured in blood and urine samples. One advantage of the biomonitoring indicators is that they provide an integrated measure of exposure from all possible sources and pathways. However, biomonitoring data are not available for all contaminants of concern for children's health. The environment and contaminant indicators and the biomonitoring indicators are complementary in that they represent different types of information about children's potential environmental exposures.

What information is provided in the draft environment and contaminant indicator documents?

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There is a separate document for each of the seven environment and contaminant topics. An introduction section explains the importance of the topic for children's health, including a discussion of health concerns associated with the contaminants or environmental conditions.

The introduction section is followed by a description of the indicators, including a summary of the data available and information on how each indicator was calculated. One to three indicators, each a graphical presentation of the available data, are included for each topic. Most of the indicators present time series data. Where data over time are unavailable, the indicators present data for the most recent year available. Where possible, the indicators incorporate information on

race/ethnicity and income level. Beneath each figure are explanatory bullet points highlighting key findings from the data presented in the figure, along with key data from any supplemental data tables.

Following the indicator figures and bullet points, each document provides data tables, references, metadata, and details of how the indicators were calculated. When ACE3 is completed, this documentation will be available in appendices and in online files. The detailed information on the calculation of the indicators and statistical testing will not be included in the published report, but will be available through the ACE website.

How were the indicators calculated and presented?

Data files: The indicators were calculated using data files obtained from the government agency websites or from government agency staff.

Population age groups: Most of the indicators used data for children ages 17 years and younger. The indicators for indoor environments were restricted to younger ages because younger children have been specifically identified as more susceptible to the effects of tobacco smoke and lead exposure. The indicator for environmental tobacco smoke (E5) used data for children ages 0 to 6 years. The indicator for interior lead hazards (Dust1) used data for children ages 0 to 5 years.

Calculate percentages: For most of the environment and contaminant topics, the information on environmental contaminants/characteristics were used to identify counties where one or more environmental contaminants were above target levels established for the indicator: for example, counties with at least one annual exceedance of the level of a National Ambient Air Quality Standard. The population of children in counties with an environmental contaminant above the target level is then calculated using census data, and divided by the total population of children to derive the indicator value as a percentage of all children in the United States.

Some indicators come from data sets that lend themselves to alternative approaches. For the indoor environments topics, survey data were obtained from representative samples of people (to estimate the percentage of children in homes with regular exposure to environmental tobacco smoke (ETS)) and homes (to estimate the percentage of children in homes with lead hazards). Survey weights equal to the number of children in the U.S. population represented by each sampled child were then used to extrapolate the survey results to the entire U.S. children's population. The food contaminants indicator reports the percentage of samples of selected foods with detectable levels of pesticides.

Statistical testing: Statistical analysis has been applied to the two indicators derived from survey data (the indoor environments indicators for ETS and lead) to determine whether any differences over time or between demographic groups are statistically significant. Analysis has also been applied to the criteria pollutants indicators to identify any statistically significant trends. The remaining environment and contaminant indicators do not readily lend themselves to an analysis of statistical significance, due to the characteristics of the underlying databases.