7. Uncertainties

The aim of burden of disease studies is to quantify risk factors to health in a comparative and internally consistent way. This would provide a framework for policy-makers and the public to assess the impact of disease on the population. It would also serve as a basis for setting priorities and, when combined with cost–effectiveness analysis, would better allocate scarce health resources. Although everyone is affected by environmental risks to some degree, the poor and children bear a disproportionate burden. The aim of this study was to quantify the environmental risks to health in one of the most affected groups – children.

Assessing the EBD is a complex process because the determinants and etiological pathways of the disease process, as well as the setting in which these risks occur, must be considered. The political, economic and social systems of a country largely determine the exposures and risks to the population. If health-based criteria are used to classify countries and subregions, the resulting classification may not correspond well with the distribution of environmental risks. This may be the case for the European Region. The WHO classification of subregions is based on adult and child mortality (see Annex 1), and may not reflect differences in the health, economic and political structures that are important in determining the extent to which children are affected by the environment. For example, Central Asian Republics, which are similar in many ways, are split into EUR B and EUR C subregions (Annex 1). A classification based on child mortality alone would have been more valid for the purpose of his study, and corresponded better to the actual socioeconomic and environmental context.

One consequence of the classification scheme we adopted is that EUR A is the only subregion for which subregional estimates can reasonably be applied to single countries in the subregion. A second consequence is that there are no great differences in the estimates for EUR B and EUR C. It may be that if a classification based on infant and child mortality had been adopted (e.g. very low, low, and intermediate infant and child mortality), there would have been a clearer gradient in the EBD. Therefore, the differences between EUR B and EUR C should be interpreted conservatively.

The results also have been biased by the weighting for the child population of a country, in favour of those countries with the highest rates of child mortality and absolute numbers of children. For example, in EUR B, Turkey has one of the highest child mortality rates and absolute numbers of children. The results may also be skewed by the availability of data, which came primarily from countries of EUR A. In addition, since much of the literature on exposure–risk relationships comes from countries outside of the European Region (i.e. in developing countries), many relationships had to be extrapolated to fit the European context. However, these extrapolations may not always be accurate. We found that changing exposure estimates by even a small amount had a significant impact upon estimates of deaths and DALYs, which underlines the importance of using the most accurate exposure data available. This clearly indicates the need for better data to improve burden of disease estimates.

Finally, our analyses for the three risk factors: indoor air pollution; water, sanitation and hygiene; and injuries used estimates from the WHO Global Burden of Disease 2001 study. The validity of the results for these factors therefore depends on the validity of the WHO estimates.

8. Conclusions

This study represents the first attempt to assess the impact of environmental risk factors on child health in the WHO European Region. A motivation for the study was the dearth of information in this area, as a result of which our understanding of how the environment affects the health of children, either directly or via adults during the reproductive years, is still incomplete. Action in this area is all the more urgent, since interventions to reduce exposure to environmental risk factors and to prevent injuries can result in substantial public-health gains. For example, phasing out lead from gasoline is effective in reducing environmental and population BLL (Smith, Corvalan & Kjellstrom, 1999; WHO, 2000a, 2002; WHO-CHOICE, 2003). Multisectoral approaches, such as engineering, educational and law enforcement interventions, also reduce the incidence of injury and the severity of the consequences (Bobak & Leon, 1992; World Bank, 2003a).

The results of our study show that air pollution, unsafe water, lead and injuries account for a high proportion of the burden of disease and deaths from all causes in children. The results also show that children are not uniformly exposed to environmental risk factors in the three EUR subregions. The variation is due to a combination of poor housing conditions, a polluted environment, and restricted access to information, preventive programmes and health care.

The findings indicate there is an urgent need for a plan of action that specifically addresses priorities for the environmental health of children. A plan of action should take into account the marked differences in the EBD for each risk factor by subregion and age group, which underscores the need for targeted action.

We hope the results of this study will serve as a foundation for further EBD studies in the European Region, and stimulate countries to initiate their own studies. When implementing national burden of disease studies, it is important to standardize how morbidity and mortality statistics are collected at the subregional level. This is especially important for EUR B and EUR C, where few data are available. The present study could also be a starting point for cost–benefit analyses of interventions to reduce the EBD.

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