



# Environmental Health

U.S. Department of Health & Human Services • Public Health Service

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## PROGRESS REVIEW



In the seventh session in the second series of assessments of *Healthy People 2010*, ADM John O. Agwunobi, Assistant Secretary for Health, chaired a focus area Progress Review on Environmental Health. He was assisted by staff of the co-lead agencies for this *Healthy People 2010* focus area, the Centers for Disease Control and Prevention (CDC), the National Institutes of Health (NIH), and the Agency for Toxic Substances and Disease Registry. Also participating in the review were representatives from other U.S. Department of Health and Human Services (HHS) offices and agencies and from the U.S. Environmental Protection Agency (EPA). In his introduction to Progress Review participants, ADM Agwunobi noted that good environmental health is central to preventing the adverse health effects of exposure to hazardous substances and conditions. It is a key to combating the societal and environmental factors that increase the likelihood of exposure and disease. He stated that following sound environmental policies can prevent injuries and illnesses resulting from exposure to environmental hazards. Progress toward the *Healthy People 2010* environmental health objectives relies on continued tracking of exposure to hazards, collaborative efforts to implement surveillance systems, and effective public health interventions. ADM Agwunobi expressed satisfaction with the increasingly widespread recognition of the implications that the condition of the environment can have for global health and well-being, but he cautioned that our citizens should not lose sight of the very real impact that degraded environments in particular areas will have on the health of local residents.

The complete text for the Environmental Health focus area of *Healthy People 2010* is available online at [www.healthypeople.gov/document/html/volume1/08environmental.htm](http://www.healthypeople.gov/document/html/volume1/08environmental.htm). More recent data used in the Progress Review for this focus area's objectives and their operational definitions can be accessed at [wonder.cdc.gov/data2010](http://wonder.cdc.gov/data2010). For comparison, the report on the first-round Progress Review (held on March 19, 2003) is archived at [www.healthypeople.gov/data/2010prog/focus08/2003fa08.htm](http://www.healthypeople.gov/data/2010prog/focus08/2003fa08.htm). The meeting agenda, tabulated data for all focus area objectives, charts, and other materials used in the Progress Review can be found at a companion site maintained by the CDC National Center for Health Statistics (NCHS): [www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa08-environment2.htm](http://www.cdc.gov/nchs/about/otheract/hpdata2010/focusareas/fa08-environment2.htm).

### Data Trends

In his overview of data for this focus area, Richard Klein of the NCHS Health Promotion Statistics Branch observed that Environmental Health constitutes one of the largest and most complex of the 28 focus area chapters of *Healthy People 2010*, encompassing six general topics—outdoor air quality, water quality, toxics and

waste, healthy homes and healthy communities, infrastructure and surveillance, and global environmental health. Of the 45 objectives and subobjectives in the focus area that have two or more data points, 8 have moved away from the target, 6 show little or no change, 17 are improving, and 14 have met or exceeded the

target. Monitoring of progress toward the focus area objectives can be difficult. From measures that can be made, however, the tremendous burden imposed on society by environmental hazards in the United States becomes apparent. For example, the cost of illness related to the airborne pollutants ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead is estimated to be about \$250 billion annually. Excess deaths related to air pollution are estimated at 50,000 to 100,000 per year. Mr. Klein then went into greater detail about selected objectives that were highlighted during the Progress Review.

**(Obj. 8-1a):** In 2004, 39 percent of the total U.S. population lived in areas that did not meet EPA standards for ozone, compared with 43 percent in 1997. Among racial and ethnic populations for which data are available, exposure to excessive levels of ozone was experienced most widely in 2004 by Asians (67 percent, compared with 71 percent in 1997) and by Hispanics (59 percent, compared with 61 percent in 1997). Notable concentrations of counties where the EPA standard for ozone exposure is not met occur in California, the urban areas in and around Dallas, Houston, and Chicago, and along the Atlantic seaboard from northern Virginia to Maine. The 2010 target is for zero percent of the population to live in areas not meeting the EPA standard for ozone exposure.

**(Obj. 8-1b):** In 2004, 10 percent of the total population lived in areas that did not meet EPA standards for particulate matter, compared with 12 percent in 1997. Among racial and ethnic populations for which data are available, exposure to excessive levels of particulate matter in 2004 was experienced most widely by Hispanics (28 percent, compared with 30 percent in 1997), Asians (22 percent, compared with 25 percent in 1997), and Native Hawaiians (22 percent, compared with 24 percent in 1997). Notable concentrations of counties where the EPA standard for exposure to particulate matter

is not met occur in northwestern Montana, central and southern California, and the Chicago area. The target is for zero percent of the population to live in areas not meeting the EPA standard for exposure to particulate matter.

**(Obj. 8-9):** In 2002, beaches monitored by state beach safety programs were open and safe for swimming during 94 percent of the days of beach season. The proportion increased to 96 percent in 2005. The target is 98 percent.

**(Obj. 8-10a):** The proportion of river and stream miles under advisories against fish consumption increased from 15.3 percent in 2002 to 24 percent in 2004. The target is 13.8 percent.

**(Obj. 8-10b):** The proportion of lake acreage under advisories against fish consumption increased from 32.9 percent in 2002 to 35 percent in 2004. The target is 29.6 percent.

**(Obj. 8-11):** The proportion of children aged 1 to 5 years who had elevated blood-lead levels decreased from 4.4 percent in 1991–1994 to 1.6 percent in 1999–2004. Among non-Hispanic black children in that age range, the decrease was from 11.2 percent in 1991–1994 to 3.1 percent in 1999–2004. The target is zero percent.

**(Obj. 8-13):** The number of visits to a healthcare facility that results from exposure to pesticides decreased from 22,933 in 1997 to 19,168 in 2004. The target is 11,398.

**(Obj. 8-25):** Within the context of the umbrella objective to reduce exposure to pesticides, heavy metals, and certain environmental chemicals, the progress of several subobjectives was a featured topic of the data presentation. The blood-level concentration of cadmium in the total population aged 1 year and older was 1.30 micrograms per liter ( $\mu\text{g/L}$ ) in 2000–2002 (1.3  $\mu\text{g/L}$  in 1999–2000). The target is 0.9  $\mu\text{g/L}$ . The blood-level concentration of lead in the total

population aged 1 year and older decreased from 4.9 µg/L in 1999 to 4.40 µg/L in 2001–2002. The target is 3.4 µg/L. The blood-level concentration of mercury in children aged 1 to 5 years decreased from 2.3 µg/L in 1999–2000 to 1.90 µg/L in 2000–2001. The target is 1.6 µg/L. In females aged 16 to 49 years (i.e., of childbearing age), the blood-level concentration

of mercury decreased from 7.1 µg/L in 1999–2000 to 4.60 µg/L in 2000–2001, surpassing the target of 5.0 µg/L. The serum concentration of lindane (beta-HCH) in persons aged 12 years and older decreased from 68.9 nanograms per gram lipid (ng/g lipid) in 1999–2000 to 43.3 ng/g lipid in 2001–2002, which betters the target of 48.2 ng/g lipid.

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## Key Challenges and Current Strategies

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In presentations that followed the data overview, the principal themes were introduced by Paul Garbe of the CDC National Center for Environmental Health and Sheila Newton of the NIH National Institute of Environmental Health Sciences (NIEHS). These agency representatives set the stage for discussions among Progress Review participants, identified a number of barriers to achieving the objectives, and discussed activities under way to meet these challenges, including the following:

- More than 4 million housing units in the United States in which young children live have deteriorated lead-based paint and elevated levels of lead-contaminated house dust. Many children with elevated blood-lead levels will go on to experience developmental delays and behavioral problems. Communities with the worst record for lead poisoning in children are often those with many other problems as well, for instance, substandard housing, social disfunctionality, and high unemployment rates.
- The amount of air pollutants emitted per mile from cars has been greatly reduced. However, these benefits are offset by the continuing increase in vehicle miles traveled and the popularity of light-duty trucks, SUVs, and minivans, which emit more pollution.
- CDC established the National Biomonitoring Program (BMP) to provide an ongoing assessment

of the U.S. population's exposure to environmental chemicals occurring in air, water, food, soil, dust, or other media. BMP assessments measure chemicals or their metabolites in blood and urine specimens from a random sample of participants in a recurring national survey. The aggregated results of these assessments are issued in periodic reports (most recently in 2005) that can be used for a variety of purposes. Among these are the determination of whether exposure levels are increasing or decreasing and are higher among vulnerable population groups and the assessment of the effectiveness of public health efforts to reduce exposures to specific chemicals.

- The Genes and Environment Initiative (GEI) is a 5-year NIH-wide program that aims to accelerate the understanding of genetic and environmental contributions to health and disease. One of the two components of GEI is the NIEHS-led Exposure Biology Program, which will develop and adapt new and innovative technologies for more precise measurement of factors that contribute to the development of disease, including exposure to environmental toxics, diet, and levels of physical activity. It is hoped that, eventually, such efforts will result in tools for exposure assessment of individuals that will provide the same degree of precision achieved in measurements of genetic variability between individuals.

- Beach-monitoring programs are typically run by local health agencies, whose monitoring results can be inconsistent with each other because agencies may use different indicator organisms and varying monitoring frequencies. In the future, however, the reporting of beach advisory data is expected to improve because EPA has now set performance criteria that states and other government entities must meet to receive that agency's beach grants.
- In addressing three key air pollutants—nitrogen dioxide, sulfur dioxide, and mercury—EPA's Clean Air Interstate Rule and Clean Air Mercury Rule aim to reduce smog, acid rain, visibility impairment, and nitrogen and mercury deposition by using a proven market-based approach that encourages the use of new and cleaner pollution technologies. Other EPA efforts include the evaluation of air toxins, a refined monitoring strategy, an improvement in assessment tools, and continued research on health effects from exposure to pollutants.
- Earlier in this decade, CDC developed the Environmental Public Health Tracking Program to foster a nationwide health tracking network for continuous collection, integration, analysis, and interpretation of data relating to environmental hazards and their health effects. Some 30 states and city health departments were funded in 2003–2005 to conduct demonstration projects and assist CDC in structuring the network. Currently, 16 state health departments, one city health department, and four universities are funded to serve as resource centers to implement the network.
- An NIEHS study addressing indoor air quality found that asthma symptoms among inner city children dropped dramatically when family members received instruction on ways to control airborne allergens (from dust mites, cockroaches, pet dander, rodents, passive smoking, and mold) in their homes and took some simple preventive measures, such as using allergen-impermeable bedding covers and air purifiers.

## **Approaches for Consideration**

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Participants in the Progress Review agreed that environmental health, community and public health, and individual health are interdependent. They made the following suggestions for public health professionals and policymakers to consider as steps to enable further progress toward achievement of the objectives for Environmental Health:

- Reinforce primary prevention with greater efforts to control or eliminate sources of lead in children's environment before they are poisoned. In conjunction with those efforts, seek to overcome some physicians' apparent lack of concern about secondary prevention and resistance to recommended screening, which often develops as the prevalence of lead poisoning in children declines.
- Increase research to better define the mechanisms through which exposure to environmental chemicals can affect people at the level of tissues, cells, and genes.
- Ensure that any successor to *Healthy People 2010* gives a central place to the establishment of national public health goals for environmental health and to the empowerment of communities to pursue and achieve those goals.
- Explore with EPA the possibility of engaging that agency as a full partner with HHS agencies in developing environmental health objectives for the

next decade and in any subsequent presentations about progress toward those objectives.

- Seek to re-establish an HHS-wide committee for environmental health policy and planning.
- With respect to clinicians and other public health professionals, endeavor to enhance their knowledge base about the effects of the environment on public and individual health and their involvement in environmental health planning.

[Signed July 10, 2007]

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