GLOBAL HEALTH ECONOMICS

MASTER IN PUBLIC POLICY, S2

HEALTH DETERMINANTS AND HEALTH OUTCOMES

PR LISE ROCHAIX

U. OF PARIS 1 & PARIS SCHOOL OF ECONOMICS

Outline

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2. Typologies of determinants
3. Health outcome measures
4. Health and wealth
5. Other types of interactions
6. Policy implications
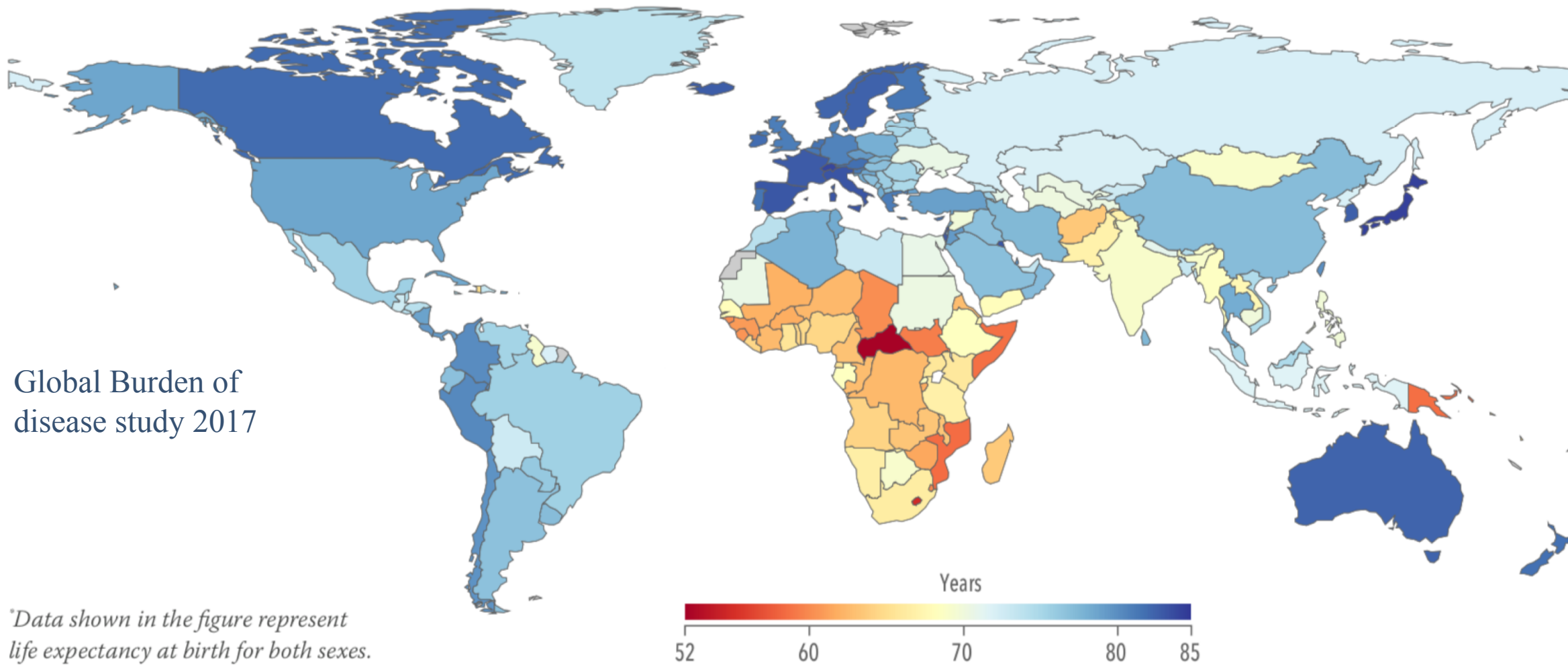
Introduction

Considerable variations in health status among individuals and countries

Health determinants are multifactorial

Their understanding is a pre-requisite for appropriate and effective policy design
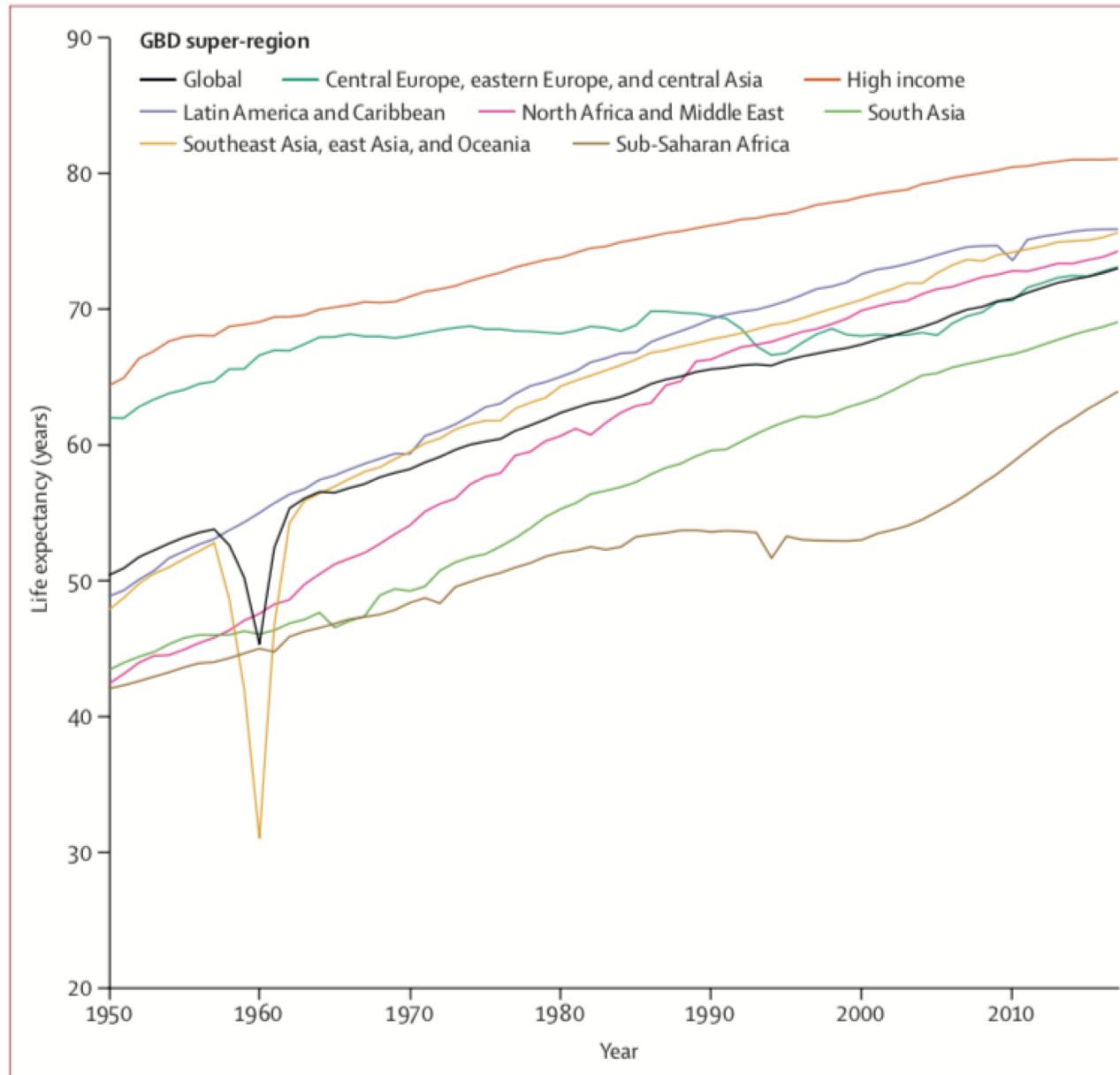
Life expectancy, 2017[*]

Global Burden of
disease study 2017

*Data shown in the figure represent
life expectancy at birth for both sexes.

Years

52   60   70   80   85

Global Burden of disease study 2017

Figure 5: Life expectancy at birth and by GBD super-region for both sexes combined, 1950–2017
GBD=Global Burden of Diseases, Injuries, and Risk Factors Study.

Introduction:

Definition: The range of personal, social, economic, and environmental factors that influence health status

Several broad categories: policymaking, social factors, health services, individual behaviour, biology and genetics

It is the interrelationships among these factors that determine individual and population health

$\Rightarrow$ Interventions that target multiple determinants of health are most likely to be effective
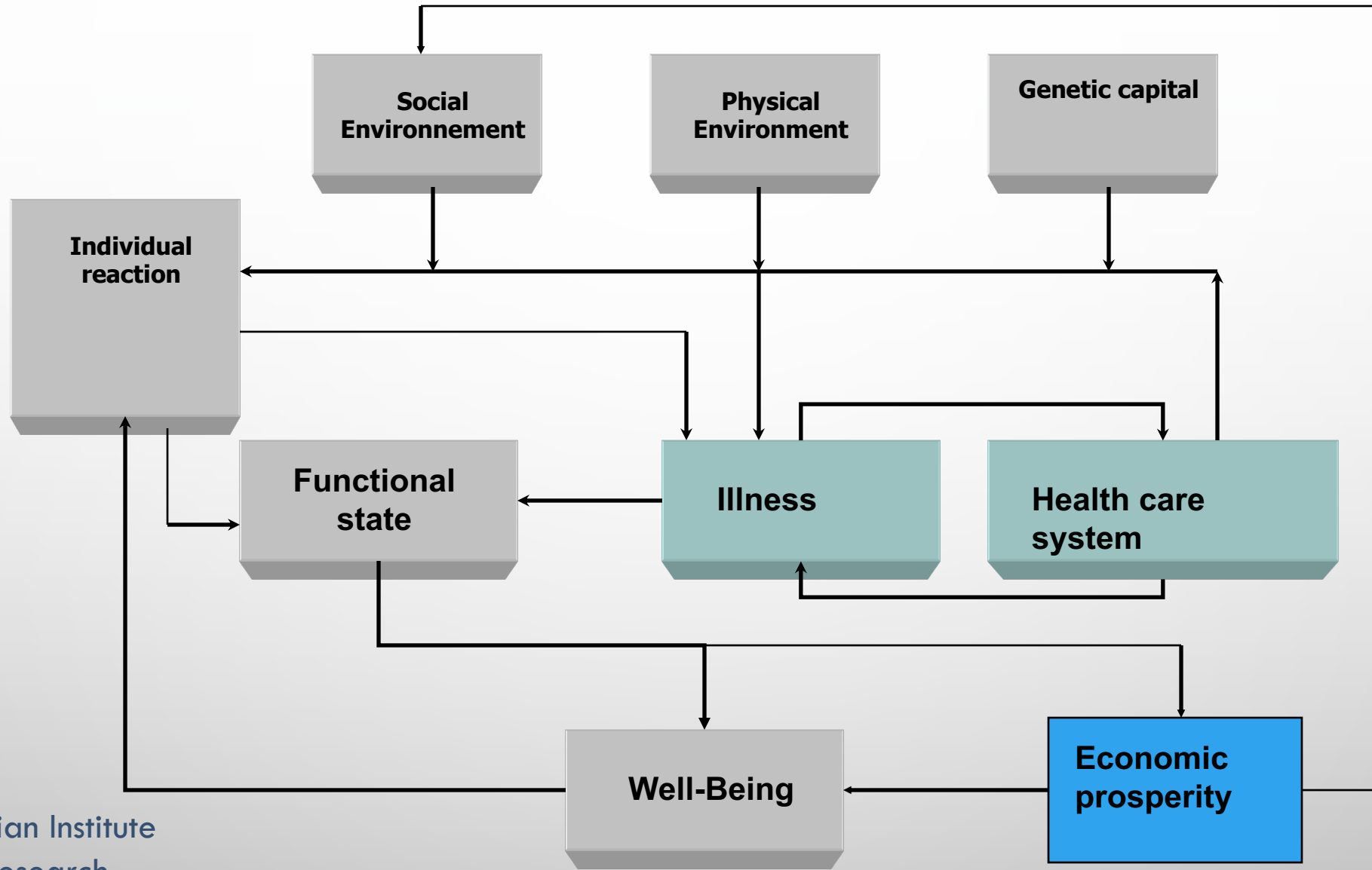
$\Rightarrow$ Determinants of health reach beyond the boundaries of traditional health care and public health sectors such as education, housing, transportation, agriculture, and environment

Source: healthy people 2020

Typologies of determinants

HEALTH DETERMINANTS

Source: Canadian Institute of Advanced Research

Physical determinants:

- Natural environment, such as plants, weather, or climate change
- Built environment, such as buildings or transportation
- Worksites, schools, and recreational settings
- Housing, homes, and neighbourhoods
- Exposure to toxic substances and other physical hazards
- Physical barriers, especially for people with disabilities
- Aesthetic elements, such as good lighting, trees, or benches

Source: healthy people 2020

Social determinants of health

- Availability of resources to meet daily needs, such as educational and job opportunities, living wages, or healthful foods
- Social norms and attitudes, such as discrimination
- Exposure to crime, violence, and social disorder, such as the presence of trash
- Social support and social interactions
- Exposure to mass media and emerging technologies, such as the Internet or cell phones
- Socioeconomic conditions, such as concentrated poverty
- Quality schools
- Transportation options
- Public safety
- Residential segregation

Source: healthy people 2020

'The social determinants of health are the circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics.'

'Health inequities are avoidable inequalities in health between groups of people within countries and between countries. These inequities arise from inequalities within and between societies.'

'Social and economic conditions and their effects on people's lives determine their risk of illness and the actions taken to prevent them becoming ill or treat illness when it occurs.'

Source: Joyce L. Browne, 2019, Utrecht, The Netherlands

1 - **Personal characteristics**: sex, age, ethnic group, and hereditary factors

2 - **Individual 'lifestyle' factors:** behaviours such as smoking, alcohol use, and physical activity

3 - **Social and community networks:** family and wider social circles

4 - **Living and working conditions:** access and opportunities in relation to jobs, housing, education and welfare services

5 - **General socioeconomic, cultural and environmental conditions:** factors such as disposable income, taxation, and availability of work
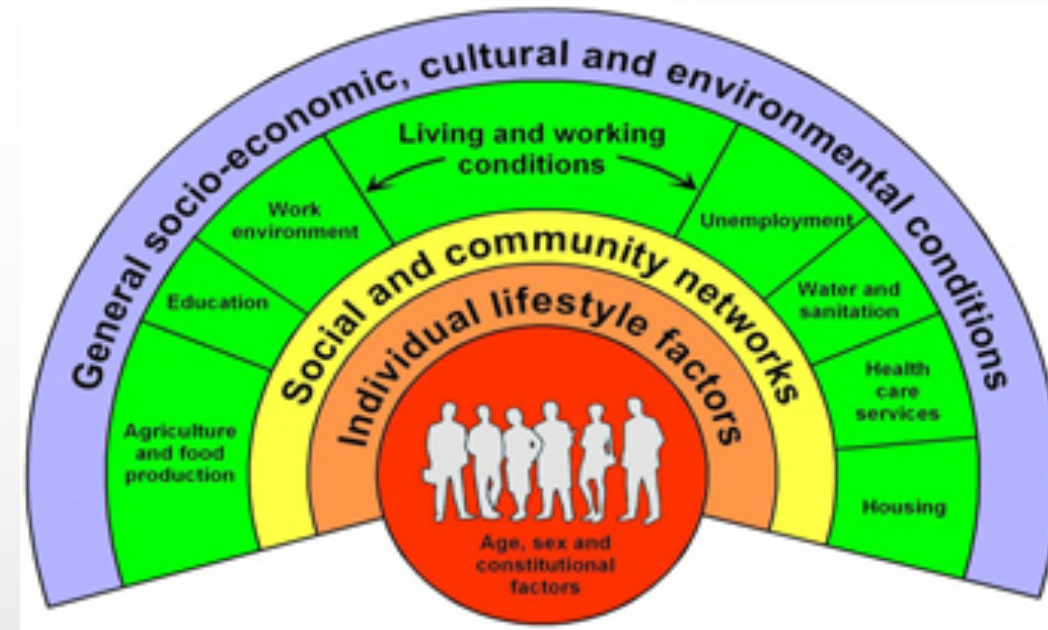
Source: Dahlgren and Whitehead (1991)

Health outcome measures

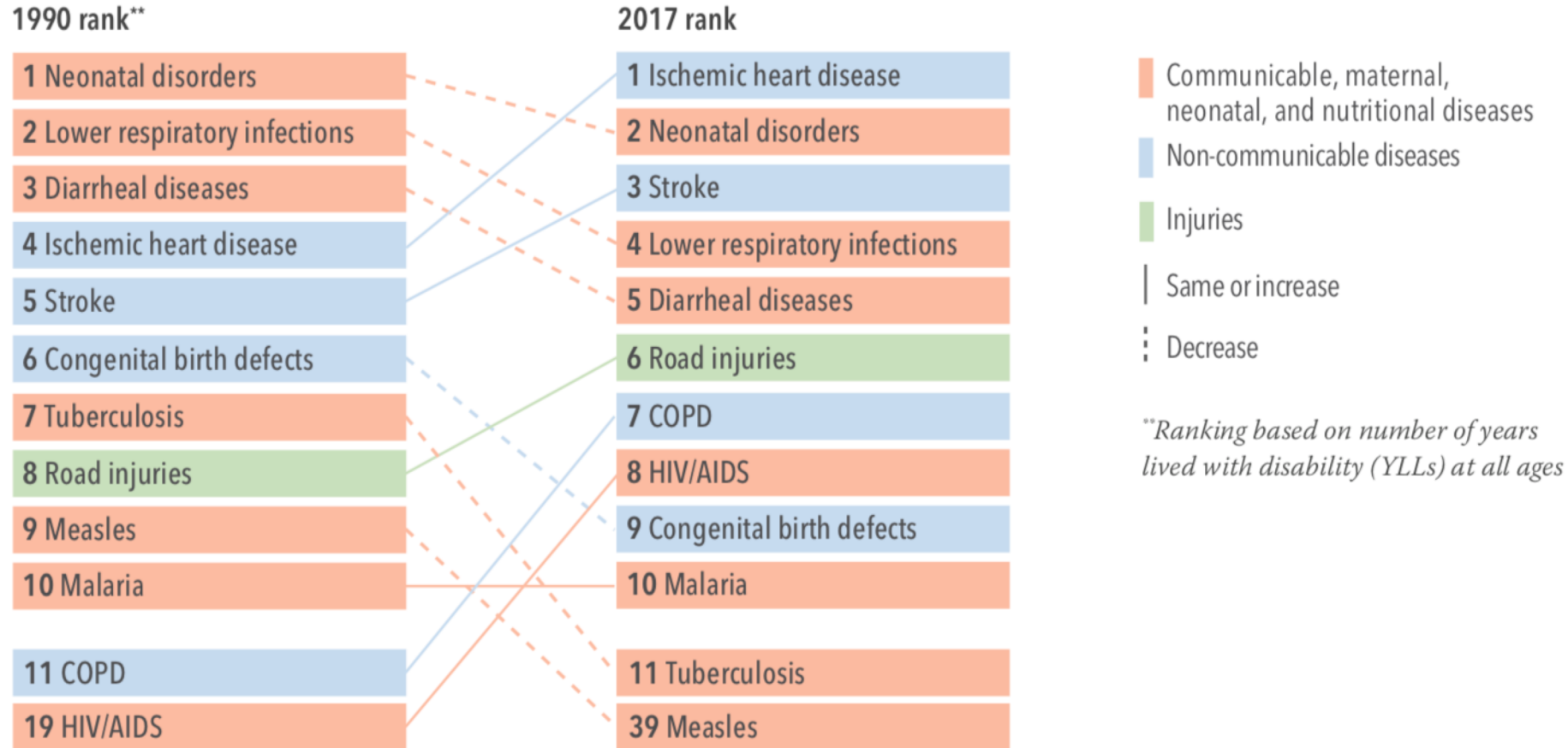**Global Burden of Disease (GBD), 1990, World Bank**

$\Rightarrow$ To quantify the health impacts of mortality and morbidity due to all diseases across the entire world

- The Disability Adjusted Life Year (DALY) metric covers:
    - Years of Life Lost (YLLs, a measure of mortality)
    - Years Lost due to Disability (YLDs, a measure of morbidity)
- YLLs measure how many years of life are not lived because of premature mortality associated with a given disease (the number of people killed by a disease multiplied by the difference between the average age of death and life expectancy)
- YLDs measure the prevalence (number of people currently suffering a disease) multiplied by a disability weight (a measure of disease severity)

For more on GBD see http://www.thelancet.com/gbd

Leading causes of early death, 1990 and 2017

Ischemic heart disease, neonatal disorders, stroke, lower respiratory infections, diarrhea, road injuries, and chronic obstructive pulmonary disease (COPD) accounted for more than 1 million deaths each worldwide in 2017.

1990 rank

1 Neonatal disorders
2 Lower respiratory infections
3 Diarrheal diseases
4 Ischemic heart disease
5 Stroke
6 Congenital birth defects
7 Tuberculosis
8 Road injuries
9 Measles
10 Malaria

11 COPD
19 HIV/AIDS

2017 rank

1 Ischemic heart disease
2 Neonatal disorders
3 Stroke
4 Lower respiratory infections
5 Diarrheal diseases
6 Road injuries
7 COPD
8 HIV/AIDS
9 Congenital birth defects
10 Malaria

11 Tuberculosis
39 Measles

Communicable, maternal, neonatal, and nutritional diseases

Non-communicable diseases

Injuries

Same or increase

Decrease

**Ranking based on number of years lived with disability (YLLs) at all ages*

Source: Global Burden of disease study 2017

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Under-5 mortality by level of socioeconomic development, 1990–2017

Declines in under-5 mortality were fastest among countries at the lowest level of Socio-demographic Index (SDI)**

Legend:
- Low SDI
- Low–middle SDI
- Global
- Middle SDI
- High–middle SDI
- High SDI
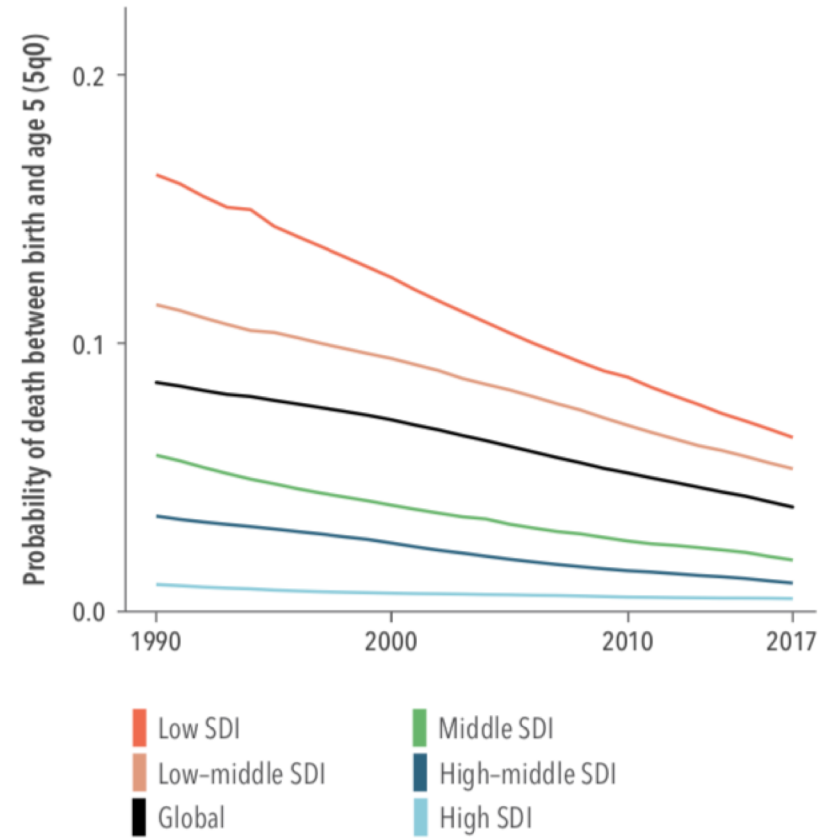
**SDI captures three different aspects of development: income, education, and fertility.

Source: Global Burden of disease study 2017

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Global mortality† from cardiovascular diseases, 2007–2017

Medications that prevent deaths from cardiovascular diseases, such as those that lower blood pressure and cholesterol, are among the most cost-effective interventions available to health systems. Despite this, mortality from cardiovascular diseases has increased since 2007 worldwide.
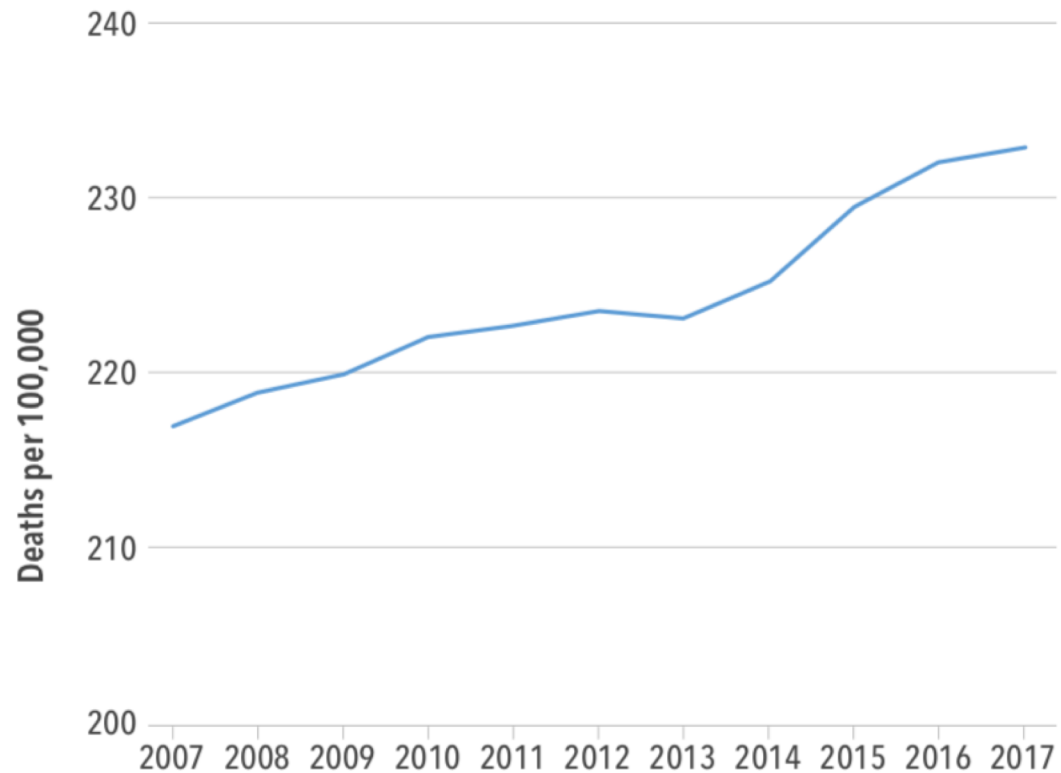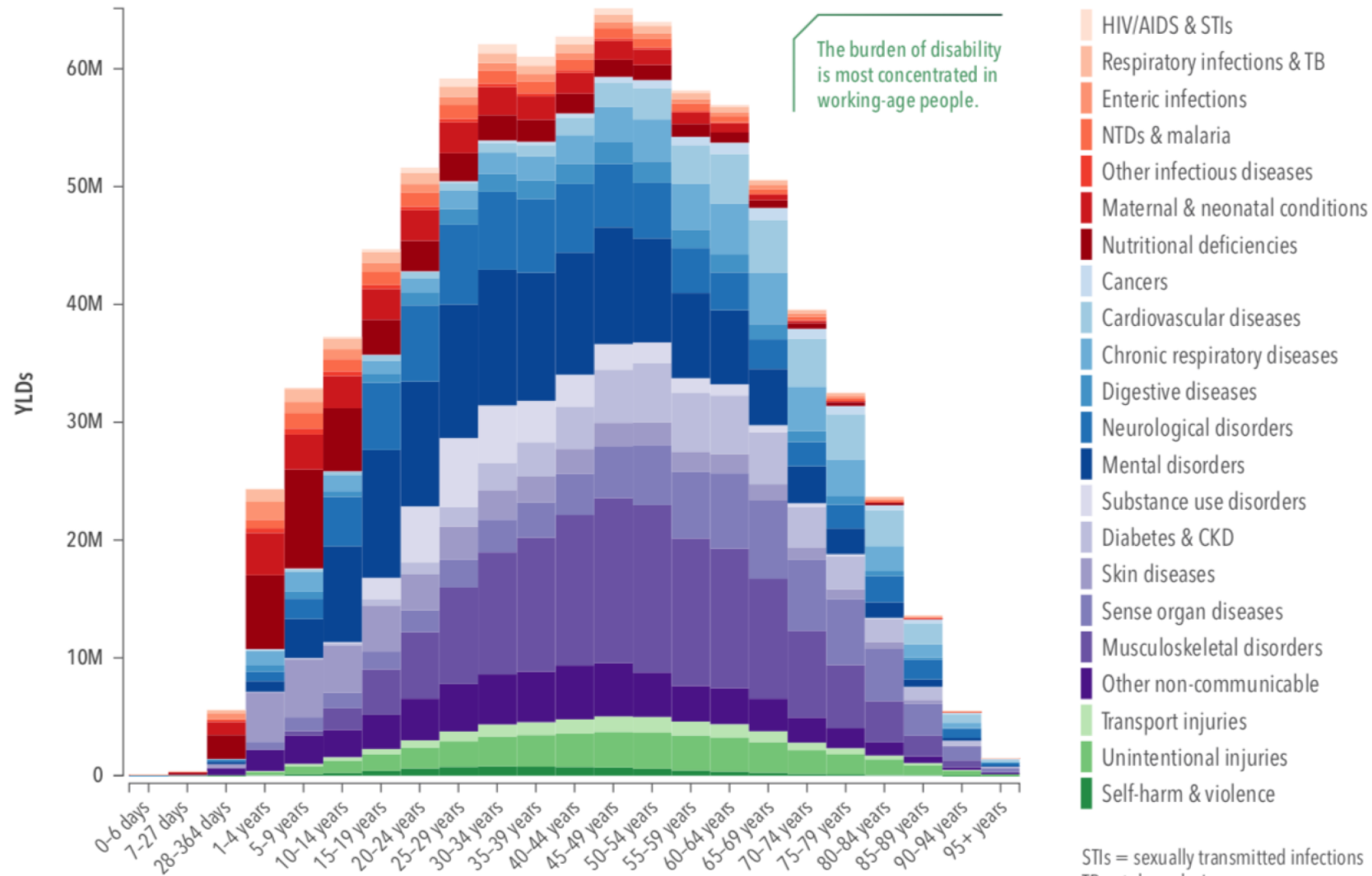

†Death rate at all ages and for both sexes

Source: Global Burden of Disease study 2017

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Years lived with disability (YLDs*), 2017

Number of total YLDs, global, both sexes, by age group and cause, 2017

The burden of disability is most concentrated in working-age people.

Legend:
- HIV/AIDS & STIs
- Respiratory infections & TB
- Enteric infections
- NTDs & malaria
- Other infectious diseases
- Maternal & neonatal conditions
- Nutritional deficiencies
- Cancers
- Cardiovascular diseases
- Chronic respiratory diseases
- Digestive diseases
- Neurological disorders
- Mental disorders
- Substance use disorders
- Diabetes & CKD
- Skin diseases
- Sense organ diseases
- Musculoskeletal disorders
- Other non-communicable
- Transport injuries
- Unintentional injuries
- Self-harm & violence

STIs = sexually transmitted infections
TB = tuberculosis
NTDs = neglected tropical diseases
CKD = chronic kidney disease

YLDs represent time lived in less-than-ideal health. Nutritional deficiencies primarily include iron deficiency anemia; mental disorders are mainly composed of anxiety and depression; musculoskeletal disorders consist largely of back pain and neck pain; and sense organ diseases mostly include hearing loss and vision loss.
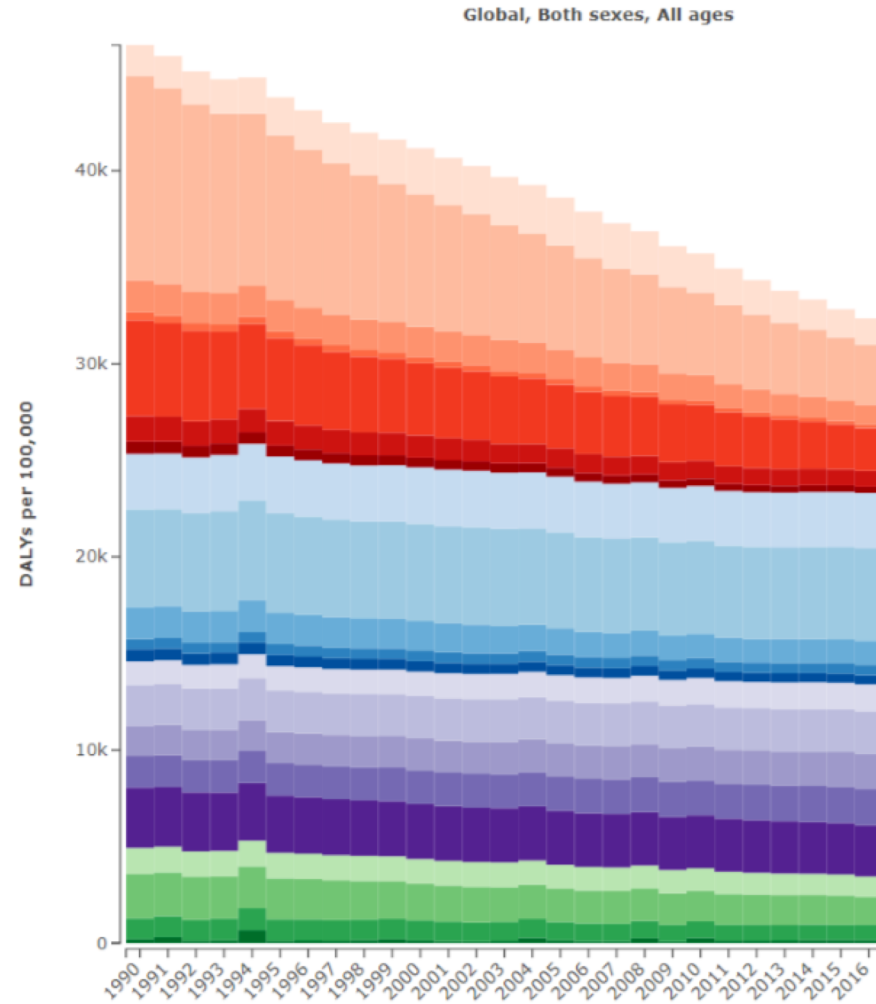
Source: Global Burden of disease study 2017

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Figure 3: Evolution of number and rate of DALYs, YLLs and YLDs from 1990-2016
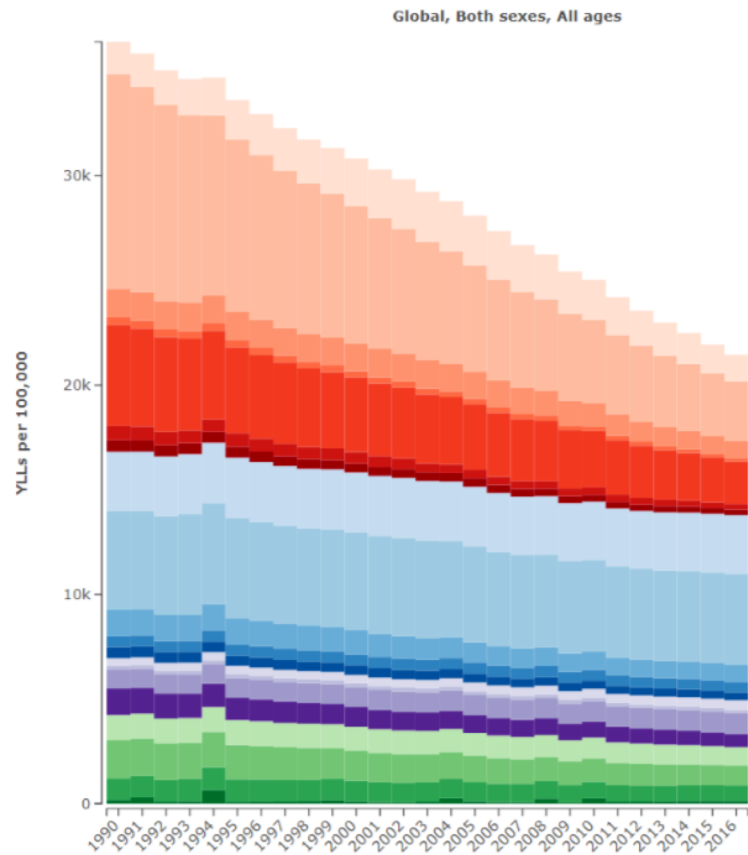

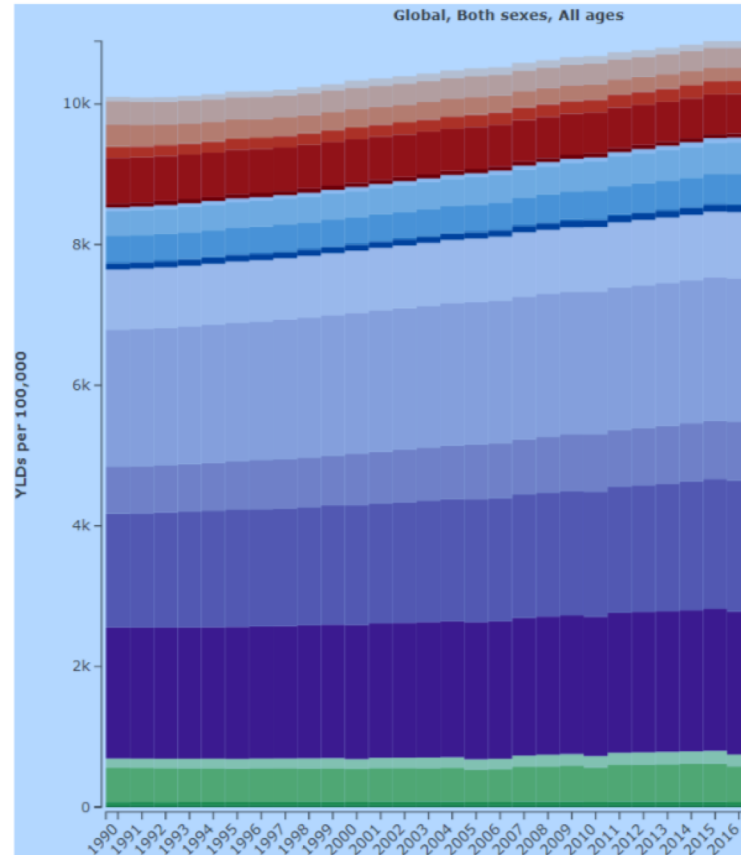(a) Evolution of number of DALYs
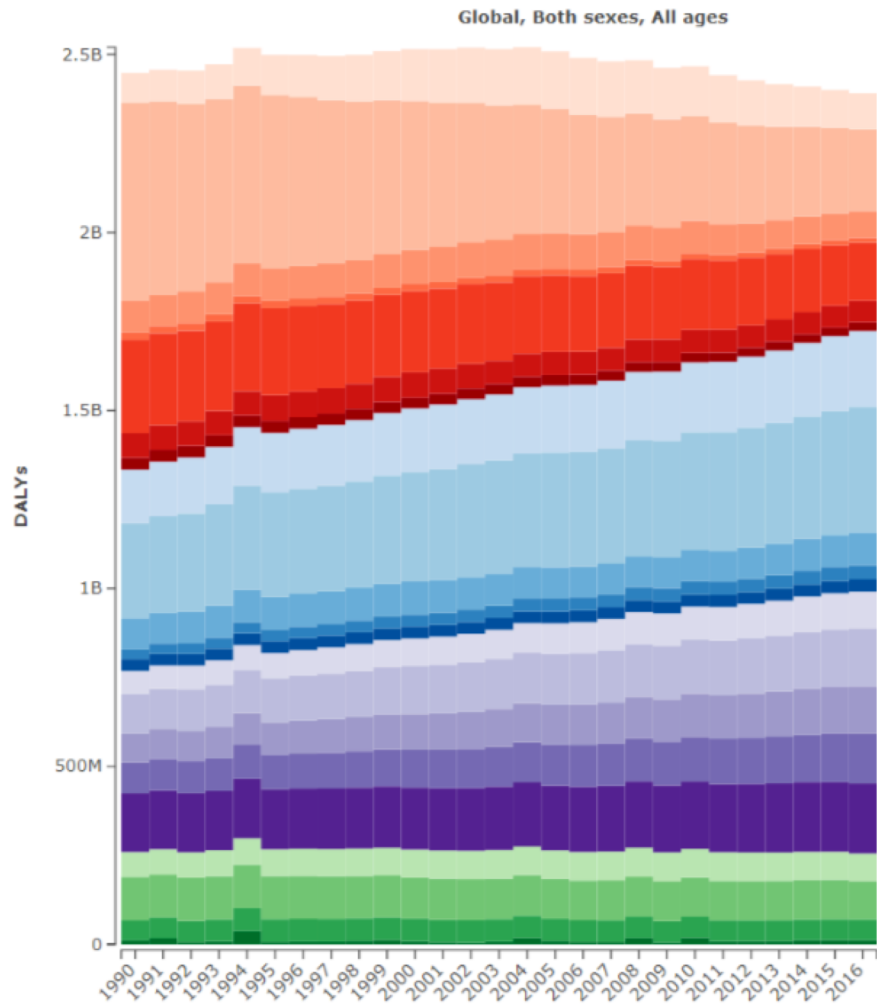
(b) Evolution of rate of DALYs

Source: Global Burden of disease study 2017

(c) Evolution of rate of YLLs

(d) Evolution of rate of YLDs

Source: Global Burden of disease study 2017

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'Global, regional, and national age-sex-specific mortality and life expectancy, 1950–2017: a systematic analysis for the Global Burden of Disease Study 2017', 2018, *GBD 2017 Mortality Collaborators*

- Global successes, such as the large decline in under-5 mortality, which reflects significant local, national, and global commitment and investment over several decades
- Age-sex-specific mortality shows that there are remarkably complex patterns in population mortality across countries
- Adult men mortality rates and, to a lesser extent, women, are in some cases increasing …

Anne Case & Angus Deaton

'Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century', 2015

'Midlife increases in suicides and drug poisonings have been previously noted. However, that these upward trends were persistent and large enough to **drive up all-cause midlife mortality** has, to our knowledge, been overlooked. If the white mortality rate for ages 45−54 had held at their 1998 value, 96,000 deaths would have been avoided from 1999–2013, 7,000 in 2013 alone. If it had continued to decline at its previous (1979–1998) rate, half a million deaths would have been avoided in the period 1999–2013, comparable to lives lost in the US AIDS epidemic through mid-2015. Concurrent declines in self-reported health, mental health, and ability to work, increased reports of pain, and deteriorating measures of liver function all point to **increasing midlife distress**.'

Anne Case & Angus Deaton 'Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century' , PNAS, December 8, 2015, 15078–15083, vol. 112, no. 49. www.pnas.org/cgi/doi/10.1073/pnas.1518393112
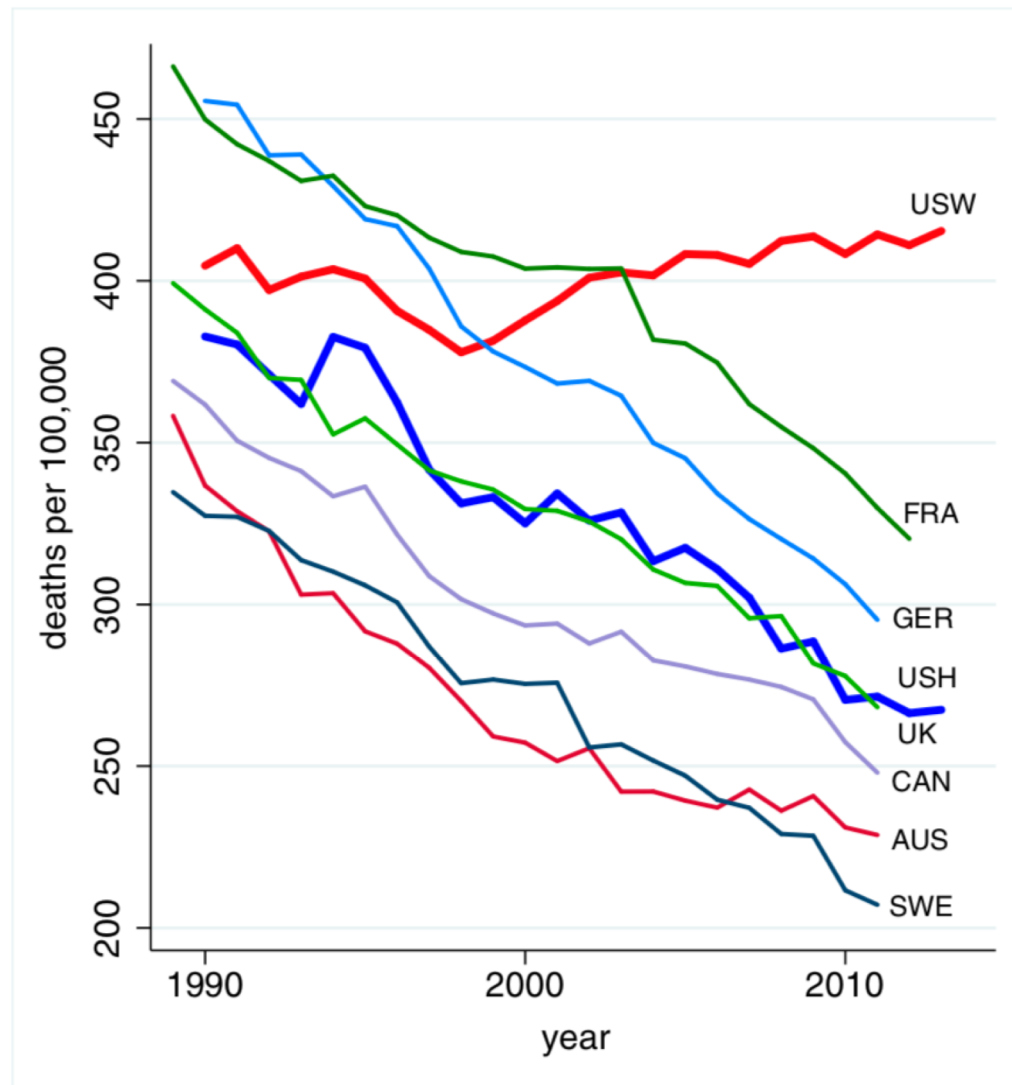
Fig. 1. All-cause mortality, ages 45–54 for US White non-Hispanics (USW), US Hispanics (USH), and six comparison countries: France (FRA), Germany (GER), the United Kingdom (UK), Canada (CAN), Australia (AUS), and Sweden (SWE).

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Anne Case & Angus Deaton 'Rising morbidity and mortality in midlife among white non-Hispanic Americans in the 21st century' , PNAS, December 8, 2015, 15078–15083, vol. 112, no. 49. www.pnas.org/cgi/doi/10.1073/pnas.1518393112
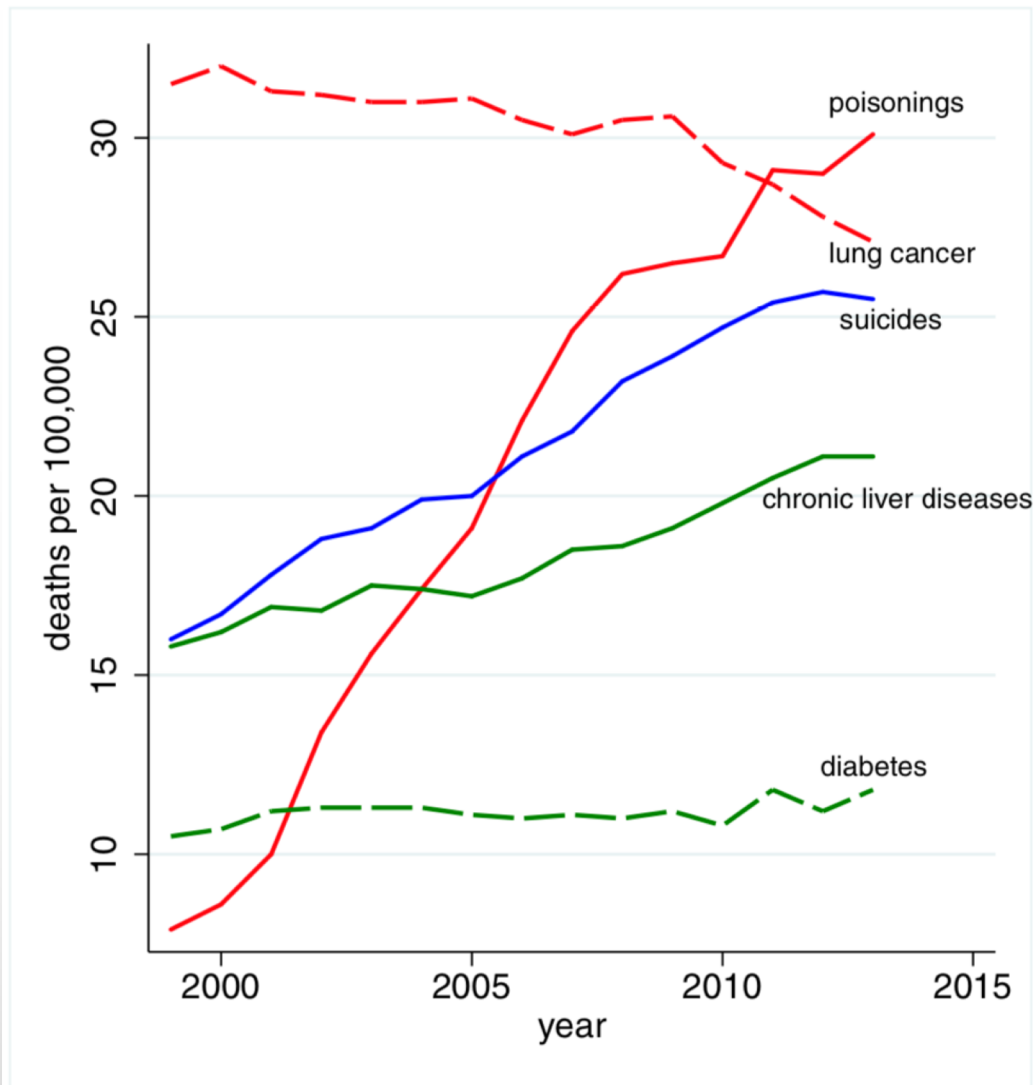
Fig. 2. Mortality by cause, white non-Hispanics ages 45–54.