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Global health challenged by toxic pollutants

By Charissa Sparks

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22 March 2011 [MediaGlobal]: Most often caused by small businesses and mining, toxic threats are endangering the lives of 100 million people worldwide. These pollutants are largely overlooked, even though they cause significant harm to humans.

"The global health impacts of toxic pollutants are much worse than previously thought," Adam Koniuszewski, Chief Operating Officer at Green Cross International, told **MediaGlobal**.

Previous estimates for the amount of people affected have been conservatively low, mainly because side effects can be slow to manifest and experts are uncertain as to the exact part pollution plays in the global health burden of disease

However, Cornell University ecologist, David Pimentel, has found that 62 million deaths per year, roughly 40 percent of all that occur, can be attributed to pollutants in water, air, and soil.

These contaminants exacerbate other health concerns by weakening the body's immune system, making it more susceptible to disease, Koniuszewski explained.

"An initial exposure to toxic pollution can be the undocumented cause of later illnesses such as respiratory infections, tuberculosis, gastrointestinal disorders, and maternal health problems," said Andrew McCartor, research coordinator at Blacksmith Institute.

LEAD

In use for thousands of years, lead is widespread, easy to extract, and simple to work with. Lead is commonly released into the air and brought back by precipitation, or implanted into the soil. It can enter the body through ingestion, inhalation, or by mother-to-child transmission.

Lead can affect almost every organ and system in the body. Typically, lead poisoning damages the nervous system and can cause brain disorders, and in some instances, death.

"To give a sense of the potential danger, Blacksmith Institute's biggest cleanup project of 2010 was in Zamfara State, Nigeria, where hundreds of children died in a very short period from lead poisoning," said McCartor

The lead poisoning came from many small scale miners who turned to mining because it produces a higher profit than farming. Often called artisanal miners, they work independently, using their own resources, and are not employed by any specific mining company. According to the United Nations Industrial Development Organization (UNIDO), between 10 and 15 million people obtain their livelihood through artisanal mining.

MERCURY



Despite the significant health threats, some people earn their living by searching landfills for metal and other recyclables. (Photo credit: Creative Commons)

Most of the mercury in the environment is derived from human activity such as coal-fired power stations, residential heating systems, waste incinerators, and the mining industry. Often spread in vapor form, once in the air, mercury is transported by dust and wind, settling in the soil or surface waters through precipitation and frequently moving far from the original source site making it difficult to track.

Exposure to mercury can cause permanent damage to the kidneys, central nervous system, and brain, as well as miscarriages, respiratory failure, and, at high doses, death. Many people are exposed to mercury through consumption of contaminated food products such as fish.

Recently, illegal gold mining activities in Colombia have led to an outbreak of mercury contamination. Colombia is now known as the world's largest mercury polluter from gold mining.

CHROMIUM

Often found in soil and groundwater at abandoned industrial sites, exposure to chromium is particularly a problem in south Asia, where it is used in small-scale tanneries and dye factories that do not have access to proper waste facilities. Because options are limited, waste contaminated with chromium has been unloaded into local dumpsites or waterways.

After reaching the blood stream, chromium damages the kidneys, the liver, and blood cells, and can cause cancer.

Kanpur is one of the most severely polluted cities in India. Home to some 350 industrial leather tanneries, a large amount of untreated waste is discharged into local groundwater sources at the Ganges River.

Blacksmith Institute has successfully lowered the impact chromium has on the locals who rely on the groundwater as their primary source of drinking water by warning the community about the dangers, digging four new wells, and providing an electron-donating chemical which changes a very dangerous form of chromium into a much more innocent form, making it safer for human exposure.

ARSENIC

Frequently released into the air when smelters try to extract valuable metals such as copper and lead, it can also be released through coal-fired power plants, or incinerators that burn products containing arsenic. Arsenic is also used in the production of pesticides, herbicides, and insecticides, which may lead to the contamination of groundwater.

Even today, the natural occurrence of arsenic in drinking water remains a problem for many parts of the world, including the US. Bangladesh has had an ongoing struggle with arsenic in its water for many years. The World Health Organization has called Bangladesh's arsenic crisis "the largest mass poisoning of a population in history" and estimates that between 35 and 77 million Bangladeshis, out of a total population of 125 million, have been exposed to toxic levels of arsenic.

PESTICIDES

Pesticides are used to kill insects that can transmit deadly diseases like malaria, yellow fever, and West Nile virus. They can also protect animals from illnesses caused by parasites such as fleas and can prevent sickness in humans that is caused by moldy foods or diseased produce. Rainwater can wash away pesticides, causing pollution of groundwater.

The World Health Organization estimates that 200,000 people are killed by pesticide poisons every year. Furthermore, 3 million agricultural workers in the developing world experience severe poisoning from pesticides and 25 million in developing countries suffer mild pesticide poisoning yearly.

RADIONUCLIDES

While some radionuclides occur naturally, many are released into the environment through accidents, weapon use, and poor waste disposal. These can be used in food preservation to kill parasites and pests, and to control the ripening of stored fruits and vegetables.

Also found in drinking water, high levels of exposure can cause cancer and even death.

Just last month, residents of a village in central Kyrgyzstan were warned of possible mudslides which could destroy a nearby radioactive waste dump and contaminate the local river.

At present, Blacksmith Institute has identified 2,150 sites where toxic pollution exceeds international safety standards. "The most impacted countries are those that are poor, but have a large industrial base," said McCartor.

Unlike high-income countries, which have cleanup mechanisms such as the US Environmental Protection Agency, low-and-middle-income countries often do not have the capability or expertise to monitor and clean up toxic pollution. Furthermore, developing countries have worsened the problem by dumping their high-levels hazardous waste in other developing countries, many in sub-Saharan Africa.

While technologies for cleaning up these toxic problems are well known, little has been done because of inadequate resources. "Affected communities and local authorities often struggle to do what they can with very limited financial and technical resources," Koniuszewski stated.

According to Koniuszewski, funding the cleanup of polluted sites should be an area of involvement for donors because the cost of cleanup ranges from \$5-\$50, comparable to bed nets and vaccinations, funding requirements are a fixed cost, and are only required one time, unlike those of diseases.

Education and public awareness are vital to lowering the number of people affected by toxic pollutants. As there are clear ties between health, poverty, and livelihood issues, it seems crucial that global leaders join together to provide education and offer financial support.

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