

Systemic Contaminants

Making Sense of an Environmental Health Threat

The last century has been a time of dramatic technological and medical advancements. This growth has not come without a price, however. Mounting evidence indicates that the by-products of industrial progress can cause adverse health effects, calling for more action to understand and limit the mortality and morbidity linked to these pollutants. As a result, Grantmakers In Health recently convened a day-long meeting to explore two environmental health topics – antibiotic resistance and systemic contaminants – and opportunities for health funders. The emerging threat of antibiotic resistance was the subject of the November 2000 Issue Focus, *Death of the Magic Bullet: Examining Antibiotic Resistance*; this Issue Focus examines the causes and effects of systemic contaminants, and describes what grantmakers can do to respond.

WHAT ARE SYSTEMIC CONTAMINANTS?

Systemic contaminants are a large group of toxic substances that can have both acute and long-term effects on the human body. These pollutants can individually affect our respiratory, immune, neurological, or reproductive systems, and can cause cancer, brain and sensory impairment, endocrine disruption, and miscarriages. At high levels, they can be fatal. Yet systemic contaminants are nearly ubiquitous in our environment today.

SOURCES OF CONTAMINANTS

Many systemic contaminants are introduced into the environment and our bodies unintentionally, as the inadvertent result of technological and industrial advances. For instance, dioxin – a contaminant known for its cancer-causing properties – is an unintentional by-product of chlorine, created by medical and industrial incineration. Another example of unintentional pollution of the environment is leaded gasoline. Beginning in the 1920s, lead was added to gasoline to boost octane levels. Scientists later realized that lead was, in fact, a highly toxic substance that accumulates in the human body. Even though lead was phased out of gasoline production years ago, it still poses a public health challenge.

But other systemic contaminants are created and used intentionally. Their ultimate dangers may be unknown or,

if suspected, their use is regulated to minimize harm. Pesticides are one such example of regulated substances which are intentionally toxic and are used specifically for their ability to destroy organisms in homes, schools, public places, lawns, and gardens, as well as in agricultural settings. Despite regulation, however, pesticides poison tens of thousands of people each year, and many more people suffer from less severe exposure to these toxic substances.

Diethylstilbesterol, or DES, is a classic example of progress gone awry. Originally prescribed in the 1950s,

FOCUS ON LEAD

Even though lead is a foreign substance not found naturally in living organisms, everybody today has detectable levels of lead in their bodies. In the past, gasoline was a major source of lead, but its use has been phased out. Today, lead-based paint – most often applied years ago before the effects of lead were known – and its derivatives are the most common source of lead exposure in this country (CDC 1997).

Research indicates that lead exposure:

- is known to have harmful effects on almost every system in the body;
- is especially dangerous to fetuses and young children;
- can result in coma, seizures, and death;
- at low levels, is linked to decreased intelligence, hearing and brain impairment, and decreased growth (NCEH 2000);
- causes low birth weight, growth retardation, and poor brain development, even at levels below those set by the EPA and the CDC; and
- has been correlated with delinquent and aggressive behavior in teenage boys (GBPSR 1996).

As with many environmental health threats, some subpopulations bear a disproportionate share of the disease burden due to lead exposure. Low-income and minority children are much more likely to be exposed to lead in their homes and neighborhoods. In addition, they are less likely to see a health care practitioner who could detect elevated blood levels and begin treatment.

1960s, and 1970s to prevent spontaneous abortion, it was not until years later that its devastating and long-term effects were discovered. We now know that female children of mothers who took DES suffer from high rates of vaginal cancer, reproductive abnormalities, reduced fertility, and poor pregnancy outcomes.

ASSESSING THE RISKS

Although we have some understanding of the effects of acute exposure to individual substances, we know very little about the results of cumulative exposure over time, and even less about the dangers posed to children, the elderly, pregnant women, or those with suppressed immune systems. Furthermore, we are only beginning to learn about the additive and synergistic effects of exposure to a variety of these substances in the environment.

GRANTMAKER OPPORTUNITIES

A number of health funders support programs to limit the negative consequences of systemic contaminants. For example, many diseases, including asthma and some kinds of cancer, are the endpoints of exposure to environmental pollutants, and many grantmakers fund programs and grants based on specific diseases such as these. Foundations also fund programs to support those populations most affected by different systemic contaminants, including agricultural workers, low-income children, and women. The following are some examples of the types of philanthropic projects under way to eradicate or alleviate the effects of systemic contaminants.

- **Support research to improve knowledge of the health hazards of systemic contaminants.** The Jessie B. Cox Charitable Trust provides funding to the Silent Spring Institute, a partnership of scientists, physicians, public health advocates, and community activists committed to identifying and changing the links between the environment and women's health. One of the Institute's primary projects is the Cape Cod Breast Cancer and Environment Study, which aims to discover the causes of increased breast cancer incidence in Cape Cod, Massachusetts.
- **Increase the interest and capacity of community members to address systemic contaminant and pollution issues in their own neighborhoods.** The California Wellness Foundation supports community-level solutions to environmental health issues in East Los Angeles and Bayview-Hunters Point, working-class minority communities in Los Angeles and San Francisco. Centro de Niños and the Urban Habitat Program, the Foundation's grantees, are recruiting and training neighborhood residents to determine the most

dangerous environmental health hazards and find ways to reduce pollutants through organizing and legislative advocacy.

- **Address the private and public systems and institutions that contribute to the damage caused by systemic contaminants.** The Pew Charitable Trusts established a commission to bring together national leaders in health, business, environment, government, and communities to strengthen the nation's public health defenses against environmental threats. The Pew Environmental Health Commission produces a series of reports that provide policymakers, health and environmental organizations, and the public with a proposed framework to improve the public health infrastructure. The Commission is focusing on several issues, including the asthma epidemic, the "right to know" principle, and the scientific and policy capacity of the federal public health system.

This Issue Focus is based on the GIH Issue Dialogue, *Progress and Peril: Examining Antibiotic Resistance and Systemic Contaminants*, held on October 3, 2000. A full report will be available in the spring, and will include the citations from this Issue Focus.

RESOURCES

Greater Boston Physicians for Social Responsibility (GBPSR) and the Massachusetts Public Interest Research Group Education Fund (MASSPIRG), *Generations at Risk: How Environmental Toxins May Affect Reproductive Health in Massachusetts* (Boston, MA: July 1996).

National Center for Environmental Health
Centers for Disease Control and Prevention
www.cdc.gov/nceh

Office of Pesticide Programs
Environmental Protection Agency
www.epa.gov/pesticides

GRANTMAKER CONTACTS

The California Wellness Foundation
www.tcwf.org
818.593.6600
Fatima Angeles, Program Officer

The Jessie B. Cox Charitable Trust
www.agmconnect.org.cox.html
617.557.9775
Rachel Pohl, Associate Director

Pew Environmental Health Commission
www.pewenvirohealth.jhsph.edu
410.659.2690
Shelley Hearne, Executive Director