WHO Diabetes Country Profiles 2016

Explanatory Notes

Background

In April 2016 the World Health Organization released the first Global report on diabetes. In conjunction with this report, WHO developed a series of diabetes country profiles to highlight the status of diabetes prevention and control in each WHO Member State. The profiles present information for each country on their diabetes-related mortality, risk factors and national systems capacity to prevent and control diabetes. The profiles include the number of deaths from diabetes and high blood glucose; proportional mortality from NCDs including diabetes, trends in age-standardized prevalence of diabetes; the prevalence of selected risk factors; and information describing current national responses to prevention and control of diabetes. These data were derived from several sources, each of which is explained in the following notes. The mortality and risk factor data presented in the profiles were estimated by WHO using standard methods to maximize cross-country comparability. As a result, they are not necessarily the official statistics of Member States.

Demographics

The rounded total population estimates for 2015 were taken from the most recent United Nations Population Division World Population Prospects (1). World Bank income group data were based on 2014 gross national income (GNI) per capita, calculated using the World Bank Atlas method (2).

Mortality

Overall all-cause mortality rates and diabetes deaths by age group and sex for 2012 were derived from WHO's Global Health Estimates. Causes of death were estimated for 2012 using data sources and methods that were specific for each cause of death (3). Vital registration systems which record deaths with sufficient completeness

and quality of cause of death information were used as the preferred data source. Mortality by cause was estimated for all Member States with a population greater than 250,000. Larger countries with an asterisk (*) on their profile have mortality data which are not based on any national NCD mortality data. These mortality estimates were based on a combination of country life tables, cause of death models, regional cause of death patterns, and WHO and UNAIDS programme estimates for some major causes of death (not including NCDs). Detailed information on methods for mortality and causes of death estimates were previously published (3).

Deaths attributable to high blood glucose

There is convincing evidence for a causal relationship between higher-than-optimal fasting blood glucose levels and cardiovascular disease (CVD), chronic kidney disease, and tuberculosis (TB) mortality. The optimal distribution of fasting blood glucose (FPG) in a population is estimated to be a normal distribution with a mean of 4.9–5.3 mmol/L, standard deviation 0.4–0.6, which are levels corresponding to lowest all-cause mortality as derived from meta-analyses of prospective studies (4). Relative risks of higher-than-optimal fasting plasma glucose were derived from meta-analyses of prospective studies (4, 5). Population-attributable fractions for each age-sex group and each country were calculated using the estimated distribution of FPG and relative risks for each cause of death (CVD, chronic kidney disease, and TB). The number of deaths attributable to higher-than-optimal fasting blood glucose was calculated by multiplying the population-attributable fraction for CVD deaths, chronic kidney disease deaths and TB deaths by the number of deaths from each cause for each age-sex-country unit. All deaths with diabetes assigned as the underlying cause of death were assumed to be caused by higher-than-optimal fasting blood glucose. More details on the methodology are available elsewhere (6).

Prevalence and trends of diabetes and related risk factors

Prevalence of diabetes

The diabetes prevalence data presented in this report were estimated by the NCD Risk Factor Collaboration (NCD-RisC) – a worldwide network/consortium of public health and medical researchers and practitioners who together work with the World Health Organization to document NCD risk factors and their health effects around the world. Diabetes prevalence and mean fasting plasma glucose (FPG) were estimated in the adult population (18 years and older) for the years 1980 to 2014. Diabetes was defined as fasting plasma glucose levels >=7.0 mmol/L (126 mg/dl); or using insulin or oral hypoglycaemic drugs; or having a history of diagnosis of diabetes (7).

To estimate diabetes prevalence and mean fasting plasma glucose by country for the years 1980 to 2014, NCD-RisC used data provided to WHO or to the NCD-RisC group (7). Inclusion criteria for analysis were that the data had come from a random sample of a national, subnational, or community population, with clearly described survey methods and a clearly specified definition of diabetes, and which had measured one of the following biomarkers: FPG, 2-hour oral glucose tolerance test (2hOGTT), and/or HbA1c. Regressions were used to convert any prevalence data that had been defined using alternative definitions of diabetes, such as definitions using 2hOGTT and FPG, or based on an alternative FPG cut-off. Statistical models were used to estimate prevalence and mean fasting plasma glucose by country and year (for description, see (8) in references). Uncertainty in estimates was analysed by taking into account sampling error and uncertainty due to statistical modelling. For time trends, prevalence estimates were age-adjusted using the Standard WHO Population (9).

The estimates are an update of estimates for the same year published in the Global status report on NCDs 2014 (10), as they include additional survey data.

Prevalence of overweight and obesity

The prevalence of overweight and obesity data presented in this report were estimated by NCD-RisC. Prevalence of overweight and obesity were estimated in the adult population (18 years and older) for 2014. Overweight was defined as the percentage of the population aged 18 or older having a body mass index (BMI) ≥25

kg/m2. Obesity was defined as the percentage of the population aged 18 or older having a body mass index (BMI) ≥30 kg/m2. NCD-RisC used data provided to WHO or to the NCD-RisC group (11). Inclusion criteria for analysis were that the data had come from a random sample of a national, subnational, or community population, with clearly described survey methods and were height and weight were measured in the study population. Statistical models were used to estimate prevalence by country and year (for description, see (12) in references). Uncertainty in estimates was analysed by taking into account sampling error and uncertainty due to statistical modelling.

Prevalence of insufficient physical activity

The prevalence of insufficient physical activity data presented in this report were estimated by WHO. Prevalence of insufficient physical activity was estimated in the adult population (18 years and older) for 2010. Insufficient physical inactivity was defined as the percentage of the population aged 18 or older who are not performing at least 150 minutes of moderate-intensity physical activity per week, or equivalent (13). Prevalence of insufficient physical activity was estimated from population-based surveys meeting the following criteria: (i) provide survey data for the definition of doing less than 150 minutes of moderate physical activity per week (or equivalent), or doing less than 5 times 30 minutes of moderate physical activity per week (or equivalent); (ii) survey data cover all domains of life, including work/household, transport and leisure time; (iii) include randomly selected participants of the general population who were representative of the national or a defined subnational population; (iv) present prevalence by age and sex, with a sample size of each sex-age group of at least 50 participants. Countries with no surveys were excluded from the analysis. Regression models were applied to adjust for the definition (for those countries where only the definition of doing less than 5 times 30 minutes of moderate physical activity per week (or equivalent) was available), for over-reporting of the International Physical Activity Questionnaire (IPAQ) (14, 15, 16), for survey coverage (for those countries where only urban data was available), and to estimate missing age groups (for those countries

where data did not cover the full age range). Data reported before October 2014 were included in the estimation process.

National response to diabetes

All data in this section of the profile were taken from Member State responses to the 2015 NCD Country Capacity Survey (CCS). The NCD CCS is conducted periodically by WHO to assess individual country capacity for NCD prevention. A first survey was conducted in 2000, followed by surveys in 2005, 2010, 2013 and 2015. The questionnaire covers health system infrastructure; funding; policies, plans and strategies; surveillance; primary health care; and partnerships and multilateral collaboration.

The 2015 NCD CCS was completed through a web-based platform between May and August 2015 by national NCD focal points or designated colleagues within the ministry of health or a national institute/agency. Member States responding affirmatively to questions pertaining to policies on diabetes, reducing overweight and obesity, physical inactivity, as well as the questions on evidenced-based national guidelines were requested to submit documentation of each policy or guideline. Member States who did not provide the requested documentation have a † appearing next to their response indicating that documentation was not provided.

Of 194 Member States, 177 responded to the survey, representing 97% of the world's population. The 17 Member States (out of 194 total) that did not respond to the survey have "ND" (No Data) for all fields in this section of the profile. If a Member State responded to the survey but did not respond to a particular question or responded "Don't know" to a particular question, the Member State would have a "NR" or "DK", respectively, for the related indicator in the profile.

More information on the NCD CCS, including the questionnaire and past survey reports, is available on the survey website (http://www.who.int/chp/ncd_capacity/en/).

References

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