



The National Centers for Environmental Health: National Biomonitoring Program

Overview

For more than 30 years, the Environmental Health Laboratory of CDC's National Center for Environmental Health (NCEH) has been performing biomonitoring measurements--direct measurements of people's exposure to toxic substances in the environment. By analyzing blood, urine and tissues, scientists can now measure actual levels of more than 450 chemicals and nutritional indicators in people's bodies.

Using biomonitoring data, CDC publishes the *National Report on Human Exposure to Environmental Chemicals*, which provides an ongoing assessment of the U.S. population's exposure to environmental chemicals. The third of these reports was published in 2005. For that report, CDC measured 148 chemicals, 38 of which had never been measured in the U.S. population. The report provides exposure data on the U.S. population by age, sex, and race or ethnicity. Public health officials can use the report to determine which chemicals get into people's bodies and at what concentrations; assess the effectiveness of public health efforts to reduce exposure to specific chemicals; and track trends in exposure levels over time, in order to help set priorities for research on human health effects.

Relationship to States

In addition to supporting the *Exposure* report, funding provided to NCEH has been used to support state biomonitoring planning and implementation. In FY 2002 and FY 2003, the NCEH awarded funding to states for planning grants. In FY 2004, NCEH provided a total of \$2,679,913 to states for a biomonitoring implementation grant. Included in those funds was an implementation grant for a biomonitoring consortium consisting of New Mexico, Arizona, Colorado, Montana, Utah and Wyoming. Using intramural funds, CDC continued to fund the consortium for implementation activities through FY 2008, but that money is not expected to continue without additional appropriations. California and Minnesota have continued biomonitoring activities with state funds. CDC has provided technical assistance to these states.

Accomplishments

Historically, biomonitoring data have informed major health policy decisions.

- Data on blood lead levels in the U.S. population were a major factor in justifying the rapid removal of lead from gasoline in the U.S., which had a significant impact on the cognitive development of children in the U.S.
- Biomonitoring data also showed that restrictions on smoking in public places caused significant decreases in environmental tobacco exposure.

More recently, CDC has had many other advances related to biomonitoring. In the past year, CDC has worked with state health departments, academic partners and others to provide

exposure information for more than 50 public health investigations and studies involving environmental chemicals. Specific accomplishments include the following:

- In the last two years, CDC has developed 16 new laboratory methods to measure exposure to additional environmental chemicals and nutritional indicators, including methods for measuring melamine and arsenic.
- CDC also produced, within the last two years, first-time data on the U.S. population's exposure to triclosan (a chemical used in detergents, soaps, and skin cleaners), benzophenone-3 (a chemical used in sunscreen), polybrominated diphenyl ethers (a class of chemicals added to plastics and foam products to make it more difficult for them to burn), and bisphenol-A (a chemical used to make one type of polycarbonate plastic and certain types of epoxy resins).
- Biomonitoring data contributed to the science used to support the Consumer Product Safety Commission Reform Act of 2008, which banned three phthalates used in children's toys and child-care products.
- CDC researchers, in collaboration with the Harvard School of Public Health, recently reported that premature infants in neonatal intensive care units have bisphenol-A (BPA) levels one order of magnitude higher than the general population. They found that the difference in exposure to BPA was dependent on the use of plastic medical products containing the phthalate DEHP.

Future Direction

With additional funding, the NCEH could fund states or consortia of states to expand their capability to identify individuals experiencing harmful chemical exposures; improve health risk assessment; and guide future treatment and prevention efforts. Specific activities would include conducting state biomonitoring surveillance programs; conducting rapid response to assess exposure to toxic chemicals; hiring personnel; and purchasing instruments and supplies.

NCEH could also enhance its intramural activities. It could increase the number of chemicals measured in the *Exposure* report; provide measurements for chemicals in newborns and women participating in the National Children's Study; develop biomonitoring methods for additional chemicals; provide training and quality assurance for state laboratories awarded biomonitoring funds; increase the number of studies used to assess health effects associated with exposure to environmental chemicals; and maintain the capacity to provide emergency response support related to exposure to environmental chemicals.