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METADATA – BURDEN OF ALCOHOL USE

Description	Alcohol-attributable mortality rate refers to the number of deaths attributed to alcohol use per 100,000 people. This metric estimates the portion of the overall mortality burden linked to alcohol consumption. The inclusion of rates allows for standardized comparisons across different regions, age groups and sex.
Rationale	Alcohol use significantly affects public health, contributing to a substantial share of preventable health burdens worldwide. Measuring and understanding this impact is crucial for informing public health interventions and policies. One way to assess this is by calculating the burden attributable to alcohol consumption. Indeed, alcohol use has been linked to over 200 health conditions and is associated with mortality from 34 causes of death. The portion of disease burden that could be prevented by eliminating alcohol consumption is determined using comparative risk assessment (CRA) methodology, which involves calculating the population attributable fraction (PAF). The PAF represents the share of a particular health outcome that can be linked to the risk factor—in this case, alcohol consumption. Alcohol exposure is estimated based on prevalence (lifetime abstainers, current or former drinkers) and the average amount consumed (in grams per day among current drinkers), in Belgium. To determine the attributable burden, the PAF is multiplied by the overall disease burden, which can be expressed in terms of both morbidity and mortality. By employing CRA, policymakers can more effectively set priorities and design strategies to reduce the health burden associated with alcohol use.
Primary Data source	National data : • Alcohol use exposure data are drawn from the Belgium Health Interview Survey by age, sex, and region for every wave. • Population data and mortality data from Statistics Belgium. International data : Relative Risk dataset from the Global Burden of Disease Study regarding current drinkers (Murray, 2020) and World Health Organisation regarding former drinkers (Shield, 2020).
Indicator source	Estimate for alcohol attributable deaths by age, sex and region from the Belgian Burden of Disease study, Sciensano
Periodicity	Yearly estimates from 2013
Calculation, technical definitions and limitations	The Comparative Risk Assessment (CRA) framework compares a current harmful risk factor in the population against a "counterfactual" exposure situation, where the selected risk factor is reduced to the so-called Theoretical Minimum Risk Exposure Level (TMREL), here zero alcohol use. This allows to estimate the proportion of the disease attributable to that risk factor or the Population-Attributable Fraction (PAF) (Murray et al., 2003; Plass et al., 2022). We present risk factor attributable burden from 2013 to the most recent reference year (2021) by region, sex, and age group, using a time series of data and present yearly estimates of risk-attributable burden. $$\text{PAF} = \frac{P_{abstainers} + P_{former} * RR_{former} + P_{current} * RR_{current} - 1}{P_{abstainers} + P_{former} * RR_{former} + P_{current} * RR_{current}}$$ Where, $P_{abstainers}$ = prevalence of lifetime abstainers P_{former} = prevalence of former drinkers RR_{former} = relative risk (RR) for former drinkers $P_{current}$ = prevalence of current drinkers who consume an average daily amount (x) of alcohol $RR_{current}$ = average daily amount of alcohol consumed by current drinkers

	Smoking exposure data is retrieved from the BHIS which defines the following exposure indicators for smoking status and measures of frequency or intensity: • Current drinkers is the proportion of individuals who have consumed at least one alcoholic beverage (or some approximation) in 12 months • Former drinkers refers to the proportion of people who have consumed alcohol in the past but have not consumed any alcohol in the 12 months • Lifetime abstainer is the proportion of individuals who have never consumed an alcoholic beverage • Mean consumption in grams per day per day represents the average amount of pure alcohol that individuals drink on a daily basis, expressed in grams, in the past 12 months. The primary data for this measure come from the World Health Organization's Global Health Observatory (GHO), which provides overall estimates of alcohol per capita estimations in litres of pure alcohol consumption for different countries. These global estimates are then refined using the Belgian Health Interview Survey (BHIS) data distribution (e.g., by age group, sex, region). This method was developed by Rehm et al. (2007). The attributable burden is calculated as the PAF multiplied with the burden, here deaths, due to a certain diseases. 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." These mortality data is made available by StatBel who are responsible for linking the death certificates to ICD codes. This data is used as the burden component in the multiplication with the PAF. Attributable deaths are the number of deaths that can be attributed to alcohol exposure. Results are stratified by age, sex and region. $$Attributable\ Deaths = Deaths * PAF$$ The results, alcohol associated deaths, remain estimates. Below some general limitations of this method : - self-reported data: drinking prevalence and the distribution of the average consumed are derived from self-reported surveys, which may be subject to reporting bias, including underreporting of drinking behavior or misclassification of former and current drinkers. - simplified assumptions: The CRA method assumes that reducing alcohol exposure to TMREL (zero alcohol use) would eliminate the attributable burden. In reality, other risk factors and variables, comorbidities, and environmental influences could contribute to the observed disease burden, leading to potential over-attribution of deaths to smoking. - relative risk estimates: RRs used in the model are derived from GBD and WHO, although extensive, these estimates remain global. These estimates may not fully capture variations across populations, regions, or subgroups, and may not account for other behavioral or genetic modifiers. - morbidity component: does not take account morbidity or non-fatal outcomes.
International comparability	Availability : yes, estimates are available and calculated by GBD for each country. Comparability : estimates are produced using the Belgian population, specific structure (age, sex, region) and Belgium smoking exposure. Also the mortality component is specific to the Belgian context. In regards to the mortality data, a limitation is the differences in the coverage of residents dying abroad or non-residents dying in the reported country which 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

Murray, C. J., Ezzati, M., Lopez, A. D., Rodgers, A., & Vander Hoorn, S. (2003). Comparative quantification of health risks: Conceptual framework and methodological issues. *Population Health Metrics*, *1*, 1. https://doi.org/10.1186/1478-7954-1-1

Murray, C. J. L., Aravkin, A. Y., Zheng, P., Abbafati, C., Abbas, K. M., Abbasi-Kangevari, M., Abd-Allah, F., Abdelalim, A., Abdollahi, M., Abdollahpour, I., Abegaz, K. H., Abolhassani, H., Aboyans, V., Abreu, L. G., Abrigo, M. R. M., Abualhasan, A., Abu-Raddad, L. J., Abushouk, A. I., Adabi, M., … Lim, S. S. (2020). Global burden of 87 risk factors in 204 countries and territories, 1990–2019: A systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, *396*(10258), 1223–1249. https://doi.org/10.1016/S0140-6736(20)30752-2

Plass, D., Hilderink, H., Lehtomäki, H., Øverland, S., Eikemo, T. A., Lai, T., Gorasso, V., & Devleesschauwer, B. (2022). Estimating risk factor attributable burden—Challenges and potential solutions when using the comparative risk assessment methodology. *Archives of Public Health*, *80*(1), 148. https://doi.org/10.1186/s13690-022-00900-8

Shield, K., Manthey, J., Rylett, M., Probst, C., Wettlaufer, A., Parry, C. D. H., & Rehm, J. (2020). National, regional, and global burdens of disease from 2000 to 2016 attributable to alcohol use: A comparative risk assessment study. *The Lancet Public Health*, *5*(1), e51–e61. https://doi.org/10.1016/S2468-2667(19)30231-2

Rehm, J., Klotsche, J., & Patra, J. (2007). Comparative quantification of alcohol exposure as risk factor for global burden of disease. *International Journal of Methods in Psychiatric Research*, *16*(2), 66–76. https://doi.org/10.1002/mpr.204