

# Years of life lost (percentage of total)

## Rationale for use

Years of life are lost (YLL) take into account the age at which deaths occur by giving greater weight to deaths at younger age and lower weight to deaths at older age. The years of life lost (percentage of total) indicator measures the YLL due to a cause as a proportion of the total YLL lost in the population due to premature mortality.

## Definition

YLL are calculated from the number of deaths multiplied by a standard life expectancy at the age at which death occurs. The standard life expectancy used for YLL at each age is the same for deaths in all regions of the world and is the same as that used for the calculation of Disability Adjusted Life Years (DALY). Additionally 3% time discounting and non-uniform age weights which give less weight to years lived at young and older ages were used as for the DALY. With non-uniform age weights and 3% discounting, a death in infancy corresponds to 33 YLL, and deaths at ages 5 to 20 to around 36 YLL.

## Associated terms

**The Disability Adjusted Life Year or DALY** is a health gap measure that extends the concept of potential years of life lost due to premature death (PYLL) to include equivalent years of 'healthy' life lost by virtue of being in states of poor health or disability (1). DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD) for incident cases of the health condition.

## Data sources

Death registration data for 112 WHO Member States, sample registration systems (India, China), available data on child and adult mortality from censuses and surveys, together with population-based epidemiological studies, disease registers and notifications systems for the estimation of mortality due to 21 specific causes of death.

## Methods of estimation

Life tables specifying all-cause mortality rates by age and sex for 192 WHO Member States were developed for 2002 from available death registration data, sample registration systems (India, China) and data on child and adult mortality from censuses and surveys. Cause of death distributions were estimated from death registration data for 107 countries, together with data from population-based epidemiological studies, disease registers and notifications systems for selected specific causes of death. Causes of death for populations without useable death registration data were estimated using cause-of-death models together with data from population-based epidemiological studies, disease registers and notifications systems for 21 specific causes of death.

## Disaggregation

By age and sex.

## References

- Lopez AD, Mathers CD, Ezzati M, Murray CJL, Jamison DT, 2006. Global burden of disease and risk factors. New York: Oxford University Press. (<http://www.dcp2.org/pubs/GBD>)
- Mathers, C. D. Uncertainty and data availability for the Global Burden of Disease estimates 2000-2002. Evidence and Information for Policy Working Paper. 2005. Geneva, World Health Organization. (<http://www.who.int/entity/healthinfo/publications/boduncertaintypaper2002.pdf>)
- Mathers CD, Ma Fat D, Inoue M, Rao C, Lopez AD. Counting the dead and what they died from: an assessment of the global status of cause of death data. Bulletin of the World Health Organization 2005;83(March):171-7. ([http://whqlibdoc.who.int/bulletin/2005/Vol83-No3/bulletin\\_2005\\_83\(3\)\\_171-177.pdf](http://whqlibdoc.who.int/bulletin/2005/Vol83-No3/bulletin_2005_83(3)_171-177.pdf))

#### Database

- WHO mortality database: (<http://www.who.int/healthinfo/statistics/mortality/en/index.html>)  
The data available on this web site comprise deaths registered in national vital registration systems, with underlying cause of death as coded by the relevant national authority.
- Death and Disability Adjusted Life Years (DALY) estimates for 2002 by cause for WHO Member States. The Excel spreadsheet contains estimates of numbers, crude rates and age-standardized rates, as well as information on data sources and levels of evidence. (<http://www.who.int/entity/healthinfo/statistics/bodgbdeathdalvestimates.xls>)

#### Comments

Uncertainty in estimated all-cause YLL ranges from around  $\pm 1\%$  for high-income countries to  $\pm 15-20\%$  for Sub-Saharan Africa, reflecting large differences in the availability of data on mortality, particularly for adult mortality. Uncertainty ranges are generally larger for estimates of deaths from specific diseases. For example, the relative uncertainty for deaths from ischaemic heart disease ranges from around  $\pm 12\%$  for high-income countries to  $\pm 25-35\%$  for Sub-Saharan Africa. The relatively large uncertainty for high-income countries reflects a combination of uncertainty in overall mortality levels, in cause of death assignment, and in the attribution of deaths coded to ill-defined causes.