

**NATIONAL  
CENTER FOR  
ENVIRONMENTAL  
HEALTH**

**F a c t B o o k**

**MARCH**

**2000**



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Centers for Disease Control and Prevention





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Centers for Disease Control and Prevention



# **MISSION**

*TO PROVIDE  
NATIONAL LEADERSHIP,  
THROUGH SCIENCE  
AND SERVICE,  
THAT PROMOTES  
HEALTH AND QUALITY  
OF LIFE BY  
PREVENTING OR CONTROLLING  
THOSE DISEASES, BIRTH DEFECTS,  
DISABILITIES, OR DEATHS  
THAT RESULT FROM  
INTERACTIONS  
BETWEEN PEOPLE  
AND THEIR  
ENVIRONMENT.*

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## II

## PREFACE

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**A**s we begin a new century, we cannot know for certain what challenges lie ahead. We do know, however, that our mission at the National Center for Environmental Health (NCEH) remains constant: to prevent or control those diseases, birth defects, disabilities, or deaths that result from interactions between people and the environment. And we know that we have the challenge and good fortune to do meaningful work that powerfully influences the quality of life of people in this country and throughout the world.

The work described in the following pages lets you know what we've accomplished in fiscal year 1999. Much of that work has involved collaboration with colleagues throughout the country and the world; with the scientific community and academic institutions; with various federal, state, and local agencies; with nongovernmental organizations; with private-sector business interests; and with numerous community groups. These collaborations have been fruitful and have helped us understand the social, political, health, and economic issues that ordinary people face every day.

Let us not, however, think about environmental decisions too narrowly. Toxic chemicals and radiation are environmental hazards, and we work hard to reduce or eliminate their impact on human health, but environmental issues are more encompassing and often more subtle. Every person has a stake in environmental public health, and as environments deteriorate, so does the physical and mental health of the people who live in them. There is a connection, for example, between the fact that the urban sprawl we live with daily makes no room for sidewalks or bike paths and the fact that we are an overweight, heart disease-ridden society.

We must seize opportunities to form coalitions with architects, builders, city planners, transportation officials, building inspectors, police officers, and others so that we are "at the table" when environmental decisions are made. Such decisions include whether to install sidewalks in the next subdivision (or whether to build the subdivision at all if it means leveling a forest). It means thinking about what constitutes safe and affordable housing and neighborhoods and providing green space for people to enjoy where they live and work, and it means rethinking how we travel from one place to another.

Land-use decisions are just as much public health decisions as are decisions about food preparation. What, for example, are the implications for children with asthma of building yet another expressway? We must also question whether a fatality involving a pedestrian isn't actually the result of poor urban planning, thoughtless land use, or inferior urban design rather than "simply" a motor vehicle crash. We must be alert to the health benefits, including less stress, lower blood pressure, and overall improved physical and mental health, that can result when people live and work in accessible, safe, well-



designed, thoughtful structures and landscapes. We must measure the impact of environmental decisions on real people, and we must begin, in earnest, to frame those decisions in light of the well being of children, not only in this country but across the globe.

We are mindful of the critical work that remains and the opportunities we have to contribute significantly to better health for everyone. Four broad goals that we have already begun to address with our partners are 1) decreasing health risks from environmental exposures; 2) improving children's health, which includes working to eliminate childhood lead poisoning as a major public health problem by 2010 and preventing birth defects; 3) enhancing emergency preparedness and response; and 4) improving the lives of people with disabilities. Each of these goals falls within our mission and expertise, and reaching them will involve not only all the scientific, political, and creative skills at our disposal but also the public's active participation. Thus, as you read through this document, know that all of us at NCEH are looking ahead even as we use this time to acknowledge the past.



Richard J. Jackson, MD, MPH  
Director





## OUR PARTNERS IN PUBLIC HEALTH

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*State and local health departments*

*Other CDC centers, institutes, and offices*

*Other federal agencies*

*Foreign governments*

*International health organizations*

*Nongovernmental organizations*

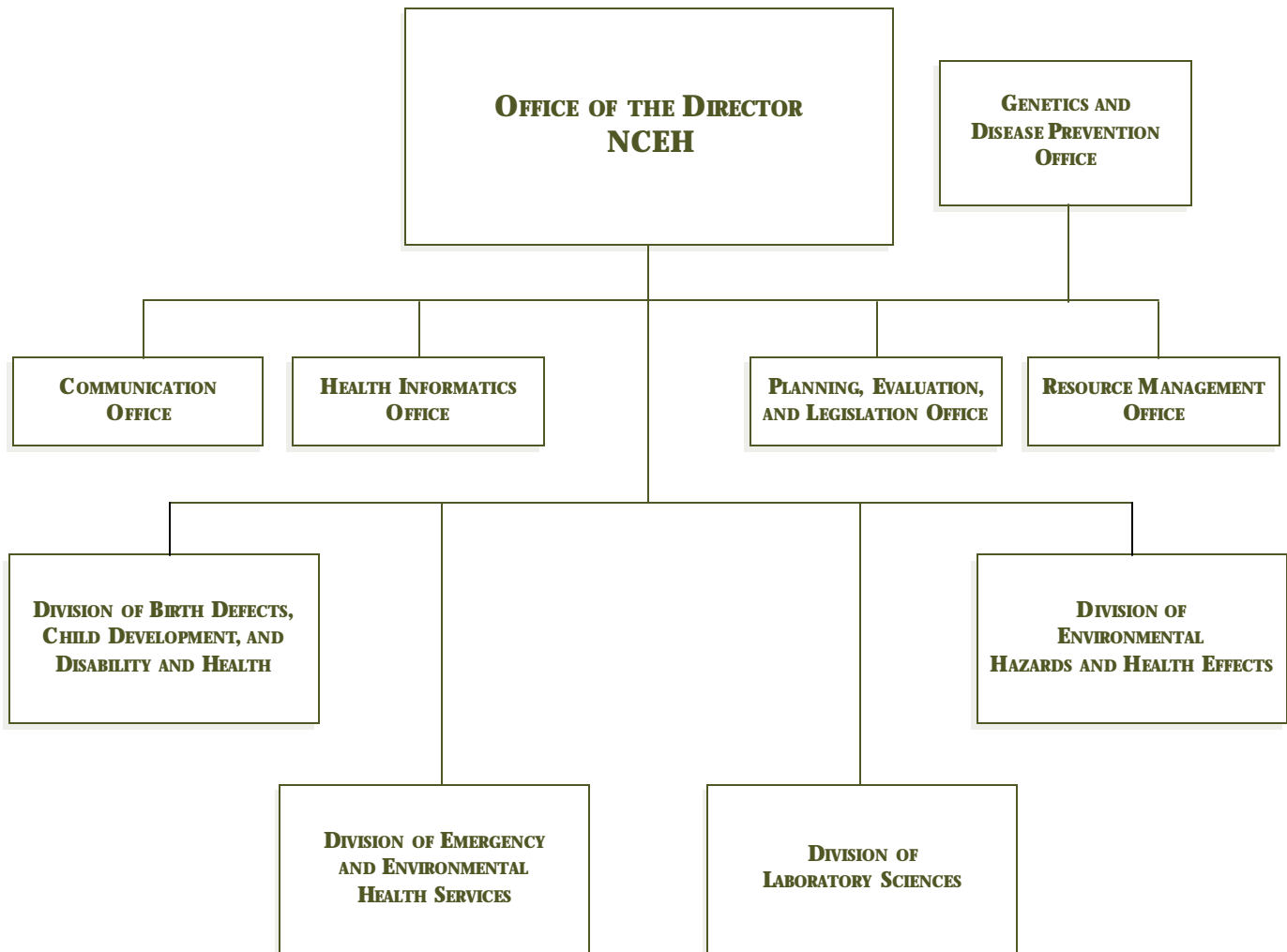
*Academic institutions*

*Philanthropic foundations*



# NATIONAL CENTER FOR ENVIRONMENTAL HEALTH

P R O P O S E D

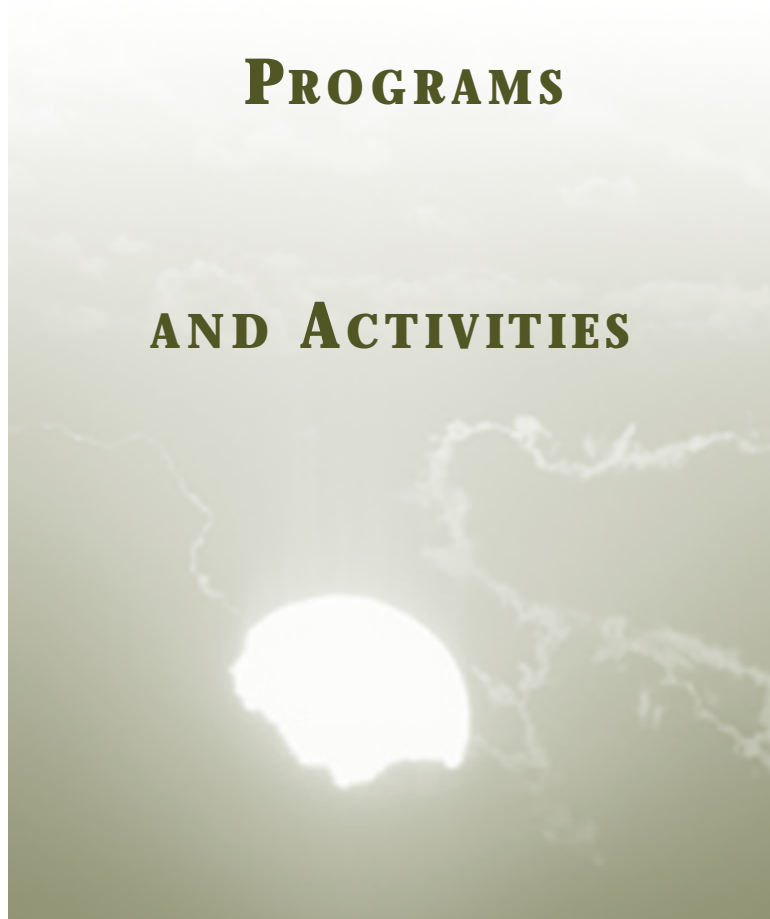


**NCEH**

**HIGHLIGHTS:**

**PROGRAMS**

**AND ACTIVITIES**





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**BIRTH DEFECTS, CHILD DEVELOPMENT,**



**AND DISABILITY AND HEALTH**

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**T**he Division of Birth Defects, Child Development, and Disability and Health (BDCDDH) seeks to promote optimal fetal, infant, and child development; prevent birth defects and childhood developmental disabilities; and enhance the quality of life and prevent secondary conditions among children, adolescents, and adults who are living with a disability. BDCDDH houses the following branches: Birth Defects and Pediatric Genetics, Developmental Disabilities, Fetal Alcohol Syndrome, and Disability and Health. Unless otherwise indicated, all work described on the following pages occurred during fiscal year (FY) 1999 (October 1, 1998-September 30, 1999).

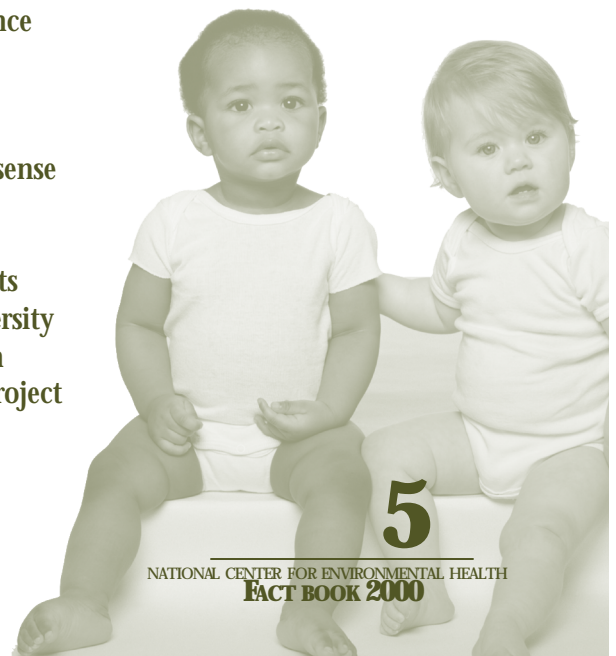
## **HEALTHY PEOPLE 2010 HEALTH OBJECTIVES**

NCEH, the Division of Reproductive Health in CDC's National Center for Chronic Disease Prevention and Health Promotion, and the Health Resources and Services Administration have the co-lead for revising the objectives in the chapter on maternal infant and child health in *Healthy People 2010*, which was published in January 2000. A companion document that focuses on preventing birth defects and developmental disabilities will be published later in 2000.

NCEH also provided leadership and support in working with other federal, state, and research partners to develop a new chapter on disability and health for *Healthy People 2010*. These objectives provide for the first time a distinct emphasis to assist those at the federal, state, local, and private-sector levels in promoting public health and wellness activities for people with disabilities.

## **CHILD DEVELOPMENT**

- Supported Legacy for Children, a set of randomized, controlled, longitudinal research projects through which NCEH personnel and contractors will examine the potential for improving child developmental outcomes through programs designed to influence parenting behavior. The programs, which emphasize parental responsibility and parent-child interaction style, seek to give parents confidence that they can make a difference in their child's development and to provide parents with a heightened sense of community.
- Legacy for Children funded the first stage of multiyear contracts with two research sites, the University of Miami and the University of California at Los Angeles. These two contractors, along with Research Triangle Institute (RTI), which is contracted as the Project Coordinating Center, developed plans that will lead to a pilot intervention and research study that began in FY 2000.



A woman in a dark sweater is holding a baby in a striped shirt. The woman is looking down at the baby with a gentle expression. The background is slightly blurred, showing what appears to be a library or a store with shelves.

## CEREBRAL PALSY

- Completed the first year of data collection for surveillance of cerebral palsy among children as young as 6 months old in the metropolitan Atlanta area. Previously, only children aged 3 years and older were included in the Metropolitan Atlanta Developmental Disabilities Surveillance Program.
- Received an award through the Prevention Research Infrastructure Funds, Office of Prevention Research, CDC, to hold a workshop with external consultants to develop a prevention-research agenda concerning infection during pregnancy and neurodevelopmental outcome, including cerebral palsy. The workshop will be held during FY 2000.

## MENTAL RETARDATION

- Sponsored a workshop on fragile X syndrome. Attendees included family advocates, genetics experts, and researchers examining the effects of early intervention among children with the syndrome, a leading genetic cause of mental retardation. The purpose of the meeting was to obtain advice on potential roles for public health in preventing this syndrome and in intervening to assist children with fragile X.

## AUTISM

We were involved in a number of activities related to the epidemiology of autism. These included continuing efforts to complete the inaugural year of autism surveillance in the metropolitan Atlanta area among children aged 3 to 10 years old, the initiation of a case-control study to examine the possible association between childhood vaccinations and autism, and the completion of data collection in the investigation of the prevalence of autism in Brick



Township, New Jersey. A special workgroup of outside experts has been formed to provide consultation on autism activities.

## EARLY HEARING DETECTION AND INTERVENTION

Conducted various events dealing with hearing impairment: 1) hosted a meeting on the epidemiology of newborn hearing screening, 2) convened a workshop in Atlanta on the genetics of congenital hearing impairment, 3) held bimonthly teleconferences on early hearing detection and intervention with an average of 50 group participants, and 4) developed and conducted a pilot survey of the systems that states use to disseminate information to service providers and parents of infants or children identified as having a hearing loss.

## ATTENTION DEFICIT HYPERACTIVITY DISORDER

Hosted a conference, "Attention Deficit Hyperactivity Disorder: A Public Health Perspective," which was attended by more than 150 people from a variety of research, academic, medical, and psychological disciplines to discuss public health issues related to attention deficit hyperactivity disorder as well as potential mechanisms for future research to address identified needs and concerns.



## FETAL ALCOHOL SYNDROME

Consumption of alcohol during pregnancy is harmful to the developing fetus. Frequent alcohol use, defined as the consumption of at least seven drinks per week or five drinks or more on at least one occasion (binge drinking), is known to produce adverse reproductive effects. NCEH conducts studies related to alcohol use among women and uses data from these studies to plan and implement activities to prevent fetal alcohol syndrome (FAS).

- Implemented an epidemiologic survey of 1,500 women in 6 community-based settings in order to measure the prevalence rate of women at increased risk for an alcohol-exposed pregnancy. If suspected above-average prevalence rates at these settings are confirmed, these settings can be recommended for targeted intervention efforts.
- Designed a dual-focus behavioral intervention to be implemented among nonpregnant women at risk for an alcohol-exposed pregnancy. The intervention will be implemented in FY 2000 and will focus both on alcohol reduction and on pregnancy postponement until problem drinking is resolved.



- Designed, developed, and tested health communication messages aimed at preventing alcohol-exposed pregnancies among African-American women. Produced brochures, posters, and print ads for public health dissemination.



- Collaborated with the American College of Obstetricians and Gynecologists (ACOG) to develop a national survey of clinicians' knowledge and attitudes regarding mothers' prenatal alcohol, tobacco, and other drug use. The survey was conducted by ACOG and analyzed with assistance from CDC. A

jointly written manuscript describing survey results was accepted for publication in *Obstetrics and Gynecology*.

- In an ongoing effort to develop surveillance programs to measure the extent of the damage caused by prenatal alcohol exposure and to evaluate the effectiveness of intervention programs, implemented the Fetal Alcohol Syndrome Surveillance Network (FASSNet) in five state health departments (Colorado, Arizona, Wisconsin, New York, and Alaska) using uniform case definitions and reporting methods.

- Assumed responsibility for convening the congressionally mandated National Task Force on Fetal Alcohol Syndrome at the request of the Assistant Secretary of Health. The task force is charged with advising federal, state, and local programs and researchers about FAS and the less severe condition known as fetal alcohol effect.



- Collaborated with the National Institute on Alcohol Abuse and Alcoholism in providing technical assistance to South Africa on issues related to FAS surveillance. Recent studies indicate that the FAS rate is 11% among children of people working in the vineyards of the Western Cape.
- Published “Comparison Binge Drinking Among Pregnant and Nonpregnant Women, United States, 1991-1995” (*Am J Obstet Gynecol* 1999;180(1):1-7). This study showed that pregnant women were one-fifth as likely as nonpregnant women to binge drink; however, from 1991 through 1995, the prevalence of binge drinking among pregnant women increased significantly from 0.7% to 2.9% but remained about the same for nonpregnant women. This study indicates that there is an increased need to educate women of childbearing age about the dangers of binge drinking.
- Published “Pregnancy-Related Alcohol Use Among Women in the United States, 1988-1995” (*Prenat Neonat Med* 1999;4:39-46). The study of pregnancy-related alcohol use among U.S. women from 1988 through 1995 showed that the median number of drinks consumed per week remained steady over time for both pregnant and nonpregnant women who drank. Among reproductive-age women who are frequent alcohol users, the likelihood of continuing frequent alcohol use into pregnancy has increased in recent years, but the amount consumed has remained stable.
- Published “Alcohol Use Prior to Pregnancy Recognition” (*Am J Prev Med* 1999;17(2):101-7). An NCEH study showed that 45% of U.S. women who delivered a liveborn child in 1988 reported consuming alcohol during the 3 months before finding out they were pregnant (the periconceptional period), and 5% reported consuming six or more drinks per week.



## **COSTS OF BIRTH DEFECTS AND DEVELOPMENTAL DISABILITIES**

Funded a project by RTI in North Carolina to assess the direct and indirect costs of each new case of mental retardation, cerebral palsy, vision impairment, hearing impairment, and autism. A report will be published in FY 2000.

- Published “Cost-Effectiveness of Oral Isotretinoin” [letter] (*Dermatology* 1999;198:404-5). This letter was written in response to two articles that had recently been published in *Dermatology* and which espoused the cost-effectiveness of isotretinoin without considering many of the costs associated with its teratogenicity.

## BIRTH DEFECTS SURVEILLANCE

- Published “International Trends in Rates of Hypospadias and Cryptorchidism” (*Environ Health Perspect* 1999;107:297-302). The study noted increases in both defects in a number of countries. Most increases leveled off after 1985. Further investigation of the causes of these increases is warranted.
- The National Birth Defects Prevention Network, an organization sponsored by NCEH to promote sharing of birth defects surveillance data and the use of the data for prevention, held its second annual workshop January 26-27, 1999, in Arlington, VA. Approximately 230 representatives from state and local health departments, academic institutions, and private organizations attended the workshop.
- Awarded 3-year cooperative agreements to 18 state health departments to support birth defects surveillance activities and the use of surveillance data to guide prevention and intervention programs. The awards went to seven states with existing surveillance systems, seven with newly formed or pilot systems, and four with no surveillance system. All these states will be developing programs and activities to prevent the occurrence of neural tube defects. After they have been evaluated, the materials and methods that are developed will be made available to all states.
- Cosponsored the workshop “Data Systems as the Scientific Foundation in Support of Newborn Screening Programs.” The purpose of the meeting was to review how newborn screening data are currently collected and used and to discuss new strategies for the future collection of population-based data to support and enhance newborn screening programs.

## BIRTH DEFECTS EPIDEMIOLOGY

- NCEH Centers for Birth Defects Research and Prevention continued collecting data for the first in-depth national case-control study of major birth defects. The National Birth Defects Prevention Study is now operational, with approximately 2,000 interviews complete. Representatives from the eight centers met in September to review the progress of the national study and to discuss research activities at each of the centers.
- Published “Epidemiology of Neural Tube Defects” (*Mental Retardation and Developmental Disabilities Research Reviews* 1998;4:241-6). This review article discusses geographic variation; distinctive recurrence patterns within families; variations in rates by race or ethnicity, socioeconomic strata, and sex of the infant; the change in rates over time; and the relevance of epidemiologic data to screening and counseling policies. A major conclusion in the article

is that maternal diet plays a major role in the epidemiology of neural tube defects.

## PEDIATRIC GENETICS

- Published “Hemochromatosis-Associated Mortality in the United States from 1979 to 1992: An Analysis of Multiple-Cause Mortality Data” (*Ann Intern Med* 1998;129:946-53). The authors evaluated trends over 14 years in deaths and medical conditions associated with hemochromatosis in the United States. They concluded that either the penetrance or the recognition of hemochromatosis, or both, is low in the general U.S. population. Nevertheless, substantial mortality resulting from a variety of liver diseases argues for the improved diagnosis and treatment of hemochromatosis.
- Published “Risk Factors for Trisomy 21: Maternal Cigarette Smoking and Oral Contraceptive Use in a Population-Based Case Control Study” (*Genetics in Medicine* 1999;1(3):80-8). This study provides additional evidence that a mother’s smoking before conception could increase the risk that her offspring will develop Down syndrome.

## FOLIC ACID FOR PREVENTING SPINA BIFIDA AND ANENCEPHALY

- Held a national conference to provide training to 700 partners who wish to help in the National Folic Acid Education Campaign. The conference was cosponsored by the March of Dimes and the National Council on Folic Acid (NCFA), and many of the member organizations sent individuals to be trained. Conference participants were encouraged to form state coalitions to develop campaigns for their geographic areas. The state campaigns are now under way, and NCEH is providing materials and advice.

**BEFORE  
YOU  
KNOW  
IT,**

your baby is this big.

You just found out. You're pregnant! For you, the hopes and dreams begin. But your baby's brain and spine have been growing for weeks now. It's too late to prevent some types of serious birth defects. That's why it's so important to get enough folic acid every day long before you realize you're pregnant. Most women don't get enough of this B-vitamin in their daily diets. An easy way to get folic acid is in a vitamin supplement or multivitamin. Breakfast cereals, breads, and pastas, have folic acid too, but it takes careful planning every day to get enough. For more information, call 1-888-932-6789.

**FOLIC ACID NOW**

The time to prevent birth defects is before you know you're pregnant.



Antes de que te  
des cuenta que  
estás embarazada

- Published the Folic Acid Resource Guide to provide technical assistance for our partners, local organizations, and health departments conducting local folic acid education campaigns. More than 5,000 copies of the guide have already been distributed, and requests for it continue to be filled daily. The guide can be requested through Flo@cdc.gov.
- Produced campaign materials for two different target audiences: women contemplating a pregnancy and those not contemplating a pregnancy. The campaign for “contemplators,” *Before You Know It*, has been widely distributed through the NCFPA partnership. Shriners Hospitals for Children printed more than 1 million copies of the material for CDC to distribute through NCFPA. *Before You Know It* received a Videography Award of Excellence, an International QUESTAR Gold Award, and the Grand Award as the best public service announcement submitted in the International QUESTAR competition. The campaign targeted to the “noncontemplators,” called *Ready, Not*, is now complete, and copies will be available soon. *Ready, Not* has received outstanding reviews from the few audiences that have previewed it.
- Published “Knowledge and Use of Folic Acid by Women of Childbearing Age, United States, 1995 and 1998” (*MMWR* 1999;48(16):325-7). The authors compared the results of a 1998 Gallup survey of women of reproductive age contacted by the March of Dimes with those of an earlier survey conducted in 1995. In 1998, 13% of women were aware that folic acid helps prevent birth defects, and 7% knew that folic acid needed to be taken before pregnancy. These figures are up from the 5% and 2%, respectively, that were reported in 1995.
- Published “Efficacy of Folic Acid Prophylaxis for the Prevention of Neural Tube Defects” (*Mental Retardation and Developmental Disabilities Research Reviews* 1998; 4:282-90). This review article summarizes data collected over the past 30 years showing that folic acid prophylaxis is effective and discusses approaches to increasing folic acid consumption.
- Coauthored “Trends in Serum Folate after Food Fortification” (*Lancet* 1999;354:915-6). Through an NCEH cooperative agreement, Kaiser Permanente of Southern California conducted a study to measure serum folate levels since fortification of foods with folic acid in 1998. The study showed that between 1994 and 1998, median clinical serum folate levels increased from 12.6 to 18.7 nanograms of folate per milliliter of serum.

## PREVENTION AND HEALTH COMMUNICATION

- Completed an Epi-Aid investigation of pregnancies of women in California who had been exposed to Accutane, a known human

teratogen. Accutane® is contraindicated in pregnancy, and information on the Accutane® box includes clear warnings about the necessity of avoiding pregnancy; however, exposed pregnancies continue to occur. Although all 14 women interviewed knew that Accutane® should not be used during pregnancy, none reported seeing all components of the manufacturer's Pregnancy Prevention Program (PPP), and 4 reported not seeing any components of the PPP other than the information available on the pill packet.

- Completed an Epi-Aid investigation of pyloric stenosis among infants treated prophylactically with erythromycin in Knoxville, Tennessee. The report suggested that neonates receiving oral erythromycin may experience an increased risk for pyloric stenosis and that the risks and benefits of using erythromycin for neonatal pertussis prophylaxis should be further examined.
- Published "The Return of Thalidomide" (*Drug Saf* 1999;21(3): 161-9). This report discussed efforts to prevent fetal exposures to thalidomide, a drug recently approved by FDA and known to cause serious birth defects.
- Published "Teratogen Update: Methylene Blue" (*Teratology* 1999; 60:42-8). This article summarizes what is known about the biological actions of methylene blue, the results of its use in obstetrics, and the evidence for its teratogenicity. The report concludes with the recommendation that methylene blue not be used during midtrimester amniocentesis and that warnings should be included on package inserts and widely disseminated among health care providers who perform amniocentesis.

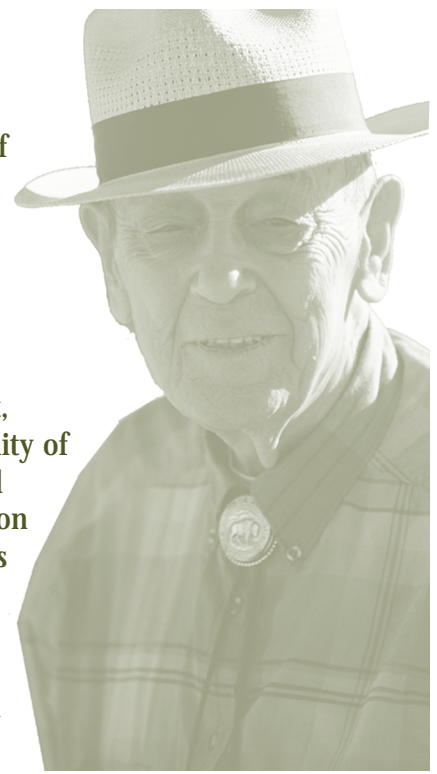
## DISABILITY AND HEALTH

- Sponsored the "Conference on Secondary Conditions Among People with Disabilities from Minority Cultures," which was held March 12-14, 1999, in Chicago, Illinois. The conference promoted a process for ensuring that the cultural, ethnic, and disability-related interests of minorities with disabilities are addressed in efforts to promote health and wellness for people with disabilities.
- Cosponsored the "National Conference on Promoting the Health and Wellness of Women with Disabilities," which was held August 2-5, 1999, in San Antonio, Texas. The conference provided a forum for presenting and discussing health issues of concern to women with disabilities, highlighted innovative health-promotion programs, encouraged adoption of healthier lifestyles, and promoted partnerships among women with disabilities and public health officials on a national basis.



Participant at the San Antonio conference gets her point across. Photo © 1999 Suzanne C. Levine

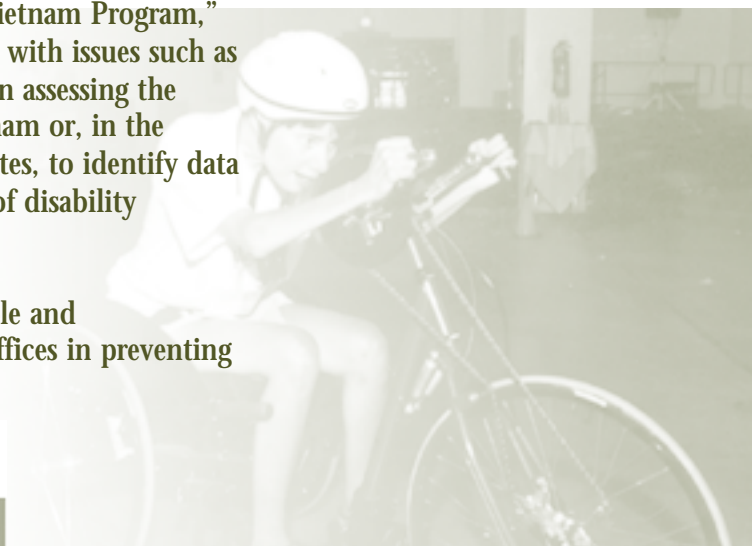
- Funded the National Center on Physical Activity and Disability (NCPAD), a new national center located at the University of Illinois, Chicago. NCPAD accepts inquiries, does literature searches, and disseminates information on how physical activity can improve the health of people with disabilities.
- Conducted a study of sensory impairment, activity limitation, and health-related quality of life among older adults. The study showed that sensory impairments are fairly common among older adults. Among U.S. residents 70 years or older, 18% reported impairment in vision, 33.2% impairment in hearing, and 8.6% impairment in both hearing and vision. These results will be used to design focused intervention programs for select populations.
- Using data from the National Health Interview Survey-Disability Supplement, described the degree to which children's disabilities contribute to family financial problems and work disruptions and proposed intervention strategies that might minimize such problems within families. Concluded that the impact of children's disabilities on families is most strongly associated with 1) a child's need for long-term specialized therapeutic services that might not be covered by conventional health insurance; 2) the necessity for expensive therapeutic equipment; and 3) modifications to the family's home that enhance the child's mobility but are expensive, cannot be moved when the family changes homes, or require frequent reconstruction.
- Developed a reimbursable work agreement with the Social Security Administration to develop measurements for assessing the status and needs of children, youth, and young adults who are recipients of physical or mental health or rehabilitation services designed to help them establish or maintain personal independence or autonomy.
- Funded the American Amputee Coalition to conduct the Limb Loss Research and Prevention of Secondary Conditions Project. The major research partner in this effort is Johns Hopkins University. The research focuses on the epidemiology of limb loss, surveillance, data collection and analysis, and intervention design, including health promotion programs for people who have lost a limb.
- Funded 14 states to build capacity for health promotion and prevention of secondary conditions among people with disabilities. Funding supported the inclusion of disability screening questions and follow-up questions in state Behavioral Risk Factor Surveillance





System surveys. Thus far, data from 11 states have been subjected to preliminary analyses, which show that, on average, about 20% of the people in these states have a disability.

- Participated in a project in Hanoi, Vietnam, to develop a proposal for use by the American Ambassador to interest bilateral and multilateral organizations in funding the “Safe Vietnam Program,” which is an injury-prevention program that deals with issues such as land mines. Helped provide technical assistance in assessing the capacity to estimate disability prevalence in Vietnam or, in the absence of generally acceptable prevalence estimates, to identify data sources that could be used to generate estimates of disability in Vietnam.
- Convened a CDC-wide decision group on the role and responsibility of CDC’s centers, institutes, and offices in preventing secondary disabilities in the U.S. population.



*Checking out a hand-cranked bicycle—looks like fun!  
Photo©1999 Suzanne C. Levine*

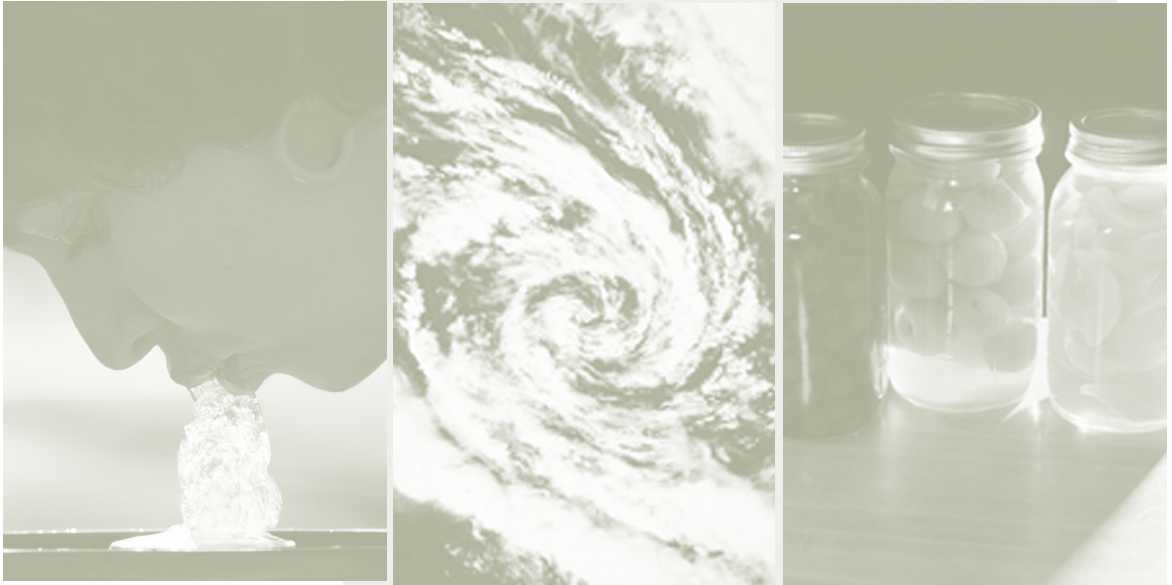


*Clockwise, starting from top left : Two members of the Inflight Dance Troupe spread their wings; conference poster; at the Conference's Computer Learning Center, participant searches for health information; taking advantage of a free health screening playing roundball. All photos© 1999 Suzanne C. Levine*



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**E M E R G E N C Y**



**AND ENVIRONMENTAL HEALTH SERVICES**

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**T**he mission of the Division of Emergency and Environmental Health Services (EEHS) is to provide national leadership for coordinating, delivering, and evaluating emergency and environmental health services. EEHS helps local, state, federal, and international agencies plan their responses to emergency situations. We respond to requests for emergency and recovery assistance after natural or technologic disasters and provide technical support for public health activities during emergencies such as civil strife, disasters, and famine. EEHS established and now maintains the National Pharmaceutical Stockpile, which is designed to ensure the rapid deployment of lifesaving pharmaceuticals to treat victims of terrorist attacks. We also provide a variety of environmental health services that help other agencies and professionals prepare for, identify, and respond to environmental health issues and their consequences. Activities of EEHS are carried out by these branches: Emergency Preparedness and Response, International Emergency and Refugee Health, National Pharmaceutical Stockpile, Chemical Demilitarization, and Environmental Health Services; activities also are carried out by the Vessel Sanitation Program. Unless otherwise indicated, all work described in the following pages occurred in fiscal year (FY) 1999 (October 1, 1998-September 30, 1999).

## **EMERGENCY PREPAREDNESS AND RESPONSE**

The Emergency Preparedness and Response Branch's mission is to ensure that appropriate local, state, and federal organizations are able to respond effectively to public health issues associated with natural and technologic disasters and terrorism. The branch has been designated as the primary focus within CDC for emergency response planning and coordination and is responsible for the overall management and operation of the domestic emergency response program.

Specific duties include developing and maintaining the CDC Emergency Response Plan, operating the CDC 24-hour emergency response system, participating with other federal and state agencies in disaster exercises, assisting state and local health departments with emergency response and preparedness activities, coordinating CDC's response to disasters, and managing public health and recovery programs in states affected by disasters.

- Helped address public health and environmental health issues associated with the impact of hurricanes Georges (Florida and Puerto Rico) and Floyd (North Carolina, South Carolina, Georgia, Florida, Virginia, and New York).
- Helped numerous state and local health officials and other emergency response agencies respond to bioterrorism threats involving anthrax-hoax letters.



*In the aftermath of Hurricane Floyd, clean-up begins in flood-stricken North Carolina.*

- Provided financial and technical assistance to 10 states and 1 city for bioterrorism preparedness planning and readiness activities as part of CDC's public health preparedness for possible acts of bioterrorism.

## **INTERNATIONAL EMERGENCY AND REFUGEE HEALTH**

Through this branch, we coordinate CDC's response to complex humanitarian emergencies. The branch provides technical assistance to other U.S. government, United Nations (UN), and nongovernmental organizations in diverse areas related to the health of refugee populations. The branch also collaborates on, designs, and conducts operational research, applying epidemiologic and public health principles to the study of complex emergencies. In addition to conducting training at CDC and several universities, staff members also conduct training for various international organizations.



*Children outside their tent homes at refugee camp in Bojane, Macedonia, during the Kosovo conflict.*

- Directed CDC's response to the Kosovo refugee crisis. In response to requests from the U.N. High Commissioner for Refugees (UNHCR) and from several partner nongovernmental organizations, sent eight people to Kosovo and Macedonia. Staff members participated in diverse field activities, including being seconded to the UNHCR to act as health director for all refugees in Macedonia, being a member of the U.S. President's Research

Committee for Mental Health in Kosovo, acting as the health advisor for the Office of Foreign Disaster Assistance's Kosovo Disaster Assistance Response Team.

- Implemented mass immunization campaigns, established a health surveillance system in Kosovo Province, and conducted multiple health- and nutrition-related studies. Overall, staff members spent more than 400 person-days in the field working with Kosovo refugees.
- Conducted research on indicators of health status in refugee populations as part of an ongoing collaborative research project with Johns Hopkins University and with the Center of Excellence in Hawaii and also in Tanzania, Thailand, and Azerbaijan. This project, which has thus far collected data from more than 40 refugee camps throughout the world, is the most comprehensive attempt to empirically establish cross-cultural indicators of refugee health status.
- Collaborated with the UNHCR to develop a Microsoft Access®-based health information system to improve surveillance activities in Afghani refugee camps in Pakistan. Staff members made two trips to Pakistan with a trainee from the International Emergency Capacity Development (IECD) Program and with a staff member from the Health Informatics Program at NCEH. As of October 1999, the system was up and running, collecting crucial data that will be used to evaluate the needs of Afghani refugees.
- Completed the first 2-year IECD program and recruited a second IECD class. The IECD program trains mid-level CDC health professionals to answer requests for technical assistance in the field of complex emergencies. The first class, consisting of 12 people, included physicians, nurses, epidemiologists, and public health advisors. The FY 2000 class consists of 13 CDC personnel.
- Taught courses and delivered lectures at universities and professional organizations. Staff members taught a comprehensive course on refugee health at Emory University and delivered multiple lectures at Columbia University. In addition to conducting training in university settings, staff members lectured at the Center of Excellence's HELP courses (training courses in complex humanitarian emergencies) in Maryland and Hawaii and spoke at many professional meetings in the United States and Europe. This commitment to training is helping to further the application of science to the field of complex humanitarian relief.



*Conducting physical exam for Kenya Adolescent Survey, Kakuma Refugee Camp, Kenya.*

- Investigated whether indicators of adolescent nutritional status are appropriate for adolescent refugee populations in Kenya and Nepal. Staff members have been investigating whether standard nutritional status indicators are appropriate when they are applied to adolescents rather than to children or adults. Initial findings indicate that adolescent-specific indicators of nutritional status need to be developed and validated in refugee populations. Once this is achieved, the health, productivity, and future of a large segment of refugees all over the world can be improved through the more efficient targeting of resources.
- Developed and began applying a research plan to create rapid assessment procedures for measuring the health and nutritional status of refugee populations by applying appropriate technologies such as Global Positioning Systems (GPS) and Geographic Information Systems (GIS). These GIS/GPS techniques were first used in the field in the spring of 1999 in refugee camps in Tanzania. The successful development of these methods may make possible faster logistical responses to refugee crises and better allocation of scarce resources.
- Designed a study protocol to look at the impact that population displacement has on the mental health of communities and individuals. During the summer of 1999, a medical epidemiologist and an IECD trainee conducted a detailed survey of mental health status in Kosovo. Follow-up studies are planned in other refugee populations. This research agenda will help address the needs of refugees and improve the public health tools used to treat and evaluate the psychosocial consequences of mass population displacement.

## **NATIONAL PHARMACEUTICAL STOCKPILE**

As part of CDC's mission to respond to possible acts of terrorism involving chemical or biologic weapons (bioterrorism), NCEH established the National Pharmaceutical Stockpile Program (NPSP) in FY 1999. Because this is a new initiative, activities focused on the basic development of NPSP. When fully operational, NPSP will help provide certain pharmaceuticals and medical materiel to states and localities whose supplies are projected to be depleted in the aftermath of a bioterrorism event.

- Developed what is termed "Now Capability" to provide interim support to the American people should a bioterrorism event





occur before NPSP selects a federal logistics partner and becomes fully operational. In developing this “Now Capability,” worked with the CDC Procurement and Grants Office, Contracts Management Branch, to establish business relationships with three major pharmaceutical vendors. Should a bioterrorism event occur between now and the time NPSP is fully operational, these vendors have agreed to immediately provide the branch with the pharmaceuticals most likely to be needed.

- Identified a federal logistics partner able to procure and store certain components of the National Pharmaceutical Stockpile (NPS), to establish contractual relationships with pharmaceutical manufacturers for other components of NPS, and to develop a contract with a national cargo carrier to move NPS components rapidly to the site of a bioterrorism event. That partner, the Department of Veterans’ Affairs, Office of Acquisition and Materiel Management, is expected to begin procurement for the stockpile early in FY 2000.
- Produced a working-draft operational plan for NPSP. When completed, the plan will set forth all specifications for NPSP’s development. It will also address how the branch can monitor the performance of NPSP and its partners as well as specify procedures that NPSP partners are expected to follow in responding to a bioterrorism event or other disaster.
- Began developing a national training program on how to use NPSP. The training program will target emergency response personnel in state and local health departments, emergency management agencies, and first-responder organizations and institutions.

## CHEMICAL DEMILITARIZATION

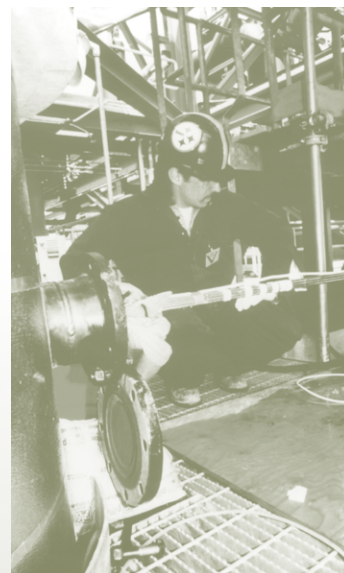
The mission of the Chemical Demilitarization Branch is to fulfill the congressionally mandated oversight responsibility to ensure that the health and safety of workers and the general population are protected during the handling and destruction of the nation’s chemical weapons. We also provide public health screening and review of environmental impact statements prepared by all federal agencies for major new projects such as construction of new highways or power plants.



*CDC conducts site visits to ensure that lethal chemical agents are stored safely before they are destroyed.*

- Provided public health and safety oversight for the safe destruction of lethal chemical warfare agents. Destruction of these agents began in 1990, and more than 1 million pounds of these agents were destroyed by the end of FY 1999.

- Conducted visits to all nine Army sites in the United States where chemical agents are stored and eventually will be destroyed or otherwise disposed of safely. Consulted with and advised state health and environmental officials on the status of chemical disposal technologies, including proposed alternative destruction technologies.
- Collaborated with CDC's National Institute for Occupational Safety and Health and the Army to develop an expanded and updated quality assurance plan for monitoring chemical warfare agents.
- Provided public health input at four community stakeholder meetings at which health and safety activities at local demilitarization sites were reviewed.
- Provided public health and safety expertise at 10 demilitarization inspections and evaluations.
- Conducted safety and environmental health reviews at five sites suspected of containing improperly disposed-of chemical munitions. One site review has been completed, and four are ongoing, including one on the property of the residence of the South Korean ambassador in Washington, D.C.
- Reviewed more than 150 quality-control data sets from air monitoring systems at the various disposal sites.
- Screened all weekly listings of environmental impact statements and environmental assessment documents as reported in the *Federal Register* and provided a public health review and response for 10 such documents.



## ENVIRONMENTAL HEALTH SERVICES

The Environmental Health Services Branch (EHSB) provides technical assistance and scientific guidance in response to state, local, and nongovernmental agencies engaged in environmental health services programs, concentrating its efforts on disciplines where there are gaps in support from other sources, such as food safety or water and sanitation issues. EHSB participates in outbreak investigations, identifies environmental antecedents contributing to an outbreak, and translates information for use by state and local public health officials.

- Improved our ability to respond to the needs of state, local, and tribal environmental public health programs by adding two senior specialists in food safety, one senior environmental health officer, and one medical epidemiologist. These new staff members join a staff that includes one medical officer and one sanitarian.
- Participated in developing the Protocol for Assessing Community Excellence in Environmental Health (PACE-EH). By 2003, PACE-EH will be used by health departments in 200 cities and counties. PACE-EH is sponsored by NCEH through a cooperative agreement with the National Association of County and City Health Officials (NACCHO) and is being developed with input from the Environmental Protection Agency, the Agency for Toxic Substances and Disease Registry, city and county health agencies, and voluntary organizations.
- Encouraged student research and participation in environmental public health by establishing awards for presentation at the annual National Environmental Health Association conference. Five awards were presented at the 1999 conference.
- Taught a course in environmental public health at Colorado State University as part of an effort to build future leadership in environmental public health.
- Initiated an interagency agreement with Mississippi Valley State University (MVSU) to strengthen its undergraduate-level capacity to prepare students for the field of environmental public health. MVSU, a member of Historically Black Colleges and Universities, has an accredited program in environmental health.
- Provided technical support to state and local environmental public health professionals through programs to expand the delivery of information, technical assistance, and training. For example, established a Web site devoted to environmental public health (<http://www.cdc.gov/nceh/programs/ehserv>).



- Through cooperative agreements with the Association of Schools of Public Health and the Association of Teachers of Preventive Medicine, funded the following:
  - The University of Oklahoma 1) to develop a centralized food-complaint system that will detect outbreaks and define the epidemiology of foodborne illness complaints, 2) to train local health departments to conduct effective environmental investigations when foodborne outbreaks occur, and 3) to select a group of local health departments to conduct focused inspections of restaurants that will identify environmental factors associated with disease outbreaks.
  - Yale University to study various factors that contribute to foodborne illnesses associated with food-service activities.
  - Tulane University to work with state and local agencies to determine the environmental causes of arbovirus transmission in Louisiana.
  - University of Arizona to develop a model for disease prevention through detection of *C. immitis* in the environment.
  - The National Association of Local Boards of Health to develop a primer on environmental health for local health board members.
  - The Environmental Science and Protection Accreditation Council for a faculty-government forum on incorporating current food-safety science and protection into curricula at accredited programs.
  - The American Public Health Association to determine the core competencies needed to practice environmental public health at the local level.
  - NACCHO for development and improvement of environmental public health programs in county and city health departments and agencies.
- Participated in a World Health Organization (WHO) meeting in Stockholm, Sweden, on developing a framework for revising WHO guidelines on water and sanitation issues.
- Completed the first joint Centers for Disease Control and Prevention-Food and Drug Administration investigation of environmental risks for foodborne outbreaks. This investigation helped to identify the source of *Salmonella* contamination for a shipment of cilantro imported from Costa Rica that was discovered before the cilantro was distributed within the United States.

## VESSEL SANITATION

CDC established the Vessel Sanitation Program (VSP) in 1975 as a cooperative endeavor with the cruise vessel industry to assist the industry in fulfilling its responsibility for developing and implementing comprehensive sanitation programs to protect the health of passengers and crew members aboard cruise vessels. Every cruise vessel that has a foreign itinerary and that carries 13 or more passengers and calls on a U.S. port is subject to biannual operational inspections and when necessary, to reinspections by VSP. The vessel owner pays a fee, based on the gross registered tonnage of the vessel, for all operational inspections. Details of these inspections are covered in the *VSP Operations Manual*, which is available from VSP.

On a voluntary basis, cruise vessel owners or shipyards that build or renovate cruise vessels may request plan reviews, inspections of on-site shipyard construction, or final inspections of new or remodeled vessels. The purpose of these inspections is to ensure that cruise vessels are in compliance with CDC's Recommended Shipbuilding Construction Guidelines for Cruise Vessels Destined to Call on U.S. Ports. The guidelines provide a framework of consistency for the sanitary design and construction of cruise vessels to protect the health of passengers and crew aboard those vessels.

The VSP also collects and monitors reports of diarrheal illness on board passenger vessels. This surveillance system is designed to estimate the magnitude of gastrointestinal illness among passengers and crew and to detect outbreaks of gastrointestinal illness. If at least 0.3% of a ship's passengers or crew members have gastrointestinal illness, the VSP may conduct an investigation aboard the vessel.

VSP provides technical assistance to other foreign and international public health officials on a variety of public health issues related to vessel sanitation. We maintain information on all aspects of the programs, including inspection scores and reports, on the VSP Web site at <http://www.cdc.gov/nceh/vsp>.

- Conducted more than 231 environmental sanitation health inspections on 117 international cruise vessels calling on U.S. ports, reviewed blueprints and plans for 15 new vessel-construction and renovation projects, and inspected 15 new vessels and 6 renovated vessels that began carrying passengers to U.S. ports in 1999.
- Coordinated three outbreak investigations of diarrheal disease on cruise vessels.
- Provided comprehensive training to more than 400 cruise vessel industry managers and supervisors. We also provided specialized training to three major Japanese cruise ship lines now sailing into U.S. ports.



- Continued to work with the Health Canada Vessel Sanitation Inspection Program to achieve a coordinated, seamless North American vessel sanitation inspection system.
- Provided technical assistance to Australian health officials on establishing a vessel sanitation program for cruise ships visiting Sydney for the 2000 Olympics.
- Provided technical assistance to the Port Health Authority of Southampton, U.K., to better coordinate VSP activities in the United States and Southampton.

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**E N V I R O N M E N T A L H A Z A R D S**



**A N D H E A L T H E F F E C T S**

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**T**he mission of the Division of Environmental Hazards and Health Effects (EHHE) is to conduct investigations that increase knowledge about the relationship between human health and the environment and to use this knowledge to develop national public health programs and policy aimed at preventing disease. We study ways to prevent or control health problems associated with exposure to air pollution, nuclear radiation, lead, and other toxicants, as well as those health problems resulting from natural and technologic disasters. The following branches are housed in EHHE: Air Pollution and Respiratory Health, Health Studies, Lead Poisoning Prevention, Radiation Studies, and Surveillance. Unless otherwise indicated, all work described on the following pages occurred during fiscal year (FY) 1999 (October 1, 1998-September 30, 1999).

## **AIR POLLUTION AND RESPIRATORY HEALTH**

We conduct epidemiologic research and investigations of human exposure to airborne environmental agents and their potential effects on respiratory diseases, such as asthma, and designs, implements, and evaluates the success of public health intervention and surveillance programs in reducing the contribution of air pollution to respiratory diseases.

### ***Asthma***

- Sponsored a conference entitled “A Public Health Response to Asthma” in Atlanta, Georgia, at which participants discussed state-of-the-art asthma research. About 200 people attended from academia; health organizations; and federal, state, and local government agencies.
- Funded four states (Rhode Island, Michigan, Oregon, and Illinois) to increase their capacity to respond to the increased prevalence of asthma.
- Funded Hawaii to investigate the health effects of exposure to volcanic emissions on children.
- Funded the University of Michigan, the University of Texas, and Columbia University to develop methods for the early detection of asthma in school populations.



## **HEALTH STUDIES**

We investigate the human health effects associated with exposure to environmental hazards and to natural or technologic disasters. We develop and evaluate strategies for preventing people’s exposure to these hazards and disasters and for minimizing the effects of such exposures.

## Heat

Although heat-related illnesses and death are readily preventable, exposure to extremely high temperatures caused an annual average of 381 deaths in the United States during 1979-1996. Basic behavioral and environmental precautions are essential to preventing adverse health outcomes associated with sustained periods of hot weather.



- Collaborated with the Illinois Department of Public Health and the Chicago Department of Public Health to identify risk factors for heat-related death during a record-setting heat wave in which approximately 100 heat-related deaths were recorded by the Office of the Medical Examiner. Results will be compared with those found during a similar study conducted in 1995.
- Reviewed heat-wave emergency operations plans in 12 large U.S. cities, identified major components common to the plans, and described these components for a guide to be used by other municipal agencies developing response plans in their cities.
- Published “Heat-related Illnesses and Deaths—Missouri, 1998, and United States, 1979-1996” (*MMWR* 1999; 48:469-72), which highlighted heat-related deaths in Missouri, an area not typically associated with extreme heat, and identified risk factors for heat-related deaths across the United States. Suggested ways to help prevent heat-related illness and death during heat waves.
- Conducted a study of heat-related mortality in Cincinnati, Ohio, during the 1999 heat wave and evaluated the effectiveness of Cincinnati’s heat-wave response plan. The investigation led to the identification of a previously untargeted at-risk group.

## Pesticides

The extent to which pesticide exposure and illness, especially among vulnerable populations such as children and women of reproductive age, is not well defined. We do know that pesticide poisoning is commonly underdiagnosed and that such poisonings are preventable.



- Collaborating with the Texas Department of Health and the Environmental Protection Agency on

an investigation of children 6 years old or younger in whom pesticide poisoning was diagnosed during 1997- 1998 in the Lower Rio Grande Valley and in a nonborder comparison region. Information from this study will help us to evaluate whether children in this area may be at increased risk for poisoning, to identify risk factors for childhood poisoning in this region, and to direct intervention activities aimed at reducing or preventing pesticide poisoning in this population.

- Participating in multiple projects to measure exposure to persistent pesticides such as DDT among Alaska Natives who eat marine mammals as part of their subsistence diet. The animals are contaminated by the atmospheric drift of these chemicals, and the extent of human exposure is just beginning to be determined. We are measuring levels of these pesticides in women and infants and evaluating health effects such as breast cancer and immune deficiencies.



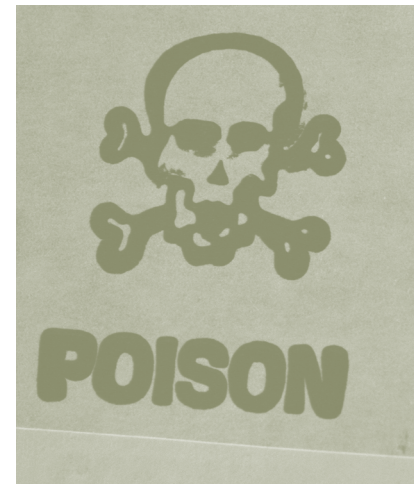
- Collaborating with the Texas Department of Health and EPA on a pilot surveillance project to track acute nonoccupational pesticide-related health conditions. The purpose of this project is to

evaluate the public health impact of nonoccupational pesticide exposures in Texas. The project involves active case-finding and follow-up activities, outbreak investigations, and intervention and prevention activities. A final component will evaluate the program for the completeness and representativeness of the case-finding effort.

- Assisted the New Mexico Department of Health in an evaluation of statewide 1998 poison-control center reports of nonoccupational pesticide poisoning. A descriptive analysis of the data will be used to identify intervention and prevention activities that may help reduce this kind of poisoning in the state.

## ***Pfiesteria***

*Pfiesteria piscicida* is a newly described, single-celled organism found in estuarine waters of the U.S. eastern seaboard. Over the past few years, this organism has been found in North Carolina and Maryland in association with large numbers of dying or dead fish, suggesting that it produces a substance toxic to fish. There have also been reports that people exposed to water with high concentrations of *P. piscicida* have experienced symptoms such as skin rashes and problems concentrating. In March 1998, Congress appropriated funds for CDC to investigate the public health significance of the presence of *P. piscicida* in estuarine waters.



- Continued to provide leadership and coordinate CDC-state health department activities for coastal states potentially affected by *Pfiesteria*. Since 1998, CDC has funded cooperative agreements with Delaware, Florida, Maryland, North Carolina, South Carolina, and Virginia. All six states are now conducting uniform surveillance for possible estuary-associated syndrome. In addition, Virginia, North Carolina, and Maryland—in collaboration with local universities—are conducting cohort studies investigating the potential association between *Pfiesteria* and human health effects.
- Helped state health agencies create appropriate public health messages about the presence of *P. piscicida* in coastal waters.

### ***Confined Animal Feeding Operations (CAFOs)***



- Conducted pilot studies in Iowa and Ohio on the movement of pathogens from CAFOs into ground and surface water and provided reports to the states on our preliminary findings of the environmental impact of CAFOs. We are also currently involved in the second phase of a CAFO study in Iowa that examines off-farm transport of waste-associated nutrients, trace elements, heavy metals, antibiotics, microbes, and antimicrobial-resistance genes. Information from these studies will be used to direct future research on the potential pathways of human exposure to the environmental contaminants produced by CAFOs.
- Collaborated with private, state, and federal laboratories to develop new methods for studying the impact of chemical and microbial constituents from CAFOs on the environment.
- Currently initiating multistate follow-up studies of surface water contamination proximal to CAFOs.

### ***U.S.-Mexico Border Activities***

- Conducting the second phase of data collection for a study of the association between lupus and environmental contaminants in Nogales, Arizona.
- Coordinated two binational pediatric lead poisoning assessments in Arizona-Sonora and New Mexico-Chihuahua in which portable blood lead analyzers were used.
- Conducted a retrospective study of the association between pediatric asthma and air quality in the El Paso, Texas, area.



- Currently investigating the exposure of children to pesticides in Yuma County, Arizona.

### ***Emergency Response Activities***

- **Honduras:** Responded to requests for assistance when Hurricane Mitch produced torrential rains, resulting in catastrophic flooding and landslides throughout Honduras. In southern municipalities, extensive flooding reportedly destroyed pesticide factories. On November 26-28, EHHE staff conducted an environmental exposure assessment and evaluated potential health effects related to chemical contamination of potable water and soil in a severely affected community.
- **Malaysia:** Assisted the Malaysian government in assessing the short- and long-term public health impact of haze from uncontrolled forest fires in Indonesia that resulted in severe smoke pollution in seven countries in Southeast Asia. With Malaysia's Ministry of Health, evaluated 1) the feasibility of an environmental exposure assessment and selected health outcomes related to the constituents of the haze among children younger than 12 years old and 2) maternal exposure to the haze during pregnancy and birth outcomes.
- **Turkey:** Assisted organizations in Turkey in evaluating morbidity resulting from the severe earthquake that rocked western Turkey on August 17, 1999. Also conducted a rapid epidemiologic assessment of the needs of displaced people who were affected by the disaster.



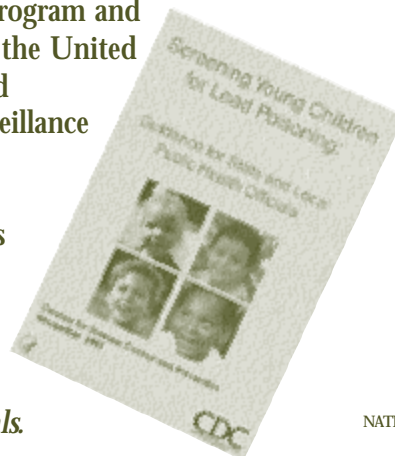
***Collecting water samples during an investigation of pesticide contamination related to flooding after Hurricane Mitch, Choluteca, Honduras, November 1998.***



***Performing a community needs assessment after earthquake in Golciik, Turkey, August 1999.***

## **LEAD POISONING PREVENTION**

CDC has childhood lead poisoning prevention program and surveillance grants with 40 states and 16 cities in the United States. Project officers and other management and technical staff, as well as selected staff of the Surveillance Branch, provide ongoing technical assistance and consultation to grantees in order to ensure implementation of CDC's guidelines. All grantees are required to develop and implement comprehensive screening plans based on these guidelines, which were published in 1997 in *Screening Young Children for Lead Poisoning: Guidance for State and Local Public Health Officials*.



- Provided technical assistance and awarded nearly \$26 million to 48 state and local health departments to develop, implement, and improve childhood lead poisoning prevention programs. The grants are used to insure screening of children at high risk for lead exposure, to ensure that children with elevated blood lead levels are referred for medical and environmental intervention, and to educate the public about childhood lead poisoning and how to prevent it.
- Awarded approximately \$640,000 to eight states (Alaska, Florida, Hawaii, Oklahoma, Oregon, Texas, Washington, and Wyoming) to develop laboratory-based statewide surveillance for elevated blood lead levels among young children. In addition, provided technical assistance to all state and local grantees to improve the surveillance component of their comprehensive childhood lead poisoning prevention programs.
- Awarded approximately \$500,000 to five states (Illinois, North Carolina, Utah, Washington, and Wisconsin) to develop alternative methods of conducting statewide surveillance activities.



- Awarded more than \$600,000 through cooperative agreements to the University of Maryland (Baltimore) and St. Louis University to measure the effectiveness of efforts to prevent exposure to lead in the home environment.
- Provided technical assistance and support for an NCEH Web site (<http://www.cdc.gov/nceh/programs/lead/lead.htm>) that includes a geographic database which identifies populations at high risk for childhood lead exposure. State and local health officials can use information on this Web site to develop targeted screening strategies.
- Provided financial and technical support to the National Lead Information Center's hotline and clearinghouse, which consult with and provide information to the public and health care professionals on childhood lead poisoning and its prevention.

- With the World Bank and the George Foundation (India), cosponsored the international conference, “Lead Poisoning Prevention and Treatment,” held in Bangalore, India. This 3-day conference resulted in the development of an Indian national plan to prevent childhood lead poisoning.
- At the request of the Indian Ministry of Health, helped train Mumbai health care professionals in the use of portable blood-lead analyzers.
- Provided technical assistance to the Middle East Regional Cooperation Project to promote environmental health and establish an organizational framework to eliminate childhood lead poisoning in the Middle East. Continue to help project collaborators from Israel, Jordan, and the Palestinian areas of the West Bank and Gaza to evaluate the extent of the childhood lead poisoning problem and determine how best to solve it.

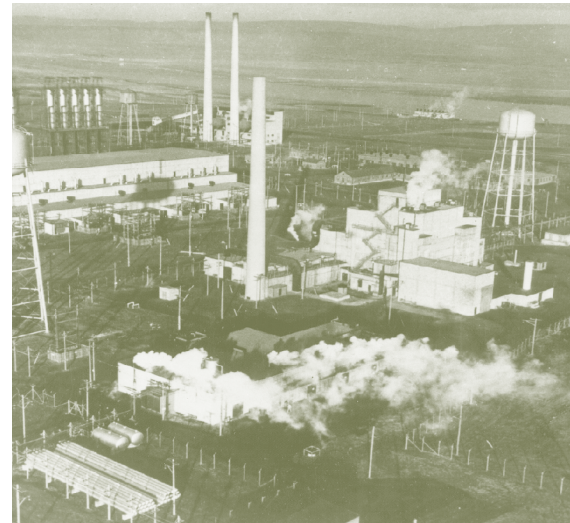


*Healthcare workers in Mumbai, India, learn how to use a portable blood-lead analyzer.*

## **RADIATION STUDIES**

We work to identify the public health risks and potential human health effects from environmental exposures to ionizing radiation and associated toxicants. We also ensure that the public is involved in decision-making and review processes, provides education and training activities for affected communities, and offers educational outreach to culturally diverse and vulnerable populations.

- Released the draft report of the congressionally mandated Hanford Thyroid Disease Study in January 1999. The report examines past exposure to iodine-131 (I-131) among residents who lived near the Hanford, Washington, nuclear facility during 1944-1957 and their risk for thyroid disease. The draft final report is currently being reviewed by the National Academy of Sciences. The final report will be released in 2000.
- As part of the Hanford Individual Dose Assessment Project and in collaboration with the Washington Department of Health, the Idaho Department of Health and Welfare, and the Oregon Health Division, provided individualized estimates of past I-131 radiation exposure to people who requested them. To date, more than 10,000 requests have been received.
- Completed the Fernald Risk Assessment Project. The purpose of this project was to estimate possible health risks to people who lived near the Fernald (Ohio) Feed Materials Processing Center during its years of operation (1951-1988). The project was conducted in two phases. The Phase I report showed that area residents may have a 1%-12% greater risk of dying of lung cancer. The Phase II report will describe “worst-case” scenarios: residents’ maximum plausible



*Hanford's B Reactor at the 560-square-mile Hanford Site in Washington state.*

lifetime risk of developing leukemia or cancers of the lung, kidney, bone, or female breast. Results of both phases will be used to help focus future CDC research and public health activities related to past radiation exposure among Fernald-area residents.

- Released the draft results of the Phase II report from the Savannah River Site Dose Reconstruction Project. The report contains estimates of the types and quantities of chemical and radioactive materials released from the site during 1954-1992. The report is currently being reviewed by the National Academy of Sciences.
- In conjunction with the University of Utah, initiated a follow-up epidemiologic study of a cohort of school children exposed to radioactive fallout from the Nevada Test Site.
- With CDC's National Institute for Occupational Safety and Health, the Agency for Toxic Substances and Disease Registry, and the Department of Energy (DOE), released for public comment the Draft Agenda for Public Health Activities for Fiscal Years 1999 and 2000 at Department of Energy Sites. Comments are currently being reviewed and incorporated by the participating agencies, and a final document will be released in FY 2000.
- Established cooperative agreements with community-based organizations near DOE sites to provide education and training to people living near these sites.
- Initiated a radiation research grants program to evaluate current and new scientific methodologies and strategies in the areas of radiation research. Grantees include the University of Michigan, the University of Florida, and SENES Oak Ridge, Inc.



## **SURVEILLANCE**

The Surveillance Branch coordinates the development of technical information resources and the surveillance of human exposures and adverse health effects with federal, state, and local agencies. This is accomplished by 1) developing strategies and methods for environmental surveillance, 2) conducting surveillance for human exposure to toxic substances and environmental hazards and the health effects associated with these exposures, 3) studying the statistical relationship between environmental hazards and adverse health effects in human populations, and 4) developing methods for analyzing and displaying environmental health surveillance data. We work with other branches, (e.g., with the Health Studies Branch on *Pfiesteria* surveillance) to provide needed information.

- Compiled and analyzed surveillance data on more than 3.8 million children tested for lead poisoning. These data, collected from more than 20 state childhood lead surveillance programs, are used by the



states to target resources, direct screening activities, and assess the effectiveness of intervention efforts.

- Provided state and local lead surveillance programs with an updated, Windows-based version of a CDC-developed software program (STELLAR). More than 350 programs use STELLAR to manage data on children tested for lead poisoning and to track intervention efforts. State and local programs that use STELLAR can easily do the following:
  - Estimate the number of children with elevated blood lead levels and monitor short-term trends.
  - Identify clusters of cases and determine the geographic distribution of cases.
  - Examine risk factors among children with elevated blood lead levels (BLLs).
  - Identify risk factors for elevated BLLs among specific population groups and target intervention programs to those groups.
- Funded four states (Illinois, North Carolina, Utah, and Wisconsin) to develop new approaches for estimating the number of children with elevated blood lead levels. These activities will focus on assessing the extent of lead screening among children eligible for Medicaid.
- Provided consultation and technical assistance to more than 40 states in developing, implementing, and evaluating data-collection systems to track children with elevated blood lead levels.
- Created an interactive, global database on lead-related publications. The database consists of 38 fields of specific information from research studies referencing human blood lead levels on a global scale and contains information from 700 articles and 64 different countries. Also developed Web-based Intranet links to 11 states with surveillance programs. These links highlight and summarize accomplishments in screening children for lead poisoning and in providing follow-up care for lead-poisoned children.

## **MEDICAL EXAMINER/CORONER INFORMATION-SHARING PROGRAM**

The goal of the Medical Examiner/Coroner Information-Sharing Program is to promote and facilitate 1) the use of information collected during death investigations for health research and program planning and 2) communication and collaboration among death investigators, the public health community, government agencies, and other interested groups.

- Worked with medical examiner offices to monitor heat-related mortality during the 1999 heat wave in selected cities with a combined population of 57 million people.
- Collaborated with the National Association of Medical Examiners and Emory University to collect data on children's deaths involving toxic substances. These data can be found at <http://www.thename.org/pedtox/pedtox.htm>.
- Updated a directory of officials responsible for medico-legal death investigations in each state, county, and city and made it available on the Internet. This directory can be found at <http://www2.cdc.gov/nceh/meccdir/meccdir01.htm>.

## VETERANS' HEALTH ACTIVITY WORKING GROUP

Through this working group, we coordinate CDC's research activities related to Gulf War veterans with the Department of Defense (DOD), the Department of Veterans' Affairs, other Public Health Service agencies, academic institutions, and veterans' service organizations.

- Sponsored "The Health Impact of Chemical Exposures During the Gulf War: A Research Planning Conference." The purpose of this conference was to obtain broad public input into the development of a multiyear research plan for investigating the relation between chemical exposures during the Persian Gulf War and illnesses affecting Gulf War veterans. The final report and recommendations from the conference will be published in FY 2000.
- Funded a 1-year cooperative agreement with the Iowa Department of Public Health and the University of Iowa as a follow-up study on asthma to correlate self-reported asthma symptoms with objective measures of asthma among both Gulf War veterans and military personnel who did not serve in the Gulf War.
- Consulted with DOD on a study of Saudi Arabia National Guard (SANG) members to determine whether these troops are experiencing symptoms similar to those reported by other coalition forces who participated in the Gulf War. In August 1998, we participated on an interagency team that traveled to Saudi Arabia to meet with SANG officials about the feasibility of conducting a study. This visit resulted in the development of a study protocol using automated medical records maintained by King Fahad National Guard Hospital. These data will be used to characterize hospitalization rates and categories of discharge diagnoses among SANG troops since January 1988. Team members returned to Saudi Arabia in October 1999 to collect data and begin data analysis.



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**G E N E T I C S**



**A N D D I S E A S E P R E V E N T I O N**

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**T**he mission of the Office of Genetics and Disease Prevention (OGDP) is to integrate advances in human genetics into public health research and into policy and program development and evaluation. OGDP operates under the aegis of NCEH's Office of the Director. Unless otherwise indicated, all work described on the following pages occurred in fiscal year (FY) 1999 (October 1, 1998-September 30, 1999).

## **NATIONAL LEADERSHIP IN GENETICS AND PUBLIC HEALTH**

- Represented CDC at national policy-setting panels, including the Department of Health and Human Services (HHS) Secretary's Advisory Committee on Genetic Testing.
- Chaired an HHS interagency working group to establish a national framework for collecting, analyzing, and disseminating data on genetic tests. The group conducted two 1-day workshops on cystic fibrosis and hemochromatosis. These were used as models to determine the data-collection requirements for evaluating the validity and utility of genetic tests. Two feasibility studies are in progress to develop a model of public-private partnership to collect data on genetic tests.
- Convened discussion forums on integrating genetics into existing CDC programs. These forums included meetings of the Genetics Oversight Committee (consisting of CDC center and office directors) to review CDC-wide activities in genetics as well as meetings of the CDC Genetics Implementation Team (consisting of representatives from CDC programs) to assess ways of integrating genetics into CDC research, policy, and programs.
- Formed extended partnerships with national, state, academic, and professional organizations that involved participating in ongoing discussions toward forming an interagency agreement with various HHS partners, meeting with several state public health program leaders, and visiting several schools of public health.
- Participated as invited speakers or panelists in numerous national professional and scientific conferences. Also delivered lectures at several academic institutions on how genetic discoveries can be integrated into public health.

## **SCIENTIFIC INFORMATION FOR PUBLIC HEALTH ACTION**

- Funded two extramural prevention research projects on using genetic information to improve health and prevent disease. The two funded projects were "Gene-Environment Interactions in Cardiovascular Disease" (University of Texas) and



“Educating Families About Colon Cancer Genetic Risk” (University of Rochester).

- Provided Georgia’s Department of Human Resources, Division of Public Health, with technical assistance in evaluating data from its newborn screening program. Results of this evaluation revealed that, as with other newborn screening programs, the Georgia program does not have sufficient data with which to evaluate its newborn screening program. Recommendations for strengthening data links were published in the December 10, 1999 issue of *Morbidity and Mortality Weekly Report (MMWR)*.
- Collaborated with the Cystic Fibrosis Foundation (CFF) to determine whether asymptomatic newborns identified as having cystic fibrosis (CF) through newborn screening were at less risk for growth retardation, impaired pulmonary function, and the acquisition of *Pseudomonas* (a family of bacteria to which people with CF are susceptible) during their first 10 years of life than were those whose CF was diagnosed later. Longitudinal data from the CFF national registry revealed that early diagnosis of CF through newborn screening and subsequent referral to special CF centers was not associated with a delay in the acquisition of *Pseudomonas* or with reduced pulmonary function impairment.
- Analyzed data from the CDC Healthstyles Survey, a U.S. population-based survey to evaluate public opinion and attitudes about donating and storing blood for genetic research. This study revealed substantial public concern about participating in genetic research and will be helpful in developing health communication messages about genetics.
- Provided the Council of State and Territorial Epidemiologists (CSTE) with technical assistance on a multistate report about the status of genetics in public health programs. This report revealed an emerging need for public health training in genetics and for integrating genetics into various public health programs such as newborn screening, birth defects, and disabilities.

## INFORMATION ON THE IMPACT OF GENETICS ON DISEASE PREVENTION

- Published the “Genetics and Disease Prevention Weekly Update” through the Genetics Listserv and on the OGDP Web site. This update features weekly information for public



health professionals about the impact of genetic discoveries on disease prevention and public health.

- Developed a CDC-wide communication plan that outlines the agency's approach to communicating with various audiences, including public health officials, researchers, health care providers, and the general public.
- Enhanced the Human Genome Epidemiology Network (HuGE Net) by publishing five HuGE reviews, establishing an editorial board, and partnering with several journals. HuGE Net serves as a forum for information exchange on the epidemiology of genetic variation and as an online knowledge base about the impact of genetic variation on health and disease.
- Coedited *Genetics and Public Health in the 21st Century: Using Genetic Information to Improve Health and Prevent Disease*. The book, which will be the first comprehensive genetics and public health text, is scheduled to be published in 2000. Portions of the book will be published online at the OGDG Web site.

## **TRAINING OPPORTUNITIES FOR THE PUBLIC HEALTH WORKFORCE**

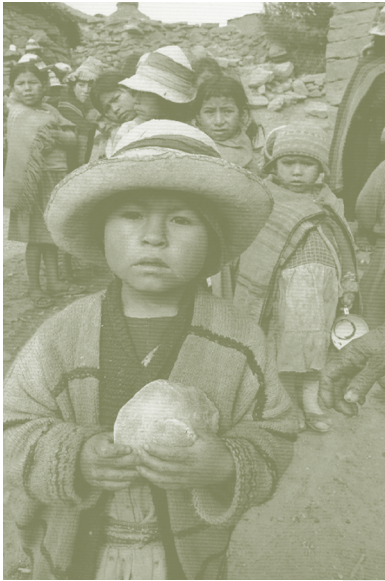
- Developed and presented a 2-day course entitled "Genetics and Disease Prevention: An Introductory Course." Participants included 30 CDC staff members and 25 public health representatives from 15 states who discussed emerging issues in genetics and how they can be incorporated into public health program planning.
- Developed and presented a 2-day course entitled "Genetics and Disease Prevention: A Scientific Basis for Public Health Action." Developed new case studies for this course, and participants learned to identify and apply concepts from epidemiology, laboratory sciences, prevention effectiveness, and communication sciences to genetics.
- Conducted a 1-day workshop entitled "Advances in Human Genetics: Relevance to Public Health Practice," which was presented at the annual CSTE conference in June 1999.
- Sponsored a CDC-wide distinguished speakers series on various genetics topics. These speakers addressed national genetics-related issues, including human genome mapping; law, ethics, and policy; human environmental susceptibility; and the challenges of communicating information about genetics.
- Provided five new CDC genetics career development positions via an agreement with the Association for Teachers of Preventive Medicine Career Development Program.





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**G L O B A L**



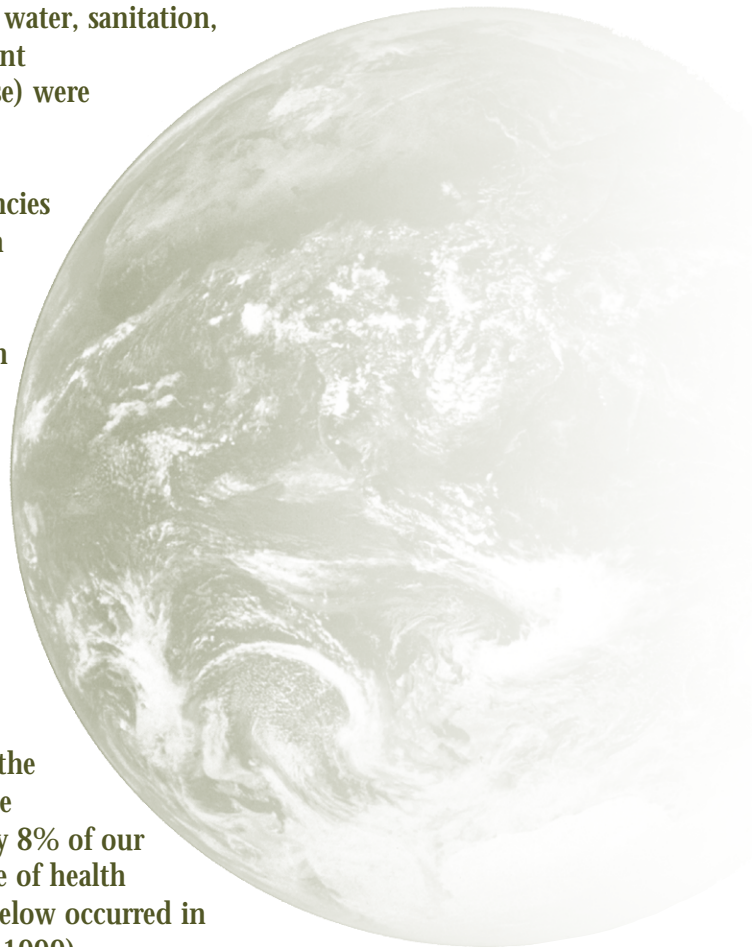
**H E A L T H**

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**S**ince its inception in 1998, our Global Health Office, which is housed in NCEH's Office of the Director, has helped the center prioritize and coordinate its global activities. Our goal is to work with partners to improve health worldwide. The center's five main global priorities (childhood lead poisoning prevention; water, sanitation, and hygiene; urban health and megacities; micronutrient malnutrition; and emergency preparedness and response) were established in 1998.

Key global partners have included United Nations agencies (e.g., the World Health Organization [WHO], the Pan American Health Organization [PAHO], the World Bank, the United Nations International Children's Emergency Fund [UNICEF], the United Nations High Commissioner on Refugees [UNHCR], the United Nations Centre for Human Settlements/Habitat); U.S. Government agencies (e.g., the National Institutes of Health [NIH], the Environmental Protection Agency [EPA], the Department of State, the United States Agency for International Development [USAID]); academic institutions; and nongovernmental agencies and civic organizations (e.g., Kiwanis International, CARE). NCEH is also home to three WHO Collaborating Centres: Environmental Epidemiology, Complex Emergency Preparedness and Response, and the Laboratory Reference and Referral for Blood Lipids. We collaborated with 68 countries, investing approximately 8% of our composite personnel time and addressing a broad range of health issues. Unless otherwise indicated, all work described below occurred in fiscal year (FY) 1999 (October 1, 1998-September 30, 1999).



## **CHILDHOOD LEAD POISONING PREVENTION**

The U.S. success story in preventing childhood lead poisoning is a triumph in environmental public health. CDC contributed to that success and has begun to collaborate with other countries on this issue. Our vision is to help eliminate childhood lead poisoning worldwide in the 21st century by 1) helping to develop an effective international agenda for reducing childhood lead poisoning worldwide, 2) helping other countries use scientific knowledge to guide public health actions, and 3) mobilizing a global coalition of partners to address the lead problem.

Since 1989 we have collaborated with 20 countries in addressing public health problems related to lead. During FY 1999, we collaborated with five countries.

- Conducted a pediatric blood lead assessment in the New Mexico-Chihuahua border region as part of EPA and CDC's efforts to address environmental health issues. This project was a binational



effort, with CDC, EPA, the New Mexico Department of Health, the New Mexico Border Health Office, and the Office of the Secretary of Health in Chihuahua, Mexico. This project assessed the blood lead levels of 941 children aged 1-6 years who lived on either side of the border. The overall mean blood level for these children was 2.7 micrograms per deciliter (mcg/dL), with a range from 0.7mcg/dL to 19.8 mcg/dL. Participants from the U.S. side of the border had significantly lower mean blood levels than participants from the Mexico side. Continued and focused surveillance based on risk factors is important in the efforts of health officials to identify children with elevated blood lead levels and to respond rapidly so that their exposure can be reduced as quickly as possible.

- Provided technical assistance to the U.S. Embassy in China to develop a project to measure the blood lead levels of expatriate children in China. This assistance continued with data analysis and project write-up. Low blood lead levels were found among the expatriate children who participated in this study, as compared with the previously reported results of high blood lead levels of Chinese children in the same areas. This collaboration adds information to the sparse body of knowledge about the extent and sources of lead poisoning in China.
- Evidence suggests that lead poisoning rates in India may be high, but the problem has not been well studied. NCEH collaborated with Macro International on a USAID-funded population-based study of blood lead levels of children in India. The results of this study, still pending, will be used in reports to the government and in other publications and may be used to guide future lead poisoning prevention programs in India.



*Children in this New Delhi grammar school were tested for lead poisoning by the All-India Institute of Medical Sciences. Some children had dangerously high (up to 97 mcg/dL) blood lead levels*

- NCEH cosponsored a national workshop on treating and preventing pediatric lead poisoning in India. The workshop included presentations and discussions on the effects and socioeconomic costs of lead poisoning, the extent of lead poisoning

and screening techniques, environmental sources of lead and lead poisoning prevention methods, the diagnosis and treatment of lead poisoning; and the development of a national prevention and treatment program. This workshop resulted in the formulation of a national lead poisoning prevention plan for India.

## WATER, SANITATION, AND HYGIENE

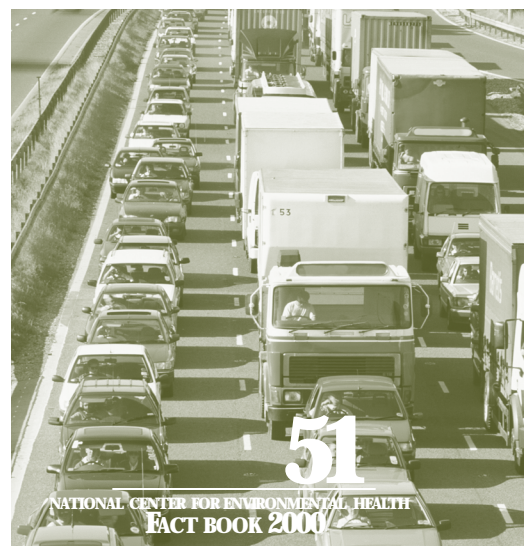
Collectively, inadequate water, sanitation, and hygiene are the leading environmental cause of disease burden worldwide. NCEH's vision is to increase health and survival through better water, sanitation, and hygiene, including food safety. Even though our involvement in this area is relatively recent, We have been working to identify our role and the most appropriate ways to contribute to global efforts to address these problems. We collaborated with 14 different countries in addressing these problems through research, technical assistance, and communication.

- Provided, through the Vessel Sanitation Program (VSP), technical consultation about water and sanitation issues in the construction of new cruise vessels to shipyard personnel in Germany, France, Italy, Finland, Japan, Sweden, the Dominican Republic, Austria, and the Netherlands.
- Began collaborations with the Egyptian Ministry of Health to implement a VSP-like program for Egypt.
- Collaborated with the Food and Drug Administration on an investigation of *Salmonella* in cilantro in Costa Rica and helped describe the environmental health conditions that may have led to the contamination of a food product with a pathogen. On the basis of observation of the process and area, a description of the physical setting, and environmental sampling, investigators identified potential sources of the *Salmonella* organism and made recommendations to the Costa Rican government on ways to prevent future outbreaks.

## URBAN HEALTH AND MEGACITIES

Approximately half of the world's population now lives in urban areas. Both urban sprawl in the United States and rapid, unplanned urbanization in other countries are creating unhealthy environments and increasing the challenges to people's health and the quality of their lives. NCEH's vision is "healthy people in healthy cities." To work toward accomplishing that vision, we did the following:

- Completed a review of existing global urban-health data. For the most part, health data are not collected or used to guide the setting of public health priorities, resource allocation, or technical



interventions within urban settings. The gathering of this information will help guide NCEH programming in urban health.

- Collaborated with investigators from PAHO and the Mexican Ministry of Health to evaluate exposure of commuters in Mexico City to volatile organic compounds (VOCs), including benzene, toluene, and methyl tertiary-butyl ether. Significantly higher levels of many gasoline-related VOCs were found in the blood of these commuters. These findings point to the need for further efforts to reduce pollution in Mexico City and other cities with heavy vehicular traffic in order to protect citizens from exposure to potentially toxic chemicals.
- Collaborated with the University of North Carolina's Kenan Institute (Chapel Hill, NC) and the Centre for Technology Foresight in Thailand on a "Healthy Megacities" project sponsored through the Asia-Pacific Economic Cooperative (APEC). NCEH took the lead on writing a white paper describing the issues surrounding health and the urban environment and helped plan an international meeting of international experts slated for June 2000. This project will increase the visibility of environmental health issues in urban/megacities planning.

## MICRONUTRIENT MALNUTRITION

The World Bank estimates that 2 billion people worldwide are at risk from deficiencies in iron, vitamin A, iodine, and folate and that 1 billion are actually ill or disabled by these deficiencies. CDC's vision is to help eliminate micronutrient malnutrition worldwide in the next century. We worked with these partners on the following projects to develop an agency-wide strategy to address this issue:

- Began a collaboration with the Chilean Ministry of Health, PAHO, and the March of Dimes to perform a baseline evaluation of folate in bread and serum in a population sample. These results will be compared with results from samples taken in FY 2000 to evaluate the impact of the fortification of flour with folic acid that began in January 2000.
- Continued a long-standing collaboration with Beijing Medical University (BMU) using folic acid to prevent neural tube defects. This collaboration included analyzing and publishing the results of a large-scale community-intervention program. Study results showed



that 0.4 mg. of folic acid alone prevents neural tube defects, thus validating the U.S. Public Health Service recommendations that all women capable of becoming pregnant should consume 0.4 mg. of folic acid daily to prevent neural tube defects in their offspring.

- Conducted several nutritional assessments among refugee populations. These included a nutritional survey of adolescents in refugee camps in Kenya and Tanzania as well as of adolescent Bhutanese refugees living in camps in Nepal. Refugee adolescents in Kenya had a very high prevalence of low body-mass index; however, other data did not indicate widespread malnutrition. The reference population recommended by WHO for use in studying adolescents is probably not appropriate for ethnic groups that are normally much taller and thinner than the population of U.S. adolescents on which the reference population is based. Although the prevalence of anemia was high, it was no higher than the prevalence in other settled African populations. Adolescents in Nepal had the expected pattern of “anemia of adolescence” (i.e., more females than males were anemic [anemia peaks among females after menarche and remains high, whereas among males, anemia peaks at ages 14-15 years, then rapidly declines in their later teen years]). However, these Bhutanese adolescent refugees had substantially lower overall hemoglobin levels than did the U.S. population. Laboratory results assessing riboflavin levels in the Bhutanese populations in Nepal are pending. Iron deficiency was a major contributor to anemia in both the African and Bhutanese populations, and supplementation for adolescent girls will prevent the development of more severe anemia later when these young women become pregnant.



*Doing a blood test for iron and vitamin levels in a Bhutanese refugee camp in Nepal.*

## **EMERGENCY PREPAREDNESS AND RESPONSE**

NCEH's goal is to help minimize the negative health impact of emergencies worldwide by assisting international organizations and other nations in preparing for and responding to natural and technologic disasters, complex humanitarian emergencies, and the increasing threat of bioterrorism. NCEH responded to a wide range of disasters and conducted related training in many countries.

- Provided technical assistance to seven missions during the Kosovo humanitarian crisis. These missions involved rapid needs assessments, health-status assessments, and administration of health activities in refugee camps. For 3 months, NCEH staff filled the role of health coordinator



*Assessing needs of population during Kosovo crisis*

for the UNHCR. In addition, during the crisis we developed and implemented a mental health assessment tool for use with returning refugees and former internally displaced populations. Finally, we provided assistance to WHO in establishing a health-surveillance system in Kosovo.

- Assisted in planning and developing a standardized computer-based health-information system for augmenting health-surveillance activities among Afghani refugee groups in Pakistan.
- Conducted a nutritional survey of adolescents in camps of displaced central Africans in Kakuma, Kenya. The study looked at specific indicators of protein-energy and micronutrient malnutrition among adolescents. Preliminary results indicate that anemia among adolescents seems to be caused by vitamin A deficiency. Other signs of vitamin A deficiency were also found.
- Conducted an ongoing multisite research project that examined refugee-specific indicators of health status in northern Tanzania, Thailand, and Azerbaijan. Forty-one camps have already been surveyed, and nine other camp surveys were completed by January 2000. The implications for this study are wide ranging. Results will be used to develop cross-cultural, cross-geographic indicators of health status in refugee populations that will allow for rapid and accurate assessment of health in displaced populations.
- Provided epidemiologic assistance for implementing surveillance on a series of health outcomes, design-control methodology, and corrective actions to prevent further spread of disease in Nicaragua after Hurricane Mitch devastated this country.
- Continued collaborating with the Malaysian Ministry of Health on a project examining the health effects of forest fires.
- Responded to requests for technical assistance to address the immediate public health needs after catastrophic earthquakes in Bolivia and Turkey.
- Conducted, in collaboration with other CDC centers, offices, and institutes and the United States Army Medical Research Institute of Infectious Diseases, a workshop for the Office of Foreign Disaster Assistance on bioterrorism involving biologic agents.
- Developed the first 50 of 150 tests as part of a laboratory rapid toxic screen to measure 150 toxic substances (e.g., nerve agents, mustards, lewisite, hydrogen cyanide, and other toxic chemicals) in as many as 50 people within 48 hours.
- Participated in a needs assessment for developing and implementing an emergency health and medical-response program for trauma care in an austere environment in Tanzania.



*Obtaining blood sample for Adolescent Health Survey, Kakuma Camp, Kenya.*



*Working with the Red Cross to determine people's critical needs after devastating earthquakes in Turkey.*



## OTHER GLOBAL PRIORITIES

### *Pesticides*

- Collaborated with the Office of the Mayor and the Port Authority of Venice, Italy, in an exposure assessment study of people who eat large amounts of fish and people who do not eat fish to examine the effects of heavy industrialization of the Venice Lagoon area and the potential for bioaccumulation of persistent chemicals. Levels of dioxins, furans, PCBs, and organochlorine pesticides were higher among people who ate fish than among people who did not. However, these levels were not elevated relative to levels found in other groups that eat fish. On the basis of these results, the Venice government decided not to place additional restrictions related to eating fish from the Venice Lagoon.
- Measured human serum levels of dioxins, furans, polychlorinated biphenyls, and organochlorine pesticides in a representative sample of the New Zealand population. This is the first known nationally representative survey of dioxins and furan levels in people. The levels of these chemicals in the New Zealand population are the lowest measured to date in any sample of individuals from industrialized countries.

### *Birth Defects*

- Continued a long-standing collaboration with BMU in the use of folic acid to prevent neural tube defects. (See “Micronutrient Malnutrition.”)
- Participated in the NTD 2000 meeting in Germany. This meeting brought together scientists from throughout the world, all of whom were studying neural tube defects, to discuss the latest developments in the field and to stimulate new work.
- Continued participation in the International Center for Birth Defects, which functions as the coordinating and scientific headquarters for the International Clearinghouse for Birth Defects Monitoring Systems (ICBDMS). Main activities focus on international birth defect surveillance and etiologic studies aimed at preventing birth defects.

### *Genetics and Disease Prevention*

- Cosponsored the 20th Annual David W. Smith Workshop on Malformations and Morphogenesis that was attended by clinical geneticists and dysmorphologists from the United States and several foreign countries. Speakers presented research findings relevant to



the causes and mechanisms of birth defects. These findings are used to generate further hypotheses that can be tested using various data sets at CDC and ICBDM.

### ***Child Development***

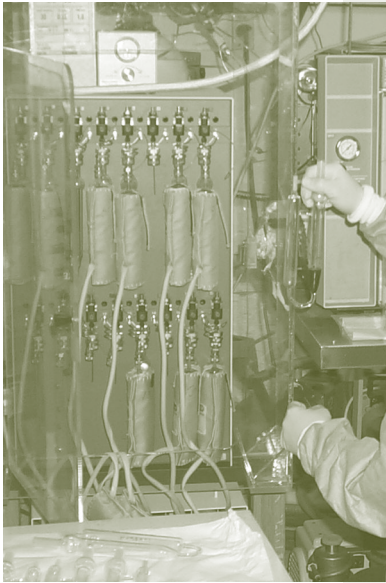
- Continued collaborating with scientists at the Danish Epidemiology Sciences Centre, Denmark, to investigate the role of infection in pregnancy as a potential risk factor for poor neurodevelopmental outcome, including cerebral palsy.
- Continued collaborating with colleagues in South Africa to examine fetal alcohol syndrome (FAS). This collaboration involves 1) designing, implementing, and evaluating an effective screening and case-finding method and developing a report on replicating the method in other South African provinces; 2) determining the prevalence of FAS in the four populations where case-finding is conducted and developing a report for the South African Ministry of Health; 3) building local capacity to monitor trends in the prevalence of FAS among school children with recommendations for developing prevention activities; 4) developing a better understanding of the relation of local alcohol-use customs and practices and the occurrence of FAS to better target prevention efforts; and 5) increasing CDC's understanding of how the surveillance and prevention methods used in South Africa can be replicated in other communities.

### ***Disabilities and Health***

- WHO is revising its classification system for describing disability. The Disability and Health Branch has a cooperative agreement with WHO to support an environmental task force as an adjunct to the revision process, which will result in the publication of the more comprehensive *International Classification of Functioning and Disability*.
- Collaborated with the National Center for Injury Prevention and Control to develop a proposal for the American Ambassador in Vietnam to generate interest for a "Safe Vietnam" program. The program would have as its priority reducing injuries in the Vietnamese population in all settings. It is also intended to mitigate the effects of disabilities resulting from injuries and other causes and create a safer environment throughout the country.

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**L A B O R A T O R Y**



**S C I E N C E S**

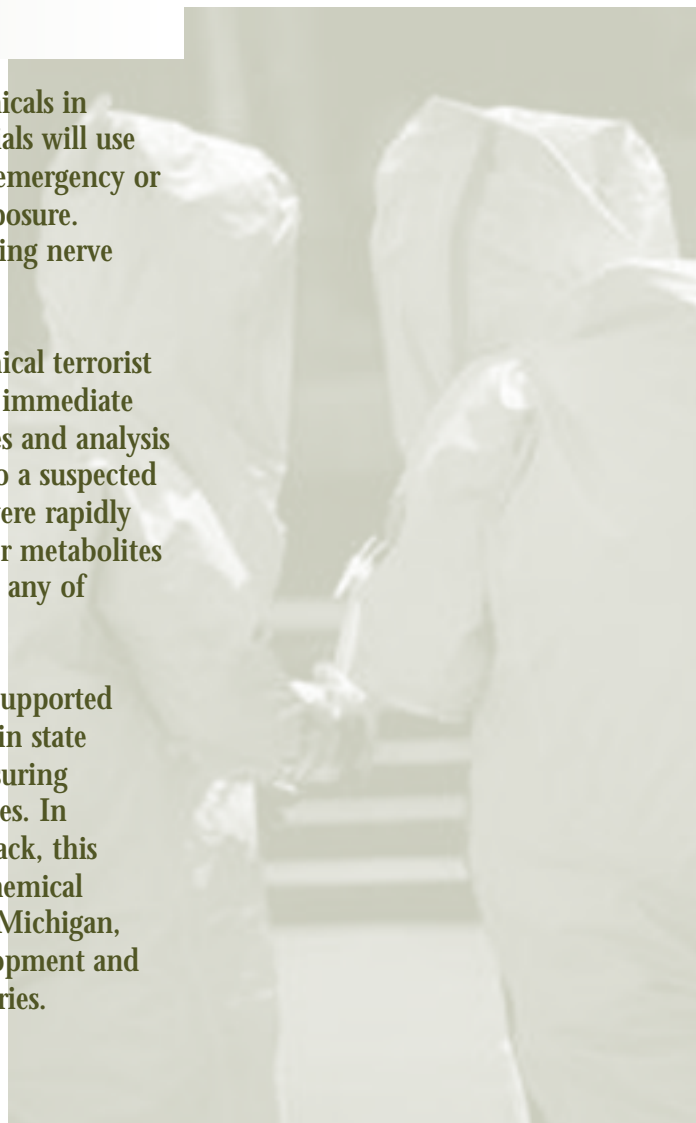
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**T**he mission of the Division of Laboratory Sciences (DLS) is to develop and apply laboratory science to prevent disease and death caused by exposure to toxic substances and to improve the diagnosis, treatment, and prevention of selected chronic diseases. DLS activities are organized in these branches: Air Toxicants, Clinical Biochemistry, Molecular Biology, Nutritional Biochemistry, Special Activities, and Toxicology. DLS specializes in biomonitoring, which is the assessment of individual human exposure to toxic substances by measuring them in human specimens (e.g., blood or urine). Biomonitoring provides valuable and unique information that guides health officials in risk assessment, treatment, and prevention. All work described on the following pages occurred during fiscal year 1999 (October 1, 1998- September 30, 1999).

## **CHEMICAL TERRORISM**

- Developing a Rapid Toxic Screen to measure 150 chemicals in samples of human blood and urine. Public health officials will use this test to discern which chemicals are involved in an emergency or terrorist act, who has been exposed, and the level of exposure. Developed tests for the first 50 chemical agents, including nerve agents, sulfur mustards, and toxic heavy metals.
- Established a laboratory-response team to address chemical terrorist acts. The team provides around-the-clock coverage for immediate response to incidents requiring the collection of samples and analysis of potential exposures to chemical agents. Responded to a suspected chemical terrorist event in another country. Methods were rapidly developed to screen human blood and urine samples for metabolites of several toxic agents. However, analysis did not detect any of these agents.
- As part of CDC's bioterrorism preparedness program, supported the development of a network of chemical laboratories in state health departments. Will transfer technologies for measuring chemical agents and provide training to state laboratories. In response to a known or suspected chemical terrorist attack, this network will work in partnership with DLS to assess chemical exposures. Provided funding to four states (California, Michigan, New York, and Virginia) for chemical laboratory development and purchased state-of-the-art equipment for these laboratories.



## STUDIES OF TOXIC EXPOSURES: UNITED STATES

DLS provides laboratory analysis to help health departments and academic institutions assess the impact of chemical exposures. DLS contributes to assessments of the role of environmental factors in causing or exacerbating diseases. DLS also works with state and local health departments to conduct health investigations and respond to chemical emergencies.

- Supported an emergency-response investigation with Tennessee, addressing exposure to chemical fumes in a local high school. This incident resulted in the school being closed for a week. Laboratory analysis revealed that levels of organophosphates, polychlorinated biphenyls (PCBs), organochlorine, and volatile organic compounds (VOCs) for 50 people were within normal range. These results helped public health officials decide when they could safely reopen the school.
- Collaborated on a study with the Environmental Protection Agency to examine the absorption and metabolism of methyl tertiary butyl ether, a gasoline additive, following different routes of exposure. Internal dose levels resulting from ingestion (drinking contaminated water) were lower than those from breathing or skin exposure.
- Completed the sample analysis for an Agency for Toxic Substances and Disease Registry (ATSDR) investigation of indoor spraying of methyl parathion, a pesticide whose use is restricted to the outdoors. Analyzed about 16,000 samples from children and adults. The results were used to decide who needed to be evacuated, which houses needed to be renovated, and whether remediation efforts were successful.
- Assessed routes of exposure to trihalomethanes in people. These byproducts of the water-chlorination process have been linked to bladder cancer and possibly to birth defects. Results indicated that showering and bathing are more significant sources of exposure than drinking the water.
- Published "Uranium and Thorium in Urine of United States Residents: Reference Range Concentrations" (*Environ Res* Section A 1999;81:45-51). This study established reference ranges of U.S. residents' exposure to uranium and thorium.
- Completed an analysis of approximately 4,000 maternal serum samples to assess exposure to organochlorine pesticides and PCBs. This analysis supported a study examining women's levels of these chemicals and abnormalities such as hypospadias and hypotonia that occur during the fetal development of their children. The samples were collected in the early 1960s as part of the Collaborative Perinatal Project.

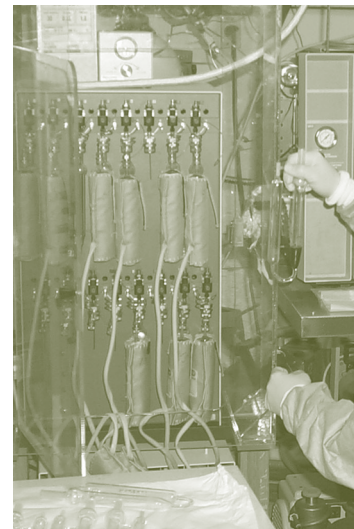


***Participant in CDC-EPA study of the gasoline additive methyl tertiary butyl ether undergoes tests.***

- Served as the central laboratory for the Treatment of Lead-Exposed Children Clinical Trial. This trial is assessing the impact of various interventions on the cognitive functioning of exposed children.
- Completed the analysis for a National Institute of Occupational Safety and Health study of the relationship between cervical cancer and the exposure of dry-cleaning workers to tetrachloroethene. Levels of exposure among dry-cleaning workers were several orders of magnitude higher than those in the general population.
- Completed a study to assess dioxin, furan, and PCB levels in residents near a Louisiana Superfund site (a vinyl chloride plant). Previous research indicated that the soil at this site was contaminated with dioxin. Laboratory analysis found elevated levels in humans, particularly for 12378-PCDD (dioxin).
- Completed the Great Lakes Control Study to assess human levels of 22 dioxins, furans, and PCBs as part of the ATSDR Great Lakes Human Health Effects Research Program. Data analysis is in progress.
- Completed the Aleutian Villages Alaska Study examining human levels of 38 PCBs and 13 chlorinated pesticides. The study examined the relationship between exposure levels and the traditional diet of Aleutian natives. Study results have not yet been released.

## STUDIES OF TOXIC EXPOSURES: INTERNATIONAL

- Completed a study of exposure among commuters in Mexico City to gasoline-related analytes. Results showed that commuters in Mexico City had higher levels of these analytes than a sample of the U.S. population.
- Published results of a study showing an association between exposure to the pesticide dieldrin and development of breast cancer among Danish women (“Organochlorine Exposure and Risk of Breast Cancer.” *Lancet* 1998;352:1816-20). These results indicate that compounds with estrogenic properties may increase the risk for breast cancer.
- Supported an emergency-response investigation after severe flooding in Honduras. Drinking water was found to contain the pesticides parathion, chlorpyrifos, and diazinon. Urine samples from 50 people affected by this emergency had elevated levels of the metabolites of parathion and chlorpyrifos.
- In collaboration with researchers in Italy and at the University of California at Berkeley, completed a study examining the relation between 2378-TCDD (dioxin) and endometriosis among women



from the Seveso, Italy, area. More than 500 samples were analyzed for this study. Also participated in a study to examine the impact of dioxin exposure on the ratio of boy-to-girl infants born in the Seveso area. Papers reporting the results of these studies are under development.

- Completed the Venice, Italy, Lagoon Pilot Study, which examined the levels of 22 dioxins, furans, and PCBs in people who ate fish from the lagoon. PCB levels were slightly higher than background levels but not higher than in other fish-eating populations.

## NATIONAL EXPOSURE REPORT CARD



We are developing a National Exposure Report Card to describe the exposure of the U.S. population to 25 priority toxic substances. The report card will be used to identify exposures to toxic substances that can harm health, to identify whose health is most at risk, and to monitor how well actions to prevent exposures are working. We analyzed exposure to several substances for the report card, including lead, cadmium, mercury, and other metals as well as to cotinine, a marker of exposure to tobacco smoke. We also upgraded methods to allow faster measurement of persistent pesticides for inclusion in the report card.

## NEW AND IMPROVED BIOMONITORING METHODS

We developed new biomonitoring methods and to improve its existing methods by making them faster, more accurate, easier to conduct, or less costly. These methods are used to support health investigations and to assess population exposure to toxic substances.



- Developed a faster method of measuring VOCs in blood. The instruments used are more accessible to local and state health departments because they are less expensive and easier to use.
- Developed a method to measure methyl eugenol in human serum. Methyl eugenol is used either by itself or in combination with other chemicals as a food-flavoring agent. Long-term carcinogenicity testing at the National Toxicology Program found that methyl eugenol is a potent animal carcinogen.



- Finished developing a “quantitative screen” for measuring 6 metabolites of approximately 30 organophosphate pesticides (e.g., chloropyrifos, malathion, naled, diazinon).
- Researched a faster chromatographic technique for measuring the 22 dioxins, furans, and coplanar PCBs usually found in human serum. Analytical chromatographic time has been reduced to 10 minutes, which is three times faster than the previous method and six times faster than the earliest method. This new method allows DLS to provide results to academic and state health department partners more quickly than in the past for use in health investigations and exposure assessments.
- Developed a method to assess human exposure to eight commercially used phthalate esters by measuring their metabolites in human urine. These phthalate esters have been implicated as endocrine-disrupting chemicals.
- Developed a method of assessing human exposure to eight phytoestrogens in human serum or urine. These phytoestrogens are known to be naturally occurring endocrine-disrupting chemicals. Measured 8 phytoestrogens in specimens from a subsample of 200 people who had participated in the Third National Health and Nutrition Examination Survey (NHANES III).
- Developed a faster and more accurate method of measuring multiple trace elements in small quantities of urine. This method will provide data for “reference ranges” of toxic and essential elements in the U.S. population.

## NEWBORN SCREENING

- Provided dried blood-spot (DBS) quality assurance (QA) materials and reports on performance status to 64 U.S. newborn screening labs and 33 such labs in other countries. Prepared, certified, and distributed approximately 250,000 DBSs for the QA of screening tests for phenylketonuria, congenital hypothyroidism, galactosemia, congenital adrenal hyperplasia, homocystinuria, maple syrup urine disease, and sickle cell disease to promote early intervention and to prevent mental retardation, severe illness, and premature death.
- Provided DBSs to the 51 state and territorial laboratories and 4 international laboratories that conduct newborn screening services for sickle cell disease. Of the 55 participating laboratories, 10 misclassified a total of 12 samples and were provided immediate consultation to solve analytic problems.



## HIV/AIDS

- Provided comprehensive QA services to laboratories testing DBSs for HIV antibodies. Measured the drug zidovudine (AZT) in DBSs and cord blood; contributed special QA services to the AZT Short-Course Therapy Studies for reducing maternal-infant HIV transmission.
- Provided QA services to approved laboratories using the CDC-developed less-sensitive enzyme immunoassay (detuned assay) that facilitates the monitoring of HIV infection incidence for prevention programs.

## CARDIOVASCULAR DISEASE

- Provided QA services to support research efforts through the CDC Lipid Standardization Program. Provided services to 80 domestic and 36 international laboratories involved in approximately 100 ongoing clinical studies of lipid risk factors for cardiovascular disease and other related chronic diseases.
- Provided QA services to support clinical measurements of cholesterol through the Cholesterol Reference Method Laboratory Network. The network certified 2 manufacturers of clinical diagnostic products for measuring total cholesterol, 278 laboratories for total cholesterol methods, and 8 manufacturers of high-density lipoprotein cholesterol diagnostic products.
- Collaborated with the Pan American Health Organization to develop a network of lipid reference laboratories in Latin America and the Caribbean.

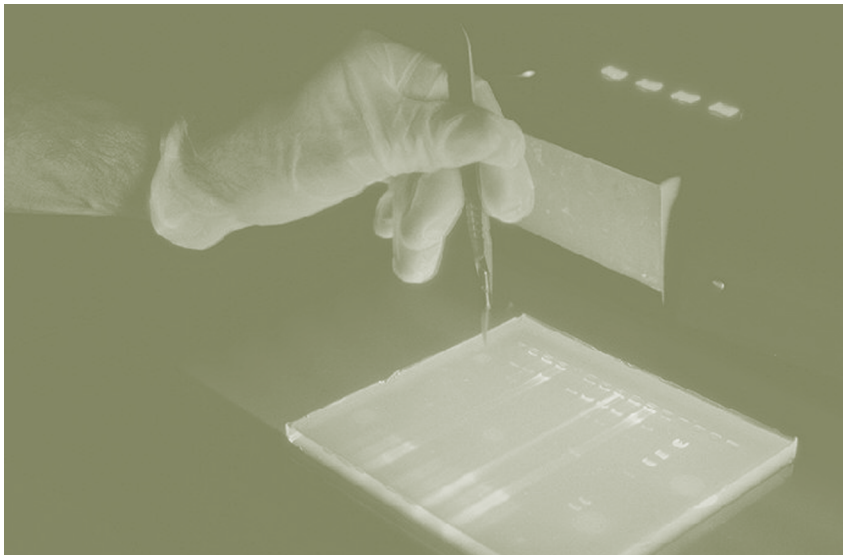
## DIABETES

CDC's National Diabetes Laboratory supports emerging scientific efforts to address type 1 diabetes.

- Awarded grants totaling almost \$700,000 to Spect R<sub>x</sub> Inc.; National Applied Science, Inc.; and the Massachusetts Institute of Technology to develop devices and techniques that are noninvasive or minimally invasive for monitoring hypoglycemia (low blood sugar). Recent research shows that people with type 1 diabetes who take small but frequent doses of insulin have a reduced risk for long-term complications of diabetes but an increased risk for hypoglycemia. Hypoglycemia can cause serious complications such as blackouts or comas and can markedly affect the quality of life for people with diabetes.



- Examined the potential application of DBSs for expanding and supporting diabetes prevention research. Produced a research protocol for assessing the comparability of serum and DBSs for measuring diabetes status. Initial research data indicate that DBSs are a potentially valuable sample matrix for use in prevention studies.
- Began a collaboration with the Juvenile Diabetes Foundation International and major research institutions to collect specimens for the study of the genetics of type 1 diabetes and its complications. Began a collaboration with the Immunology of Diabetes Society to establish the Diabetes Autoantibody Standardization Program. This program will assess the performance of type 1 diabetes autoantibody assays in laboratories throughout the world.
- Evaluated, characterized, and implemented methods for measuring hemoglobin A1c (HbA1c) as part of an international network to standardize HbA1c measurements. Passed four international intercomparison studies.



## GENETICS

We conduct specialized studies to assess the role of genetic risk factors in the development of disease. We also work in partnership with CDC's National Center for Health Statistics (NCHS) to provide access to samples from the NHANES III DNA bank for study by academic and government researchers.

- Developed semiautomated methods to rapidly identify two variants of the recently identified hemochromatosis (iron overload) gene. Now using these methods with specimens in the NHANES DNA bank to 1) determine the prevalence of the two variants in the U.S. population and 2) quantify associations between the variants and screening tests for hemochromatosis. Information from this study will be useful to evaluate the feasibility and value of genetic testing to screen for and prevent hemochromatosis.

- Continued preparations for distributing NHANES III DNA bank samples. In collaboration with NCHS, DLS has banked this nationally representative sample of DNA for use by the international research community in studying the genetic basis for disease. Developed QA procedures and sample-collection and storage logistics for the NHANES IV DNA bank.
- Assessed the frequency of alleles of methylene-tetrahydrofolate-reductase in a representative anonymous sample of the newborn population in metropolitan Atlanta. People with a common variant of this gene have reduced enzyme activity and increased levels of plasma homocysteine, which can be lowered by consuming supplemental folic acid. This gene variant has been shown to be a risk factor for spina bifida and anecephaly and may provide a partial explanation for why folic acid reduces the risk for these types of neural tube defects.

## NUTRITIONAL CAUSES OF DISEASE

DLS measures the nutritional status of the U.S. population and participates in studies to assess nutritional causes of disease. These include studies of vitamin and mineral levels, iron deficiency, homocysteine levels, and other nutritional factors.

- Began the Fourth National Health and Nutrition Examination Survey (NHANES IV) of the United States. All specimen handling and analytic procedures were rigorously tested in a pilot study. In addition, we prepared quality control materials for each of the NHANES analytes.
- Published the first set of NHANES III data reports (“Blood Folate and Vitamin B12: United States, 1988-1994.” *Vital Health Stat* 1999;11(243):1-78).
- Analyzed more than 600 specimens from participants in the Age-Related Eye Disease Study of the National Eye Institute. Laboratory analyses included serum lipid levels and serum concentrations of zinc and copper. Future analyses will include vitamins A, C, and E and will be conducted with the use of an updated method.



- Began developing reference methods for folate and homocysteine. Conducted a study to determine interlaboratory variation in plasma total homocysteine measurements. Results documented the need to improve analytical precision and to decrease differences among methods.
- Completed analyses of 700 serum samples for vitamin D for the National Cancer Institute (NCI)/Navy Colon Adenoma Study. Provided measurements of selenium, folate, vitamin B12, ferritin, homocysteine, and methylmalonic acid for the NCI Women's Alcohol Study.
- Initiated a "round robin" to assess methodologic variation in testing for iron status and related indicators. One of the indicators, transferrin saturation, can be used in screening for hemochromatosis.
- Continued to provide coordination, planning, and guidance for a joint U.S.-Russia initiative to address micronutrient malnutrition in the Russian Federation.

## TOBACCO USE

- Published "Supercritical Fluid Extraction and Gas Chromatography/Mass Spectrometry for the Analysis of Tobacco-Specific Nitrosamines in Cigarettes" (*Anal Chem* 1999; 71(7):1303-8) on tobacco-specific nitrosamines (TSNAs) in cigarettes which showed that the levels of cancer-causing TSNAs in tobacco varied for the different cigarette brands. This variation results from differences in the manufacturing process. Completed methods for measuring TSNAs in the particulate phase of tobacco smoke; measurements showed that the differences in TSNAs between brands and manufacturers are also seen in the smoke itself.
- Developed a method for analyzing the primary TSNAs identified in humans. Applied the new method to measure TSNAs in human urine samples.
- Measured nicotine, moisture, pH, and free nicotine in smokeless tobacco samples purchased in Florida. The six brands sampled included the highest-selling brands and covered a wide range of free nicotine levels. Results showed a wide range of free nicotine levels in commercial smokeless tobacco products, suggesting that smokeless tobacco products may be designed for various groups in the market, from people just beginning to chew tobacco to more experienced chewers.
- Completed measurements of the levels of alkenylbenzenes and other flavor-related compounds in the tobacco from more than 60 top-selling brands of commercial cigarettes. Many of these compounds have known toxic and carcinogenic properties. More



flavor-related compounds in ventilated cigarettes were transferred from the tobacco into tobacco smoke when the ventilation holes were covered. The act of covering ventilation holes greatly increases the exposure of the smoker to these compounds.



- Developed a method to measure ammonia in cigarette smoke. The average ammonia content of most commercial cigarettes is about 20 g/cigarette. Research suggests that ammonia may be used in cigarette manufacturing to alter the smoke pH and generate a larger fraction of free nicotine in the smoke.
- Developed a salivary cotinine method and completed a serum-saliva comparison study to support the use of saliva as a surrogate for serum in epidemiologic studies of exposure to environmental tobacco smoke (ETS). Measured cotinine levels in support of six studies of ETS exposure among infants and children and one of ETS exposure among pregnant women. Completed the cotinine analysis of a set of 130 cord blood samples in a study of maternal smoking, the regulation of newborn heart rates, and the risk for sudden infant death syndrome.
- Developed and validated a method of measuring nicotine and cotinine in dust, dust wipes, and finger wipes. This method is intended for use in evaluating secondary routes of nicotine exposure among children of smokers. To date, 118 samples from a collaborative study with San Diego State University have been analyzed; results show that levels of nicotine in the homes of smokers are higher than those in the homes of nonsmokers.

## 1999 PUBLICATIONS

*Publications are one important way for NCEH scientists to share the results of their work with the public; legislators; partner organizations; and their colleagues in local, state, and federal agencies. This work clearly manifests NCEH's commitment to scientific excellence and its efforts to meet the public health needs of people in this nation and across the globe.*

### Journal Articles

Backer LC, Rubin CS, Marcus M, Kieszak SM, Schober SE. Serum follicle-stimulating hormone and luteinizing hormone levels in women aged 35–60 in the U.S. population: the Third National Health and Nutrition Examination Survey (NHANES III, 1988–1994). *Menopause* 1999;6(1):29-35.

Balleg C, Khan LK, Kaufmann R, Mokdad A, Miller DT, Gunter EW. Blood lead concentration and children's anthropometric dimensions in the Third National Health and Nutrition Examination Survey (NHANES III), 1988-1994. *J Pediatr* 1999;134:623-30.

Barlow S, Kavlock RJ, Moore JA, Schantz SL, Sheehan DM, Shuey DL, Lary JM. Teratology Society Public Affairs Committee position paper: Developmental toxicity of endocrine disruptors to humans. *Teratology* 1999;60:365-75.

Barr DB, Barr JR, Driskell WJ, Hill RH Jr, Ashley DL, Needham LL, Head SL, Sampson EJ. Strategies for biological monitoring of exposure for contemporary-use pesticides. *Toxicol Ind Health* 1999;15(1-2):168-79.

Beeson MD, Driskell WJ, Barr DB. Isotope dilution high-performance liquid chromatography/tandem mass spectrometry method for quantifying urinary metabolites of atrazine, malathion, and 2,4-dichlorophenoxyacetic acid. *Anal Chem* 1999;71(16):3526-30.

Berry RJ, Li Z, Erickson JD, Li S, Moore CA, Wang H, Mulinare J, Zhao P, Wong L-YC, Gindler J, Hong S-X, Correa A, Hao L, Gunter EW, for the China-U.S. Collaborative Project for Neural Tube Defect Prevention. Prevention of neural-tube defects with folic acid in China. *N Engl J Med* 1999;341(20):1485-90.

Blindauer KM, Jackson RJ, McGeehin M, Pertowski C, Rubin C. Environmental pesticide illness and injury: the need for a national surveillance system. *Journal of Environmental Health* 1999;61(10): 9-13, 40.

Blindauer KM, Rubin C, Morse DL, McGeehin M. The 1996 New York blizzard: impact on noninjury emergency visits. *Am J Emerg Med* 1999;17(1):23-7.

Boneva RS, Moore CA, Botto L, Wong L-Y, Erickson JD. Nausea during pregnancy and congenital heart defects: a population-based case-control study. *Am J Epidemiol* 1999;149(8):717-25.

Botto LD, Moore CA, Khoury MJ, Erickson JD. Neural-tube defects. *N Engl J Med* 1999;341(20):1509-19.

Boyle CA. Frequent ear infections and child care. *Paediatr Perinat Epidemiol* 1999;13:473-4.

Boyle CA, Bertrand J, Yeargin-Allsopp M. Surveillance of autism. *Infants and Young Children* 1999;12(2):75-8.

Boyle CA, Yeargin-Allsopp, Schendel DE, Holmgreen P, Oakley GP. Tocolytic magnesium sulfate exposure and risk of cerebral palsy among children with birthweights less than 1750g. *Paediatr Perinat Epidemiol* 1999;13(4):A38.

Calafat AM, Barr DB, Pirkle JL, Ashley DL. Reference range concentrations of *N*-acetyl-*S*-(2-hydroxyethyl)-*L*-cysteine, a common metabolite of several volatile organic compounds, in the urine of adults in the United States. *J Expo Anal Environ Epidemiol* 1999;9(4):336-42.

Chace DH, Adam BW, Smith SJ, Alexander JR, Hillman SL, Hannon WH. Validation of accuracy-based amino acid reference materials in dried-blood spots by tandem mass spectrometry for newborn screening assays. *Clin Chem* 1999;45(8):1269-77.

Chen JC, Mannino DM. Worldwide epidemiology of chronic obstructive pulmonary disease. *Curr Opin Pulm Med* 1999;5:93-9.

Combs DL, Quenemoen LE, Parrish RG, Davis JH. Assessing disaster-attributed mortality: development and application of a definition and classification matrix. *Int J Epidemiol* 1999;28:1124-9.

Correa A, Stone AE Jr, Wong L-Y, Lin B, Lynberg M. Assessing exposure to trihalomethanes in tap water in studies of pregnancy outcome. *Am J Epidemiol* 1999;149(11):558.

Cragan JD. Teratogen update: methylene blue. *Teratology* 1999;60:42-8.

Dearborn DG, Yike I, Sorenson WG, Miller MJ, Etzel RA. Overview of investigations into pulmonary hemorrhage among infants in Cleveland, Ohio. *Environ Health Perspect* 1999;107(Suppl 3):495-9.

Dearry AD, Collman GW, Saint C, Fields N, Redd S. Building a network of research in children's environmental health. *Environ Health Perspect* 1999;107(Suppl 3):391-2.



Ebrahim SH, Andrews WW, Zaidi AA, Levine WC, DuBard MB, Goldenberg RL. Syphilis, gonorrhoea, and drug abuse among pregnant women in Jefferson County, Alabama, US, 1980-94: monitoring trends through systematically collected health services data. *Sex Transm Infect* 1999;75:0-5.

Ebrahim SH, Diekman ST, Decouflé P, Tully M, Floyd RL. Pregnancy-related alcohol use among women in the United States, 1988-95. *Prenat Neonat Med* 1999;4:39-46.

Ebrahim SH, Diekman ST, Floyd RL, Decouflé P. Comparison of binge drinking among pregnant and nonpregnant women, United States, 1991-1995. *Am J Obstet Gynecol* 1999;180(1):1-7.

Eheman CR, Tolbert PE. Estimating occupational radiation doses when individual dosimetry information is not available: a job exposure matrix. *Am J Ind Med* 1999;36:348-59.

Esteban E, Rubin CH, Jones RL, Noonan G. Hair and blood as substrates for screening children for lead poisoning. *Arch Environ Health* 1999;54(6):436-40.

Falter KH. Preface. In: Falter KH, Betts DR, Rolka DB, Rolka HR, Sieber WK, guest editors. Symposium on statistical bases for public health decision making: from exploration to modelling. *Stat Med* 1999;18(23):3159.

Falter KH, Betts DR, Rolka DB, Rolka HR, Sieber WK, guest editors. Symposium on statistical bases for public health decision making: from exploration to modelling. *Stat Med* 1999;18(23):3159-3376.

Floyd RL, Ebrahim SH, Boyle CA. Preventing alcohol-exposed pregnancies among women of childbearing age: the necessity of a pre-conceptual approach. *Journal of Women's Health and Gender-Based Medicine* 1999;8(6):733-6.

Ford ES, Kelly AE, Teutsch SM, Thacker SB, Garbe PL. Radon and lung cancer: a cost-effectiveness analysis. *Am J Public Health* 1999;89(3):351-7.

Ford ES, Sowell A. Serum alpha-tocopherol status in the United States population: findings from the Third National Health and Nutrition Examination Survey. *Am J Epidemiol* 1999;150(3):290-300.

Garger EK, Hoffman FO, Thiessen KM, Galeriu D, Kryshev AI, Lev T, Miller CW, Nair SK, Talerko N, Watkins B. Test of existing mathematical models for atmospheric resuspension of radionuclides. *Journal of Environmental Radioactivity* 1999;42:157-75.

- Gorjanc ML, Flanders WD, VanDerslice J, Hersh J, Malilay J. Effects of temperature and snowfall on mortality in Pennsylvania. *Am J Epidemiol* 1999;149(12):1152-60.
- Honein MA, Paulozzi LJ. Birth defects surveillance: assessing the "gold standard." *Am J Public Health* 1999;89(8):1238-40.
- Honein MA, Paulozzi LJ. Cost-effectiveness of oral isotretinoin. *Dermatology* 1999;198:404-5.
- Honein MA, Paulozzi LJ. Family history, maternal smoking, and clubfoot: an indication of a gene-environment interaction. *Am J Epidemiol* 1999;149(11):S67.
- Honein MA, Paulozzi LJ, Cragan JD, Correa A. Evaluation of selected characteristics of pregnancy drug registries. *Teratology* 1999;60:356-64.
- Honein MA, Paulozzi LJ, Himelright IM, Lee B, Cragan JD, Patterson L, Correa A, Hall S, Erickson JD. Infantile hypertrophic pyloric stenosis after pertussis prophylaxis with erythromycin: a case review and cohort study. *Lancet* 1999;354:2101-5.
- Ikegami T, Kimata K, Hosoya K, Tanaka N, Oida T, Smith CJ, Moffett DB, Grainger J, Patterson DG Jr. Isolation of polychlorodibenzo-p-dioxins and polychlorobiphenyls upon deproteinization of a serum sample by HPLC with restricted-access reversed-phase packing materials. *J High Resol Chromatogr* 1999;22(5):287-93.
- Ing PS, Van Dyke DL, Caudill SP, Reidy JA, Bice G, Bieber FR, Buchanan PD, Carroll AJ, Cheung SW, DeWald G, Donahue RP, Gardner HA, Higgins J, Hsu LYF, Jamehdor M, Keitges EA, Laundon CH, Luthardt FW, Mascarello J, May KM, Meck JM, Morton C, Patil S, Peakman D, Pettenati MJ, Rao N, Sanger WG, Saxe DF, Schwartz S, Sekhon GS, Vance GH, Wyandt HE, Yu CW, Zenger-Hain J, Chen ATL. Detection of mosaicism in amniotic fluid cultures: a CTYO2000 collaborative study. *Genetics in Medicine* 1999;1(3):94-7.
- Jacobson J, Acuna J. Summary of CDC rapid assessment of post-hurricane needs in the Dominican Republic. *Food Forum* 1999;48 (May-June):3-5.
- Keim M, Kaufmann AF. Principles for emergency response to bioterrorism. *Ann Emerg Med* 1999;34(2):177-82.
- Kharrazi M, Epstein D, Hopkins B, Kreutzer R, Doebbert G, Hiatt R, Swan S, Eskenazi B, Pirkle JL, Bernert JT. Evaluation of four maternal smoking questions. *Public Health Rep* 1999;114:60-70.

Khoury MJ. Human genome epidemiology (HuGE): translating advances in human genetics into population-based data for medicine and public health. *Genetics in Medicine* 1999;1(3):71-3.

Kilbourne EM. The spectrum of illness during heat waves. *Am J Prev Med* 1999;16(4):361-2.

Kimberly MM, Leary ET, Cole TG, Waymack PP, for the Cholesterol Reference Method Laboratory Network. Selection, validation, standardization, and performance of a designated comparison method for HDL-cholesterol for use in the Cholesterol Reference Method Laboratory Network (CRMLN). *Clinical Chemistry Laboratory Medicine* 1999;37:S263.

Lary JM, Lyon Daniel K, Erickson JD, Roberts HE, Moore CA. The return of thalidomide: can birth defects be prevented? *Drug Saf* 1999;Sept 21(3):161-9.

Lawrence JM, Petitti DB, Watkins M, Umekubo MA. Trends in serum folate after food fortification. *Lancet* 1999;354(9182):915-6.

Mannino DM, Giovino G, Ford E. Lung cancer mortality and cigarette smoking in the U.S.: an analysis of the 1993 mortality follow-back study. *Am J Respir Crit Care Med* 1999;159(3):A320.

Matt GE, Wahlgren DR, Hovell MF, Zakarian JM, Bernert JT, Meltzer SB, Pirkle JL, Caudill S. Measuring environmental tobacco smoke exposure in infants and young children through urine cotinine and memory-based parental reports: empirical findings and discussion. *Tob Control* 1999;8:282-9.

Meneses F, Romieu I, Ramirez M, Colome S, Fung K, Ashley D, Hernandez-Avila M. A survey of personal exposures to benzene in Mexico City. *Arch Environ Health* 1999;54(5):359-63.

Meyer P, Mannino D, Homa D, Naeher L, Redd S. Every breath we take. *Forum for Applied Research and Public Policy* 1999;winter:43-9.

Meyer P, Mannino D, Redd S. Air pollution and health: what Georgia physicians should know. *J Med Assoc Ga* 1999;85(4):18-23.

Miller CW. An application of the NCRP screening techniques to atmospheric radon releases from the former Feed Materials Production Center near Fernald, Ohio. *Health Phys* 1999;77(5):545-55.

Moorman J, Mannino D. Demographic components of the increase in asthma mortality. *Am J Resp Crit Care Med* 1999;159(3):A133.

Mueller PW. Review of the genetics of renal disease. *Ren Fail* 1999;21(3&4):395-402.

Mueller PW. Study design and data analysis in clinical and environmental models of nephrotoxicity. *Ren Fail* 1999;21(3&4):337-40.

Mueller PW, Caudill SP. Urinary albumin excretion in children: factors related to elevated excretion in the United States population. *Ren Fail* 1999;21(3&4):293-302.

Najam AR, Korver MP, Williams CC, Burse VW, Needham LL. Analysis of a mixture of polychlorinated biphenyls and chlorinated pesticides in human serum by column fractionation and dual-column capillary gas chromatography with electron capture detection. *J AOAC Int* 1999;82(1):177-85.

Oida T, Barr JR, Kimata K, McClure PC, Lapeza CR Jr, Hosoya K, Ikegami T, Smith CJ, Patterson DG Jr, Tanaka N. Photolysis of polychlorinated biphenyls on octadecylsilylated silica particles. *Chemosphere* 1999;39(11):1795-1807.

Olney RS. Preventing morbidity and mortality from sickle cell disease: a public health perspective. *Am J Prev Med* 1999;16(2):116-21.

Paulozzi LJ, Lary JM. Laterality patterns in infants with external birth defects. *Teratology* 1999;60:265-71.

Paulson JA, Jackson RJ, Sussman D. Expanding the physician's role in pediatric environmental health. *J Med Assoc GA* 1999;88(4):13-7.

Pfeiffer CM, Gunter EW, Miller DT. Folic acid fortification. *N Engl J Med* 1999;341(12):923.

Pfeiffer CM, Gunter EW, Wright JD. Validation of a homocysteine (HCY) and methylmalonic acid (MMA) assay for the upcoming NHANES 1999+. *FASEB J* 1999;13:A890.

Pfeiffer CM, Huff DL, Gunter EW. Rapid and accurate HPLC assay for plasma total homocysteine and cysteine in a clinical laboratory setting. *Clin Chem* 1999;45(2):290-2.

Pfeiffer CM, Huff DL, Smith SJ, Miller DT, Gunter EW. Comparison of plasma total homocysteine measurements in 14 laboratories: an international study. *Clin Chem* 1999;45(8):1261-8.

Pfeiffer CM, Smith SJ, Miller DT, Gunter EW. Comparison of serum and plasma methylmalonic acid measurements in 13 laboratories: an international study. *Clin Chem* 1999;45(12):2236-42.

Pfeiffer CM, Twite D, Shih J, Holets-McCormack SR, Gunter EW. Method comparison for total plasma homocysteine between the Abbott IMx analyzer and an HPLC assay with internal standardization. *Clin Chem* 1999;45(1):152-3.

Posada de la Paz M, Philen RM, Schurz HH, Hill RH Jr, Giménez Ribota O, Gómez de la Camara A, Kilbourne EM, Abaitua I. Epidemiologic evidence for a new class of compounds associated with toxic oil syndrome. *Epidemiology* 1999;10(2):130-4.

Rasmussen SA, Moore CA, Paulozzi L, Rhodenhiser E. Gestational age and risk for congenital defects: a population-based study. *Genetics in Medicine* 1999;1(2):44.

Rasmussen SA, Yang QH, Friedman JM. Mortality associated with neurofibromatosis 1 in the United States from 1983 to 1995. *Am J Hum Genet* 1999;65(4):A49.

Rogers JF, Killough GG, Thompson SJ, Addy CL, McKeown RE, Cowen DJ. Estimating environmental exposures to sulfur dioxide from multiple industrial sources for a case-control study. *J Expo Anal Environ Epidemiol* 1999;9(6):535-45.

Romieu I, Ramirez M, Meneses F, Ashley D, Lemire S, Colome S, Fung K, Hernandez-Avil M. Environmental exposure to volatile organic compounds among workers in Mexico City as assessed by personal monitors and blood concentrations. *Environ Health Perspect* 1999;107(7):511-5.

Rubin CH, Niskar AS. Endocrine disrupters: an emerging environmental health problem. *J Med Assoc Ga* 1999;88(4):27-30.

Semenza JC, McCullough JE, Flanders WD, McGeehin MA, Lumpkin JR. Excess hospital admissions during the July 1995 heat wave in Chicago. *Am J Prev Med* 1999;16(4):269-77.

Song S, Ashley DL. Supercritical fluid extraction and gas chromatography/mass spectrometry for the analysis of tobacco-specific nitrosamines in cigarettes. *Anal Chem* 1999;71(7):1303-8.

Stanfill SB, Ashley DL. Solid phase microextraction of alkenylbenzenes and other flavor-related compounds from tobacco for analysis by selected ion monitoring gas chromatography-mass spectrometry. *J Chromatogr A* 1999;858:79-89.

Sun F, Cheng R, Flanders WD, Yang Q, Khoury MJ. Whole genome association studies for genes affecting alcohol dependence. *Genet Epidemiol* 1999;17(Suppl 1):S337-42.

Ting BG, Paschal DC, Jarrett JM, Pirkle JL, Jackson RJ, Sampson EJ, Miller DT, Caudill SP. Uranium and thorium in urine of United States residents: reference range concentrations. *Environ Res Section A* 1999;81:45-51.

Trevathan E, Murphy CC, Yeargin-Allsopp M. The descriptive epidemiology of infantile spasms among Atlanta children. *Epilepsia* 1999;40(6):748-51.

Van der Schalie WH, Gardner HS Jr, Bantle JA, De Rosa CT, Finch RA, Reif JS, Reuter RH, Backer LC, Burger J, Folmar LC, Stokes WS. Animals as sentinels of human health hazards of environmental chemicals. *Environ Health Perspect* 1999;107(4):309-15.

Van Naarden K, Decouflé P. Relative and attributable risks for moderate to profound bilateral sensorineural hearing impairment associated with lower birth weight in children 3 to 10 years old. *Pediatrics* 1999;104(4):905-10.

Wang SS, Fernhoff PM, Hannon WH, Khoury MJ. Medium chain acyl-CoA dehydrogenase deficiency: human genome epidemiology review. *Genetics in Medicine* 1999;1(7):332-9.

Wang SS, FitzSimmons S, Khoury MJ. Does newborn screening for cystic fibrosis reduce the risk of *Pseudomonas aeruginosa* in colonization among cystic fibrosis patients in the United States? *Am J Epidemiol* 1999;149(11):S76.

Wang SS, FitzSimmons S, Khoury MJ. Does newborn screening for cystic fibrosis reduce the risk of *Pseudomonas aeruginosa* in colonization among cystic fibrosis patients in the United States? *Paediatr Perinat Epidemiol* 1999;13(4):A38.

Wang SS, Fridinger F, Sheedy KM, Linnan H, Khoury MJ. Public attitudes regarding the donation and storage of blood specimens for genetic research. *Am J Hum Genet* 1999;65(Suppl)(4):A411.

Wang SS, Khoury MJ. An epidemiologic assessment of the relationship between the G985A medium chain acyl-CoA dehydrogenase deficiency (MCADD) allelic variant and sudden infant death syndrome (SIDS). *Genetics in Medicine* 1999;1(2):43.

Watkins ML, Erickson JD, Mulinare J. Folic acid fortification. *N Engl J Med* 1999;341(12):923-4.

Wolfe M. Working for the CDC. *Sonoma County Physician* 1999;Sept/Oct:22-5.

Yamada EG, Roberto L, Sudhakar R, Wilson SR, Mannino DM, Mejia C, Huss N, Grado J. Poor asthma control and inadequate medication regimens in a population of Medi-Cal children with asthma. *Am J Resp Crit Care Med* 1999;159(3):A267.

Yang Q, Khoury MJ, Atkinson M, Sun F, Cheng R, Flanders WD. Using case-control designs for genome-wide screening for associations between genetic markers and disease susceptibility loci. *Genet Epidemiol* 1999;17(Suppl 1):S779-84.

Yang Q, Khoury MJ, Sun F, Flanders WD. Case-only design to measure gene-gene interaction. *Epidemiology* 1999;10(2):167-70.

Yang Q, Sherman SL, Hassold TJ, Allran K, Taft L, Pettay D, Khoury MJ, Erickson JD, Freeman SB. Risk factors for trisomy 21: maternal cigarette smoking and oral contraceptive use in a population-based case-control study. *Genetics in Medicine* 1999;1(3):80-8.

### **At-a-Glance Publications**

---

Office of Planning, Evaluation, and Legislation. Asthma prevention program of the National Center for Environmental Health, Centers for Disease Control and Prevention: At-a-Glance, 1999. Atlanta: Centers for Disease Control and Prevention; 1999.

Office of Planning, Evaluation, and Legislation. The biomonitoring program of the National Center for Environmental Health, Centers for Disease Control and Prevention: At-a-Glance, 1999. Atlanta: Centers for Disease Control and Prevention; 1999.

Office of Planning, Evaluation, and Legislation. National folic acid program of the National Center for Environmental Health, Centers for Disease Control and Prevention: At-a-Glance, 1999. Atlanta: Centers for Disease Control and Prevention; 1999.

### **Books**

---

Acuña J, Yoon P, Erickson JD. *The prevention of neural tube defects with folic acid [La prevención de los defectos del tubo neural con ácido fólico]*. Atlanta: Centers for Disease Control and Prevention; 1999.

Bass J. *Your guide to household pesticide safety [Su guía de seguridad sobre pesticidas caseros]*. Atlanta: Centers for Disease Control and Prevention; 1999.

Centers for Disease Control and Prevention. *The diethylstilbestrol exposure registry workshop: a summary report*. Atlanta: Centers for Disease Control and Prevention; 1999.

Executive Committee of the International Conference on Lead Poisoning (Ackerman R, Ahmed K, Falk H, Flockler HH, Ganguly NK, George AM, Kaufmann R, Krishnaswamy K, Markowitz M, Nair PP, Nitze W, Null S, Saiyed HN, Seth PK, von Schirnding Y, Sonawane B). *A call for action on the prevention and treatment of lead poisoning in developing countries: recommendations on national policy and implementation*. The International Conference on Lead Poisoning; 1999 Feb 8-10; Bangalore, India. Bangalore: The George Foundation; Nov 1999.

National Center for Environmental Health. *Global health activities: annual report for FY 1998*. Atlanta: Centers for Disease Control and Prevention; 1999.

National Center for Environmental Health. *National Center for Environmental Health* [recruitment book]. Atlanta: Centers for Disease Control and Prevention; 1999.

National Center for Environmental Health. *National Center for Environmental Health: fact book*. Atlanta: Centers for Disease Control and Prevention; 1999.

National Center for Environmental Health. *Recommended shipbuilding construction guidelines for cruise vessels destined to call on U.S. ports*. Atlanta: Centers for Disease Control and Prevention; 1999.

## Book Chapters

---

Hough J. Disability and health: a national public health agenda. In: Simeonsson RJ, McDevitt LN, editors. *Issues in disability and health: the role of secondary conditions and quality of life*. Chapel Hill (NC): University of North Carolina; 1999. p. 161-203.

Hough J. Surveillance and outcome measurement systems for monitoring disabilities. In: Simeonsson RJ, McDevitt LN, editors. *Issues in disability and health: the role of secondary conditions and quality of life*. Chapel Hill (NC): University of North Carolina; 1999. p. 95-128.

LeDuc JW, Ostroff SM, McDade JE, Lillibridge S, Hughes JM. The role of the public health community in detecting and responding to domestic terrorism involving infectious agents. In: Scheld WM, Craig WA, Hughes JM, editors. *Emerging infections 3*. Washington (DC): ASM Press, 1999. p. 219-29.

Lollar D. Clinical dimensions of secondary conditions. In: Simeonsson RJ, McDevitt LN, editors. *Issues in disability and health: the role of secondary conditions and quality of life*. Chapel Hill (NC): University of North Carolina; 1999. p. 41-50.

Miller C. Health implications of the 1997 Nevada Test Site fallout report. In: *Radiation risk communication: implications of new thyroid disease and fallout data*; 1999 Nov 1; Richland (WA). Seattle: University of Washington; 1999.

Noji EK, Burkholder BT. Public health interventions. In: Leaning J, Briggs SM, Chen LC, editors. *Humanitarian crises: the medical and public health response*. Cambridge: Harvard University Press, 1999:41-67.

Nolte KB, Wolfe MI. Medical examiner and coroner surveillance for emerging infections. In: Scheld WM, Craig WA, Hughes JM, editors. *Emerging infections 3*. Washington (DC): ASM Press; 1999. p. 201-17.



## Letters to the Editor

---

Buehler JW. Abandoning race as a variable in public health research [letter]. *Am J Public Health* 1999;89(5):783.

Hollowell JG Jr, Garbe PL, Miller DT. Increase in iodine intake [letter]. *New Engl J Med* 1999;341(26):2016.

Jackson RJ, Erickson JD, McGeehin M, Moore CA, Roberts HE, Lary JM. Possible teratogenic effects of intrauterine exposure to chlorpyrifos (Dursban). [letter] *Arch Environ Health* 1999;54(2):141-2.

Marcus M, Kiely J, Parker J, McGeehin M, Jackson R, Sinks T. Anything other than by chance? [letter]. *Fertil Steril* 1999;71 (5):969-70.

## Proceedings

---

Broome KN, Mulinare J, Watkins ML. A comparison of 1996 and 1997 folic acid usage and knowledge among women of childbearing years (18-44). In: Program book: 16th Annual BRFSS (Behavioral Risk Factor Surveillance System) Conference; 1999 May 5-7; Minneapolis (MN). Atlanta: Centers for Disease Control and Prevention; 1999. Poster 21.

Broome K, Mulinare J, Watkins ML. A comparison of reported folic acid usage and knowledge among women of childbearing years (18-44) using BRFSS 1996 and 1997. In: Program book: The 1999 Maternal, Infant, and Child Health Epidemiology (MICHEP) Workshop: Building Data Capacity in Maternal and Child Health; 1999 Dec 8-9; Atlanta (GA). Atlanta: Centers for Disease Control and Prevention; 1999. p. 155.

George AM, editor. The George Foundation; the World Bank; Centers for Disease Control and Prevention; U.S. Environmental Protection Agency; World Health Organization, contributors. Lead poisoning prevention and treatment: implementing a national program in developing countries. Proceedings of the International Conference on Lead Poisoning Prevention and Treatment; 1999 Feb 8-10; Bangalore, India. Bangalore: The George Foundation; 1999.

Grosse SD, Webster D, Hannon WH. Cost comparison of newborn cystic fibrosis screening protocols in New Zealand. In: Travert G, Wursteisen B, editors. Neonatal screening for cystic fibrosis. Proceedings of the international conference; 1998 Sep 10-11; Caen, France. Caen: Université de Caen; 1999. p. 349-55.

Kaufmann R, Fast A, Parsons P, Chaudhary Webb M, Reigart R, Choudhury RK, Matson W, Venkatesh T. Workshop on screening standards, laboratory requirements, and coverage in a national program. In: George AM, editor. Proceedings of the International Conference on

Lead Poisoning Prevention and Treatment; 1999 Feb 8-10; Bangalore, India. Bangalore: The George Foundation; 1999. 307-13.

Miller CW. Status of the dose reconstruction projects associated with the Hanford Nuclear Weapons site and the Hanford Thyroid Disease Study. In: Third Annual University of Washington Conference on the ecological, community and occupational health issues at Hanford; 1999 Nov 2-3; Richland (WA). Seattle: University of Washington; 1999. p. 21.

Najam AR, Williams CC, Young SL, Burse VW. Evidence of a discrepancy in the assignment of reference values to mackerel oil CRM-350. In: Program book; 11th Annual California Pesticide Residue Workshop; 1999 Mar 20-25; Sacramento (CA). Sacramento: California Department of Food and Agriculture; 1999. Poster abstract 012.

Webster D, Hannon H, Ranieri E, Francis I, Travert G, Ferré C. Quality assurance in CF screening. In: Travert G, Wursteisen B, editors. Neonatal screening for cystic fibrosis. Proceedings of the international conference; 1998 Sep 10-11; Caen, France. Caen: Université de Caen; 1999. p. 71-6.

### ***Articles in Morbidity and Mortality Weekly Report (MMWR)***

---

Centers for Disease Control and Prevention. Adult lead poisoning from an Asian remedy for menstrual cramps—Connecticut, 1997. *MMWR* January 22, 1999;48(2):27-9.

Centers for Disease Control and Prevention. Bioterrorism alleging use of anthrax and interim guidelines for management—United States, 1998. *MMWR* February 5, 1999;48(4):69-74.

Centers for Disease Control and Prevention. Surveillance of morbidity during wildfires—Central Florida, 1998. *MMWR* February 5, 1999;48(4):78-9.

Centers for Disease Control and Prevention. Needs assessment following Hurricane Georges—Dominican Republic, 1998. *MMWR* February 12, 1999;48(5):93-5.

Centers for Disease Control and Prevention. Adverse events associated with ingestion of gamma-butyrolactone—Minnesota, New Mexico, and Texas, 1998-1999. *MMWR* February 26, 1999;48(7):137-40.

Centers for Disease Control and Prevention. Outbreaks of gastrointestinal illness of unknown etiology associated with eating burritos—United States, October 1997-October 1998. *MMWR* March 1999;48(10):210-3.

Centers for Disease Control and Prevention. Aldicarb as a cause of food poisoning—Louisiana, 1998. *MMWR* 1999;48(13):269-71.

Centers for Disease Control and Prevention. Knowledge and use of folic acid by women of childbearing age—United States, 1995 and 1998. *MMWR* 1999;48(16):325-7.

Centers for Disease Control and Prevention. Mental retardation following diagnosis of a metabolic disorder in children aged 3–10 years—Metropolitan Atlanta, Georgia, 1991–1994. *MMWR* 1999;48(17):353-6.

Centers for Disease Control and Prevention. Possible estuary-associated syndrome. *MMWR* 1999;48(18):381-2.

Centers for Disease Control and Prevention. Determination of nicotine, pH, and moisture content of six U.S. commercial moist snuff products—Florida, January–February 1999. *MMWR* 1999;48(19):398-401.

Centers for Disease Control and Prevention. Heat-related illnesses and deaths—Missouri, 1998, and United States, 1979-1996. *MMWR* 1999;48(22):469-72.

Centers for Disease Control and Prevention. Achievements in public health, 1900-1999: control of infectious diseases. *MMWR* 1999;48(29):621-9.

Centers for Disease Control and Prevention. Carbon Monoxide poisoning deaths associated with camping—Georgia, March 1999. *MMWR* 1999;48(32):705-6.

Centers for Disease Control and Prevention. Iron deficiency anemia in Alaska Native Children—Hooper Bay, Alaska, 1999. *MMWR* 1999;48(32):714-6.

Centers for Disease Control and Prevention. Framework for program evaluation in public health. *MMWR* 1999;48(RR11):1-40.

Centers for Disease Control and Prevention. Vaccination campaign for Kosovar Albanian refugee children—former Yugoslav Republic of Macedonia, April - May, 1999. *MMWR* 1999;48(36):799-803.

Centers for Disease Control and Prevention. Achievements in public health, 1900-1999: safer and healthier foods. *MMWR* 1999;48(40):905- 13.

Centers for Disease Control and Prevention. Folic acid campaign and evaluation—Southwestern Virginia, 1997-1999. *MMWR* 1999;48(40):914-7.

Centers for Disease Control and Prevention. Self-reported asthma in adults and proxy-reported asthma in children—Washington, 1997-1998. *MMWR* 1999;48(40):918-20.

Centers for Disease Control and Prevention. Assessment of laboratory tests for plasma homocysteine—selected laboratories, July-September 1998. *MMWR* 1999;48(44):1013-5.

Centers for Disease Control and Prevention. Surveillance for acute pesticide-related illness during the Medfly Eradication Program—Florida, 1998. *MMWR* 1999;48(44):1015-8, -27.

Centers for Disease Control and Prevention. Evaluating newborn screening program data systems—Georgia, 1998. *MMWR* 1999;48(48):1101-4.

Centers for Disease Control and Prevention. Hypertrophic pyloric stenosis in infants following pertussis prophylaxis with erythromycin—Knoxville, Tennessee, 1999. *MMWR* 1999;48(49):1117-20.

Centers for Disease Control and Prevention. Surveillance for sensory impairment, activity limitation, and health-related quality of life among older adults—United States, 1993-1997. *MMWR* 1999;48(SS08):131-56.

Centers for Disease Control and Prevention. Community needs assessment and morbidity surveillance following an earthquake—Turkey, August 1999. *MMWR* 1999;48(50):1147-50.

### **EPI-Aid Investigations**

---

Jacobson J. Health needs assessment of hurricane-affected population three months after Hurricane Mitch: Honduras and Nicaragua. January 22, 1999; EPI-99-33-1.

Honein MA. Investigation of isotretinoin-exposed pregnancies, California. March 9, 1999; EPI-99-45-1.

Honein MA. Investigation of pyloric stenosis among infants treated prophylactically with erythromycin, Tennessee. April 14, 1999; EPI-99-58-1.

Daley R. Health effects and risk factors of a severe tornado disaster, Oklahoma. May 5, 1999; EPI-99-63-1.

Rubin C. Heat-related mortality, Chicago, Illinois. August 6, 1999; EPI-99-87-1.

Kaiser R. Heat-related mortality, Cincinnati, Ohio. August 13, 1999; EPI-99-88-1.

Savage Brown A. Investigation of a cluster of cases of the birth defect gastroschisis, Kansas. September 2, 1999; EPI-99-95-1.

Naughton, M. Health needs assessment of people in temporary camps and follow-up studies at an Istanbul hospital of injuries and illnesses that occurred during the one-month period following the earthquake—Istanbul, earthquake zone, and surrounding regions; Turkey. September 21, 1999; EPI-99-105-1.



# NCEH FY1999 COLLABORATIVE EFFORTS



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