ENVIRONMENTAL JUSTICE FOR ALL: COMMUNITY PERSPECTIVES ON HEALTH AND RESEARCH NEEDS

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Some individuals, groups, and communities are at special risk from environmental threats. This is especially the case for low income persons, the working class, and people of color whose health may be imperiled by lead in their houses, pollution in their neighborhoods, and hazards in their workplace. Moreover, many of their children face potential health threats in the parks where they play. The environmental justice perspective unmasks the ethical *and* political *questions of "who gets what, why, and in what amounts." An environmental and public health strategy is needed to ensure that all Americans are protected.*

INTRODUCTION

Environmental and health laws have not provided equal protection for all Americans. Some populations in the nation are more vulnerable than others to health risks from environmental threats (Edelstein, 1988). Some of the worst environmental and health problems in the nation confront communities as distinct as urban ghettos, rural "poverty pockets," and impoverished

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4. Abbreviations: ACLU, American Civil Liberties Union; AMA, American Medical Association; ATSDR, Agency for Toxic Substances and Disease Registry; CAA, Clean Air Act; CDC, Centers for Disease Control and Prevention; CO, carbon monoxide; DDT, dichloro diphenyl trichloroethane; EDF, Environmental Defense Fund; EPA, U.S. Environmental Protection Agency; FIFRA, Federal Insecticide, Fungicide, and Rodenticide Act; HBCU, historically black colleges and universities; HUD, U.S. Department of Housing and Urban Development; LULUs, locally unwanted land uses; NAACP, National Association for the Advancement of Colored People; NCHS, National Center for Health Statistics; NIEHS, National Institute of Environmental Health Sciences; NOPES, non-occupational pesticide exposure study; NO_X, nitrogen oxides; PCP, pentachlorophenol; ROD, record of decision; SO_2, sulfur dioxide; TVA, Tennessee Valley Authority.

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Native American reservations. Many of these same communities are faced with a crumbling infrastructure, deteriorating housing, redlining and economic disinvestment, inadequate schools, chronic unemployment, high poverty rate, and overloaded health care systems (Reynolds, 1980; Bullard and Wright, 1986, 1990; Russell, 1989; Bullard, 1990; Ong and Blumenberg, 1990; Wright and Bullard, 1990; Bryant and Mohai, 1992; Bullard and Feagin, 1991; Grossman, 1992).

Despite the recent attempts by federal environmental and health agencies to reduce risks to all Americans, environmental inequities persist (U.S. EPA, 1992a). Some children, workers, and communities are disproportionately affected by unhealthy air, unsafe drinking water, dangerous chemicals, toxic wastes, and pesticides. Specifically, people of color, working-class persons, and low-income persons are exposed to elevated environmental hazards on their jobs, in their homes, and in the parks where their children play.

This nation's Black, Brown, and Red "Love Canals" have gone unnoticed for decades. Many African American, Latino American, and Native American communities have become some of the unhealthiest places to live in the country (Blumberg and Gottlieb, 1989; Bullard, 1990; Kozol, 1991; Angel, 1992). Historically, these communities and their inhabitants were seen as the paths of least resistance. They became likely targets for solid waste landfills, hazardous waste incinerators, chemical plants, lead smelters, abandoned toxic waste sites, and a host of other polluting industries.

Environmental decision making is influenced and shaped by the ethics and values of the decision makers. Consequently, "who gets what, where, and why" are issues of environmental justice that have far less to do with science than with institutional arrangements. Are locally unwanted land uses (LULUs) and health risks randomly distributed? The answer to this question is a resounding "No."

This paper examines inequities in exposure to toxicants and the resultant health effects in communities that are most vulnerable to environmental threats: low-income communities and communities inhabited by people of color. The paper also evaluates the role of government in reducing environmental inequities and protecting at-risk individuals, groups, and communities.

INEQUITIES IN EXPOSURE

Where a person lives, works, and plays can greatly influence his or her exposure to environmental hazards. Both race and class are related to the distribution of air pollution (Freeman, 1972; Gianessi et al., 1979; Gelobter, 1988; Wernette and Nieves, 1992), location of municipal landfills and incinerators (Bullard, 1983, 1987, 1990, 1991), and multimedia exposure to pesticides.

Hazardous Waste Incinerators

The mounting problem of garbage and hazardous waste disposal is adding another potential threat to high-impact areas. Incineration has become a leading technology for disposal of this

waste. This "risky" technology is also becoming a major source of lead in the air. In the next few years, millions of pounds of lead will be emitted into the air each year from the nation's municipal solid waste incinerators despite the known hazardous effects of this substance (Costner and Thornton, 1990).

Hazardous waste incinerators are not randomly scattered across the urban landscape. Communities with hazardous waste incinerators generally have large minority populations, low incomes, and low property values (Bullard, 1983, 1990; United Church of Christ Commission for Racial Justice, 1987; Costner and Thornton, 1990).

A 1990 Greenpeace report, *Playing with Fire*, found the following: (1) in communities with existing incinerators, the proportion of the population composed of minorities is 89% higher than the national average; (2) in communities where incinerators are proposed, the minority population is 60% higher than the national average; (3) in communities with existing incinerators, average income is 15% less than the national average; (4) in communities with incinerators, property values are 38% lower than the national average; and (5) in communities where incinerators are proposed, average property values are 35% lower than the national average (Costner and Thornton, 1990).

A report commissioned by the California Waste Management Board in 1984 advised the state on how to overcome political obstacles to siting mass-burn garbage incinerators (Cerrell Associates, Inc., 1984). Cerrell Associates concluded that "the state is less likely to meet resistance in a community of low-income, blue collar workers with a high school education or less." The report also warned the state that "all socioeconomic groupings tend to resent the nearby siting of major facilities, but the middle and upper socioeconomic strata possess better resources to effectuate their opposition" (Cerrell Associates, Inc. 1984).

Apparently following this advice, the City of Los Angeles proposed building its first state-of-the-art solid waste incinerator in the mostly African American and Latino South Central Los Angeles neighborhood. The project was defeated by local residents (Blumberg and Gottlieb, 1989). The California Department of Health Services granted two permits for state-of-the-art toxic waste incinerators for communities where Latinos constitute the majority of the population: Vernon, near East Los Angeles, and Kettleman City. The Vernon proposal was defeated, while the Kettleman City proposal is still pending. Latinos make up more than 95% of the population of Kettleman City, a small farmworkers' community of approximately 1,200 residents. The tiny community is already home to the largest hazardous waste landfill west of the Mississippi River. Chemical Waste Management, the largest waste disposal company in the world (Siler, 1991) operates the facility and is now proposing to build the hazardous waste incinerator under the State of California's permit. Local citizen concerns revolve around: (1) the farmworkers and their families who are already exposed to dangerous pesticides sprayed in the fields, (2) risks from the nearby operating hazardous waste landfill, and (3) added risks from the proposed hazardous waste incinerator.

Air Pollution

Most of the work documenting race- or income-based differences in exposure to air pollution has focused on the six criteria pollutants covered under the Clean Air Act Amendments (CAA) of 1970 (particulates, SO_2, NO_x, CO, oxidants, and lead). The work in this area falls into three chronological periods.

The first documentation of exposure differentials began in the early 1970s. Investigators then hypothesized that race and income differentials in exposure would disappear because the CAA standards were mandated to be applied uniformly. The second phase of investigation began in 1986 when Gelobter completed his work on the distribution of outdoor air pollution by income and race, from 1970 to 1984 (Gelobter, 1988). Since then, Wernette and Nieves (1992) have conducted similar work on the geographic distribution of air pollution.

Virtually all of the studies of exposure to outdoor air pollution have found significant differences in exposure by income and race. Gelobter (1988, 1990) found the effect on race to be considerably stronger than the effect on class, because the largest exposure differentials between the richest and the poorest were smaller than the exposure differentials between whites and nonwhites. This result holds even after controlling for the greater urbanization of people of color.

African Americans and Latinos are more likely to live in areas with reduced air quality than are whites. For example, Wernette and Nieves (1992) found the following:

> In 1990, 437 of the 3,109 counties and independent cities failed to meet at least one of the EPA ambient air quality standards. . . 57% of whites, 65% of African Americans, and 80% of Hispanics live in 437 counties with substandard air quality. Out of the whole population, a total of 33% of whites, 50% of African Americans, and 60% of Hispanics live in the 136 counties in which two or more air pollutants exceed standards. The percentage living in the 29 counties designated as nonattainment areas for three or more pollutants are 12% of whites, 20% of African Americans, and 31% of Hispanics.

Environmental epidemiology has traditionally sought to avoid studies that include "confounding factors" such as race or class. As a result, the public health community has very little information to explain the magnitude of some of the health problems related to air pollution. A classic example is found in South Central Los Angeles.

In the Los Angeles air basin, over 71% of African Americans and 50% of Latinos live in areas with the most polluted air, while only 34% of whites live in these highly polluted areas (Ong and Blumenberg, 1990; Mann, 1991). For a few days in 1992, the attention of the entire world was fixed on the flames of Los Angeles. Even before the uprising, however, the now riot-torn

South Central Los Angeles neighborhood was located in the "dirtiest" zip code in California (Kay, 1991; Mann, 1991).

This 1-square-mile area is saturated with abandoned toxic waste sites, freeways, smokestacks, and wastewater pipes from polluting industries. Some 18 industrial firms in 1989 discharged more than 33 million pounds of waste chemicals into the environment. The population living in the zip code area corresponding to this neighborhood is 59% African American and 38% Latino.

Dr. Russell Sherwin, a University of Southern California pathologist, performed autopsies on 100 youths between the ages of 15 and 25 who had died as a result of violence, accidents, and other nondisease causes. Sherwin (1990) discovered that 80% of the youths had "notable lung abnormalities" and 27% had "severe lesions on their lungs." The pathologist concluded that the youths were "running out of lung" (Sherwin, 1990; Mann, 1991).

Pesticides

Pesticides, which are designed to kill living creatures, represent a hazard to human health and the environment. Although there is sufficient information on many pesticides to identify the hazards associated with them, the vast majority of pesticides in use has never been fully tested in accordance with modern safety standards, as required by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Of the 620 pesticides that were grandfathered onto the market under 1972 FIFRA amendments with the condition that they would be fully tested, only 19 have been fully evaluated for health effects. Despite this lack of testing, we know that nearly 70 pesticides can cause either cancer, birth defects, or neurological problems (Moses, 1989).

People of color reside in communities that disproportionately host pesticide production facilities or disposal sites. They also are more likely to be employed as migrant farmworkers, an occupation that further exposes them to dangerous pesticides. Therefore, assumptions about acceptable daily intake of pesticides from dietary exposure, for example, ignore the reality of the daily exposure to pesticides both at work and by virtue of living in such a community.

Dietary Exposure. Triana, a small, all-black town in northern Alabama, is a good example of excessive exposure to pesticides in the diet. Barbara Reynolds in *National Wildlife* described Triana as the "unhealthiest town in America" (Reynolds, 1980). The federal Centers for Disease Control (CDC) tested the residents of this rural town of 1,000 people and found they had excessive levels of DDT (a pesticide) and of polychlorinated biphenyls, a highly toxic group of industrial chemicals (Kreiss et al., 1981). Some of the residents were contaminated with the highest levels of DDT ever recorded.

The DDT was produced at nearby Redstone Arsenal Army missile base from 1947 to 1971 by Olin Chemical Company. In 1971, DDT was banned in the United States. The manufacturing plant was torn down, but over 4,000 tons of DDT residue remained buried in the area and

eventually leached into Indian Creek, a tributary of the Tennessee River and a popular fishing place for the Triana residents (Haggerty, 1980).

The Tennessee Valley Authority (TVA) knew that the fish in Indian Creek were contaminated with DDT as early as 1978. However, it was not until the city's mayor, Clyde Foster, filed a class-action lawsuit in 1980 against Olin Chemical Company that the problems of the Triana residents were taken seriously (Haggerty, 1980). After years of delays and attempts to co-opt the local citizens, the lawsuit was settled out of court in 1983 for $25 million. The model settlement agreement had three main points. Olin Chemical Company agreed to: (1) clean up residual chemicals, (2) set aside $5 million to pay for long-term medical surveillance and health care of Triana residents, and (3) pay "cash-in-pocket" settlements to each resident (Bullard, 1990).

The problems associated with contaminated fish consumption in Triana have implications for the larger population. The Environmental Protection Agency's (EPA's) definition of an "average" fish consumer (one who consumes 0.04 kg fish/day) fails to address both economic and cultural differences in eating habits. Certain subpopulations, including rural poor, people of color living along waterways, and groups that depend on fish for subsistence, consume more fish than the general population (West et al., 1990). Currently, EPA's water quality standards for dioxin fail to reflect the exposure of the subpopulations that consume large quantities of fish (e.g., Native Americans, subsistence fishermen, and persons in the South living on the popular "catfish" diet).

Residential Exposure. Nearly four million public and subsidized housing units in the United States are frequently treated with pesticides hazardous to the occupants. The residents of these units include a disproportionately high number of people of color and those who are most vulnerable to pesticide exposure: young children and older people (Lewis et al., 1991).

Exposure to pesticides at home is usually low-level but long-term, which can lead to high total exposures. Every year, millions of pounds of pesticides (over 69 million pounds in 1989) are applied to homes and gardens (Lewis et al., 1991). The contamination of indoor air by these pesticides is a topic of increasing concern among public health officials.

EPA conducted the Non-Occupational Pesticide Exposure Study (NOPES) and found that indoor air concentrations of many common pesticides are more than 10 times greater than concentrations outdoors. EPA researchers found 23 pesticides in indoor household dust and air. In general, they found that the pesticides had been recently applied or used in the home. However, the study also showed that residues of many pesticides are found in and around the home even when the current residents have never knowingly used them. This finding applied to older as well as newer homes (Lewis et al., 1991).

Ground Water and Drinking Water Contamination. Because of the spiraling rise of groundwater contamination, the high value placed on clean water for drinking and other purposes, and the growing demand for this precious and declining resource, concern about pesticide contamination of groundwater has grown steadily in the past decade. These concerns are well-placed.

According to a report by the Office of Technology Assessment, "Because of the nature of groundwater contamination, largely out of reach of remedial actions and, thus essentially irreversible, prevention of groundwater contamination is the only means currently available for responding to the need to protect essential resources, environmental quality, and health" (U.S. EPA, 1990). EPA has detected 74 pesticides in the ground water of 38 states. In areas where drinking water is contaminated, the cost of bottled water and water filters is prohibitive for low-income groups.

Occupational Exposure. More than four million migrant and seasonal farmworkers and their dependents live in the United States and work on farms in almost every state in the country. Migrant and seasonal farmworkers are predominantly people of color: more than 80% are Latino, with African Americans forming the next largest group; Haitians, West Indians, Southeast Asians, and Native Americans are also members of America's hired farm labor force. Up to 25% of farmworkers are children.

As many as 300,000 U.S. farmworkers are poisoned by pesticides each year (Coye, 1985). These problems are complicated by inadequate health care and worker protection (Moses, 1989). More than 40% of all farmworkers in the United States have been sprayed directly or exposed by drifting spray. Of farmworker poisonings reported by physicians, 40% are caused by exposure to pesticide residues remaining in the fields after spraying.

Farmworkers earn an average of $5,000 per year, one of the lowest incomes in the nation (Moses, 1989). Migrant and seasonal farmworkers, both adults and children, face many of the same workplace hazards that endanger family farmers, including exposure to pesticides. But farmworkers are at an even greater risk of illness, because they have virtually no control over when, where, how, or how long they are exposed to danger. Unlike other workers in this country, migrant farmworkers are not informed what hazardous substances are being used at their worksite or how to protect themselves from these substances (Moses, 1989; Perfecto and Velasquez, 1992).

Nor does the law mandate workplace training for farmworkers. Farmworkers have been waiting since 1979 for regulations. No other occupational group has suffered so long without protection in the workplace. Few safeguards exist to protect noncertified pesticide applicators, who, for example, are allowed to apply even highly toxic, restricted-use pesticides without the guiding presence of a trained, certified applicator.

Fear of being fired and economic necessity are potent deterrents that keep most farmworkers from questioning the safety of their workplaces, from filing complaints against their employers when they recognize violations of workplace health and safety, or even from protecting themselves from the imminent threat of poisoning. The practice of "job blackmail" endangers the health of workers and communities (Bullard, 1990). It is tantamount to economic slavery.

Native American Land

Native American lands are a special case. Native American reservations and Indian nations are quasi-sovereign and do not fall under state and federal environmental regulations. As a result, they are prime targets for risky technologies. Reservations have been described as the "lands the feds forgot" (Beasley, 1990b; Tomsho, 1990). In addition, few of these nations have an infrastructure to handle the polluting industries that are being proposed for their communities. More than 100 waste disposal facilities have been proposed for Native American lands (Kay, 1991; Angel, 1992). Such proposals are made in spite of the fact that reservation inhabitants face some of the worst poverty, unemployment, education, and health problems of all Americans.

INEQUITIES IN HEALTH RISKS

Health threats posed by risky technologies generally increase with proximity to the source. Proximity to abandoned hazardous waste sites (United Church of Christ Commission for Racial Justice, 1987) and substandard housing result in increased health risks such as increased incidence of birth defects (Geschwind et al., 1992) and lead poisoning in children (Agency for Toxic Substances and Disease Registry, 1988).

Hazardous Waste

Scientific evidence is mounting to support what many researchers, lay organizers, and community leaders have been proclaiming for years: living near toxic waste dumps may be hazardous to one's health. A recent study, conducted by researchers at Yale University School of Medicine and the New York Department of Health, gives greater urgency to the need for more attention to these issues (Geschwind et al., 1992). The study, which reviewed the relationship between birth defects and residence near inactive hazardous waste sites, found a statistically significant 12% increase in the incidence of birth defects in babies born to mothers living near toxic sites.

Lead

Studying the health risks from proximity to lead is illuminating. For at least 40 years, America's children have been poisoned by lead. African American children, however, have been exposed to lead far more than white children. This poisoning has occurred with the full knowledge of the medical and public health communities and with open acknowledgement by state and federal officials. The practice continues today.

In 1971, a child was not considered "at risk" unless he or she had 40 micrograms of lead per deciliter of blood (40 µg/dl). Since that time, the amount of lead that is considered "safe" has continually dropped. In 1991, the U.S. Public Health Service (Centers for Disease Control, 1991) reduced the official "unsafe" level to 10 µg/dl. Even at that level, a child's IQ can be diminished and her or his physical growth stunted (Needleman, et al., 1992).

Whether in central cities, the suburbs, or rural areas, African American children suffer greater rates of lead poisoning than their white counterparts. The 1988 Report to Congress of the Agency for Toxic Substances and Disease Registry (ATSDR) estimates the percentages of elevated blood lead levels (>15 µg/dl) for U.S. children. Nearly half (49%) of African American children living in central cities suffer from elevated lead levels compared with 16% of whites living there. Similarly, 36% of African Americans and 9% of whites who live outside central cities are poisoned by lead.

Lead poisoning is also correlated with income. The same 1988 ATSDR report found that, in families earning less than $6,000, 68% of African American children had lead poisoning, compared with 36% of white children with similar family income. In families with incomes exceeding $15,000, 85% of African American children in cities have unsafe blood lead levels, compared to 47% of white children (Florini et al., 1990). Further, in this same income bracket, more than 38% of African American children suffer from lead poisoning, compared with 12% of white children. Thus, even when income is held constant, middle-class African American children are three times more likely to be poisoned by lead than their middle-class white counterparts.

In the spring of 1991, the Bush Administration announced an ambitious program to reduce the lead exposure of American children, including widespread testing of homes, certification of those who remove lead from homes, and medical treatment for affected children. Six months later, officials at the CDC announced that the administration "does not see this as a necessary federal role to legislate or regulate the cleanup of lead poisoning or to require that homes be tested, or to require home owners to disclose results once they are known, or to establish standards for those who test or clean up lead hazards" (Hilts, 1991).

As reported in the *New York Times*, the National Association of Realtors pressured President Bush to drop his lead initiative, because they feared that forcing homeowners to eliminate lead hazards would add $5,000 to $10,000 to the price of those homes, further harming a real estate market already devastated by the aftershocks of Reaganomics. The debate has been framed in the context of an "either-or" proposition: whether to maintain housing prices or improve human health. Certainly, improving both housing and human health should be a national goal.

For more than two decades, Congress and the nation's medical and public health establishments have waffled, procrastinated, and shuffled papers while the lead problem

steadily grows worse. During the years of Mr. Reagan's policy of "benign neglect," funding was considerably reduced. Even when funding reached $50 million per year, however, it was still inadequate and did little to correct the problem.

Meanwhile, year after year scientists document the harmful effects of lead poisoning in communities all across the nation. Coalitions of environmental, social justice, and civil liberties groups are now joining forces to address the lead problem. For example, the Natural Resources Defense Council, National Association for the Advancement of Colored People (NAACP) Legal Defense Fund, American Civil Liberties Union (ACLU), and Legal Aid Society of Alameda County (California) won an out-of-court settlement worth $15 - $20 million for a blood lead testing program in *Matthews v. Coye*. In this lawsuit, the plaintiff Matthews sued the state of California for not providing federally mandated blood lead testing for 557,000 children receiving Medicaid. This historic settlement will probably trigger similar lawsuits in other states (Lee, 1992).

Dallas is the seventh largest city in the United States and, with a population just under one million, the second largest city in Texas. The 265,594 African Americans who live there represent about 30% of the city's population. Dallas is still a racially segregated city, in which 8 of every 10 African Americans live in areas where the majority of the population is African American. In West Dallas, which has always been an African American community, the population of 13,161 residents is more than 85% African American. Before the area was annexed by the city of Dallas in 1954, few basic services were provided to local residents. However, Dallas did allow the area to be used as a garbage dump. The neighborhood is also home to a lead smelter that dates back to the 1930s. All of the lead smelters in the city are located in mostly African American and Latino neighborhoods (Bullard, 1990).

The 63-acre Murph Metals lead smelter (later renamed RSR Corporation) is located in West Dallas next to an elementary school and across the street from the West Dallas Boys Club and a 3,500-unit public housing project. The West Dallas housing project is located just 50 feet from the sprawling property line of the lead smelter and in the direct path of prevailing southerly winds.

During the peak period of operation in the mid-sixties, the plant employed more than 400 persons, few of whom lived in the West Dallas neighborhood. The smelter pumped more than 269 tons of lead particles each year into the West Dallas air. Lead particles were blown by prevailing winds through the doors and windows of nearby residents and onto the West Dallas streets, ball parks, and children's playgrounds.

Dallas passed a stringent lead ordinance in 1968. However, lax enforcement rendered the ordinance worthless. Dallas officials were informed as early as 1972 that the blood lead levels were elevated for children who lived in two African American and Latino neighborhoods: West Dallas and East Oak Cliff, where the Dixie Metals smelter operated (Dallas Alliance

Environmental Task Force, 1983). Living near the two smelters was associated with a 36% increase in blood lead levels. The city was urged to restrict the emissions of lead in the atmosphere and to undertake a comprehensive screening program to determine the extent of the public health problem. The city failed to take immediate action to protect the residents, most of whom were African American and poor, living near the smelters.

In 1980, the federal EPA, informed about possible health risks associated with the Dallas lead smelters, commissioned another lead screening study. In 1981, EPA's assessment confirmed what had been known a decade earlier: children living near the smelters were likely to have greater blood lead concentrations than children who did not live near the smelters (U.S. EPA, Region VI, 1991).

Soil-lead concentrations near the RSR smelter in West Dallas, for example, averaged 9 times that in the control area, while the average concentration near the Dixie Metals smelter in East Oak Cliffs was 13 times the norm. The lead levels in the soil were so high that the director of the nearby West Dallas Boys Club was forced to suspend outdoor activities.

After nearly four decades of complaining to city officials, local residents organized the West Dallas Neighborhood Committee on Lead Contamination in 1981. The group was assisted by staff from Common Ground Community Economic Development Corporation, a grassroots self-help group. Common Ground assisted the West Dallas residents in getting their case into the public domain, testifying at hearings, producing reports, and providing general technical assistance (Bullard, 1990).

The city took action only after a series of articles made the headlines in the local Dallas newspapers (Nauss, 1983). The *Dallas Morning News* broke the headline-grabbing story of the "potentially dangerous" lead levels discovered by EPA researchers in 1981. The articles triggered widespread concern, public outrage, several class action lawsuits, and legal action by the Texas attorney general.

Although the federal EPA was armed with a wealth of scientific data on the West Dallas lead problem, the Agency scrapped a voluntary plan offered by RSR to clean up the "hot spots" in the neighborhood. John Hernandez, a deputy administrator of the EPA, blocked the cleanup and called for yet another round of tests to be designed by CDC in conjunction with the EPA and the Dallas Health Department.

The results of the new study were released in February 1983. Again, this study established the smelter as the source of elevated lead levels in West Dallas children (U.S. EPA, 1983). Residents saw the government's earlier failure to respond as insensitive, unjust, and racist. Hernandez's delay of cleanup actions in West Dallas was tantamount to "waiting for a body count" (Lash et al., 1984).

Public pressure forced the Dallas City Council to appoint a task force to study the lead problem in 1983. The Dallas Alliance Environmental Task Force concluded that "the city [Dallas] has missed many opportunities to serve and protect the community-at-large and two neighborhoods in particular in relation to the lead problem we now address" (Dallas Alliance Environmental Task Force, 1983).

Two years after filing suit, the West Dallas plaintiffs negotiated an out-of-court settlement worth over $45 million. In the settlement, reached in June 1983, RSR agreed to clean up soil in West Dallas, set up a blood testing program for children and pregnant women, and install new antipollution equipment. The settlement, however, did not require the smelter to close.

The settlement was made on behalf of 370 children, almost all of whom were poor and black residents of the West Dallas public housing project, and 40 property owners. The agreement was one of the largest community settlements involving lead contamination ever awarded in the United States.

The pollution control equipment for the smelter was never installed. In May 1984, the Dallas Board of Adjustments, a city agency responsible for monitoring land use violations, requested the city attorney to order the smelter permanently closed for violating the city's zoning code. As it turns out, the lead smelter had been operating in the mostly African American West Dallas neighborhood for 50 years without having the necessary use permits. Four months later, the Dallas Board of Adjustments ordered the West Dallas smelter permanently closed.

The smelter is now closed. Although an initial cleanup was carried out in 1984, the lead problem remained. On December 31, 1991, the federal EPA crews began a "comprehensive" cleanup of the West Dallas neighborhood. It is estimated that the crews will remove between 30,000 and 40,000 cubic yards of lead-contaminated soil from several West Dallas sites, including school property and about 140 private homes. The project will cost from $3 to $4 million.

Still, West Dallas residents wonder why they had to wait 20 years for the government to act. After repeated health citations, fines, and citizen complaints against the smelter, one has to question the city's lax enforcement of health and land use regulations in its African American and Latino neighborhoods. Why were the people in this community deserted by the city, state, and federal government? It was not because the officials did not have sufficient scientific evidence or documentation of the health problem. Having all the facts has never been sufficient when people of color are the victims. The West Dallas example typifies environmental racism.

Residents of Dallas' East Oak Cliff neighborhood had to wait even longer than the residents of West Dallas. The Dixie Metals smelter was allowed to operate under a phase-down agreement. A coalition of African American and Latino residents was successful in closing the Dixie

Metals smelter under a settlement agreement in 1990, 6 years after the RSR lead smelter in West Dallas closed.

The nation's "Jim Crow" laws and practices forced African Americans into "dirty" jobs, polluted neighborhoods, and unhealthy playgrounds. Classic epidemiology has not been sensitive to the history and culture of families or communities. It has failed to assess how families and communities may be affected by stress or economic factors, which epidemiologists do not adequately take into account when assessing health outcomes. More importantly, much of science fails to examine the knowledge that local populations possess regarding their own health and well-being.

People who are studied by government health specialists often feel that their fear is not taken seriously. Moreover, the prejudices of some researchers lead them to conclude that health outcomes among the poor are a result of poverty and the resultant lack of quality health care, without taking into account their fundamentally different exposure to toxic chemicals. These problems are examined in the case studies in the following section.

COMMUNITY CASE STUDIES

Many children poisoned by lead live in housing and physical environments that are overburdened with a multitude of environmental problems: older housing with lead-based paint, congested freeways that crisscross their neighborhood, and industries that emit dangerous pollutants. No one knows the cumulative and synergistic effects of all these poisons on human health. Places like Louisiana's "Cancer Alley," Illinois' East St. Louis, Texarkana, and Southside Chicago are the dumping grounds for all kinds of toxins.

Southeast Louisiana's "Cancer Alley"

African American communities continue to become "sacrifice zones" for all types of LULUs. The threatened communities in Southeast Louisiana's "Cancer Alley" and in the petrochemical corridor (the 85-mile stretch along the Mississippi River from Baton Rouge to New Orleans) typify this pattern (Beasley, 1990a; Bullard, 1990; Lewis et al., 1992). Health concerns raised by residents and grassroots activists who live in Alsen, Reveilletown, St. Gabriel, Geismer, and Lions, all of which are located close to polluting industries, have not been adequately addressed by local, state, and federal agencies, including the federal EPA and ATSDR.

A few contaminated African American communities in "Cancer Alley" have been bought out or are in the process of being bought out by polluting industries under their "good neighbor" programs. The communities of Sun Rise and Reveilletown (founded by former slaves) no longer exist. The buy-out settlements are often sealed. Few of the recent settlement agreements provide for health monitoring or surveillance of affected residents. Some settlements have even required the victims to sign waivers that preclude them from bringing any further lawsuits against the polluting industry (Bullard, 1990).

These practices have resulted in the scattering of residents, making it difficult to carry out any future follow-up or long-term health monitoring. Some federal agencies have conducted health assessments, but few of these reports find their way into the hands of members of affected communities (Bullard, 1990; Lewis et al., 1992). Community groups could use government health studies as they negotiate buy-out agreements, contemplate litigation, or take some other remedial action.

East St. Louis, IL

Of the 66 cities in Illinois, East St. Louis "ranks first in fetal death, first in premature birth, and third in infant death" (Kozol, 1991). East St. Louis' health problem is exacerbated by raw sewage running in the streets, high lead levels in the soil, poverty, and dilapidated housing. Its population is 98% African American. The city does not have a hospital for the delivery of babies, and its health care system is insufficient in other ways.

East St. Louis is an urban environmental nightmare. The entire city lies downwind from the giant industrial plants of Monsanto, Big River Zinc, Cerro Copper, and the American Bottoms Sewage Treatment Plant and Trade Waste Incineration, one of the largest hazardous waste incineration companies in the United States. The community is further imperiled by hazardous chemicals that are transported by rail through the heart of the city. Accidents, spills, and evacuation of residents have become commonplace. Local residents have learned to live with the environmental time-bombs (some die from them) created by the nearby industries (Kozol, 1991).

Texarkana, TX

The all-black Carver Terrace neighborhood in Texarkana, Texas, was built in a 100-year flood plain, a site used by Koppers Company to treat wood until 1961. Carver Terrace was built in the 1960s and served as a "strivers row" (a neighborhood where upwardly mobile blacks could buy homes in a stable area in racially segregated Texarkana) for the 79 African American homeowners who include teachers, ministers, mail carriers, and factory workers.

In 1980, the state of Texas discovered that soil and ground water in Carver Terrace were contaminated with chemicals commonly used in wood preserving: pentachlorophenol (PCP), arsenic, and creosote. A health assessment was conducted at the Texarkana Koppers site in 1984, which became a Superfund site that same year. The EPA concluded that the Koppers Superfund site posed a "potential risk to human health resulting from possible exposure to hazardous substances at concentrations that may result in adverse health effects" (ATSDR, 1988). Clean soil and sod were placed on some of the residents' yards (U.S. EPA, 1992b).

Carver Terrace residents have had difficulty getting copies of the ATSDR health assessment on the Koppers Superfund site. EPA published a Record of Decision (ROD) in 1988 that called for a cleanup of the community. Residents wanted to be bought out and relocated from the

contaminated site since they were instructed not to let their children play outside, dig in their yards, or eat food from their gardens.

Some of the residents were not satisfied with EPA's handling of the contamination problem and appealed to their Congressional representative. Congress later mandated EPA to amend its 1988 ROD on the site, and appropriated $5 million for a buyout and relocation of the Carver Terrace residents (U.S. EPA, 1992a). As of August 11, 1992, 75% of the Carver Terrace residents remain in the contaminated neighborhood.

Southside Chicago

Chicago is the nation's third largest city and one of the most racially segregated cities in the country. Over 92% of the city's 1.1 million African American residents live in racially segregated areas. The Altgeld Gardens housing project, located on the city's southeast side, is one of these segregated enclaves.

Altgeld Gardens is encircled by municipal and hazardous waste landfills, toxic waste incinerators, grain elevators, sewage treatment facilities, smelters, steel mills, and a host of other polluting industries (Brown, 1987). Hazel Johnson, a community organizer in the neighborhood, has dubbed the area a "toxic doughnut" because of its physical location. Others see their community as a "toxic soup" where residents perform the role of human guinea pigs.

The southeast neighborhood is home to 150,000 residents, of whom 70% are African Americans and 11% are Latino. It also has 50 active or closed commercial hazardous waste landfills, 100 factories (including 7 chemical plants and 5 steel mills), and 103 abandoned toxic waste dumps (Greenpeace, 1991). Currently, health and risk assessment data collected by the state of Illinois and the federal EPA for facility permitting have failed to take into account the cumulative and synergistic effects of so many sources of poisons in one community.

The industrial encroachment into this Chicago Southside neighborhood places the community at risk. Altgeld Gardens residents wonder at what point government will declare a moratorium on granting permits for any new noxious facilities in their area. Can such a saturation threshold be determined without the necessary scientific studies that delineate the cumulative health impacts of all the polluting industries in the area? It seems apparent that such studies will not be completed in a timely fashion, especially if one industry or one chemical is examined in isolation. The totality of the polluting industries (lead smelters, landfills, incinerators, steel mills, grain elevators, etc.) imperils the health of nearby residents and should be factored into any future decisions to permit facilities.

A CALL TO ACTION

The poorest among the nation's inhabitants are being poisoned at an alarming rate. Many of these individuals, families, and communities have little or no access to regular health care.

They are among the millions of people with no health care insurance and no financial means to get even basic help. Vulnerable populations such as the elderly, the indigent, children, the unemployed, people of color, single parents, and the disabled are ignored in classic epidemiology.

Because of the cycle of poverty, racism, and ill health, these populations will drain the public health systems while the root causes of their health problems remain. The solution lies in the realm of environmental justice for all Americans. Institutional research has failed to address the "justice" question of who gets help and who does not, who can afford help and who cannot, why some contaminated communities get studied while others are not, and why industry poisons some communities and not others.

A national policy is needed to begin addressing environmental inequities. Federal legislation is needed to protect at-risk communities against environmental hazards. The Commission for Racial Justice was instrumental in convincing Congressman John Lewis (D-GA) and Senator Al Gore (D-TN) to sponsor the "Environmental Justice Act of 1992," a bill currently under debate in Congress. Regardless of the fate of this bill, all communities—rich and poor, black and white—deserve to be protected. Under our current system, some communities have received more protection than others.

In order for any exposed population or contaminated community to get help, sweeping changes are needed in key areas of the science model and the environmental health research model. At a minimum, these changes must include a reevaluation of the attitudes, biases, and values of the scientists who conduct environmental health research. There is a clear need for openness if we are to understand the diverse nature and complex health problems of at-risk individuals, groups, and communities.

Accepting the public as an active and equal participant (partner) in the governmental and academic research process is a first step toward building trust within affected communities. Governmental agencies and other responsible parties need to commit to using demonstration projects as a way to improve the health and living conditions of affected populations, rather than using the population for another study or publication.

We need a holistic methodology for documenting, remediating, and preventing environmental health problems. A commonsense approach to all health issues is beginning to emerge, not only in contaminated communities, but in all aspects of the health care system among individuals who find it impossible to pay for runaway health-care costs.

These problems of environmental and health inequities deserve to be placed on the national agenda for action.

RECOMMENDATIONS

The following recommendations are offered as starting points:

- Ensure citizen (public) participation in the development, planning, dissemination, and communication of research and epidemiologic projects. Use all available means to solicit direct input from the population being studied.

- Hold a series of congressional hearings (national and regional) on the problem of at-risk individuals, groups, and communities.

- Create a permanent Division or "Bureau of Environmental Statistics" within the federal EPA or ATSDR that collects and collates environmental and health data on at-risk groups. Develop models for preventing pollution that incorporate a framework for environmental justice.

- Establish environmental equity (justice) regional centers at historically black colleges and universities (HBCUs) and other universities. These centers should have the capacity for interacting with minority and poor communities. They should be designed to address environmental equity (justice) issues in the areas of education, research and technology, and economic development.

- Eliminate the double standard that, by omission, denies workplace protection for the nation's migrant farmworkers who, along with their families, are exposed to dangerous pesticides.

- Systematize follow-up studies and update studies of at-risk groups and communities. Given the inconclusive nature of many government-sponsored studies of the health effects of proximity to hazardous waste, some of the known affected groups and communities should be revisited.

- Pass federal legislation that outlaws discriminatory siting and permitting of facilities and mandates uniform enforcement practices at all facilities.

- Provide greater interagency coordination among EPA, ATSDR, National Center for Health Statistics (NCHS), National Institute of Environmental Health Sciences (NIEHS), Department of Housing and Urban Development (HUD), and others when assessing health risks and environmental impacts in and around at-risk communities. Enhance environmental health monitoring for site-specific health investigations. Investigate the cumulative effects of multiple sources of pollution on exposed communities. Investigate the various pathways of exposure associated with minorities and low-income communities.

- Increase the number of researchers of color who are working on environmental health problems in at-risk communities. Investigate how exposure differentials arise in particular situations. Conduct ethnographic studies of enforcement and compliance in communities inhabited by people of color and low-income groups.

- Expand the research in environmental epidemiology in an effort to document exposure levels, risks, and health effects associated with lead, hazardous waste, and other toxins. Create community health data bases with the goal of primary prevention.

- Individualize our methods of studying communities. Personalize our methods to fit the very cultures of those communities on pain of continuing to fail in our research projects.

- Train and certify lead inspectors, abatement contractors, and others who engage in the inspection, removal, covering, or replacement of paint, plaster, or other material containing a lead hazard. Lead cleanup has the potential of serving as a health and economic development program, because the worst problems generally occur in areas with high unemployment.

- Work with Native American grassroots groups and tribal governments to institute policies that prevent reservations from becoming the dumping grounds for household garbage, hazardous waste, and nuclear waste. Assist tribal governments with improving their infrastructure and with formulating regulations for protecting their environment and preventing pollution on reservations.

- Educate family physicians in small towns. Tackle the prejudices in the American Medical Association (AMA) on the subject of environmental illnesses.

- Create a national health care plan so that all people, no matter what their economic status, can receive quality health care on a regular basis.

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