Environmental Contribution to the Burden of Disease in the Asia-Pacific Region

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Abstract

WHO has developed a methodology to evaluate the global burden of disease and to quantify the health state of a population in terms of mortality and non-fatal health outcomes. The most commonly used measure of the burden of disease is disability-adjusted life years (DALYs) lost. One DALY can be regarded as one lost year of healthy life in a population due to premature deaths and individuals being in the states of poor health or disability. WHO has developed two methods to estimating the environmental contribution to the burden of disease, or environmental burden of disease. One method uses exposure data and estimate the contribution of individual environmental risk factor to the burden of disease data for a given population. The other method uses opinions of experts to determine the contributions of the whole environmental risk factors to specific diseases. Both methods estimate an "attributable fraction" (i.e. the fraction of the burden of disease attributable to an environmental risk factor), and the results are expressed as mortality and DALYs.

Using the latest estimates of the global burden of disease in 2004, WHO calculated the environmental contribution to the burden of disease in the Asia-Pacific region, which includes countries and areas of the WHO South-East Asia and Western Pacific Regions, to be 164 million DALYs per year, or 23% of the total burden of disease in DALYs, in the region. In terms of mortality, the environmental contribution was estimated as 6.8 million deaths per year, or 25% of the total mortality in the region. Of the 164 million DALYs per year, 16% was attributable to diarrhoeal diseases, 8.4% to lower respiratory infections, and 6.9% to cardiovascular diseases. Of the 6.8 million deaths per year, 1.25 million deaths were attributable to chronic obstructive pulmonary diseases (COPD), 1.2 million deaths to cardiovascular diseases, and 741,000 deaths to diarrhoeal diseases.

Among different environmental risk factors, unsafe water, sanitation and hygiene contributed to the highest burden of disease at 25 million DALYs per year in 2004, followed by indoor smoke from solid fuels at 17 million DALYs per year and occupational risks at 16 million DALYs per year (See Figure 1). In terms of mortality, indoor smoke from solid fuels was estimated to have caused 1.2 million deaths per year, followed by unsafe water, sanitation and hygiene which caused 694,000 deaths per year, and occupational risks which caused 657,000 deaths per year (See Figure 2). For a sub-population of children under 5 years of age, unsafe water, sanitation and hygiene contributed 21 million DALYs per year in 2004, followed by indoor smoke from solid fuels which caused 8.7 million DALYs per year, and lead exposure which caused 4.4 million DALYs per year. In terms of mortality, unsafe water, sanitation and hygiene caused 607,000 deaths per year, indoor smoke from solid fuels 241,000 deaths per year, and climate change 56,000 deaths per year.

In 2007, WHO provided the preliminary estimate of the total environmental burden of disease and those of key environmental risk factors for each country, as the country profile of environmental burden of disease. The country profiles and the estimates of environmental burden of disease by regions are available at the WHO website: http://www.who.int/quantifying_ehimpacts/.
Figure 1  Burden of disease attributable to major environmental risk factors in the Asia-Pacific region

Figure 2  Mortality attributable to major environmental risk factors in the Asia-Pacific region