The global burden of disease (GBD) is a complementary measure to traditional health statistics such as mortality rates and hospital productivity that do not reflect the impact of non-fatal outcomes of disease or injury over a patient’s lifetime. The first assessment of health-related quality of life was in 1970 with the development of the health status index, but the term quality-adjusted life years (QALYs) was first used in 1976 to denote a health status measure that combined duration and quality of life. Designed to overcome certain limitations of QALYs, disability-adjusted life years (DALYs) entered the health lexicon as a measure of the impact of a disease over time, which combines years lost due to disease (YLDs) and years of life lost (YLLs) due to premature death. The latter is calculated on the basis of potential longevity as defined in a standard table of mean life expectancy, adjusted to take account of changing life expectancy rather than the previously used cut-off of 70 years, or 75 years in some countries. YLDs correspond to the number of years lived with disability, the burden of disability being weighted according to disease severity on a scale of 0 (healthy) to 1 (death). The DALY measure is recommended by the World Health Organization (WHO) and by the World Bank, and was applied in the first Global Burden of Disease study in 1990 and in the World Bank Development Report in 1993, which had considerable impact on health policies by revealing the hidden burden in certain neglected health areas.

The purpose of the GBD project is to provide comprehensive health data on diagnoses and trends that are comparable between countries and thereby to aid in policy decisions at global (WHO and United Nations [UN]), regional and national levels. One of its specific aims was to develop a measure that can be used to assess the cost-effectiveness of interventions, in terms of the cost per unit of disease burden averted. However, the central concept of the GBD study is health loss, not loss of income or productivity. The financial costs of illness and their relationship to outcomes (health gains) have not as yet been assessed by the GBD studies, but since health systems are evaluated in terms of access, quality and financial protection, they are likely to be included in burden of disease measures in the future.

The 2010 GBD study used the same approach as the 1990 study but had a wider scope, a large consortium of collaborators, improved methodology and updated data on diseases, risk factors, regions and countries. The project, variously described as “a superhuman effort”, “a way of life, rather than another massive research project”, “mission impossible”, a test of fire and a Herculean task, and which few initially believed would succeed, was coordinated by the...
DALYs, in the Northern region, and risk factors Overall health is improving in all 14 as well as the burden of disease, both overall The authors used an established As confirms that YLLs due to non-fatal ischemic Another challenge will be to strengthen
non-governmental organizations, the medical community
lacunae to be identified and new priorities to be defined in
health, but also enable performance to be measured,
non-governmental organizations, the medical community
and other stakeholders to improve public health.
While research on burden of disease in Portugal is limited,
various studies have contributed to the evidence base and
enriched the debate on ways to improve health, particu-
larly in the case of hypercholesterolemia and atrial
fibrillation, as well as the burden of disease, both overall
and attributable to risk factors in the Northern region,
which have revealed new needs and health problems and
influenced regional and local health planning.
The article by Henriques et al. published in this issue of
the Journal confirms that YLLs due to non-fatal ischemic
heart disease (IHD) – myocardial infarction, angina and
heart failure – contribute much more than YLDs to the
global burden of IHD in Portugal, as expressed in DALYs.
The proportion of DALYs due to YLDs (11.7%), for both sexes,
was similar to the estimate for Western Europe (11.0%) in
2010 and was almost twice the 1990 figure (6.6%), while globally (21
world regions), YLDs due to nonfatal IHD accounted for 6%
in men and 8% in women, with inequalities between differ-
cent countries and regions. The authors used an established
methodology in international studies in this area applied to
data from five of the seven Portuguese NUTS II regions. Some
limitations of the study indicate the need to strengthen
health information systems, such as those related to mortal-
ity and the calculation of YLLs, due to the fact that the cause
of death in a significant percentage of cases was reported as
symptoms, signs, abnormal findings or ill-defined conditions
(8.7% in 2013), which would hinder comparisons if they were
excluded from the analysis, or would depend on the valid-
ity of the approach used for reclassification of such ‘garbage
codes’. Using YLDs as an indicator may underestimate hospi-
talizations for acute coronary syndromes, because these are
included in the hospital morbidity statistics of the national
health service but not of those of all Portuguese hospitals.
Furthermore, the use of data from studies conducted in
another country (Spain) to estimate the prevalence of stable
angina and heart failure points up the lack of recent data
for Portugal. Given advances in computational analysis,
the solution in the future may well be ‘big data’, the use of
computer technology to analyze large data sets in a com-
bination of volume, velocity and variety in a way that will
bring significant benefits.
Worldwide, from 1990 to 2013, life expectancy at birth
increased by 6.2 years (95% confidence interval [CI] 5.6-6.6)
and healthy life expectancy at birth rose by 5.4 years (95%
CI 4.9-5.8). This trend was consistent in 21 world regions in
2013, but around an eighth of life expectancy was associated
with disability. In Portugal, time lived with disability in 1990
corresponded to 12.5% and 14.0% of mean life expectancy for
men and women, respectively, while in 2013 this was 12.9%
and 14.7% (approximately an eighth and a seventh, respec-
tively, of life expectancy). Overall health is improving in all
countries, but the proportion of disability in the total burden
disease is increasing due to a slower decline in disability
than in mortality rates. For example, in 2015, cardiovascular
disease (CVD) was the leader in terms of global DALYs for
non-communicable diseases (NCDs) (23.5%) and the percent-
age change from 2005 to 2015, for all age-groups, was 0.1,
11.0, 17.7 and 28.0, respectively, for cerebrovascular dis-
ease, IHD, hypertensive heart disease and atrial fibrillation.
CVD was responsible for only 7% of YLDs in NCDs, and the
percentage change from 2005 to 2015 was 20.7, 28.0 and
30.2, respectively, for cerebrovascular disease, atrial fibri-
lation and IHD. These findings reflect aging populations,
an epidemiological transition to a predominance of NCDs,
and improved socioeconomic conditions, resulting in popula-
tions living longer with disabilities. Despite these advances,
health systems are facing new challenges in meeting needs,
applying resources and adapting infrastructure to deal with
populations who live longer but with disabilities.
One final observation on the importance of the IHME in
quantifying health loss around the world. The GBD project
is now a consortium of over 1900 collaborators in 125
countries, who identify the leading health issues in 195
countries and territories, covering more than 300 diseases,
injuries and risk factors. It produces the most reliable health
statistics currently available, at both national and global
level, revealing inequalities and identifying future chal-
enges that will need to be addressed in order to transform
the health and well-being of populations. These include how
to increase access to quality data for the calculation of
DALYs, for both mortality (certification of cause of death)
and morbidity, the invisible component of the burden of
disease that is difficult to estimate for many diseases and
vulnerable to bias and uncertainty, as well as how to
improve comparative risk assessment (by constructing dis-
ease models to estimate the burden of disease attributable
to risk factors). Another challenge will be to strengthen
research into the links between different development aims,
in order to measure the effect of factors that have the great-
est impact on health and to act according to this knowledge.
The GBD study adds to the evidence and whenever its data
are updated, it can serve as an audit of global health and
of achievement of goals in the future, as expressed in the
health-related targets approved by world leaders in the 2030
Agenda for Sustainable Development at the UN in 2015.
As pointed out by Dr Margaret Chan, the Director-General of the
WHO, “Data on its own won’t prevent disease or save lives,
but it shows where governments need to act to strengthen
their health systems and protect people from the potentially
devastating effects of health care costs.”
Conflicts of interest

The author has no conflicts of interest to declare.

References