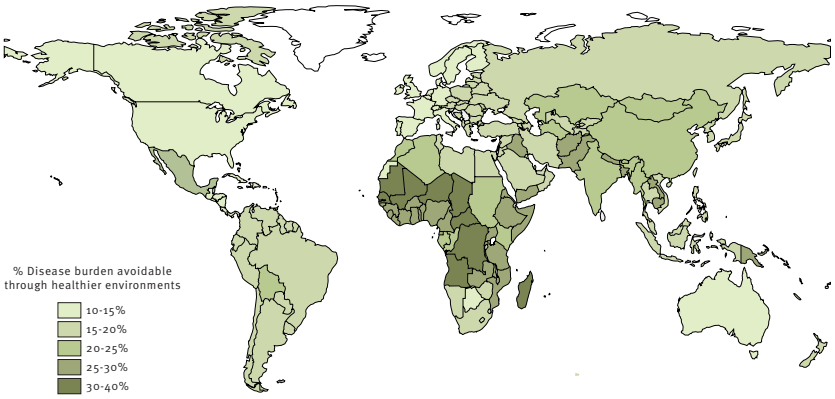
Human Health and the Environment

Ensuring a clean and healthy environment, through effective environmental management, will provide multiple benefits to society and the economy. Experts have estimated that nearly one-quarter of all diseases and deaths are due to hazards from unhealthy living and working environments[1]. Air pollution, inadequate management of chemicals and wastes, poor water quality, ecosystem degradation, climate change and ozone layer depletion all pose significant threats to human health both individually and combined.



Estimated proportion of the total burden of disease that could be prevented through proven interventions to reduce environmental risks[2].

AIR POLLUTION

The largest impacts of indoor air pollution are seen in developing countries, where almost three billion people rely on solid fuels, traditional biomass and coal, and open fires or traditional stoves for cooking and heating[3]. Approximately 4.3 million people a year die prematurely from illness attributable to household air pollution caused by the inefficient use of solid fuels. Over half of the deaths from acute lower respiratory infections among children less than 5 years old are due to air pollution from household solid fuels [4]. In addition, 3.7 million deaths can be attributed to outdoor air pollution[5] of which transport, energy production and industry are major sources. These recent findings more than double previous estimates and confirms that air pollution is now the world's largest single environmental health risk. Reducing air pollution could save millions of lives.

CHEMICAL AND WASTE EXPOSURE

Most impacts from unsafe chemical use and unsound waste disposal occur in situations of poverty.[6] The poor face these risks because of their occupations, living standards and lack of knowledge about the effects of exposure. Almost all deaths from pesticide exposure occur in developing countries.[7] The management of electronic waste, the fastest growing waste stream in the world[8], is a challenge. E-waste contains hazardous substances – including heavy metals such as mercury and lead, and substances that disrupt the hormone system – affecting human growth, reproduction and neurological development[9]. However, they also contain many strategic metals such as gold, palladium and rare earth metals, which can be recovered and recycled.

WATER-RELATED ILLNESSES

Water-related diseases are another major concern: over half the world's hospital beds are occupied by people suffering from such illnesses.[10] Diarrhoeal diseases cause over four per cent of the global disease burden, 90 per cent of these cases are linked to environmental pollution and lack of access to safe drinking water and sanitation.[11] Diarrhoeal disease, although preventable and treatable, is the second leading cause of death in children under five, with nearly 1.7 billion cases and 760,000 deaths annually.[12] Salinization of overexploited aquifers, especially in coastal areas, is a further challenge. One recent study found that salinization causes hypertension and (pre)eclampsia, the latter accounting for direct maternal deaths, stillbirths, neonatal deaths and a series of long-term neurological disabilities.[13]

ECOSYSTEM DEGRADATION AND MALNUTRITION

Ecosystem degradation has multiple detrimental effects on human health, including on food security and resulting malnutrition. A recent survey by the International Soil Reference and Information Centre (ISRIC) found that almost one fifth of cropland is degraded resulting in lower food production and approximately 1.5 billion people depend directly on these degraded areas.[14] Today, 842 million people are undernourished, the vast majority (827 million) in developing countries.[15] About 45 per cent of all child deaths are linked to malnutrition.[16]

CLIMATE CHANGE AND OZONE

Climate change is not only an important global environmental challenge, it is also a significant threat to public health. Although it may have some localised beneficial effects on human health, such as fewer winter deaths in temperate climates and increased food production in

certain areas, most effects are expected to be negative.[17] Climate change affects concentrations of fine particulate matter and ozone in the air which contributes to cardiovascular and respiratory diseases with the latter affecting particularly children, elderly and people with vulnerable immune systems. A 2013 study indicates that 21st century climate change will increase premature deaths associated with $PM_{2.5}$ by approximately 100,000 and from respiratory disease associated with ozone by 6,300 deaths annually[18]. Ozone is the air pollutant most consistently projected to increase under future climate change and this has been linked to increased occurrences of asthma in children[19]. Every year, weather-related disasters result in over 60,000 deaths, mainly in developing countries and this will continue to increase[20]. Floods and increasingly variable rainfall patterns are likely to affect fresh water supplies, with negative health consequences. Climate variability and change plays a powerful role in the occurrence and spread of diseases worldwide. People in many areas are at an increasing risk of vector-borne diseases, such as malaria, dengue fever and other tropical disease.

Stratospheric ozone protects humans and other organisms because it absorbs ultraviolet-B (UV-B) radiation from the sun. Its depletion has led to heightened exposure to UV-B radiation increasing the risk of skin cancer, cataracts and suppression of the immune system. Excessive UV-B exposure can also damage terrestrial plant life, single-cell organisms and aquatic ecosystems.

INTEGRATED SOLUTIONS

Switching to **cleaner fuels and alternative sources of energy, and more efficient production and use** of fuels and energy, are effective ways to address air pollution exposures and thereby improve health. Implementing these will accrue other benefits, including more time for income-generating activities, reduced health risks from carrying heavy loads of firewood over long distances, reduced deforestation, greater access to affordable transport, particularly public transport, increased access to modern energy services and a reduction in black carbon – a global warming substance – and other greenhouse gases.

To protect human health and the environment and to benefit fully and safely from chemicals, **sound chemicals management** should be advanced worldwide by: developing comprehensive chemicals management strategies; mainstreaming chemicals management into national public health, social and economic development programmes; regulating and reducing the use of chemicals of highest concern and substituting them with safer alternatives; integrating and coordinating international and intergovernmental programmes to increase synergies and effectiveness; and developing new national and international approaches to financing sound chemicals management.

Controls implemented under the Montreal Protocol on Substances that Deplete the **Ozone Layer** have enabled the global community to avoid millions of cases of fatal skin cancer and tens of millions of cases of non-fatal skin cancer and cataracts. For example, the United States estimates that by the year 2065, efforts to protect the ozone layer will have prevented more than 6.3 million skin cancer deaths in the nation and saved an estimated US$4.2 trillion in healthcare costs over the period 1990–2065. In addition, more than 22 million Americans born between 1985 and 2100 would avoid suffering from cataracts.[21] Phase out of the remaining ozone-depleting substances (ODSs), particularly hydrochlorofluorocarbons (HCFCs), and ensuring sound management of existing ODSs captured in buildings and equipment will not only protect the ozone layer and human health but also contribute to mitigating climate change, as ODSs are also potent greenhouse gases. In this phase-out process, opportunities exist to make technology choices that are climate friendly.

Sustainable land and forest management, along with conservation and restoration, will protect and enhance biodiversity and ecosystem services. This will lead to improved rain infiltration, increased water storage and availability, more biomass, and greater food security thus reducing malnutrition. Sustainable management practices will reduce pressures on land and the need to convert forests and rangelands to cropland. These restorative activities will not only ensure food security, but also a clean and healthy environment to nurture cultural, social and recreational activities important to our mental health, and economic growth for local populations and businesses.

Options for reducing water-related diseases include: restoring catchments and improving wastewater management; improving water quality by raising service standards; promoting innovative low-cost and low-carbon technologies; and providing robust and effective water governance through more effective institutions and administrative systems. Protecting water quality from all sources of wastewater pollution – domestic, industrial or agricultural – is essential for sustainable development, human wellbeing and ecosystem health.

Measures to reduce impacts from climate change can address threats to public health, with additional multiple benefits. For example, the Urban Heat Island Initiative of the City of Chicago serves to educate the public, local businesses and government about the measures that can be taken to cool the city . It includes the use of light covered surfaces for buildings and roads, as well as the planting of urban trees and gardens in strategic locations to reduce heat generation and cooling costs. Sustainable wetlands management can anticipate the expected increase in water-born vectors such as malaria. Furthermore, effective use of climate information can help address health impacts. Closer collaboration between the meteorological, public health and environmental authorities can provide communities and relevant health institutions with tools to identify elevated risks, take preventive measures and plan effective responses.

To conclude, providing a clean and healthy environment - now and for future generations – will reduce mortality, improve human health and well-being and lead to substantial savings in associated healthcare costs.

References can be found at: http://www.unep.org/post2015

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