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Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition

GBD 2013 DALYs and HALE Collaborators*

Summary

Background—The Global Burden of Disease Study 2013 (GBD 2013) aims to bring together all available epidemiological data using a coherent measurement framework, standardised estimation methods, and transparent data sources to enable comparisons of health loss over time and across causes, age–sex groups, and countries. The GBD can be used to generate summary measures such as disability-adjusted life-years (DALYs) and healthy life expectancy (HALE) that make possible comparative assessments of broad epidemiological patterns across countries and time. These summary measures can also be used to quantify the component of variation in epidemiology that is related to sociodemographic development.

Methods—We used the published GBD 2013 data for age-specific mortality, years of life lost due to premature mortality (YLLs), and years lived with disability (YLDs) to calculate DALYs and HALE for 1990, 1995, 2000, 2005, 2010, and 2013 for 188 countries. We calculated HALE using the Sullivan method; 95% uncertainty intervals (UIs) represent uncertainty in age-specific death rates and YLDs per person for each country, age, sex, and year. We estimated DALYs for 306 causes for each country as the sum of YLLs and YLDs; 95% UIs represent uncertainty in YLL and YLD rates. We quantified patterns of the epidemiological transition with a composite indicator of sociodemographic status, which we constructed from income per person, average years of schooling after age 15 years, and the total fertility rate and mean age of the population. We applied hierarchical regression to DALY rates by cause across countries to decompose variance related to the sociodemographic status variable, country, and time.

Findings—Worldwide, from 1990 to 2013, life expectancy at birth rose by 6·2 years (95% UI 5·6–6·6), from 65·3 years (65·0–65·6) in 1990 to 71·5 years (71·0–71·9) in 2013, HALE at birth rose by 5·4 years (4·9–5·8), from 56·9 years (54·5–59·1) to 62·3 years (59·7–64·8), total DALYs

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Contributors

TV, ADL, JAS, and CJLM prepared the first draft. CJLM and TV finalised the draft based on comments from other authors and reviewer feedback. TV, ADL, JAS, and CJLM conceived of the study and provided overall guidance. RB and KF performed final statistical analyses. All other authors provided data, developed models, reviewed results, provided guidance on methodology, and reviewed the manuscript.

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For the United Nations Development Programme Human Development Index see <http://hdr.undp.org/en/content/human-development-index-hdi>

See Online for appendix

fell by 3·6% (0·3–7·4), and age-standardised DALY rates per 100 000 people fell by 26·7% (24·6–29·1). For communicable, maternal, neonatal, and nutritional disorders, global DALY numbers, crude rates, and age-standardised rates have all declined between 1990 and 2013, whereas for non-communicable diseases, global DALYs have been increasing, DALY rates have remained nearly constant, and age-standardised DALY rates declined during the same period. From 2005 to 2013, the number of DALYs increased for most specific non-communicable diseases, including cardiovascular diseases and neoplasms, in addition to dengue, food-borne trematodes, and leishmaniasis; DALYs decreased for nearly all other causes. By 2013, the five leading causes of DALYs were ischaemic heart disease, lower respiratory infections, cerebrovascular disease, low back and neck pain, and road injuries. Sociodemographic status explained more than 50% of the variance between countries and over time for diarrhoea, lower respiratory infections, and other common infectious diseases; maternal disorders; neonatal disorders; nutritional deficiencies; other communicable, maternal, neonatal, and nutritional diseases; musculoskeletal disorders; and other non-communicable diseases. However, sociodemographic status explained less than 10% of the variance in DALY rates for cardiovascular diseases; chronic respiratory diseases; cirrhosis; diabetes, urogenital, blood, and endocrine diseases; unintentional injuries; and self-harm and interpersonal violence. Predictably, increased sociodemographic status was associated with a shift in burden from YLLs to YLDs, driven by declines in YLLs and increases in YLDs from musculoskeletal disorders, neurological disorders, and mental and substance use disorders. In most country-specific estimates, the increase in life expectancy was greater than that in HALE. Leading causes of DALYs are highly variable across countries.

Interpretation—Global health is improving. Population growth and ageing have driven up numbers of DALYs, but crude rates have remained relatively constant, showing that progress in health does not mean fewer demands on health systems. The notion of an epidemiological transition—in which increasing sociodemographic status brings structured change in disease burden—is useful, but there is tremendous variation in burden of disease that is not associated with sociodemographic status. This further underscores the need for country-specific assessments of DALYs and HALE to appropriately inform health policy decisions and attendant actions.

Introduction

The Global Burden of Disease study 2013 (GBD 2013) seeks to bring together all available epidemiological data using a coherent measurement framework, standardised estimation methods, and transparent data sources to allow comparisons of health loss to be made over time and across causes, age–sex groups, and geographies. The GBD 2013 data for disease and injury incidence and prevalence, years lived with disability (YLDs), causes of death, and years of life lost because of premature mortality (YLLs) for 188 countries provide an opportunity to assess the effect of recent changes in population health by examining summary measures of health loss attributed to specific causes, expressed in DALYs, and summary measures of average population health, expressed as HALE.^{1,2} These measures are crucial to track health progress, strengthen policy decisions, assess programme effects and results, and inform health service and research priorities. Such holistic measures of population health, encompassing both disability and mortality levels and patterns in populations, are also attracting interest as part of the discussion around the Sustainable Development Goals.^{3–5}

A hallmark of the GBD approach is an emphasis on making national data easier to compare by taking into account the extensive variation that exists in national medical certification and cause of death coding practices and widely varying case definitions and measurement methods used to track the incidence and prevalence of diseases and injuries.^{1,2} The GBD not only provides detailed metrics for specific causes, but also generates summary measures, such as DALYs and HALE, which enable comparative assessments of broad epidemiological patterns across countries and different time periods. HALE is a useful summary of overall health for a country and DALYs allow assessment of both premature mortality and non-fatal outcomes by cause. These broad summary measures allow quantification of general trends, such as the epidemiological transition, while also making clear how countries and regions deviate from general patterns.⁶⁻⁹ The unfolding of the HIV epidemic and the rise of adult mortality, especially among men in Eastern Europe and Central Asia, have called into question the notion of a universal pattern of epidemiological change that occurs with sociodemographic development.^{2,10-13} However, the general notion of a shift from communicable to non-communicable causes of disease burden and injuries remains a powerful framework for global and regional health policy debates.^{9,14-18} The GBD provides an opportunity to quantify these patterns and explore the extent to which epidemiological change is driven by sociodemographic change, reduction of health risks, improvement of health management, or other local factors.

GBD 2013 results for deaths, YLLs, incidence, prevalence, and YLDs by cause for 1990 to 2013 for 188 countries have already been published.^{1,2} In this study we use these GBD 2013 results to calculate DALYs and HALE. These summary metrics are used to characterise broad patterns of lost healthy life and cross-country variations within these patterns. The GBD 2013 provides a complete re-analysis of each country's data from 1990 to 2013 and thus supersedes all previously published GBD analyses of DALYs and HALE.

Methods

Study design

GBD 2013 uses a hierarchy of causes that organises 306 diseases and injuries into four levels of classification, the rationale for which has been described previously.^{2,19} The first level distinguishes three broad categories: first, communicable, maternal, neonatal, and nutritional disorders; second, non-communicable diseases; and third, injuries. Level 2 has 21 mutually exclusive and collectively exhaustive categories, level 3 has 163 categories, and level 4 has 254 categories. The full cause list, including International Classification of Diseases tenth edition (ICD-10) codes, has been reported previously.^{1,2} Mortality rates and causes of death for each country–age–sex–year group have been estimated in accordance with some general principles: identification of all available data sources, evaluation of the quality and correction for known bias in each data source, consistent statistical estimation including uncertainty analysis, and cross-validation analysis to assess model performance. Details of data sources and estimation methods used to deal with missing data and multiple measurements for the same country–age–sex–year group have been described previously.² Disease and injury incidence and prevalence and computation of YLDs have been estimated in line with similar principles of identification and assessment of the quality of all available

sources for 2337 sequelae of the 301 diseases and injuries.¹ The discrepancy between the 306 diseases and injuries for which DALYs are calculated and the 301 diseases and injuries for which YLDs are calculated is attributable to five diseases that cause death but do not cause disability: sudden infant death syndrome, indirect maternal deaths, late maternal deaths, maternal deaths aggravated by HIV/AIDS, and aortic aneurysm. Various statistical estimation methods were used depending on the details of specific diseases, the most common approach being the application of a Bayesian metaregression model, DisMod-MR 2.0.²⁰ We used alternative methods when the basic susceptible, with disease, and dead states in DisMod-MR 2.0 were insufficient to capture the natural history of a sequela. We aggregated sequelae prevalence into YLDs first by estimating the distribution of comorbidities through microsimulation, and second by using disability weights derived from population-based surveys of the general public to assign disability weights to each sequela and combination of sequelae—details of both steps have been described previously.^{1,21}

We used the GBD 2013 results for YLLs² and YLDs¹ to calculate DALYs. To calculate HALE, we used YLDs per person and life tables.^{1,2} We applied decomposition of variance using hierarchical regression to DALY rates by cause.

Years lived with disability

For each year for which YLDs have been estimated (1990, 1995, 2000, 2005, 2010, and 2013), we computed DALYs by adding YLLs and YLDs for each age–sex–country group. We assumed that uncertainty in YLLs is independent of uncertainty in YLDs. We did this by summing the first draw of the 1000 draws for YLLs and YLDs and then repeating for each subsequent draw. We calculated 95% uncertainty intervals (UIs) using the 25th and 975th ordered draw of the DALY uncertainty distribution.

Healthy life expectancy

We calculated HALE in accordance with the methods outlined by Salomon and colleagues.⁸ In brief, we used Sullivan's method²² to incorporate information about average levels of health experienced at different ages into an abridged life table to produce estimates of life expectancy that are adjusted for reductions in functional health status relating to prevalent health conditions. Effectively, the cumulative years lived in an age group in the abridged life table (the life expectancy column) for each country–age–sex group is multiplied by the YLDs per person for that country–age–sex group. Calculation of HALE relies on three inputs from GBD 2013: life tables by sex, country, and year; estimates of the prevalence of 2337 sequelae by age, sex, country and year; and disability weights for 235 unique health states that collectively cover the range of functional health losses and symptoms associated with the 2337 sequelae. Wang and colleagues² have described data sources and methods to estimate mortality and life tables, and Vos and colleagues¹ have described these for the measurement of prevalence of sequelae and disability weights.¹ We combined information about prevalence and disability weights into measures of the overall rate of YLDs per person in each age–sex–country group. We make the strong assumption that uncertainty in YLDs per person is independent of uncertainty in age-specific death rates to calculate uncertainty distributions for HALE.

Decomposition of variance and epidemiological transition

The epidemiological transition is an extension of the notion of the demographic transition. In demographic transition, a characteristic evolution occurs in populations over time towards reduced fertility rates, reduced mortality rates, and an older age distribution of the population. The widely used concept of the epidemiological transition adds the idea that, in addition to these changes, a characteristic change occurs in the contributing causes of death. The epidemiological transition has been broadened to encompass the more general health transition, including both morbidity and mortality. A single variable to characterise countries over time in terms of their demographic and epidemiological status would be crucial to describe the epidemiological transition. Some studies examine associations with income per person, whereas others use variables such as mean age of the population.^{23,24} We aimed to construct a single composite variable to represent both demographic status and socioeconomic development to explore the patterns of the epidemiological transition. To construct this sociodemographic status variable, we assessed variables indicative of socioeconomic status and demographic change that were available for all 188 countries from 1990 to 2013. We did not include measures of income inequality, such as the Gini coefficient, because these were not available for all countries for each year. We used principal components analysis (PCA) of the log transformation of income per person (in constant international dollars), average years of schooling of the population after age 15 years, the log of the total fertility rate, and the log of the mean age of the population. The relationship between the PCA variables and DALY rates were highly non-linear, but became linear with respect to the log DALY rates after log transformation of three of the four sociodemographic status component variables. Before using PCA, we normalised each variable to have a mean of zero and a standard deviation of 1.0. Only the first component of the PCA had an eigenvalue greater than 1.0 and the weights were 0.471 for income per person, -0.517 for total fertility rate, 0.495 for education per person, and 0.516 for mean age.²⁵ As expected, the sign on the total fertility rate was negative, whereas the sign on the other three components was positive. We also tested all possible combinations of the four variables using the same PCA approach to confirm that the principal component of all four was the most predictive of variation in DALY rates by cause. We used the predicted value of the first component for each country-year in the subsequent ANOVA and predictions of the epidemiological change with sociodemographic status.

We used hierarchical regression to decompose variance in log DALY rates into components related to the sociodemographic status, intercountry variation, year, and fraction explained by the interactions of the other variables. This approach estimates a simple model with uncorrelated random effects for year, country, and sociodemographic status.²⁶ We divided sociodemographic status into vigintiles (20 equal interval bins) to allow for non-linear correlations between log DALY rates and sociodemographic status for a cause. We did tests with up to 50 bins for the sociodemographic status variable with no change in qualitative results. We divided the variance of each random effect by total variance to decompose variance into different factors. We did this variance decomposition analysis for GBD level 2 and level 3 causes. We use these regressions to predict the pattern of DALYs by cause (and through separate regressions for YLLs and YLDs) purely as a function of sociodemographic status, holding all other random effects (year and country) at zero. Because there could be

lagged effects between sociodemographic status and DALY rate, we tested alternative models with sociodemographic status lagged from 1 to 10 years. Use of sociodemographic status from the same year as the DALY rates explained, on average, the highest proportion of the variance in DALY rates.

Age standardisation

We selected the revised GBD 2013 world population standard for the age standardisation of rates. Details of the age standard, and its development, have been reported previously.²

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. All authors had access to the data in the study and final responsibility to submit the paper.

Results

Global

Global life expectancy at birth for both sexes combined increased from 65.3 years (95% UI 65.0–65.6) in 1990 to 71.5 years (71.0–71.9) in 2013, whereas during the same interval, HALE at birth for both sexes combined increased from 56.9 years (54.5–59.1) to 62.3 years (59.7–64.8). The survivorship curves shift up and to the right with increasing quintiles of country sociodemographic status (figure 1). In the three groups of countries, defined as the lowest, middle three, and highest quintiles of country sociodemographic status in 2013, individuals are distributed across ranges of disability weights, with the majority of the population in most age groups living in health states with disability weights in the range 0.0–0.1. The fraction of individuals in the life table in full health (ie, living with a disability weight of zero) is 16.3% in the lowest sociodemographic status quintile of countries. Even in the most advantageous sociodemographic quintile of countries, the time lived in full health constitutes only a small fraction (17.5%) of the overall life course. At the other end of the spectrum, the expectation of years lived with disability weights greater than 0.5 is 3.59 years in the lowest quintile and 6.60 years in the highest quintile of countries.

Figure 2 shows the need to understand global epidemiological change in terms of numbers, rates, and age-standardised rates. The number of DALYs caused by communicable, maternal, neonatal, and nutritional disorders has declined steadily from 1.19 billion (95% UI 1.15 billion to 1.24 billion) in 1990 to 769.3 million (725.5 million to 814.9 million) in 2013, whereas DALYs for non-communicable diseases (NCDs) have increased steadily, rising from 1.08 billion (0.97 billion to 1.20 billion) to 1.43 billion (1.26 billion to 1.61 billion) during the same period (figure 2A). The year of crossover, during which global DALYs for NCDs exceeded those for global communicable, maternal, neonatal, and nutritional causes, was 1994. DALYs due to injuries have remained relatively constant, decreasing slightly from 269.6 million (251.6 million to 286.7 million) to 247.6 million (231.3 million to 265.1 million). Figure 2B shows crude DALY rates per 100 000 people for these three broad cause groups, thereby removing the effect of global population growth during the period. The DALY rate for NCDs has remained fairly constant, while substantial

declines have occurred in DALY rates for communicable, maternal, neonatal, and nutritional disorders (52.2%, 50.1–54.4) and injuries (32.0%, 27.0–35.9). The analysis of age-standardised DALY rates, shows that, after controlling for changes in population size and composition, NCD disease burden worldwide, has continued to decline, falling by 14.5% (11.6–17.3) between 1990 and 2013 (figure 3C). During the same period, worldwide age-standardised DALY rates fell by 42.4% (40.0–45.0) for communicable, maternal, neonatal, and nutritional disorders and 30.9% (26.1–34.7) for injuries.

We decomposed the changes in the number of DALYs into trends for two periods: 1990–2005 and 2005–2013 (figure 3).¹⁰ Between 1990 and 2005, the number of global DALYs changed only slightly, from 2.54 billion (95% UI 2.40 billion to 2.70 billion) to 2.51 billion (2.33 billion to 2.72 billion). Looking at disease-level details within this relative stagnation reveals important trends for specific diseases (figure 3A); the earlier period was characterised by decreases in the number of DALYs from diarrhoea, lower respiratory infections, measles, neonatal causes, tuberculosis, and tetanus, with smaller contributions from declines in congenital causes and some injuries. Conversely, large increases in disease burden were recorded for HIV/AIDS and malaria, with smaller increases for road injuries and a diverse range of NCDs, including ischaemic heart disease, diabetes, low back and neck pain, stroke, and depression, in addition to several types of cancer. From 2005 to 2013, total DALYs worldwide decreased from 2.51 billion (2.33 billion to 2.72 billion) to 2.45 billion (2.23 billion to 2.68 billion; figure 3B). Decreases were recorded for diarrhoea, malaria, HIV/AIDS, lower respiratory infections, measles, tuberculosis, and neonatal causes, and nearly all injuries. Increases were noted for a wide range of NCDs, especially low back and neck pain, ischaemic heart disease, diabetes, chronic obstructive pulmonary disease (COPD), depression, stroke, and sense organ disorders. Although they were not large contributors to the number of DALYs, notable increases were seen for dengue, food-borne trematodes, and leishmaniasis. Separate analyses of changes in age-standardised DALY rates for the period 2005–13 (data not shown) suggest that most of the increases shown in figure 3 are caused by ageing of the population and population growth.

We assessed changes in the age-standardised DALY rates of the leading GBD level 3 causes for 1990–2005 and 2005–2013 (figure 4; level 4 of the GBD cause hierarchy is reported in the appendix p 2). Between 1990 and 2005 huge reductions occurred in measles, meningitis, iron-deficiency anaemia, congenital anomalies, tuberculosis, drowning, protein-energy malnutrition, and some neonatal disorders, whereas disease burden from HIV/AIDS and malaria substantially increased (figure 4). From 2005 to 2013, age-standardised DALY rates for ischaemic heart disease, lower respiratory infections, and cerebrovascular disease have declined, although not sufficiently for these conditions to be replaced as the leading causes of disease burden worldwide. The ranks of low back and neck pain, road injuries and COPD have all increased since 2005. Age-standardised rates decreased significantly for 16 of the 25 leading causes of DALYs in 2013; for the remaining nine causes (Alzheimer's disease, chronic kidney disease, congenital anomalies, depressive disorders, diabetes, low back and neck pain, migraine, neonatal sepsis, and skin diseases), age-standardised rates did not significantly change.

Table 1 shows DALYs for each cause in 2005 and 2013 and changes in numbers and age-standardised rates of the DALYs (for the same information for 1990 to 2013 see appendix p 4).

Decomposition of epidemiological patterns

We decomposed the variance of DALY rates for GBD level 2 causes into contributions from sociodemographic status, year, country, and unexplained sources (residual; table 2). Sociodemographic status explained more than 50% of the variance for diarrhoea, lower respiratory infections and other common infectious diseases; maternal disorders; neonatal disorders; nutritional deficiencies; other communicable diseases; musculoskeletal disorders; and other NCDs. Furthermore, sociodemographic status explains between a fifth and a half of the variance for HIV/AIDS and tuberculosis; neurological disorders; mental and substance use disorders; transport injuries; and forces of nature, war, and legal intervention. Sociodemographic status explained little of the variance in the DALY rates for neglected tropical diseases and malaria, for which time-invariant country differences account for 84-98% of the variance. Notably, less than 10% of the variance in the burden of several level 2 causes could be related to sociodemographic status, including cardiovascular diseases; chronic respiratory diseases; cirrhosis; diabetes, urogenital, blood, and endocrine diseases; unintentional injuries; and self-harm and interpersonal violence. Year explained less than 7% of variance for all causes. By contrast, time invariant intercountry variation was an important component of the variance in DALY rates for all causes, ranging from a low of 11.29% for neonatal disorders to 91.23% for self-harm and interpersonal violence. Intercountry variation explains more than two-thirds of the total variance in DALY rates for HIV/AIDS and tuberculosis; neglected tropical diseases and malaria; neoplasms; cardiovascular diseases; chronic respiratory diseases; cirrhosis; digestive diseases; mental and substance use disorders; diabetes, urogenital, blood, and endocrine disorders; unintentional injuries; and self-harm and interpersonal violence. Notably, together, sociodemographic status and country account for more than 90% of the variance for 17 of 21 GBD level 2 causes; indeed, the lowest fraction of variance accounted for by these three factors is 80.2% for forces of nature, war, and legal intervention.

Figure 5 shows the predicted global composition of YLLs and YLDs for level 2 causes at different levels of sociodemographic status, controlling for year and country. YLLs from diarrhoea, lower respiratory infections, and other common infections, and neonatal disorders fall substantially as sociodemographic status increases. Other YLLs that fall noticeably with rising sociodemographic status include YLLs from maternal causes, nutritional deficiencies, other non-communicable causes (including congenital causes), and unintentional injuries. YLLs from cardiovascular diseases at first increase slightly with increasing sociodemographic status, but then decrease at the highest levels of country sociodemographic status. Some important causes of global YLLs are not strongly related to sociodemographic status because they are largely country-specific, such as neglected tropical diseases and malaria, neoplasms, and intentional injuries. By contrast, overall YLDs decline slightly at first, but then increase substantially, showing the opposite trend to YLLs. The large increases in YLDs are related to musculoskeletal disorders; mental and substance use disorders; diabetes, urogenital, blood, and endocrine diseases; and neurological

disorders. As sociodemographic status rises, the steady decreases in YLLs and increases in YLDs cause the proportion of total DALYs attributable to YLDs to steadily rise from 9.9% at the lowest level of sociodemographic status to 49.1% in the highest quintile. Above the tenth quintile of sociodemographic status, the rise in YLDs and fall in YLLs nearly compensate for each other so that DALY rates have remained largely constant.

Country-specific results

In 1990, life expectancy ranged from 46.9 years (95% UI 45.1–48.2) in the Central African Republic to 80.7 years (78.7–82.5) in Andorra, while HALE ranged from 40.4 years (38.2–42.5) in the Central African Republic to 70.2 years (67.7–72.5) in Japan. By 2013, life expectancy ranged from 48.3 years (46.5–50.1) in Lesotho to 83.9 years (82.3–85.5) in Andorra, and HALE ranged from 42.0 years (39.8–44.2) in Lesotho to 73.4 years (70.5–76.0) in Japan. Disaggregating by sex, in 1990, there were no countries in which men had attained a HALE of 70 years or more, and only in Japan and Andorra did women attain this. By 2013, HALE for men exceeded 70 years in only two countries (Japan and Singapore), whereas HALE for women exceeded 70 years in 40 countries (table 3). Of the 21 GBD regions, nine contained at least one country in which female HALE was at least 70 years in 2013. For most countries, changes in HALE were positive for both men and women between 1990 and 2013, and the differences were significant. However, HALE in 2013 was not significantly higher than it was in 1990 in 43 countries for men and in 32 countries for women. As life expectancy increases, the gap between life expectancy and HALE widens, increasing to more than 10 years at a life expectancy of 77 years for women and 78 years for men. The life expectancy minus HALE divided by life expectancy (the percentage of life expectancy lost because of poor health) ranged between 11.5% and 15.0%.

Figure 6 shows the ten most common causes of DALYs for each country in 2013. The leading causes of DALYs vary substantially across regions, representing both different levels of sociodemographic status and distinct regional patterns. In high-income regions, low back and neck pain, ischaemic heart disease, cerebrovascular disease, and tracheal, bronchus, and lung cancer are often among the four most common causes, although major depression, COPD, and diabetes come into the top four slots in some countries. In central and eastern Europe, cardiovascular diseases rank consistently in the most common causes of DALYs. Self-harm and depression frequently rank higher in eastern Europe than in central Europe or elsewhere. In central Asia, representative of the mixed levels of sociodemographic status present in the region, leading causes include neonatal encephalopathy and congenital causes. In central Latin America, violence, ischaemic heart disease, diabetes, low back and neck pain, and road injuries comprise the top five causes. Other examples of distinct regional patterns include the high ranking of COPD in east Asia, the dominance of malaria in west Africa, and the dominance of HIV/AIDS in eastern and southern sub-Saharan Africa. Within some regions, such as north Africa and the Middle East, the leading causes varied substantially.

Discussion

Global health is improving: life expectancy at birth rose by 6.2 years between 1990 and 2013, while HALE at birth increased by 5.4 years during the same interval; worldwide, age-standardised DALY rates fell by 27%. Global progress has accelerated since 2005 because of major reductions in HIV/AIDS and malaria, in addition to continued progress against other major communicable, maternal, neonatal, and nutritional disorders. Although the total volume of DALYs is down by only 3.6% over the 23 year period, this is largely explained by population growth and ageing driving up numbers of DALYs. Declines in age-standardised DALY rates are counterbalanced by population growth and ageing, so that, despite improvements in age–sex-specific health status, demands on health systems remain high. An example of these demands is the fact that the number of individuals in the world living in states of health characterised by a disability weight greater than 0.1 has increased by 43% from 1990 to 2013.

In 1971, Omran²⁷ outlined the concept of the epidemiological transition to describe the changing pattern of causes of death that results from sociodemographic development. The notion of the epidemiological transition has been expanded to recognise the phase in transition that leads to double burden of disease^{9,28,29} and the countertransitions of the HIV/AIDS epidemic and the rise of mortality in the former Soviet Union.^{2,10,11,13,30-32} Many studies have recognised regional and national variation in the epidemiological transition.^{9,14,33-35} Taking advantage of the database of the GBD 2013 country-level results from 1990 to 2013, we have quantified the extent to which sociodemographic status accounts for changes in epidemiological patterns, as opposed to other factors changing over time or static variation between countries. Isolation of this component of the variation of DALY rates allows examination of the shifts in disease and injury patterns that would be expected purely as a function of changing sociodemographic status. As sociodemographic status rises, YLLs from diarrhoea, lower respiratory infections, neonatal causes, maternal mortality, and other infectious causes decline substantially, while at the same time, there has been a slower rise in YLDs from musculoskeletal disorders, mental and substance use disorders, neurological disorders, and diabetes, urogenital, blood, and endocrine diseases. DALY rates for neoplasms and cardiovascular disease are minimally related to sociodemographic status; instead local factors have a profound effect. However, with rising sociodemographic status, the proportion of DALYs due to these causes increases because of decreases in other causes of YLLs. Although, DALY rates for cardiovascular disease seem not to be related to sociodemographic status, large declines have been recorded for these causes in high-income countries in age-standardised rates over the past decades. The wide variation between some high sociodemographic status countries, such as Japan and Finland, shows how other factors, such as diet, physical activity, and other risks, vary substantially within the same level of sociodemographic status and also affect cardiovascular disease outcomes. Furthermore, our analysis of the epidemiological transition is based on crude population rates, so reductions in age-specific cardiovascular rates associated with rising sociodemographic status are countered by shifts towards an older population. Our analysis of the epidemiological transition shows decreases in DALY rates for cardiovascular disease at the very highest levels of sociodemographic status. Notably, the predictable rise in YLD

rates for some causes (such as musculoskeletal disorders, diabetes mellitus, and mental and substance use disorders) driven by population ageing is not well recognised in the literature about the epidemiological transition.

Our decomposition of variance analysis shows that, for many NCDs, the main determinants of variation in DALY rates are country-specific effects, not the epidemiological transition. Global health can be understood in terms of a general theme in which change in epidemiological patterns is related to sociodemographic status, upon which country-specific patterns are overlaid. Little of the variation in DALY rates was attributable to the year, which contrasted with previous findings showing that the association between life expectancy and income and education has shifted over time.^{24,36-38} Our analysis only covers a 23 year period, which might be too short to fully capture the effects of changing sociodemographic status. Some of the country effects, such as those noted for neglected tropical diseases and malaria, might have been related to sociodemographic status in a longer run analysis. The substantial effect of country variation on the epidemiological transition pattern reinforces the importance of estimating the burden of disease for each country individually. The GBD results can be used productively in the future to characterise the deviation of individual countries from the general epidemiological transition. Our analysis of the association between crude DALY rates and country sociodemographic status does not provide insights into within-country disease associations across individual levels of socioeconomic status. For example, findings from multiple studies have shown that individuals of lower socioeconomic status have increased rates of cardiovascular and circulatory diseases.³⁹⁻⁴⁷

HALE varies widely between countries and over time. As a single summary measure of population health, HALE is fairly simple to explain and provides an indicator that is affected by any changes in mortality rates or prevalence of disease or injury. HALE has been proposed as an indicator for the Sustainable Development Goals. As calculated through the GBD, HALE is an attractive measure that is sensitive to intervention and comparable over time and between populations. Although HALE needs input about the prevalence of multiple sequelae, the annual revisions of the GBD provide a widely available source for regular updates. By contrast, some other variants of health expectancies might be less appropriate for intertemporal or cross-country comparison. With measures that define disability according to arbitrary thresholds of disability weight, such as disability-free life expectancy (DFLE),⁴⁸ even slight changes in the disability weight threshold will profoundly affect conclusions about levels and changes in healthy life expectancy, as can be seen in figure 1. Moreover, these measures are non-standardised and hence not comparable: in some implementations of DFLE, the choice of the severity threshold to define disability is left to individual respondents in the surveys. For example, the European Union⁴⁹ has adopted a measure of healthy life expectancy based on survey responses to a single item on activity limitations. Such a measure is susceptible to variation in the meaning attached to categorical descriptions of limitation levels, both between individuals and over time, as seen in related survey items on health status.⁵⁰⁻⁵² An example of the sensitivity of DFLE measured in Europe is the reported decline in DFLE in Italy after 2004, which was caused by a change in question phrasing; we noted an increase in HALE for Italy in this study.⁵³ Although HALE and DFLE both use disability weights, the continuous scale of disability weights used in

HALE makes it less sensitive to measurement error than are the dichotomous (zero or one) weights used in DFLE.

Our findings support those of Salomon and colleagues,⁸ which showed that HALE is increasing more slowly than life expectancy: ie, as life expectancy increases, the expectation of years lived with multiple sequelae increases as well. The difference between life expectancy and HALE has increased, whereas the ratio of this difference to life expectancy has remained fairly constant. Whether or not this change should be termed an expansion of morbidity is not the issue. Rather, we saw that while health loss because of YLDs from cardiovascular and circulatory diseases and neoplasms might be decreasing, the real drivers of the difference between HALE and life expectancy are musculoskeletal disorders, mental and substance use disorders, neurological disorders, and diabetes, along with vision loss and hearing loss. Prevalence for all of these conditions is strongly age-related, and age-standardised rates for them are not declining. Even though the age of onset for mental health and substance use disorders is not strongly age-related, the prevalence of these conditions tends to rise with age. Prevalence of musculoskeletal disorders, neurological disorders, diabetes, and hearing and vision loss rise even more profoundly with age. As individuals increasingly survive to 80 years and older, the amount of time spent with a combination of these disorders increases, even though age-standardised rates have not increased over time. According to our analysis, the available therapies have not led to significant declines in age-standardised YLD rates. Very few, if any, of these disorders receive the attention they deserve in public policy discourse about health and health research priorities.

Global health progress has been driven by impressive progress in reducing age-standardised rates for a wide range of causes of death. Age-standardised YLD rates, however, are not declining. Many potential reasons exist to explain the general success for mortality and absence of success for disease prevalence. Research and development investments by funders such as the US National Institutes of Health (NIH) and the pharmaceutical industry have focused on cardiovascular diseases, neoplasms, and endocrine disorders.⁵⁴⁻⁵⁹ As we report, in the early phases of the epidemiological transition, the major driver of change in disease and injury patterns is progress in the reduction of YLLs. We believe that the historical focus of health research funding on causes of YLLs was probably appropriate. However, health progress now means that more research investment is needed for the disorders that debilitate, rather than kill. With each passing year, the shift towards YLDs as the leading causes of disease burden will be more evident. Action is needed now to develop preventive, curative, and ameliorative strategies for these conditions rather than waiting until this shift is even more obvious.

Controlling for sociodemographic status, substantial variation exists for DALY rates between countries. In our decomposition of variance, the importance of intercountry variation fluctuated by cause; for example, country level variation explains little variation for neonatal causes, but most variation for self-harm and interpersonal violence. These findings raise the question of whether the division of countries into 21 regions in GBD based on geographic contiguity and the levels and patterns of adult and child mortality rates is the best way to explain the variance in DALY rates. With country-specific results now available, more sophisticated clustering methods could be used, with various constraints, to propose a

more empirically calculated set of regions. Regions have two dimensions: analytical and presentational. The presentational dimension is easily addressed because results for any set of countries can easily be generated from the country-specific results. In fact, the GBD Compare data visualisation tool provides several alternative presentational groupings, such as WHO political regions or World Bank regions. However, regions have an analytical effect on the results if the super-region and region hierarchy have been used in the Bayesian modelling. In the GBD cause of death analysis, spatiotemporal Gaussian process regression models use the GBD hierarchy to borrow strength. In DisMod-MR 2.0, the regional hierarchy also affects estimation of the prior for each country analysis. More simply, where data are sparse or not available, the GBD regional groupings can have an important analytical effect. More research is needed on two fronts. First, to explore the extent to which alternative regional groupings would explain more of the variance in the DALY results (or any other GBD indicator). Second, whether analytical tools, such as cause of death ensemble modelling (CODEm)⁶⁰ or DisMod-MR 2.0,¹ could be modified to easily allow for different regional hierarchies for different causes.

This study has all the limitations previously reported for the GBD 2013 analysis of YLLs and YLDs.^{1,2} Additionally, a key limitation is the assumption that uncertainty is independent for YLLs and YLDs. In fact, for diseases modelled with DisMod-MR 2.0, we estimated a correlation between the uncertainty in condition-specific mortality and the uncertainty in prevalence. However, DisMod-MR 2.0 estimates excess mortality related to a cause, not the mortality that would be assigned to a cause according to the ICD principles of underlying cause. In future iterations of the GBD, it might be useful to attempt to use the correlation structure produced from DisMod-MR 2.0 as a proxy for the correlation between the underlying cause and prevalence. By assuming independence, we might be underestimating overall uncertainty in DALYs. However, more careful examination of the uncertainty in YLDs reveals that most uncertainty stems from uncertainty in disability weights and not from uncertainty in prevalence. We have no reason to assume that the uncertainty associated with valuations of health states in population surveys would be correlated with either disease or death outcomes. Inclusion of the smaller component of the correlation of prevalence with mortality in the estimation of DALY uncertainty would probably not substantially alter the large uncertainty already recorded for DALYs. Another key limitation, is that our assessment of the burden of disease related to sociodemographic status was affected by the choice of variables that we have included in our sociodemographic status indicator (income per person, average years of schooling after age 15 years, total fertility rate, and mean age of the population). Alternative measures of sociodemographic status could be developed that might explain more of the variance seen for some GBD level 2 causes of DALYs. However, we experimented with alternative formulations, including the addition of urbanisation and all combinations of the four variables in our index, and established that the approach we used had the most explanatory power. Other variables that would be interesting to include in a composite country-level sociodemographic status measure, such as the Gini coefficient, were not available for all countries in all years. Notably, where both measures are available, the correlation between the sociodemographic status indicator and the UN Human Development Index during the 23 year time period was 0.95.

In the post-Millennium Development Goal (MDG) era, there is much interest in identification of appropriate goals for population health and how these goals should be monitored.⁴ Increasingly, measurement frameworks to assess levels of health in populations have moved away from measures of survival to encompass more holistic measures of disability as well as mortality. Our findings suggest that this broader focus is probably going to be increasingly relevant to guide countries' public policy interventions. Large, impressive, and sustained gains are being made against the majority of leading causes of death in most countries, but as our findings show, these gains are not being accompanied by commensurate declines in age-standardised rates of disability, especially from major musculoskeletal disorders, mental and substance use disorders, neurological disorders, and diabetes. Moreover, the failure of health information systems to reliably describe trends in these disorders not only severely hampers policy responses, but contributes greatly to their further neglect and insufficient awareness of the significant part they now play in overall population health. Despite the important country variation in measures of population, now is the time for the global health community, donors and countries alike, to maximise the opportunities for health that have resulted from the data revolution, and ensure that priority is given to the development of scientifically valid, feasible, and informative data systems to measure progress in reducing disability. Improved data and monitoring can help decision makers to reduce DALYs from a wide range of causes by pursuing the most important opportunities for prevention, treatment, and rehabilitation.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Declaration of interests

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References

1. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015; 386:743–800. [PubMed: 26063472]
2. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age–sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2014; 385:117–71. [PubMed: 25530442]
3. Alliance NCD. Healthy planet, healthy people: The NCD alliance vision for health in the post-2015 development agenda. NCD Alliance; Geneva: 2013.

4. [accessed Feb 9, 2015] Open working group proposal for Sustainable development goals. 2014. [enthttps://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=1579&menu=1300](https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=1579&menu=1300)
5. Pintér, L.; Almásy, D.; Hatakeyama, S. Sustainable Development Goals and indicators for a small planet—Part II: Measuring sustainability. Asia-Europe Foundation; Singapore: 2014.
6. Murray CJ, Salomon JA, Mathers C. A critical examination of summary measures of population health. *Bull World Health Organ.* 2000; 78:981–94. [PubMed: 10994282]
7. Murray CJL, Vos T, Lozano R, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2012; 380:2197–223. [PubMed: 23245608]
8. Salomon JA, Wang H, Freeman MK, et al. Healthy life expectancy for 187 countries, 1990–2010: a systematic analysis for the Global Burden Disease Study 2010. *Lancet.* 2012; 380:2144–62. [PubMed: 23245606]
9. Santosa A, Wall S, Fottrell E, Högberg U, Byass P. The development and experience of epidemiological transition theory over four decades: a systematic review. *Glob Health Action.* 2014; 7:23574. [PubMed: 24848657]
10. Murray CJL, Ortblad KF, Guinovart C, et al. Global, regional, and national incidence and mortality for HIV, tuberculosis, and malaria during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet.* 2014; 384:1005–70. [PubMed: 25059949]
11. Hill K, Vapattanawong P, Prasartkul P, Porapakkham Y, Lim SS, Lopez AD. Epidemiologic transition interrupted: a reassessment of mortality trends in Thailand, 1980–2000. *Int J Epidemiol.* 2007; 36:374–84. [PubMed: 17182635]
12. Hofmarcher MM. Is public health between East and West? Analysis of wealth, health and mortality in Austria, Central and Eastern European Countries and Croatia relative to the European Union. *Croat Med J.* 1998; 39:241–48. [PubMed: 9740635]
13. Kahn K, Garenne ML, Collinson MA, Tollman SM. Mortality trends in a new South Africa: hard to make a fresh start. *Scand J Public Health Suppl.* 2007; 69:26–34. [PubMed: 17676500]
14. Rivera JA, Barquera S, Campirano F, Campos I, Safdie M, Tovar V. Epidemiological and nutritional transition in Mexico: rapid increase of non-communicable chronic diseases and obesity. *Public Health Nutr.* 2002; 5:113–22. [PubMed: 12027273]
15. United Nations General Assembly. Prevention and control of non-communicable diseases: Report of the Secretary General. United Nations; New York, NY: 2011.
16. World Health Organization (WHO). 2008–2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases: Prevent and control cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. World Health Organization; Geneva, Switzerland: 2009.
17. Yang G, Kong L, Zhao W, et al. Emergence of chronic non-communicable diseases in China. *Lancet.* 2008; 372:1697–705. [PubMed: 18930526]
18. Yang G, Wang Y, Zeng Y, et al. Rapid health transition in China, 1990–2010: findings from the Global Burden of Disease Study 2010. *Lancet.* 2013; 381:1987–2015. [PubMed: 23746901]
19. Murray CJL, Ezzati M, Flaxman AD, et al. GBD 2010: design, definitions, and metrics. *Lancet.* 2012; 380:2063–66. [PubMed: 23245602]
20. Flaxman, A. Integrated MetaRegression Framework for Descriptive Epidemiology. University of Washington Press; Seattle, WA: 2014.
21. Salomon JA, Vos T, Hogan DR, et al. Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study 2010. *Lancet.* 2012; 380:2129–43. [PubMed: 23245605]
22. Sullivan DF. A single index of mortality and morbidity. *HSMHA Health Rep.* 1971; 86:347–54. [PubMed: 5554262]
23. Bloom DE, Canning D. Policy forum: public health. The health and wealth of nations. *Science.* 2000; 287:1207–09. 1209. [PubMed: 10712155]
24. Preston SH. The changing relation between mortality and level of economic development. *Popul Stud (Camb).* 1975; 29:231–48. [PubMed: 11630494]
25. Jolliffe, I. *Encyclopedia of Statistics in Behavioral Science.* John Wiley & Sons; West Sussex: 2005. Principal component analysis.

26. Gelman A. Analysis of variance—why it is more important than ever. *Ann Stat.* 2005; 33:1–53.
27. Omran AR. The epidemiologic transition. A theory of the epidemiology of population change. *Milbank Mem Fund Q.* 1971; 49:509–38. [PubMed: 5155251]
28. Agyei-Mensah S, de-Graft Aikins A. Epidemiological transition and the double burden of disease in Accra, Ghana. *J Urban Health.* 2010; 87:879–97. [PubMed: 20803094]
29. Frenk J, Bobadilla JL, Stern C, Frejka T, Lozano R. Elements for a theory of the health transition. *Health Transit Rev.* 1991; 1:21–38. [PubMed: 10148802]
30. Andreev EM, Nolte E, Shkolnikov VM, Varavikova E, McKee M. The evolving pattern of avoidable mortality in Russia. *Int J Epidemiol.* 2003; 32:437–46.
31. McMichael AJ, McKee M, Shkolnikov V, Valkonen T. Mortality trends and setbacks: global convergence or divergence? *Lancet.* 2004; 363:1155–59. [PubMed: 15064037]
32. Smallman-Raynor M, Phillips D. Late stages of epidemiological transition: health status in the developed world. *Health Place.* 1999; 5:209–22. [PubMed: 10984576]
33. Carolina Martínez S, Gustavo Leal F. Epidemiological transition: model or illusion? A look at the problem of health in Mexico. *Soc Sci Med.* 2003; 57:539–50. [PubMed: 12791495]
34. Caselli G, Meslé F, Vallin J. Epidemiologic transition theory exceptions. *Genus.* 2002; 58:9–51.
35. Rivera-Andrade A, Luna MA. Trends and heterogeneity of cardiovascular disease and risk factors across Latin American and Caribbean countries. *Prog Cardiovasc Dis.* 2014; 57:276–85. [PubMed: 25218566]
36. Bloom DE, Canning D. Commentary: The Preston Curve 30 years on: still sparking fires. *Int J Epidemiol.* 2007; 36:498–99. discussion 502–03. [PubMed: 17550948]
37. Mackenbach JP, Looman CW. Life expectancy and national income in Europe, 1900–2008: an update of Preston’s analysis. *Int J Epidemiol.* 2013; 42:1100–10. [PubMed: 23920140]
38. Preston SH. The changing relation between mortality and level of economic development. *Population Studies*, Vol. 29, No. 2, July 1975. 2007; 36:484–90.
39. Bergström G, Redfors B, Angerås O, et al. Low socioeconomic status of a patient’s residential area is associated with worse prognosis after acute myocardial infarction in Sweden. *Int J Cardiol.* 2015; 182:141–47. [PubMed: 25577750]
40. Capingana DP, Magalhães P, Silva ABT, et al. Prevalence of cardiovascular risk factors and socioeconomic level among public-sector workers in Angola. *BMC Public Health.* 2013; 13:732. [PubMed: 23924306]
41. Chang P, Nead KT, Olin JW, Cooke JP, Leeper NJ. Clinical and socioeconomic factors associated with unrecognized peripheral artery disease. *Vasc Med.* 2014; 19:289–96. [PubMed: 24872403]
42. Di Cesare M, Khang Y-H, Asaria P, et al. the *Lancet* NCD Action Group. Inequalities in non-communicable diseases and effective responses. *Lancet.* 2013; 381:585–97. [PubMed: 23410608]
43. Marmot MG, Kogevinas M, Elston MA. Social/economic status and disease. *Annu Rev Public Health.* 1987; 8:111–35. [PubMed: 3555518]
44. Marmot MG, Shipley MJ, Rose G. Inequalities in death—specific explanations of a general pattern? *Lancet.* 1984; 1:1003–06. [PubMed: 6143919]
45. Marmot MG, Smith GD, Stansfeld S, et al. Health inequalities among British civil servants: the Whitehall II study. *Lancet.* 1991; 337:1387–93. [PubMed: 1674771]
46. Wang J-Y, Wang C-Y, Juang S-Y, et al. Low socioeconomic status increases short-term mortality of acute myocardial infarction despite universal health coverage. *Int J Cardiol.* 2014; 172:82–87. [PubMed: 24444479]
47. Wu W-H, Yang L, Peng F-H, et al. Lower socioeconomic status is associated with worse outcomes in pulmonary arterial hypertension. *Am J Respir Crit Care Med.* 2013; 187:303–10. [PubMed: 23220911]
48. Robine, J-M.; Mathers, CD.; Bone, MR.; Romieu, I. Calculation of Health Expectancies: Harmonization, Consensus Achieved and Future Perspectives. John Libbey Eurotext; Paris: 1993.
49. Jagger C, Gillies C, Moscone F, et al. the EHLEIS team. Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis. *Lancet.* 2008; 372:2124–31. [PubMed: 19010526]

50. King G, Murray CJL, Salomon JA, Tandon A. Enhancing the validity and cross-cultural comparability of measurement in survey research. *Am Polit Sci Rev.* 2004; 98:191–207.
51. Salomon JA, Nordhagen S, Oza S, Murray CJL. Are Americans feeling less healthy? The puzzle of trends in self-rated health. *Am J Epidemiol.* 2009; 170:343–51. [PubMed: 19564169]
52. Salomon JA, Tandon A, Murray CJL. Comparability of self rated health: cross sectional multi-country survey using anchoring vignettes. *BMJ.* 2004; 328:258. [PubMed: 14742348]
53. Gennaro V, Ghirga G, Corradi L. In Italy, healthy life expectancy drop dramatically: from 2004 to 2008 there was a 10 years drop among newborn girls. *Ital J Pediatr.* 2012; 38:19. [PubMed: 22607773]
54. Catalá-López F, García-Altés A, Alvarez-Martín E, Gènova-Maleras R, Morant-Ginestar C. Does the development of new medicinal products in the European Union address global and regional health concerns? *Popul Health Metr.* 2010; 8:34. [PubMed: 21172012]
55. Dorsey ER, Thompson JP, Carrasco M, et al. Financing of U.S. biomedical research and new drug approvals across therapeutic areas. *PLoS One.* 2009; 4:e7015. [PubMed: 19750225]
56. Gross CP, Anderson GF, Powe NR. The relation between funding by the National Institutes of Health and the burden of disease. *N Engl J Med.* 1999; 340:1881–87. [PubMed: 10369852]
57. Keyhani S, Wang S, Hebert P, Carpenter D, Anderson G. US pharmaceutical innovation in an international context. *Am J Public Health.* 2010; 100:1075–80. [PubMed: 20403883]
58. Luengo-Fernandez R, Leal J, Gray AM. UK research expenditure on dementia, heart disease, stroke and cancer: are levels of spending related to disease burden? *Eur J Neurol.* 2012; 19:149–54. [PubMed: 21951976]
59. Moses H 3rd, Matheson DHM, Cairns-Smith S, George BP, Palisch C, Dorsey ER. The anatomy of medical research: US and international comparisons. *JAMA.* 2015; 313:174–89. [PubMed: 25585329]
60. Foreman KJ, Lozano R, Lopez AD, Murray CJ. Modeling causes of death: an integrated approach using CODEm. *Popul Health Metr.* 2012; 10:1. [PubMed: 22226226]

Research in context

Evidence before this study

In 2012, results from the first complete revision of the Global Burden of Disease (GBD) since the first assessment in 1993 became available. This effort was called the GBD 2010 study and reported on disability-adjusted life-years (DALYs) and health-adjusted life expectancy (HALE) by country for 1990 and 2010 based on analyses of an extensive data collection effort to collate all available information on causes of death and disease occurrence in 187 countries. In response to the need for up-to-date information about the health of populations to inform health policy decision making, a decision was made to produce annual updates. The GBD 2013 is the first of these annual updates. In previous papers on the GBD 2013 study, we have documented the new data and new methods used to assess mortality and morbidity by country and over time.

Added value of this study

Here, we present the results for the aggregation of mortality and morbidity in terms of DALYs and HALE by country and for the time period 1990 to 2013. We examined to what extent the changes in DALYs since 1990 by disease and country can be explained by a composite indicator of sociodemographic status, constructed from income per person, years of schooling after age 15 years, median age of the population and total fertility rate. These GBD 2013 results for the period 1990 to 2013 for DALYs and HALE supersede all previously published GBD findings on DALYs and HALE.

Implications of all the available evidence

Numbers of DALYs and crude and age-standardised DALY rates for communicable diseases, maternal, neonatal, and nutritional disorders have decreased since 1990. For non-communicable diseases, the number of DALYs have increased, crude rates have remained stable, and age-standardised rates have decreased. Global health is improving but population increase and ageing are keeping the crude rates of DALYs constant, showing that progress in health does not mean fewer demands on health systems. The epidemiological transition, as quantified using our sociodemographic status indicator, accounts for much of the variation between countries and over time for most communicable, maternal, and neonatal causes but not for many non-communicable causes such as cardiovascular disease. The large variation in burden that is not associated with sociodemographic status emphasises the need for ongoing detailed assessments of DALYs and HALE at the country level to inform health policies.

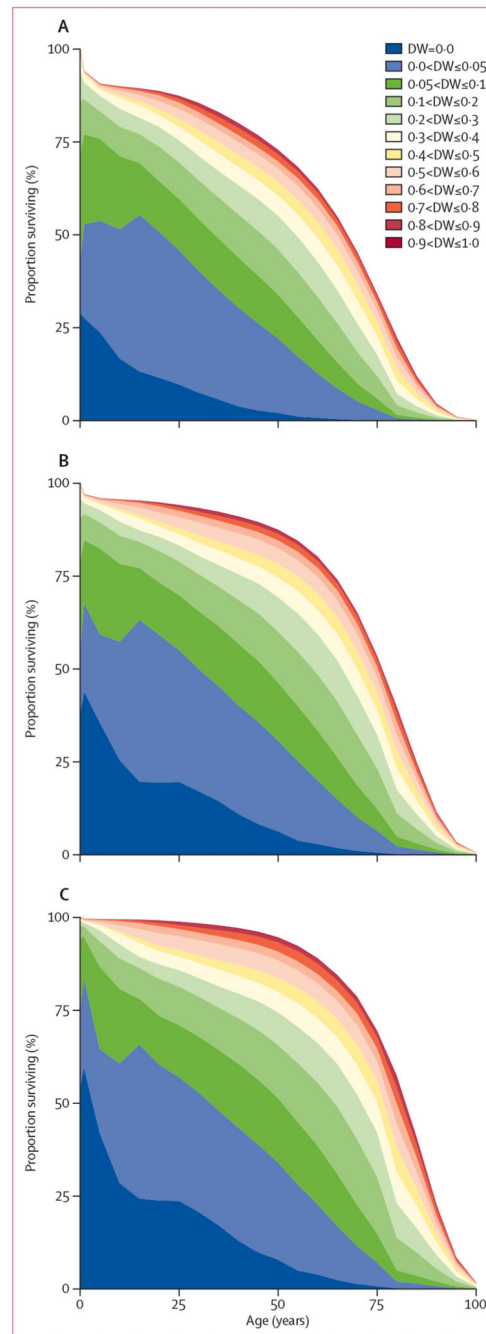


Figure 1. Survivorship curve stratified by disability weight in 2013

Health survivorship function showing the fraction of a birth cohort alive at each age exposed to 2013 death rates, with the fraction of time spent at each age by the birth cohort decomposed by level of disability weight. Countries are grouped by sociodemographic status into quintiles, including the lowest quintile (A), the three middle quintiles (B), and the highest quintile (C). DW=disability weight.

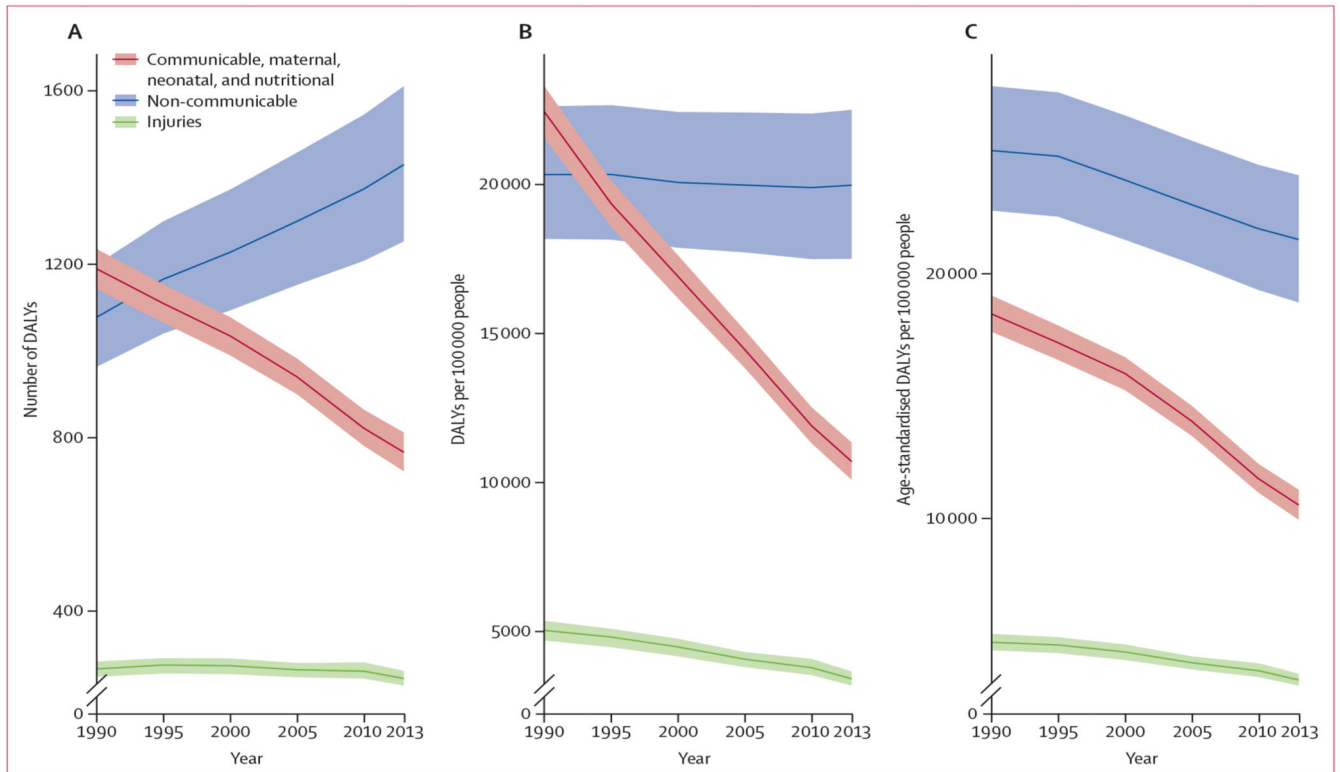


Figure 2. Total DALYs, crude DALY rates, and age-standardised DALY rates from 1990 to 2013
 Changes in global DALYs caused by communicable, maternal, neonatal, and nutritional disorders, non-communicable diseases, and injuries shown in terms of numbers of DALYs (A), DALY rates per 100 000 people (B), and age-standardised DALY rates per 100 000 people (C). The difference in trends between A and B is caused by population growth and the difference between B and C because of changes in the percentage distribution of the population by age. Shaded areas show 95% uncertainty intervals. DALY=disability-adjusted life-years.

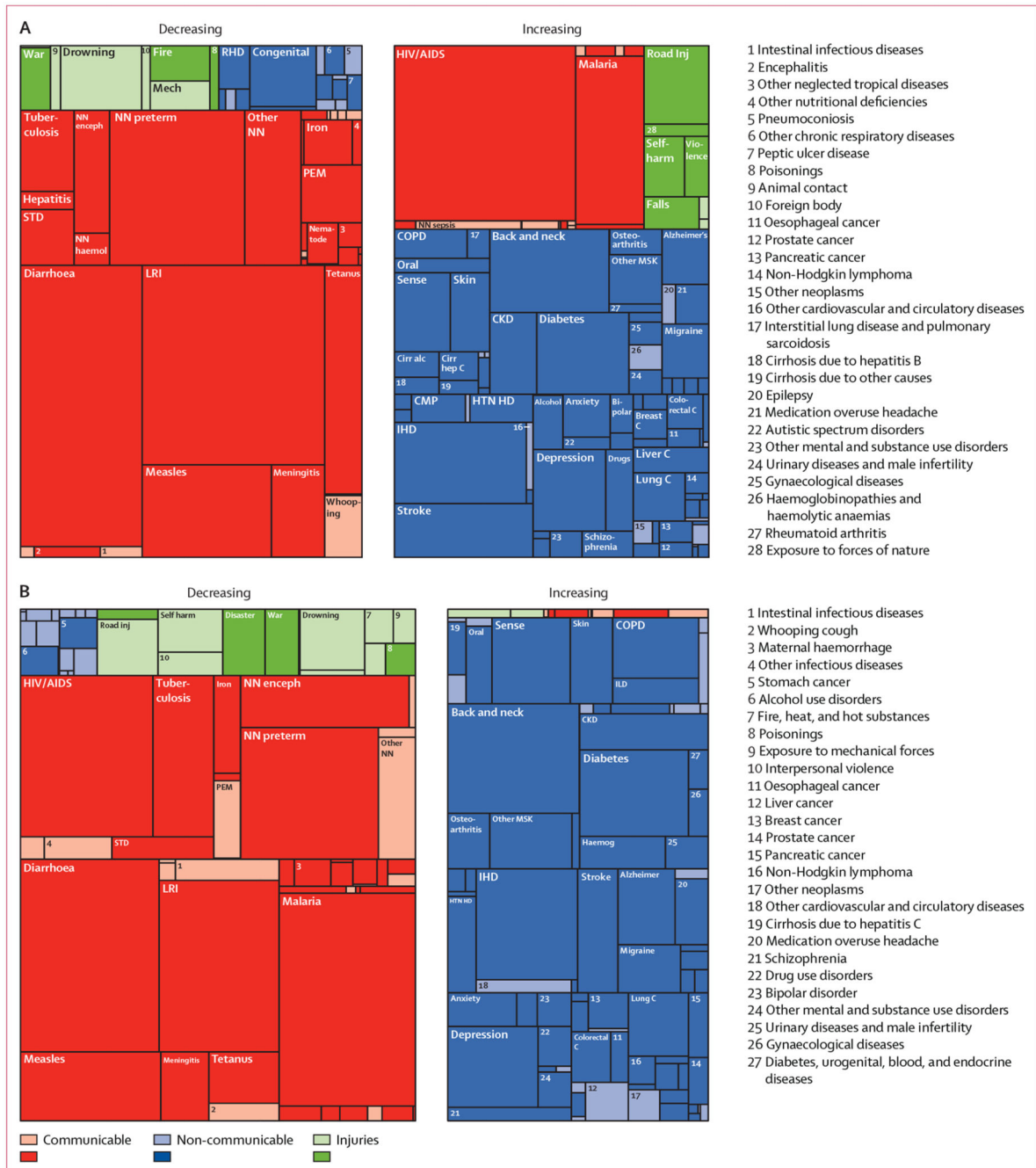


Figure 3. Change in DALYs for GBD level 3 causes

Increasing and decreasing global DALYs for GBD level 3 causes from 1990 to 2005 (A) and 2005 to 2013 (B). Within each tree map, the size of the rectangle for each cause is proportional to the magnitude of the decrease or increase in DALYs for each cause. Dark shading show statistically significant changes and light shading shows changes that are not significant. Unmarked boxes represent causes for which the decrease or increase was less than 1 000 000 DALYs. Table 1 and the appendix (p 4) contains numerical values for each cause. DALY=disability-adjusted life-years. GBD=Global Burden of Disease.

Diarrhoea=diarrhoeal diseases. LRI=lower respiratory infections. NN enceph=neonatal encephalopathy due to birth asphyxia and trauma. NN haemol=haemolytic disease and other neonatal jaundice. Other NN=other neonatal disorders. NN preterm=preterm birth complications. Nematode=intestinal nematode infections. Iron=iron-deficiency anaemia. PEM=protein-energy malnutrition. STD=sexually transmitted diseases excluding HIV. TB=tuberculosis. Whooping=whooping cough. NN sepsis=neonatal sepsis and other neonatal infections. Congenital=congenital anomalies. RHD=rheumatic heart disease. Oral=oral disorders. Sense=sense organ diseases. Cirr alc=cirrhosis due to alcohol use. Cirr hep C=cirrhosis due to hepatitis C. CKD=chronic kidney disease. CMP=cardiomyopathy and myocarditis. HTN HD=hypertensive heart disease. IHD=ischaemic heart disease. Stroke=cerebrovascular disease. Diabetes=diabetes mellitus. Alcohol=alcohol use disorders. Anxiety=anxiety disorders. Bipolar=bipolar disorder. Drugs=drug use disorders. Depression=depressive disorders. Other MSK=other musculoskeletal disorders. Back and neck=low back and neck pain. Breast C=breast cancer. Colorectal C=colon and rectum cancer. Liver C=liver cancer. Lung C=tracheal, bronchus, and lung cancer. Alzheimer's=Alzheimer disease and other dementias. COPD=chronic obstructive pulmonary disease. Skin=skin and subcutaneous diseases. Fire=fire, heat, and hot substances. Mech=exposure to mechanical forces. War=collective violence and legal intervention. Violence=interpersonal violence. Road inj=road injuries. Haemog=haemoglobinopathies and haemolytic anaemias. ILD=interstitial lung disease and pulmonary sarcoidosis. Disaster=exposure to forces of nature.

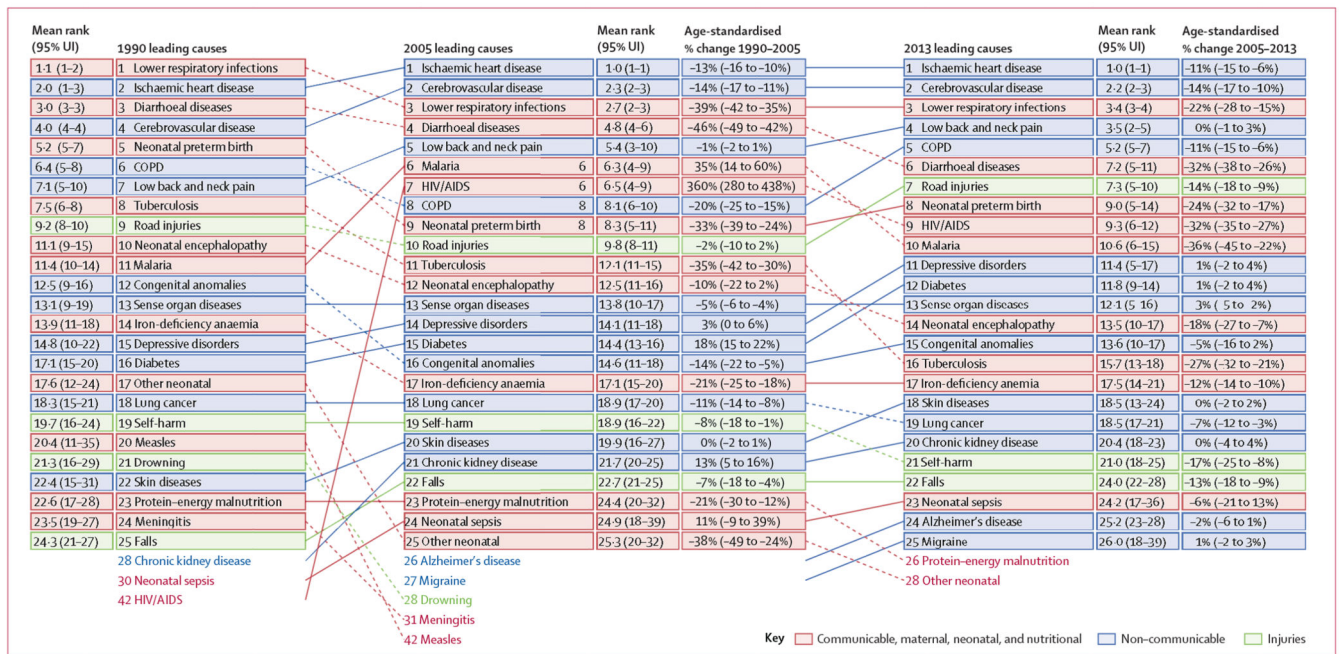


Figure 4. 25 most common GBD level 3 causes of global DALYs for both sexes combined, 1990, 2005, and 2013, with age-standardised median percentage change
Ranks are based on the number of DALYs. 95% UIs for mean rank are from 1000 draws of DALYs. Communicable, maternal, neonatal, and nutritional disorders causes are shown in red, non-communicable causes in blue, and injuries in green. DALY=disability-adjusted life-years. GBD=Global Burden of Disease. UI=uncertainty interval. COPD=chronic obstructive pulmonary disease.

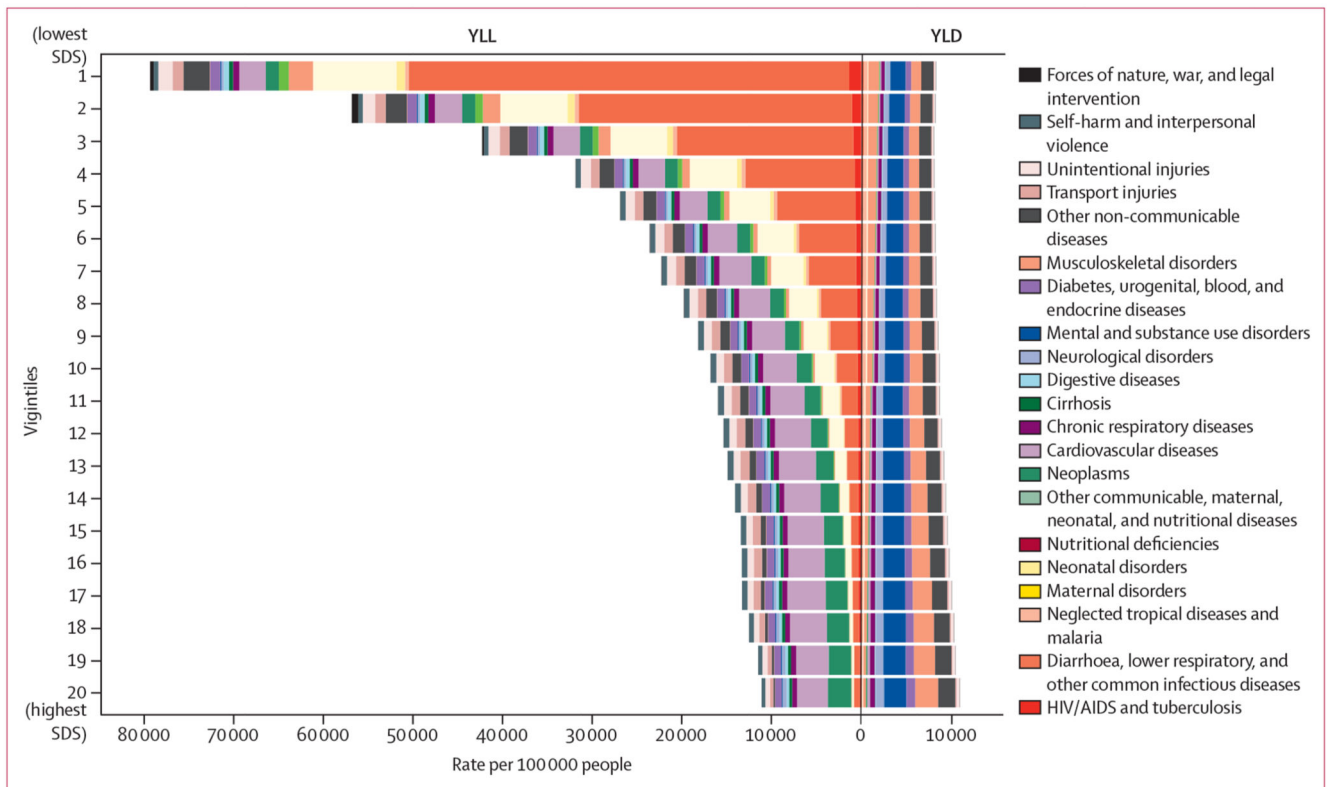


Figure 5. YLL and YLD cause composition of DALY rates by sociodemographic status quintile
 The epidemiological transition based on predicted YLL and YLD rates per 100 000 people as a function of the level of sociodemographic status by quintile and broken down into GBD level 2 causes. These predicted levels control for variation explained by year and country. YLL= years of life lost. YLD=years lived with disability. GBD=Global Burden of Disease.

	1	2	3	4	5	6	7	8	9	10
Global	IHD	LRI	Stroke	Back & neck	Road inj	Diarrhoea	COPD	NN preterm	HIV/AIDS	Malaria
Developed	IHD	Back & neck	Stroke	Lung C	Depression	COPD	Sense	Diabetes	Alzheimer's	Falls
Developing	IHD	LRI	Stroke	Back & neck	Diarrhoea	NN preterm	HIV/AIDS	Road inj	Alzheimer's	COPD
High-income	Back & neck	IHD	Stroke	Lung C	COPD	Depression	Diabetes	Alzheimer's	Sense	Other MSK
Australasia	Back & neck	IHD	Depression	Other MSK	COPD	Alzheimer's	Lung C	Stroke	Diabetes	Sense
Australia	Back & neck	IHD	Depression	Other MSK	COPD	Alzheimer's	Lung C	Stroke	Diabetes	Sense
New Zealand	Back & neck	IHD	COPD	Depression	Alzheimer's	Lung C	Stroke	Diabetes	Sense	Other MSK
High-income Asia Pacific	Back & neck	Stroke	IHD	Diabetes	Lung C	Self-harm	Other MSK	LRI	Sense	Depression
Brunei	Back & neck	IHD	Diabetes	Stroke	Depression	Road inj	Congenital	Skin	Iron	Other MSK
Japan	Back & neck	Stroke	IHD	LRI	Lung C	Other MSK	Diabetes	Sense	Self-harm	Depression
Singapore	IHD	Depression	Diabetes	Back & neck	LRI	Stroke	Sense	Other MSK	Lung C	Skin
South Korea	Back & neck	Stroke	Diabetes	Self-harm	IHD	Liver C	Lung C	Other MSK	Stomach C	Migraine
High-income North America	IHD	Back & neck	COPD	Lung C	Depression	Diabetes	Alzheimer's	Other MSK	Stroke	Sense
Canada	Back & neck	IHD	Lung C	Other MSK	Alzheimer's	Diabetes	Sense	Depression	COPD	Stroke
USA	IHD	Back & neck	COPD	Lung C	Depression	Diabetes	Alzheimer's	Other MSK	Stroke	Sense
Southern Latin America	IHD	Back & neck	COPD	Stroke	Depression	LRI	Road inj	Congenital	Diabetes	Skin
Argentina	IHD	COPD	Back & neck	Stroke	LRI	Depression	Road inj	Congenital	Diabetes	Skin
Chile	Back & neck	IHD	Stroke	Depression	COPD	Road inj	Skin	Congenital	Anxiety	CKD
Uruguay	IHD	Stroke	Back & neck	COPD	Alzheimer's	Lung C	Depression	Road inj	Sense	LRI
Western Europe	Back & neck	IHD	Stroke	Lung C	Alzheimer's	Sense	Falls	Depression	COPD	Diabetes
Andorra	Back & neck	IHD	Stroke	Lung C	Depression	Alzheimer's	Falls	Alzheimer's	COPD	Skin
Austria	IHD	Back & neck	Stroke	Alzheimer's	Lung C	Sense	Falls	Depression	Diabetes	COPD
Belgium	Back & neck	IHD	Lung C	COPD	Alzheimer's	Stroke	Falls	Road inj	Sense	Self-harm
Cyprus	Back & neck	IHD	Diabetes	Depression	Stroke	Sense	Alzheimer's	Skin	Lung C	CKD
Denmark	Back & neck	IHD	Stroke	COPD	Lung C	Alzheimer's	Falls	Depression	Skin	Colorect C
Finland	IHD	Back & neck	Falls	Alzheimer's	Stroke	Depression	Diabetes	Sense	Lung C	Self-harm
France	Back & neck	IHD	Lung C	Falls	Depression	Sense	Stroke	Skin	Alzheimer's	Self-harm
Germany	Back & neck	IHD	Stroke	Sense	Alzheimer's	Lung C	Diabetes	COPD	Falls	CKD
Greece	IHD	Back & neck	Stroke	Lung C	COPD	Alzheimer's	Sense	Depression	CKD	Falls
Iceland	Back & neck	IHD	Stroke	COPD	Sense	Alzheimer's	Lung C	Depression	Diabetes	Stroke
Ireland	IHD	Back & neck	Depression	COPD	Lung C	Stroke	Skin	Sense	Falls	Diabetes
Israel	Back & neck	IHD	Depression	Diabetes	Alzheimer's	CKD	Skin	Sense	COPD	Lung C
Italy	Back & neck	IHD	Alzheimer's	Sense	Stroke	Lung C	Falls	Depression	Migraine	COPD
Luxembourg	Back & neck	IHD	Stroke	Lung C	COPD	Depression	Migraine	Sense	Falls	Diabetes
Malta	Back & neck	IHD	Diabetes	Stroke	Depression	Sense	Lung C	Falls	CKD	COPD
Netherlands	Back & neck	IHD	Lung C	COPD	Skin	Stroke	Diabetes	Sense	Depression	Alzheimer's
Norway	Back & neck	IHD	Alzheimer's	Stroke	Lung C	Falls	COPD	Anxiety	Depression	Skin
Portugal	Back & neck	Stroke	IHD	Diabetes	Depression	Alzheimer's	Sense	Lung C	CKD	COPD
Spain	Back & neck	IHD	Diabetes	Stroke	COPD	Alzheimer's	Depression	Lung C	Sense	Falls
Sweden	Back & neck	IHD	Stroke	Falls	COPD	Depression	Sense	Alzheimer's	Lung C	Skin
Switzerland	Back & neck	IHD	Falls	COPD	Alzheimer's	Stroke	Sense	Lung C	Depression	Skin
UK	Back & neck	IHD	Stroke	COPD	Lung C	Alzheimer's	Sense	Depression	Falls	Skin
England	Back & neck	IHD	Stroke	COPD	Lung C	Alzheimer's	Sense	Depression	Falls	Skin
Northern Ireland	IHD	Back & neck	Depression	Lung C	Stroke	COPD	Alzheimer's	Falls	Skin	Sense
Scotland	Back & neck	IHD	Lung C	Stroke	COPD	Alzheimer's	Sense	Diabetes	Falls	Skin
Wales	Back & neck	IHD	Stroke	COPD	Lung C	Alzheimer's	Depression	Sense	Falls	Diabetes
Central Europe, eastern Europe, and central Asia	IHD	Stroke	Back & neck	LRI	Self-harm	Depression	Sense	Lung C	Road inj	COPD
Central Asia	IHD	LRI	Stroke	NN enceph	Back & neck	Congenital	Road inj	Depression	Diabetes	NN preterm
Armenia	IHD	Stroke	Diabetes	Back & neck	Lung C	Depression	Sense	Road inj	Congenital	COPD
Azerbaijan	IHD	LRI	Stroke	Back & neck	Diabetes	NN enceph	Depression	Congenital	Road inj	Sense
Georgia	IHD	Stroke	COPD	Diabetes	Back & neck	Sense	Depression	Falls	Alzheimer's	Road inj
Kazakhstan	IHD	Stroke	Self-harm	Back & neck	Road inj	Congenital	LRI	COPD	NN enceph	Depression
Kyrgyzstan	IHD	Stroke	LRI	NN enceph	NN preterm	Congenital	Back & neck	Road inj	COPD	Depression
Mongolia	IHD	Stroke	LRI	Liver C	NN enceph	Congenital	Self-harm	Road inj	NN preterm	Back & neck
Tajikistan	LRI	IHD	NN preterm	Diarrhoea	NN enceph	Congenital	Stroke	Back & neck	Depression	Drown
Turkmenistan	IHD	LRI	Stroke	NN enceph	Diarrhoea	Back & neck	Congenital	NN preterm	Depression	Diabetes
Uzbekistan	IHD	LRI	Stroke	NN enceph	Back & neck	Road inj	Depression	Diabetes	Congenital	HTN HD
Central Europe	IHD	Stroke	Back & neck	Lung C	Falls	COPD	Sense	Diabetes	Depression	Alzheimer's
Albania	IHD	Stroke	Back & neck	Depression	LRI	Falls	Lung C	Sense	COPD	Diabetes
Bosnia and Herzegovina	IHD	Stroke	Back & neck	Diabetes	Lung C	CMP	COPD	Sense	Depression	Falls
Bulgaria	IHD	Stroke	Back & neck	COPD	Diabetes	HTN HD	Falls	Lung C	Sense	Alzheimer's
Croatia	IHD	Stroke	Back & neck	Lung C	Sense	COPD	Diabetes	Alzheimer's	Depression	Falls
Czech Republic	IHD	Back & neck	Stroke	Falls	Lung C	Sense	Diabetes	COPD	Depression	Alzheimer's
Hungary	IHD	Stroke	Back & neck	Lung C	Falls	COPD	Sense	Diabetes	Colorect C	Depression
Macedonia	Stroke	IHD	Back & neck	Diabetes	Lung C	Depression	Sense	Falls	COPD	CKD
Montenegro	IHD	Stroke	Back & neck	Lung C	Diabetes	Sense	Falls	Depression	Self-harm	CKD
Poland	IHD	Stroke	Back & neck	Lung C	Falls	COPD	Sense	Depression	Diabetes	Self-harm
Romania	IHD	Stroke	Back & neck	Lung C	Falls	Sense	Depression	COPD	Diabetes	Alzheimer's
Serbia	IHD	Stroke	Back & neck	CMP	Lung C	Diabetes	Sense	COPD	Depression	Alzheimer's
Slovakia	IHD	Back & neck	Stroke	Falls	Lung C	Sense	Depression	Diabetes	Colorect C	COPD
Slovenia	Back & neck	IHD	Falls	Stroke	Lung C	Sense	Depression	COPD	Alzheimer's	Diabetes
Eastern Europe	IHD	Stroke	Back & neck	Self-harm	CMP	Depression	Sense	Alcohol	Lung C	Road inj

	1	2	3	4	5	6	7	8	9	10
Belarus	IHD	Stroke	Back & neck	Self-harm	Road inj	Lung C	Depression	Sense	COPD	Alcohol
Estonia	IHD	Stroke	Back & neck	Depression	Lung C	Sense	Alzheimer's	Alcohol	Diabetes	HTN HD
Latvia	IHD	Stroke	Back & neck	Sense	CMP	Lung C	Alzheimer's	Self-harm	Depression	Diabetes
Lithuania	IHD	Stroke	Back & neck	Self-harm	Sense	Depression	Lung C	Alzheimer's	COPD	Road inj
Moldova	IHD	Stroke	Back & neck	Depression	Cirr HepC	Sense	LRI	COPD	Self-harm	Lung C
Russia	IHD	Stroke	Back & neck	CMP	Self-harm	Depression	Alcohol	Sense	Road inj	Lung C
Ukraine	IHD	Stroke	Back & neck	Depression	Self-harm	Sense	HIV/AIDS	Lung C	Road inj	COPD
Latin America and Caribbean	IHD	Violence	Back & neck	Road inj	Diabetes	Depression	Stroke	LRI	Congenital	Sense
Andean Latin America	LRI	Road inj	IHD	Back & neck	Congenital	Depression	NN preterm	Sense	Stroke	F Body
Bolivia	LRI	F Body	Road inj	NN preterm	IHD	Congenital	NN enceph	Back & neck	Depression	Diarrhoea
Ecuador	LRI	Road inj	IHD	Congenital	Violence	Back & neck	Depression	CKD	Stroke	Sense
Peru	LRI	Back & neck	IHD	Depression	Road inj	Sense	Congenital	COPD	NN preterm	Stroke
Caribbean	IHD	Stroke	Diabetes	LRI	HIV/AIDS	Road inj	Depression	Diarrhoea	Back & neck	Congenital
Antigua and Barbuda	Diabetes	IHD	Stroke	Depression	Back & neck	Sense	Road inj	Iron	CKD	LRI
Barbados	Diabetes	IHD	Stroke	Back & neck	Depression	Sense	CKD	LRI	COPD	Skin
Belize	Diabetes	IHD	Stroke	Violence	Road inj	NN preterm	Depression	Congenital	Iron	HIV/AIDS
Cuba	IHD	Stroke	Diabetes	Sense	Depression	Lung C	Back & neck	COPD	LRI	Road inj
Dominica	Diabetes	IHD	Stroke	Depression	Back & neck	Road inj	Sense	LRI	CKD	NN preterm
Dominican Republic	IHD	Road inj	Stroke	NN preterm	Congenital	Diabetes	Depression	Back & neck	LRI	Violence
Grenada	IHD	Diabetes	Stroke	Road inj	Depression	Back & neck	LRI	Sense	HIV/AIDS	Violence
Guyana	IHD	HIV/AIDS	Stroke	Diabetes	Road inj	Congenital	LRI	Self-harm	Violence	NN preterm
Haiti	HIV/AIDS	LRI	Diarrhoea	Stroke	PEM	NN sepsis	Iron	IHD	NN preterm	Congenital
Jamaica	Diabetes	Stroke	IHD	Violence	Depression	Back & neck	NN preterm	Sense	CKD	Congenital
Saint Lucia	Diabetes	IHD	Stroke	Depression	Back & neck	Sense	Violence	Road inj	LRI	COPD
Saint Vincent and the Grenadines	IHD	Diabetes	Stroke	Depression	Back & neck	NN preterm	Road inj	HIV/AIDS	Violence	Sense
Suriname	IHD	Stroke	Diabetes	NN preterm	Congenital	Road inj	LRI	Depression	HIV/AIDS	Back & neck
The Bahamas	IHD	Diabetes	Stroke	HIV/AIDS	Depression	Back & neck	Violence	Road inj	CKD	Sense
Trinidad and Tobago	Diabetes	IHD	Stroke	Road inj	Violence	Depression	Back & neck	CKD	Sense	HIV/AIDS
Central Latin America	Violence	IHD	Diabetes	Back & neck	Road inj	Depression	CKD	Congenital	LRI	Sense
Colombia	Violence	IHD	Depression	Back & neck	Road inj	Congenital	COPD	Stroke	Diabetes	Sense
Costa Rica	Back & neck	IHD	Depression	Road inj	Sense	Congenital	CKD	COPD	Asthma	Diabetes
El Salvador	Violence	IHD	Back & neck	Road inj	CKD	Congenital	Diabetes	LRI	Depression	Iron
Guatemala	LRI	Violence	Diarrhoea	NN preterm	Back & neck	IHD	Iron	Congenital	Diabetes	PEM
Honduras	IHD	Congenital	Violence	Depression	NN preterm	COPD	Back & neck	Stroke	Diarrhoea	LRI
Mexico	Diabetes	IHD	CKD	Back & neck	Depression	Road inj	Congenital	Violence	Sense	COPD
Nicaragua	Congenital	CKD	Back & neck	War	Depression	LRI	IHD	NN preterm	Diabetes	Road inj
Panama	Back & neck	IHD	Congenital	Depression	Violence	Road inj	Diabetes	Stroke	Sense	CKD
Venezuela	Violence	IHD	Road inj	Back & neck	Diabetes	Depression	Stroke	Congenital	Sense	CKD
Tropical Latin America	IHD	Back & neck	Stroke	Road inj	Diabetes	Depression	Stroke	Congenital	Sense	CKD
Brazil	IHD	Back & neck	Violence	Stroke	Road inj	Diabetes	Depression	Anxiety	COPD	Sense
Paraguay	IHD	Road inj	Back & neck	Stroke	Congenital	Diabetes	NN preterm	Depression	LRI	Violence
Southeast Asia, east Asia, and Oceania	Stroke	IHD	Back & neck	Road inj	COPD	Diabetes	Sense	Lung C	Depression	LRI
East Asia	Stroke	Back & neck	IHD	COPD	Road inj	Lung C	Sense	Depression	Diabetes	Liver C
China	Stroke	Back & neck	IHD	COPD	Road inj	Lung C	Depression	Sense	Diabetes	Liver C
North Korea	Stroke	IHD	Back & neck	COPD	Lung C	Road inj	Liver C	Stomach C	Sense	Congenital
Taiwan (province of China)	Back & neck	Diabetes	IHD	Stroke	Liver C	Sense	Road inj	Lung C	Skin	Self-harm
Oceania	LRI	IHD	Diabetes	Diarrhoea	Malana	Congenital	NN preterm	Stroke	Road inj	Other NN
Federated States of Micronesia	IHD	Diabetes	Stroke	LRI	Congenital	Road inj	Back & neck	Skin	COPD	Asthma
Fiji	IHD	Diabetes	Stroke	LRI	Congenital	NN preterm	Back & neck	CKD	COPD	Sense
Kiribati	Diabetes	Stroke	IHD	LRI	Other NN	Congenital	Road inj	Diarrhoea	Asthma	Back & neck
Marshall Islands	IHD	Diabetes	LRI	Stroke	Congenital	NN preterm	Road inj	Other NN	Back & neck	CKD
Papua New Guinea	LRI	IHD	Diarrhoea	Diabetes	Malaria	NN preterm	Congenital	Other NN	Road inj	HIV/AIDS
Samoa	Diabetes	IHD	Stroke	Back & neck	LRI	Congenital	Skin	Sense	CKD	Road inj
Solomon Islands	IHD	Diabetes	Stroke	LRI	Diarrhoea	Congenital	NN preterm	Back & neck	Asthma	TB
Tonga	IHD	Diabetes	LRI	Stroke	NN preterm	Back & neck	Congenital	Road inj	Skin	Other NN
Vanuatu	IHD	Diabetes	LRI	Stroke	NN preterm	Congenital	Other NN	Road inj	Diarrhoea	Back & neck
Southeast Asia	Stroke	IHD	LR	Road inj	TB	Diabetes	Back & neck	NN preterm	Sense	COPD
Cambodia	IHD	LRI	NN preterm	War	Stroke	Congenital	Road inj	Iron	TB	COPD
Indonesia	Stroke	IHD	TB	LRI	Diabetes	Road inj	NN enceph	Back & neck	Diarrhoea	NN preterm
Laos	LRI	NN preterm	IHD	Stroke	Diarrhoea	Road inj	Congenital	NN enceph	Iron	TB
Malaysia	IHD	Road inj	Stroke	LRI	Diabetes	Back & neck	COPD	Skin	Depression	Nematode
Maldives	IHD	Back & neck	Congenital	Stroke	COPD	Sense	NN enceph	Diabetes	Skin	NN preterm
Myanmar	Stroke	LRI	TB	IHD	Sense	Malaria	COPD	NN preterm	Diabetes	Road inj
Philippines	IHD	LRI	Stroke	Back & neck	TB	NN preterm	Congenital	Diabetes	COPD	Iron
Sri Lanka	IHD	Self-harm	Diabetes	COPD	Back & neck	Stroke	Sense	Road inj	Asthma	Depression
Thailand	IHD	Road inj	Stroke	Diabetes	LRI	Sense	COPD	CKD	Liver C	HIV/AIDS
Timor-Leste	LRI	NN preterm	Diarrhoea	Congenital	IHD	Iron	Stroke	Other NN	NN enceph	Road inj
Vietnam	Stroke	Road inj	Back & neck	Sense	LRI	NN preterm	Liver C	Depression	War	COPD
South Asia	IHD	LRI	NN enceph	NN preterm	Diarrhoea	COPD	TB	Stroke	Back & neck	Road inj
Afghanistan	LRI	Diarrhoea	NN preterm	IHD	Congenital	Road inj	Stroke	Iron	Meningitis	Other NN
Bangladesh	Stroke	Back & neck	NN enceph	IHD	NN preterm	LRI	COPD	Drown	Iron	Depression
Bhutan	IHD	LRI	NN enceph	Stroke	Back & neck	NN preterm	COPD	Road inj	Depression	Diabetes

	1	2	3	4	5	6	7	8	9	10
India	IHD	COPD	TB	LRI	NN preterm	NN enceph	Diarrhoea	Stroke	Road inj	Back & neck
Nepal	LRI	IHD	Back & neck	NN enceph	Diarrhoea	Stroke	COPD	TB	Self-harm	NN preterm
Pakistan	LRI	NN enceph	Diarrhoea	IHD	NN preterm	NN sepsis	Stroke	Meningitis	Road inj	Congenital
North Africa and Middle East	IHD	Back & neck	Congenital	NN preterm	Stroke	Diabetes	Road inj	Depression	LRI	COPD
Algeria	NN preterm	IHD	Back & neck	Congenital	Road inj	Stroke	Diabetes	Depression	Sense	Iron
Bahrain	Diabetes	Back & neck	Drugs	Depression	IHD	Road inj	Skin	Sense	Iron	Congenital
Egypt	IHD	Stroke	Back & neck	Congenital	COPD	LRI	Diabetes	Cirr hep C	Sense	Other cardio
Iran	IHD	Back & neck	Congenital	NN preterm	Depression	Road inj	Diabetes	Sense	Stroke	Drugs
Iraq	NN preterm	IHD	Congenital	Stroke	Diabetes	Back & neck	LRI	Iron	CKD	Road inj
Jordan	Congenital	Back & neck	NN preterm	Diabetes	IHD	Depression	Drugs	Iron	Skin	LRI
Kuwait	IHD	Diabetes	Depression	Drugs	Congenital	Road inj	Back & neck	Skin	Sense	NN preterm
Lebanon	IHD	Diabetes	Depression	Back & neck	Congenital	Skin	War	COPD	Stroke	Drugs
Libya	IHD	Back & neck	Diabetes	Congenital	Stroke	Depression	Road inj	NN preterm	COPD	Iron
Morocco	Back & neck	NN preterm	IHD	Diabetes	Drugs	Depression	Road inj	Congenital	NN enceph	NN enceph
Oman	Road inj	Back & neck	IHD	Diabetes	Depression	Sense	Congenital	Drugs	Skin	Stroke
Palestine	Congenital	IHD	Depression	Back & neck	Diabetes	Stroke	NN preterm	LRI	Iron	Road inj
Qatar	Drugs	Back & neck	Road inj	Depression	Diabetes	Skin	Congenital	IHD	NN preterm	Sense
Saudi Arabia	Road inj	Diabetes	Back & neck	IHD	Depression	Congenital	Drugs	NN preterm	Skin	Stroke
Sudan	NN preterm	IHD	Congenital	Diarrhoea	LRI	Stroke	Back & neck	Road inj	Iron	Malaria
Syria	War	IHD	Stroke	Back & neck	Depression	Congenital	Diabetes	Iron	Migraine	COPD
Tunisia	IHD	Back & neck	Road inj	Stroke	Depression	Congenital	Diabetes	COPD	Sense	NN preterm
Turkey	IHD	Back & neck	COPD	Diabetes	Congenital	Stroke	Lung C	Depression	Road inj	NN preterm
United Arab Emirates	Road inj	Back & neck	Drugs	Depression	IHD	Diabetes	Skin	Congenital	Sense	COPD
Yemen	NN preterm	IHD	Diarrhoea	Congenital	LRI	Stroke	Iron	Malaria	Road inj	Back & neck
Sub-Saharan Africa	HIV/AIDS	Malaria	LRI	Diarrhoea	NN preterm	PEM	NN enceph	Congenital	TB	Road inj
Central sub-Saharan Africa	LRI	Diarrhoea	Malaria	PEM	HIV/AIDS	NN preterm	Congenital	TB	NN enceph	Meningitis
Angola	LRI	Diarrhoea	HIV/AIDS	Malaria	Congenital	PEM	NN preterm	TB	NN enceph	Road inj
Central African Republic	HIV/AIDS	LRI	Diarrhoea	Malaria	TB	NN preterm	PEM	STD	Meningitis	NN enceph
Congo	HIV/AIDS	LRI	Malaria	Congenital	Stroke	Diarrhoea	NN preterm	NN enceph	Measles	TB
Democratic Republic of the Congo	Diarrhoea	LRI	Malaria	PEM	NN preterm	HIV/AIDS	Congenital	TB	NN enceph	Iron
Equatorial Guinea	HIV/AIDS	LRI	Malaria	Congenital	Road inj	Diarrhoea	Stroke	NN preterm	NN enceph	NN enceph
Gabon	HIV/AIDS	LRI	Malaria	Stroke	Road inj	Congenital	TB	Diarrhoea	IHD	NN enceph
Eastern sub-Saharan Africa	HIV/AIDS	LRI	Malaria	Diarrhoea	TB	NN preterm	NN enceph	PEM	NN sepsis	Congenital
Burundi	Malaria	LRI	Diarrhoea	TB	HIV/AIDS	NN preterm	PEM	NN enceph	NN sepsis	Congenital
Comoros	LRI	Diarrhoea	TB	NN preterm	Malaria	NN enceph	Stroke	NN sepsis	Road inj	Congenital
Djibouti	HIV/AIDS	LRI	Malaria	Diarrhoea	TB	Stroke	NN enceph	Depression	PEM	Congenital
Eritrea	Diarrhoea	LRI	TB	HIV/AIDS	Malaria	Iron	NN preterm	PEM	Depression	Meningitis
Ethiopia	LRI	Diarrhoea	HIV/AIDS	TB	NN preterm	NN enceph	Malaria	NN sepsis	Congenital	Meningitis
Kenya	HIV/AIDS	LRI	Diarrhoea	TB	NN preterm	Malaria	NN enceph	Congenital	PEM	NN sepsis
Madagascar	LRI	Diarrhoea	Stroke	NN preterm	PEM	Malaria	STD	Iron	Depression	Congenital
Malawi	HIV/AIDS	LRI	Diarrhoea	PEM	Malaria	TB	NN preterm	Congenital	NN enceph	Meningitis
Mauritius	Diabetes	IHD	Stroke	CKD	Back & neck	Sense	COPD	Road inj	Depression	LRI
Mozambique	HIV/AIDS	Malaria	LRI	Diarrhoea	TB	NN sepsis	NN enceph	NN preterm	STD	Road inj
Rwanda	HIV/AIDS	LRI	Malaria	Diarrhoea	NN preterm	War	NN enceph	Road inj	TB	NN sepsis
Seychelles	IHD	Stroke	LRI	Diabetes	Back & neck	HTN HD	Sense	COPD	Road inj	Depression
Somalia	Diarrhoea	LRI	Malaria	TB	PEM	Meningitis	NN preterm	NN enceph	Tetanus	Other NN
South Sudan	LRI	Diarrhoea	HIV/AIDS	TB	PEM	Meningitis	Malaria	STD	NN preterm	NN enceph
Tanzania	HIV/AIDS	LRI	Malaria	Diarrhoea	TB	Congenital	PEM	NN enceph	STD	NN preterm
Uganda	HIV/AIDS	Malaria	LRI	Diarrhoea	NN preterm	NN enceph	TB	NN sepsis	PEM	Road inj
Zambia	HIV/AIDS	Malaria	LRI	Diarrhoea	PEM	TB	NN enceph	Congenital	NN sepsis	Meningitis
South sub-Saharan Africa	HIV/AIDS	LRI	Diarrhoea	TB	Back & neck	Violence	NN preterm	Stroke	Diabetes	Road inj
Botswana	HIV/AIDS	TB	LRI	Diarrhoea	Back & neck	NN preterm	Road inj	Depression	Other NN	Self-harm
Lesotho	HIV/AIDS	TB	Diarrhoea	LRI	NN preterm	Violence	Other NN	NN enceph	Road inj	Self-harm
Namibia	HIV/AIDS	TB	LRI	Diarrhoea	Stroke	Self-harm	Road inj	NN preterm	Other NN	Back & neck
South Africa	HIV/AIDS	LRI	TB	Diarrhoea	Back & neck	Diabetes	Violence	Stroke	COPD	Road inj
Swaziland	HIV/AIDS	LRI	TB	Diarrhoea	Road inj	NN preterm	Other NN	Violence	Self-harm	Stroke
Zimbabwe	HIV/AIDS	LRI	Diarrhoea	TB	NN preterm	NN enceph	Stroke	PEM	Malaria	Road inj
Western sub-Saharan Africa	Malaria	LRI	HIV/AIDS	Diarrhoea	NN preterm	NN enceph	Haemog	Road inj	PEM	NN sepsis
Benin	Malaria	LRI	HIV/AIDS	Diarrhoea	NN preterm	NN enceph	Congenital	Iron	Road inj	NN sepsis
Burkina Faso	Malaria	LRI	Diarrhoea	NN preterm	Congenital	Meningitis	NN enceph	Road inj	HIV/AIDS	NN sepsis
Cameron	HIV/AIDS	Malaria	LRI	Diarrhoea	Road inj	NN preterm	NN enceph	Congenital	PEM	NN sepsis
Cape Verde	Stroke	Back & neck	Depression	Congenital	IHD	LRI	Iron	COPD	Sense	Skin
Chad	Diarrhoea	LRI	Malaria	HIV/AIDS	PEM	NN preterm	Meningitis	NN enceph	Iron	Congenital
Côte d'Ivoire	LRI	HIV/AIDS	Malaria	Diarrhoea	NN preterm	NN enceph	Road inj	NN sepsis	Congenital	PEM
Ghana	Malaria	LRI	HIV/AIDS	NN sepsis	NN preterm	PEM	NN enceph	Stroke	Road inj	Iron
Guinea	Malaria	LRI	Diarrhoea	HIV/AIDS	NN preterm	NN enceph	PEM	NN sepsis	Meningitis	Road inj
Guinea-Bissau	Malaria	HIV/AIDS	LRI	Diarrhoea	NN preterm	PEM	NN enceph	Meningitis	Road inj	Congenital
Liberia	Malaria	LRI	Diarrhoea	HIV/AIDS	NN preterm	NN enceph	PEM	TB	NN sepsis	Congenital
Mali	Malaria	Diarrhoea	LRI	PEM	NN preterm	NN enceph	Iron	Meningitis	NN sepsis	Congenital
Mauritania	LRI	Malaria	Diarrhoea	NN enceph	NN preterm	Road inj	Congenital	Iron	NN sepsis	Stroke
Niger	Malaria	Diarrhoea	LRI	PEM	NN preterm	Meningitis	Iron	Congenital	NN enceph	NN sepsis

	1	2	3	4	5	6	7	8	9	10
Nigeria	Malaria	LRI	HIV/AIDS	Haemog	Road inj	NN preterm	NN enceph	Diarrhoea	PEM	NN sepsis
São Tomé and Príncipe	Malaria	LRI	Stroke	NN preterm	Congenital	NN enceph	Iron	NN sepsis	PEM	Diarrhoea
Senegal	Malaria	LRI	Diarrhoea	NN preterm	NN enceph	Iron	NN sepsis	HIV/AIDS	Congenital	Road inj
Sierra Leone	Malaria	LRI	HIV/AIDS	PEM	NN preterm	Diarrhoea	NN enceph	Congenital	NN sepsis	Haemog
The Gambia	Malaria	LRI	Diarrhoea	Congenital	NN preterm	HIV/AIDS	NN sepsis	NN enceph	Road inj	PEM
Togo	Malaria	LRI	HIV/AIDS	Diarrhoea	NN preterm	NN enceph	Congenital	PEM	NN sepsis	Haemog
Ischaemic heart disease	IHD	Road injuries	Road inj	Depressive disorders	Depression					
Lower respiratory infections	LRI	Diarrhoeal diseases	Diarrhoea	Neonatal encephalopathy due to birth asphyxia and trauma	NN enceph					
Cerebrovascular disease	Stroke	Chronic obstructive pulmonary disease	COPD	Congenital anomalies	Congenital					
HIV/AIDS	HIV/AIDS	Preterm birth complications	NN preterm	Diabetes mellitus	Diabetes					
Low back and neck pain	Back & neck	Malaria	Malaria	Sense organ diseases	Sense					

Figure 6. Ten most common GBD level 3 causes of DALYs for 188 countries in 2013

The 15 most common global causes of DALYs are coloured. Alcohol=alcohol use disorders. Alzheimer=Alzheimer's disease and other dementias. Anxiety=anxiety disorders. Back and neck=low back and neck pain. Cirr Hep C=cirrhosis due to hepatitis C. CKD=chronic kidney disease. CMP=cardiomyopathy and myocarditis. Colorect C=colon and rectum cancer. Congenital=congenital disorders. COPD=chronic obstructive pulmonary disease. Depression=depressive disorders. Diabetes=diabetes mellitus. Diarrhoea=diarrhoeal diseases. Drown=drowning. Drugs=drug use disorders. F Body=foreign body. Haemog=haemoglobinopathies and haemolytic anaemias. HTN HD=hypertensive heart disease. IHD=ischaemic heart disease. Iron=iron-deficiency anaemia. Liver C=liver cancer. LRI=lower respiratory infections. Lung C=tracheal, bronchus, and lung cancer. Nematode=intestinal nematode infections. NN enceph=neonatal encephalopathy due to birth asphyxia and trauma. NN preterm=preterm birth complications. NN sepsis=neonatal sepsis and other neonatal infections. Other cardio=other cardiovascular and circulatory diseases. Other MSK=other musculoskeletal disorders. Other NN=other neonatal disorders. PEM=protein-energy malnutrition. Road inj=road injuries. Sense=sense organ diseases. Skin=skin and subcutaneous diseases. STD=sexually transmitted diseases excluding HIV. Stomach C=stomach cancer. Stroke=cerebrovascular disease. TB=tuberculosis. Violence=interpersonal violence. War=collective violence and legal intervention. DALY=disability-adjusted life-years. GBD=Global Burden of Disease.

Table 1
Global all-age DALYs and age-standardised DALYs for 306 causes in 2005 and 2013 with percentage change

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
All causes	2 513 239·2 (2 331 974·5 to 2 717 184·5)	2 449 810·0 (2 234 094·6 to 2 675 167·6)	-2·5 (-4·7 to -0·3)*	41 072·6 (38 101·1 to 44 409·9)	35 523·9 (32 416·1 to 38 774·8)	-13·5 (-15·3 to -11·6)*
Communicable, maternal, neonatal, and nutritional diseases	943 358·6 (903 197·4 to 985 632·0)	769 288·8 (725 481·2 to 814 936·0)	-18·5 (-21·2 to -15·8)*	14 031·9 (13 434·2 to 14 662·0)	10 606·9 (10 004·2 to 11 234·3)	-24·4 (-26·9 to -21·9)*
HIV/AIDS and tuberculosis	150 304·0 (141 828·2 to 159 539·6)	119 179·6 (112 497·7 to 127 584·9)	-20·8 (-24·4 to -16·5)*	2344·3 (2214·0 to 2489·5)	1656·0 (1563·5 to 1774·5)	-29·5 (-32·6 to -25·6)*
Tuberculosis	59 600·6 (53 405·7 to 64 094·8)	49 816·2 (44 744·3 to 54 313·4)	-16·4 (-22·9 to -9·4)*	964·1 (866·4 to 1035·6)	706·9 (635·9 to 771·7)	-26·7 (-32·3 to -20·5)*
HIV/AIDS	90 703·4 (83 401·7 to 99 132·8)	69 363·4 (64 972·5 to 76 330·2)	-23·9 (-28·1 to -18·5)*	1380·2 (1269·6 to 1507·9)	949·1 (890·0 to 1045·1)	-31·5 (-35·3 to -26·7)*
HIV/AIDS resulting in mycobacterial infection	6573·9 (5371·5 to 8050·8)	4303·1 (3496·7 to 5323·6)	-34·8 (-38·8 to -29·4)*	100·3 (82·0 to 122·8)	58·9 (47·9 to 72·9)	-41·5 (-45·1 to -36·7)*
HIV/AIDS resulting in other diseases	84 129·5 (77 516·6 to 92 482·2)	65 060·3 (60 939·8 to 71 903·6)	-23·0 (-27·3 to -17·6)*	1279·9 (1179·5 to 1404·1)	890·2 (834·3 to 984·9)	-30·7 (-34·6 to -25·9)*
Diarrhoea, lower respiratory, and other common infectious diseases	316 908·8 (298 964·3 to 335 711·2)	249 855·1 (231 222·1 to 269 625·3)	-21·1 (-26·0 to -16·4)*	4762·3 (4499·7 to 5038·0)	3488·6 (3231·6 to 3760·2)	-26·7 (-31·2 to -22·4)*
Diarrhoeal diseases	99 453·9 (90 724·0 to 108 320·9)	72 796·6 (65 452·9 to 80 756·7)	-26·9 (-33·5 to -19·7)*	1497·5 (1370·2 to 1625·7)	1015·5 (915·5 to 1126·3)	-32·3 (-38·4 to -25·8)*
Intestinal infectious diseases	17 538·4 (9936·1 to 28 497·3)	15 376·5 (8627·8 to 24 958·9)	-12·6 (-22·2 to 1·0)	252·9 (143·5 to 410·7)	210·7 (118·4 to 341·5)	-17·0 (-26·2 to -4·2)*
Typhoid fever	12 863·1 (7058·4 to 21 368·4)	11 127·8 (6013·6 to 18 314·8)	-13·7 (-24·6 to 1·0)	185·4 (101·8 to 307·6)	152·5 (82·6 to 250·5)	-17·9 (-28·3 to -4·0)*
Paratyphoid fever	4150·1 (2271·2 to 6940·7)	3820·5 (2084·1 to 6493·0)	-8·0 (-25·2 to 12·5)	59·8 (32·8 to 100·1)	52·3 (28·6 to 89·0)	-12·5 (-28·8 to 6·7)
Other intestinal infectious diseases	525·2 (460·0 to 598·7)	428·3 (373·2 to 486·9)	-18·4 (-25·3 to -11·4)*	7·7 (6·8 to 8·8)	5·9 (5·1 to 6·7)	-24·2 (-30·6 to -17·7)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Lower respiratory infections	133 899.9 (124 847.7 to 142 498.1)	113 363.1 (103 083.5 to 122 202.1)	-15.3 (-22.1 to -8.2)*	2043.4 (1912.2 to 2169.8)	1599.1 (1451.9 to 1721.3)	-21.7 (-27.8 to -15.5)*
Upper respiratory infections	2743.4 (1630.3 to 4451.0)	3031.0 (1757.4 to 4934.2)	10.4 (7.3 to 13.4)*	41.3 (24.5 to 66.8)	41.9 (24.3 to 68.2)	1.6 (-1.3 to 4.3)
Otitis media	1751.5 (1102.5 to 2735.2)	1806.5 (1129.8 to 2812.2)	3.1 (0.5 to 5.7)*	26.2 (16.5 to 40.8)	25.0 (15.6 to 38.9)	-4.5 (-7.0 to -2.0)*
Meningitis	24 317.0 (21 010.6 to 27 891.4)	21 014.9 (17 519.8 to 24 328.1)	-13.7 (-20.8 to -5.5)*	358.3 (310.2 to 410.1)	288.2 (240.6 to 333.3)	-19.7 (-26.3 to -12.1)*
Pneumococcal	6343.8 (5493.7 to 7161.7)	5509.2 (4678.8 to 6363.5)	-13.3 (-20.8 to -3.1)*	93.9 (81.5 to 105.7)	75.7 (64.3 to 87.4)	-19.5 (-26.5 to -10.4)*
<i>Haemophilus influenzae</i> type B	6300.1 (5188.0 to 7431.5)	5177.1 (4196.8 to 6211.1)	-17.8 (-27.9 to -7.7)*	91.6 (75.4 to 108.1)	70.7 (57.3 to 84.7)	-22.9 (-32.2 to -13.3)*
Meningococcal	4733.3 (4055.1 to 5610.2)	4314.7 (3583.0 to 5116.6)	-8.5 (-18.7 to 1.3)	69.9 (59.8 to 82.5)	59.2 (49.2 to 70.1)	-15.0 (-24.4 to -5.8)*
Other meningitis	6939.8 (6097.9 to 8066.0)	6014.0 (5084.4 to 6954.2)	-13.2 (-22.2 to -2.9)*	102.9 (90.6 to 119.5)	82.6 (70.0 to 95.4)	-19.7 (-28.0 to -10.2)*
Encephalitis	5087.0 (4236.1 to 6021.8)	4804.2 (4022.4 to 5926.9)	-5.3 (-19.2 to 9.0)	75.4 (62.9 to 89.4)	66.3 (55.6 to 81.9)	-11.9 (-24.6 to 1.3)
Diphtheria	316.5 (153.3 to 671.8)	253.6 (126.5 to 536.1)	-17.8 (-74.5 to 124.7)	4.6 (2.2 to 9.8)	3.5 (1.7 to 7.3)	-22.8 (-75.9 to 111.9)
Whooping cough	6478.7 (2580.1 to 12 839.5)	5250.9 (2029.0 to 11 658.9)	-22.4 (-71.4 to 125.5)	93.9 (37.4 to 186.1)	71.5 (27.6 to 158.8)	-27.0 (-73.1 to 112.1)
Tetanus	7223.6 (4402.4 to 8704.6)	3654.7 (2312.7 to 4911.4)	-49.8 (-58.0 to -36.8)*	105.1 (64.5 to 126.3)	50.2 (32.0 to 67.5)	-52.6 (-60.2 to -40.5)*
Measles	17 635.2 (9981.3 to 28 573.5)	8015.1 (4077.1 to 14 458.0)	-55.9 (-74.0 to -17.9)*	256.3 (145.0 to 414.8)	109.7 (55.8 to 197.8)	-58.5 (-75.5 to -22.7)*
Varicella and herpes zoster	463.7 (371.2 to 580.9)	487.9 (384.7 to 622.7)	5.2 (-12.2 to 26.9)	7.4 (5.9 to 9.2)	7.0 (5.5 to 8.9)	-6.1 (-20.7 to 12.4)
Neglected tropical diseases and malaria	121 587.6 (108 043.8 to 136 597.5)	90 676.8 (75 748.9 to 107 737.6)	-25.8 (-34.3 to -14.6)*	1798.1 (1596.1 to 2023.0)	1248.4 (1043.0 to 1483.2)	-30.9 (-38.7 to -20.6)*
Malaria	94 497.4 (83 484.0 to 106 879.0)	65 493.1 (53 064.9 to 79 960.7)	-31.3 (-41.6 to -16.9)*	1385.1 (1224.9 to 1565.9)	897.6 (728.1 to 1094.8)	-35.7 (-45.3 to -22.3)*
Chagas disease	326.6 (172.5 to 850.4)	338.5 (183.8 to 846.4)	4.6 (-18.4 to 27.8)	5.9 (3.1 to 15.9)	5.2 (2.8 to 12.8)	-12.3 (-32.6 to 7.4)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Leishmaniasis	3939.2 (3292.5 to 4619.1)	4283.1 (3527.8 to 5090.9)	8.8 (-6.4 to 25.3)	57.3 (47.9 to 67.1)	58.6 (48.2 to 69.7)	2.5 (-11.7 to 18.0)
Visceral	3908.5 (3272.6 to 4591.9)	4241.5 (3488.2 to 5044.7)	8.7 (-6.7 to 25.2)	56.8 (47.5 to 66.7)	58.0 (47.7 to 69.0)	2.4 (-12.0 to 18.0)
Cutaneous and mucocutaneous	30.6 (14.0 to 58.4)	41.7 (19.0 to 80.1)	35.9 (23.7 to 49.0)*	0.5 (0.2 to 0.9)	0.6 (0.3 to 1.1)	23.0 (12.3 to 34.8)*
African trypanosomiasis	854.4 (454.4 to 1366.7)	390.1 (211.4 to 615.3)	-54.3 (-58.7 to -49.1)*	12.6 (6.7 to 20.2)	5.3 (2.9 to 8.3)	-58.2 (-62.2 to -53.5)*
Schistosomiasis	3511.3 (1999.8 to 6207.9)	3062.8 (1690.1 to 5662.0)	-13.9 (-18.5 to -1.4)*	52.3 (29.9 to 92.1)	42.1 (23.3 to 77.8)	-20.5 (-24.7 to -8.8)*
Cysticercosis	409.7 (291.1 to 530.4)	341.2 (244.4 to 442.0)	-16.4 (-31.7 to 1.3)	6.4 (4.6 to 8.3)	4.7 (3.4 to 6.1)	-26.0 (-39.2 to -11.0)*
Cystic echinococcosis	211.5 (185.0 to 243.3)	181.7 (155.7 to 211.7)	-14.1 (-17.3 to -11.1)*	3.3 (2.9 to 3.8)	2.6 (2.2 to 3.0)	-22.3 (-25.0 to -19.7)*
Lymphatic filariasis	2406.4 (1241.2 to 4094.3)	2022.1 (1096.3 to 3294.4)	-14.3 (-31.4 to -5.3)*	39.6 (20.4 to 67.1)	28.9 (15.7 to 47.1)	-25.7 (-40.1 to -18.0)*
Onchocerciasis	1445.3 (792.4 to 2241.9)	1179.8 (556.6 to 1992.7)	-19.4 (-33.0 to -5.0)*	22.6 (12.6 to 34.4)	16.6 (7.9 to 27.6)	-27.5 (-40.0 to -14.4)*
Trachoma	208.9 (141.3 to 286.9)	171.2 (115.3 to 241.7)	-18.1 (-27.5 to -8.4)*	4.2 (2.9 to 5.8)	2.8 (1.9 to 4.0)	-33.4 (-41.0 to -25.6)*
Dengue	957.9 (627.9 to 1395.8)	1142.7 (727.6 to 1978.2)	17.0 (-7.9 to 53.1)	14.1 (9.3 to 20.6)	15.8 (10.1 to 27.4)	9.8 (-13.3 to 43.0)
Yellow fever	30.2 (25.1 to 36.8)	30.7 (25.3 to 37.1)	1.8 (-18.2 to 25.3)	0.4 (0.4 to 0.5)	0.4 (0.3 to 0.5)	-4.2 (-22.9 to 17.5)
Rabies	1449.7 (1124.4 to 1833.1)	1242.9 (914.6 to 1526.7)	-14.6 (-27.6 to 0.9)	21.8 (16.9 to 27.5)	17.3 (12.7 to 21.2)	-20.9 (-32.9 to -6.5)*
Intestinal nematode infections	4641.3 (2899.4 to 7110.5)	4029.4 (2516.8 to 6137.0)	-13.1 (-18.3 to -7.8)*	69.4 (43.3 to 106.4)	55.7 (34.8 to 84.9)	-19.6 (-24.4 to -14.7)*
Ascariasis	1796.2 (1150.3 to 2720.3)	1271.7 (843.1 to 1916.7)	-29.0 (-35.9 to -21.3)*	26.8 (17.2 to 40.7)	17.6 (11.6 to 26.5)	-34.3 (-40.7 to -27.2)*
Trichuriasis	652.0 (357.4 to 1063.6)	576.0 (310.1 to 972.6)	-12.3 (-26.3 to 8.8)	9.8 (5.4 to 16.0)	8.0 (4.3 to 13.5)	-19.1 (-32.1 to 0.4)
Hookworm disease	2193.2 (1335.6 to 3401.2)	2181.7 (1338.6 to 3354.5)	-0.5 (-6.9 to 6.6)	32.8 (20.0 to 50.8)	30.2 (18.5 to 46.4)	-7.8 (-13.9 to -1.3)*
Food-borne trematodiasis	3161.5 (1039.8 to 6574.9)	3634.8 (1160.2 to 7692.4)	14.6 (8.6 to 23.2)*	51.3 (16.8 to 106.9)	51.3 (16.3 to 108.6)	-0.3 (-5.4 to 6.5)
Other neglected tropical diseases	3536.4 (2652.7 to 4638.1)	3132.7 (2328.1 to 4208.7)	-11.8 (-18.0 to -3.1)*	51.8 (38.9 to 67.8)	43.5 (32.3 to 58.4)	-16.3 (-22.2 to -8.3)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Maternal disorders	21 717.2 (19 935.4 to 23 449.9)	18 027.8 (16 051.8 to 19 989.5)	-17.0 (-25.6 to -7.9)*	312.7 (287.2 to 337.5)	239.2 (213.3 to 264.9)	-23.5 (-31.4 to -15.3)*
Maternal haemorrhage	3551.9 (3154.8 to 3980.3)	2561.7 (2219.9 to 2926.6)	-28.2 (-38.0 to -16.3)*	51.3 (45.6 to 57.5)	34.0 (29.5 to 38.9)	-34.0 (-42.7 to -23.0)*
Maternal sepsis and other maternal infections	1781.7 (1580.7 to 2007.9)	1369.6 (1156.9 to 1624.0)	-23.5 (-36.2 to -7.9)*	25.6 (22.7 to 28.8)	18.2 (15.3 to 21.5)	-29.4 (-41.0 to -15.1)*
Maternal hypertensive disorders	2281.0 (2038.0 to 2547.4)	1753.2 (1523.0 to 1996.7)	-23.4 (-32.7 to -10.8)*	32.6 (29.2 to 36.4)	23.2 (20.2 to 26.4)	-29.1 (-37.5 to -17.3)*
Obstructed labour	2312.0 (1963.9 to 2679.8)	2023.4 (1686.8 to 2414.0)	-12.5 (-20.5 to -3.8)*	33.6 (28.5 to 39.0)	27.1 (22.5 to 32.3)	-19.5 (-26.9 to -11.6)*
Complications of abortion	2886.2 (2603.8 to 3192.2)	2476.5 (2169.9 to 2841.6)	-14.6 (-24.6 to -0.5)*	41.6 (37.6 to 46.0)	32.8 (28.7 to 37.6)	-21.6 (-30.8 to -8.8)*
Indirect maternal deaths	2391.2 (2110.7 to 2718.2)	1790.8 (1534.9 to 2074.7)	-25.3 (-37.7 to -9.9)*	34.3 (30.3 to 38.9)	23.7 (20.3 to 27.4)	-31.1 (-42.4 to -17.2)*
Late maternal deaths	2525.7 (2151.7 to 2947.8)	2481.8 (2030.4 to 2992.2)	-1.3 (-23.0 to 23.2)	36.2 (30.8 to 42.2)	32.9 (27.0 to 39.7)	-8.6 (-28.6 to 13.7)
Maternal deaths aggravated by HIV/AIDS	184.7 (113.8 to 248.6)	117.2 (72.6 to 162.7)	-36.6 (-43.9 to -27.7)*	2.7 (1.7 to 3.6)	1.5 (1.0 to 2.1)	-42.5 (-49.2 to -34.3)*
Other maternal disorders	3761.6 (3379.7 to 4197.0)	3420.6 (2936.5 to 3954.0)	-9.4 (-21.3 to 7.9)	54.2 (48.7 to 60.4)	45.4 (39.0 to 52.4)	-16.6 (-27.5 to -0.5)*
Neonatal disorders	221 687.5 (213 295.0 to 230 283.3)	189 601.0 (179 024.1 to 200 044.0)	-14.5 (-18.1 to -10.7)*	3155.7 (3035.7 to 3278.5)	2560.0 (2416.8 to 2700.5)	-18.9 (-22.3 to -15.3)*
Preterm birth complications	88 971.6 (75 761.9 to 108 464.4)	70 843.1 (57 523.4 to 85 348.6)	-20.3 (-28.6 to -12.2)*	1267.2 (1079.1 to 1543.9)	957.0 (777.2 to 1152.8)	-24.4 (-32.3 to -16.7)*
Neonatal encephalopathy (birth asphyxia and trauma)	66 760.9 (53 355.4 to 77 432.1)	58 012.7 (46 947.7 to 68 198.2)	-13.2 (-22.7 to -1.8)*	948.9 (758.6 to 1100.2)	782.6 (633.4 to 919.7)	-17.6 (-26.6 to -6.8)*
Sepsis and other neonatal infections	32 000.2 (19 472.8 to 44 418.3)	31 631.8 (20 147.7 to 44 128.5)	-1.0 (-16.8 to 19.3)	455.0 (277.0 to 631.4)	426.7 (271.9 to 595.3)	-6.1 (-21.1 to 13.2)
Haemolytic disease and other neonatal jaundice	3639.6 (2720.1 to 4907.6)	3299.4 (2496.2 to 4382.9)	-9.0 (-29.7 to 14.7)	52.5 (39.3 to 70.7)	44.9 (33.9 to 59.6)	-14.2 (-33.6 to 8.0)
Other neonatal disorders	30 315.2 (24 647.8 to 38 101.8)	25 814.0 (20 483.9 to 32 840.8)	-14.7 (-27.3 to 0.7)	432.1 (351.0 to 542.8)	348.8 (276.7 to 443.7)	-19.1 (-31.1 to -4.6)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Nutritional deficiencies	79 695.9 (63 911.4 to 99 518.1)	74 834.4 (59 402.0 to 94 084.1)	-6.2 (-10.9 to -1.4)*	1192.4 (958.9 to 1486.1)	1040.7 (828.2 to 1306.8)	-12.8 (-17.1 to -8.5)*
Protein-energy malnutrition	29 772.1 (23 294.2 to 35 802.7)	27 709.9 (21 411.5 to 33 507.3)	-7.1 (-17.5 to 4.5)	447.4 (348.0 to 536.2)	386.1 (298.4 to 465.7)	-13.7 (-23.1 to -3.6)*
Iodine deficiency	2155.1 (1364.0 to 3259.2)	2189.6 (1406.6 to 3401.4)	1.5 (-5.9 to 9.8)	32.6 (20.7 to 49.4)	30.1 (19.3 to 46.7)	-7.9 (-14.7 to -0.3)*
Vitamin A deficiency	177.2 (113.8 to 261.1)	153.7 (99.0 to 224.9)	-13.2 (-19.5 to -6.8)*	2.6 (1.7 to 3.9)	2.1 (1.4 to 3.1)	-19.1 (-24.8 to -13.2)*
Iron-deficiency anaemia	46 359.5 (33 059.4 to 64 257.3)	43 747.6 (30 848.7 to 61 398.4)	-5.6 (-8.2 to -3.6)*	690.1 (494.3 to 954.8)	607.6 (428.9 to 852.3)	-12.0 (-14.4 to -10.0)*
Other nutritional deficiencies	1232.0 (847.8 to 2025.2)	1033.5 (715.8 to 1747.2)	-16.1 (-29.0 to -2.5)*	19.6 (13.4 to 31.8)	14.8 (10.3 to 25.1)	-24.3 (-35.1 to -12.3)*
Other communicable, maternal, neonatal, and nutritional diseases	31 457.6 (24 584.5 to 39 680.1)	27 114.0 (21 684.1 to 33 977.7)	-13.5 (-23.8 to -3.7)*	466.5 (367.2 to 585.0)	373.8 (300.0 to 466.4)	-19.7 (-29.1 to -10.7)*
Sexually transmitted diseases excluding HIV	15 145.4 (9593.7 to 22 186.1)	12 857.2 (8079.7 to 19 013.3)	-14.9 (-30.4 to -0.2)*	218.6 (139.2 to 319.6)	174.6 (109.8 to 258.0)	-19.9 (-34.5 to -6.2)*
Syphilis	13 710.1 (8228.6 to 20 649.7)	11 324.5 (6634.9 to 17 484.8)	-17.1 (-33.7 to -1.2)*	197.1 (118.6 to 296.5)	153.8 (90.3 to 237.3)	-21.8 (-37.3 to -6.7)*
Chlamydial infection	645.9 (424.5 to 990.0)	692.4 (454.5 to 1065.5)	7.2 (2.2 to 12.7)*	9.4 (6.2 to 14.4)	9.3 (6.1 to 14.2)	-1.6 (-6.4 to 3.4)
Gonococcal infection	293.9 (219.3 to 401.1)	313.9 (229.4 to 438.1)	6.8 (-3.2 to 16.8)	4.3 (3.3 to 5.8)	4.2 (3.1 to 5.9)	-2.3 (-11.5 to 7.1)
Trichomoniasis	105.1 (41.3 to 221.3)	113.9 (45.1 to 242.9)	8.2 (-1.8 to 20.0)	1.5 (0.6 to 3.2)	1.5 (0.6 to 3.2)	-0.8 (-9.9 to 10.0)
Genital herpes	279.9 (89.6 to 671.1)	311.6 (98.3 to 748.5)	11.2 (8.5 to 13.6)*	4.5 (1.4 to 10.9)	4.4 (1.4 to 10.5)	-3.0 (-4.9 to -1.0)*
Other sexually transmitted diseases	110.5 (93.5 to 133.7)	101.0 (86.1 to 121.0)	-8.8 (-16.9 to 2.4)	1.7 (1.4 to 2.0)	1.4 (1.2 to 1.7)	-17.7 (-25.2 to -7.6)*
Hepatitis	7094.0 (6392.5 to 8180.0)	6556.8 (5774.7 to 8208.0)	-8.2 (-17.4 to 5.3)	108.7 (98.6 to 124.5)	91.2 (80.5 to 113.7)	-16.6 (-24.8 to -4.2)*
Hepatitis A	1456.7 (673.5 to 2476.5)	1214.6 (553.8 to 2108.4)	-17.2 (-34.1 to 6.1)	21.3 (9.8 to 36.1)	16.6 (7.6 to 28.8)	-22.4 (-38.2 to -0.7)*
Hepatitis B	2860.3 (2022.3 to 3868.0)	2587.3 (1839.1 to 3512.8)	-10.1 (-21.5 to 4.9)	46.3 (33.3 to 61.3)	37.1 (26.6 to 49.8)	-20.4 (-30.0 to -8.0)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Hepatitis C	126.5 (37.9 to 269.5)	138.0 (41.4 to 310.4)	8.1 (-8.7 to 34.5)	2.0 (0.6 to 4.3)	2.0 (0.6 to 4.4)	-5.0 (-19.3 to 17.0)
Hepatitis E	2650.5 (1991.7 to 3421.7)	2616.9 (1962.3 to 3508.9)	-1.8 (-12.8 to 13.4)	39.1 (29.2 to 50.8)	35.6 (26.6 to 47.8)	-9.5 (-19.6 to 4.5)
Leprosy	36.6 (24.2 to 51.9)	39.7 (26.6 to 56.0)	8.6 (2.3 to 15.4)*	0.7 (0.4 to 0.9)	0.6 (0.4 to 0.9)	-8.9 (-13.9 to -3.5)*
Other infectious diseases	9181.6 (5667.4 to 12 740.2)	7660.3 (5301.6 to 10 204.5)	-14.5 (-33.4 to 2.7)	138.6 (87.1 to 190.1)	107.4 (74.9 to 142.3)	-20.9 (-37.7 to -5.1)*
Non-communicable diseases	1 302 199.4 (1 155 437.8 to 1 460 687.4)	1 432 938.8 (1 256 004.9 to 1 614 026.7)	10.0 (7.7 to 12.8)*	22 873.8 21 458.5 to 25 487.7)	21 452.8 18 880.3 to 24 078.4)	-6.3 (-8.3 to -3.8)*
Neoplasms	180 409.6 (175 482.3 to 185 592.2)	197 093.5 (189 237.0 to 206 258.5)	9.3 (4.9 to 13.9)*	3289.8 (3196.1 to 3384.1)	3001.7 (2881.6 to 3136.4)	-8.7 (-12.3 to -5.0)*
Oesophageal cancer	8905.2 (7787.5 to 10 237.4)	9843.1 (8655.5 to 11 620.1)	10.3 (1.9 to 20.3)*	168.8 (148.2 to 193.7)	152.3 (134.0 to 180.1)	-9.9 (-16.7 to -1.7)*
Stomach cancer	19 059.1 (18 331.4 to 19 926.9)	17 906.5 (16 863.7 to 19 067.8)	-6.0 (-11.5 to -0.6)*	357.4 (343.9 to 373.8)	277.7 (261.5 to 295.9)	-22.2 (-26.8 to -17.9)*
Liver cancer	19 175.3 (18 331.6 to 20 085.5)	20 888.7 (19 321.9 to 22 518.1)	9.2 (-0.2 to 17.7)	344.0 (329.1 to 360.4)	313.0 (289.9 to 336.5)	-8.9 (-16.3 to -1.9)*
B Liver cancer due to hepatitis	8198.9 (7558.5 to 8758.0)	8590.9 (7761.8 to 9462.3)	4.8 (-6.5 to 16.2)	143.6 (132.7 to 153.2)	126.2 (114.1 to 138.7)	-12.1 (-21.3 to -2.7)*
C Liver cancer due to hepatitis	5902.3 (5484.4 to 6445.1)	7967.1 (7271.6 to 8807.4)	35.1 (21.9 to 47.7)*	109.0 (101.5 to 118.8)	121.4 (111.1 to 133.6)	11.5 (0.7 to 21.5)*
use Liver cancer due to alcohol	2450.5 (2239.5 to 2675.5)	1980.4 (1813.1 to 2189.7)	-19.1 (-27.9 to -9.7)*	46.1 (42.2 to 50.2)	30.7 (28.2 to 33.9)	-33.2 (-40.2 to -25.7)*
causes Liver cancer due to other	2623.7 (2366.6 to 2881.3)	2350.2 (2098.1 to 2595.8)	-9.4 (-24.9 to 2.8)	45.3 (40.9 to 49.7)	34.6 (31.0 to 38.3)	-22.8 (-35.9 to -12.4)*
Larynx cancer	2075.5 (1812.6 to 2544.4)	2136.7 (1815.5 to 2620.1)	3.0 (-3.8 to 10.0)	38.6 (33.6 to 47.1)	32.6 (27.8 to 39.9)	-15.5 (-20.9 to -9.9)*
Tracheal, bronchus, and lung cancer	30 791.6 (29 492.6 to 31 587.1)	34 732.9 (33 042.6 to 36 328.1)	12.9 (6.6 to 19.1)*	586.7 (562.2 to 601.6)	542.8 (516.4 to 567.1)	-7.4 (-12.4 to -2.5)*
Breast cancer	11 762.5 (10 713.2 to 13 178.0)	13 258.7 (12 105.4 to 14 558.1)	13.0 (4.5 to 19.8)*	209.8 (190.6 to 234.6)	196.4 (178.1 to 215.5)	-6.1 (-13.0 to -0.7)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Cervical cancer	6775.6 (5813.9 to 7591.5)	6914.7 (5774.5 to 7589.1)	2.1 (-5.7 to 9.5)	118.0 (101.3 to 131.9)	100.9 (84.4 to 110.5)	-14.4 (-20.7 to -8.2)*
Uterine cancer	1526.9 (1184.9 to 1824.8)	1660.9 (1276.3 to 1961.6)	8.1 (-1.1 to 21.3)	28.5 (22.3 to 34.0)	25.4 (19.6 to 30.0)	-11.3 (-18.6 to -0.7)*
Prostate cancer	3812.1 (3236.1 to 4802.3)	4768.8 (4067.0 to 6034.1)	25.0 (19.3 to 31.6)*	80.2 (68.3 to 100.9)	81.3 (69.2 to 103.0)	1.3 (-3.3 to 6.7)
Colon and rectum cancer	13 747.9 (13 378.9 to 14 138.6)	15 794.1 (15 165.3 to 16 421.4)	14.9 (10.8 to 19.1)*	261.6 (254.4 to 268.9)	246.7 (237.0 to 256.2)	-5.7 (-9.0 to -2.4)*
Lip and oral cavity cancer	2963.9 (2620.9 to 3442.8)	3589.3 (3031.8 to 4109.0)	21.1 (9.8 to 32.1)*	53.8 (47.7 to 62.6)	53.8 (45.5 to 61.7)	0.0 (-9.1 to 8.7)
Nasopharynx cancer	2034.5 (1831.3 to 2318.1)	1933.7 (1723.7 to 2211.8)	-5.0 (-13.1 to 4.1)	34.5 (31.2 to 39.3)	27.9 (24.9 to 31.9)	-19.3 (-26.1 to -11.7)*
Other pharynx cancer	1732.8 (1545.7 to 1880.0)	2137.7 (1832.0 to 2368.2)	23.3 (10.9 to 36.4)*	31.5 (28.2 to 34.2)	31.8 (27.3 to 35.2)	1.2 (-9.1 to 11.9)
Gallbladder and biliary tract cancer	2550.4 (2310.8 to 2841.4)	2701.1 (2338.8 to 2977.8)	6.3 (-2.9 to 14.1)	49.0 (44.4 to 54.8)	42.4 (36.9 to 47.0)	-13.0 (-20.7 to -6.7)*
Pancreatic cancer	5704.7 (5557.7 to 5841.8)	7029.1 (6775.5 to 7276.7)	23.2 (19.2 to 27.5)*	109.5 (106.6 to 112.1)	110.2 (106.3 to 114.1)	0.6 (-2.7 to 4.0)
Malignant skin melanoma	1394.8 (1102.7 to 1877.5)	1555.5 (1227.7 to 2089.3)	12.0 (3.5 to 18.7)*	24.8 (19.3 to 33.5)	23.2 (18.1 to 31.1)	-6.1 (-13.0 to -0.8)*
Non-melanoma skin cancer	724.2 (602.1 to 903.6)	816.5 (682.2 to 1039.9)	12.4 (6.7 to 20.1)*	13.7 (11.4 to 16.9)	12.9 (10.8 to 16.3)	-6.2 (-10.7 to 0.0)
Ovarian cancer	3541.7 (3324.8 to 3725.9)	4056.5 (3794.9 to 4400.2)	14.5 (7.0 to 23.1)*	64.1 (60.2 to 67.3)	60.6 (56.6 to 65.5)	-5.5 (-11.4 to 1.3)
Testicular cancer	354.9 (284.9 to 439.2)	378.7 (284.3 to 470.6)	7.2 (-3.8 to 16.4)	5.5 (4.4 to 6.8)	5.2 (3.9 to 6.5)	-4.4 (-14.2 to 3.6)
Kidney cancer	2810.2 (2675.3 to 2923.1)	3150.3 (2988.6 to 3320.7)	12.2 (5.8 to 18.1)*	51.8 (49.2 to 54.0)	48.3 (45.8 to 50.8)	-6.7 (-12.0 to -2.2)*
Bladder cancer	2987.4 (2743.2 to 3270.2)	3139.9 (2868.8 to 3479.6)	4.9 (0.8 to 10.3)*	59.0 (54.0 to 64.4)	50.6 (46.3 to 56.0)	-14.4 (-17.6 to -10.0)*
Brain and nervous system cancer	6163.4 (5120.0 to 7002.9)	6692.2 (5592.3 to 7765.2)	8.4 (2.3 to 15.4)*	102.6 (85.2 to 115.8)	96.8 (80.9 to 112.1)	-5.7 (-10.8 to 0.4)
Thyroid cancer	764.5 (673.5 to 870.8)	851.9 (739.8 to 983.2)	12.3 (2.4 to 19.2)*	14.0 (12.4 to 16.0)	13.0 (11.3 to 14.9)	-6.7 (-14.4 to -1.1)*
Mesothelioma	504.0 (444.0 to 581.2)	763.5 (686.2 to 864.4)	51.8 (40.0 to 63.4)*	9.5 (8.3 to 11.0)	11.8 (10.5 to 13.4)	24.4 (14.7 to 33.8)*
Hodgkin's lymphoma	1126.5 (1027.5 to 1378.4)	989.6 (867.9 to 1304.0)	-13.5 (-21.9 to 4.2)	17.7 (16.2 to 21.8)	14.0 (12.3 to 18.4)	-22.3 (-29.4 to -7.0)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Non-Hodgkin lymphoma	5627.7 (4867.0 to 6301.8)	6412.8 (5495.7 to 7202.7)	14.6 (5.7 to 21.1)*	96.9 (83.1 to 107.1)	94.9 (81.2 to 106.2)	-1.4 (-8.9 to 4.0)
Multiple myeloma	1384.2 (1174.0 to 1635.6)	1661.5 (1397.5 to 1964.8)	20.3 (13.4 to 25.0)*	26.6 (22.5 to 31.5)	26.1 (21.8 to 31.0)	-1.7 (-7.3 to 2.2)
Leukaemia	9384.9 (9081.5 to 9744.4)	9301.0 (8869.0 to 9752.8)	-0.7 (-6.0 to 3.6)	150.0 (145.2 to 155.3)	133.7 (127.6 to 140.1)	-10.8 (-15.2 to -7.0)*
Other neoplasms	11 023.4 (10 179.5 to 12 208.5)	12 027.7 (10 693.3 to 13 370.7)	10.3 (-3.1 to 17.1)	182.0 (167.7 to 200.3)	175.3 (156.1 to 194.1)	-2.7 (-13.8 to 2.9)
Cardiovascular diseases	308 887.0 (294 356.7 to 324 066.8)	329 705.6 (311 188.8 to 348 206.2)	6.7 (2.6 to 11.7)*	5907.1 (5641.6 to 6181.0)	5206.3 (4924.1 to 5485.9)	-11.9 (-15.1 to -8.0)*
Rheumatic heart disease	10 103.6 (8576.3 to 12 982.8)	9517.7 (7867.8 to 11 950.8)	-5.9 (-13.9 to 3.4)	170.0 (144.4 to 219.1)	138.9 (115.1 to 174.2)	-18.4 (-25.5 to -10.3)*
Ischaemic heart disease	138 547.2 (127 675.5 to 149 798.3)	150 238.6 (135 388.5 to 162 458.7)	8.4 (2.9 to 15.0)*	2670.7 (2461.1 to 2880.1)	2375.9 (2142.4 to 2565.1)	-11.1 (-15.2 to -6.0)*
Cerebrovascular disease	107 737.1 (99 331.7 to 116 802.3)	112 878.9 (104 002.3 to 124 567.7)	4.7 (0.2 to 9.6)*	2096.8 (1934.1 to 2266.5)	1806.9 (1667.4 to 1991.7)	-13.9 (-17.5 to -9.9)*
Ischaemic stroke	44 730.9 (38 134.8 to 49 037.1)	47 424.7 (40 537.5 to 52 211.8)	6.0 (0.8 to 11.0)*	920.4 (787.2 to 1007.9)	791.3 (678.0 to 868.8)	-14.0 (-18.2 to -10.0)*
Haemorrhagic stroke	63 006.2 (57 306.5 to 70 880.3)	65 454.2 (59 497.4 to 74 654.7)	3.8 (-1.6 to 10.1)	1176.4 (1068.3 to 1325.3)	1015.6 (923.2 to 1163.2)	-13.8 (-18.2 to -8.5)*
Hypertensive heart disease	16 427.8 (13 746.5 to 19 904.3)	19 248.1 (15 498.3 to 22 588.0)	17.7 (6.2 to 27.9)*	320.7 (269.1 to 388.9)	308.0 (248.4 to 360.3)	-3.6 (-12.9 to 4.7)
Cardiomyopathy and myocarditis	12 876.8 (10 178.6 to 14 361.3)	12 472.7 (10 209.8 to 14 036.3)	-3.5 (-8.0 to 5.8)	220.3 (176.5 to 244.8)	184.3 (151.9 to 207.8)	-16.7 (-20.3 to -9.5)*
Atrial fibrillation and flutter	1477.2 (1238.5 to 1748.3)	1888.7 (1590.0 to 2224.9)	28.1 (20.9 to 34.6)*	32.1 (27.0 to 37.9)	32.6 (27.5 to 38.2)	1.6 (-4.1 to 6.9)
Aortic aneurysm	2404.4 (1973.3 to 2797.7)	2652.7 (2217.4 to 3109.6)	10.2 (5.5 to 16.3)*	46.5 (38.3 to 54.3)	42.2 (35.2 to 49.4)	-9.4 (-13.1 to -4.7)*
Peripheral vascular disease	510.7 (438.1 to 599.2)	596.1 (515.2 to 705.5)	16.8 (10.6 to 23.2)*	11.0 (9.4 to 12.9)	10.2 (8.8 to 12.1)	-7.1 (-12.1 to -2.1)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Endocarditis	1769.6 (1301.1 to 2161.5)	1913.5 (1420.8 to 2342.1)	7.9 (0.2 to 17.9)*	29.8 (22.1 to 36.3)	28.0 (20.8 to 34.4)	-6.4 (-12.7 to 2.4)
Other cardiovascular and circulatory diseases	17 032.8 (14 236.3 to 254.9)	18 298.8 (15 153.9 to 824.3)	7.3 (-6.6 to 23.5)	309.3 (259.6 to 383.7)	279.3 (231.5 to 346.9)	-9.7 (-21.1 to 3.6)
Chronic respiratory diseases	104 250.7 (92 540.7 to 118 201.1)	112 710.7 (98 871.9 to 128 147.8)	8.1 (2.7 to 13.8)*	1935.3 (1734.0 to 2180.3)	1754.3 (1550.4 to 1981.3)	-9.3 (-13.9 to -4.6)*
Chronic obstructive pulmonary disease	66 478.5 (58 577.5 to 309.8)	71 900.7 (61 998.5 to 621.4)	8.2 (3.0 to 13.6)*	1276.2 (1136.1 to 1435.7)	1137.9 (990.5 to 1299.5)	-10.8 (-15.1 to -6.3)*
Pneumoconiosis	4770.7 (3830.8 to 6066.8)	5468.0 (4285.5 to 6974.4)	14.4 (-1.8 to 33.7)	90.3 (72.5 to 114.6)	85.5 (67.0 to 108.8)	-5.6 (-18.9 to 10.3)
Silicosis	926.8 (635.0 to 1323.0)	983.6 (682.7 to 1386.8)	6.0 (-8.0 to 22.3)	17.5 (12.0 to 24.9)	15.4 (10.8 to 21.5)	-12.2 (-23.6 to 1.2)
Asbestosis	467.4 (340.7 to 629.7)	554.3 (403.8 to 754.9)	18.2 (1.8 to 40.0)*	8.7 (6.3 to 11.7)	8.5 (6.2 to 11.6)	-2.2 (-15.9 to 15.7)
Coal workers' pneumoconiosis	531.1 (393.2 to 749.6)	600.2 (447.6 to 838.6)	13.0 (-2.5 to 31.4)	9.8 (7.3 to 14.0)	9.2 (6.9 to 12.8)	-6.8 (-19.3 to 8.2)
Other pneumoconiosis	2845.4 (2258.8 to 3640.8)	3329.9 (2525.9 to 4296.4)	16.7 (-3.9 to 40.9)	54.3 (43.2 to 69.6)	52.4 (39.8 to 67.9)	-3.7 (-20.4 to 16.5)
Asthma	22 240.4 (17 995.5 to 896.9)	22 182.7 (17 852.3 to 053.6)	-0.5 (-6.7 to 6.9)	373.1 (304.1 to 471.9)	326.4 (263.3 to 414.3)	-12.7 (-19.0 to -6.1)*
Interstitial lung disease and pulmonary sarcoidosis	5929.3 (4466.5 to 7311.7)	8178.0 (6359.8 to 10 399.7)	38.8 (18.3 to 56.6)*	116.0 (88.1 to 142.5)	131.3 (102.3 to 166.8)	13.8 (-2.7 to 28.6)
Other chronic respiratory diseases	4831.8 (3897.3 to 5955.2)	4981.3 (4025.8 to 6185.0)	2.9 (-5.0 to 11.6)	79.6 (63.8 to 99.0)	73.2 (59.3 to 90.8)	-8.3 (-15.0 to -0.6)*
Cirrhosis	35 528.4 (34 221.3 to 36 967.4)	36 858.1 (35 053.9 to 39 022.5)	3.6 (-1.5 to 9.7)	606.6 (585.5 to 629.5)	535.9 (510.2 to 567.0)	-11.8 (-16.1 to -6.8)*
Cirrhosis due to hepatitis B	9321.9 (8709.4 to 9936.2)	9399.4 (8557.4 to 10 303.7)	0.7 (-8.4 to 12.2)	159.9 (149.6 to 170.4)	136.9 (124.9 to 149.7)	-14.5 (-22.0 to -4.7)*
Cirrhosis due to hepatitis C	8937.8 (8404.8 to 9505.2)	9939.9 (9200.4 to 10 788.7)	11.3 (1.7 to 22.5)*	156.3 (147.2 to 165.7)	146.2 (135.9 to 158.6)	-6.5 (-14.2 to 2.6)
Cirrhosis due to alcohol use	11 182.1 (10 401.0 to 948.2)	10 886.3 (9929.1 to 11 927.3)	-2.8 (-12.5 to 8.9)	195.0 (181.9 to 207.7)	159.7 (146.2 to 174.5)	-18.3 (-26.0 to -8.6)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Cirrhosis due to other causes	6086.6 (5445.6 to 6855.8)	6632.4 (5969.0 to 7450.4)	9.0 (-6.4 to 26.6)	95.3 (85.3 to 107.3)	93.1 (83.9 to 104.3)	-2.4 (-16.2 to 13.9)
Digestive diseases	37 037.5 (33 945.1 to 40 627.4)	37 341.2 (33 670.4 to 41 452.4)	0.7 (-5.3 to 7.7)	643.0 (589.7 to 704.5)	557.3 (502.6 to 617.9)	-13.5 (-18.2 to -7.7)*
Peptic ulcer disease	9090.0 (7900.7 to 10 341.3)	8457.8 (6967.0 to 9805.3)	-7.2 (-15.3 to 2.8)	163.6 (142.5 to 185.8)	128.5 (106.4 to 148.5)	-21.7 (-27.9 to -13.7)*
Gastritis and duodenitis	3900.1 (2949.8 to 5033.5)	3860.1 (2931.3 to 4985.7)	-1.0 (-6.7 to 4.7)	67.1 (51.1 to 86.6)	58.1 (44.1 to 75.2)	-13.5 (-18.2 to -8.7)*
Appendicitis	3082.0 (2452.4 to 3652.8)	2760.7 (2084.3 to 3383.6)	-10.9 (-23.0 to 4.8)	48.7 (38.6 to 57.5)	39.1 (29.4 to 47.8)	-20.0 (-30.4 to -6.4)*
Paralytic ileus and intestinal obstruction	5468.0 (4182.4 to 7560.0)	6071.7 (4684.6 to 8303.2)	10.9 (1.4 to 22.2)*	93.8 (71.4 to 129.9)	90.0 (69.3 to 123.2)	-4.2 (-12.2 to 5.1)
Inguinal, femoral, and abdominal hernia	982.8 (773.4 to 1426.7)	954.8 (742.2 to 1381.4)	-2.0 (-16.9 to 9.4)	17.8 (14.1 to 25.4)	14.7 (11.5 to 21.2)	-16.5 (-28.2 to -6.2)*
Inflammatory bowel disease	3545.7 (2854.3 to 4368.0)	3729.1 (2964.8 to 4665.3)	5.2 (0.2 to 10.0)*	59.1 (47.4 to 72.8)	54.1 (43.1 to 67.6)	-8.6 (-12.6 to -4.7)*
Vascular intestinal disorders	1158.5 (729.7 to 1739.6)	1241.5 (800.0 to 1839.5)	7.2 (-0.5 to 14.9)	22.6 (14.3 to 33.4)	20.0 (13.0 to 29.4)	-11.6 (-17.8 to -5.5)*
Gallbladder and biliary diseases	2420.2 (2141.2 to 2789.6)	2559.7 (2191.8 to 2924.8)	6.0 (-0.8 to 11.1)	44.6 (39.6 to 51.3)	39.7 (34.0 to 45.5)	-10.8 (-16.5 to -6.8)*
Pancreatitis	3925.9 (2838.2 to 4834.3)	4198.8 (3062.6 to 5140.9)	7.0 (-2.3 to 17.5)	66.0 (47.7 to 81.2)	60.8 (44.4 to 74.4)	-7.8 (-15.5 to 0.9)
Other digestive diseases	3464.3 (2944.0 to 4039.4)	3506.9 (2924.0 to 4110.0)	1.2 (-3.9 to 7.0)	59.8 (51.0 to 69.8)	52.4 (43.8 to 61.3)	-12.5 (-16.6 to -7.7)*
Neurological disorders	72 438.0 (56 404.6 to 91 027.3)	84 048.0 (65 694.2 to 105 692.5)	16.1 (13.4 to 18.4)*	1267.8 (1007.2 to 1568.2)	1264.4 (1000.7 to 1571.9)	-0.2 (-2.5 to 1.7)
Alzheimer's disease and other dementias	17 737.9 (16 089.2 to 19 551.9)	22 238.9 (19 993.3 to 24 542.5)	25.3 (21.2 to 29.7)*	404.3 (366.7 to 445.2)	394.6 (354.9 to 435.5)	-2.4 (-5.6 to 1.1)
Parkinson's disease	1489.6 (1240.4 to 1727.5)	1829.0 (1502.7 to 2135.0)	22.9 (18.0 to 26.8)*	31.5 (26.2 to 36.4)	31.2 (25.7 to 36.3)	-0.8 (-4.8 to 2.6)
Epilepsy	13 039.4 (10 714.7 to 15 492.8)	13 372.1 (10 920.9 to 15 979.4)	2.4 (-4.5 to 10.0)	196.8 (161.5 to 233.9)	185.2 (151.2 to 221.3)	-6.0 (-12.3 to 0.9)
Multiple sclerosis	1150.9 (906.8 to 1361.7)	1342.8 (1068.4 to 1625.8)	16.6 (9.3 to 25.1)*	19.3 (15.2 to 22.9)	19.2 (15.3 to 23.1)	-0.8 (-7.2 to 6.4)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Migraine	25 780.9 (15 613.2 to 37 987.5)	28 898.1 (17 585.8 to 42 420.1)	12.1 (8.8 to 15.3)*	395.8 (240.2 to 582.7)	398.4 (242.4 to 584.9)	0.6 (−2.2 to 3.5)
Tension-type headache	2031.8 (985.5 to 3558.8)	2363.2 (1151.9 to 4155.0)	16.3 (13.7 to 19.0)*	31.6 (15.3 to 55.2)	32.9 (16.0 to 57.8)	4.2 (1.9 to 6.6)*
Medication overuse headache	7577.4 (4426.0 to 11 589.5)	9845.7 (5777.9 to 15 100.3)	30.0 (22.7 to 37.1)*	121.8 (71.3 to 186.3)	138.5 (81.3 to 212.1)	13.7 (7.3 to 19.8)*
Other neurological disorders	3630.1 (3079.2 to 4245.0)	4158.2 (3465.2 to 4719.9)	15.0 (7.2 to 20.4)*	66.7 (56.2 to 78.3)	64.4 (53.8 to 73.5)	−3.0 (−9.2 to 1.5)
Mental and substance use disorders	157 899.7 (117 039.4 to 202 585.3)	173 177.4 (127 426.5 to 221 734.1)	9.7 (7.8 to 11.0)*	2443.3 (1812.5 to 3131.3)	2399.8 (1765.2 to 3064.4)	−1.8 (−3.4 to −0.7)*
Schizophrenia	13 972.2 (10 445.2 to 16 601.6)	15 687.2 (11 647.4 to 18 704.1)	12.3 (10.8 to 13.6)*	221.6 (165.7 to 263.0)	217.2 (161.4 to 258.7)	−1.9 (−3.2 to −0.8)*
Alcohol use disorders	13 856.3 (10 676.5 to 17 518.8)	12 772.1 (9872.5 to 16 401.5)	−8.0 (−11.5 to −3.5)*	217.5 (168.0 to 274.0)	175.7 (136.1 to 224.8)	−19.3 (−22.7 to −15.0)*
Drug use disorders	16 573.6 (12 990.6 to 20 087.4)	17 953.0 (14 163.9 to 21 969.4)	8.3 (4.5 to 11.8)	247.3 (194.2 to 299.1)	242.2 (191.3 to 296.2)	−2.1 (−5.5 to 1.0)
Opioid use disorders	8577.2 (6762.8 to 10 512.9)	8136.2 (6171.1 to 10 485.5)	−5.4 (−11.2 to 0.9)	130.1 (102.8 to 159.0)	110.3 (83.7 to 142.2)	−15.4 (−20.6 to −9.6)*
Cocaine use disorders	1056.2 (739.6 to 1439.9)	1200.4 (851.2 to 1619.0)	13.8 (9.3 to 18.5)*	15.6 (11.0 to 21.3)	16.1 (11.5 to 21.7)	3.3 (−0.8 to 7.5)
Amphetamine use disorders	1937.0 (1244.8 to 2768.9)	2117.2 (1388.2 to 2987.5)	9.3 (4.9 to 14.3)*	27.9 (18.0 to 39.9)	28.2 (18.5 to 39.8)	1.1 (−2.9 to 5.5)
Cannabis use disorders	383.5 (254.8 to 557.0)	395.6 (261.2 to 576.2)	3.2 (0.1 to 6.4)*	5.5 (3.6 to 7.9)	5.3 (3.5 to 7.7)	−3.0 (−5.8 to −0.1)*
Other drug use disorders	4619.7 (3665.7 to 5670.2)	6103.5 (5006.4 to 7312.4)	32.3 (23.5 to 41.6)*	68.1 (54.2 to 83.3)	82.2 (67.5 to 98.3)	20.8 (12.9 to 29.1)*
Depressive disorders	54 086.1 (36 401.9 to 75 052.8)	61 632.8 (41 353.8 to 85 621.4)	14.0 (10.4 to 17.1)	856.4 (580.2 to 1186.5)	864.4 (580.0 to 1202.1)	1.1 (−2.5 to 3.6)
Major depressive disorder	45 539.4 (29 829.4 to 64 133.2)	51 783.9 (33 888.2 to 665.8)	13.8 (9.4 to 17.5)*	717.2 (471.7 to 1011.6)	724.9 (475.7 to 1030.7)	1.3 (−2.8 to 4.4)
Dysthymia	8546.7 (5687.3 to 12 278.3)	9848.9 (6586.6 to 14 166.0)	15.2 (14.0 to 16.3)*	139.3 (93.5 to 200.2)	139.5 (93.7 to 200.9)	0.2 (−0.6 to 0.9)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Bipolar disorder	8715.9 (5487.1 to 13 043.4)	9911.1 (6260.6 to 14 791.0)	13.7 (12.1 to 15.8)*	135.4 (85.0 to 201.5)	136.6 (86.3 to 202.5)	0.8 (−0.4 to 2.5)
Anxiety disorders	21 949.1 (14 287.0 to 31 597.3)	24 355.8 (16 148.6 to 35 139.0)	11.0 (8.5 to 13.6)*	337.7 (221.6 to 481.8)	337.7 (224.4 to 486.3)	0.0 (−2.0 to 1.9)
Eating disorders	1742.9 (1135.8 to 2601.1)	1853.7 (1189.9 to 2753.8)	6.3 (4.2 to 8.5)*	24.6 (16.0 to 36.8)	24.6 (15.9 to 36.6)	0.0 (−2.0 to 1.8)
Anorexia nervosa	448.5 (302.6 to 644.7)	474.0 (318.2 to 682.3)	5.7 (1.9 to 9.4)*	6.3 (4.3 to 9.1)	6.3 (4.3 to 9.1)	−0.2 (−3.8 to 3.2)
Bulimia nervosa	1294.4 (797.2 to 1995.9)	1379.7 (850.7 to 2136.6)	6.5 (4.1 to 9.1)*	18.3 (11.3 to 28.1)	18.3 (11.3 to 28.3)	0.0 (−2.1 to 2.4)
Autistic spectrum disorders	7721.8 (5369.6 to 10 463.8)	8449.0 (5888.1 to 11 458.7)	9.4 (8.6 to 10.3)*	116.6 (81.1 to 158.0)	117.1 (81.6 to 158.7)	0.4 (−0.4 to 1.1)
Autism	4884.2 (3285.3 to 6671.6)	5345.0 (3583.6 to 7309.9)	9.4 (8.3 to 10.6)*	73.8 (49.6 to 100.6)	74.1 (49.7 to 101.3)	0.4 (−0.6 to 1.4)
Asperger's syndrome	2837.6 (1981.9 to 3949.6)	3104.0 (2169.6 to 4325.0)	9.4 (8.5 to 10.3)*	42.9 (30.0 to 59.6)	43.0 (30.1 to 59.9)	0.3 (−0.5 to 1.1)
Attention-deficit hyperactivity disorder	478.9 (287.4 to 740.8)	479.9 (287.4 to 745.8)	0.2 (−1.5 to 1.9)	6.6 (4.0 to 10.2)	6.6 (3.9 to 10.2)	0.0 (−1.7 to 1.7)
Conduct disorder	6192.7 (3889.5 to 8986.2)	6159.0 (3868.2 to 8911.6)	−0.5 (−1.7 to 0.6)	84.0 (52.7 to 122.0)	85.3 (53.6 to 123.4)	1.5 (0.3 to 2.6)*
Idiopathic intellectual disability	4575.2 (3011.1 to 6496.0)	4666.7 (3084.8 to 6640.0)	2.1 (−4.1 to 8.6)	68.0 (44.7 to 96.6)	64.3 (42.5 to 91.5)	−5.3 (−10.9 to 0.7)
Other mental and substance use disorders	8035.0 (5442.0 to 10 785.3)	9257.2 (6277.9 to 12 411.5)	15.2 (14.2 to 16.2)*	127.6 (86.5 to 170.7)	128.1 (86.9 to 171.6)	0.3 (−0.4 to 1.1)
Diabetes, urogenital, blood, and endocrine diseases	120 976.5 (101 712.4 to 143 463.1)	141 620.9 (118 713.4 to 168 158.3)	17.0 (13.1 to 21.5)*	2069.2 (1759.6 to 2429.2)	2089.4 (1759.1 to 2468.6)	0.8 (−2.1 to 5.2)
Diabetes mellitus	46 039.4 (38 599.7 to 54 434.2)	55 832.6 (46 374.6 to 66 808.6)	21.2 (17.6 to 25.3)*	837.8 (706.6 to 981.8)	846.2 (704.8 to 1007.4)	0.9 (−2.1 to 4.4)
Acute glomerulonephritis	805.7 (535.0 to 1067.9)	715.4 (519.0 to 923.1)	−11.2 (−22.1 to 4.4)	12.6 (8.5 to 16.6)	10.2 (7.4 to 13.1)	−19.4 (−28.8 to −6.2)*
Chronic kidney disease	28 349.4 (24 290.4 to 31 773.7)	33 187.2 (28 461.0 to 37 316.0)	17.1 (12.5 to 22.0)*	497.7 (425.7 to 555.5)	497.3 (427.5 to 557.2)	−0.1 (−4.0 to 4.1)
Chronic kidney disease due to diabetes mellitus	4493.8 (3673.0 to 5204.8)	5939.3 (5014.8 to 6940.1)	31.8 (25.4 to 43.0)*	82.9 (67.7 to 95.9)	90.9 (77.1 to 105.9)	9.4 (4.4 to 18.6)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Chronic kidney disease due to hypertension	6482.8 (5143.8 to 7544.1)	7986.4 (6335.9 to 9233.9)	23.1 (17.4 to 29.7)*	116.3 (92.2 to 134.8)	121.1 (95.7 to 139.8)	4.1 (-0.9 to 9.6)
Chronic kidney disease due to glomerulonephritis	6585.6 (5631.4 to 7535.5)	6126.2 (5138.3 to 7170.7)	-7.2 (-12.0 to -1.1)*	108.1 (92.5 to 123.7)	88.2 (74.0 to 103.2)	-18.6 (-22.9 to -13.2)*
Chronic kidney disease due to other causes	10 787.2 (8898.8 to 12 207.3)	13 135.4 (10 821.2 to 14 992.9)	21.7 (14.7 to 28.9)*	190.4 (156.3 to 215.6)	197.2 (162.6 to 225.1)	3.5 (-2.4 to 9.7)
Urinary diseases and male infertility	8848.5 (7381.2 to 10 580.7)	10 292.4 (8404.5 to 12 529.3)	16.1 (12.2 to 21.0)*	163.6 (135.1 to 197.1)	160.4 (130.6 to 196.4)	-2.2 (-5.2 to 1.6)
Interstitial nephritis and urinary tract infections	3481.9 (2922.5 to 3776.0)	3808.0 (3143.5 to 4201.1)	9.0 (3.4 to 16.7)*	61.4 (51.6 to 66.3)	57.6 (47.6 to 63.3)	-6.5 (-11.3 to -0.2)*
Urolithiasis	923.5 (699.2 to 1196.0)	1006.8 (748.8 to 1326.3)	9.0 (2.9 to 14.6)*	16.5 (12.6 to 21.4)	15.2 (11.3 to 20.0)	-7.9 (-12.8 to -3.4)*
Benign prostatic hyperplasia	2759.5 (1817.4 to 3851.3)	3552.9 (2316.5 to 4993.7)	28.7 (25.2 to 32.1)*	56.9 (37.5 to 79.4)	59.1 (38.6 to 83.1)	3.8 (1.0 to 6.6)*
Male infertility due to other causes	221.8 (95.4 to 456.2)	258.6 (111.8 to 531.4)	16.4 (7.7 to 26.6)*	3.2 (1.4 to 6.7)	3.4 (1.5 to 7.1)	5.6 (-2.1 to 14.7)
Other urinary diseases	1461.7 (1070.5 to 1708.8)	1666.0 (1158.6 to 1976.5)	13.9 (5.7 to 23.1)*	25.5 (18.6 to 29.9)	25.0 (17.4 to 29.7)	-2.1 (-8.8 to 5.4)
Gynaecological diseases	8262.5 (5405.8 to 12 229.0)	9237.3 (6081.1 to 13 702.3)	11.7 (8.8 to 15.2)*	124.5 (81.5 to 184.8)	124.5 (81.9 to 184.7)	-0.1 (-2.6 to 3.0)
Uterine fibroids	2012.5 (1178.8 to 3388.1)	2187.3 (1265.4 to 3702.5)	8.4 (5.7 to 13.8)*	31.0 (18.2 to 52.1)	29.6 (17.2 to 50.2)	-4.5 (-6.9 to 0.2)
Polycystic ovarian syndrome	1085.3 (512.3 to 2026.3)	1196.1 (567.0 to 2231.8)	10.2 (6.4 to 14.0)*	16.1 (7.6 to 30.0)	16.0 (7.6 to 29.9)	-0.5 (-3.8 to 2.8)
Female infertility due to other causes	169.4 (68.0 to 357.4)	191.9 (75.2 to 399.1)	13.2 (2.6 to 25.3)*	2.5 (1.0 to 5.2)	2.6 (1.0 to 5.3)	4.0 (-5.6 to 14.9)
Endometriosis	1227.9 (824.6 to 1673.5)	1371.5 (917.7 to 1873.2)	11.8 (7.4 to 16.6)*	18.4 (12.3 to 25.0)	18.4 (12.3 to 25.1)	0.0 (-3.9 to 4.4)
Genital prolapse	960.4 (483.2 to 1792.7)	1111.1 (550.4 to 2058.2)	15.5 (12.4 to 19.2)*	15.5 (7.8 to 28.9)	15.5 (7.7 to 28.7)	-0.6 (-3.2 to 2.5)
Premenstrual syndrome	2136.2 (1333.1 to 3184.3)	2548.6 (1581.3 to 3777.0)	19.0 (9.9 to 30.9)*	31.1 (19.4 to 46.3)	33.9 (21.0 to 50.2)	8.7 (0.4 to 19.6)*
Other gynaecological diseases	670.9 (472.0 to 922.5)	630.8 (443.0 to 873.1)	-5.7 (-13.1 to -0.5)*	9.9 (7.0 to 13.6)	8.5 (6.0 to 11.7)	-14.3 (-21.0 to -9.5)*
Haemoglobinopathies and haemolytic anaemias	20 495.6 (12 009.2 to 32 293.0)	23 368.9 (12 797.5 to 39 245.7)	11.9 (0.7 to 33.0)*	302.4 (178.3 to 473.5)	322.0 (177.3 to 538.3)	4.4 (-5.9 to 24.2)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Thalassaemias	2096.3 (1466.2 to 2677.9)	1814.1 (1257.4 to 2332.0)	-15.4 (-23.1 to 4.8)	30.1 (21.0 to 38.5)	24.7 (17.1 to 31.7)	-19.9 (-27.1 to -0.6)*
Thalassaemia trait	3401.3 (2267.4 to 4899.0)	3769.6 (2508.9 to 5442.2)	10.8 (8.1 to 13.8)*	51.0 (34.1 to 73.6)	52.4 (34.9 to 75.7)	2.7 (0.1 to 5.5)*
Sickle cell disorders	11 142.6 (3743.2 to 22 090.0)	13 650.5 (4382.8 to 29 097.8)	20.8 (0.1 to 52.5)*	161.9 (54.6 to 320.2)	186.5 (59.8 to 397.2)	13.4 (-6.1 to 43.9)
Sickle cell trait	1251.0 (829.2 to 1811.0)	1396.6 (929.4 to 2004.9)	11.5 (6.2 to 19.0)*	18.4 (12.2 to 26.7)	19.3 (12.9 to 27.8)	4.8 (-0.1 to 11.8)
Glucose-6-phosphate dehydrogenase deficiency	269.1 (176.5 to 341.5)	269.1 (174.8 to 371.8)	-0.7 (-11.3 to 22.7)	4.0 (2.6 to 5.1)	3.7 (2.4 to 5.1)	-8.2 (-17.9 to 12.8)
Glucose-6-phosphate dehydrogenase deficiency trait	44.6 (27.7 to 66.0)	48.8 (30.1 to 73.3)	9.2 (-12.1 to 34.0)	0.7 (0.4 to 1.0)	0.7 (0.4 to 1.0)	2.4 (-17.6 to 25.1)
Other haemoglobinopathies and haemolytic anaemias	2294.8 (1707.8 to 2962.2)	2420.1 (1814.8 to 3146.8)	5.1 (-1.0 to 13.6)	36.4 (27.2 to 46.8)	34.7 (26.2 to 45.1)	-4.9 (-10.2 to 2.2)
Endocrine, metabolic, blood, and immune disorders	8175.5 (7030.5 to 9563.7)	8987.0 (7724.2 to 10 348.0)	10.1 (1.9 to 17.8)*	130.6 (111.8 to 152.6)	128.9 (110.9 to 148.3)	-1.1 (-8.2 to 5.4)
Musculoskeletal disorders	126 874.2 (91 296.7 to 167 000.8)	149 435.7 (106 888.5 to 197 565.1)	17.7 (16.2 to 19.8)*	2162.3 (1559.6 to 2834.5)	2178.0 (1561.5 to 2875.0)	0.6 (-0.5 to 2.4)
Rheumatoid arthritis	4299.0 (3304.9 to 5461.2)	4741.2 (3597.6 to 5988.1)	10.2 (7.5 to 13.5)*	78.0 (60.2 to 98.8)	72.5 (55.1 to 91.3)	-7.2 (-9.5 to -4.4)*
Osteoarthritis	10 401.5 (7337.3 to 14 133.8)	12 811.1 (9030.0 to 17 281.2)	23.2 (21.6 to 24.7)*	201.3 (142.1 to 272.9)	201.7 (142.3 to 271.8)	0.2 (-1.1 to 1.5)
Low back and neck pain	91 729.2 (64 002.3 to 123 315.7)	106 665.5 (74 116.9 to 142 959.7)	16.2 (14.0 to 19.2)*	1525.7 (1066.3 to 2048.4)	1532.8 (1065.6 to 2052.0)	0.4 (-1.4 to 2.9)
Low back pain	61 611.0 (42 074.7 to 84 850.7)	72 317.6 (49 051.0 to 99 738.5)	17.2 (14.9 to 21.1)*	1032.4 (705.9 to 1418.2)	1045.3 (710.2 to 1440.6)	1.0 (-0.8 to 4.4)
Neck pain	30 118.2 (20 855.1 to 41 090.2)	34 347.9 (23 792.0 to 47 418.5)	14.1 (10.1 to 18.3)*	493.3 (342.4 to 672.2)	487.5 (337.8 to 672.2)	-1.1 (-4.5 to 2.5)
Gout	154.3 (106.8 to 205.2)	185.5 (129.0 to 249.2)	20.1 (16.5 to 24.5)*	2.9 (2.0 to 3.8)	2.8 (2.0 to 3.8)	-0.8 (-3.7 to 2.8)
Other musculoskeletal disorders	20 290.1 (14 431.4 to 27 422.7)	25 032.4 (17 671.6 to 34 085.8)	23.3 (21.2 to 25.5)*	354.4 (251.9 to 481.1)	368.3 (260.1 to 502.1)	3.9 (2.4 to 5.6)*
Other non-communicable diseases	157 897.8 (120 772.1 to 197 000.8)	170 947.9 (130 922.9 to 210 972.9)	8.7 (3.1 to 11.6)*	2549.4 (1934.9 to 3320.6)	2465.7 (1884.2 to 3234.3)	-3.0 (-7.3 to 0.6)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
	204 769.6	223 484.3				
Congenital anomalies	56 944.6 (49 141.0 to 69 460.2)	57 173.2 (50 550.4 to 66 265.6)	1.6 (−10.4 to 9.0)	827.1 (714.5 to 1007.5)	779.9 (689.9 to 903.0)	−4.6 (−15.8 to 2.4)
Neural tube defects	7161.8 (4444.2 to 12 759.5)	6236.6 (3854.9 to 10 918.2)	−12.7 (−28.6 to 4.8)	102.6 (63.7 to 183.0)	84.4 (52.2 to 147.9)	−17.4 (−32.5 to −0.9)*
Congenital heart anomalies	26 144.1 (22 321.2 to 32 868.8)	26 219.2 (23 222.4 to 30 340.6)	1.7 (−12.6 to 11.8)	377.4 (322.2 to 473.6)	356.6 (316.0 to 412.7)	−4.1 (−17.6 to 5.4)
Orofacial clefts	416.1 (257.1 to 602.1)	352.3 (229.2 to 515.7)	−15.6 (−31.8 to 8.8)	6.0 (3.7 to 8.6)	4.8 (3.1 to 7.0)	−20.3 (−35.5 to 2.6)
Down's syndrome	3578.6 (2139.0 to 5189.6)	3851.4 (2556.6 to 5223.2)	8.7 (−8.6 to 27.8)	53.5 (32.8 to 76.8)	53.2 (35.5 to 71.8)	0.5 (−14.9 to 17.5)
Turner's syndrome	3.8 (1.9 to 6.1)	4.3 (2.2 to 6.9)	13.3 (5.1 to 23.2)*	0.1 (0.0 to 0.1)	0.1 (0.0 to 0.1)	4.4 (−3.3 to 13.4)
Klinefelter's syndrome	1.2 (0.6 to 2.2)	1.3 (0.6 to 2.4)	13.0 (5.2 to 21.5)*	0.0 (0.0 to 0.0)	0.0 (0.0 to 0.0)	2.1 (−4.9 to 9.6)
Chromosomal unbalanced rearrangements	2629.6 (1930.4 to 3774.0)	2985.4 (2313.0 to 3917.7)	16.2 (−2.6 to 25.0)	40.2 (29.9 to 56.8)	41.7 (32.4 to 54.6)	5.8 (−9.8 to 13.3)
Other congenital anomalies	17 009.4 (13 826.2 to 25 442.3)	17 522.7 (14 425.9 to 24 552.1)	4.1 (−9.1 to 14.4)	247.4 (201.2 to 368.7)	239.1 (196.7 to 334.7)	−2.4 (−14.5 to 7.1)
Skin and subcutaneous diseases	37 827.9 (25 158.8 to 56 628.8)	41 597.6 (27 763.0 to 62 743.1)	10.0 (7.8 to 12.0)*	582.5 (390.2 to 865.7)	582.9 (390.1 to 872.3)	0.1 (−1.8 to 1.8)
Dermatitis	8431.6 (5490.7 to 12 137.7)	9278.4 (6029.0 to 13 326.7)	10.0 (9.2 to 11.0)*	128.6 (83.5 to 184.8)	128.7 (83.6 to 184.9)	0.1 (−0.4 to 0.6)
Psoriasis	4187.6 (2896.0 to 5899.7)	4726.7 (3254.7 to 6621.9)	12.9 (11.4 to 14.4)*	67.2 (46.4 to 94.6)	66.8 (46.0 to 93.6)	−0.5 (−1.6 to 0.6)
Cellulitis	1083.0 (809.2 to 1402.4)	1064.7 (814.0 to 1397.5)	−2.3 (−11.5 to 11.1)	17.7 (13.1 to 23.0)	15.5 (11.8 to 20.2)	−13.2 (−21.1 to −1.7)*
Pyoderma	943.5 (698.5 to 1195.4)	1141.6 (888.5 to 1330.2)	21.4 (4.7 to 39.8)*	15.7 (11.7 to 19.6)	16.6 (13.0 to 19.3)	6.4 (−7.2 to 21.3)
Scabies	1624.7 (927.0 to 2620.2)	1705.4 (967.2 to 2711.6)	4.8 (−3.4 to 15.1)	24.1 (13.8 to 38.9)	23.5 (13.3 to 37.3)	−2.8 (−10.2 to 6.7)
Fungal skin diseases	3447.0 (1403.8 to 7290.4)	3847.2 (1574.5 to 8139.8)	11.6 (10.5 to 12.8)*	53.4 (21.8 to 113.0)	54.0 (22.1 to 114.2)	1.0 (0.5 to 1.4)*
Viral skin diseases	3752.1 (2284.2 to 5820.4)	3955.0 (2398.4 to 6150.9)	5.4 (4.1 to 6.7)*	55.1 (33.4 to 85.5)	54.7 (33.3 to 85.0)	−0.6 (−1.5 to 0.3)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Acne vulgaris	6982.2 (3360.8 to 12 916.9)	7180.8 (3451.6 to 13 214.1)	2.5 (-3.7 to 11.1)	96.9 (46.7 to 179.1)	96.7 (46.4 to 177.8)	-0.5 (-6.5 to 7.7)
Alopecia areata	257.7 (163.9 to 382.5)	292.4 (186.8 to 435.2)	13.5 (10.3 to 16.8)*	4.2 (2.7 to 6.3)	4.2 (2.7 to 6.3)	-0.1 (-2.9 to 2.7)
Pruritus	9.2 (4.4 to 17.1)	10.8 (5.1 to 20.0)	17.4 (9.2 to 25.7)*	0.2 (0.1 to 0.3)	0.2 (0.1 to 0.3)	0.9 (-6.2 to 8.6)
Urticaria	3993.4 (2616.6 to 5702.1)	4720.7 (3036.5 to 6737.2)	19.0 (2.7 to 32.6)*	64.6 (42.5 to 92.2)	67.0 (43.2 to 95.5)	4.3 (-9.4 to 16.1)
Decubitus ulcer	546.8 (454.9 to 647.3)	660.6 (553.9 to 782.1)	20.9 (14.5 to 27.7)*	10.9 (9.1 to 12.8)	10.8 (9.1 to 12.7)	-0.8 (-5.8 to 4.6)
Other skin and subcutaneous diseases	2569.0 (1164.2 to 5187.3)	3013.3 (1374.5 to 6234.7)	17.2 (13.2 to 20.7)*	44.0 (19.4 to 93.1)	44.2 (19.8 to 93.3)	0.4 (-0.7 to 1.6)
Sense organ diseases	47 426.9 (31 917.8 to 66 335.1)	54 428.1 (36 458.4 to 76 075.4)	14.7 (13.2 to 16.2)*	868.4 (588.1 to 1206.6)	839.3 (564.9 to 1165.9)	-3.4 (-4.6 to -2.2)*
Glaucoma	701.8 (496.4 to 963.7)	807.5 (571.6 to 1102.8)	15.0 (10.0 to 20.2)*	13.3 (9.5 to 18.2)	12.7 (9.0 to 17.3)	-5.1 (-9.4 to -1.0)*
Cataract	2592.9 (1853.6 to 3530.8)	2916.7 (2055.1 to 3962.2)	12.5 (8.2 to 16.9)*	54.1 (38.6 to 73.4)	49.0 (34.7 to 66.4)	-9.4 (-12.8 to -5.9)*
Macular degeneration	516.8 (368.3 to 697.4)	725.6 (509.4 to 985.1)	40.4 (33.8 to 47.0)*	10.8 (7.7 to 14.5)	11.9 (8.4 to 16.2)	10.6 (5.1 to 16.0)*
Uncorrected refractive error	10 004.7 (6360.2 to 15 412.8)	11 257.2 (7149.8 to 17 452.3)	12.5 (10.7 to 14.3)*	176.9 (112.7 to 272.8)	169.2 (107.6 to 261.9)	-4.4 (-5.7 to -3.0)*
Age-related and other hearing loss	28 010.5 (18 942.1 to 39 007.8)	32 579.7 (22 083.7 to 45 846.1)	16.3 (13.9 to 18.8)*	521.4 (355.2 to 721.5)	507.3 (346.5 to 710.4)	-2.7 (-4.5 to -0.9)*
Other vision loss	1690.5 (1191.0 to 2309.3)	1793.5 (1260.4 to 2452.0)	6.0 (2.8 to 9.7)*	29.8 (21.1 to 40.7)	27.1 (19.1 to 36.9)	-9.4 (-11.8 to -6.5)*
Other sense organ diseases	3909.6 (2421.5 to 5767.2)	4348.0 (2704.3 to 6435.1)	11.2 (9.5 to 12.9)*	62.1 (38.5 to 91.5)	62.2 (38.7 to 91.9)	0.1 (-1.3 to 1.6)
Oral disorders	14 385.1 (8778.2 to 22 332.8)	16 449.5 (10 022.3 to 25 506.3)	14.3 (13.2 to 15.5)*	252.5 (156.1 to 388.1)	245.9 (151.1 to 378.7)	-2.7 (-3.9 to -1.5)*
Deciduous caries	173.7 (75.1 to 335.6)	181.1 (79.0 to 350.9)	4.2 (2.7 to 5.9)*	2.5 (1.1 to 4.9)	2.5 (1.1 to 4.9)	-0.2 (-1.6 to 1.4)
Permanent caries	2190.3 (1007.6 to 4232.7)	2411.0 (1102.6 to 4664.5)	10.1 (8.6 to 11.5)*	33.2 (15.3 to 64.0)	33.4 (15.3 to 64.5)	0.5 (-0.9 to 1.8)
Periodontal diseases	2748.2 (1103.3 to 5617.2)	3286.0 (1318.3 to 6750.3)	19.6 (17.2 to 22.0)*	47.2 (19.0 to 96.4)	47.7 (19.1 to 97.9)	1.0 (-1.0 to 3.0)

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
loss						
Edentulism and severe tooth	5953.6 (4032.0 to 8148.1)	6855.6 (4647.2 to 9420.4)	15.2 (13.1 to 17.2)*	117.6 (79.7 to 160.8)	110.5 (75.0 to 151.7)	-6.1 (-7.6 to -4.5)*
Other oral disorders	3319.4 (2096.9 to 4915.4)	3715.7 (2347.5 to 5558.6)	11.9 (10.2 to 13.8)*	52.0 (32.9 to 77.0)	51.9 (32.8 to 77.6)	-0.2 (-1.7 to 1.4)
Sudden infant death syndrome	1313.3 (860.2 to 2147.1)	1299.5 (828.6 to 1849.5)	0.6 (-27.3 to 25.2)	18.8 (12.3 to 30.8)	17.6 (11.2 to 25.0)	-5.1 (-31.4 to 18.1)
Injuries	267 681.2 (250 424.7 to 283 221.0)	247 582.4 (231 253.2 to 265 122.7)	-7.6 (-11.7 to -2.8)*	4166.9 (3895.0 to 4427.3)	3464.2 (3234.7 to 3720.4)	-17.0 (-20.6 to -12.3)*
Transport injuries	82 941.2 (75 570.2 to 87 805.0)	78 952.9 (72 122.8 to 85 115.6)	-4.9 (-9.8 to 0.7)	1270.5 (1154.4 to 1349.4)	1092.2 (998.8 to 1177.4)	-14.1 (-18.5 to -9.1)*
Road injuries	76 626.7 (70 107.3 to 81 166.5)	73 251.1 (66 857.1 to 78 671.0)	-4.4 (-9.5 to 1.0)	1171.6 (1069.3 to 1242.2)	1012.5 (923.7 to 1087.5)	-13.6 (-18.1 to -8.7)*
Pedestrian road injuries	26 400.1 (22 734.6 to 30 607.2)	25 580.0 (21 221.0 to 29 568.6)	-2.9 (-10.5 to 4.7)	408.7 (352.0 to 471.8)	358.0 (297.3 to 412.8)	-12.2 (-19.0 to -5.5)*
Cyclist road injuries	5010.9 (4305.2 to 5689.1)	4701.5 (4005.2 to 5424.2)	-6.4 (-12.6 to 0.7)	78.5 (67.6 to 88.9)	66.2 (56.5 to 76.3)	-15.9 (-21.4 to -9.4)*
Motorcyclist road injuries	15 234.5 (12 694.2 to 17 550.9)	14 199.2 (11 743.8 to 16 579.2)	-7.0 (-13.6 to 0.7)	227.8 (190.0 to 262.2)	192.8 (159.4 to 225.1)	-15.5 (-21.5 to -8.6)*
Motor vehicle road injuries	28 677.5 (25 364.5 to 31 686.1)	27 692.3 (24 232.9 to 30 737.9)	-3.4 (-8.0 to 1.4)	436.9 (386.5 to 482.5)	380.6 (333.3 to 422.3)	-12.9 (-16.9 to -8.7)*
Other road injuries	1303.7 (971.1 to 1666.4)	1078.1 (779.9 to 1337.0)	-17.6 (-28.2 to -2.3)*	19.7 (14.7 to 25.2)	14.9 (10.8 to 18.5)	-24.5 (-34.3 to -11.3)*
Other transport injuries	6314.5 (5315.6 to 7082.6)	5701.8 (4908.3 to 6443.6)	-10.1 (-15.9 to -0.8)*	98.8 (83.0 to 111.4)	79.7 (68.6 to 90.4)	-19.7 (-24.6 to -11.7)*
Unintentional injuries	112 792.0 (104 542.3 to 121 686.5)	105 941.3 (96 996.1 to 117 265.2)	-6.3 (-11.1 to 0.2)	1789.1 (1651.5 to 1938.7)	1509.4 (1379.5 to 1673.8)	-15.8 (-20.0 to -10.1)*
Falls	26 950.1 (22 901.1 to 31 245.3)	27 491.4 (23 388.5 to 31 888.5)	2.1 (-4.0 to 7.6)	480.3 (407.5 to 561.2)	415.4 (352.5 to 483.2)	-13.5 (-18.4 to -9.0)*
Drowning	25 529.1 (21 942.1 to 29 975.8)	21 608.0 (18 192.8 to 29 799.1)	-17.3 (-23.9 to 4.0)	376.2 (323.4 to 441.8)	297.7 (250.8 to 410.4)	-22.6 (-28.7 to -2.8)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
Fire, heat, and hot substances	13 280.4 (11 575.9 to 15 303.6)	12 314.8 (10 493.2 to 14 700.0)	-7.8 (-20.3 to 11.5)	202.5 (176.3 to 232.5)	170.8 (145.7 to 203.9)	-16.2 (-27.1 to 0.7)
Poisonings	5492.5 (4200.6 to 6146.7)	4535.6 (3221.0 to 5172.8)	-17.4 (-25.8 to -9.0)*	83.4 (64.0 to 93.1)	62.7 (44.6 to 71.5)	-24.8 (-32.6 to -17.2)*
Exposure to mechanical forces	14 798.4 (13 371.9 to 16 946.5)	14 037.9 (12 407.2 to 17 176.1)	-6.1 (-11.5 to 6.0)	226.7 (204.2 to 259.5)	194.8 (172.2 to 237.8)	-14.9 (-19.6 to -3.8)*
Unintentional firearm injuries	2843.7 (2559.5 to 3173.4)	2502.6 (2193.8 to 2959.6)	-12.2 (-23.2 to 1.8)	42.5 (38.3 to 47.3)	34.2 (30.0 to 40.2)	-19.8 (-29.5 to -7.2)*
Unintentional suffocation	2365.8 (1972.6 to 3969.2)	2586.9 (1941.6 to 5623.3)	4.2 (-13.5 to 51.0)	34.5 (28.8 to 57.8)	35.4 (26.6 to 76.8)	-2.4 (-18.9 to 41.8)
Other exposure to mechanical forces	9588.9 (8377.2 to 11 050.4)	8948.4 (7781.4 to 10 308.1)	-6.7 (-12.1 to -1.3)*	149.6 (130.2 to 173.0)	125.3 (108.6 to 144.8)	-16.3 (-20.9 to -11.6)*
Adverse effects of medical treatment	5102.7 (3964.6 to 5855.4)	5392.2 (4125.3 to 6588.9)	5.5 (-7.8 to 22.5)	81.5 (63.3 to 93.0)	76.9 (58.9 to 93.8)	-5.8 (-17.1 to 8.4)
Animal contact	4358.7 (3411.5 to 6835.1)	4281.1 (3418.6 to 6930.8)	-2.7 (-15.2 to 14.8)	66.5 (52.4 to 104.3)	59.7 (47.7 to 96.8)	-11.0 (-22.2 to 5.0)
Venomous	3081.3 (2335.1 to 5172.1)	3002.4 (2356.4 to 5144.3)	-3.4 (-17.3 to 17.0)	46.6 (35.5 to 78.5)	41.7 (32.7 to 71.6)	-11.2 (-23.9 to 7.3)
Non-venomous	1277.4 (965.0 to 1739.0)	1278.7 (1012.2 to 1926.0)	-1.5 (-12.5 to 20.5)	19.9 (15.1 to 27.0)	18.0 (14.3 to 27.1)	-10.7 (-20.4 to 8.6)
Foreign body	7331.3 (5388.3 to 10 125.9)	6988.8 (4964.4 to 9369.6)	-4.9 (-16.4 to 8.1)	112.8 (82.5 to 154.6)	98.5 (69.8 to 131.8)	-12.9 (-22.9 to -1.4)*
Pulmonary aspiration and foreign body in airway	6999.5 (5046.8 to 9797.1)	6633.1 (4586.4 to 8996.4)	-5.5 (-17.1 to 8.1)	107.4 (77.4 to 149.2)	93.4 (64.4 to 126.4)	-13.2 (-23.5 to -1.2)*
Foreign body in eyes	56.4 (33.4 to 85.5)	60.3 (35.0 to 91.7)	6.9 (3.8 to 9.6)*	0.9 (0.5 to 1.4)	0.9 (0.5 to 1.3)	-5.5 (-9.0 to -2.8)*
Foreign body in other body part	275.3 (225.5 to 344.5)	295.4 (241.7 to 384.4)	7.5 (-1.7 to 15.7)	4.5 (3.7 to 5.5)	4.2 (3.5 to 5.5)	-5.4 (-13.0 to 2.2)
Other unintentional injuries	9948.8 (9059.1 to 10 862.9)	9291.4 (8357.0 to 10 332.8)	-6.8 (-12.5 to 0.4)	159.1 (144.0 to 175.0)	132.8 (118.9 to 148.0)	-16.7 (-21.7 to -10.5)
Self-harm and interpersonal violence	60 826.5 (51 784.1 to 65 431.4)	56 574.6 (48 677.7 to 63 256.5)	-7.1 (-13.5 to 1.2)	925.1 (787.0 to 993.3)	773.4 (665.2 to 864.1)	-16.5 (-22.3 to -9.0)*
Self-harm	37 921.9 (31 030.3 to 40 888.4)	35 170.4 (29 194.0 to 39 484.9)	-7.5 (-15.9 to 3.5)	584.8 (478.8 to 629.8)	484.3 (403.8 to 542.8)	-17.4 (-24.7 to -7.7)*
Interpersonal violence	22 904.6 (17 216.9)	21 404.2 (16 041.0)	-6.8 (-12.2 to 1.0)	340.3 (255.2 to 405.6)	289.1 (216.7 to 347.3)	-15.3 (-20.2 to -8.2)*

	All ages DALYs (thousands)*			Age-standardised DALYs (per 100 000)*		
	2005	2013	Percentage change	2005	2013	Percentage change
	to 27 308.2)	to 25 695.2)				
Assault by firearm	9378.3 (6442.6 to 11 785.2)	9601.7 (6465.3 to 12 129.8)	2.0 (-5.5 to 12.4)	137.6 (94.4 to 173.8)	128.9 (86.8 to 163.0)	-6.6 (-13.4 to 2.8)
Assault by sharp object	6242.7 (4123.9 to 8202.9)	5907.0 (4065.6 to 8254.7)	-6.1 (-16.0 to 10.5)	92.9 (61.4 to 121.8)	79.7 (54.9 to 111.1)	-14.8 (-23.8 to 0.2)
Assault by other means	7283.5 (5393.8 to 9079.7)	5895.5 (4268.5 to 7509.6)	-19.7 (-25.6 to -8.9)*	109.9 (81.3 to 136.6)	80.5 (58.3 to 102.3)	-27.3 (-32.6 to -17.7)*
Forces of nature, war, and legal intervention	11 121.5 (6687.7 to 18 862.5)	6113.6 (3504.8 to 11 068.7)	-45.0 (-55.3 to -35.0)*	182.2 (108.3 to 312.3)	89.1 (50.7 to 160.0)	-51.2 (-59.7 to -42.9)*
Exposure to forces of nature	4123.6 (2740.1 to 7479.8)	1325.5 (818.9 to 2516.9)	-69.6 (-75.1 to -51.1)*	64.3 (42.4 to 116.3)	19.1 (11.8 to 36.1)	-71.9 (-76.9 to -55.7)*
Collective violence and legal intervention	6997.9 (3408.9 to 12 878.9)	4788.1 (2602.8 to 8707.0)	-31.2 (-47.5 to -5.7)*	118.0 (57.1 to 219.7)	70.1 (37.7 to 128.1)	-40.4 (-53.2 to -19.7)*

Data are DALYs (95% UI) or % change (95% UI). UI=uncertainty interval. DALY=disability-adjusted life-years.

* Percentage change is statistically significant (p<0.05).

Table 2
Decomposition of variance in 2013 global DALY rates per 100 000 people for GBD level 2 causes using hierarchical regression

	Sociodemographic status	Year	Country	Unexplained
A.1. HIV/AIDS and tuberculosis	20.65%	1.13%	73.09%	5.13%
A.2. Diarrhoea, lower respiratory, and other common infectious diseases	79.14%	0.76%	18.19%	1.91%
A.3. Neglected tropical diseases and malaria	14.04%	0.08%	84.98%	0.91%
A.4. Maternal disorders	80.34%	0.17%	17.75%	1.74%
A.5. Neonatal disorders	86.90%	0.25%	11.29%	1.56%
A.6. Nutritional deficiencies	80.48%	0.06%	17.12%	2.33%
A.7. Other communicable, maternal, neonatal, and nutritional diseases	56.61%	0.52%	40.94%	1.94%
B.1. Neoplasms	15.62%	0.28%	80.91%	3.19%
B.2. Cardiovascular diseases	3.01%	1.19%	88.69%	7.11%
B.3. Chronic respiratory diseases	6.41%	3.05%	82.74%	7.80%
B.4. Cirrhosis	1.18%	0.10%	90.78%	7.94%
B.5. Digestive diseases	17.49%	0.96%	76.95%	4.60%
B.6. Neurological disorders	45.38%	0.01%	53.01%	1.61%
B.7. Mental and substance use disorders	28.62%	0.37%	68.41%	2.60%
B.8. Diabetes, urogenital, blood, and endocrine diseases	8.77%	1.85%	83.05%	6.33%
B.9. Musculoskeletal disorders	65.71%	0.02%	33.30%	0.96%
B.10. Other non-communicable diseases	57.14%	1.05%	33.72%	8.08%
C.1. Transport injuries	21.39%	1.76%	63.26%	13.58%
C.2. Unintentional injuries	4.58%	6.27%	80.81%	8.33%
C.3. Self-harm and interpersonal violence	2.61%	0.36%	91.23%	5.80%
C.4. Forces of nature, war, and legal intervention	24.54%	1.18%	55.63%	18.65%

DALY=disability-adjusted life-years. GBD=Global Burden of Disease.

Table 3
Life expectancy at birth and HALE at birth for 1990, 2005, and 2013 for both sexes and 188 countries

	1990			2005			2013			
	Male population Life expectancy (years)	HALE (years)	Female population Life expectancy (years)	Male population Life expectancy (years)	HALE (years)	Female population Life expectancy (years)	Male population Life expectancy (years)	HALE (years)	Female population Life expectancy (years)	
Global	63.01 (62.59-63.46)	55.40 (53.10-57.42)	67.68 (67.20-68.10)	66.23 (65.90-66.57)	58.27 (55.96-60.39)	71.31 (70.95-71.64)	68.80 (68.16-69.41)	60.59 (58.15-62.89)	74.29 (73.79-74.79)	64.13 (61.25-66.84)
Developed	70.64 (70.56-70.71)	62.12 (59.70-64.26)	77.97 (77.90-78.04)	72.55 (72.51-72.59)	63.56 (61.04-65.82)	79.85 (79.82-79.89)	75.50 (75.27-75.76)	66.00 (63.26-68.39)	81.82 (81.62-82.02)	70.03 (66.71-73.04)
Developing	61.40 (60.86-61.99)	54.04 (51.75-56.06)	64.89 (64.25-65.43)	64.96 (64.54-65.41)	57.30 (55.07-59.35)	69.14 (68.67-69.57)	67.30 (66.50-68.09)	59.47 (57.11-61.77)	72.28 (71.67-72.92)	62.65 (59.89-65.27)
High income	72.63 (72.60-72.67)	63.70 (61.19-65.94)	79.35 (79.31-79.39)	76.40 (76.37-76.44)	66.56 (63.82-69.04)	82.15 (82.11-82.18)	77.83 (77.51-78.15)	67.72 (64.81-70.25)	83.22 (82.97-83.49)	70.92 (67.54-74.08)
Australasia	73.68 (73.57-73.78)	64.00 (61.31-66.46)	79.82 (79.70-79.94)	78.60 (78.48-78.70)	67.68 (64.65-70.43)	83.32 (83.23-83.43)	79.53 (79.02-80.03)	68.39 (65.28-71.11)	83.77 (83.32-84.22)	70.60 (66.94-73.89)
Australia	73.93 (73.80-74.05)	64.14 (61.40-66.61)	80.15 (80.01-80.28)	78.80 (78.67-78.93)	67.79 (64.76-70.55)	83.62 (83.52-83.74)	79.71 (79.13-80.30)	68.43 (65.30-71.22)	83.99 (83.48-84.52)	70.63 (66.92-73.92)
New Zealand	72.49 (72.26-72.69)	63.27 (60.70-65.60)	78.21 (77.98-78.43)	77.56 (77.36-77.76)	67.12 (64.14-69.78)	81.86 (81.66-82.06)	78.61 (77.82-79.36)	68.19 (65.19-70.88)	82.66 (82.02-83.32)	70.48 (66.98-73.58)
High-income Asia Pacific	74.20 (74.09-74.30)	66.37 (64.12-68.35)	80.79 (80.68-80.90)	77.97 (77.92-78.02)	69.16 (66.57-71.42)	84.87 (84.81-84.93)	79.43 (78.82-80.08)	70.45 (67.82-72.84)	85.91 (85.37-86.50)	74.82 (71.64-77.76)
Brunei	72.41 (71.88-72.90)	65.11 (62.90-67.06)	75.67 (75.09-76.25)	75.73 (74.97-76.65)	67.79 (65.37-69.99)	78.90 (78.23-79.69)	76.88 (74.71-78.99)	68.80 (66.05-71.51)	80.65 (78.76-82.42)	70.97 (67.86-73.94)
Japan	76.04 (75.98-76.10)	68.09 (65.83-70.11)	81.96 (81.86-82.05)	78.66 (78.60-78.71)	69.89 (67.31-72.12)	85.48 (85.41-85.54)	80.05 (79.26-80.84)	71.11 (68.50-73.57)	86.39 (85.74-87.12)	75.56 (72.46-78.42)
Singapore	72.60 (72.39-72.79)	65.26 (63.12-67.16)	77.61 (77.39-77.83)	77.99 (77.79-78.20)	69.25 (66.67-71.56)	82.28 (82.05-82.51)	79.71 (79.01-80.39)	70.75 (68.01-73.17)	84.03 (83.33-84.76)	73.35 (70.28-76.30)
South Korea	67.74 (67.42-68.02)	60.48 (58.30-62.38)	76.26 (76.00-76.49)	75.32 (75.19-75.45)	66.59 (64.02-68.81)	81.95 (81.80-82.11)	77.20 (76.37-78.07)	68.26 (65.57-70.64)	83.66 (82.95-84.33)	72.05 (68.74-75.07)
High-income North America	72.10 (72.02-72.18)	62.91 (60.36-65.24)	79.00 (78.94-79.06)	75.32 (75.23-75.41)	65.08 (62.23-67.67)	80.48 (80.39-80.56)	76.64 (75.90-77.42)	66.17 (63.13-68.98)	81.62 (80.89-82.28)	68.85 (65.36-72.17)
Canada	74.20 (74.10-74.31)	65.13 (62.54-67.48)	80.59 (80.48-80.69)	77.87 (77.74-77.99)	67.84 (64.98-70.45)	82.64 (82.53-82.75)	79.44 (78.85-80.01)	69.11 (66.08-71.82)	83.43 (82.85-83.95)	71.04 (67.54-74.25)
USA	71.87 (71.79-71.96)	62.66 (60.13-64.98)	78.84 (78.77-78.90)	75.04 (74.94-75.14)	64.78 (61.92-67.37)	80.25 (80.16-80.34)	76.33 (75.50-77.18)	65.84 (62.83-68.74)	81.42 (80.58-82.16)	68.61 (65.10-71.93)
Southern Latin America	69.14 (69.02-69.26)	61.39 (59.16-63.30)	76.39 (76.26-76.51)	72.67 (72.59-72.76)	64.31 (61.92-66.41)	79.54 (79.45-79.62)	73.38 (72.73-73.99)	65.03 (62.64-67.23)	80.20 (79.73-80.71)	69.81 (66.80-72.49)
Argentina	69.00 (68.84-69.16)	61.27 (59.30-63.68)	76.21 (76.02-76.39)	72.67 (72.59-72.76)	64.31 (61.92-66.41)	79.00 (78.88-79.12)	72.29 (71.60-72.96)	64.17 (61.75-66.39)	79.58 (79.03-80.21)	69.44 (66.52-72.10)
Chile	69.51 (69.36-69.67)	61.72 (59.30-63.68)	76.54 (76.39-76.69)	75.51 (75.38-75.63)	66.51 (63.90-68.78)	81.12 (80.98-81.26)	76.31 (75.33-77.32)	67.32 (64.75-69.69)	81.72 (80.79-82.63)	70.77 (67.66-73.58)
Uruguay	69.20 (68.98-69.43)	61.49 (59.32-63.40)	76.68 (76.40-76.94)	71.69 (71.33-72.03)	63.79 (61.52-65.79)	79.01 (78.66-79.32)	73.03 (71.67-74.49)	64.78 (62.07-67.23)	80.62 (79.28-81.86)	70.03 (66.78-72.90)
Western Europe	72.89 (72.86-72.92)	63.57 (60.94-65.90)	79.48 (79.44-79.52)	77.01 (76.98-77.05)	66.88 (64.04-69.39)	82.60 (82.56-82.63)	78.64 (78.43-78.84)	68.17 (65.17-70.76)	83.68 (83.50-83.87)	71.07 (67.59-74.21)
Andorra	77.26 (74.31-79.57)	66.90 (63.21-70.19)	83.69 (81.63-85.87)	71.01 (67.26-74.61)	68.73 (65.72-71.63)	86.39 (85.04-87.63)	80.88 (78.82-83.59)	69.92 (66.35-73.17)	86.62 (84.68-88.75)	73.39 (69.46-77.29)
Austria	72.18 (72.05-72.31)	63.40 (60.77-65.66)	78.81 (78.65-78.99)	76.69 (76.56-76.82)	66.97 (64.22-69.33)	82.35 (82.21-82.52)	78.30 (77.65-78.98)	68.47 (65.67-71.07)	83.10 (82.49-83.72)	71.21 (67.86-74.27)
Belgium	72.68 (72.54-72.81)	63.02 (60.31-65.48)	79.22 (79.06-79.38)	76.26 (76.13-76.37)	65.74 (62.81-68.56)	81.98 (81.84-82.12)	77.62 (76.62-78.57)	67.05 (64.00-69.94)	82.66 (81.75-83.53)	70.29 (66.89-73.64)
Cyprus	75.59 (75.07-76.05)	65.10 (61.90-67.84)	81.06 (80.65-81.43)	77.50 (77.11-77.91)	67.34 (64.45-69.97)	83.44 (83.14-83.74)	79.59 (78.51-80.61)	69.16 (66.02-71.97)	84.73 (83.83-85.56)	72.22 (68.71-75.60)
Denmark	72.31 (72.15-72.47)	63.20 (60.51-65.44)	77.81 (77.62-78.02)	75.85 (75.66-76.02)	66.07 (63.26-68.48)	80.39 (80.22-80.56)	77.82 (77.05-78.54)	67.79 (64.88-70.32)	82.02 (81.29-82.77)	70.14 (66.78-73.26)
Finland	70.94 (70.78-71.10)	61.40 (58.70-63.74)	79.00 (78.79-79.18)	75.30 (75.12-75.47)	64.68 (61.60-67.26)	82.11 (81.92-82.31)	77.37 (76.69-78.13)	66.45 (63.30-69.33)	83.79 (83.11-84.47)	70.68 (66.93-73.93)
France	73.04 (72.96-73.13)	64.00 (61.40-66.24)	81.21 (81.09-81.32)	76.84 (76.74-76.94)	67.10 (64.29-69.51)	83.88 (83.78-83.97)	78.38 (77.81-78.98)	68.43 (65.51-71.11)	84.91 (84.43-85.40)	72.32 (68.87-75.53)
Germany	71.96 (71.88-72.04)	62.32 (59.63-64.74)	78.52 (78.42-78.60)	76.59 (76.51-76.67)	66.11 (63.13-68.71)	82.07 (82.00-82.13)	78.18 (77.94-78.42)	67.27 (64.18-70.02)	83.14 (82.91-83.37)	70.31 (66.67-73.60)

	2013									
	2005			2013						
	Male population		Female population		Male population		Female population			
Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)			
Greece	74.53 (74.38-74.68)	65.34 (62.70-67.63)	79.44 (79.29-79.59)	66.82 (64.07-69.25)	81.47 (81.28-81.68)	70.22 (66.93-73.03)	77.41 (77.77-78.07)	67.90 (65.13-70.44)	82.24 (81.67-82.75)	70.75 (67.46-73.67)
Iceland	75.98 (75.51-76.51)	65.94 (63.07-68.59)	80.23 (79.63-80.81)	68.66 (65.52-71.55)	83.07 (82.52-83.65)	70.50 (66.98-73.68)	80.81 (79.45-82.21)	69.72 (66.51-72.60)	84.82 (83.61-86.05)	72.00 (68.40-75.30)
Ireland	72.13 (71.94-72.33)	63.31 (60.81-65.50)	77.64 (77.39-77.89)	66.74 (63.94-69.22)	81.26 (81.01-81.50)	69.49 (66.14-72.38)	78.20 (76.70-79.55)	68.20 (65.13-71.01)	82.67 (81.36-83.81)	70.73 (67.38-73.99)
Israel	74.72 (74.50-74.93)	65.22 (62.56-67.62)	78.08 (77.89-78.28)	67.51 (64.53-70.18)	82.03 (81.85-82.21)	70.20 (66.83-73.12)	80.25 (79.82-80.68)	69.46 (66.46-72.26)	84.02 (83.59-84.42)	71.70 (68.22-74.95)
Italy	73.60 (73.53-73.67)	64.47 (61.92-66.74)	80.23 (80.11-80.35)	68.12 (64.71-71.15)	83.76 (83.68-83.84)	70.95 (67.41-74.16)	79.45 (78.63-80.20)	69.11 (66.24-71.89)	84.60 (83.80-85.28)	71.36 (67.70-74.92)
Luxembourg	71.64 (71.19-72.08)	62.52 (59.85-64.89)	78.43 (77.94-78.93)	67.06 (63.74-70.02)	82.47 (82.03-82.88)	69.81 (66.27-73.04)	79.05 (78.15-80.13)	68.14 (65.04-71.19)	83.10 (81.79-84.36)	70.48 (66.79-73.79)
Malta	74.99 (74.46-75.60)	65.03 (62.33-67.50)	80.04 (79.54-80.55)	67.90 (64.41-70.91)	82.77 (82.30-83.19)	69.93 (66.32-73.25)	79.81 (78.49-81.02)	68.77 (65.75-71.73)	84.35 (83.19-85.46)	71.16 (67.56-74.72)
Netherlands	73.85 (73.74-73.80)	64.56 (61.93-66.91)	80.09 (79.97-80.22)	68.33 (65.06-71.32)	81.60 (81.46-81.72)	70.38 (67.03-73.42)	79.09 (78.66-79.48)	68.56 (65.57-71.25)	83.71 (83.32-84.16)	71.66 (68.36-74.79)
Norway	73.62 (73.43-73.80)	64.23 (61.62-66.54)	80.04 (79.83-80.25)	68.57 (65.38-71.53)	82.30 (82.09-82.50)	70.38 (67.03-73.42)	79.09 (78.66-79.48)	68.56 (65.57-71.25)	83.71 (83.32-84.16)	71.66 (68.36-74.79)
Portugal	70.65 (70.52-70.80)	61.78 (59.26-64.05)	77.84 (77.67-77.98)	66.87 (63.72-69.66)	81.71 (81.56-81.85)	69.72 (66.30-72.67)	76.65 (76.00-77.31)	66.74 (63.86-69.29)	82.95 (82.36-83.62)	70.75 (67.29-74.09)
Spain	73.33 (73.22-73.45)	63.89 (61.15-66.19)	80.57 (80.44-80.70)	68.88 (65.50-71.82)	83.74 (83.63-83.86)	71.49 (68.08-74.58)	78.97 (78.41-79.57)	68.40 (65.34-71.23)	84.43 (83.98-84.90)	71.83 (68.22-75.18)
Sweden	74.78 (74.63-74.91)	64.73 (61.96-67.24)	80.39 (80.21-80.55)	68.22 (64.89-71.29)	82.54 (82.37-82.70)	69.96 (66.57-73.13)	79.64 (79.01-80.28)	68.53 (65.53-71.37)	83.87 (83.26-84.54)	70.95 (67.58-74.27)
Switzerland	74.07 (73.91-74.22)	63.59 (60.69-66.15)	80.94 (80.76-81.12)	67.93 (64.53-71.15)	83.64 (83.48-83.81)	69.88 (66.12-73.31)	80.46 (79.81-81.09)	68.63 (65.34-71.51)	84.77 (84.17-85.35)	71.16 (67.44-74.56)
UK	72.87 (72.79-72.95)	63.76 (61.12-66.08)	78.44 (78.35-78.52)	67.26 (64.17-70.08)	81.21 (81.11-81.31)	69.26 (65.88-72.21)	79.09 (78.57-79.67)	68.48 (65.50-71.16)	82.84 (82.25-83.35)	70.56 (67.16-73.66)
Central Europe, Eastern Europe, and central Asia	64.77 (64.58-64.95)	57.48 (55.33-59.31)	73.62 (73.44-73.77)	64.25 (61.49-66.62)	73.51 (73.41-73.60)	64.05 (61.28-66.45)	67.73 (67.47-67.96)	60.24 (58.08-62.23)	76.92 (76.69-77.15)	66.89 (63.97-69.48)
Central Asia	62.82 (62.48-63.18)	56.08 (54.11-57.81)	70.31 (69.93-70.66)	61.67 (59.05-63.90)	71.32 (70.88-71.74)	62.56 (59.99-64.86)	65.59 (64.52-66.56)	58.68 (56.55-60.70)	73.64 (72.74-74.62)	64.59 (61.99-67.18)
Armenia	66.32 (65.52-66.98)	59.11 (56.97-61.10)	73.60 (72.91-74.40)	64.46 (61.72-66.84)	68.28 (67.56-69.09)	66.40 (63.52-68.93)	70.22 (68.97-71.45)	62.73 (60.21-64.87)	77.55 (76.24-78.50)	67.76 (64.80-70.53)
Azerbaijan	62.31 (61.45-63.17)	55.71 (53.62-57.71)	70.03 (69.25-70.76)	61.14 (58.56-63.59)	66.22 (65.36-67.15)	63.31 (60.52-65.93)	68.75 (66.87-71.05)	61.21 (58.58-63.85)	75.82 (74.11-77.11)	65.75 (62.73-68.70)
Georgia	65.82 (64.82-66.57)	58.78 (56.67-60.77)	74.23 (73.45-75.01)	65.22 (62.54-67.64)	76.98 (76.19-77.54)	67.23 (64.38-69.77)	67.69 (66.45-69.02)	60.52 (58.20-62.73)	78.16 (76.86-79.18)	68.28 (65.34-71.05)
Kazakhstan	61.99 (61.16-62.82)	55.43 (53.47-57.27)	71.29 (70.56-72.00)	62.53 (59.97-64.93)	59.28 (58.44-60.17)	62.03 (59.53-64.34)	62.60 (60.59-64.29)	56.29 (53.79-58.55)	73.07 (71.44-74.50)	64.24 (61.46-66.82)
Kyrgyzstan	61.42 (60.60-62.29)	54.90 (52.81-56.80)	69.11 (68.30-69.89)	60.73 (58.14-63.05)	62.52 (61.66-63.36)	62.17 (59.57-64.44)	64.48 (62.94-66.14)	57.92 (55.68-60.12)	72.87 (71.45-74.28)	64.10 (61.30-66.70)
Mongolia	59.39 (58.19-60.67)	53.08 (50.91-55.02)	64.37 (63.27-65.64)	57.01 (54.66-59.31)	58.36 (57.25-59.47)	59.24 (56.96-61.31)	60.54 (58.40-62.54)	54.58 (52.13-56.86)	69.38 (67.53-71.26)	61.61 (59.06-64.22)
Tajikistan	62.39 (61.39-63.34)	55.52 (53.35-57.54)	67.50 (66.57-68.38)	59.37 (56.85-61.69)	66.40 (65.49-67.51)	62.40 (59.58-64.85)	68.09 (66.48-70.16)	60.24 (57.54-62.96)	73.19 (71.34-74.70)	64.08 (61.21-66.81)
Turkmenistan	59.89 (58.84-60.89)	53.57 (51.46-55.53)	66.63 (65.60-67.59)	58.69 (56.17-61.00)	60.89 (57.91-63.95)	60.71 (57.48-63.67)	63.47 (60.49-66.53)	57.11 (54.02-60.18)	71.73 (68.65-73.93)	63.19 (59.90-66.28)
Uzbekistan	64.58 (63.81-65.34)	57.60 (55.50-59.50)	70.64 (69.96-71.43)	61.90 (59.14-64.24)	65.38 (64.24-66.43)	62.35 (59.76-64.81)	66.64 (63.73-69.56)	59.60 (56.48-62.60)	72.95 (70.38-75.91)	64.25 (61.01-67.69)
Central Europe	67.25 (67.09-67.41)	59.27 (56.95-61.29)	74.90 (74.74-75.04)	65.29 (62.56-67.72)	70.64 (70.59-70.69)	67.63 (64.59-70.24)	73.14 (72.84-73.45)	64.30 (61.76-66.57)	80.09 (79.83-80.31)	69.39 (66.32-72.11)
Albania	71.02 (70.35-71.64)	61.83 (59.17-64.26)	76.24 (75.66-76.77)	65.74 (62.76-68.51)	71.53 (70.46-72.58)	67.00 (63.88-69.82)	72.68 (69.64-75.97)	63.85 (60.53-67.08)	79.32 (76.65-81.80)	68.64 (64.96-71.89)
Bosnia and Herzegovina	69.36 (69.14-69.56)	61.24 (58.87-63.32)	76.71 (76.39-77.06)	66.88 (63.95-69.43)	72.55 (72.33-72.78)	63.09 (60.24-65.71)	74.36 (73.42-75.24)	65.23 (62.44-67.69)	80.63 (79.73-81.58)	70.05 (67.03-72.93)
Bulgaria	68.31 (68.13-68.49)	60.02 (57.61-62.15)	74.78 (74.60-74.96)	65.13 (62.34-67.56)	69.06 (68.91-69.21)	60.83 (58.37-62.96)	71.23 (70.72-71.70)	62.75 (60.29-64.94)	77.81 (77.39-78.25)	67.64 (64.72-70.37)
Croatia	68.71 (68.52-68.90)	60.96 (58.66-62.97)	76.69 (76.44-76.96)	67.03 (64.21-69.46)	72.43 (72.24-72.61)	63.91 (61.43-66.08)	74.18 (73.61-74.67)	65.52 (62.97-67.85)	81.29 (80.71-81.86)	70.62 (67.48-73.43)
Czech Republic	67.82 (67.69-67.94)	59.61 (57.25-61.68)	75.45 (75.29-75.61)	65.50 (62.63-68.02)	73.01 (72.89-73.13)	63.57 (60.79-65.96)	79.44 (79.29-79.57)	65.62 (62.75-68.06)	80.93 (80.56-81.30)	69.79 (66.58-72.65)

	2005						2013					
	Male population			Female population			Male population			Female population		
	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	HALE (years)
Saint Lucia	68.20 (66.59-69.36)	60.22 (57.37-62.62)	72.27 (70.97-73.50)	62.63 (59.42-65.56)	62.46 (59.97-64.84)	76.20 (75.14-77.26)	65.92 (62.80-68.66)	72.11 (69.47-74.71)	63.94 (60.67-67.08)	76.89 (74.31-79.65)	66.62 (63.14-70.16)	
Saint Vincent and the Grenadines	67.79 (65.18-69.50)	60.24 (57.13-62.74)	71.63 (69.57-73.42)	62.51 (59.31-65.33)	60.69 (58.28-63.06)	73.36 (72.37-74.33)	63.68 (60.80-66.27)	70.53 (67.79-72.68)	62.63 (59.64-65.50)	74.99 (72.73-77.70)	64.98 (61.51-68.17)	
Suriname	66.27 (65.15-67.16)	57.89 (54.59-60.45)	71.32 (70.30-72.27)	61.21 (58.07-64.07)	58.15 (55.67-60.42)	71.56 (70.57-72.48)	61.85 (58.98-64.56)	66.99 (63.70-70.28)	59.70 (56.42-63.15)	73.33 (70.35-76.36)	63.53 (60.05-67.29)	
The Bahamas	65.29 (63.90-66.81)	58.25 (55.83-60.45)	71.86 (70.42-73.21)	62.64 (59.68-65.42)	61.58 (59.12-63.88)	74.57 (73.76-75.48)	64.55 (61.46-67.26)	69.54 (66.41-72.85)	61.82 (58.34-65.51)	75.47 (72.78-78.90)	65.27 (61.59-69.26)	
Trinidad and Tobago	66.98 (66.19-67.62)	59.86 (57.65-61.95)	72.47 (71.67-73.04)	63.45 (60.64-65.84)	60.18 (58.04-62.22)	74.54 (73.88-75.18)	64.73 (61.81-67.36)	67.39 (65.08-69.56)	60.29 (57.41-62.96)	75.47 (73.48-77.28)	65.45 (62.18-68.64)	
Central Latin America	68.19 (67.94-68.43)	59.32 (56.86-61.62)	74.69 (74.46-74.90)	64.28 (61.23-66.91)	62.60 (60.02-64.87)	77.81 (77.60-78.03)	66.74 (63.50-69.49)	72.07 (71.47-72.57)	63.30 (60.82-65.61)	78.58 (78.08-79.01)	67.52 (64.36-70.39)	
Colombia	66.96 (66.36-67.62)	58.42 (56.00-60.68)	75.01 (74.50-75.54)	64.38 (61.34-67.27)	61.98 (59.42-64.30)	77.49 (76.94-78.09)	66.31 (63.14-69.24)	72.28 (69.99-74.50)	63.24 (60.21-66.28)	78.94 (77.10-80.67)	67.56 (64.17-70.99)	
Costa Rica	74.59 (74.26-74.86)	65.40 (62.71-67.75)	78.72 (78.44-79.01)	67.90 (64.73-70.66)	67.20 (64.50-69.60)	81.16 (80.94-81.39)	66.17 (62.76-69.13)	69.29 (66.60-71.68)	68.01 (65.07-70.58)	82.11 (81.47-82.84)	70.14 (66.72-73.30)	
El Salvador	65.26 (64.81-65.68)	50.27 (44.91-54.23)	74.35 (73.86-74.77)	63.01 (59.45-66.05)	58.11 (54.46-61.04)	77.85 (77.61-78.10)	62.22 (58.97-65.21)	69.29 (66.60-71.68)	60.38 (57.02-63.61)	78.10 (75.93-80.12)	66.84 (63.32-70.22)	
Guatemala	62.56 (62.09-63.14)	50.27 (44.91-54.23)	67.16 (66.50-67.70)	56.64 (52.73-59.76)	55.49 (52.06-58.41)	73.06 (72.67-73.38)	62.22 (58.97-65.21)	69.29 (66.60-71.68)	59.51 (56.56-62.31)	75.21 (74.20-76.29)	64.53 (61.42-67.43)	
Honduras	66.49 (65.24-67.77)	57.85 (54.79-60.34)	70.15 (68.65-71.45)	60.52 (57.48-63.32)	59.98 (56.15-63.88)	71.83 (68.06-76.28)	61.86 (57.69-66.16)	70.11 (66.66-73.88)	61.70 (57.79-65.17)	74.00 (70.36-78.37)	63.93 (60.02-68.15)	
Mexico	68.88 (68.54-69.23)	60.78 (58.34-62.95)	75.34 (74.95-75.66)	65.17 (62.17-67.85)	64.01 (61.52-66.28)	78.48 (78.26-78.70)	67.47 (64.24-70.22)	72.21 (71.91-72.53)	63.80 (61.31-65.99)	78.72 (78.41-78.99)	67.79 (64.64-70.58)	
Nicaragua	68.63 (67.90-69.41)	41.79 (31.29-50.92)	73.23 (72.50-73.94)	56.90 (49.16-63.35)	54.16 (47.43-59.86)	77.33 (76.85-77.86)	64.33 (59.85-68.32)	73.74 (72.53-74.82)	60.76 (55.84-64.58)	79.07 (78.00-80.06)	67.36 (63.99-70.50)	
Panama	72.78 (72.14-73.47)	63.84 (61.09-66.22)	77.80 (77.19-78.41)	67.06 (63.78-69.90)	64.78 (74.21-75.33)	79.86 (79.31-80.42)	68.43 (65.07-71.44)	74.99 (73.10-76.78)	65.80 (62.79-68.78)	80.89 (79.43-82.18)	69.38 (65.87-72.44)	
Venezuela	69.93 (69.76-70.12)	61.55 (59.10-63.76)	75.52 (75.33-75.71)	65.64 (62.79-68.19)	63.02 (60.55-65.19)	78.63 (78.49-78.76)	67.69 (64.47-70.53)	71.84 (70.56-73.29)	63.31 (60.73-65.93)	79.32 (78.08-80.48)	68.21 (64.97-71.11)	
Tropical Latin America	65.64 (65.31-65.99)	57.90 (55.61-59.88)	73.04 (72.69-73.40)	62.80 (59.90-65.44)	61.34 (58.84-63.54)	77.10 (76.89-77.28)	66.11 (62.98-68.94)	71.62 (70.65-72.62)	62.75 (59.96-65.32)	78.37 (77.61-79.20)	67.02 (63.70-70.07)	
Brazil	65.47 (65.13-65.83)	57.76 (55.47-59.74)	72.97 (72.60-73.32)	62.73 (59.82-65.38)	61.29 (58.78-63.49)	77.14 (76.92-77.34)	66.13 (62.99-68.97)	71.63 (70.63-72.65)	62.75 (59.94-65.33)	78.43 (77.64-79.28)	67.06 (63.72-70.13)	
Paraguay	72.58 (72.00-73.18)	63.75 (61.10-66.06)	75.78 (75.16-76.45)	65.37 (62.37-68.12)	63.12 (60.63-65.33)	75.42 (74.54-76.42)	65.35 (62.30-68.14)	71.42 (69.03-73.49)	63.07 (60.11-65.98)	76.21 (74.30-78.87)	66.02 (62.77-69.52)	
Southeast Asia, east Asia, and Oceania	65.45 (64.63-66.51)	58.32 (56.00-60.42)	69.81 (68.68-70.74)	61.24 (58.71-63.66)	62.65 (60.44-64.58)	75.50 (74.97-75.98)	66.30 (63.57-68.74)	72.04 (71.13-73.29)	64.44 (62.14-66.78)	78.26 (77.45-79.15)	68.76 (65.95-71.43)	
East Asia	66.08 (65.05-67.45)	59.22 (56.89-61.40)	70.28 (68.77-71.46)	61.94 (59.36-64.44)	64.00 (61.70-65.99)	76.84 (76.27-77.47)	67.56 (64.84-70.09)	73.50 (72.43-75.23)	65.85 (63.48-68.42)	79.90 (78.87-81.02)	70.19 (67.34-73.00)	
China	66.01 (64.94-67.45)	59.16 (56.83-61.37)	70.21 (68.67-71.46)	61.88 (59.29-64.40)	64.01 (61.72-66.00)	76.88 (76.29-77.54)	67.59 (64.86-70.10)	73.53 (72.44-75.35)	65.89 (63.53-68.46)	79.99 (78.92-81.17)	70.28 (67.41-73.11)	
North Korea	66.04 (62.08-70.34)	59.34 (55.65-63.20)	69.39 (65.43-73.16)	61.34 (57.45-65.26)	67.48 (65.52-69.52)	72.30 (70.71-73.80)	64.02 (61.32-66.58)	68.30 (66.07-71.15)	61.56 (59.00-64.52)	73.83 (72.00-76.53)	65.46 (62.51-68.39)	
Taiwan (province of China)	71.31 (71.18-71.45)	63.71 (61.38-65.62)	76.74 (76.61-76.87)	67.27 (64.42-69.83)	66.68 (64.37-68.71)	80.72 (80.61-80.85)	70.41 (67.46-73.07)	76.42 (76.10-76.75)	68.11 (65.59-70.23)	82.36 (82.05-82.66)	71.66 (68.51-74.46)	
Oceania	56.67 (52.29-60.98)	51.09 (47.14-54.96)	59.22 (54.36-63.81)	52.77 (48.43-56.95)	57.93 (53.18-62.40)	60.36 (55.18-64.99)	53.93 (49.17-58.17)	59.83 (54.91-64.24)	54.09 (49.75-58.22)	62.70 (57.29-67.32)	55.93 (51.14-60.21)	
Federated States of Micronesia	59.95 (54.43-65.55)	54.47 (49.56-59.37)	64.81 (59.21-70.08)	57.91 (52.81-62.55)	57.09 (54.51-59.57)	68.05 (62.19-73.11)	60.73 (55.53-65.48)	64.41 (58.75-69.51)	58.47 (53.21-62.96)	69.49 (63.79-74.55)	61.93 (56.72-66.52)	
Fiji	61.58 (58.49-65.13)	55.47 (52.25-58.70)	67.05 (64.20-70.16)	59.54 (56.25-62.68)	63.38 (61.16-65.72)	67.36 (65.40-69.61)	59.76 (57.11-62.53)	64.02 (60.96-67.18)	57.84 (54.54-60.92)	68.28 (64.85-71.18)	60.63 (57.11-63.76)	
Kiribati	55.06 (52.12-58.25)	49.46 (46.51-52.44)	60.17 (57.20-63.33)	53.28 (50.08-56.34)	56.82 (52.98-60.99)	64.64 (60.50-68.87)	57.10 (53.32-60.83)	58.08 (53.42-63.29)	52.31 (48.37-56.65)	66.48 (62.29-71.41)	58.63 (54.41-62.91)	
Marshall Islands	61.52 (59.56-63.93)	55.56 (53.08-58.04)	67.57 (65.38-69.58)	59.82 (56.90-62.49)	61.59 (58.45-64.88)	65.52 (62.43-68.60)	58.32 (55.01-61.61)	62.24 (57.49-67.14)	56.44 (51.92-60.58)	67.35 (63.30-71.76)	59.91 (55.99-64.10)	
Papua New Guinea	54.87 (49.90-60.47)	49.46 (45.01-54.18)	56.69 (51.38-62.11)	50.56 (45.86-55.17)	50.89 (46.02-55.52)	58.32 (52.63-63.67)	52.20 (46.96-56.84)	58.59 (53.01-63.81)	52.99 (48.13-57.64)	61.08 (55.08-66.49)	54.58 (49.39-59.25)	
Samoa	65.49 (61.83-69.06)	59.20 (55.75-62.75)	71.68 (68.46-74.72)	63.83 (60.19-67.33)	62.13 (59.61-64.74)	72.89 (70.54-75.05)	64.82 (62.06-67.67)	70.77 (68.26-73.15)	63.67 (60.70-66.62)	72.82 (70.20-75.13)	64.75 (61.61-67.68)	
Solomon Islands	59.08 (53.34-64.73)	53.79 (48.57-58.71)	61.79 (55.62-67.96)	55.47 (49.95-60.64)	55.33 (50.15-60.01)	63.35 (57.36-68.88)	56.84 (51.39-61.58)	62.19 (56.61-67.44)	56.65 (51.37-61.22)	65.35 (59.63-70.85)	58.46 (53.13-63.23)	
Tonga	67.00 (63.85-70.56)	60.25 (57.05-63.56)	70.38 (67.05-73.09)	62.51 (59.13-65.83)	60.27 (57.92-62.51)	72.40 (70.69-74.04)	64.04 (61.06-66.75)	67.37 (65.82-71.10)	60.89 (57.41-64.39)	73.23 (69.93-76.78)	64.83 (61.30-68.18)	

	2013					
	2005			2013		
	Male population	Female population	HALE (years)	Life expectancy (years)	Male population	Female population
Life expectancy (years)	Life expectancy (years)	HALE (years)	Life expectancy (years)	Life expectancy (years)	HALE (years)	
Vanuatu	60.79 (55.27-66.22)	64.71 (58.84-70.27)	55.08 (50.25-59.88)	64.71 (58.84-70.27)	62.49 (57.16-67.84)	56.76 (51.62-61.35)
Southeast Asia	63.89 (63.01-64.63)	68.78 (67.77-69.63)	55.91 (53.30-58.25)	68.78 (67.77-69.63)	68.83 (67.78-69.85)	61.37 (59.18-63.53)
Cambodia	56.87 (55.77-57.92)	61.16 (59.88-62.44)	39.74 (30.29-46.94)	61.16 (59.88-62.44)	64.82 (62.86-66.47)	54.62 (49.86-58.25)
Indonesia	63.18 (62.52-63.85)	66.84 (66.03-67.60)	56.20 (54.04-58.16)	66.84 (66.03-67.60)	68.34 (67.17-69.90)	61.33 (59.04-63.65)
Laos	54.51 (49.52-59.71)	47.82 (43.37-52.22)	47.82 (43.37-52.22)	57.15 (52.12-62.32)	63.82 (58.29-68.96)	56.48 (51.52-60.92)
Malaysia	69.88 (69.76-70.00)	62.40 (60.17-64.35)	62.40 (60.17-64.35)	74.53 (74.35-74.72)	71.75 (70.67-72.89)	64.09 (61.69-66.23)
Maldives	66.02 (65.16-66.81)	58.22 (55.73-60.37)	49.78 (45.00-54.12)	65.42 (64.62-66.13)	77.62 (76.30-78.84)	68.55 (65.54-71.22)
Myanmar	56.43 (51.30-61.44)	49.78 (45.00-54.12)	49.78 (45.00-54.12)	59.74 (54.61-65.47)	77.62 (76.30-78.84)	68.55 (65.54-71.22)
Philippines	67.35 (66.72-67.76)	54.96 (50.53-57.93)	54.96 (50.53-57.93)	62.28 (59.07-65.06)	66.41 (63.92-68.85)	58.76 (55.97-61.56)
Sri Lanka	68.44 (67.58-69.32)	61.38 (59.18-63.43)	59.69 (57.48-61.79)	66.08 (63.27-68.58)	72.09 (70.17-73.90)	64.14 (61.39-67.00)
Thailand	58.98 (57.32-60.86)	51.40 (48.76-53.96)	51.40 (48.76-53.96)	66.07 (63.42-68.44)	71.51 (68.75-74.21)	64.30 (61.20-67.29)
Timor-Leste	65.94 (64.06-67.54)	55.60 (50.67-59.15)	55.60 (50.67-59.15)	58.75 (53.49-63.47)	70.20 (68.10-71.96)	61.65 (58.86-64.34)
Vietnam	57.60 (56.39-58.88)	50.21 (47.81-52.48)	50.21 (47.81-52.48)	58.53 (57.29-59.84)	72.26 (69.13-75.51)	63.77 (60.17-67.14)
South Asia	50.71 (46.90-54.80)	42.96 (38.35-46.87)	42.96 (38.35-46.87)	49.98 (46.73-53.18)	64.36 (62.46-66.29)	56.50 (53.78-59.17)
Afghanistan	58.12 (56.13-60.26)	49.99 (47.10-52.67)	49.99 (47.10-52.67)	58.98 (56.73-61.32)	56.45 (52.17-61.38)	49.07 (44.73-53.64)
Bangladesh	59.02 (53.93-64.25)	52.07 (47.45-56.47)	52.07 (47.45-56.47)	59.72 (54.45-64.96)	68.29 (66.02-71.23)	59.49 (56.29-62.89)
Bhutan	57.25 (55.79-58.77)	50.07 (47.64-52.43)	50.07 (47.64-52.43)	58.19 (56.64-59.77)	68.03 (61.82-73.67)	60.12 (54.88-64.93)
India	58.00 (56.21-59.84)	50.49 (47.98-52.99)	50.49 (47.98-52.99)	58.93 (56.88-61.21)	64.16 (61.97-66.70)	56.52 (53.59-59.25)
Nepal	62.20 (60.46-64.05)	54.08 (51.45-56.53)	54.08 (51.45-56.53)	62.54 (60.56-64.43)	69.10 (66.94-71.40)	60.36 (57.35-63.44)
Pakistan	64.83 (64.16-65.43)	56.86 (54.60-59.03)	56.86 (54.60-59.03)	69.12 (68.60-69.61)	64.33 (61.38-67.72)	56.46 (53.08-59.58)
North Africa and Middle East	69.03 (67.05-71.17)	60.45 (57.54-63.14)	60.45 (57.54-63.14)	71.94 (70.28-73.44)	71.96 (71.14-72.70)	63.28 (60.79-65.75)
Algeria	70.70 (69.03-72.34)	61.72 (58.98-64.41)	61.72 (58.98-64.41)	72.41 (71.18-73.62)	75.13 (73.63-76.83)	65.60 (62.53-68.31)
Bahrain	62.42 (61.41-63.48)	55.08 (52.89-57.21)	55.08 (52.89-57.21)	66.69 (65.52-67.69)	78.26 (75.71-80.67)	67.22 (63.53-70.72)
Egypt	63.48 (60.90-65.50)	55.60 (52.69-58.44)	55.60 (52.69-58.44)	69.46 (67.74-70.95)	68.31 (66.78-69.83)	60.37 (57.90-62.73)
Iran	68.59 (65.82-71.61)	59.17 (55.47-62.60)	59.17 (55.47-62.60)	69.86 (66.82-72.60)	76.12 (73.81-78.08)	66.75 (63.65-69.75)
Iraq	70.83 (67.92-73.19)	61.50 (58.17-64.63)	61.50 (58.17-64.63)	73.20 (71.64-75.02)	70.57 (66.63-74.38)	61.04 (57.09-65.07)
Jordan	76.74 (76.32-77.11)	65.32 (61.95-68.16)	65.32 (61.95-68.16)	79.09 (78.78-79.35)	76.77 (74.45-78.97)	66.07 (62.76-69.47)
Kuwait	65.28 (58.68-69.57)	52.87 (45.32-58.65)	52.87 (45.32-58.65)	70.63 (66.68-73.72)	79.39 (78.72-80.09)	68.54 (65.42-71.51)
Lebanon	71.75 (68.94-74.40)	62.27 (58.81-65.44)	62.27 (58.81-65.44)	74.36 (71.94-76.30)	73.82 (71.42-76.63)	64.42 (61.35-67.89)
Libya	66.56 (65.04-67.91)	57.92 (55.10-60.38)	57.92 (55.10-60.38)	60.45 (57.66-63.24)	72.60 (69.68-75.11)	63.19 (59.67-66.21)
Morocco	64.83 (64.16-65.43)	56.86 (54.60-59.03)	56.86 (54.60-59.03)	69.12 (68.60-69.61)	64.33 (61.63-68.80)	56.46 (53.08-59.58)
	69.03 (67.05-71.17)	60.45 (57.54-63.14)	60.45 (57.54-63.14)	71.94 (70.28-73.44)	74.18 (73.61-74.71)	63.28 (60.79-65.75)
	70.70 (69.03-72.34)	61.72 (58.98-64.41)	61.72 (58.98-64.41)	72.41 (71.18-73.62)	75.83 (73.43-77.50)	65.60 (62.53-68.31)
	62.42 (61.41-63.48)	55.08 (52.89-57.21)	55.08 (52.89-57.21)	66.69 (65.52-67.69)	76.88 (76.09-77.92)	64.88 (61.46-68.17)
	63.48 (60.90-65.50)	55.60 (52.69-58.44)	55.60 (52.69-58.44)	69.46 (67.74-70.95)	72.24 (71.58-72.92)	61.68 (58.47-64.53)
	68.59 (65.82-71.61)	59.17 (55.47-62.60)	59.17 (55.47-62.60)	69.86 (66.82-72.60)	77.28 (76.49-78.02)	65.40 (62.01-68.62)
	70.83 (67.92-73.19)	61.50 (58.17-64.63)	61.50 (58.17-64.63)	73.20 (71.64-75.02)	68.52 (66.48-71.65)	59.06 (55.74-62.81)
	76.74 (76.32-77.11)	65.32 (61.95-68.16)	65.32 (61.95-68.16)	79.09 (78.78-79.35)	73.90 (72.84-75.70)	62.77 (59.44-65.98)
	65.28 (58.68-69.57)	52.87 (45.32-58.65)	52.87 (45.32-58.65)	70.63 (66.68-73.72)	80.38 (80.16-80.63)	68.41 (64.86-71.47)
	71.75 (68.94-74.40)	62.27 (58.81-65.44)	62.27 (58.81-65.44)	74.36 (71.94-76.30)	78.53 (77.05-79.64)	66.15 (62.04-69.80)
	66.56 (65.04-67.91)	57.92 (55.10-60.38)	57.92 (55.10-60.38)	60.45 (57.66-63.24)	76.41 (74.64-78.01)	65.10 (61.55-68.27)
					74.05 (71.96-75.73)	63.82 (60.57-67.10)
					72.60 (69.68-75.11)	63.19 (59.67-66.21)
					75.95 (73.34-78.10)	65.42 (61.76-69.03)
					64.81 (63.52-65.96)	55.58 (52.05-58.30)
					52.48 (48.79-56.28)	45.71 (42.20-49.29)
					69.39 (68.05-70.55)	58.68 (55.47-61.71)
					68.10 (62.54-73.04)	58.90 (54.01-63.48)
					64.74 (63.11-66.12)	55.71 (52.80-58.54)
					68.62 (66.70-70.38)	59.38 (56.51-62.28)
					63.58 (61.63-65.80)	54.61 (51.72-57.57)
					74.18 (73.61-74.71)	63.62 (60.55-66.47)
					75.83 (73.43-77.50)	65.07 (61.62-68.18)
					76.88 (76.09-77.92)	64.88 (61.46-68.17)
					72.24 (71.58-72.92)	61.68 (58.47-64.53)
					77.28 (76.49-78.02)	65.40 (62.01-68.62)
					68.52 (66.48-71.65)	59.06 (55.74-62.81)
					73.90 (72.84-75.70)	62.77 (59.44-65.98)
					80.38 (80.16-80.63)	68.41 (64.86-71.47)
					78.53 (77.05-79.64)	66.15 (62.04-69.80)
					76.41 (74.64-78.01)	65.10 (61.55-68.27)
					74.05 (71.96-75.73)	63.82 (60.57-67.10)
					72.60 (69.68-75.11)	63.19 (59.67-66.21)
					75.95 (73.34-78.10)	65.42 (61.76-69.03)

