Protecting Children from Chemical Exposure: Social Work and U.S. Social Welfare Policy

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Evidence suggests that the combinations of over 70,000 to 75,000 chemicals in air, land, water, and food to which children are exposed daily are instrumental in increasing the rates and severity of preventable childhood illness from asthma, leukemia, and other diseases. This article defines chemical contamination and reviews data regarding the ubiquity of toxic chemicals in the United States. It describes major risk pathways to fetuses and children at different developmental stages and discusses evidence regarding exposure and harm to children from chemical contamination. The adequacy of national social welfare and environmental policies is assessed and policy-level interventions are recommended to address the unique vulnerability of children—especially children who are poor and children of color—to toxic chemicals. The authors review the roles for social workers in protecting current and future generations from environmental contaminants.

Key words: childhood illness; environmental degradation; policy; social justice; toxic chemicals

Children in the United States are exposed daily to combinations of more than 70,000 to 75,000 chemicals in air, land, water, and food (Mott, 1996). Evidence suggests that those chemicals are instrumental in increasing rates of childhood asthma, leukemia and other diseases. Deaths from pollution-linked asthma (Dassen et al., 1986), and blood-lead levels are high enough to cause permanent neurological damage in 3 to 4 million children in the United States (Natural Resources Defense Council [NRDC], 1998). Despite life-changing—and largely preventable—consequences for children, the regulation of chemicals is rarely thought of as social welfare policy. Consequently, the social work profession is generally disengaged from practice-related knowledge and advocacy channels entailed by environmental legislation.

This article uses a policy research approach, with a focus on U.S. federal domestic policy, to provide a primer of the complex issues of children’s exposure to chemicals in the environment. The problem has local and international dimensions. Although we discuss implications of chemical exposure for children for social work practice at subnational levels, an adequate discussion of international policy in this arena, including U.S. foreign policy, is beyond the scope of this article (see, however, Hoff & McNutt, 1994; Rogge, 1998). The article’s focus on U.S. federal domestic policy illustrates the profound and broad influences that environmental legislation can have on children’s well-being. And the vantage point of a national perspective positions social workers to mobilize more rapidly to advocate for improvement in local and state environmental
policy or in U.S. foreign and other international policies, depending on the geopolitical communities and populations they serve.

The Social Work Imperative

Environmental organizations such as the Natural Resources Defense Council have taken important action to protect children’s health from environmental threats, as have the legal and medical professions. Social work as a profession has largely been absent from the struggle to protect children from this serious threat (Rogge & Darkwa, 1996).

Social work has not always been uninvolved in such arenas, however. Since the inception of social work as a profession, its commitment to children has never been questioned (Bruno, 1948); one of the first manifestations of that commitment occurred through the leadership of the Children’s Bureau in the early years of the 20th century (Combs-Orme, 1988). Indeed, innovative research conducted by the social workers in the Children’s Bureau indicted crowded, unsanitary housing and contaminated milk as major contributors to infant mortality (Devine, 1909; Lathrop, 1919). Using this information, Children’s Bureau social workers were instrumental in shaping successful policies to provide pure milk at reduced prices to poor families and to educate poor immigrants about pregnancy and the need for medical care during delivery (Combs-Orme, 1988).

Since that time, social work has been prominent in several movements to improve child health, including the Child Health Insurance Program, which provides health insurance for low-income children (Keigher, 1997). Indeed, enhancing the health of this country’s children is the area in which lies the greatest potential—and greatest challenge—for social work’s contribution to child well-being. Yet, health insurance can do little to address the kind of damage that can be inflicted by a poisoned environment.

The deplorable risk to children from chemical exposure is more so for its disproportionate burden on children of color, who more often live in communities characterized by low income, urban congestion, inadequate housing, poor home ventilation systems, poor air quality, and overcrowding. Wennette and Nieves (1992) found that 57 percent of white people, 65 percent of African Americans, and 80 percent of Hispanics live in counties that exceed at least one EPA air quality standard. In the midst of controversy, a number of studies indicate that people of color live in neighborhoods with disproportionately high numbers of pollution treatment, storage, and production sites, such as municipal landfills, sewage treatment plants, toxic waste sites, industrial facilities, and bus depots (Brown, 1995).

This issue is consistent with social work’s history and commitment to social justice. Hoff and Rogge (1996) emphasized the convergence of social, economic, and environmental issues, as it becomes increasingly obvious that although advantaged communities and nations prosper because of industrialization and technology, less-advantaged communities and nations often pay the price through environmental degradation and destruction.

Chemical Contamination and Children

More than 80 percent of the more than 70,000 natural and synthetic chemicals used in modern society have not been studied for their effects on human well-being or health (Johnson, 1995). Exposure to chemicals is ubiquitous: outdoors and indoors; in the air we breathe, on the land we walk; and in the water that we drink, in which we bathe, and with which we nourish our crops and yards. Exposure derives from industrial, transportation, commercial, and agricultural processes, as well as from household and yard use of solvents, pesticides, and other products.

Chemical exposure can cause genetic and chromosomal mutation; birth defects, miscarriages and other developmental damage; damage to female or male reproductive capacity; central and peripheral nervous system damage; cancer; chronic respiratory damage through tissue damage; or death from acute exposure through lungs or skin. Endocrine and immune system disruption, including reduced sperm count and reproductive cancers, is a rapidly emerging concern (Colburn, Dumanoski, & Myers, 1997). The effects of polychlorinated biphenyls (PCBs) are illustrative. PCBs were widely used in electrical equipment until their production was halted in 1977. These chemicals break down very slowly in the environment and accumulate in human tissue following exposure through air, water, and food. PCBs are associated with cancer and liver and reproductive and developmental damage; their accumulation in human breast milk is a continuing focus of research (Vartiainen, Jaakkola, Saarikoski,
As potentially dangerous as chemical exposure is, the risk is disproportionately experienced by children.

**Exposure Pathways and Unique Vulnerability of Children**

A National Academy of Sciences committee charged in 1988 with studying childhood exposure and vulnerability to pesticides in food indicated that children are physiologically more susceptible to harm and are—pound per pound—more exposed to chemicals than are adults. Moreover, the report noted that the full extent of children’s risk is difficult to determine because of inadequate information about children’s food consumption, the extent of their exposure, and the differential effects of chemicals on children (National Research Council, 1993).

**Preconception and In-utero Risk.** Children’s exposure to chemicals often begins with parental occupational exposure and may involve all physiological systems (O'Leary, Hicks, Peters, & London, 1991). Loewenherz and colleagues (1997) found that children of farm workers, the majority of whom are Mexican-born immigrants, who applied pesticides had significantly higher rates of pesticide exposure than referent children (see also Dawson & Madsen, 2000, regarding Navajo uranium miners). Lead poisoning in children of male and female lead workers was documented as early as 1891 (Lin-Fu, 1979). Indeed, exposure to some chemicals in childhood may have effects on the ova with which women are born, resulting in damage to fetuses conceived many years later (Bearer, 1995). Similar damage can occur to sperm when males are exposed to toxic chemicals up to a few days before conception (Colburn et al., 1997).

**Childhood Risk Exposure.** Children and adults breathe, eat, drink, and absorb toxins through skin. However, the rate of inhalation for infants at rest is twice that of adults, resulting in more exposure to chemicals in the air (Bearer, 1995). Moreover, developing cells are more susceptible to damage, and toxins concentrate more rapidly in smaller bodies, affecting brain, lung, bone, and skin development. The central nervous system is particularly affected during the first six years of life when cells are growing rapidly, and immature kidney and gastrointestinal tract development limit the body’s ability to eliminate toxins (Needleman & Landrigan, 1994).

Recent studies indicate that children’s exposure to chemicals in their daily environment—homes, schools, playground—has a greater role in childhood illness than previously thought. For example, a study of children living in homes with pentachlorophenol pesticide residue found that children had almost twice the level of this pesticide in their blood, compared with their parents (Cline, Hill, Phillips, & Needham, 1989).

Diet is a source of toxin exposure for children. Compared to adults, children eat a less diverse diet and, relative to body weight, eat and drink proportionately more, resulting in greater exposure to chemicals in food and water. Infants may experience the greatest risk in this regard. During infancy, for example, toxins in breast milk are passed to infants as are toxins in baby food that is contaminated by toxins in raw fruit and vegetables (National Research Council, 1993) and contaminated water used to reconstitute powdered baby formula (Bearer, 1995).

Pica, the eating of dirt, paint, or other nonfood substances, is common in most young children and is likely to pose a particular health risk in communities contaminated by industry (Lin-Fu, 1979); however, data are not available to quantify the ingestion or to document the effects of specific contaminants. Moreover, estimates of the risks of exposure to contaminated soil are based on chronic exposure, not the acute ingestions that result from normal exploratory behavior in very young children (Calabrese, Stanek, James, & Roberts, 1997).

Play also poses unique risks to children. Infant and toddler hand-to-mouth activity increases the likelihood of ingesting toxins. Pesticides and other toxins concentrate in or near the earth, where children play, and, particularly in developing countries, where they work (Wesseling, McConnell, Partanen, & Hogstedt, 1997). Children’s skin area is twice that of adults, considering body weight, so that skin contact with toxins, such as formaldehyde from sitting or walking on carpet, poses greater risk (National Research Council, 1993). Older children’s outdoor exploration may draw them to abandoned lots, brownfields (chemical or radiation-contaminated land on which vegetation will not grow), and dangerous work sites.

Adolescence brings its own risks and a new cycle of exposure with the completion of ova and sperm maturation and brain, breast, and gonad development. Two forces increase adolescents’
risk. First, the increased mobility that results from employment, independent transportation, and decreased parental supervision may provide new experiences that expose adolescents to contaminants (Bearer, 1995). Second, adolescents are often unaware of risks or unwilling to modify their behavior to avoid the risks of which they are aware. Such risk taking, which is normative developmental behavior for adolescents, can lead to addiction or pregnancy and can result in exposure to environmental toxins (Lightfoot, 1997).

Consequences of Chemical Exposure for Children

Lead poisoning and asthma are major contributors, about which relatively much is known, to morbidity and mortality among children. They are, however, just two of many linked with chemical exposure. Other conditions, including certain childhood cancers, endocrine and immune system disruption, and damage to the central nervous system, are relatively new areas about which data are emerging (Colburn et al., 1997).

Lead Poisoning. Lead poisoning in children causes deficits in intelligence and reading and hearing ability; it can lead to learning disabilities, reduced attention span, and increased hyperactivity, headaches, antisocial behavior, and violence. It is associated with brain, liver, and kidney damage and death (Harte, Holdren, Schneider, & Shirley, 1991). Research indicates that there are intergenerational risks from lead poisoning; Gonzalez-Cossio and colleagues (1997) found children of Mexican mothers exposed to lead to be at risk of low birth weight and developmental and behavioral deficits. The Centers for Disease Control and Prevention (CDC) estimated that over 560,000 children drink lead-contaminated water (Mott, Fore, Curtis, & Solomon, 1997).

More than 80 percent (64 million) of U.S. homes built before 1978 contain lead paint and children under seven years of age live in approximately 19 percent (12 million) of these homes (U.S. Environmental Protection Agency [EPA], 1996).

That lead poisoning is preventable has been known since the early 1900s (Lin-Fu, 1979). Medical literature of the first half of the 20th century contained dozens of articles about childhood lead poisoning (Berney, 1993). Data revealed connections to slum dwellings, with a higher incidence among African Americans, and identified pica as a source of lead poisoning. Extensive epidemiological and case studies in Baltimore showed most cases to occur in two-year-old children and during the summer months (Berney).

Although the population at greatest risk, the source of the poison, and the seasonal variation in poisoning were identified in the early 1950s (Eidsvold, Mustalish, & Novick, 1974), significant action to prevent the disease did not begin until individual health workers began to act in the 1950s and 1960s (Lin-Fu, 1979).

Early efforts to prevent lead poisoning and identify children for treatment grew from advocacy groups, with the Children's Bureau and other public agencies moving to educate the public. Chicago led the way in developing and expanding mass screening programs, and early screenings found 25 percent to 45 percent of children living in urban, high-risk areas to have dangerous levels of blood lead (Lin-Fu, 1979). Lead poisoning was a salient issue for the social action movements associated with the War on Poverty in the 1960s. Staff of the community health centers and hospitals in low-income communities rallied to it (Berney, 1993), organizing with residents to demand better conditions and health care that would reduce the prevalence of lead poisoning. Social workers were an integral part of those early programs (Combs-Orme, 1990).

Despite continued exposure, there has been a significant reduction in children's blood lead levels. Legislation banning lead-based gasoline, lead-based paint, lead solder in food cans, and lead in ceramic products intended for use with food and drink have reduced U.S. children's exposure to lead substantially. Results from the National Health and Nutrition Examination Survey show significant declines in blood lead levels for all ages, with particular improvements for children (Anonymous, 1996).

Indeed, the percentage of children with blood lead levels equal to or greater than 10 micrograms of lead per deciliter (µg/dL) fell from 88.2 percent in 1976–80 to 8.9 percent in 1988–91 to 4.4 percent in 1991–94. Overall, lead poisoning still affects 4.4 percent (close to 1 million) of all American preschoolers (CDC, 1997). Lead remains one of the most serious and researched environmental risks for children (Berney, 1993).

Lead poisoning continues to affect children of color disproportionately, however. Lead poisoning affects 11.2 percent of African American children compared with 2.3 percent of white children.
(EPA, 1996). Much of the racial disparity in lead poisoning is accounted for by poverty; 8 percent of low-income children compared with 1 percent of high-income children have blood-lead levels exceeding federal safety standards. Indeed, among all poor children in the United States, lead affects 28.4 percent of African American and 9.8 percent of white children (Brody et al., 1994).

**Asthma.** Asthma is a chronic condition characterized by reduced respiratory functioning and distress due to mucous secretion and acutely or chronically inflamed, constricted bronchial airways (NRDC, 1998). At least 6 percent of U.S. children, or approximately 5 to 6 million children, have asthma (CDC, 1996). Asthma is the most prevalent chronic childhood illness and the leading cause of school absences and hospital admissions for children (CDC, 1996; EPA, 1996). CDC studies indicate that asthma increased 118 percent overall and 160 percent among preschool children between 1980 and 1993. Moreover, asthma-related deaths among children ages five to 14 more than doubled from 1979 to 1995.

Like lead poisoning, asthma strikes people who are poor, and thus people of color, disproportionately (Newacheck & Taylor, 1992). A recent study in New York City found an astounding 38 percent of homeless children to suffer from asthma (Bernstein, 1999). African American children are four times more likely to die from asthma than white children. The largest increase in asthma in the 1980s and 1990s was among inner-city African American children, but other children of color also have significantly elevated risk. The rate of asthma for children of Puerto Rican Hispanic mothers is 2.5 times that of white children and over 1.5 times of African American children (Beckett, Belanger, Gent, Holford, & Leaderer, 1996).

Pesticide exposure among the approximately 1 million children of farm workers (77 percent of farm workers are Mexican-born; 75 percent earn less than $10,000 yearly; 6 percent of farm workers are between ages 13 and 18; U.S. Department of Labor, 2000) places them at disproportionate risk of asthma and related respiratory diseases as well as other illness disability (Guillette, Aquilar, Soto, & Garcia, 1998).

The causes of asthma are not fully understood, although allergens, dust, cockroach feces, and indoor and outdoor air pollution are clearly implicated (Needleman & Landrigan, 1994). Sources of chemical contamination linked to asthma and other childhood respiratory illnesses include coal-burning power plants and other industrial facilities; dry cleaning stores and other neighborhood commercial businesses; vehicles; and household materials including formaldehyde in new carpet and wood preserved with creosote and arsenic. Review articles (Bates, 1995; EPA, 1996) on the effects of air pollutants on children indicate that sulfur dioxide, carbon monoxide, ozone, benzene, and formaldehyde are among the chemicals associated with acute and chronic respiratory illness; decreased lung function and resistance to respiratory infections; and exacerbated episodes of asthma and other respiratory conditions.

A recent Dutch study of 459 children with allergies found that increasing concentrations of particulates were related to increased wheezing and shortness of breath (Boezem et al., 1999). Particulate matter air pollution is associated with more restricted activity days, school absences, increased acute and chronic respiratory distress, and asthma and bronchitis in children. Particulate matter, in addition, typically contains heavy metals such as lead, mercury, and arsenic (Peters, Dockery, Heinrich, & Wichmann, 1997) and can damage and inflame lung cells, constrict bronchial passages, and suppress immune system responses. Acute and chronic heavy air pollution are associated with higher mortality rates and mortality risk in children with asthma and other respiratory illness (CDC, 1996).

**Federal Environmental and Social Welfare Policies**

The general failure of policy to protect children is demonstrated by federal toxicity standards based on estimated average chemical effects on adults (Landrigan & Carlson, 1995). Children’s unique exposure pathways and susceptibility to chemicals have been largely unaccounted for in federal laws designed to protect humans from drugs, other toxic substances and chemicals, and hazardous household and commercial waste (Landrigan & Carlson). Policies designed to protect children from harmful chemicals are included in environmental and housing regulations and have been generally absent from health and social policy.

Until very recently, the only federal laws specifically mandating attention to children’s special vulnerability to chemical contamination were the Lead-Based Paint Poisoning Prevention Act (P.L.
the Childhood Lead Poisoning Control Act, the Poison Prevention Packaging Act of 1970 (P.L. 91-601), and certain aspects of the Clean Air Act. The Lead-Based Paint Poisoning Prevention Act, passed in 1971, led to mass screening and treatment programs in War on Poverty programs, including the Children and Youth Projects, Community Health Centers, and the Early and Periodic Screening, Diagnosis and Treatment (EPSDT) program, part of Medicaid.

The Residential Lead-Based Paint Hazard Reduction Act of 1992, Title X of the Housing and Community Development Act of 1992 (P.L. 106-568), provides grants to reduce lead, train workers in abatement, and identify lead-based paint hazards. As of March, 1996, regulations require, for most housing units, disclosure of information about lead-based paint before the units can be sold or rented (Title 24, Housing and Urban Development Act, 1965). Nevertheless, lead abatement in homes and water systems is technically difficult and expensive. Public policy, often in the form of nonfunded or partially funded mandates, has been slow and ineffective in reducing this significant risk to poor children (Berney, 1993).

A 1999 report by the Alliance to End Childhood Lead Poisoning and the National Center for Lead-Safe Housing (Alliance for Healthy Homes, 2003) highlighted local and state activity from the legislation discussed earlier. The report noted that most states do not monitor intervention outcomes or track measures used to correct home hazards. Moreover, only 29 states have written standards for case management; 35 have written standards for environmental investigations. A minority of states have legal authority to order cleanup in homes with lead contamination, even in cases of documented child poisoning.

Early air quality standards were initiated in the 1950s, but the first major legislation was the Clean Air Act (P.L. 91-604, 1970), which set tolerances for and regulated outdoor air quality, including programs for acid rain, ozone depletion and fuel formulas. The increased stringency of air particulate emission standards, established through EPA policy changes in 1997, is an important step toward greater regulatory protection for children from asthma and other respiratory illnesses.

Amendments to the Safe Drinking Water Act (P.L. 104-182) in 1996 include a right-to-know mandate requiring water suppliers to mail customers yearly status reports of contaminants in their water supply, and computer-based, publicly accessible information on contaminants in water systems across the nation (Mott et al., 1997). Social workers are mindful of the fact that low-income families and those with less education may be less able to use this information to protect their children, so that advocacy on behalf of these groups remains essential.

Recent developments suggest increased sensitivity to children's need for protection from chemical toxins. In September 1996 EPA Administrator Carol Browner announced that children's needs would be incorporated into all new agency regulatory standards and that existing standards also would be revised (EPA, 1996). In 1997 President Clinton signed Executive Order No. 13,045 directing all federal agencies to incorporate children's needs into current and future regulatory action (Executive Order, 1997). Other developments are a new EPA Office of Children's Health Protection (EPA, 2003a); the Agency for Toxic Substances and Disease Registry's Child Health Initiative (2003) to assess risk for children living near toxic waste sites; and, in 1998 the allocation, through EPA and DHHS, of $10.6 million for new Centers of Excellence in Children's Environmental Health (EPA, 2003a).

One of the most encouraging developments is the Food Quality Protection Act (FQPA) of 1996 (P.L. 104-170). This act amends the Federal Food, Drug, and Cosmetic Act (P.L. 92-387) and the Federal Insecticide, Fungicide, and Rodenticide Act (P.L. 92-516, 1972) to strengthen U.S. food safety standards, with particular attention to children's vulnerability. The FQPA mandates risk assessment procedures based on precautionary principles, such as the use of pesticide residue safety standards with a tenfold margin of safety for infants and children. The FQPA requires the EPA, U.S. Department of Agriculture, and the Department of Health and Human Services (DHHS) to reduce the gap in knowledge about children's food consumption patterns through national surveys and data collection. FQPA requires public dissemination of pesticide residue tolerances established for infants and children. Furthermore, it establishes a consumer right-to-know process for distributing information about health risks from pesticides in food, actions taken to reduce these risks, and ways that citizens can reduce exposure to chemicals in food.

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Moreover, the recently introduced Children’s Environmental Protection and Right to Know Act, most recently subsumed under the No Child Left Behind Act of 2003 (H.R. 963, 2003), would amend the Emergency Planning and Community Right-To-Know Act of 1986 (P.L. 99-499) and the Federal Hazardous Substances Act (P.L. 86-613, 1960) to establish, for facilities using toxic chemicals, reporting thresholds that take children’s risk into account. The proposed act requires DHHS to publish a list of chemicals determined by any federal agency to have carcinogenic, neurotoxic, or reproductive toxic effects. The act also requires manufacturers and importers of children’s toys and other products used by children to report their use of such chemicals to the Consumer Product Safety Commission, which, in turn, will publish this information.

Under consideration as well in various forms is the School Environment Protection Act (SEPA), also recently subsumed in the No Child Left Behind Act of 2003 (H.R. 693). SEPA would require schools to maximize the use of integrated pest management methods (that is, nonchemical approaches including sanitation, biological controls, structural repairs); minimize the use of pesticides; and require that parents and staff receive notification before pesticide applications on school grounds.

**Practice, Policy, and Research Challenges**

Children’s risk from chemicals in the environment is an emerging professional practice arena, shaped to date largely by environmental activists and scientists and the medical and legal professionals. Social work must act soon to have a defining influence on how child protective practice evolves. This section suggests practice, policy, and research roles for social workers at federal, state, and local levels. A number of suggested websites are included. For social workers, forays into this arena generally means applying familiar skills to a new substantive area, with new collaborators and antagonists, through new advocacy channels.

**Practice Challenges**

For social work practitioners across the micro-macro practice continuum, many familiar educational, collaborative, assessment, and intervention skills apply. One important early step in collecting information is to learn what client–constituents and colleagues know or suspect; often, when children have been harmed by chemical exposure (for example, the contamination at New York’s Love Canal), the problem was first identified by the families experiencing exposure (Center for Environmental Health and Justice, 2003).

Clinicians, case managers, organizers, and administrators can work with client–constituent groups to arrange agency in-service training, local brown bags, and other educational venues on children’s chemical exposure. Education is a natural way to build new collaborations with environmental professionals and activists in the public, not-for-profit, and private sectors. Collaboration with children, their families and their support systems can raise the level of education and empowerment—for client–constituents and social workers—as learning about the risks, sources, consequences, and strategies to reduce or treat exposure is shared.

Clinical and direct practitioners may focus training on symptoms associated with chemical exposure (Wacker Foundation, 2003). With lead, pesticides, and other chemicals exposure emerging as a cause of antisocial behavior and of developmental disabilities such as attention deficit hyperactivity disorder (Schettler, Stein, Reich, & Valenti, 2000), training might discuss the socioeconomic costs of reducing contact with chemicals that cause such disorders versus the cost of chemicals used to treat them. Organizers may consult with client–constituents and government and environmental organizations to learn about the quality of local air and water and use Internet-accessible databases to map the proximity of chemical-emitting facilities to schools and residential areas (Environmental Defense Fund, 2003; EPA, 2003b). Organizers can use community mapping techniques with neighborhood associations and youth groups to locate sources of contamination (for example, polluted waterways, commercial facilities). Managers and administrators can identify and reduce chemical hazards in their organizations’ facilities (that is, pesticide use or indoor air pollution) as well as locate new funding sources for programs with environmental components.

Social workers in health and mental health, schools, social services, and other settings can integrate basic environmental contaminant content into psychosocial assessments of children. The American Academy of Pediatrics’ environmental home inventory, for example, comprises 20 yes–no
response items about where a child spends time; parental workplace; household and yard contaminants; diet (for example, contaminated fruits or water supply); and hobbies (for example, exposure to lead, solvents; Etzel & Balk, 1999; see also the Children’s Environmental Health Network, 2003). With knowledge about symptoms of chemical exposure, such information can alert practitioners children for medical assessment and treatment, educate children and their families, and help them reduce chemical exposure in their lives.

Counseling, support, and case management roles are important for children and families facing chemical exposure. Lin-Fu (1979) noted the stressful home environments commonly experienced by children with lead poisoning (and, presumably, children diagnosed with other contaminant-induced diseases or disabilities) and social workers’ roles in providing emotional support, locating community resources, negotiating with landlords, and finding safe housing. Since the 1960s, social work practice regarding genetic disorders mostly has been limited to clinical assessment and counseling services as, for example, families decide about pregnancy and abortion of affected fetuses (Rauch & Black, 1995). As Rauch and Black stated, however, “Documentation of relationships between environmental agents and birth defects highlights the importance of preventive practice” (p. 1114). Although they advocated organizing workers and citizens to protect themselves against dangerous contaminants, they did not document the source or nature of contaminants. Expanded social work roles include documenting suggestive evidence of children’s exposure in their environments and sharing that evidence with others such as constituents, public health officials, and interdisciplinary coalitions.

Social work has been tangentially involved in environmental contamination on several fronts. In the 1960s social workers in War on Poverty programs fought to improve conditions in neighborhoods where Head Start and health clinics were located and to empower disadvantaged communities to lobby for clean-up. In these cases, environmental advocacy was an integral part of service delivery success. New advocacy roles may include interceding with medical personnel for blood or hair sample tests for exposure to chemicals and pressing government officials and health insurance carriers to pay for such tests. New roles may involve organizing with client-constituents toward negotiations with landlords and housing officials to adopt integrated pest management techniques, renewing the fight to abate lead in housing, or challenging polluters in court. Environmental advocacy for children provides new incentives for locality development and political social work roles in rejuvenating contaminated “brownfields” in low-income neighborhoods, developing “green” industry that protects workers and their families, or reducing vehicular pollution emissions (Natural Resources Defense Council, 2003).

In addition, social workers who practice with farm workers, laborers, and others in workplaces can provide language and culturally sensitive information in keeping with workers’ right-to-know about hazardous chemicals in the workplace, provide information about chemicals carried home from the workplace, engage with workers and others to assess and monitor workplace safety measures regarding chemicals, and advocate with workers, workplace owners, and regulatory officials to improve worker safety.

Each aspect of practice described requires an understanding of the risks of chemical exposure for children. It is not reasonable to require social work educational programs to provide comprehensive information, given the already-packed social work curriculum. It is feasible, however, to address children’s developmental vulnerability to chemicals in a session in human behavior and the social environment (HBSE) courses. Orientation to primer information and key resources in HBSE can alert future social workers to the significance and ubiquity of the issue. Data and case examples of children’s chemical exposure can be used in a number of courses to illustrate, for example, social, economic and environmental justice issues, and to identify new field and community service opportunities (see, for example, Hoff & McNutt, 1994; Rogge, 1993).

Policy Challenges
Among the policy-related strategies for social workers regarding children and chemical exposure is to be well positioned and active in leadership roles: currently, there are no social workers (as identified by degree or professional association) on advisory bodies for the Children’s Environmental Health Network (2003), EPA’s Office of Children’s Health Protection (EPA, 2003a), or
the Agency for Toxic Substances and Disease Registry’s (2003) Office of Children’s Health. However, the most efficient way for social work to influence policy in this arena is through our national and state professional associations. Collectively, we have an important role to play at the environmental table with other organizations such as the:

- American Psychological Association, Parkinson’s Disease Foundation, and others promoting the ban of neurotoxic, manganese-based gasoline additives (Anonymous, 1996)
- United Farm Workers of America, American Public Health Association, and others petitioning the EPA to designate farm children as a special risk group regarding pesticide exposure (Natural Resources Defense Council, 1998)
- National Council of La Raza, the Association of Schools of Public Health, the World Wildlife Fund, and others fighting to ban the testing of pesticides on humans (Children’s Environmental Health Network, 2003)
- American Federation of Teachers, Union of Concerned Scientists, the National Wildlife Federation; and others lobbying for environmental protection in schools (Beyond Pesticides/National Coalition against the Misuse of Pesticides, 2003).

Collective approaches can be used at state and local levels. For example, only 30 states regulate pesticide use in schools. The existence and implementation of pesticide policies for individual schools and districts vary tremendously (Owens & Feldman, 1998). Moreover, social workers can help organize constituent and interdisciplinary groups that include, for example, teachers, nurses, public health building inspectors, local and state pollution control officials, and environmental scientists and activists to advocate with organizations and legislative bodies for chemical regulation, indoor and neighborhood air and water quality, and other environmental issues that put children at risk.

Constant vigilance is required to protect existing legislation. Opponents of the EPA’s 1997 ozone and particulate matter standards, for example, continue efforts to block the standards, which, if implemented, are estimated to improve significantly the health of 35 million U.S. children (Mott et al., 1997). The pesticide industry is press- ing to diffuse FQPA requirements, including the children’s 10X safety margin factor for pesticide residue standards in food (Kenney, Groth, & Benbrook, 1998); the recent ban of about 800 over-the-counter products containing the pesticide Durban (the registered trademark for chlorpyrifos, a neurotoxin also suspected of causing cancer and immune system damage) is widely attributed to the FQPA (Brown & Warrick, 2000).

**Research Challenges**

For social work’s contributions in policy to be effective and to remain so over time, ongoing rigorous research must provide the best information. Despite gains generated through studies such as the 1993 National Academy of Sciences report, there continue to be important gaps in what we know about the relationship between children’s well-being and environmental contaminants. Health effects research that focuses on children, particularly children of color because of their generally heightened level of risk, should be strengthened in several areas. Although these areas have not traditionally been the focus of social work researchers, social workers can be part of such research, stay current in the field, and disseminate findings to colleagues and constituents.

First, further study on children’s unique developmental vulnerabilities and exposure pathways is a priority. Second, research methods should shift from traditional risk assessment (for example, chemical risk-averaging methods estimating adult effects) to approaches based on precautionary principles (for example, risk standards estimating effects on the most vulnerable children; National Research Council, 1993). Methods should reflect adequate sampling. A recent Federal Drug Administration assessment of the fungicide and suspected carcinogen benomyl in imported bananas, for example, based results on a sample of 75 out of an estimated 25 billion bananas (Wargo, 1996). Third, research should emphasize risks to children from multiple chemicals with similar effects (for example, accumulative effects from contact with neurotoxins through occupational exposure and household solvents) and synergistic effects (for example, interactive effects from pesticide residues in milk, household water, and vehicle emissions; Mott et al., 1997). Finally, more research is needed that examines lifetime opportunity risks and benefits of protecting children (for
example, health care costs, reproductive costs, and educational and employment costs) through environmental legislation. For example, using data on lead exposure, cognitive skills, educational training, and labor market trends, Schwartz (1994) and Salkever (1995) estimated that, per annual birth cohort, reducing children’s blood lead levels can save from $5 billion to 7.5 billion in future earnings.

Conclusion

Social work is committed to protecting children and must act to prevent harm to children from environmental contamination. Indeed, the NASW policy statement on Children and Youths: A Bill of Rights (NASW, 1994) stated that “Children should have freedom from pollution of the air, water, and food,” p. 47). In an encouraging move, the 1999 NASW Delegate Assembly approved an environmental policy statement (NASW, 2000) that replaced an earlier statement deleted at the 1996 Assembly. NASW’s reinstated environmental policy can be used to leverage greater recognition of social work’s responsibility in this arena.

Social workers have important research, policy, and practice functions to fulfill regarding this emerging threat to current and future generations. Our profession’s depth of knowledge and experience in children’s welfare and skills as advocates for disenfranchised populations is unique. We must see new connections between traditional social welfare policy and environmental policy, create new collaborations, and apply our diverse skills to this threat. Most important, failure to engage will result in the loss of a significant opportunity to protect children from preventable illness, disease, and disability.

References

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