

Inconclusive by Design

*Waste,
Fraud
and Abuse
in Federal
Environmental
Health
Research*

ENVIRONMENTAL HEALTH NETWORK
NATIONAL TOXICS CAMPAIGN FUND

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An Investigative Study by
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"One of the conspicuous casualties in the war against toxic wastes is the public's regard for public health officials... More often than anyone would like, frustrated and concerned citizens have received little sympathy, understanding, or help from local, state, or federal health agencies. Instead, officials have tried to minimize public concern, often irrespective of the situation. Departments of public health have become departments of public reassurance."

— Dr. David Ozonoff and Leslie I. Boden
Boston University School of Public Health
"Truth and Consequences: Health Agency
Responses to Environmental Health Problems"

Abstract

Two federal agencies, the Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR), bear the primary responsibility for safeguarding the nation's environmental health. They are responsible for studying communities exposed to toxic pollution and wastes and making recommendations for public protection. Instead of ensuring a margin of safety and recommending measures to end public exposures to toxics, both of these agencies have routinely funded and conducted studies of effects of toxic pollution on public health which are *inconclusive by design*. These intentionally inconclusive studies have been used by polluters and government officials to mislead local citizens into believing that further measures to prevent toxic exposures are unnecessary. In systematically engaging in such practices, the two agencies are violating sound public health policy. This report offers an accounting of the waste, fraud and abuse that has proliferated in these agencies, and recommends reforms and congressional action to end the patterns identified.

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This Report Is Dedicated To The Memory
Of The Uncounted Multitudes
Whose Lives Were Taken by Toxic Pollution

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Executive Summary

You were feeling very ill, so you went to the doctor. Unfortunately, the doctor seemed to ignore most of what you said about your symptoms. After briefly consulting a musty reference book, he administered a few simple tests. Finding nothing in the book to explain your condition, and nothing abnormal in the tests, he told you that the problem must be in your head.

Years went by; your health continued to decline. Ten years later, you died of your mysterious ailment. An autopsy determined that you were unwittingly consuming tiny amounts of poison on a daily basis. Neither the doctor's outdated reference book nor his misdirected tests were capable of providing the warning you needed. His refusal to listen closely, and to appraise your situation carefully, sealed your fate.

Such a malpractice scenario is tragic when it occurs in an individual case. It is a national disaster, however, when perpetrated on a massive, institutionalized basis. This report documents that this kind of institutionalized malpractice is occurring in the United States today. The "patients" are the 40 million Americans who live in close proximity to hazardous waste sites. The "doctors" are two federal environmental health agencies, responsible for investigating the health effects of hazardous wastes and other pollution sources.

About one sixth of the U.S. population lives within four miles of a chemical dump or other potentially hazardous waste site. At a number of these sites, medical tests and scientific studies have demonstrated links between toxic pollution and birth defects, spontaneous abortions, cardiac abnormalities, fatigue, and neurologic impairments. Other studies have indicated statistical increases in cancer.

Conclusive studies of the linkages between exposure and disease at these sites, however, have been a rarity. In order to prevent further harmful exposures and to assess the extent of potential health effects, Congress has directed the Centers for Disease Control (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) to conduct investigations at toxic sites, and to recommend appropriate action to protect public health.

But instead of systematically applying precautionary public health principles consistent with their legal and ethical duties, the federal agencies have engaged in politically-driven whitewashes. They have become virtual propaganda tools of polluting industries -- making public reassurance instead of public protection their foremost focus. One result has been an increase in public complacency and government inaction at many sites where further precautions to reduce toxic exposures are merited.

The methods of distortion in the agencies' investigative techniques have varied from site to site, but underlying most of their activities is a single theme. The studies in which they are engaged often may appear to be formal and scientific, but behind this veneer are *inconclusive by design*. The misdesign of the many studies has been due to one or more of the following factors:

- o Inadequate contact with populations being studied, including refusals to study the sickest populations in the relevant communities;
- o Reliance upon testing techniques entirely inappropriate to the type of exposure that is involved;
- o Reliance upon statistical methods of inquiry which are entirely unsuited to the small and mobile populations residing around waste sites;
- o Contracting with researchers who are known to be biased against finding any connection between toxic pollution and disease;
- o Studying the wrong types of illnesses, e.g. focusing on death studies where health problems experienced to date have been nonlethal, such as respiratory illnesses or reproductive problems.

The combination of several of these research design flaws has become virtually routine. Quite predictably, no finding of an association between disease and exposure is drawn in studies and assessments which currently cost over \$30 million per year in federal tax monies. The inconclusive results of studies are used by polluters and government officials to quell public concern and justify cutting corners on remedial expenditures needed to end public exposure to toxics. Thus, in addition to wasting millions of dollars of taxpayers' money, they are jeopardizing public health. More rigorous public health evaluations have indicated that many of these communities should be subject to added precautionary measures to reduce public exposures to chemical wastes.

A Massive Environmental Health Threat

After decades of sharply rising production of synthetic chemicals in the United States, during the 1980's our society suddenly became aware that at many locations air, water or land had become saturated with chemical wastes. Through the federal Superfund law, EPA identified a staggering total of 32,645 sites of past chemical waste dumping in need of cleanup. Disposal of chemicals to air, water and land continues today. As much as one trillion pounds of toxic chemicals are emitted to the environment.

Many of these chemicals have been shown through testing on animals, by nationwide epidemiological data, and by workplace exposure data, to pose strong cancer hazards. Together, they are capable of attacking virtually every organ system of the human body.

As our environment has become saturated with man-made chemicals, so has the human population. In apparent correspondence to the exposure trend, incidences of cancer and other diseases are rising rapidly in the American population. Since 1950, the incidence of cancer per 100,000 U.S. citizens rose by 42.2%. Between 1980 and 1987, the prevalence of asthma increased 29% among Americans. The National Cancer Institute reported a 28 percent increase in the incidence of childhood cancer from 1950 to 1987. Various studies have demonstrated clear associations between childhood cancers and exposure to chemicals. Fertility is decreasing among Americans in their prime reproductive years (their 20's).

Within this context of growing public exposures to toxic chemicals, and shifting health conditions in our population, the federal environmental health agencies have been charged with assessing pollution hazards and recommending precautionary measures.

Centers For Disease Control

Superfund Whitewashes

In communities where CDC has assessed Superfund sites, residents and their experts assert that the agency has engaged in whitewashes of pollution impacts. CDC has asserted an inability to detect a health impact from toxic sites, sometimes very deliberately omitting strong evidence of severe impacts. At Times Beach, Missouri, where citizens were evacuated due to the toxic hazards posed by dioxin, CDC concluded that the residents suffered no health effects from dioxin exposure. But CDC had cut residents from the study because, according to CDC, *they were too ill to participate*. These included four people with chloracne symptoms (chloracne is a skin disease caused by dioxin). In contrast to CDC's biased inquiry, other studies of former Times Beach residents showed distinct evidence of immune system abnormalities.

At Love Canal, the site in New York State that first focused the nation's attention on the dire health consequences of toxic wastes, CDC attempted to turn a physical health study into a study of the mental health of the residents. After this effort to divert attention from physical illnesses and birth defects in the community was blocked by the residents, CDC botched a second study with a defective methodology.

In Jacksonville, Arkansas, where one-quarter of the herbicide Agent Orange used in the Vietnam War was manufactured, an outbreak of Sudden Infant Death Syndrome (SIDS) seemed to local physicians to be related to a chemical waste disposal site. But CDC narrowly limited its study of health effects in the community, and refused to test the tissues of one hundred SIDS victims which a physician at the Arkansas Children's Hospital believed to contain high levels of toxic chemicals.

Intentionally Misleading Congress, EPA and the Public on Dioxin

At the helm of CDC's environmental health efforts has been Dr. Vernon Houk, Director of CDC's Center for Environmental Health. Dr. Houk has been notorious for his fundamental hostility to the idea that environmental exposures cause illness. Dr. Houk's approach to issues regarding dioxin exemplifies this bias. Dioxin, a chlorine-based compound, is notorious within the scientific community as one of the most toxic man-made chemicals known. In the early 1980's the safe exposure level for dioxin was established by CDC at one part per billion in soil.

CDC was asked by Congress to study the effects of Agent Orange (which contains dioxin) on Vietnam Veterans, but according to Elmo R. Zumwalt, Jr., Chief of Naval Operations during the Vietnam War, CDC's investigation was "a fraud." Zumwalt told Congress that Dr. Houk "made it his mission to manipulate and prevent the true facts from being determined." In his testimony before Congress, Dr. Houk withheld some key data and altered other data, in order to support the view that a large study of exposed veterans was not feasible. CDC cancelled its study of the issue after spending \$43 million. Yet several other studies conducted thereafter by other researchers documented that Vietnam Veterans exposed to Agent Orange had increased illness rates.

Dr. Houk has continued his campaign to underrate hazards of dioxin. On August 14, 1991, based largely upon Dr. Houk's downgraded estimation of dioxin's risks, EPA announced a reassessment of dioxin and indicated that its strict dioxin standards might soon be relaxed.

Scientific findings do not justify Houk's reassessment. "Nothing that has been learned about dioxin... supports a revision of science-based policy or action," according to Dr. Ellen Silbergeld, professor of pathology at the University of Maryland. Dr. Houk seems less concerned with health, and more concerned with reducing environmental compliance costs to businesses such as paper mills and incinerators which produce dioxin as a byproduct of their operations.

Agency for Toxic Substances And Disease Registry

ATSDR Health Assessments Do More Harm Than Good

ATSDR has conducted over 950 health assessments since the agency's inception. "Health assessments" are preliminary evaluations of risks to human health by waste sites, based on the known health effects of the contaminants, and the potential paths of human exposure such as water, air or food. The assessments are the basis for ATSDR recommendations to the Environmental Protection Agency (EPA) on any needed exposure-reduction measures, such as providing alternative water supplies or relocating residents. The assessments also are used by ATSDR to decide whether to conduct more in-depth health studies at each site.

An August 1991 critique by the U.S. General Accounting Office concluded that ATSDR assessments were often incomplete, and of limited usefulness. Many of the assessments were so weak that they did not even provide enough information to reasonably determine whether further study was merited!

Hundreds of communities have relied on these incomplete assessments as the final word on whether they are at risk from toxic exposures. Based on the recommendations in these assessments, decisions have been made by EPA on clean-up activities, and on whether to move out residents or give them cleaner water.

One of the most heinous and pervasive defects of the health assessments program has been a lack of ATSDR contact with local residents. The result has been an appalling absence of even the most basic understanding of local conditions. In Columbia, Mississippi, for example, a hazardous waste site floods into local homes each spring. The water causes blisters on the legs and feet of residents; many families have complained of stomach, kidney, and liver problems, and reproductive difficulties. ATSDR's health assessment team, after failing to interview anyone living at the site, concluded that there was no health risk in the community!

ATSDR has also failed to engage in appropriate contact with communities after completing its assessments. For instance, in Texarkana, Texas, ATSDR had concluded in 1984 that the local site posed a "potential risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects." But in 1985, the agency had not yet informed the local residents. They finally found out about the assessment through their own inquiries.

ATSDR Ties to CDC and EPA Undermine Credibility

ATSDR's public credibility problems are worsened by the Agency's subordinate relationship to both CDC and EPA.

For its first six years, ATSDR was under the direct authority of Dr. Vernon Houk. Dr. Richard Clapp, who as Director of the Massachusetts Cancer Registry was involved with ATSDR around 22 Superfund sites, remembers attending a 1987 meeting in Atlanta, attended by Houk. Houk "had a dismissive attitude," says Clapp, "maintaining that ATSDR wasn't really necessary, that there was not enough of a significant [environmental] health problem for all this attention to be paid to it. Besides [in Houk's view], his center at CDC was taking care of it. ATSDR was like an unwanted stepchild of CDC."

Although ATSDR has since then been separated from CDC and made a separate branch of the Public Health Service, the pall cast on the agency's credibility by Dr. Houk continues. Many grassroots activists and experts believe that the institutional memory and biases of CDC have been transferred to ATSDR.

ATSDR's relationship to the Environmental Protection Agency is another serious impediment to its credibility and freedom to make health-protective recommendations. Although ATSDR employs about 250 people, its budget of \$50 million annually is paid by EPA out of EPA's Superfund budget. Many observers believe these budgetary ties deprive ATSDR of the independence needed to properly do its job. One of EPA's key concerns is containing costs at Superfund sites. ATSDR's public health-based recommendations for relocation or additional remedial action may disrupt impending EPA settlements and increase costs at sites. Thus, where ATSDR publicly pressures a reluctant EPA to expand on its Superfund expenditures, EPA may strike back by clipping ATSDR's pursestrings. In 1990, ATSDR was instrumental in getting EPA to increase its field investigation and monitoring at the Industrial Excess Landfill

Superfund site in Uniontown, Ohio and to buy out 13 homes along the margin of the Superfund site. According to a citizen leader from Uniontown, ATSDR Assistant Administrator Barry Johnson has stated that ATSDR lost \$15 million in [EPA] funding as punishment for this strong effort to protect the health of Uniontown residents.

ATSDR Health Studies are Inconclusive by Design

After ATSDR completes health assessments, the agency sometimes conducts more in-depth health *studies*. These studies have been plagued with credibility problems, due to an emphasis on scientific and statistical techniques incapable of drawing any reliable conclusions regarding environmental health problems.

ATSDR has largely relied upon traditional epidemiological approaches in their studies, even though the standard statistical approaches employed by epidemiology are not readily adaptable to hazardous waste sites. When applied to the small populations involved in a particular neighborhood around a hazardous waste site, such studies ordinarily result in "inconclusive" findings. This is entirely predictable; statistical types of analyses do not work when the sample population is small and there are numerous other potentially confounding variables. Even if the rate of cancer were double or triple the normal rate for the population, in many small communities this would not be high enough for statisticians to confirm the link between exposure and disease. In fact, the number of cases may have to be as many as eight times as high as the normal population before a connection would be drawn.

Another way in which ATSDR studies are inconclusive by design involves testing for toxic chemicals in bodily tissues. Blood and urine testing has apparently been conducted by ATSDR and subcontracting agencies in a deceptive manner that most assuredly would not find contaminants present. The "scientific" study then becomes a means of calming public concern. For instance, Cathy Hinds, Director of the Health Project for the National Toxics Campaign Fund relates how in her own town of Gray, Maine, residents had been exposed to volatile organic compounds in the drinking water. After clean water had been provided to residents, federal officials tested residents' blood for volatile compounds. Since volatiles leave the blood a half an hour after exposure, it was no surprise to the CDC physicians who conducted the tests that no contaminants were detected!

Studying Communities to Death

Two different tasks subsumed under the category of "environmental health" are public health protection and pure research. The first of these tasks, a traditional role of environmental health professionals, is to utilize available data to protect the public's health against potential environmental health hazards. In this role, it is the duty of the scientist to ensure that toxic exposures are reduced below an adequate margin of safety, so as to prevent harm to exposed populations. In the second task of pure research, the scientist works to advance the state of science itself. In this role, it is the job of public health professionals to devise new methods of studying people and populations, so that eventually they will be able to assess the extent of damage that toxic chemicals inflict on health. Unfortunately, the federal environmental health agencies have all too often blurred these two tasks, thereby allowing their inconclusive "pure research" studies to misinform public decisions. As a result, no precautions are taken in many instances where a focus on the health protective task would make it clear that intervention is

needed. The agencies are literally studying communities to death. For instance, in a neighborhood in Kellogg, Idaho where a smelter has caused massive lead pollution, ATSDR, CDC and the State have monitored blood-lead levels in children for over 15 years. Despite continued findings of damaging levels of lead in blood, ATSDR action has been constrained to monitoring and informing; they have ignored real needs for treatment and relocation.

Hiring Biased Investigators

At least 23 state health departments are involved in conducting ATSDR health investigations and health assessments. However, many of these state health departments are inappropriate for conducting health studies. Some carry preconceived and even publicly stated biases against finding any health problems to be related to pollution. State agencies have also become dependent upon ATSDR for regular operating expenses, and have been spending money which should go to health studies on day to day agency administration.

Perpetuating Environmental Health Illiteracy

By law, ATSDR was supposed to begin ensuring environmental health education for health professionals and communities. But most primary health care physicians are inadequately trained to recognize and treat illnesses that stem from unhealthy environments at work or in the home. Though ATSDR has been spending \$4.3 to \$5.6 million per year on educational programs, the agency has lacked the leadership needed to recruit the medical and public health professions into filling these needs. What is worse, ATSDR has prepared profiles of chemicals found in Superfund sites which ignore even many health hazards identified in conventional scientific references. Thus the agency is making it even more likely that physicians around Superfund sites will overlook the potential connection between patterns of patients' sicknesses and the poisons they are exposed to via air, water and soil.

Increasing Public Relations but not Public Protection

Under a growing storm of public criticism, ATSDR has made some changes on paper regarding its rules of operation, and has added some new public relations personnel. However, the agency's shortcomings continue.

The fundamental question of continuing bias and conflicting allegiances at ATSDR persists, because the agency is still subordinate to EPA. Moreover, the system is not yet designed to allow local communities to make well-informed decisions about whether to seek ATSDR health studies, and what kinds of strategies such studies should employ.

ATSDR is establishing more community advisory panels. But such panels have been established by ATSDR in the past, without ensuring ATSDR responsiveness. For instance, in Saint Gabriel, one of the communities studied in this report, ATSDR put together a community advisory panel. Citizens on the panel and their experts made numerous recommendations, which the agency then ignored. Establishing community advisory panels may be merely a sophisticated public relations ploy, unless these panels are given real power, such as the right to veto ATSDR

activities that are inappropriate or inconsistent with the preferences and concerns of the affected local public.

ATSDR plans to revisit only 165 of the more than 950 health assessments it has conducted; there are no plans to revisit any of its earlier health *studies*. By "locking in" the rushed and inaccurate appraisals of the past, many communities previously assessed may be doomed to living and acting in accord with error-filled underestimations of the hazards to which they are exposed.

KEY RECOMMENDATIONS

Placing primary emphasis on a precautionary approach to environmental health. The primary role of federal environmental health agencies should be to identify situations in which additional precautionary measures are needed to reduce public exposure to toxic substances. Clear thresholds should be established and adhered to in recommending actions such as relocation and alternative water supplies.

Restructuring or eliminating environmental health role of Centers for Disease Control. The CDC, and in particular Vernon Houk, the director of the Center for Environmental Health, have appeared from the outset to be biased against community environmental concerns. There is little reason to believe that this agency can do its job credibly. If it cannot be cleaned up, Congress should explore the elimination of CDC's Center for Environmental Health and the transfer of all environmental health responsibilities from CDC to ATSDR.

End federal funding of studies which are inconclusive by design. With the exception of research which is conducted solely to advance methods in conducting health studies, no federal funding should be provided for community health studies for which conclusive results are statistically implausible.

Revisit past ATSDR assessments and studies. ATSDR should thoroughly revisit all health assessments and health studies conducted during the 1980s.

Expand ATSDR budget and authority, and sever relations to other agencies. ATSDR should be established as an independent Federal agency with authority, mandates, budget and administration entirely separate from CDC and EPA. ATSDR's authority to take independent action should include the power to order the relocation of residents in areas contaminated by toxic releases or take other appropriate action to end public exposures. When ATSDR makes a recommendation to EPA, there should be a mandated time-frame within which EPA must act. Procedures should be put in place to monitor follow-up on ATSDR recommendations.

Establish health technical assistance grants. Health studies should only be conducted after the communities in question have received expert advice, independent of CDC and ATSDR. Congress should enact legislation to establish Health Technical Assistance Grants (H-TAGs), and grant community groups the right to receive such grants at all National Priority List sites and all sites at which health assessments have been performed.

Overhaul health assessment and health studies procedures. Health assessment and health studies processes must be overhauled. The fundamental direction of such studies should be to aid EPA and local communities in applying precautionary principles to end potentially harmful exposures. The local community's right to veto the undertaking of health studies should be clarified explicitly in federal legislation. Experts utilized in such assessments and studies should be thoroughly scrutinized for biases and their public reputations; private universities and experts should be added to the pool of experts available for such studies.

End environmental health illiteracy. Environmental health education under ATSDR's mandate should be expanded. Congress should establish a community environmental health training program funded by ATSDR and conducted by universities and by public health advocacy institutions. The purpose of the training should be to educate communities on health hazards presented by hazardous substances, the federal and state environmental health programs and studies, and on strategies for local problem solving. Federal legislation should require all medical and public health students and professionals to receive training in environmental health.

ATSDR officials should conduct meetings with communities studied in this report. ATSDR Assistant Administrator Barry Johnson should meet with representatives of the communities studied in this report to discuss the concerns raised and responsive actions that the agency will take to address them.

Congress should hold hearings and enact legislation. Congress should conduct a hearing regarding the past and current performance of ATSDR and CDC, and enact legislation to embody the recommendations contained in this report. The hearing should review the practices of CDC, ATSDR and EPA, including the practice of conducting studies which are inconclusive by design, funding relationships between EPA and ATSDR and the blatant biases of Vernon Houk. Other issues as raised by local citizens groups and all of the recommendations of this report should also be considered.

Systemic environmental health problems demand systemic solutions. Patterns of environmental health victimization most often begin with poverty and unemployment accompanied by indiscriminate toxic chemical usage and dumping. In addition to the specific reforms of ATSDR and CDC set forth above, dramatic shifts in national policies on pollution prevention, liability law and health care are needed to rectify the fundamental injustices we have observed.

A national shift toward pollution prevention is needed, to reduce the use of toxic chemicals and the generation of toxic wastes. Some chemicals which are known to be most harmful should be banned; the usage of others should be curtailed to the extent feasible by each industrial user. National legislation such as pending proposals to amend the national solid waste law, the Resource Conservation and Recovery Act, can help to effectuate such policies and thereby end the cycle of waste production and exposure of local populations. A national pollution prevention strategy would pay a financial return to our national economy, by reducing skyrocketing health-related costs.

Worker compensation and disability laws, as well as liability laws applicable to locally exposed citizens, must be reformed to aid victims. Many workers whose health is harmed through exposure to chemicals in the workplace find that they are without recourse, due to the long latency periods from the time of exposure to the onset of diseases. Neighbors of pollution

sources often find it economically and technically impossible to bring suits due to the high costs of evidence, and the over-reliance by many courts on epidemiological studies. As this report documents, such studies, by their statistical nature, are unlikely to produce conclusive results at waste sites. Congress should establish a system to either provide clinical screening services such as annual physical examinations to communities exposed to toxic releases; or establish a right to medical care for people whose diseases are likely to be due to the chemicals to which they were exposed. The presence of exposures to certain chemicals combined with contracting of diseases which are closely linked to exposure would trigger the right to care. Examples might include ensuring treatment for bladder cancer for people exposed to betanaphthylamine, and for birth defects or leukemia where there was exposure to trichloroethylene.

Finally, a national health care program may be the only practical way to eliminate a portion of the injustices suffered in toxic-exposed communities. Millions of Americans have no health insurance or access to regular health care. Toxic exposures tend to be the worst in lower income communities, where the need for such resources is most acute. In many of the communities we have studied, chemical exposures and the lack of available health care together exacerbate the cycle of ill health and financial problems that local residents are unable to escape.

INCONCLUSIVE BY DESIGN: *Waste, Fraud and Abuse* *in Federal Environmental Health Research*

Chapter One:

THE ENVIRONMENTAL HEALTH CRISIS

"[T]he nation is not adequately identifying, assessing or ranking hazardous waste site exposures and their potential effects on public health...[P]rudent public policy demands that a margin of safety be provided regarding potential health risks from exposures to hazardous waste sites. We do no less in designing bridges and buildings. We do no less in establishing criteria for scientific credibility. We must surely do no less when the health and quality of life of Americans are at stake."

National Research Council of
National Academy of Sciences, 1991¹

Origins of the Environmental Health Crisis

Since 1940, the annual production of synthetic organic chemicals in the U.S. increased rapidly, from 2.2 billion to 214 billion pounds. This increase in production was accompanied by an enormous increase in chemical waste disposal. However, public awareness of the extent of toxic waste disposal and of community exposures to those wastes has only emerged recently.

Two federal programs established during the 1980's have been pivotal in creating a dramatically new societal understanding of the magnitude of chemical waste disposal. Through the Superfund program, the Environmental Protection Agency (EPA) inventoried hazardous waste sites. As of December 31, 1990, EPA had identified a staggering total of 32,645 dangerous sites. Of these, EPA listed more than 1,200 on its National Priority List of the worst contamination sites.²

Through the Community Right to Know Act, in the late 1980's industries were

required for the first time to disclose the amount of toxic chemicals they discharge to air, water and land. In 1989, according to EPA, 22,650 industrial plants and sites across the United States reported releasing 5.78 billion pounds of toxic chemicals into the air, ground, and water. Total emissions are actually far higher, since the 330 hazardous substances monitored by the EPA's Toxics Release Inventory do not include more than 500 toxic chemicals regulated under other environmental laws. In addition, many companies are flouting the Right to Know law, and have not yet filed the legally required information.³ All told, one analysis has estimated that a more accurate assessment of toxic emissions in the U.S. is about one trillion pounds (500 million tons) rather than the limited quantity of emissions thus far documented in the Toxic Release Inventory.⁴

These massive chemical releases have been reaching the human population and altering the chemistry of our bodies. According to EPA, at least 140 chemicals foreign to the body contaminate our tissues. Today all adult Americans have measurable quantities of styrene in their fatty tissues; 100% have ethyl phenol; 96% have ethyl benzene; 96% have chlorobenzene; 96% have benzene; 91% have toluene; 83% have PCBs; 93% have DDE, a breakdown by-product of DDT.⁵ If the breast milk from American mothers were bottled and sold as a commercial product, it would probably be banned by the U.S. Food and Drug Administration, because it is so contaminated with pesticides and industrial poisons that it would fail to meet FDA standards for food suitable for human consumption.⁶

**Science indicates
that chemical
pollution will
harm health**

While there has been an explosion of data and understanding regarding the extent of human and environmental exposure to toxic substances, a precise scientific consensus as to the health effects of exposures at toxic sites will take a long time to develop. Yet, even though there have been few conclusive studies at Superfund sites, there are more than enough conclusive studies from workplace exposures and other settings to demonstrate that the dangers are severe.

The National Research Council (NRC) of the National Academy of Sciences was charged by Congress with reviewing available data and estimating the extent of health problems at Superfund sites. The NRC was unable to say exactly what portion of the U.S. population has been harmed by hazardous wastes. But they did conclude that hazardous waste sites have produced serious health effects, and that the government's current approach to deal with Superfund sites may be leaving many members of the public exposed to dangerous levels of chemical exposures. They reached these conclusions using a number of information sources, including data on potential exposures at Superfund sites, animal studies showing toxicity or carcinogenicity, knowledge of human health risks based on similar exposures in other circumstances, and studies revealing symptomatology or diseases in those exposed to hazardous wastes. Various studies have identified populations with serious health

impairments seemingly correlated with polluted air, water, or soil.⁷ For instance, a study of lung cancer in all U.S. counties found a pattern of excessive cancers associated with four manufacturing industries: paper, chemicals, petroleum and transportation (where workers are exposed to solvents and paints.)⁸

The NRC's conclusions reaffirmed concerns raised in diverse scientific sources. We already know the potential severity of chemical hazards from testing on animals⁹, and from epidemiological studies conducted in workplaces. One particularly revealing group of studies relates to death rates among chemists. Numerous studies have shown that chemists tend to die of cancer more frequently than the rest of the population. A recent study of Exxon employees, for instance, revealed that there is an increased risk of leukemia and lymphatic cancers among Exxon's scientists, engineers and research technicians when compared with managerial employees with less workplace chemical exposure.¹⁰

Various of the man-made chemicals reaching the water we drink and the air we breathe can cause cancer or attack virtually every organ system. Many of the types of diseases that are on the rise in the U.S. population could be caused by pollution. Since 1950, the incidence of cancer per 100,000 U.S. citizens has risen by 42.2%.¹¹ Between 1980 and 1987, the prevalence of asthma increased 29% among Americans.¹² Among white Americans in their prime reproductive years (their 20's), fertility is decreasing; among African-Americans of the same age, fertility is decreasing even more rapidly. There is evidence of decreased sperm counts and increased numbers of abnormalities in sperm.¹³ The incidences of Parkinson's disease and of neuromotor disease are also increasing.¹⁴

In 1990, the National Cancer Institute reported a 28 percent increase in the incidence of childhood cancer from 1950 to 1987.¹⁵ More than 20 studies in the U.S. and elsewhere have demonstrated clear associations between childhood cancers and exposure to carcinogenic chemicals. The three most common childhood malignancies, kidney cancer, brain cancer, and acute leukemia, are often related to the occupational exposure of fathers and mothers. Such exposure includes organic solvents, hydrocarbons, lead, paints, dyes, pigments and pesticides.

Historical Background on the Federal Environmental Health Agencies

Public Demand for Expert Assistance

In case after case, otherwise inexplicable clusters of illness have emerged around toxic sites. Neighborhoods have suffered horrific epidemics of miscarriages, birth defects, and cancers as well as respiratory disease, skin disease, and depressed immune systems. Not every person who gets sick near a hazardous waste site gets sick *because of* the waste in the site. Yet very often there is strong circumstantial evidence to corroborate residents' beliefs that illnesses derive from toxic exposures.

Connecting toxic pollution with specific outbreaks of illness is scientifically difficult and politically charged. In an ironic turning of the tables, sick people residing near toxic waste sites are often treated by local officials as if they are mere trouble-makers or publicity hounds, or at best, as victims of randomly occurring illness who seek to pin the blame on the nearest target. Not surprisingly, the victims at these sites often look to public health experts to vindicate their suspicions of a causal link between illnesses and toxic sites, and to provide authoritative recommendations that will result in exposure reduction measures such as relocation of exposed persons.

Thus, cross-linked with the scientific debate regarding causation of the health problems from the sites are separate issues regarding elimination of exposures and shouldering the costs. While we may never know conclusively in many toxic-saturated neighborhoods whose illnesses were and were not caused by the chemical-laden environment, other public health questions demand immediate answers: Should or will local residents be relocated away from the sites? Is an alternative water supply needed? Are extra remediation measures needed to curtail exposures? Who will pay for such measures? Reasonable public health precautions may require additional steps. By law, the costs are imposed on the parties who dumped the wastes. Therefore, the companies who dumped wastes in Superfund sites have a strong interest in minimizing risk estimates and thereby containing their corresponding costs.

It is within this sensitive and politically charged context that Congress asked federal public health agencies to investigate environmental health concerns. Congress charged two federal agencies with investigating the health effects of toxic chemicals in the environment. The Centers for Disease Control (CDC)

**Federal Agencies
Established To
Aid Communities
At Risk**

has a broad mission to monitor public health and conduct educational activities. It has become involved in environmental health issues through its Center for Environmental Health from the time of discovery of Love Canal and other early toxic sites.

Congress charged the Agency for Toxic Substances and Disease Registry (ATSDR), in the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), with assuming a principal role in identifying health problems related to the release of hazardous substances into the environment and to establish public health strategies to prevent or mitigate such problems. ATSDR tasks include conducting "health assessments" of all Superfund waste sites, developing toxicological profiles of the hazardous substances detected at the sites, establishing registries of people exposed to hazardous substances, and educating the public and professionals in regard to hazardous substances. The agency's current annual budget is \$54.5 million.

During the 1980's first CDC, and then ATSDR, were cast in the leading federal role for the investigation of public health effects of toxic pollution. From the standpoint of the communities who were investigated, the first ten years of environmental health efforts by these agencies have been a severe disappointment.

Two fundamentally different tasks may be subsumed under the heading of "environmental health." One of the tasks, a traditional role of public health professionals, is to utilize available scientific data to protect the public's health. In this role, it is the duty of the scientist to ensure that toxic exposures are reduced below an adequate margin of safety, so as to prevent harm to exposed populations. The second task is pure research -- advancing the state of science itself. In this role, it is the job of public health professionals to devise new methods of studying people and populations, in order to assess the extent of damage that toxic chemicals inflict on health.

So far, due to the inapplicability of many assessment techniques previously used in other public health contexts, the science of assessing how much harm is done to local populations from pollution sources is fairly weak, and frequently incapable of drawing scientifically defensible conclusions.

Unfortunately, our federal public health officials have often erred by confusing these two tasks. As a result, the many predictably inconclusive health assessments and studies in local communities have been allowed to misinform public decisions regarding precautionary health protection measures, i.e. to prevent and even discourage appropriate action from being taken to reduce toxic exposures.

The remainder of this report will review the efforts of the federal agencies, and make recommendations for changes to ensure that the next ten years of federal environmental health programs are more viable.

The Centers for Disease Control: A Legacy of Environmental Health Whitewashes

The Centers for Disease Control (CDC) have amassed an appalling record of poorly timed and selected studies, refusals to take account of the most compelling evidence of local environmental health crises, and leadership that seems more interested in protecting business interests than in protecting public health.

Superfund Sites

Love Canal

In 1980, the contamination of an area near Niagara Falls, N.Y. known as the Love Canal, first focused the nation's attention on the dire health consequences of toxic wastes. The discovery that a neighborhood had been built upon a chemical waste disposal canal brought Congressional response in the form of the landmark Superfund legislation mandating cleanup of hazardous sites. In the neighborhood of the canal near the Hooker Chemical plant, a study commenced by one scientist indicated bizarre chromosomal abnormalities in residents. The chromosomal breakages were believed a possible warning sign for increased risk of cancer, reproductive disorders, or genetic damage. However, since this EPA-funded study was technically defective in the design of control groups, it was aborted before it could be completed.¹⁶

Subsequent to that initial, aborted study, 900 Love Canal families were evacuated and relocated by the state and federal governments. The same year, CDC announced plans to do a complete health study of the neighborhood. A questionnaire was drawn up and provided to residents in advance, including CDC's proposed methodologies. CDC's focus, however, did not concern health related questions, but rather the psychological stability of residents. Disturbed by this orientation, the residents called for drastic changes.

CDC finally agreed to a number of these changes, but when the Reagan Administration took office the \$250,000 study was abruptly dropped and the monies reallocated elsewhere.¹⁷ *In the meantime, studies conducted by other researchers found an unusually high incidence of low birth weight babies, serious birth defects and childhood seizures, learning disabilities, hyperactivity and eye irritations, among other symptoms.*¹⁸

Another CDC study was planned, this time assessing chromosome damage by drawing blood. But by then a few years had passed and the Love Canal residents were wary of such a statistical review. Too many residents had moved from the area; in some cases having been away for as long as three years. This would bias the study against making reliable findings and in testing the most heavily exposed population. Thus, the remaining residents sought to redirect the money toward a study that would more likely detect any reproductive problems. Their efforts did not prevail; CDC proceeded with its chromosome study and found no abnormal statistics among the residents.¹⁹

Times Beach

The Citizen's Clearinghouse for Hazardous Wastes, which published a 1985 report detailing CDC's look-the-other-way approach, also recounts the agency's activities at Times Beach, Missouri, where citizens had been evacuated due to the toxic hazard posed by dioxin. In its study of the contamination there, which resulted from waste oils sprayed on local roads to control dust, CDC selected 82 people from among 800 who had been asked to fill out questionnaires. CDC's conclusion was that Times Beach residents showed no abnormal effects from dioxin exposure. But many residents subsequently complained that *they were cut from the study because CDC said they were too ill to participate.*²⁰ CDC reported no cases of chloracne (a skin disease caused by dioxin exposure), yet in its own report stated that *four people with chloracne symptoms had been eliminated from the study.* A later non-CDC study, published in the *Journal of the American Medical Association*, showed distinct evidence of immune system abnormalities in former residents of the area.²¹

*Jacksonville,
Arkansas*

Another apparent CDC whitewash occurred in Jacksonville, Arkansas, where one-quarter of the herbicide Agent Orange used in the Vietnam War was manufactured. At the site of manufacture, dioxin residues have been measured in soil samples at levels well above the range that led to the evacuation of Times Beach. In 1983, after numerous citizens complained about ill health, Arkansas' health director, Dr. Ben Saltzman, requested help from CDC. CDC agreed to analyze data on the health effects of toxic chemicals in Jacksonville. At that time, the only other tests had been conducted by the Mount Sinai Medical Center, which found "effects of unknown significance" on nerve conduction in 46 percent of 55 former chemical plant workers tested. Despite a state recommendation that all toxics be considered in the CDC's investigation, CDC examined only the EPA's measured dioxin levels in Jacksonville.

In July 1985, CDC decided not to undertake a fatty-tissue study of Jacksonville residents. Their reasoning, which was contradicted by EPA studies, was that Jacksonville's dioxin problem was not as severe as that of Times Beach. In December 1985, tests by the Arkansas Children's Hospital detected high levels of several man-made chemicals in the tissues of a victim of Sudden Infant Death Syndrome (SIDS). CDC, however, refused the hospital's request for further investigation of this SIDS case. CDC also refused to conduct assays on the tissues of approximately one hundred other SIDS victims which were

**Dioxin
Scandal**

then stored at the same hospital.²² (See Case Study: Jacksonville, Arkansas, page 26.)

Since the inception of CDC's Center for Environmental Health, Dr. Vernon Houk has been its director. His is one of the government's most senior posts for environmental health. Yet according to Dr. Richard Clapp, an epidemiological specialist with the JSI Research & Training Institute in Boston and former Director of the Massachusetts Cancer Registry, "Historically, Dr. Houk has been hostile to the idea that environmental exposures cause significant human disease. Certainly when it comes to hazardous waste site exposure, he has not been open to that possibility." Dr. Houk's handling of dioxin issues exemplifies the biases and abuses which have become routine for CDC.

Dioxin is widely known within the scientific community as one of the most toxic man-made chemicals known. In the early 1980's the safe exposure level for dioxin was established by CDC at one part per billion in soil.

Since the mid-1980's the chlorine industry has attempted to cast doubt on the hazardousness of this substance, by commissioning studies of their own. The chlorine industry has billions of dollars at stake in proving dioxin nonhazardous, since chlorine products used in paper bleaching and plastics play a key role in the formation of dioxin. Early in 1988, Dr. Houk offered these comments about dioxin:

Our concern about the human health effects of chronic low-dose exposure are much less than they were in 1980. We have gotten a lot of information that appears that humans are not as sensitive to dioxin as the most sensitive laboratory animal. Everybody in this country has TCDD [the most lethal form of dioxin] in their body, up to 18 parts per trillion measured in fat. It is no cause for alarm.²³

With this statement, Dr. Houk began to spearhead an effort to deregulate human exposure and environmental releases of dioxin.

Back in 1982, after receiving thousands of complaints from Vietnam veterans who believed their exposure to dioxin-laden Agent Orange had seriously impaired their health, Congress authorized a \$63 million study by Dr. Houk's Center to determine whether this was true. In June of 1990, Elmo R. Zumwalt, Jr., Chief of Naval Operations during the Vietnam War, testified before Congress that CDC's work on Agent Orange had been "a fraud." Zumwalt specifically named Dr. Houk for having "made it his mission to manipulate and prevent the true facts from being determined." New York Congressman Ted Weiss added that CDC appeared to have "rigged" its investigation to support its view that a large study of exposed veterans was not feasible. CDC subsequently admitted to having altered evidence in the Agent Orange study.²⁴

Houk arranged for blood tests of 646 Vietnam veterans, selected on the basis of their probable exposure, to look for elevated levels of dioxin in blood. None had abnormal blood levels. But this was no surprise, since the exposures were 20 years earlier and *none of the veterans tested had handled Agent Orange directly*. Houk used these results, despite scathing critiques by scientists, to contend that the Pentagon records could not be used to document exposure to Agent Orange. After \$43 million was spent, he recommended canceling the study; the White House did so.²⁵

Yet, at around the same time a study being completed by the Massachusetts Department of Public Health indicated that *Massachusetts Vietnam Veterans had five times the expected number of deaths from soft tissue sarcomas when compared with veterans who served elsewhere*.²⁶

Dr. Houk continues his campaign to ignore the evidence of danger from dioxin. On May 24, 1991, speaking at the 25th Annual Conference on Trace Substances in Environmental Health, Dr. Houk stated that he no longer viewed dioxin as "the most toxic man-made chemical," as EPA had described it. If dioxin is a carcinogen at all, Houk said, "it is, in my view, a weak one that is associated only with high-dose exposures." He added that, if he had to do it all over again, he would certainly not recommend evacuation of the residents of Times Beach, Missouri.²⁷ On August 14, 1991, based largely upon Dr. Houk's revised estimation of dioxin's risks, EPA announced a reassessment of dioxin and indicated that its strict dioxin standards might soon be relaxed.

The science does not justify this sudden reassessment. "Nothing that has been learned about dioxin since 1985, when EPA first published its risk assessment finding on dioxin in the environment, supports a revision of science-based policy or action," according to Dr. Ellen Silbergeld, professor of pathology at the University of Maryland.²⁸ Indeed, a meeting of scientists in September 1991 in North Carolina regarding dioxin demonstrated that severe health concerns remain. Papers presented at that conference demonstrated that dioxin suppresses the immune system, is a powerful cancer promoter, affects several enzyme systems, and has dire reproductive effects. Recent human epidemiologic evidence is in line with the evidence available for other organisms. While the biological mechanisms by which the chemical acts may be more complicated than anyone had previously anticipated, there was little evidence to justify relaxing the regulation of dioxin. Any such relaxation would not be based on a better understanding of the science, but on a collapse of government regulators under political pressure from industry.²⁹ The risks of dioxin exposure are as dangerous as they were ever thought to be; what has changed is that Dr. Houk and EPA are giving greater weight to reducing the cleanup and disposal costs of industries whose manufacturing processes produce dioxin as a byproduct, particularly paper pulp mills, hazardous waste incinerators and municipal incinerators.

**CDC Director and
White House
Block Federal
Action on Lead**

At times, CDC's weakness in protecting health has been driven clearly and directly from pressure from the White House. A recent example under the Bush Administration involved children's exposure to lead, which can cause severe damage to the developing nervous system. In the spring of 1991, CDC staff developed a plan for widespread testing of homes for lead hazards and treatment for affected children. At that time, CDC Director Dr. William Roper commented that lead poisoning is the "number one environmental problem" facing America's children. However, in July of 1991, the Bush Administration and CDC reversed course. A few days before a congressional hearing, the White House Office of Management and Budget approached Dr. Vernon Houk, Director of CDC's Center for Environmental Health, about altering his pending testimony. Dr. Houk inserted a statement that "the Administration sees no reason for the Federal government to legislate or regulate" in regards to lead poisoning.³⁰

Chapter Four:

**The Agency for Toxic Substances and Disease Registry
Misses the Mark on Public Protection**

**ATSDR Health
Assessments Fail
To Provide
Needed
Information And
Guidance**

Health assessments are typically the first step in ATSDR's involvement with a community. As prescribed by the Superfund law, ATSDR "health assessments" are preliminary assessments of the risks to human health posed by sites, based on the type of contamination, potential pathways of human exposure such as water, air and food, health effects associated with hazardous substances, and the consideration of existing health statistics and standards.³¹ These assessments, which comprise the biggest share of the ATSDR budget (36% in 1989), are important to people who reside near Superfund sites. They are the mechanism under the Superfund Act through which ATSDR is supposed to develop recommendations to EPA to determine whether exposure reduction actions should be taken such as providing alternative water supplies or relocating residents. They are also used to decide whether more in-depth studies of health effects are appropriate. ATSDR estimates that 6,000 to 7,000 people on average are affected by any given recommendation.³² As of December 31, 1991 ATSDR had completed 1,355 health assessments at 1,208 sites. During the current fiscal year, ATSDR expects to spend \$21.2 million on health assessments.

In August 1991 the U.S. General Accounting Office (GAO) released a report³³ evaluating the usefulness of a sampling of 15 ATSDR health

assessments. The report concluded that the assessments were of questionable utility. They were so incomplete that they were not even reliable for indicating whether follow-up health studies would be appropriate!

Under its 1986 congressional mandate, ATSDR was given a two year deadline for completing health assessments for 951 contaminated sites then on the EPA's National Priority List. ATSDR officials and outside experts have acknowledged that under this deadline pressure the agency sacrificed quality in order to achieve quantity. ATSDR staff relied solely upon EPA's data, even though this was inadequate to make reasonable assessments. Yet, based on the recommendations contained in ATSDR's grossly inadequate health assessments, EPA made decisions on clean-up activities, and whether to provide alternative water supplies or to relocate residents.

In addition to asserting that the assessment deadlines of the law were impossible to meet,³⁴ ATSDR has also acknowledged doing a poor job of follow-up on their recommendations in the assessments.³⁵ Few EPA officials interviewed by the GAO thought that the ATSDR's health assessments added anything to what EPA's own analyses revealed. ATSDR assessments were of limited usefulness to EPA, or anyone else, due to their extremely general conclusions and the overlap with EPA analyses.

Another major weakness in ATSDR's approach has been its lack of involvement with the public. During and after health assessments, contact with and outreach to local residents by ATSDR has been grossly inadequate. ATSDR has acknowledged this shortcoming as well. Asked by the Environmental Health Network, a network of hazardous waste victims and public health experts, the agency gave itself a "C-" when it comes to "communication with communities." The agency stated that "because of resource restraints, in the past ATSDR has not been able to be as communicative with communities as we would have liked." The implications of this failure to communicate are dire, just as where a doctor fails to listen carefully to his or her patient.

*Columbia,
Mississippi*

A hazardous waste site floods into area homes each spring. The water can be ignited by a match and causes blisters on the legs and feet of residents. Clothing is often ruined and must be discarded. An extraordinary number of families living around the site have complained of stomach, kidney, and liver problems, including sclerosis and cancer, as well as reproductive difficulties. But an ATSDR health assessment team, which neglected to interview anyone living at the site, concluded that there was no particular health risk from the facility!

Texarkana, Texas

Five years after the all-black neighborhood of Carver Terrace was placed on EPA's Superfund NPL list in 1984, ATSDR conducted a health assessment. It concluded that the site poses a health concern because of the "potential risk to human health resulting from possible exposure to hazardous substances at

concentrations that may result in adverse health effects."³⁶ The local community, however, was not informed by either EPA or ATSDR about the 35 identified on-site contaminants and polluted groundwater. Almost a year after the assessment was completed, the Carver Terrace Community Action Group learned of its existence and content. They held a press conference describing EPA as "irresponsible" for keeping the report to itself. (See Case Study: Texarkana, Texas page 28.)

**Deficient
Assessments at
Department of
Defense Sites**

Health assessments have been particularly deficient at 117 defense-related Federal facilities on the Superfund NPL list. U.S. Congressman Gerry Sikorski (D-MN) described ATSDR's situation at a congressional hearing in September 1990³⁷:

[ATSDR health] assessments were to be performed within a year of the date on which the sites were proposed for the [EPA's NPL Superfund] list. Even though some of these sites have been listed for as many as seven years, a thorough health assessment has yet to be completed at even one federal facility.

Meanwhile, preliminary work done by ATSDR forecasts the ominous things to come:

- A health consultation performed at Wright-Patterson Air Force Base in Ohio uncovered a substantial risk of explosion due to methane.
- In Minnesota, a preliminary health assessment at the Twin Cities Army Ammunition plant highlighted a concern for human exposure to groundwater contaminants.
- Preliminary investigations at the Rocky Mountain Arsenal in Colorado indicate possible human exposure to contaminated water, air, and soil.

Who knows what a thorough health assessment might uncover at these and the hundreds of other Federal hazardous waste sites.

**ATSDR Lacks
Needed
Independence
From CDC And
EPA**

"What I find with ATSDR is the same kind of problem that I find with CDC. They feel as if public hysteria is the most feared thing, rather than actual serious health effects. So they are always minimizing the effects."

-- Dr. Beverly Paigen, senior staff scientist
Jackson Laboratory in Bar Harbor, Maine³⁸

ATSDR has a fundamental credibility problem because of its subordinate relationships to both CDC and EPA.

CDC and ATSDR function under separate congressional mandates, but they are joined at the top as arms of the Public Health Service. Prior to 1986 when the Superfund law was amended, ATSDR was no more than a CDC augmentation, under the umbrella of CDC's Center for Environmental Health. In the early 1980's, the Public Health Service implemented its portion of the Superfund mandate by creating a Superfund Implementation Group within CDC. This marked the beginning of ATSDR, which was created to implement CDC's health-related role at hazardous waste sites on EPA's National Priority List (NPL).

For its first six years, ATSDR remained under the direct authority of Dr. Vernon Houk. During this initial phase of ATSDR's existence, the agency was poorly funded and structured.³⁹ Its record in fulfilling its original Congressional mandate was appalling. While ATSDR was supposed to conduct epidemiological health studies at the 812 sites then on EPA's Superfund NPL, by 1986 ATSDR had completed only three, all of which had been started by CDC before the Superfund law was enacted in 1980. Only eleven more studies were in progress. No registry of individuals living around hazardous waste sites had been established. No listing of areas closed to the public due to toxic contamination had begun. Each of these failures violated the intent of Congress in its passage of Superfund.⁴⁰

In 1986, a joint lawsuit brought by the Environmental Defense Fund and the Chemical Manufacturers' Association forced the Public Health Service to set up ATSDR as a separate agency. However, CDC and ATSDR continue to share a common chief Administrator, Dr. William Roper. Under the amended Superfund law passed by Congress later that year, ATSDR's mandate was broadened considerably.

Dr. Richard Clapp, who as Director of the Massachusetts Cancer Registry was involved with ATSDR around 22 Superfund sites, remembers attending a 1987 meeting in Atlanta, where CDC's Houk offered his own description of ATSDR's mandate. "He had a dismissive attitude," says Clapp, "maintaining that ATSDR wasn't really necessary, that there was not enough of a significant [environmental] health problem for all this attention to be paid to it. Besides [in Houk's view], his center at CDC was taking care of it. ATSDR was like an unwanted stepchild of CDC."⁴¹

Until mid-1990, Dr. Houk was accustomed to telling audiences that he not only directed CDC's Center for Environmental Health, but also represented ATSDR. When citizens' groups asked ATSDR's Assistant Administrator, Barry Johnson, about this, Johnson replied: "Dr. Houk is not on our payroll."⁴² Yet, among dozens of grassroots organizations nationwide, the confusion persists. Many believe that, because of ATSDR's lack of experience,

the institutional memory and biases of CDC have simply been transferred into ATSDR. Because CDC has such a poor reputation with numerous communities on pollution-related issues, ATSDR has slowly begun exerting effort to further separate itself from its mother agency.⁴³

ATSDR's relationship to the Environmental Protection Agency is another serious impediment to ATSDR's ability to make decisions based on scientific judgments, and to their credibility with the public. Although ATSDR employs about 250 people, the entire ATSDR budget - currently \$54.5 million annually - is drawn from EPA's Superfund program. Each year, the budget submitted by ATSDR is worked into EPA's overall Superfund budget, with Congress making the final appropriation.⁴⁴ ATSDR's budget is over 20 times smaller than that allocated by the Federal government to CDC.

Many observers believe that ATSDR's budgetary ties to EPA deprive ATSDR of the independence needed to properly do its job. One of EPA's principal challenges at Superfund sites is to involve the responsible parties, such as large chemical companies, in a settlement. ATSDR's evaluations, in the event they disagree with EPA's, may result in a call by ATSDR for relocation or additional remedial action and thus disrupt an impending settlement by increasing the costs to be collected from responsible parties.⁴⁵ Where ATSDR was able to force a reluctant EPA to follow up on its recommendations, EPA has sometimes apparently struck back by punitively imposing constraints on ATSDR's purse strings.

*Uniontown,
Ohio*

An example raising this concern occurred in 1990, when ATSDR was instrumental in getting EPA to increase its field investigation and monitoring at the Industrial Excess Landfill Superfund site in Uniontown, Ohio. Citizens had complained for years that not enough information existed about the flow of groundwater at the landfill, and ATSDR responded by bringing in a U.S. Geological Survey team which contradicted earlier EPA findings. Even more importantly, an ATSDR health advisory warning people that they were at risk from migration of toxic landfill gases played a key role in persuading EPA to buy out 13 homes along the margin of the Superfund site.⁴⁶ The results of ATSDR's involvement in Uniontown, however, apparently did not sit well with EPA. Chris Borello, a citizen leader in Uniontown, recounts that she was told by ATSDR's Barry Johnson in front of witnesses that ATSDR lost \$15 million in [EPA] funding as punishment for helping Uniontown. Borello is asking for a congressional hearing into the matter.⁴⁷

**"In-depth" Health
Studies:
Inconclusive by
Design**

If ATSDR finds substantial human exposures in a health assessment, the agency may conduct a more in-depth study of the health effects caused by exposures. Currently, about forty such ATSDR health studies are ongoing at an annual cost of \$9.8 million.

The neighborhoods adjacent to toxic sites which suffer epidemics of health

problems often look to government-sponsored studies for vindication of citizens' beliefs that toxic waste is causing their illnesses. Even more importantly, the residents want to see the studies followed with action to protect their health. Unfortunately, the reality has been that intervention by public health officials seldom has provided either.

Communities are often misled into thinking that the insensitive studies funded by ATSDR, CDC or state health departments -- studies which are predictably inconclusive before they are even commenced -- will somehow resolve the serious questions that the communities ponder. No community with serious exposure and a genuine interest in a sound, precautionary approach should be led to believe that epidemiology will solve their local problems. Most often, exposed citizens would have been better off engaging in political organizing than in placing their hopes on these studies.

**Environmental
Epidemiology
Boondoggles**

ATSDR health studies typically utilize an epidemiological approach, that is the analysis and comparison of health statistics to determine potential patterns and causal effects as between toxic exposures and diseases. Typically, these studies involve comparing data from the exposed population's health with the same statistics from the general population.⁴⁸ Yet this approach is ordinarily, by its very design, incapable of confirming the toxic origination of public health problems even if the link is quite apparent based on other contextual evidence.

Unfortunately, the standard statistical analyses employed by epidemiology for laboratory animals and broad populations are not readily adaptable to hazardous waste sites. Even more unfortunately, ATSDR officials continue to fund and conduct these studies as if they are applicable, even though it is quite apparent from the outset that the studies will be inconclusive.

When applied to the small populations in neighborhoods around hazardous waste sites, and when faced with the many confounding variables typically present at such sites, epidemiological studies will ordinarily result in inconclusive findings. According to the National Academy of Sciences, in order for one of these statistical studies to be effective, eight basic characteristics of the findings must be considered: "the strength, specificity and consistency of the association, the period of exposure, the relationship between the dose and the response, the effects of the removal of the suggested cause, the biologic plausibility of the association, and the overall coherence of the findings."⁴⁹ Unfortunately, several of these factors are by their nature almost impossible to find present in the typical hazardous waste exposure case.

*Friendly Hills,
Denver, Colorado*

The rules of statistical significance used in epidemiology do not work well when the sample population is small. For example, the Friendly Hills neighborhood, a suburb of Denver, Colorado was allegedly exposed to

contaminants including the cancer-causing chemicals hydrazine and trichlorethylene through its drinking water supply. Four childhood cancer cases occurred in the neighborhood; twice as many as would be expected if the average number of cases occurred. But according to Dr. David Ozonoff, who testified in a court case on this situation, an eight-fold increase in such cases, rather than a simple doubling, would be needed for epidemiologists to declare the statistical increase to be "significant," in view of the small size of the population reviewed. This does not mean that the cases in Friendly Hills are not attributable to the chemical exposures; it only means that epidemiologists are by their blunt tools incapable of drawing the correlation.

*Environmental epidemiology can work, but only where there are large exposed populations or tightly controlled laboratory conditions.*⁵⁰

Added to the problem of sample size in epidemiological studies of community toxics exposures are other confounding variables to muddy the findings. Typically these variables include a lack of detailed information on chemical exposure levels; the presence of multiple chemicals at a single site; exposure of the population to other disease promoters such as cigarette smoke; the movement of many exposed people out of study areas making study samples incomplete; and the long lag times that typically occur from toxic exposure until the appearance of symptoms. Each of these variables erode the conclusiveness of epidemiology studies at Superfund sites. As a result, most studies relying on epidemiology end up stating as in a New Hampshire health department cancer review conducted for the community of North Hampton: "The methodology used in this study is not capable of either proving or disproving a causal relationship between any specific exposure and any disease." (See Case Study on North Hampton, New Hampshire page 35.) Such an apologetic statement is included even in studies where a neighborhood has numerous people exhibiting strong clinical proof of the connection between their toxic exposures and their illnesses.⁵¹

The outcome of the proliferation of these "inconclusive by design" studies is a predictably appalling record of equivocating reports. For instance, out of 108 studies by CDC following cancer clusters over 22 years, none revealed any clear cause.⁵²

Although various strategies can be employed to improve the quality of such studies, so far the situation is not being improved. For instance, to solve the problem of keeping track of exposed populations for a long enough time to track the manifestation of diseases after long latency periods, ATSDR is required by law to establish registries. Instead of a National Exposure Registry, the agency has only established "experimental" exposure registries at a few sites. A National Disease Registry to list individuals suffering serious illnesses due to possible toxic effects, is not yet operational.

Misusing Biological Markers

In addition to the use of population statistics such as death statistics, ATSDR sometimes tests "biological markers" to determine the extent of exposure of a local population. As defined by the NRC a "biologic marker" is "any cellular or molecular indicator of toxic exposure, adverse health effects or susceptibility [to disease]."⁵³ These markers include not only tests for the presence of the chemicals themselves within the body, but also tests for chemical byproducts and changes in tissue that indicate that the patient has been exposed to toxic substances. The most common and conventional of such tests are such markers as blood lead levels and urinary phenol levels after benzene exposures. Unfortunately, such testing, when conducted in an inappropriate manner, has often been abused to provide false reassurances of safety to the chemically exposed public.

Many of the chemicals of concern are, based on their chemical properties, no longer present in the blood or urine once exposure has ended and testing begun. One review has noted that of 21 pilot studies summarized in an ATSDR annual report, 19 involved the testing of blood or urine samples for heavy metal or organic chemical concentrations and comparing these to control groups and/or available national sampling data. The National Center for Health Statistics conducted a study comparing blood and urine sampling with fat tissue sampling; they found that 8 of 17 semivolatile compounds were detected in over 90% of fat samples but in less than 10% of blood samples.

...Three of the five most frequently encountered compounds at the National Priority List uncontrolled hazardous waste sites are volatile organic solvents including benzene, trichloroethylene and perchloroethylene (lead and PCB's being the other two). Volatile organics pose greater complexities in terms of the reliability of blood sampling because of lung elimination, evaporation from collected samples, and falling in the class of compounds for which there is the least sampling experience....Finally, tissue sampling may not be performed until long after the more serious exposures have occurred, raising further questions about the appropriateness of comparison studies of blood levels as the principal determinant of risk from exposure....⁵⁴

In some communities, the residents believe that blood and urine testing was conducted precisely because the testing officials knew that no contaminants would be detected. By picking a sampling method that ensures no detection, they could use the "scientific" study as a means of calming public concern. For instance, in blood tests conducted on people near Doylestown, Pennsylvania, ATSDR reported finding no volatile organic chemicals in excess of normal levels. But according to Dr. Marvin Legator, the study was designed to give this result. Since the volatiles evaporate quickly from the blood, naturally no high levels would be detected. The study would have to be designed, for instance, to test within a half hour of inhaling volatiles in a shower. Thus, according to Legator, the Doylestown study was designed to find

"clean" blood.

In an even more extreme example of this kind of testing abuse, Cathy Hinds, Director of the Health Project for the National Toxic Campaign Fund relates the experience of her own town of Gray, Maine, where residents had been exposed to volatile organic compounds in the drinking water. After the exposure to toxins in the drinking water had ended, federal officials conducted blood tests to check for volatile compounds. A CDC physician who was administering the tests was asked what he expected to find. He said that he didn't expect to find anything. Given the fact that exposure to the substances of concern had ended months before, this was of course, quite accurate. It appears that the blood testing process was being used to give people a "clean bill of health." This inaccurate blood test might have the appearance of being scientific; it certainly would not be a reliable indicator of the damage done by previous exposures.

Hiring the Wrong Investigators

In 1987, ATSDR made a commitment to having state health departments conduct health investigations and health assessments.⁵⁵ Under its cooperative agreement program with states ATSDR had provided funding to 23 states by the beginning of Fiscal Year 1990.⁵⁶

However, many of these state health departments are a poor choice for assuming a primary role of conducting health studies. Often state agencies have already proclaimed a lack of any environmentally-related health problems.⁵⁷ ATSDR's sub-contracts for health studies with many state agencies have often been ineptly or very slowly conducted. Many state health departments have now come to depend upon ATSDR money for their regular operating expenses. The state health departments are so pressed for funds that they take the money without faithfully completing the tasks that their contracts call for. Instead, the money goes into the regular operating expenses.⁵⁸ Ironically, ATSDR justifies the continued funding of these state health departments because it wants assessments done by "agencies directly accountable to the public." Yet the record shows that many of these officials are not at all accountable to the communities being studied, but rather appear far more accountable to the polluters that have caused the relevant problems.

Instead of placing such heavy reliance on state governments, ATSDR could rely more on a network of experts at various universities and hospitals around the U.S. This includes general physicians, epidemiologists, toxicologists, and sub-specialists who have knowledge about chemical exposures in various fields. But under its current approach, ATSDR does not provide grants to private universities and hospitals, thus denying the public access to this expertise. In the St. Gabriel, Louisiana, miscarriage study, the Hansen's Disease Center, a national health hospital, is located right in the community. Yet the resources of its expertise remained untapped by ATSDR's investigation. Because most universities are not government agencies or political sub-divisions, ATSDR cannot engage many highly respected experts to undertake studies.

Woburn,
Massachusetts

In Woburn, Massachusetts, a reproductive surveillance project funded by ATSDR is described by Boston public health experts as a continuing disaster. This study is a follow-up to a leukemia cluster that was detected by Harvard University researchers in the Woburn area in the 1970's and early 1980's. Contaminated wells in Woburn were shut down at that time. Because no additional patients have been diagnosed with leukemia since 1986, a determination was made by ATSDR to look for birth defects and adverse reproductive outcomes. The plan was to monitor all birth defects in children born after 1987, to see if any unusual pattern emerged that might be related to current exposures. The preliminary two-year report of the Massachusetts Health Research Institute was planned to have been completed by October 1990. However, at that time, analysis of the data had not even begun. ATSDR has since fired the first project director.⁵⁹ In general, the high "burn-out" rate at ATSDR means that ATSDR normally has a high proportion of inexperienced personnel.

**"Inconclusive by Design"
Translates to
"Inaction By Political Inertia"**

The delivery of a finished, inconclusive-by-design health study has often been the death knell for attempts to relocate residents away from toxic exposures, secure alternative water supplies, or improve upon remedial measures. When inconclusive studies are delivered, local industries and politicians fall back upon the studies to curtail expenditures and public attention to toxic sites. In short, the studies are utilized as a tool to cut polluters' costs while continuing to expose the public to health threatening pollutants.

As the National Research Council has stated after review of ATSDR's efforts, "We are concerned that populations may be at risk that have not been adequately identified, because of the inadequate program of site... assessment."⁶⁰ Moreover, they stated that while they "are currently unable to answer the question of the overall impact on public health of hazardous wastes... [U]ntil better evidence is developed, prudent public policy demands that a margin of safety be provided regarding potential health risks. We do no less in designing bridges and buildings. We do no less in establishing criteria for scientific credibility. We must surely do no less when the health and quality of life of Americans are at stake."⁶¹

**Studying
Communities to
Death**

Health studies in the absence of action recommendations do not adequately serve communities at risk. Two examples out of the many frustrating experiences of communities will serve to illustrate this point.

Kellogg, Idaho

In a neighborhood where the now-closed Bunker Hill smelter facility caused massive lead contamination, ATSDR, CDC and local agencies have monitored blood-lead levels in children for over 15 years. In the most recent round of testing, 56 of 200 children tested were found to have blood lead levels in excess of ten micrograms per deciliter. At this level, lead is known to cause neurological damage and other health problems. Yet, despite the continuing detection of these high levels, ATSDR and others have not intervened to

ensure treatment or relocation of the lead-exposed children. Instead, the agency has merely engaged in a data-gathering effort, and has turned a deaf ear to citizens' calls for genuine action to protect health.⁶²

Texarkana, Texas

An ATSDR health assessment of the Carver Terrace neighborhood indicated that "Long-term exposures to contaminated soils in the residential area pose a potential health risk for ingestion and skin absorption of soil contaminants," and that "Groundwater beneath the site is contaminated and would pose a potential health risk if used for potable [drinking water] purposes."⁶³ The ATSDR assessment told of at least 35 identified on-site contaminants, including cancer-causing dioxins and furans. Some of these, such as pentachlorophenol, were detected in sub-surface soil, groundwater, air, and surface soil. ATSDR also described 15 off-site contaminants of concern, some of them also in more than one medium.

Poisons found to be "substantially higher than background" included polynuclear aromatic hydrocarbons (PAH), pentachlorophenol, other phenols and toxic metals. ATSDR "concluded that this site is of potential health concern because of the potential risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects." However ATSDR failed to recommend a relocation of the residents. It took extensive political organizing by the local residents to win a relocation. The residents persuaded Congress to allocate \$5 million to relocate them. As this report went to press, the planning for the relocation was underway.

**Unresponsiveness
to Local Citizens**

In case after case, the first and last impression of ATSDR health studies has been poor, due to the agency's unresponsiveness to community requests and needs. According to both local citizens and their physicians, ATSDR has lacked even the simple etiquette of returning their phone calls. Some local citizens and experts have called a hundred or more times without getting responses. Agency officials have themselves acknowledged that "Unless you are a senator or a senator's staff we won't respond."

Today, the ATSDR credibility problem is so severe that communities are beginning to turn the agency away, rather than allowing them conduct further studies to aid the community and the nation in assessing the extent of the health crisis posed by toxics.

*St. Gabriel,
Louisiana*

This small Mississippi River town is located in a "chemical corridor" that is one of the two most polluted areas in the U.S., according to information released under the Right-to-Know Act. In 1987, a local citizen first requested

state officials to investigate the area's rate of miscarriages, after personally logging 65 miscarriages out of approximately 195 pregnancies within one 26-month period. Funded by ATSDR, with technical assistance being provided by CDC, Tulane University's School of Public Health and Tropical Medicine conducted a health study. The original ATSDR protocol specified door to door interviews by trained professionals. That specification was jettisoned in favor of recruiting study participants by public notices and mailings. These volunteers were then interviewed over the phone by college students from local campuses. Given this odd means of selecting the sample population which would tend to under-record the number of miscarriages, the accuracy of the study was cast in doubt from the outset.

Investigators also decided to limit their survey to women between the ages of eighteen and fifty, eliminating younger women who had also suffered miscarriages. The report concluded that the rates found were not elevated and that further study of miscarriages was not warranted. Study investigators claimed to have documented only 54 miscarriages out of 430 reported pregnancies in Iberville Parish, Louisiana between 1982 and 1987.

Officials of the Louisiana Chemical Association praised the study, but researchers at Boston's Center for Environmental Health Studies described it as "fraught with problems" and said it "should be considered inconclusive."⁶⁴ In addition, as Willie Fontenot, Environmental Assistant to the Louisiana Attorney General describes the results, "In St. Gabriel, nobody looked at the toxic releases, what might have been in the air when those people were breathing it, or what kind of health problems that might have caused."⁶⁵ (See Case Study: St. Gabriel, Louisiana, page 31.)

*East Gray,
Maine*

Ignoring research that had uncovered a miscarriage rate in East Gray, Maine, more than six times the national average, ATSDR pulled out of a study before its completion. ATSDR officials were reportedly angered when the state health department completed the study and then listed ATSDR in the credits.⁶⁶

*New Bedford,
Massachusetts*

According to Dr. Richard Bird, Jr., the ATSDR funded response at the New Bedford Harbor PCB waste site avoided meeting the real and immediate medical needs of local residents. The greater New Bedford and Acushnet Estuary has the highest river sediment concentrations of PCBs in the world. Community members became concerned about health effects in the early 1980's, after three mothers from a single neighborhood recognized one another in Massachusetts General Hospital while having their children treated for leukemia. Their concerns and requests to ATSDR included a cross-sectional symptoms prevalence study of neighborhoods situated in areas where waste dumping had occurred, the testing of mother's milk and making recommendations on restricting nursing if necessary, and arranging for local clinics to have knowledgeable physicians available for examinations. ATSDR did not honor these requests but instead focused on determining whether PCB

levels in blood samples were higher than national levels. Some individuals were found with inordinately high levels of serum PCBs, but according to ATSDR the majority were "for the most part" within the typical range of the U.S. population.⁶⁷ Questions about mothers milk and symptoms in the communities remain.

*North Hampton,
New Hampshire*

Adjacent to the Coakley Landfill, where barrels of toxic waste were dumped for years under the cover of darkness, residents' well water became severely contaminated. Several residents contracted extraordinary ailments such as enlarged organ systems, which led to heart attacks and other organ failures. In 1988, the closest to an actual health study was done by a local resident, who knocked on doors asking her neighbors about health problems. ATSDR's health assessors knocked on no doors at all. Instead they relied solely upon information gathered by the state - whose own study consisted primarily of an examination of death certificates.⁶⁸ The residents cannot understand why ATSDR has passed over their community in choosing where to conduct its in-depth health studies, especially given the fact that their area has the highest cancer rate in the entire state.

**ATSDR
Toxicological
Profiles Downplay
Known Chemical
Hazards**

ATSDR is required by law to prepare profiles of pollutants' toxicological hazards for use by physicians and the public. Such profiles, if prepared accurately, could provide quality information for physicians and the exposed public to identify and investigate links between disease occurrences and pollution. But inaccurate profiles, as prepared by ATSDR, actually jeopardize public health by steering local physicians and citizens away from the links, thereby prolonging dangers to the exposed public.

Instead of steering doctors and their patients toward consideration of all plausible chemical-disease links, these profiles have actually underplayed the known effects of chemicals. They typically depart from the international scientific consensus in order to minimize the number and type of hazards associated with the substances profiled.

For instance, vinyl chloride is a known human carcinogen. The International Agency for Research on Cancer (IARC) is considered the world authority on cancer-causing chemicals due to the hard deliberations of its international committees of scientists. As early as 1979 IARC wrote that "several independent but mutually confirmatory studies have shown that exposure to vinyl chloride results in an increased carcinogenic risk in humans, involving the liver, brain, lung and haemo-lymphatic system."⁶⁹

In contrast, more than ten years later ATSDR's "Environmental Alert" monograph on vinyl chloride stated with regard to cancer only that "Chronic low-level vinyl chloride exposure may cause angiosarcoma of the liver, an

extremely rare form of cancer."

Dr. Marvin Legator, at the University of Texas Medical School at Galveston is appalled at this hazard statement. "For ATSDR to minimize effects of vinyl chloride is startling. First of all," he notes, "there is no doubt that vinyl chloride does cause angiosarcoma." Secondly, ATSDR has systematically winnowed away at the types of cancers which are due to vinyl chloride, to the point where a physician reading the environmental alert would not even have a clue that a case or even an outbreak of lung, brain or haemo-lymphatic cancer that presented itself might be due to vinyl chloride exposures."

Instead of promoting more physician attention to toxic chemicals as potential sources of their patients' illnesses, and enlisting their help in identifying and combatting harmful exposures, the ATSDR profiles downplay the possibilities of such links and thus actually mislead doctors away from such considerations. Legator noted this across-the-board problem with ATSDR's profiles in a letter to the agency in early 1991. As this report went to press, he had still received no response.

**Environmental
Education for All
Health
Professionals**

According to a report by the National Academy of Sciences Institute of Medicine, most primary health care physicians are inadequately trained to recognize and treat illnesses that stem from unhealthy environments at work or in the home. Further complicating the situation, hospitals and doctors in areas dependent on corporate jobs and financing are often reluctant to acknowledge the potential problems caused by industry. This lack of involvement by the medical community has created a void of medical protocols and the absence of referral networks to care for individuals affected by environmental hazards.

ATSDR is mandated to step into this breach, but has failed to exercise the leadership and imagination needed to develop the kind of massive education program that is appropriate. Although the agency is mandated to develop materials and conduct trainings on environmental health for physicians, medical educators, and health care providers, this program for education of professionals remains a very meager part of ATSDR's budget. The education program constitutes \$4.3 to \$5.6 million annually (declining in the latest fiscal year), or about ten percent of the agency's budget. ATSDR could get a lot more mileage out of this money if it would coordinate, engage and encourage other parts of the medical community to participate in the process of environmental health education.

Moreover, ATSDR lacks a program to provide credible educational materials and training to communities at risk so they understand the hazards to which they are exposed.

SOME STEPS CITIZENS CAN TAKE TO IMPROVE ATSDR PERFORMANCE IN THEIR COMMUNITY

Petition for health assessments. The Superfund Act requires ATSDR to consider all petitions filed for health assessments at sites of hazardous materials releases. A petition by an individual or a group requesting a health assessment should include:

- o Name, address, and telephone number.
- o Organization represented, if any.
- o The name, location, description of the facility or chemical release.
- o A statement of concerns about the site and request.
- o An approximation of the number of people who live or work around the site, and how close.
- o A list of other agencies contacted or which have investigated the concerns.

Send copies of the petition to the local press as well. If a petition is turned down, you are entitled to a written explanation from ATSDR.

Insist on meetings with ATSDR staff during health assessments. ATSDR now does "scoping visits" to Superfund communities in which health assessors walk the site, talk to local and state officials, and meet with community members. If you are a local citizen concerned about direct public contact with the agency, you should insist that the agency hold a public meeting during the assessment process. Often ATSDR staff will hold a "public availability meeting" where citizens can meet with staff.

Submit comments on health assessments. Based on its 1990 Citizen's Roundtable discussion, ATSDR has instituted a public comment period for every health assessment, which is advertised in a local newspaper. This period is currently 30 days; ATSDR is considering lengthening it. Every commenter receives a copy of the final Health Assessment. Public meetings are often held to announce the final results.

Petition for review of inadequate action by ATSDR. If you feel there has been inadequate attention to health concerns, or if a study was not done with good scientific methods, you should petition ATSDR for review and other suitable action on your study.

ATSDR address:

Lydia Ogden Askew, Community Involvement Liaison
ATSDR-Division of Health Assessment & Consultation
1600 Clifton Road, NE (E32)
Atlanta, Georgia 30333

**Confusing
Public Relations
And Public
Protection**

In the face of a groundswell of public and scientific criticism, ATSDR has made a few small structural changes. For instance, the agency has added public relations staff and begun to experiment in a limited way with other forms of biological markers besides blood and urine testing. The agency has begun to reconsider the manner in which it conducts health assessments.

Despite these marginal improvements, the fundamental shortcomings of ATSDR remain unrectified.⁷⁰ In most of the communities studied in this report, the policy changes adopted at ATSDR have not translated into action, or responsiveness to local demands, or even further health studies. The fundamental problem of bias and conflicting allegiances persists, since the agency continues to be subordinated to EPA and linked to CDC.

The agency has also begun establishing more community advisory panels. However, such panels have been established by ATSDR in the past without actually increasing ATSDR's responsiveness. For instance, in St. Gabriel, Louisiana, one of the communities studied in this report, ATSDR put together a community advisory panel. Citizens on the panel and their experts made numerous recommendations, which the agency then ignored. Establishing community advisory panels may be merely a sophisticated public relations ploy, unless these panels are given real power, such as the right to veto ATSDR activities that are inappropriate or inconsistent with local preferences.

**How Many Deaths
Will Result From
Studies
"Inconclusive
by Design?"**

The sordid record of ATSDR's and CDC's innumerable studies which were inconclusive by design is causing genuine harm to many communities today. ATSDR has no plans to revisit the vast majority of the 950 original, hastily performed health assessments, nor any of its studies.⁷¹ The communities studied may be condemned to live with the agency's sloppy and deceptive studies, in many instances without the precautionary measures merited by toxic exposure conditions.

Chapter Five:

The Local Experience: Five Case Studies

JACKSONVILLE, ARKANSAS

In Jacksonville, Arkansas, a community of 29,000 residents, located 12 miles northeast of the State Capitol of Little Rock, dioxin has been measured in the soil at levels well above the range that led to EPA's 1983 evacuation of Times Beach, Missouri. For more than 40 years, three different companies manufactured a host of toxic chemicals here - including approximately one-quarter of the "Agent Orange" used to defoliate the jungles of Vietnam. Today, EPA is moving forward with plans to incinerate more than 29,000 barrels of toxic waste still contained behind the closed plant gates of the last occupant, Vertac Chemical Corporation.

In 1983, after numerous citizens complained about ill health, Arkansas' then-health director, Dr. Ben Saltzman, requested help from the Centers for Disease Control. CDC agreed to analyze data on Jacksonville chemicals. At that point, the only other tests that had been conducted were by the Mount Sinai Medical Center. They found "effects of unknown significance" on nerve conduction in 46 percent of the 55 former chemical plant workers tested. Despite a state recommendation that all toxics be considered in CDC's investigation, CDC examined only EPA's measured dioxin levels in Jacksonville. In July 1985, CDC decided not to undertake a fatty-tissue study of residents. Their reasoning, which was contradicted by EPA studies, was that Jacksonville's dioxin problem was not as severe as that of Times Beach, Missouri.

An informal survey taken in 1985 by the Arkansas Democrat newspaper, of children living near to two Superfund dump-sites in Jacksonville, found 10 of 18 with serious health problems - including spina bifida (failure of the spinal column to close), seizures, an infant with a hole between the chambers of the heart, and a baby born with part of her brain outside the skull. One of seven

babies to become SIDS victims in 1985 was Joseph Shelton, three months old. What follows is the story of efforts by the Shelton child's parents and Arkansas physicians to involve CDC in determining whether industrial chemicals had been the cause of Joseph's death.

On September 6, 1985, only hours after the then-healthy Shelton baby had received a 2 a.m. bottle feeding, the parents awoke to find him dead in his crib. A week later another child, 17-month-old Jeff Shelton, began having seizures and was rushed to the hospital. The director of pediatric neurology at Arkansas Children's Hospital, Dr. Robert Woody, suspected something unusual after an intern ruled out spinal meningitis.

Hospital tests on Jeff seemed to reveal the existence of high-levels of chlorophenol in his blood. The physicians then closely examined tissues from an autopsy that had already been performed on Joseph, a standard Arkansas practice for SIDS deaths. Dr. Marge Brewster, in charge of the hospital's Metabolic Laboratory as well as Arkansas' Reproductive Health Monitoring System, then contacted a Richardson, Texas, laboratory, Enviro-Health Systems, one of the few private labs in the U.S. that is equipped to do further testing. It agreed to do an unusual assay (analysis) of the deceased child's liver and kidneys, looking for specific toxic chemicals.

According to Dr. Brewster, "Part of what we asked for was an assay for chlorophenols, thinking that those being released at the time through the Jacksonville sewer system could potentially be volatilized and available for exposure." In December 1985, Arkansas Children's Hospital received the test results. Levels ranging as high as 508 parts per billion of six chlorophenols - the class of chemicals used in the manufacturing of 2,4,5-T, 2,4-D, 2,4-DB, and Silvex herbicides - were detected in the Shelton baby. At least three of these were known to cause cancer in laboratory animals. One was a mutagen that alters cells' genetic material. Dr. Woody told the Arkansas Democrat that the amounts were "above usual levels for urban adults," and added that there are no "normal" levels of such chemicals in the blood. Other chemicals, phenoxy herbicides, were also found in two urine samples taken from the mother, Brenda Shelton.

Dr. Brewster recalls: "We then requested that the Centers for Disease Control in Atlanta utilize the other half of [Joseph's] tissue we had stored, to repeat the assay. "At the time we had stored approximately one hundred other babies' tissues from SIDS deaths that could have been assayed simultaneously. After quite some time, the answer we got from CDC was that no, they would not re-assay the tissues or anybody else's either. The reason they gave me was that they had sent an investigator and were not pleased with the quality control at the Texas lab."

Dr. Brewster adds: "I was very disappointed at their approach. CDC has billed itself as being the nation's public health laboratory, and with a question of this type, it's really the only resource we have to go to for an answer. I

thought we had all the material they needed to get some very definitive answers, and their excuse made no sense to me."

After CDC turned down further testing of the Shelton baby, Dr. Brewster personally contacted four EPA/CDC labs. Each of these also turned her down. Finally, a California lab said it would examine ten unlabeled baby assays, including the Shelton's, for a \$10,000 fee. In the interim, Dr. Brewster reports that one hundred other tissue samples of SIDS victims being preserved by Children's Hospital were thrown out, apparently by accident, by a morgue attendant. "I feel now that I should have gathered them in a safe," she says.

Finally, under prodding from Arkansas doctors and health officials, CDC did agree to do a study to gauge children's exposure level to chemicals, using "control groups" of 100 children from Jacksonville and Conway, a town 30 miles away. The study did not show substantially higher levels of chlorophenols in the Jacksonville children, although some doctors questioned the wisdom of comparing samples from communities in such close proximity. Dr. Brewster then asked state health officials if they could obtain CDC's samples from the urine of the Jacksonville children, but her request was denied. "The reason given by CDC was that the remaining volumes of urine were too small to test," says Dr. Brewster.

Paul Connett, a biochemist at New York's St. Lawrence University, became convinced after a visit to Jacksonville that "politics" explains why CDC called off further investigation into the sudden, inexplicable death of the Shelton baby. "I'm sure somebody told them it's a bombshell," says Connett. "Because one of the claims that the industry always makes is that no one has ever died from dioxin or related chemicals. And once that can be shown, it's a whole different ball game - for the Vietnam veterans exposed to Agent Orange, and for many other people."⁷²

TEXARKANA, TEXAS

About a mile from the Texas-Arkansas state line and approximately one-and-a-half miles west of downtown Texarkana, a city of 33,000, lies a residential area known as the Carver Terrace Subdivision. Its citizens are all black, their family incomes averaging between \$10,000 and \$20,000 annually.⁷³ The neighborhood has existed since 1964, when a business consortium called Carver Terrace, Inc. purchased these 62 acres of land and built 79 single-family homes on the north side.⁷⁴

Only three years prior to the founding of Carver Terrace - and for over fifty years before that - activity of an entirely different sort had taken place on these 62 acres. EPA summarizes the history: "In 1910, the National Lumber and Creosote Company began operating a wood treatment facility at this site. In 1938, the land and the wood treatment facility were sold to the Wood Preserving Corporation, which was eventually acquired by Koppers Company. Koppers Company conducted wood preserving operations until 1961, when they closed the facility and sold the land."⁷⁵

J.E. "Sonny" Fields, who has lived there since Carver Terrace's beginnings three years after Koppers departed, remembers: "There was always a smell. All over this vicinity, even in the outlying areas. It gets strong at times." What kind of smell? "Creosote. But nobody knew it was a hazard to their health. That wasn't all that was in our yards. But people who were getting sick back in the earlier days never knew what was wrong, or the cause, until these test results began to leak out. The first test taken out here never was made public. That was before 1980."⁷⁶

EPA recounts: "In the early 1980's, the State of Texas and Koppers Company found that soil and ground water were contaminated with chemicals commonly used to preserve wood: pentachlorophenol (PCP), arsenic, and creosote. In 1984, EPA placed the Koppers Texarkana site on the National Priorities List (NPL) of hazardous waste sites, making it eligible for action under the Superfund program.

"In 1985, EPA allowed the Koppers Company, one of the Potentially Responsible Parties (PRP's) for the site, to place clean soil and sod in the yards of some homes in the Carver Terrace subdivision to prevent residents from being exposed to contaminated soils while the site was being studied.

"The Koppers Company agreed to conduct a Remedial Investigation and Feasibility Study (RI/FS) of the site. The RI determined the types, amounts and location of contaminants....

"In September 1988, after [RI/FS] completion.....EPA selected Mechanical Soil Washing as the method to treat contaminated soils on the site....to prevent an additional risk of cancer from exposure to contaminated soils below the ground surface."⁷⁷

Around the same time, Roy Irwin of the Fort Worth office of the U.S. Fish & Wildlife Commission, wrote a 19-page letter to EPA after visiting the Carver Terrace site and reviewing EPA documents. Irwin noted serious flaws in EPA's \$8-million study that could have resulted in "an underestimation of the long-term hazards posed by contaminants."

Talmadge Cheatham, a Carver Terrace resident, recalled an EPA official dressed in a moon-suit coming to his home, where black goo had backed up in his bathtub. "Well, you certainly protect yourself," Cheatham told him, "but

what is supposed to protect me and my family?"

For the health assessment required under Superfund, ATSDR relied largely on EPA data about the extent of the contamination. ATSDR also came to Carver Terrace for a site visit in July 1988, though "they didn't really talk to people," according to Fields. The people avoided by ATSDR had experienced miscarriages, respiratory problems, cancer, heart problems, nervous disorders, kidney, liver and skin disorders, and depression. The health agency's 16-page assessment was published on April 10, 1989. But nobody in Carver Terrace heard about it.

Almost a year later, on March 23, 1990, local environmentalists called a press conference. Linda James, speaking for the Carver Terrace Community Action Group, called EPA "irresponsible" for not informing the community about the ATSDR report which "proves beyond a doubt...residents of Carver Terrace are being poisoned every day, the year round."⁷⁸

Roger Meacham, the spokesman for EPA's Region VI office in Dallas, responded: "We certainly have not kept this report secret. It has been a matter of public record and available to anyone who requested it since the day of publication."⁷⁹ This missed the point, however, which was that neither EPA nor ATSDR seemed to have made the slightest effort to let the people of Carver Terrace know what the health assessment contained. Or even that it had been published at all.

According to Meacham, the ATSDR report simply concluded what EPA had been saying all along, that "there is no evidence of imminent or substantial endangerment to citizens in the subdivision."⁸⁰ But a close examination of the report indicated otherwise to those same citizens. "Long-term exposures to contaminated soils in the residential area pose a potential health risk for ingestion and dermal absorption of soil contaminants," the report summarized. "Ground water beneath the site is contaminated and would pose a potential health risk if used for potable [drinking water] purposes."⁸¹

The ATSDR assessment told of at least 35 identified on-site contaminants, including cancer-causing dioxins and furans. Some of these, such as pentachlorophenol, were detected in sub-surface soil, groundwater, air, and surface soil. ATSDR also described 15 off-site contaminants of concern, some of them also in more than one medium. Poisons found to be "substantially higher than background" included polynuclear aromatic hydrocarbons (PAH), pentachlorophenol, other phenols and toxic metals. PAH's had definitely invaded the shallow aquifer near Carver Terrace as the poisons migrated off-site. While no testing of plants and animals was conducted, only two fish of edible size - out of 6,099 observed - were found in Wagner Creek, which borders the subdivision on the southwest.

ATSDR "concluded that this site is of potential health concern because of the potential risk to human health resulting from possible exposure to hazardous

substances at concentrations that may result in adverse health effects."

Sonny Fields has kept a record of the cancer victims in Carver Terrace since 1985. He has counted 26.

Back in 1989, long before the residents were made aware of ATSDR's evidentiary findings, the overwhelming sentiment in Carver Terrace was clear. "We are all seeking," as Patsy Oliver put it, "a government buy-out." So the citizens rallied, and got the Texarkana City Council behind them, and wrote hundreds of letters to Congressmen.

In the summer of 1990, Congressman Jim Chapman, a Texas Democrat, filed and won an amendment to an appropriations bill allocating \$5-million to buy out and relocate the residents of Carver Terrace. That November, the bill passed both houses and was signed by President Bush.

"The [ATSDR] health assessment was helpful [with Congress]," Fields believes. "Because it put more light on acknowledgment of what the officials didn't know." But, as Patsy Oliver says, "What really did it was a lot of prayers, a lot of letters, a lot of marching." The long wait for the people of Carver Terrace, who unknowingly moved almost a generation ago onto a toxic-waste site, seems about to be over.

ST. GABRIEL, LOUISIANA

St. Gabriel, Louisiana is one of three unincorporated towns in east Iberville parish. According to a recent national report by the Citizen Action organization, surveying the latest information available under the "Right-to-Know Act," this parish ranks as one of the two most polluted areas in America. St. Gabriel is located on the east bank of the Mississippi River south of Baton Rouge in the industrial area known as "Cancer Alley." There are 35 industrial sites, including eight or nine chemical plants. There is also a hazardous waste disposal site in the parish at Bayou Sorrell, presently being cleaned up as a Superfund site.

It is a rural area except for the industry along the Mississippi River bank. At night the chemical plants can look like carnivals with their great display of lights. Considerable wildlife abounds in the swamps to the east of the populated area where bald eagles can be seen. In Spanish Lake, also to the east, mink, weasels and alligators are plentiful as are waterfowl in the flyaway season. Unfortunately, the entire area of east Iberville drains into Spanish Lake. On a foggy night the croaking of the bullfrogs is punctuated by the moans from the foghorns of the riverboats. But when a frontal system comes

through, and the wind shifts from the southeast, the air reeks of chemicals, both from the plants in Iberville and Ascension and from across the river.

Small groups of residences are clustered among the chemical plants. Also located in St. Gabriel are a woman's prison, the only one in the state, and a processing center for about 1000 male prisoners on their way to Angola or other prisons. According to Jim Gentry, a longtime resident of St. Gabriel, whenever a prisoner escapes from one of the prisons, pursuit on horseback and in jeeps is swift and relentless. But, Gentry says, whenever a chemical escapes from one of the plants, nobody comes out of the plant to investigate the effect of the leak.

Chemicals do escape routinely from the plants, and often among them are carcinogens (cancer-causing agents), mutagens (genetic malformation-causing agents), and teratogens (reproduction-affecting agents). In 1985 the figures for Iberville parish and neighboring Ascension parish were as follows [as cited by Bob Anderson and Mike Dunne of the Baton Rouge Morning Advocate, 9-14-87]:

- * 818,000 pounds of hydrogen chloride (a mutagen in animal experiments).
- * 120,000 pounds of propylene oxide (a mutagen and carcinogen in animal experiments).
- * 288,000 pounds of methylene chloride (an experimental carcinogen, mutagen and tumorigenic agent).
- * 256,000 pounds of chloroform (a suspected human carcinogen and teratogen).
- * 634,000 pounds of carbon tetrachloride (a potential human carcinogen and teratogen).
- * 84,000 pounds of methyl chloroform (a suspected human carcinogen and an experimental mutagen).
- * 116,000 pounds of perchloroethylene (an potential carcinogen and mutagen).
- * 288,000 pounds of vinyl chloride (a human carcinogen).
- * 210,000 pounds of vinylidene chloride (a potential human carcinogen and experimental mutagen).
- * 26,000 pounds of epichlorohydrin (a suspected human carcinogen and an experimental mutagen).
- * 226,000 pounds of toluene (a suspected carcinogen and experimental mutagen).
- * 24,000 pounds of phenol (a potential carcinogen and mutagen).
- * 36,178 pounds of ammonia were released into the air.

It is no surprise, with such air quality, that Iberville parish, along with the rest of the southern parishes of the Mississippi River corridor, should rank highest in the nation for deaths from lung cancer. Although there are some, principally in the chemical industry, who claim the high rate is due to excessive cigarette smoking in the area, Dr. Vilma Hunt, formerly of the Harvard

Department of Epidemiology, says it is reasonable to assume the extraordinary levels of chemical pollution are causing cancers. "The fact is," she has stated, "there is a soup there - an array of chemicals that changes all the time."

But it was not cancer that attracted the attention of Kay Gaudet, a pharmacist operating her own store in St. Gabriel, it was the miscarriage by her sister, Peggy Hoffman, in 1986. Even then, when her sister suggested that perhaps her miscarriage and those of several friends had been caused by the local pollution, Gaudet was skeptical. She thought there must be some other problem, although by July of that year she began thinking differently. In a ten day period, four more women informed her that they had miscarriages. It was too much of a coincidence. Gaudet began charting the miscarriages and soon had counted 65 among 195 pregnant women in east Iberville parish, over a 26-month period.

When Gaudet took her information to the Louisiana Department of Health and Hospitals (DHH), she got little satisfaction from the DHH, or from any government agency, except from the office of Louisiana Attorney General William J. Guste, Jr.. Guste notified the Louisiana Department of Health and Human Resources (DHHR) and asked that agency to investigate the situation.

But it was when the Delta Chapter of the Sierra Club, then headed by Darryl Malek-Wiley, took an interest in her data that things began to happen. The Sierra Club provided financing, and Malek-Wiley accompanied Gaudet on a trip to Washington, D.C. which he had arranged. There Gaudet met with then-U.S. Congressman Buddy Roemer. Roemer, (now a former Louisiana governor) reported his concern to EPA and to the U.S. Public Health Service (PHS).

Thus encouraged, the Louisiana DHHR responded by examining records of birth rates and fetal losses. Although the rates of the St. Gabriel area and the rest of the state of Louisiana were similar, a number of biases existed in the estimates. As a result, the DHHR contracted with the Tulane University School of Public Health and Tropical Medicine to conduct an investigation of the rate of miscarriage and stillbirth in east Iberville parish. Funding came from the Agency for Toxic Substances and Disease Registry (ATSDR). Technical assistance came from the Centers for Disease Control (CDC).

The completed report concluded, as stated in the abstract of the report, "On the basis of analysis of these data and criteria established before the investigation, the rates found were judged not to be elevated and further study of miscarriages in the area is felt not to be warranted at this time." ATSDR's Barry Johnson still defends the study, saying "We believe it was done quite well [and] was done to the standard of current scientific protocol." The problem was, many people were not happy with either the "criteria established before the investigation," or the way the study was conducted.

The original protocol specified door to door interviews by trained professionals. That specification was jettisoned in favor of recruiting volunteers by public notices and mailings, who were then interviewed over the phone by college students from local campuses. Thus the accuracy of the report was cast in doubt from the beginning. In the words of Jim Gentry, "They [the people of St. Gabriel] are not easily involved. For the miscarriage report to be accurate, one hundred percent community participation was necessary." The Tulane investigators also decided to limit their survey to women 18 to 50 years old, eliminating any other women who had suffered miscarriages.

The advisor to Kay Gaudet and her group was Paul Templet. At the time he was with the Institute for Environmental Studies at Louisiana State University. Later he became the Secretary of the Louisiana Department of Environmental Quality (DEQ) under Governor Roemer. During the debate over the protocol, Jim Gentry remembers Templet telling him, "Without a control, the miscarriage report is an evasion doomed to failure." Gentry argued, unsuccessfully, at a hearing held in New Orleans by the DHHR that surely some town exists in nearby Mississippi with a similar population but without the presence of chemical plants. Gentry was told his proposal was impractical.

Templet today says, "In science, a conclusion has to be 95% certain before it is acceptable. That's the way it has evolved in science over the years in the laboratory. But to apply this generally, as with the miscarriage report, is not practical. The whole issue is specious." When he was the advisor to Kay Gaudet, he continues, "I asked for surrogate analysis, that is, for a measurement of the effects of the chemical plants based on distance from the plants. I also asked if there were any clusters of miscarriages. When I saw that there were, I asked that they be analyzed. In both cases I was told that more money was needed. The money never came, the analyses never came."

Willie Fontenot is the Environmental Assistant to the Louisiana Attorney General. He comments about the study: "In St. Gabriel, it was simply: who volunteered to come in and talk about it and what public health records might show. This was a far cry from the health study done in Woburn, Massachusetts, by the Harvard School of Public Health, where they went in and looked at a list of more than a hundred different types of health problems, including miscarriages, to determine whether or not there was some correlation between exposure to contaminants in the drinking water and the people who drank that water. In St. Gabriel nobody looked at the toxic releases, what might have been in the air when those people were breathing it, what kind of health problems that might have caused. So I think that the study is seriously flawed. We might be talking about a whole community that is exposed to some chemical that could cause genetic effects, or birth defects that could affect a much larger number than miscarriages. And there were some resources in that community that could have been used when they were not. The national health hospital, the Hansen's Disease Center, is right in the

community. There were all these federal medical experts sitting there, and resources that could have been used that were not."

Vicky Arroya has been with the Louisiana Department of Environmental Quality (DEQ) and EPA in Washington, D.C. While in the DEQ she said: "In some cases, the models actually did show that you should be concerned for a higher incidence of cancer around high risk point sources, also spontaneous abortions and miscarriages. To suggest that a study like the miscarriage report is necessarily going to have the answer, or to suggest, if it is inconclusive, that there really isn't a problem, is, I think, unconscionable, when scientifically it hasn't been solved at all."

NORTH HAMPTON, NEW HAMPSHIRE

"They let us drink this water for ten years before they admitted anything was in there. It's scary, because what we've gone through for the last ten years is [to be] stuck here with no help," says a woman who raised a family for those ten years on Lafayette Terrace in North Hampton, New Hampshire, a street adjacent to the Superfund site known as the Coakley Landfill. Her attitude is typical of the residents of that street, who feel they were neglected and left alone to deal with a catastrophe.

Originally, the Coakley Landfill was a sand and gravel pit. In other words, before the landfill operation began, the surface layer had been largely scraped away and removed. In 1971 the town of North Hampton applied to the state of New Hampshire Bureau of Solid Waste for a permit to use the Coakley site as a sanitary landfill. When abutting landowners objected to the dump, the town of North Hampton stated the landfill would be for household refuse only.

A woman living on adjacent Lafayette Terrace (who requested anonymity) remembers more than that was brought to the site. "Helicopters used to come in by night and dump barrels...cloak and dagger...I saw them by going up there at night with a friend. The barrels were marked 'corrosive' and had little triangles on them." It wasn't long before the residents of Lafayette Terrace began to notice problems with their water. In 1975 the first complaints were made. According to Ruth Martin, a resident since before the landfill operation began, the water began to smell and taste bad.

"The water was so bad," says John Wylie, another resident of the street, "that you smelled worse after you took a shower." As Ruth Martin puts it, "Everyone in the neighborhood stunk but they didn't realize it, they were so

used to it." She also states that clothes would come out of the washing machine black. The water turned rust-colored, pipes deteriorated, the washing machine, the bathroom plumbing, all had to be replaced because of corrosion.

About this time John Wylie's wife, Lillian, took her child to a doctor for treatment of bronchitis. Following the doctor's orders, on coming home she steamed the child in the bathroom. The child convulsed and had to be rushed to a hospital and put in a breathing apparatus.

Ruth Martin reports that the first major health problem appeared in her family when her husband suffered a heart attack. When he was sent home, he was told to drink a lot of water. He soon had a brain hemorrhage and died in Massachusetts General Hospital.

When her daughter came down with a kidney infection, Ruth Martin decided to call the state to have the water tested. The state of New Hampshire replied that since it was a private well, she would have to arrange to have it tested herself. She would also have to pay for the test.

The problems continued. Ruth Martin's older daughter and all the kids in the block were often lethargic. When her oldest daughter was married, the family was too embarrassed to have guests come to their house. The air smelled too bad. A number of domestic pets in the neighborhood had to have litters aborted. Mice and rats were often seen convulsing in the road. Then Mrs. Martin received a telephone call from Auburn, New Hampshire where her 32 year old son had moved, saying that he had died of a massive heart attack. An autopsy revealed that all of the young man's vital organs were three times normal size.

Finally, the state of New Hampshire tested the water, but only to determine if coliform bacteria from either humans or animals was present. The water tested negative. Because the state didn't find anything wrong, the residents of Lafayette Terrace didn't think anything was really wrong. "I really believed the state would tell us if anything was wrong with the water," John Wylie says.

Despite the results of the test, Lillian Wylie and her neighbors began to use bottled water. The trouble was, bottled water was expensive on their very moderate income. The Wylies, for instance, had nine people in their household. So they continued to bathe in the well water and to use it for cooking and washing.

The residents were advised by an expert whom they consulted to try putting chlorine down the well. They did so. While the color of the water improved, rashes from bathing were common. Then they learned that plans to extend the municipal water system did not include supplying Lafayette Terrace. When the homeowners tried to persuade the North Hampton Water Department to include their street, they were accused of dumping chemicals into their wells in order to get municipal water. Meanwhile, still thinking that

the problem was bacterial, they then began boiling their water, thereby possibly intensifying chemical concentrations.

Then, in 1983, a new test revealed the presence of possible carcinogens in the Lafayette Terrace water. Incredibly, the people most concerned were not officially notified. Instead, Ruth Martin, who had requested the test, was told that she should go around and inform her neighbors. The Water Department, stating that there was "the presence of significant levels of industrial chemicals" in the water, did notify the North Hampton Board of Selectmen. At this time the Water Department also urged the extension of town water to Lafayette Terrace. An order followed to shut down the contaminated wells.

With no water at all, the residents tried to use local schools and fire stations for water sources and for hygienic purposes. They were told that they could not use the public facilities, that the problem was theirs, not the town's. Only by paying between \$1200 and \$1500 per house for a temporary line did they finally get municipal water.

Soon thereafter, in September of 1983, EPA published a new National Priorities List of hazardous waste sites mandated for cleanup under Superfund. The Coakley Landfill was not included. Although EPA quickly admitted its mistake, saying that the three contaminated wells had been missed by the investigators sent to the Coakley Landfill, the residents of Lafayette Terrace were neither impressed nor reassured.

In September of 1984, a citizen's complaint was made to the New Hampshire Bureau of Solid Waste. In response, a waste management engineer, Timothy Drew, was sent to investigate the site. EPA personnel also responded. Drew found a major seep had emerged, with all vegetation in the area of the seep either dead or dying. Drew was emphatic in his reaction to the situation: "ACCESS to this site needs to be discouraged immediately!" [emphasis his].

As dire as the engineer's report appeared, town officials still did not seem to think that the situation was of special concern to the people most immediately affected. In a letter of November 3, 1984, from R.A. Southworth of the North Hampton Office of the Selectmen, Ruth Martin was informed that, "We have polled the participants in Coakley Landfill ad hoc committee and they have denied your request to be present at our meetings. We understand your interest in the matter, but some of the others feel that your interests might possibly be inimicable with theirs."

By 1986 indoor air tests were being conducted in Lafayette Terrace homes by the New Hampshire Division of Public Health. The results showed the presence of numerous volatile organic compounds (VOC's). Acetone was found in the greatest abundance, as high as 22.45 parts per billion in the Martin house. After explaining how the Division had to wrestle with existing occupational standards in order to have any kind of residential standards, a letter to Ruth Martin and her neighbors stated, "Based on the observed data

these [chronic health] risks would be expected to be very small but not nonexistent." Again, the recipients of the letter were not reassured.

Then in 1988 came two studies that the residents of Lafayette Terrace believed would confirm that there was substance to their complaints. One study, by the Bureau of Disease Control of the New Hampshire Division of Public Health, surveyed cancer incidence around the Coakley Landfill. The other study was a health assessment by the federal ATSDR. Both studies were conducted in 1988 and apparently shared information. The ATSDR and New Hampshire reports came to the same conclusions - no health problems.

The cancer study, originally requested by grassroots activist Martha Bailey, a member of the National Toxics Campaign Fund Board of Directors, stated at the outset that, "The methodology used in this study is not capable of either proving or disproving a causal relationship between any specific exposure and any disease." Why bother doing a study at all then, it might be asked. Basically, the state study consisted mostly of an examination of death certificates in the state of New Hampshire, thus excluding the death of anyone who had gone, for example, to the nearby and renowned medical facilities in Boston. A door to door health survey, using a standardized questionnaire, was also conducted by the state. Ruth Martin doesn't know what good the survey did. "When I saw the state health study, I couldn't believe what I was reading, because there was nothing in there that we had told them."

The residents of Lafayette Terrace had higher hopes for the ATSDR study. This was, after all, the federal government coming to North Hampton to determine what was really happening. Since EPA had already declared the Coakley Landfill a Superfund site, it followed that another federal agency would see that their health had been and was at risk.

Martha Bailey comments: "I'm very disappointed in the state study, and I'm even more disappointed in the fact that ATSDR did not do a full study but instead performed simply an assessment. They haven't gone around and asked people about illnesses in their families, or what was bothering them. The state of New Hampshire knocked on four or five doors. Lillian Wylie went around herself and asked her neighbors about their health problems. Her survey was the closest to a health study. ATSDR, knocked on no doors at all. Instead, they used information that the state gathered.

"I think the federal government is covering up," concludes Martha Bailey. "This area, southern Rockingham County, has the highest cancer rate in the state. But nobody is looking into why."

HOPE, MAINE

In 1967 the Union Chemical Company was founded in the small town of Hope, Maine, by Dr. Ray Esposito. Dr. Esposito purchased a part of the land from the family of Carolle Larner. In the deed for the five acres purchased from Larner was a covenant stipulating that the environment not be harmed by the new facility. That covenant was eventually broken, with a vengeance.

Union Chemical had by 1969 built a recovery unit for solvents from Chemclean, another company owned and operated by Dr. Esposito on the same site which manufactured patented solvents. The Union Chemical recovery unit was soon expanded to provide capacity to handle the reclaiming and recycling of solvents from other companies in addition to Chemclean. A fluidized-bed incinerator was built at the site in 1981 to destroy the residuals from the various operations on the site.

Beginning in 1979 and continuing for years, Union Chemical was repeatedly cited by the Maine Department of Environmental Protection (MDEP) for flagrant violations of its several operating licenses. They found barrels of hazardous waste, some of them rusted and dented, stacked four high, with the lower barrels already structurally weak as a result. These barrels were jammed together in a way that made it impossible to inspect the interior drums, let alone perform emergency service if a leak should develop. Outside the plant, incinerator sludge containing high concentrations of lead was deposited in a bermed area originally constructed (and licensed) as a containment area for the four holding tanks within. Union Chemical was instead using the containment area as an uncovered dumpster to hold lead and asbestos laden incinerator sludge. The inspectors also noted that the company was grossly dispersing ash contaminated with lead and asbestos into the air.

In March of 1984 the MDEP issued an administrative order declaring Union Chemical an uncontrolled hazardous substance site. By June of the same year the MDEP had ordered the closing of the waste treatment and recycling operation, and took final possession of Union Chemical in 1986. At that time all operations ceased. Stored on the property were 2,400 55-gallon drums and 30 liquid storage tanks, all of which were later removed by the MDEP and by the U.S. EPA. In an EPA memorandum of August 10, 1984, some of the drums are described as "deteriorating and leaking."

But Union Chemical was not closed down before it had contaminated the surrounding area and affected the health of its neighbors. What the government reports do not say is that the neighbors had long been urging the government to do something about the problem.

In December of 1979, some of the neighbors, led by Carolie Lerner, had forced the town of Hope to hold a public meeting. They wanted to know exactly what was going on at Union Chemical. Why did the air around the plant smell so badly and why had there lately been the construction and use of large boilers? Until this time, the community had believed what they had been told about Union Chemical, that the plant was engaged in the manufacture of paint removers.

At the town meeting, they discovered for the first time that Union Chemical was engaged in the recycling its own used paint removers as well as solvents, paint removers and other hazardous wastes from other businesses. That was the purpose of the boilers. The neighbors also discovered that Union Chemical was now a hazardous waste site. To their surprise they learned that some in the town government were not as ignorant of the activities at Union Chemical as they were. Also present at the meeting was a man named Clifford Goodall, who identified himself as an attorney for EPA. Under questioning from citizens, however, Goodall admitted he was a *former* EPA attorney, but was actually in the employ of Ray Esposito, owner of Union Chemical.

Alarmed by what they had learned and experienced at the town meeting, the neighbors decided they had better organize themselves. Right after Christmas of 1979 they formed an organization called "Concerned Citizens of Hope" (CCH). At first CCH worked at the town level. When Union Chemical applied for an incinerator, CCH managed to force the application to a public hearing and initially blocked the permit, though it was later granted.

Frustrated by trying to accomplish anything within the town, CCH moved on to the state level. There they received very little response and no satisfaction until they learned the ropes of dealing with government. In the meantime, the members of CCH were discovering the price of protest, at least against Union Chemical. There were the rocks through the windows of their houses, bullet holes through automobile windshields, and threatening telephone calls in the middle of the night. During one public protest march involving about a hundred residents, Ray Esposito stood in front of Union Chemical pointing a shotgun directly into the crowd. For protection, CCH began to invite the newspapers to cover all its activities.

Time passed and EPA continued to debate how to clean up Union Chemical. In the meantime, the question of the effect of the hazardous waste site on public health became a major issue. A preliminary health study by the State of Maine indicated that there were higher than expected levels of upper respiratory problems, rashes, and headaches. The state agency recommended a followup study, but this was never done. Instead, the federal government came into play. Instead of pursuing these nonlethal symptoms, ATSDR proposed conducting "death studies"; these death studies would not even consider the substantial movement of people in and out of the neighborhood.

For instance, by their methods, they would omit people who died in nursing homes, since these people's deaths would be recorded as not dying in Union. As a result of citizens' objections, ATSDR did not do such death studies -- but they also did not conduct any study of the nonlethal symptoms.

In coal mines, workers are alerted to the release of toxic gases by the death of the canaries which they bring into the mines. In Hope, Maine, mallard ducks may have served as the equivalent of a canary. One day, Carolie Lerner noticed that the incinerator was putting out something strong, which was putting pinholes in peoples' T-shirts and burning their skin. When she returned home she found that seven of her young mallard ducks and their mother were all dead. One of the ducks was sent to lab for an autopsy; the lab listed "poisoning" as cause of death. The lab tested the ducks feed and found no contamination there. On another instance, a sheep died in the same sudden manner.

ATSDR officials seemed initially interested in the situation with the ducks, but then made heavy demands on Lerner to prove that the animals' deaths were due to Union Chemical. They said that if the citizens wanted to prove that the deaths were due to Union Chemical, the citizens should themselves get veterinarians to certify each death as due to chemical exposure.

According to Carolie Lerner, "The agency's responses were political and unreliable. They sounded responsive when they first came to town, taking information about people's illnesses and other information." They also promised confidentiality, since threats were being made against people who spoke up.

Yet, when the ATSDR reports came out, according to Lerner the agency breached their commitment of confidentiality, publishing quotes and references to local people which would be more than enough to identify the speaker in this small town.

Without ever conducting studies of the nonlethal symptoms noted by the state, ATSDR eventually filed a report to EPA indicating that there was no evidence of *any* health effects from Union Chemical.

Carolie Lerner complains that "Their reports insulted our intelligence. They called readily apparent symptoms such as wheezes and rashes as 'people alleging' that they had such symptoms. These were quite objective, quite visible and audible. While a neighbor of the plant had asbestosis and his only known asbestos exposure was from the asbestos in ash that was blowing all over the place at Union Chemical, ATSDR refused to study the possible link. In short, their report was totally distorted."

"Throughout the process, the agency's emphasis was on saying 'You can't prove it came from Union Chemical.' We would reply, 'Okay, do an in-depth study to help us determine the links.' Then they would refuse to really conduct

such a study. I don't think that ATSDR is in there for the people, they seem to be in there to prove that there's no effect, or that you can't prove it."

Chapter Six:

Conclusions and Recommendations

THE PRECAUTIONARY APPROACH: AN UNMET PROMISE OF ENVIRONMENTAL HEALTH SCIENCE

During the past three years, as the National Toxics Campaign Fund and Environmental Health Network have been investigating the federal environmental health programs, we have identified extensive deficiencies in the way these programs are conducted. There have been drastic deficiencies in agency structure and leadership, in responsiveness to local communities, and in the manner in which public health investigations are conducted. Our recommendations to remedy these continuing deficiencies are set forth below.

The federal government's environmental health agencies were established to aid communities at risk. But instead of serving the people for whom they were created, the agencies have been virtually throwing away millions of dollars in taxpayers' money on misguided studies and assessments, in which inconclusive findings are entirely predictable even before the studies are implemented.

These predictably meaningless studies have become the bane of many communities where serious, toxic-related health epidemics are suffered or threatened. Instead of inducing precautionary action to end toxic contamination and exposure, they have increased the suffering and delay in numerous communities.

Despite the dreadful record of our national environmental health agencies, there remains a pressing demand for a genuinely helpful science of

environmental health. Though environmental health science has been abused frequently until now, there are real possibilities for engaging environmental health professionals in a productive, precautionary approach to toxic pollution and disease.

Placing primary emphasis on a precautionary approach

The primary role of federal environmental health agencies should be to identify situations in which additional precautionary measures are needed to reduce public exposure to toxic substances. This will require a dramatic shift in the programs and orientations of the federal environmental health agencies.

Action thresholds

Clear thresholds should be established and adhered to in recommending actions such as relocation and alternative water supplies. Action thresholds can be developed even though epidemiological studies around superfund sites are largely infeasible. The thresholds can be established by consideration of studies of the effects of chemicals on animal, and on all other relevant evidence. With such thresholds in effect, the job of environmental health agencies will become clearer -- determining whether potential exposures are rising to levels which necessitate additional health protective action.

Biological Markers

At the forefront of public health science today, researchers are developing methods for using biological markers to track the body's process of moving from exposure to clinical disease. They are learning to measure with precision the impact that chemicals have on organ systems such as the nervous and immune systems, and thereby measure the progression from exposure to disease. So far such markers have been used in some studies at hazardous waste sites and other human exposure scenarios. One of the most important prospects (suggested by the National Academy of Sciences as an "optimistic goal") is that science will move toward understanding what is happening in the human body sufficiently to see where on the exposure-disease continuum a given individual is, and to intervene appropriately either by ending exposure or by medical treatments.

This is a promising new science, for which a substantial investment of public health resources would be worthwhile. Special effort by federal environmental health agencies can identify and begin applying those markers which may indicate either prior toxic exposures or metabolic processes en route to disease. Government protocols should provide for frequent and appropriate applications of biological markers of exposure and toxic-related diseases. For example, additional use should be made of studies of nervous system, immune system and pulmonary indicators.

CENTERS FOR DISEASE CONTROL

Restructuring or Eliminating CDC Environmental Health Role

CDC and in particular Vernon Houk, the director of the Center for Environmental Health, have appeared from the outset to be biased against community environmental concerns. There is little reason to believe that this agency can do its job credibly. If it cannot be cleaned up, Congress should explore the elimination of CDC's Center for Environmental Health and the transfer of all environmental health responsibilities from CDC to ATSDR.

OVERHAUL OF HEALTH STUDIES PROCEDURES

End funding of studies which are inconclusive by design

Regardless of what agency conducts such studies, the federal government must end the practice of funding health studies which are inconclusive by design. No environmental health studies should be funded in the future unless it is first determined that the study design and situation in the local community make it plausible that the study would find an effect if one were present. For instance, if the size of a community is so small that statistically significant results would only emerge in a study which found eight or nine times the normal population's occurrence of a disease, preliminary evidence gathering efforts should determine whether there is any probability of detecting disease occurrences near that level prior to undertaking a full-blown epidemiology study.

Health Technical Assistance Grants For a "Second Opinion" Before and During Health Studies

Health studies should only be conducted after the community in question has received expert advice independent of CDC and ATSDR. Congress should enact legislation to create a program of Health Technical Assistance Grants (H-TAGs), and grant community groups the right to receive such grants at all National Priority List sites and all sites at which health assessments have been performed. The grants should be available to allow local residents to seek a "second opinion" on environmental health matters -- i.e. to review health assessments and to ascertain whether to seek further health studies. These technical assistance grants should be made available prior to any decision to conduct a health study; the technical advice provided under such a grant is essential to allow a community group to decide whether it wishes for a study

to occur and what type of study they will support. A citizens group which has already received a TAG grant from EPA for should be entitled to receive an H-TAG without going through the same initial approval process. No matching funds should be required to be provided by the local community or state. Any physician, toxicologist, or public health expert with environmental health credentials should be allowed to advise the grantee; in other words, ATSDR should not be allowed to use "political" criteria in deciding who they will fund for such independent advice.

*Public Involvement
and Veto Power*

Agencies conducting studies should be required to meet with the community to discuss potential health studies prior to developing scope, methodology and nature of the study that they intend to conduct. The initial discussion about a study should educate the community and engage in dialogue regarding possible types of studies that could be conducted in view of what is known. The local community's right to veto the undertaking of health studies should be clarified with an explicit provision of federal law.

*Health Study
Protocols*

Better protocols for health studies should be established, to expand the usage by ATSDR of alternative statistical analyses and tissue testing methods where these would be appropriate. The protocols should place greater emphasis on contact with the affected community, including interviews with residents and physical examinations, and on usage of biological markers.

*Reemphasizing
Exposure
Reduction
Precautions*

Despite inconclusive findings in health studies, precautionary principles should be applied to end potentially harmful exposures. Instead of reliance upon epidemiological evidence, other indicators such as laboratory testing of the materials involved should provide the principal guidance through which to exercise precautions.

*New Rules for
Selecting Health
Study Contractors*

ATSDR and CDC should develop new rules and procedures for selecting scientific investigators engaged in all future health studies. Instead of automatically selecting state health agencies to conduct studies, the federal agencies should utilize a public advisory process to undertake thorough screening of potential candidates to conduct the investigations -- considering their qualifications, past performance and public perceptions. No studies should be authorized for agencies or individuals with a history of engaging in public relations distortions geared toward minimizing public concern about health harms posed by environmental exposures. The pool of scientific investigators potentially eligible to conduct health studies should be broadened beyond public agencies to include credible scientific investigators in universities and the private sector; such contractors should, however, continue to be rejected for any appearance of conflict of interest, such as financial or personal ties to any corporations or individuals who have created toxic pollution sites.

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

*Overhaul of Health
Assessments
Procedures*

ATSDR's health assessment process must be overhauled. Legislation should specify:

1) The kinds of data required for a health assessment. The law should require ATSDR officials to speak with people residing in the community that is being assessed, and to secure all available public health and environmental data whenever that would be appropriate in view of the types of releases or exposures present at a site.

2) The uses of health assessments. A health assessment is a relatively quick review of available data regarding a site. The purpose and uses of such assessments should be limited to (a) identifying routes of exposure and determining whether there are substantial risks of current or future exposure to hazardous substances; (b) identifying immediate measures such as relocation of residents or provision of alternative water supplies which should be taken to end exposure, and advising residents as to possible medical implications of exposure; (c) providing information which can be utilized by the community in ascertaining whether to seek further health studies; and (d) identifying potential emergency circumstances which may spread hazardous substances, such as floods, hurricanes, earthquakes or human activities and prescribing measures to prevent harm from such contingencies. In contrast, the law should clarify that such assessments must not be utilized as the final word on whether a site presents a health threat to the community, nor in reducing the scope of remedial measures.

*Health
Assessments at
RCRA Sites*

The law should provide that at RCRA sites, a health assessment must be conducted by ATSDR if citizens petition the agency to conduct such assessments.

*Ending
Environmental
Health Illiteracy*

ATSDR should exercise leadership to encourage the public health and medical communities to increase environmental health literacy among professionals and exposed communities. Congress should establish a community environmental health training program to be funded by ATSDR and conducted by universities, and environmental and community advocacy groups. The purpose of the trainings should be to educate communities on the health hazards presented by hazardous substances, the relationship of various federal and state programs relating to hazardous waste sites, and the potential and

limitations of health assessments and studies.

Federal legislation should require that all medical and public health students complete at least one course in environmental health during their professional education. Current and future family physicians, as well as all other medical and public health professionals, should be required to attend periodic update courses on environmental health.

*Accuracy in
Chemical Profiles*

ATSDR chemical profiles should provide complete listings of all health harms for which any reputable studies have indicated to be caused by the named chemicals. Industry pressure must not be allowed to weaken these profiles.

*Eliminating
ATSDR Role in
Facility Siting*

ATSDR should be taken out of the role of telling communities that incinerators or landfills are "safe" for the community, since this is currently undercutting the agency's credibility. The law should explicitly prohibit the agency from involvement in appraisal of the safety of proposed facilities such as waste management facilities.

*Budget, Authority
and Relations To
Other Agencies*

ATSDR should be established as an independent Federal agency with authority, mandates, budget and administration entirely separate from CDC and EPA. ATSDR's authority to take independent action should include the right to order the relocation of residents in areas contaminated by toxic releases or take other appropriate action to end public exposures, in addition to their existing power to recommend action by EPA or local health authorities.

When ATSDR makes a recommendation to EPA, there should be a mandated time-frame within which EPA must act. Procedures should be put in place to monitor follow-up on ATSDR recommendations.

The ATSDR budget for fiscal 1992 should be at least double current spending -- i.e. \$100 million instead of the current \$50 million. This should include an initial allotment of \$10 million for the health technical assistance grants and \$5 million for a community training program. The registry segment of ATSDR should also be expanded budgetarily.

*Citizens Advisory
Panel*

ATSDR should immediately create a citizens' advisory board to provide accountability to the grassroots. Some elements of such accountability would include: hearings in or presentations by people from the communities affected; giving the Board their own experts (or having peer review panel advise citizens board); helping to ensure that the correct affected individuals are included in ATSDR health assessments and studies; and ensuring that the proper diseases are being investigated. Also, the Citizen Advisory Board should play a role in assessing the performance of subcontractors to ATSDR including state agencies and private health entities, and should make recommendations regarding the termination of subcontracts when appropriate.

Revisiting Past Assessments and Studies

ATSDR should thoroughly revisit all health assessments and health studies conducted during the 1980's.

ATSDR Officials Should Conduct Meetings With Communities Studied In This Report

ATSDR Assistant Administrator Barry Johnson should meet with representatives of the communities studied in this report to discuss the concerns raised and responsive actions that the agency will take to address them.

CONGRESSIONAL HEARINGS AND LEGISLATION

Congress should conduct hearings regarding the past and current performance of ATSDR and CDC. These hearings should include the following topics:

- o Examination of the reason why ATSDR and CDC continue to engage in health studies which are inconclusive by design.
- o The EPA-ATSDR relationship in general, and specifically in relation to the Uniontown, Ohio Superfund site.
- o The need for ATSDR to revisit health assessments and studies conducted during 1980's.
- o Biases displayed by CDC and Vernon Houk, including the admitted manipulation of data regarding Agent Orange by Dr. Houk in previous testimony before Congress, and his current attempts to deregulate dioxin exposures, as well as an overall inquiry into the issue of dioxin deregulation.
- o Other issues as raised by local citizens groups, who should be invited to testify, and all of the recommendations contained in this report.

Legislation should be drafted to embody the recommendations contained in this report and to address other issues raised in the hearings.

SYSTEMIC ENVIRONMENTAL HEALTH PROBLEMS DEMAND SYSTEMIC SOLUTIONS

In addition to the specific problems identified at the environmental health agencies, we have identified patterns that are common to many environmentally impacted communities. These patterns most often begin with poverty and unemployment accompanied by indiscriminate toxic chemical usage and dumping. Dramatic shifts in national policies on pollution prevention, liability law and health care are needed to correct the fundamental injustices we have observed.

Pollution Prevention

A national shift toward pollution prevention is needed, to reduce the use of toxic chemicals and the generation of the toxic wastes. Some chemicals which are known to be most harmful should be banned; the usage of others should be curtailed to the extent feasible by each industrial user. National legislation such as pending proposals to amend the national solid waste law, the Resource Conservation and Recovery Act, can help to effectuate such policies and thereby end the cycle of waste production and exposure of local populations. More money is spent by families each year on health care than anything else other than basic living expenses. More money is spent by businesses in lost work time by employees for health purposes, and for health insurance, than any other employee related expenses. Establishing a national pollution prevention strategy would pay a financial return into our national economy, by reducing skyrocketing health-related costs.

Reform Worker and Neighbor Compensation Systems

Worker compensation and disability laws, as well as liability laws applicable to locally exposed citizens, must be reformed to aid victims. Many workers whose health is harmed through exposure to chemicals in the workplace find that they are without recourse, due to the long latency periods from the time of exposure to the onset of diseases. Neighbors of pollution sources often find it economically and technically impossible to bring suits due to the high costs of evidence, and the over-reliance by many courts on epidemiological studies. As this report has documented, such studies, by their statistical nature, are unlikely to produce conclusive results at waste sites.

Some policy experts and public health professionals have suggested that additional health screening or treatment services should be provided directly to communities exposed to toxics. One way of achieving this might be to establish a national "environmental health service corporation" to supplement local health care services in toxic contaminated communities. Delivery of these services could be recoverable as damages eligible for recovery by government from responsible parties under the Superfund law. Two of the suggestions most frequently discussed by experts are (a) Providing clinical screening services such as annual physical examinations to communities exposed to toxic

releases; or (b) Establishing a right to medical care for people whose diseases are likely to be due to the chemicals to which they were exposed. The presence of exposures to certain chemicals combined with contracting of diseases which are closely linked to exposure would trigger the right to care. Examples might include ensuring treatment for bladder cancer for people exposed to betanaphthylamine, and for birth defects or leukemia where there was exposure to trichloroethylene. Such proposals should be developed further by Congress.

*National Health
Care Program*

Finally, a national health care program may be the only practical way to eliminate a portion of the injustices suffered in toxic-exposed communities. Millions of Americans have no health insurance or access to regular health care. Toxic exposures tend to be the worst in lower income communities, where the need for such resources is most acute. In many of the communities we have studied, chemical exposures are exacerbating a cycle of ill health and financial problems that are created by the lack of a sensible and fair approach to health care in the United States.

Footnotes

1. National Research Council, Environmental Epidemiology: Public Health and Hazardous Wastes, National Academy Press, 1991, p. 21.
2. Barnaby J. Feder, "In the Clutches of the Superfund Mess," New York Times, June 16, 1991 sec. 3, pp. 1,6.
3. Keith Schneider, "Toxic Pollution Shows Drop in '89," New York Times, May 17, 1991, p. A32.
4. Hirschhorn, Joel, and Kirstin Oldenburg, Prosperity Without Pollution, Van Nostrand Reinhold, 1991.
5. Peter Montague, "Earthly Necessities: A New Environmentalism for the 1990's," The Workbook, Vol. 16, No. 2, Summer 1991, P. 58.
6. The Workbook, *ibid*, P. 59.
7. See generally, National Research Council, Environmental Epidemiology: Public Health and Hazardous Wastes, National Academy Press, 1991.
8. William J. Blot and Joseph F. Fraumeni, Jr. "Geographic Patterns of Lung Cancer: Industrial Correlations," American J of Epidem. Vol. 103 (1976) pp. 539-550, cited in Hazardous Waste News, #274, Feb. 26, 1992.
9. It is essential, in order to prevent our population from being treated as "guinea pigs," to include consideration of the results of tests on animals in appraising the potential effect on human health. While a few scientists, most of whom consult for polluting industries, have attempted to challenge the relevance of animal studies to human exposure situations, the majority of public health professionals continue to assert that animal studies are one of the most viable means of determining which substances are harmful to humans. For instance, see National Research Council, *Id.* at 46, (noting that "all 52 compounds known to cause cancer in humans also produce it in animals.") and Strawn S. and Legator, M., Epidemiology and Toxic Torts: Animal Studies Yield Valid Insights, Trial, April 1991, p. 61.
10. Bengt B. Arnetz, "Mortality among Petrochemical Science and Engineering Employees," Archives of Environmental Health, Vol. 46 (July/Aug. 1991) pp. 237-248; cited in Hazardous Waste News No. 273, Feb. 19, 1992.
11. U.S. National Cancer Institute, Cancer Statistics Review, NIH Pub. #90-2789.
12. The Workbook, *ibid*, P. 60.
13. Office of Technology Assessment report BA-266, December 1985, pp. 34-2 and 346.
14. Office of Technology Assessment, report BA-436, pp. 55 and 272.
15. New York Times, July 16, 1991, Letter from Samuel S. Epstein M.D. And Ralph W. Moss.
16. The initial study was conducted by D. Piciano. Source: Interview with Dr. Marvin Legator, February 10, 1992.
17. "Center for Disease Control: Cover-Up, Deceit and Confusion," 1985 report of the Citizen's Clearinghouse for Hazardous Waste, Inc. Also, Author's Interview with Stephen Lester, Citizens' Clearinghouse for Hazardous Wastes, January 29, 1992.
18. Montague, Peter, "The Children Of Love Canal," Rachel's Hazardous Waste News #104 (November 21, 1988), pg. 1.
19. Author's Interview with Stephen Lester.

20. Citizen's Clearinghouse for Hazardous Waste, "Center for Disease Control: Cover-Up, Deceit and Confusion," 1985, p. 9.
21. R.E. Hoffman, et al. 1986, "Health effects of long-term exposure to 2,3,7,8-tetrachloro-p-dioxin," *JAMA*, 255, 2031-2038.
22. Author's interview with Dr. Marge Brewster, director of Arkansas Children's Hospital metabolic laboratory, 1988.
23. Interview with the author, published in In These Times, March 1988.
24. Time Magazine, July 23, 1990.
25. Ibid.
26. Kogan, M.D. and R.W. Clapp, "Soft tissue sarcoma mortality among Vietnam Veterans in Massachusetts, 1972 to 1983." Int J. Epidemiol. 17:39-43 (1988).
27. Associated Press article, May 25, 1991.
28. Keith Schneider, "U.S. Officials Say Dangers of Dioxin Were Exaggerated," New York Times, August 15, 1991, pp. A1, D23.
29. Richard Clapp, Summary of Conference in North Carolina, Posted on Econet, October 10, 1991.
30. Philip J. Hilts, "White House Shuns Key Role on Lead Exposure," New York Times, August 24, 1991, p. 12.
31. Health assessments are defined as "preliminary assessments of the potential risk to human health posed by individual sites and facilities, based on such factors as the nature and extent of contamination, the existence of potential pathways of human exposure (including ground or surface water contamination, air emissions, and food chain contamination,) the size and potential susceptibility of the community within the likely pathways of exposure, the comparison of expected human exposure levels to the short-term and long-term health effects associated with identified hazardous substances and any available recommended exposure or tolerance limits for such hazardous substances, and the comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure." 42 U.S.C. sec. 9604 (i)(6)(F).
32. Ibid.
33. General Accounting Office, Superfund Public Health Assessments Incomplete and of Questionable Value, August 1991.
34. ATSDR Responses to EHN, May 1991.
35. EHN interview with ATSDR's Barry Johnson, May 1991.
36. ATSDR health assessment, Koppers Superfund site, Texarkana, Texas, April 10, 1989.
37. Gerry Sikorski, "Employee Health and Safety at Federal Hazardous Waste Sites," Statement, House Civil Service Subcommittee, September 18, 1990.
38. Author's interview with Dr. Paigen, April 22, 1991.
39. Authors' interview with Dr. Richard Bird, Jr., internal medicine resident, Boston City Hospital, former director of Massachusetts Source Reduction Program, March 1991.
40. 1985 Citizen's Clearinghouse report on CDC, pp. 4-5.
41. Author's interview with Dr. Clapp, March 1991.

42. Authors' interview with Stephen Lester, Citizen's Clearinghouse for Hazardous Wastes, March 1991.
43. Author's interview with Dr. Ozonoff, March 1991.
44. ATSDR response to Environmental Health Network.
45. Authors' interview with Henry Cole, Clean Water Action Project, March 1991.
46. Authors' interviews with Henry Cole and Deborah Jacobsen, legal counsel for Cong. John Dingell's House Oversight Committee in March, 18, 1991.
47. Author's interview with Chris Borello, May 28, 1991. Borello also wonders why Dr. Mark Bashor, ATSDR's then-head of risk assessment who wrote the crucial letter to EPA's regional headquarters stating that some of Uniontown's residents should be evacuated, was transferred two-and-a-half months later to become ATSDR's liaison with the Department of Defense.
48. ATSDR has relied almost entirely in its epidemiological efforts upon examination of existing information and on "case control studies," in which a local randomly selected group is compared with a control group from another geographical area (or statistics for the broader population). Other types of epidemiological approaches which could be more suitable to a given situation are less frequently utilized. For instance, the agency has seldom used spatial clusters, comparing statistics concerning individuals living closest to a contaminated site with people living farther away. Similarly, a more comprehensive evaluation of community health, through interviews and more extensive physical examination of residents, is rarely undertaken.
49. National Research Council, Environmental Epidemiology: Public Health and Hazardous Wastes, National Academy Press, 1991, p. 4.
50. Epidemiology functions better when the population under scrutiny involves hundreds of thousands, than when it involves a few dozen or a few hundred families as is most typical around Superfund sites. Thus epidemiological investigations have proven helpful in studying some aspects of environmental hazards where the population samples have been large enough to study. For example, epidemiology has been useful to ascertain the effects of ozone [smog] on lung function, especially in children. It has also effectively identified problems of reduced intelligence and delayed cognitive development resulting from low-level lead exposures in young children, in part because the sample population is large enough to glean statistically significant results. A 1988 ATSDR report to Congress estimated that three to four million children between the ages of six months and five years are exposed to environmental sources of lead that place them at risk of adverse health effects.
51. Author's interview with Dr. Marvin Legator, toxicologist with the University of Texas in Galveston, April 17, 1991. Dr. Legator is one of the leading U.S. experts on environmental epidemiology.
52. Caldwell, "Twenty Two Years of Cancer Cluster Investigations at the Centers for Disease Control," Am. J. Epidemiology, July 1990, Supp. 1, at S43-47, cited in Strawn and Legator, "Epidemiology and Toxic Torts: Animal Studies Yield Valid Insights," Trial, April 1991, p. 61.
53. NRC, *Ibid.*, p. 219.
54. Report by Dr. Richard C. Bird, Jr., "Providing Medical Care to Communities Exposed to Environmental Hazards," June 1989, pp. 12-13. Hereinafter, Bird Report.
55. Barry Johnson, Implementation of Superfund's Health-Related Provisions by the Agency for Toxic Substances and Disease Registry, 20 ELR 10277, July 1990.
56. EHN Interview with Dr. Johnson, April 1991.
57. Author's interview with Dr. Legator.
58. Author's interview with David Ozonoff, March 1991.

59. Author's interview with Dr. Richard Clapp, March 1991.
60. NRC, *Ibid.*, p. 20.
61. *Ibid.*, p. 20.
62. Interview with Linda King, Environmental Health Network, and Barbara Miller, activist, Idaho.
63. ATSDR Health Assessment for Koppers Company, Inc., National Priorities List (NPL) Site, Texarkana, Texas.
64. Buzzworm Magazine, Sept./Oct, 1991.
65. Authors' interview with Willie Fontenot, April 1991.
66. Information provided by Cathy Hinds, National Toxics Campaign Fund.
67. Bird report.
68. Authors' interviews with North Hampton residents, March 1991.
69. IARC, Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Humans, 1979, p. 417.
70. Consider the case of Calvert City, Kentucky. After reviewing available data, the March 7, 1991, health assessment, ATSDR concluded that "the Calvert City Industrial Complex does not pose an imminent health threat requiring emergency actions. However, additional sampling data are needed before a complete analysis of the potential health threats...can be conducted."

The report called the air quality in and around the complex "degraded," but concluded that no evidence of any increase in the rate of cancer deaths in Marshall County or western Kentucky could be traced to the Complex. Yet EPA records reveal that in 1988, the seven facilities comprising the industrial complex released more than 10.5 million pounds of chemicals into the air by stack or fugitive emissions, including 1.6 million pounds of likely or known carcinogens. The Coalition for Health Concern, a Kentucky grassroots group, charges that ATSDR's Health Assessment was "misleading, deceptive, and superficial... Omitted was the fact that much of the current and off-site exposure to the Calvert City collection of toxic waste sites (241 officially listed by Kentucky) will involve relatively low doses of contaminants occurring over a long period of time. Such doses would not be expected to produce immediate adverse health symptoms. They could take the form of subclinical effects that result in illness or disease combined with other factors. We asked for body fluid and tissue testing and will continue to push for such testing by ATSDR."

Dr. Arthur C. Zahalsky, professor of immunology at Southern Illinois University, who reviewed the health assessment for Calvert City said: "This team from ATSDR should be ashamed of themselves. Basically what their health assessment tends to indicate is that ATSDR looked at limited evidence in a highly limited way...What I did not find was any reference to their own work or the necessity to follow up and perform these human health assessments in accordance with their own definitions." ATSDR's work in Calvert City, according to Zahalsky, completely obviates the ATSDR's own criteria for health assessment as set forth in an August 27, 1990 ATSDR document which indicated that ATSDR reviews should be done on "the renal (kidney), liver, biliary (gallbladder) and immune systems for persons who lived at, near, on top of, or downstream from hazardous and toxic sites..."

71. EHN interview with ATSDR's Johnson, April 1991.
72. The source material for this section was obtained by author Dick Russell, in preparing a series about Jacksonville for In These Times, March 1988.
73. Project Questionnaire for Community Health and Safety Project, submitted to Environmental Health Network by J.E. "Sonny" Fields of Texarkana.

74. EPA Superfund Project Update, Koppers Texarkana Site, April 1990.
75. EPA Superfund Project Update, Koppers Texarkana Site, April 1990.
76. Author's interview with Mr. Fields, May 23, 1991.
77. EPA Superfund Project Update, Koppers Texarkana Site, April 1990.
78. "Environmentalists Blast EPA," Texarkana Gazette, March 24, 1990, pp.1A, 10A.
79. Ibid.Emphasis added.
80. Ibid.
81. ATSDR Health Assessment for Koppers Company, Inc., National Priorities List (NPL) Site, Texarkana, Texas.