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Global Burden of Disease and Risk Factors Study (GBD) 2023 Overview

October 2026

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Background

The GBD study is a systematic, scientific effort to quantify the magnitude of health loss from all major diseases, injuries and risk factors by age, sex, location and over time (Institute for Health Metrics and Evaluation, n.d.).

The first GBD study was commissioned in the early 1990s by the World Bank and published as part of the World Development Report 1993. This study provided estimates for eight regions, 108 conditions, ten risk factors and five age groups for the year 1990. Building on this work, the Institute for Health Metrics and Evaluation (IHME), an independent population health research organisation, published its first major update, GBD 2010, in December 2012. This update was in collaboration with nearly 500 experts worldwide (IMHE, n.d.).

Since the publication of GBD 2010, the study has been co-ordinated by the IHME and is routinely updated to incorporate new data sources and changes in methodology, where appropriate (Bhutta, 2025). The latest iteration of the study, GBD 2023, was published in October 2025 and provides estimates for 375 diseases and injuries and 88 risk factors, across 204 countries and territories from 1990 to 2023. For a small number of countries, subnational estimates are also available, depending on collaborations with country partners and the availability of data. This includes the United Kingdom with subnational estimates provided for England and the nine English regions (Estep, 2025).

The GBD is underpinned by five core principles: producing the best possible estimates; comprehensive accounting across diseases, injuries and risks; focus on comparable measurements, providing summary measures of fatal and non-fatal health outcomes, and the careful evaluation of face validity (Murray, 2022).

To ensure comparability of measurement overtime and across populations, each new iteration of the GBD provides updated estimates for the entire time series back to 1990, incorporating newly available data and changes in methodology, where appropriate. This means that estimates provided by the GBD 2023 replace all previously published estimates (IHME, 2024).

Another principle of GBD is the provision of summary measures for the burden of disease. The study produces regular estimates of incidence, prevalence and mortality (such as all-cause mortality and deaths by specific causes), alongside three summary measures of disease burden: years of life lost due to premature mortality, years lived with disability, and disability adjusted life years. Table 1 provides a summary of these measures.

Table 1 Summary measures included in the Global Burden of Disease and Risk Factors Study

Measure	Definition
Measures of disease frequency	
Deaths	Deaths occurring in a population during a set period
Incidence	Number of new cases of a given cause or disease within a specified population during a set period
Prevalence	Total number of cases (both new and existing) of a given cause within a specified population at a given time
Measures of life expectancy	
Life expectancy	Number of years a person is expected to live based on their present age
Healthy life expectancy	Number of years that a person at a given age can expect to live in good health, if current rates of mortality and disability remain constant.
Measures of health burden	
Years of life lost (YLL)	Years of life lost due to premature mortality
Years lived with disability (YLD)	Years of healthy life lost due to living with illness, injury, or disability
Disability adjusted life years (DALYs)	Years of healthy life lost due to premature death and disability, calculated as the sum of YLL and YLDs. This can help us to understand the total health burden (both fatal and non-fatal) overtime.

For each measure, the number, percent and rate are presented in the GBD Results Tool and GBD Compare.

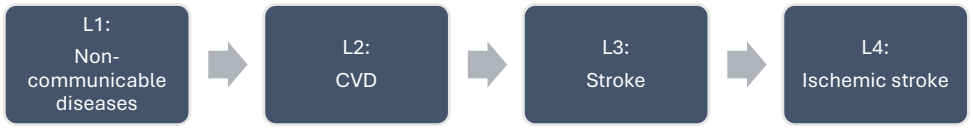
How are GBD estimates calculated?

To calculate estimates for GBD 2023, IHME and its global network of collaborators used over 310,000 sources of data which included household surveys, censuses, vital registrations (which collects data on the "vital" events, such as live births and deaths of every member of a population), and other health-related data sources (GBD 2023 Disease and Injury and Risk Factor Collaborators, 2025, Supplementary Appendix 1). All data sources included in the study underwent strict quality assurance processes such as the application of data-vetting protocols designed to assess internal consistency, completeness, and plausibility, use of statistical tools such as the MR-BRT meta-regression tool to adjust for known biases and cross-validating new sources against existing datasets (Murray, 2022).

How are estimates for the 375 diseases and injuries categorised in the GBD 2023?

GBD 2023 categorises the 375 diseases and injuries into a four-level hierarchy, which is referred to as the GBD cause hierarchy. The categories become more detailed throughout the four levels. Level 1 refers to three broad categories (communicable, maternal, neonatal, and nutritional diseases; non-communicable diseases; and injuries) and level 4 focuses on the most detailed diseases. An overarching category for all causes is also presented. Figure 1 provides an example within the context of cardiovascular disease (CVD).

Figure 1 Hierarchy of CVD cause levels used in the GBD



How are estimates for the 88 risk factors categorised in the GBD 2023?

GBD 2023 provides estimates on the burden of disease and injury attributable to specific risk factors based on the comparative risk assessment (CRA) framework. This framework is based on a causal web of hierarchically organised, modifiable risk factors or causes which contribute to health outcomes. By using a causal web, this accounts for changes in disease burden resulting from variations in multiple risk factors simultaneously. This is important as many factors can act through other, intermediate, factors, or in combination with other risks (Murray et al, 2003).

Risks are evaluated and organised into four levels within the risk factor hierarchy ranging from level 1, where risk factors are grouped into three broad categories (metabolic, behavioural, and environmental/occupational), and level 4, risks of the most granular level, such as household air pollution from solid fuels.

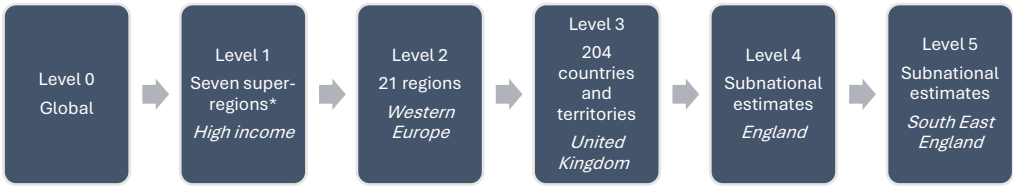
For each risk factor, the framework assesses the attributable burden, defined as the reduction in the current or future burden of disease if the past exposure to a risk factor had been at the theoretical minimum-risk exposure level (Li, et al., 2025). This refers to the level of exposure that is theoretically possible and would minimise the risk of disease or death for a population (GBD 2023 Disease and Injury and Risk Factor Collaborators, 2023). An overarching category for all modifiable risk factors is also provided An overarching category for all modifiable risk factors is also presented. The risk factors hierarchy is not collectively exhaustive. In other words, not all burden can be attributed to a risk factor (Estep, 2025).

For further information, refer to the FAQ document provided in the resources section of this briefing.

How are estimates for the 204 countries and territories categorised by the GBD 2023?

For the GBD 2023, the 204 countries and territories included were grouped into 21 regions and seven super regions. Subnational estimates were also provided for a small number of countries, depending on collaborations with in-country partners and data availability. This included England and the nine English regions, as shown in Figure 1. Previous iterations of the GBD did provide more granular breakdowns for upper-tier local authorities within each English region, such as West Sussex.

Figure 2 Summary of the GBD 2023 location hierarchy



Are estimates from the GBD 2023 comparable with previous years?

For each new iteration of the GBD, estimates for the entire time series back to 1990 are updated to incorporate new data and change in methods, where appropriate.

This allows estimates to be comparable to each other by using the same methods and approaches for all years. This means for the latest GBD 2023, estimates for the entire 1990–2023 time series therefore replace all previously published estimates.

Where can I find out further information?

The IHME provides lots of resources which help to support your learning and understanding of the GBD and what the study can and cannot tell us. Useful resources include:

- Terms and definitions used by the GBD 2023.
- Definitions of the metrics used for each measure e.g., deaths, DALYs etc.
- User guide on how to use the GBD results tool

Alongside resources provided by the IHME, a frequently asked questions document has been created for the directorate and general public. This document can be found on the Global Burden of Disease JSNA webpage.

References

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