Metadata – Mortality and causes of deaths

Description	Mortality statistics measure the level and the patterns of deaths in the Belgian population. The **crude death rate** simply describes the frequency of deaths in relation to the total population. **Age adjusting rates** are a way to make fairer comparisons between populations with different age distributions. The age-standardized rates are mathematically adjusted as if the underlying populations to be compared had the same age structure. Rates can quantify mortality for the whole population (overall mortality) or some given age groups, as the **premature mortality** i.e. mortality occurring before 75 years old. Mortality can be analyzed by all causes or by specific **Cause Of Deaths (COD)**. Besides rates, the burden of mortality can be better understood with summary measures such as the **Potential Years of Life Lost (PYLL).**
Rationale	The mortality level is a traditional health indicator that has a long tradition and is measured with more validity than any other. It is actually an indicator of "non-health" that measures irreversible events but it provides important information for public health like the importance of severe health problems and their evolution over time. In Belgium, most deaths are occurring at old ages. But reducing the mortality occurring too early is a key public health objective (1): indeed, much of the premature mortality is avoidable (2). In terms of social and economic loss, it is important to prevent citizens from dying before having achieved their potential contribution to society. Therefore, premature mortality is a classical global indicator of health status and is defined in this report as the deaths occurring before the age of 75. Specific causes of death give important information on mortality patterns. The cause-specific premature mortality is a useful tool to establish public health priorities, target prevention programs, and planning health care (3;4). Indeed, most of the causes of premature death are avoidable either through the health system or by the implementation of public health policies. The ranking of the causes of premature deaths is a very important tool to set up priorities for the reduction of premature deaths.
Primary Data source	National data: - Population: Statbel (https://statbel.fgov.be/en/themes/population/structure-population) - Daily number of death: Statbel open data (number of deaths are aggregated from the National Register primary microdata). - Cause of death: Statbel's cause of death database. This database pools and consolidates the regional databases constructed from the death certificate registration. International data: WHO mortality database
Indicator source	National data: - From 2000 to 2017 own calculations based on the Statbel cause of death and population databases - From 2017 to 2020 own calculations based on the Statbel open-access database (https://statbel.fgov.be/en/open-data/number-deaths-day-sex-district-age) International data: Own calculations from the WHO mortality database.
Periodicity	Yearly

Calculation, technical definitions, and limitations	**Population**

The population covers legally registered residents that include people registered in the RN, in the register of foreigners, and in the register of European officials. The coupling between death certificates and the registers allows Statbel to exclude non-resident deaths in Belgium and include residents' deaths occurring abroad since 2010. Since no death certificate is available for the latest, the cause of death is unknown and they are registered with an ICD10 code of death "R99".

Causes of deaths

Death certificates are filled by doctors and municipality officers. Two regions (Brussels certificates are coded by Flanders) code the information provided in the medical certificate of cause of deaths into ICD codes. Then, data are pooled by Statbel and couple with deaths registered in the National population Register (RN) since 2010.

Causes of deaths data refer to the underlying cause which – according to the World Health Organization (WHO) – is "the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury (5)." To ensure comparability, the framework used is the WHO International Classification of Diseases 10th (ICD-10)(5). Flanders (including Brussels) and Wallonia code the underlying cause of death with the ICD-10 codes and rules; but their coding practices are slightly different and affect national comparability

Indicators:

➢ *The daily number of deaths per day* represents the number of deaths that occurred each day in a year.

➢ *The crude mortality rate* is expressed in deaths per 100 000 inhabitants and calculated as the number of deaths recorded in the population for a given period divided by the population in the same period. The crude mortality rate is not well suited for health monitoring. Mortality is strongly related to age so aging populations face rising crude mortality rates even if the health conditions are improving. Since the population structure strongly influences this indicator, standardized mortality rates are calculated with the direct method of standardization.

➢ *The age-adjusted mortality rate* is also expressed in deaths per 100 000 inhabitants. Age-specific mortality rates are a weighted average of age-specific mortality rates; there are weighted by the age distribution of a standard population to harmonize the comparison of mortality rates over time. We use the European Standard Population 2010 (ESP 2010) (6) as it allows comparability with EU statistics. Age-adjusted mortality rates are calculated for the total of ages and for the age group 0-75. Mortality rates before 75 years are known as premature mortality.

➢ *Potential Years of Life Lost (PYLL)* is a summary measure of the burden of premature mortality that takes into account the frequency and the age at death. It weights each death in function of the age when the death occurred and thus gives more weight for younger ages. The upper cut-off is set at 75 years in this report; it means that a death occurring at 15 years of age is counted as the number of years missing i.e. 60 years of PYLL. The number of PYLL for each death occurring before 75 years is summed and then divided by the population before being age-standardized with ESP 2010. As recommended by many authors, the lower cut-off has been set to 1 year instead of 0 because deaths in age group 0-1 would get an excessive weight as compared to other age classes (1).

International comparability	a) Availability:
	Crude and age-adjusted mortality rates for European countries are widely available in Eurostat database (7) and OECD database (8). Both rates are available for most countries in the world in the Human Mortality Database (HMD).
	Overall all-cause and cause-specific mortality rates can be found in Eurostat.
	Under 75 mortality rates and PYLL have to be recalculated from the published age-specific rates.
	b) Comparability:
	Differences in the coverage of residents dying abroad or non-residents dying in the reported country can slightly affect the comparability among countries. Variations in coding practices of causes of deaths between countries may affect the comparability of cause-specific mortality.

Reference List

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