

## **The Lancet: Global Burden of Disease study 2015 assesses the state of the world's health**

- ***Life expectancy rises but 7 out of 10 deaths now due to non-communicable diseases***
- ***Headaches, tooth cavities, and hearing and vision loss each affect more than 1 in 10 people***
- ***Progress on reducing unsafe water and sanitation, but diet, obesity, and drug use an increasing threat***
- ***More than 275000 women died in pregnancy or childbirth in 2015, most from preventable causes***
- ***Under 5 deaths have halved since 1990, but slower progress on reducing newborn deaths***

Today, **The Lancet** publishes the most up-to-date analysis on the state of the world's health to equip governments and donors with evidence to identify national health challenges and priorities for intervention. This massive effort brings together 1870 independent experts in 127 countries and territories as part of the Global Burden of Disease, Injuries, and Risk Factors (GBD) 2015 study collaboration, published in one special issue.

New estimates reveal the key drivers of ill health, disability, and death in individual countries. Globally, people's health is improving, but progress has been far from universal, highlighting areas where improvements must be made. For the first time, GBD 2015 includes a measure of development (the Socio-Demographic Index, or SDI, which is based on income per capita, educational attainment and total fertility rate) in order to assess a country's observed performance compared to their expected performance based on their stage of development.

GBD 2015 analyses 249 causes of death, 315 diseases and injuries, and 79 risk factors in 195 countries and territories between 1990 and 2015. Four capstone papers are published alongside two on child and maternal mortality. These are summarised below, followed by key regional, national findings.

"Development drives, but does not determine health," says Dr Christopher Murray, Director of the Institute for Health Metrics and Evaluation (IHME) at the University of Washington in Seattle, the coordinating center for the GBD collaboration. "We see countries that have improved far faster than can be explained by income, education, or fertility. And we also continue to see countries – including the United States – that are far less healthy than they should be given their resources." [1]

### **Life expectancy rising but 7 out of 10 deaths now due to non-communicable diseases**

The world population has gained more than a decade of life expectancy since 1980, rising to 69.0 years in men and 74.8 years in women in 2015. An important contributor to this has been large falls in death rates for many communicable diseases particularly in the last 10 years, including HIV/AIDS, malaria, and diarrhoea. The rate of people dying from cardiovascular disease and cancers has also fallen, although at a slower pace.

The number of annual deaths has increased from roughly 48 million in 1990 to almost 56 million in 2015 (table 4). 70% (40 million) of global deaths in 2015 were due to non-communicable diseases (NCDs including ischaemic heart disease, stroke, diabetes, chronic kidney disease, Alzheimer's disease and other dementias, and drug use disorders) (table 5). In 2015, an estimated 1.2 million

deaths were due to HIV/AIDS (down 33.5% since 2005), and 730500 were due to malaria (down 37% since 2005).

**Embargoed link to PAPER 1 (journalist only):** <http://press.thelancet.com/GBD2986causes.pdf>

**Table 4 - global life expectancy and total deaths from 1980-2015**

**Table 5 - number of total deaths and death rates in 2005 and 2015 from 249 causes**

**VIDEO: embargoed video animation about the findings of paper 1**

<http://press.thelancet.com/GBDvideo.mp4>

**YOUTUBE: once the embargo lifts, the video will also appear publicly on Youtube, currently as an unlisted (private) link:** <https://youtu.be/ERvFgjBHizo>

## **Headaches, tooth cavities, and hearing and vision loss each affect more than 1 in 10 people**

In the past 25 years, the main causes of health loss (measured in years lived with disability, or YLD) have hardly changed—in 2015, low back and neck pain, sense organ disorders (including hearing loss and vision loss), depressive disorders and iron-deficiency anaemia were the leading causes of health loss (figure 2).

In 2015, eight causes of chronic disease (affecting people for 3 months or longer) each affected more than 10% of the world population: cavities in permanent teeth (2.3 billion people), tension-type headache (1.5 billion), iron-deficiency anaemia (1.47 billion), hearing loss (1.2 billion), migraine (959 million), genital herpes (846 million), common (refractive) vision problems (819 million) and ascariasis (an intestinal worm; 762 million) (table 2).

Rates for just 14 chronic conditions fell fast enough to outstrip population growth and ageing and resulted in declines in the actual number of people with that condition including chronic obstructive pulmonary disease (COPD), asthma, cervical cancer, and ischemic heart disease (table 3).

**Embargoed link to PAPER 2 (journalist only):** <http://press.thelancet.com/GBD4885years.pdf>

**Table 3 - global prevalence of 310 diseases and injuries in 2015**

**Figure 7 - data on observed vs expected performance for all countries**

## **People spending more years living with illness and disability**

Although healthy life expectancy has increased steadily in 191 of 195 countries (by 6.1 years) between 1990 and 2015, it has not risen as much as overall life expectancy (10.1 years), meaning people are living more years with illness and disability.

The burden of ill health (measured in disability-adjusted life years, or DALYs ie, the burden of years lost to premature death and disability) has shifted from communicable, maternal, neonatal, and nutritional disorders (eg, HIV/AIDS, malaria, lower respiratory infections, diarrhoeal diseases, measles, and malnutrition) to disabling NCDs (eg, drug use disorders (particularly opioids and cocaine), hearing and vision loss, and osteoarthritis)—mainly due to increases in population numbers and ageing, a trend with massive implications for health systems and the costs of treatment (table 1 and figure 1 and 2).

**Embargoed link to PAPER 3 (journalist only):** <http://press.thelancet.com/GBD4921DALY.pdf>

**Table 2 - national life expectancy and healthy life expectancy for all countries (2005 and 2015)**

**Figure 7 – observed vs expected top 10 causes of ill health for all countries**

## **Global progress on reducing unsafe water and sanitation, but diet, obesity, and drug use an increasing threat**

High blood pressure, smoking, high blood sugar, high body mass index, and childhood undernutrition were the world's leading risk factors for premature death and ill health in 2015 (figure 3). Since 1990, there have been particularly large and concerning increases in exposure to high BMI, drug use, occupational carcinogens (eg, diesel exhaust and benzene), ozone pollution, and high blood sugar, which affect the burden of conditions like diabetes, heart disease and cancers (table 3). Additionally, exposure to other risks including dietary risks (eg, diets high in salt and low in vegetables, fruit, whole grains, nuts and seeds, and seafood which together account for more than 10% of ill health worldwide), high cholesterol, alcohol, and ambient air pollution have changed very little, highlighting huge opportunities for intervention (table 3).

In contrast, marked inroads have been made in reducing exposure to some highly preventable risks such as smoking, unsafe sanitation and water, and household air pollution, although they remain major causes of poor health. Unsafe sanitation, for example, claimed 306000 fewer lives in 2015 (total deaths 808000) compared to 2005. Whilst exposure to smoking fell by over a quarter worldwide, it is still ranked among the top five risks associated with health loss in 140 countries claiming 289000 more lives in 2015 (total deaths 6.4 million) than 2005 (table 4), and is the leading risk factor for poor health in the UK and the USA.

**Embargoed link to PAPER 4 (journalist only): <http://press.thelancet.com/GBD5490risks.pdf>**

**Figure 7 - top 10 risk factors for all countries in 2015**

**Table 4 - total number of deaths and health loss from risk factors in 2005 and 2015.**

## **More than 275000 women died in pregnancy or childbirth in 2015, most from preventable causes**

Worldwide, maternal death rates have been reduced by nearly a third since 1990, falling from 282 deaths per 100000 live births in 1990 to 196 in 2015, with progress accelerating since 2000. Yet, in 2015 more than 275000 women died in pregnancy or childbirth in 2015, mostly from preventable causes.

Two thirds (122) of countries have already met the Sustainable Development Goal (SDG) target to reduce the number of women dying from pregnancy-related causes to less than 70 for every 100000 live births by 2030. However, 24 countries have seen increasing maternal death since 2000 - many of these countries have been affected by conflict (eg, Afghanistan and Palestine), but some are also high-income countries like the USA, Greece, and Luxembourg (table 1 and figure 4). Moreover, disparities between countries are widening, with the proportion of all maternal deaths rising from 68% in 1990 to 80% in 2015 in the poorest countries, where haemorrhage is the main cause of maternal death and teenage pregnancy is much more common. In contrast, in high-income countries most maternal deaths are related to complications like heart problems, blood clots, and complications of NCDs.

**Embargoed link to PAPER 5 (journalist only): <http://press.thelancet.com/GBD3271maternal.pdf>**

**Table 1 - total number and rates of maternal deaths for all countries in 1990, 2005 and 2015**

## **Under 5 deaths have halved since 1990, but slower progress on reducing newborn deaths**

Worldwide, the number of deaths in children under the age of 5 has more than halved from 12.1 million in 1990 to 5.8 million in 2015, and the gap between groups of countries with the lowest and highest rates of child mortality is shrinking. Accelerated progress since 2000 is mainly as a result of tackling infectious diseases like malaria, diarrhoea and measles (figure 3). However, the world fell short of the Millennium Development Goal (MDG) target to reduce child mortality by two thirds between 1990 and 2015, and some countries, particularly in sub-Saharan Africa, still have rates as high as 1074 per 1000 live births (figure 1), suggesting they are unlikely to achieve the 2030 SDG target to reduce under-5 mortality to less than 25 per 1000 live births.

One area that needs special attention is neonatal (in first month life) deaths which are falling more slowly than under-5 deaths and accounted for nearly half (2.6 million) of all deaths in children under 5 in 2015. Preterm birth complications and birth asphyxia and trauma are now the leading causes of deaths in children younger than 5 years worldwide, highlighting the slower progress in reducing neonatal conditions compared with communicable diseases in childhood (figure 3). Over a third of countries worldwide still face substantial challenges to reduce neonatal mortality to fewer than 12 deaths per 1000 livebirths by 2030, especially in low- and low-middle income countries with Mali (40.6), Central African Republic (40.2), and Pakistan (37.9) recording the worst rates in 2015 (table 2).

**Embargoed link to PAPER 6 (journalist only):** <http://press.thelancet.com/GBD4021child.pdf>

**Table 1 – global number and rates of stillbirths, neonatal, and child deaths**

**Table 2 - number and rates of stillbirths, neonatal, and child deaths for all countries in 1990, 2005 and 2015**

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## Key regional and country level findings

Each of these papers reveals wide differences across regions and countries in terms of their overall progress, but also wide variations between the progress observed in countries compared to what would be expected based on that country's level of development. For this, the GBD team created the Socio Demographic Index (SDI) which is based on income per capita, educational attainment and total fertility rate—key indices of a country's development status.

For instance:

### North America

- Among high SDI regions in 2015, North America had the worst healthy life expectancy at birth for both men (67.11 years) and women (69.8 years) (Paper 3, table 2, figure 4A).
- In 2015, mortality rate among children under 5 was worse than expected in USA and Canada (Paper 6, figure 7).
- In the USA, drug use disorders (particularly opioids and cocaine) and diabetes cause a disproportionate amount of ill health and early death; whilst Greenland fared badly on self-harm and alcohol (Paper 1, figure 17 and Paper 3, figure 7).

### Europe

- In 2015, premature death due to drug use disorders surpassed expected levels in Scotland, and Norway; whilst premature death from alcohol use was worse than expected in Denmark and Finland (see Paper 1, figure 17).
- Deaths in children under 5 surpassed expected levels in Scotland and Wales in 2015 (Paper 6, figure 7).
- Many Western European countries including the UK, Spain, and France performed better than expected at reducing premature deaths from stroke—potentially reflecting improved prevention and care (eg, smoking cessation, control of blood pressure, acute stroke units), and diagnosis (see Paper 1, figure 17).
- Much of Eastern Europe fared badly on self-harm, cirrhosis, and alcohol and drug use disorders. In Russia, levels of premature death and illness due to alcohol were 10 times higher than expected and drugs six times greater (Paper 3, figure 7).
- Russia has done better than expected at improving maternal survival (Paper 5, figure 6), but done badly at reducing under-5 deaths (Paper 5, figure 7).

### **Australasia**

- Australia is one of only two high-income countries (and USA) where drug use disorders were a top 10 cause of disability (Paper 2, figure 7).

### **Sub-Saharan Africa**

- Several countries in sub-Saharan Africa including Zimbabwe, South Africa, Ethiopia, and Botswana have experienced rapid and exceptional gains in life expectancy at birth—with women gaining more than 10 years over the last 10 years, nearing expected levels—thanks to improved prevention and treatment for HIV/AIDS (Paper 1, figure 16).
- Despite this progress, HIV/AIDS remains the leading cause of premature death and causes higher than expected disability in 16 of 48 countries in region (Paper 1, and Paper 2, figure 7).
- Southern sub-Saharan Africa has remained below expected healthy life expectancy levels since 1990, mainly because of the HIV/AIDS epidemic (Paper 3, figure 7).
- Several countries including Namibia and Zimbabwe have done better than expected at reducing maternal death rates (Paper 5, figure 6)
- Since 2000, 16 countries including Botswana, Liberia, Senegal, Burundi, Ethiopia, Rwanda, and Zambia have recorded more than a 5% yearly rate of decline in under-5 mortality rate—well above the MDG target of a 4.4% yearly reduction (Paper 6, table 2).

### **North Africa and Middle East**

- In 2015, war was the greatest contributor to disability in Afghanistan, Iraq, Lebanon, and Syria. For Syrian men, life expectancy fell more than 11 years comparing to the pre-war year of 2005 (Paper 1, figure 16).
- Diabetes also causes a disproportionate amount of disability, ranking in the top three leading causes of disability in over half of the countries in the region in 2015 including Egypt, Iraq, and Kuwait (Paper 2, figure 7).

- Morocco and Algeria have done extremely well at reducing maternal and child deaths since 1990 (Paper 5, figure 6).

### Latin America and Caribbean

- Over the past 25 years, healthy life expectancy at birth has exceeded expectations for men and women throughout this region (with the exception of the Caribbean in 2010 due to the Haitian earthquake) (Paper 3, figure 4A).
- Diabetes and interpersonal violence are the greatest contributors to health loss in the region, with disability due to diabetes twice as high as expected in six countries in the Caribbean including Antigua, Barbados, and Puerto Rico (Paper 2, figure 9).
- All countries in the Caribbean and Latin America (apart from Peru and Guyana) have fared badly at reducing maternal deaths over past 25 years (Paper 5, figure 6); whilst all countries in Latin America recorded under-5 death rates well below expected levels in 2015 (Paper 6, figure 7).

### South Asia

- Most countries in the region did better than expected at reducing health loss from stroke (eg, India, Pakistan) and lower respiratory infections (eg, Bangladesh, Nepal).
- India performed much worse than expected on tuberculosis; whilst Bangladesh did poorly on drowning (Paper 2, figure 7).
- All countries in the region did much worse than expected at reducing deaths in children under 5, with India recording the largest number of under-5 deaths of any country in 2015, at 1.3 million (Paper 6, figure 7).
- Bangladesh has improved maternal survival much faster than expected; whilst India and Nepal fared poorly (Paper 5, figure 6).

### East Asia

- In 2015, the burden of diabetes, ischaemic heart disease, and depression was much lower than expected in China; whilst levels of premature death and illness due to liver cirrhosis were three times higher than expected (Paper 3, figure 7).
- In China, 30 of 33 provinces and municipalities did better than expected at reducing under-5 deaths in 2015 (Paper 6, figure 7).

#### Notes to Editors:

All the studies were funded by The Bill & Melinda Gates Foundation.

[1] Quote direct from author and cannot be found in the text of the Article.

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