Chemicals of many kinds have become a global issue affecting human and environmental health across the boundaries of countries, regions, and economies. With an estimated $1.5 trillion in sales in 1998, the global chemical industry employs more than 10 million people and accounts for 7 percent of global income. In the developing world, the impact of chemicals on the lives of poor people is growing, as production of chemicals—as well as processing and formulation—steadily increases. Once released into the environment, chemicals may undergo short- or long-range transport as a result of natural environmental processes. They may be transformed into other chemicals and may cause local, regional, and/or global contamination, expose humans and wildlife and, in some cases, have toxic effects.

Exposure and effects

Exposure to toxic chemicals can be “direct,” when the chemical moves straight from the source to the person, or “indirect,” when the chemical goes through intermediate pathways. Impacts can be acute, caused by single exposures to toxic levels of chemicals (for example, pesticide poisonings) or chronic, involving exposure to lower concentrations over long terms. Chronic exposure is gradual and often not obvious to detect, but it can have significant health impacts, such as degrading neurological and physical function and capacity (for example, heavy metals poisoning).

In terms of human health, persistent organic pollutants (POPs) are of particular concern because they can move great distances from their source, degrade very slowly in the environment, and accumulate in wildlife and humans. Other substances prevalent in the environment are heavy metals such as mercury (from coal-fired power plants, industrial plants, medical equipment, and mining), lead (from leaded gasoline, consumer products), and cadmium (from batteries, sewage waste, fertilizers). Some chemicals work indirectly; for example, chlorofluorocarbons and other ozone-depleting substances created a hole in Earth’s protective ozone layer, which has increased the incidence of skin cancer and cataracts.

Some statistics have quantified the number of these exposures. A survey of child labor in several developing countries considered biological, chemical, and environmental hazards. Nine out of ten working children are in agriculture, and the study found that over 60 percent of economically active children were exposed to hazardous conditions, and over 25 percent of these hazards were due to exposure to chemicals (Ashagrie 1998). In Mexico, studies of children exposed to lead have shown 40 to 90 percent of children in certain communities with levels up to 10 micrograms/dL per day, and
Impact on poor people

Of the chemicals discussed above, lead, pesticides, and mercury affect people living in poverty the most. Exposure to lead may occur through a variety of informal sector activities such as making ceramics, recycling batteries, and scavenging or through exposure to vehicular fumes in countries that still use leaded gasoline. Exposure to mercury can be through poorly disposed mercury waste or as part of the processing in artisanal gold mining.

The World Health Organization expects the burden from chronic disease in developing economies to outweigh the burden from infectious disease by 2020. Only a subset of chronic disease is associated with chemicals, but the health effects of these substances are worse among those who are most vulnerable—those with poor nutrition, with concurrent disease, and children. Lead, for example, is known to be more toxic to children who are malnourished. In the struggle for a better quality of life and development, the neurological and health effects on children in these countries can have serious long-term effects.

POP exposure also disproportionately affects the poor. POPs and other pesticides contribute to both acute and long-term impacts on human health. Pesticide poisonings occur through direct exposure, due to lack of training or inadequate safety equipment. Pesticide drums and containers are often reused for water and food in poor communities across the globe, exposing children and others to the effects of the chemicals. When poorly stored or disposed of, obsolete pesticides (many of which are POPs) can create long-term toxic effects on the environment, creating a long-lasting and global threat to human health. People who scavenge at landfills and municipal waste dumps are often exposed to dioxins and furans, two highly toxic POPs that are emitted from incomplete combustion of waste from fires that typically occur at disposal sites.

Taking action

At the international level, approaches to these problems range from global treaties on the control of chemicals—such as the Montreal Protocol on Chemicals that Deplete the Ozone Layer and the Stockholm Convention on POPs—to specific projects to remove toxic chemicals from the environment, such as the Africa Stockpiles Programme (ASP). (See page 49 for a description of the ASP.) The Montreal Protocol shows how the global community can work together to develop a solution to a chemical threat. The Montreal Protocol Multilateral Fund provided funding to developing countries to convert to cleaner, non-ozone-depleting technologies. The Stockholm Convention hopes to follow a similar model. The Bank is working with the Global Environment Facility and clients to provide strategic guidance on how to stop using POPs and develop alternatives.

At the local level, the Bank and its partners are working to help countries understand and assess the impact of chemicals on human health. Studies include an investigation of the health impacts of pesticides in Andean farming communities in Peru, blood monitoring studies in China, and breast milk monitoring studies in Mexico. Results from these studies will allow countries like China and Mexico to be better equipped for the design of successful interventions and solutions. At the project level, through its safeguards policies, the Bank works to reduce the impact of pesticides (including DDT) and other chemicals in its country work programs.

Finally, the global community is working together to develop a Strategic Approach to International Chemicals Management. The World Bank sees this as a key step in the ability of countries to coordinate obligations under a range of chemical conventions; to integrate national, regional, and global objectives for sound chemicals management into national plans for sustainable growth; and to build capacity to reduce the risks of chemical exposure to their populations and environment.

References


