Explanatory Notes

Background
Cancer is a leading cause of premature mortality estimated to cause more than 8 million deaths each year (1). While the magnitude of the cancer epidemic has been rising in recent years, so has the knowledge and understanding of its control and prevention. Much evidence shows that cancers are to a great extent preventable. Countries can mitigate the advance of the disease through appropriate comprehensive programs which include national strategies and actions to support modifying risk factors, screening, treatment and palliative care.

In order to combat the global epidemic of cancer and noncommunicable diseases (NCDs), it is imperative to create a baseline for monitoring trends and to assess the progress of countries in addressing the epidemic.

The aim of the Global Cancer Country Profiles (Profiles) is to synthesize, in one reference document, the global status of cancer prevention and control. Each Profile includes data on cancer mortality and incidence; risk factors; availability of cancer country plans; monitoring and surveillance; primary prevention policies; screening; treatment and palliative care. The data presented in the Profiles are derived from several sources, each of which is explained in the following notes.

Demographics
Total population figures reported in each Profile are estimates provided by the most recent United Nations Population Division World Population Prospects - 2012 revision (2). World Bank income group data is based on 2012 gross national income (GNI) per capita calculated using the World Bank Atlas method (3). The 2012 total deaths and life expectancy at birth for males, females and both sexes were obtained from the WHO Global Health Observatory (GHO) data repository (1,4).

Cancer mortality
Cancer mortality is presented as the number of deaths occurring in a specified year in a particular country. The Profiles include the estimated absolute number of cancer deaths for 2012 and depict the five cancers with the highest number of deaths for each country, for males and females. Additionally, the Profiles contain age-standardized cancer mortality trends from 2000-2012 for these five cancers. Cancer mortality data presented in the Profiles was obtained from the WHO Global Health Estimates (1).

Causes of death were estimated from 2000-2012 using data sources and methods that varied by country (5). Vital registration systems which record deaths with sufficient completeness and quality of cause of death information were the preferred data source. Mortality by cause was estimated for all Member States with a population greater than 250,000. Age-standardized death rates were calculated using the WHO standard population (6).

Cancer incidence
Cancer incidence is presented as the absolute number of new cases in a given year. The methods of estimation were country specific and the quality of the estimation depends upon the information
available for each country. This information was obtained from the International Agency for Research on Cancer (IARC) - GLOBOCAN 2012, please refer to the data sources and methods webpage for the methodology used to calculate the absolute number of new cases (7). Cancer incidence estimations were included for WHO Member States with a population greater than 250,000.

**Risk factors**

- **Current tobacco smoking (2011):** Current tobacco smoking was defined as the percentage of the population aged 15 + years who smoke any tobacco product. Prevalence of current tobacco smoking was estimated from national surveys that met the following criteria: (i) provide national summary data for one or more of four tobacco use definitions- daily tobacco smoker, current tobacco smoker, daily cigarette smoker, or current cigarette smoker; (ii) include randomly selected participants who were representative of the national population; and (iii) present prevalence rates by age and sex. Countries with no surveys, or insufficient surveys (e.g. only one survey in total, or no survey during the previous 10 years), were excluded from the analysis. Regression models were applied at the UN sub-regional level to obtain age-and-sex-specific prevalence rates for current tobacco smoking for the year 2011 (8). The Profiles show age-standardized estimates of current tobacco smoking prevalence, as crude estimates had not been calculated. Age-standardized prevalence were calculated using the WHO standard population. Data reported as of December 2011. WHO is currently undertaking a revision of the tobacco prevalence estimates following a review of methods used in the past, as well as more extensive data sets for many countries. This review will likely result in corrections for some countries.

- **Total Alcohol per capita consumption, in liters of pure alcohol (2010):** The primary data source for the estimates for total alcohol per capita consumption (APC) was official data on recorded alcohol per capita consumption supplied by the respective Member States. If these data were not available, data from economic operators and the Food and Agriculture Organization of the United Nations (FAO) statistical database (FAOSTAT) were used. The recorded three-year average APC for 2008–2010 and the unrecorded consumption for 2010 were added to arrive at the total consumption in litres of pure alcohol. Data on APC were obtained from WHO Global Status Report on Alcohol and Health 2014, please refer to the methodology section of the report for additional information on the calculation of estimates (9).

- **Physical inactivity (2010):** Insufficient physical activity was defined as the percentage of adults aged 18+ years not meeting the WHO recommendations on Physical Activity for Health (10), which is, doing less than 150 minutes of moderate physical activity per week, or equivalent. 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 a sample size of 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 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). Further details on methods available on request. Data reported as of October 2014.

- **Obesity (2014):** Obesity prevalence was defined as a body mass index (BMI) ≥ 30, in adults aged 18+ years. Prevalence of obesity was estimated from population-based surveys meeting the following criteria: (i) participants randomly selected and representative of a general population; (ii) prevalence or means can be given by 5-year age and sex strata and uncertainty is known; and (iii) height and weight measured, not self-reported. Estimates are informed by survey data form the same country, through the relationship between the obesity and other variables for which data were available, and by data from other countries in the same geographical region and around the same time. Regression modeling techniques were used to produce crude adjusted estimates for obesity. Further details on methods available on request. Data reported as of October 2014.

- **Household solid fuel use (2012):** Household solid fuel use was defined as the percentage of households using solid fuels as the primary source of domestic energy for cooking and heating divided by the total population. The indicator is modelled with household survey data compiled by WHO. The information on cooking fuel use and cooking practices from more than 700 nationally representative data sources such as the ones listed above were used. Estimates for countries with no available surveys were obtained as follows: (i) when no solid fuel use information was available for the country, the regional population-weighted mean was used, (ii) countries classified as high-income with a Gross National Income (GNI) of more than US$ 12,616 - per capita were assumed to have made a complete transition from solid fuel use to non-solid fuel use and (iii) solid fuel use is reported to be less than 5%. These data were obtained from the WHO Global Health Observatory Data Repository (4).

**Cancer Plans, Monitoring and Surveillance, Primary Prevention Policies**

Information on operational cancer policy/strategy/action plan, cancer registries, overweight/obesity, physical inactivity, and harmful use of alcohol prevention and control was derived from the WHO NCD Country Capacity Survey (NCD CSS) 2013 (11). The NCD CCS is administered through the use of an electronic Excel questionnaire tool, which is completed at the country level with processes in place to ensure a comprehensive response. These indicators were analyzed based on the following questions and sub questions from the NCD CSS tool:

- Does your country have a cancer registry?
  - Is it national or subnational?
  - Are the data population-based, hospital-based, or based on another specific subpopulation?
- Is there a policy, strategy, or action plan for cancer in your country?
- Is there a policy, strategy, or action plan to decrease tobacco use in your country?
- Is there a policy, strategy, or action plan for reducing overweight / obesity in your country?
- Is there a policy, strategy, or action plan for reducing physical inactivity in your country?
• Is there a policy, strategy, or action plan for reducing the harmful use of alcohol in your country? These policy documents were considered operational if a country answered “Yes” to the question about the existence of a specific policy, strategy or action plan, and also responded “operational” for the sub question “Indicate its stage”.

The country response rate for the NCD CCS was 92% (178 countries). The information collected was validated against other known data sources and past responses to previous waves of the survey, by WHO staff in HQ and Regional Offices. Where discrepancies were identified, clarification was sought from the country and modifications were made.

**Tobacco control** data including smoke-free legislation, tobacco dependence treatment, warning labels, bans on advertising, promotion and sponsorship, and tobacco taxes were obtained from the WHO Report on the Global Tobacco Epidemic 2013. Please refer to the technical note of the report which provides the methodology used to calculate each indicator (12).

**National Immunization** data including vaccination schedules for Human Papillomavirus vaccines (HPV) and Hepatitis B were obtained from WHO Reported immunization schedule by country (13). The immunization data for Hepatitis B (HepB3) represents the percentage coverage among 1-year-olds, and were obtained from the annual WHO Global Health Observatory (4). Data reported as of July 2014.

**Cancer Screening and Early Detection**

Data on screening and early detection of **cervical, breast** and **colorectal cancers** for each country were obtained from the NCD CCS 2013 (11). These indicators were reported based on the following questions:

Indicate the availability of the following tests and procedures for early detection, diagnosis/monitoring of NCDs at the primary health care level.

- Cervical cytology;
- Acetic acid visualization;
- Breast cancer screening by palpation;
- Mammogram;
- Faecal occult blood test or faecal immunological test;
- Bowel cancer screening by exam or colonoscopy.

Countries could indicate one of the following responses for the availability of the above mentioned services: (i) generally available (available in 50% or more health care facilities); (ii) generally not available (available in less than 50% of health care facilities); and (iii) don’t know.

**Cancer Treatment and Palliative Care**

Data on the availability of **radiotherapy**, **chemotherapy**, and **oral morphine**, as well as of **community/home care services for people with advanced/end stages of cancer and other NCDs**, were reported based on data available from the NCD CCS 2013 (11). Countries were asked to indicate the availability of oral morphine in the public health sector as well as the availability of radiotherapy and chemotherapy in the public health system, and the availability of community/home care for people with advanced/end stage cancer and other NCDs. Countries could
indicate one of the following responses: (i) generally available; (ii) generally not available; and (iii) don’t know.

**Total high energy teletherapy units, Number of radiotherapy centers, and Number of radiation oncologists** data were obtained from the International Atomic Energy Agency (IAEA), Directory of Radiotherapy Centers (DIRAC) (14). DIRAC data includes information from both the public and private sectors.

**Non-methadone morphine equivalent (NME) consumption** data were obtained from the International Narcotics Control Board (INCB). The INCB dataset contains consumption data for morphine, hydromorphone, oxycodone, fentanyl, pethidine, and methadone. It includes all countries that reported opioid consumption to the INCB. NME consumption was computed as an average consumption of five out of six reported drugs as following: morphine, hydromorphone, oxycodone, fentanyl, and pethidine. The non-methadone morphine equivalent consumption (NMEc) was calculated in milligrams per cancer death by dividing the country NME consumption by number of cancer related deaths. Please refer to technical report which provides the formula used to calculate non-methadone morphine equivalent consumption (15). The number of cancer deaths by country was based on WHO Global Health Estimates (1). NME consumption data was only reported in the Profiles for WHO Member States that had records from 2010-2012 and for all five drugs mentioned above.

**References**


(13) WHO Department of Immunization, Vaccines and Biologicals. Reported immunization schedules by country. Available online at: http://www.who.int/immunization/monitoring_surveillance/data/en/
