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California's New Environmental Health Tracking Programs

Paul English, PhD and John Balmes, MD

In the wake of 9/11, renewed resources and attention have been given to the nation's public health infrastructure, especially in the areas of surveillance of acute infectious illnesses and monitoring the environment for suspicious peaks of chemical contamination. California should rightly devote resources for preparation for a chemical or biological terrorist attack. However, at the same time, we should not neglect the financial and human toll of chronic disease. Chronic diseases are the cause of approximately 75 percent of deaths in California. Unlike with infectious diseases, clinicians are not mandated to report many chronic diseases and therefore public health agencies are unable to track trends over time to determine if they are changing in specific populations or geographic areas.

Environmental exposures contribute to a significant proportion of many chronic diseases (e.g., 30 percent of childhood asthma exacerbations and 10 percent of childhood neurobehavioral disorders are attributed to environmental exposures).(1) Analyses of twin cohorts indicate that genetic factors only explain a minor part of the etiology of cancer and that the environment plays a major role.(2) The toll of environmentally-related chronic disease in California is significant. For just nine of these preventable diseases (such as childhood asthma, lead poisoning and childhood cancer) in which cost estimates are available, total costs for Californians are an estimated $10 billion per year.(3) The estimated total costs in California for work-related deaths in 1992 were $20.7 billion.4 Many workers die each year in California from preventable diseases caused by chemical exposuress.(4)

For some diseases with clear environmental links, incidence is rising; for example, the prevalence of adult asthma in California increased 76 percent between 1984 and 2002.(5) Other diseases with suspected environmental links are also increasing, such as autism (with observed diagnosed cases increasing 80 percent from 1989 to 1992 in California)(6) and testicular cancer (the most common cancer among young men in California, increasing 51 percent nationwide from 1973 to 1995).(7)

In response to the rising burden of disease caused or exacerbated by environmental factors, the California Legislature passed and the Governor signed Senate Bill 702 in 2001. This law made California the first state in the nation to begin planning an environmental public health surveillance system. The goal of such a system is "to establish ongoing surveillance of the environmental

exposures and diseases affecting Californians, with a focus on prevalence and determinants of chronic diseases."(8) The University of California, the California Department of Health Services, and the California EPA (CalEPA) partnered to form a steering committee and a panel of experts as mandated by SB 702 to develop recommendations on how such a system would be developed (see final report at www.catracking.com). One of the main recommendations is that the state establish an interagency DHS/CalEPA Office of Environmental Health Tracking to promote collaboration and integrate environmental health data.

In October 2002, the federal Centers for Disease Control and Prevention provided funding for 17 states, 3 local health departments, and three schools of public health to begin development of a National Environmental Public Health Tracking Network. The California Department of Health Services (CDHS) and the University of California, Berkeley were among the recipients of these awards. The CDHS program has the following goals:

- To increase value to existing disease registries by activities such as adding environmental exposure data;
- To establish chemical hazard tracking for the state;
- To develop state biological monitoring capabilities;
- To develop surveys that expand environmental monitoring/modeling to assess exposures;
- To develop innovative ways of interpreting and disseminating environmental health data while preserving data privacy and confidentiality; and
- To promote risk communication and health education to address disease cluster and environmental health concerns among the public.

The CDHS program is working to accomplish these goals by (1) convening a planning consortium of state agencies, nongovernmental organizations, environmental groups and community-based organizations to help plan, implement and evaluate a tracking network; (2) identifying and prioritizing state and local needs for tracking; (3) collaborating with the UC Tracking Center to develop training programs; (4) developing technical plans for an electronic standards-based tracking network; (5) developing an outreach and education strategy for communicating information; and (6) conducting two pilot demonstration projects. The demonstration projects include (1) examining the distribution of asthma and adverse reproductive outcomes in Alameda County and their relation to traffic-exhaust exposures; and (2) examining the distribution of airborne toxins and pesticides in relation to childhood blood levels of lead and other outcomes of pregnancy and childhood neurodevelopment. The primary mission of the UC Berkeley Center for Environmental Public Health Tracking is to help develop the National Environmental Health Tracking Network and to support funded states in this effort. The center is also developing special projects, including:

- Evaluating the use of the California Health Interview Survey to link data on air pollution and asthma with data on sociodemographic factors, asthma management, access to care, and risk behaviors. The usefulness of this model system for tracking other chronic diseases, such as

cardiovascular, cancer, and developmental disorders in relation to environmental exposures, will also be evaluated.

- Assisting health departments with asthma tracking by a) assessing the utility of various methods of measuring exposure to traffic-related pollutants and their impact on asthma in children using data from the Fresno Asthmatic Children's Study, and b) developing reliable methods for asthma screening in schools.
- Using biomarker data, emissions data, and exposure media measurements in mathematical models to determine limits of uncertainty regarding linkages between biological monitoring results and both exposures and health effects.
- Identifying the most relevant contaminants to measure, both in the environment and in humans, and the diseases that are at least partly caused or exacerbated by environmental factors. This project is also assessing the availability of data and developing informative methods to report the data to assess trends over time, differences between geographic areas, and differences by race/ethnicity and socioeconomic status.

Both the CDHS and the UC center are committed to working with community groups to provide access to needed environmental and health data while preserving data confidentiality and privacy rights of individuals. New developments in information technologies and geographic information systems are allowing us to present these data in a format and scale needed for communities while protecting data privacy.(9)

CalEPA has made a commitment to environmental justice principles and is working on making air contaminant data, for example, more available to communities with the introduction of its Community Health Air Pollution Information System (CHAPIS), a web-based mapping site, that will provide interactive maps of air pollution emission sources. Clinicians can also play an important role in developing environmental health surveillance. The use of Doctor's First Reports of Illness (DFRs) forms the backbone of occupational surveillance for asthma and pesticide illness. However, more resources are needed to improve insurer submissions of DFRs and to provide outreach and education to clinicians about work-related illness to improve the timely submission of these reports. Electronic reporting of DFRs would greatly enhance existing occupational disease surveillance and prevention efforts.

California has traditionally led the nation in environmental health protection for its residents. Last year, it was the first state to ban PBDEs (polybrominated diphenyl ethers), which are toxic flame retardant contaminants that have been found to be accumulating in human breast milk and wildlife tissues.(10) Women tested in California have levels that are ten to 100 times greater than human tissue levels in Europe.(11) California is also requiring its Air Resources Board to develop and adopt regulations that achieve the maximum feasible reduction of greenhouse gases emitted by vehicles and trucks by 2005.

Although these developments are encouraging, the state must actively remain on the cutting edge of environmental health by using the tools of biomonitoring and chemical hazard tracking to identify and reduce harmful environmental exposures for its

residents. For example, data from the 1960s show that levels of DDT metabolites in serum were higher in women of childbearing age who were born in California or the Southeast compared to the rest of the country.(12) Currently, we have no representative California-specific data on pesticide metabolites to corroborate these findings. Limited data regarding the use and distribution of chemical hazards in California represents a major gap for environmental health surveillance. While thousands of chemicals are produced or imported into the U.S. each year, the EPA has estimated that complete basic toxicity information is publicly available for only 7 percent of the high-volume chemicals manufactured in this country.(13) The lack of these data especially presents a hazard for California workers who may be exposed to these compounds. Even if the state had laboratory capacity for detecting all of these compounds in human tissues, no laboratory methods have been developed for many of these chemicals.

As resources for the state health and environmental departments and the UC system are declining, California needs to partner with clinicians, private industry, and community and environmental groups to protect the public from environmental health threats. Ultimately, though, the public sector has the responsibility to safeguard the public interest and health of its residents. We are confident that the initial work being accomplished by California's Environmental Health Tracking Programs will be the beginning of a collaborative partnership that will bring together all stakeholder interests to improve the environmental health of Californians. We invite you to join us in helping us plan this exciting and important initiative.

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Dr. English is Chief of the Environmental Investigations Unit, Environmental Health Investigations Branch, California Department of Health Services and Principal Investigator of the California Environmental Health Tracking Program. Dr. Balmes is Professor of Medicine and Division Chief of Occupational and Environmental Medicine at the University of California, San Francisco and Principal Investigator for the UC Center for Environmental Public Health Tracking.

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