Annex 1
Methods used for country estimates in Chapter 1 and Annex 4

The mortality and risk factor data presented in Chapter 1 and Annex 4 were estimated by WHO using standard methods to maximize cross-country comparability. They are not necessarily the official statistics of Member States.

Mortality

Age- and sex-specific all-cause mortality rates were estimated for the year 2008 for the 193 WHO Member States from revised life tables, published in World health statistics 2011 (1). Total deaths by age and sex were estimated for each country by applying these death rates to the estimated resident populations prepared by the United Nations Population Division in its 2008 revision (2).

To calculate causes of death for countries with complete or incomplete death registration data, vital registration data were used to estimate deaths by cause. Death registration data from 1980 up to 2008 (if available) were used to project recent trends for specific causes, and these trend estimates were used to estimate the cause distribution for 2008. Adjustments for deaths due to HIV, drug use disorders, war and natural disasters were based on other sources of information using similar data sources and methods as previous estimates (3).

For countries without any nationally representative data, cause-specific estimates of deaths for children under age 5 were estimated as described by Black et al. (4). For ages five years and over, previous estimated distributions of deaths by cause (3) were projected forward from 2004 to 2008, excluding human immunodeficiency virus (HIV), war and natural disasters. Detailed proportional cause distributions within the three broad groups were based on death registration data from within each region. Further information on these methods is available from WHO (3). Specific causes were further adjusted on the basis of epidemiological evidence from registries, verbal autopsy studies, disease surveillance systems and analyses from WHO technical programmes. Cause-specific estimates for HIV, tuberculosis and malaria deaths for 2008 were derived from previously published WHO estimates (5–7). Country-specific estimates of maternal mortality and cause-specific maternal mortality were based on the recent estimates for 2008 together with an analysis of regional cause patterns (8, 9). Cause-specific estimates for cancers were derived from GLOBOCAN 2008 (10).

Risk factors and morbidity

Estimates for risk factors and diabetes morbidity were produced for the standard year 2008 for all the indicators reported here. The crude adjusted estimates in Annex 4 are based on aggregated data provided by countries to WHO, and obtained through a review of published and unpublished literature. The inclusion criteria for estimation analysis included data that had come from a random sample of the general population, with clearly indicated survey methods (including sample sizes) and risk factor definitions. Adjustments were made for the following factors so that the same indicator could be reported for a standard year (in this case 2008) in all countries: standard risk factor definition; standard set of age groups for reporting; standard reporting year, and representativeness of population. Using regression modelling techniques, crude adjusted rates for each indicator were produced. To further enable comparison among countries, age-standardized comparable estimates were produced. This was done by adjusting the crude estimates to an artificial population structure that closely reflects the age and sex structure of most low- and middle-income countries. This corrects for the differences in age/sex structure between countries. Uncertainty in estimates was analysed by taking into account sampling error and uncertainty due to statistical modelling. The estimates included in the WHO Regional groupings and World Bank income groups are the age-standardized comparable estimates. Further detailed information on the methods and data sources used to produce these estimates is available from WHO.

The annual number of new cases of cancer for 2008 were obtained from GLOBOCAN 2008, an online analysis tool and database of incidence and mortality estimates in 2008 for the major types of cancer in each country worldwide (11), compiled by the International Agency for Research on Cancer (IARC). Predictions for 2030 were based on applying the estimated age-specific rates in 2008 to national projected populations for 2030 (2). As well as by country, the number of new cases in GLOBOCAN are presented according to the four World Bank income groups. Age standardization is necessary when comparing several populations given possible differences in the underlying age structure between populations, as well as the powerful influence of age on the risk of disease. Age-standardised rates are based on weighted means of the age-specific rates, with the weights taken from a standard population, here based on the WHO standard population (12).

References

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