ENAH
EUROPEAN NETWORK ARCHITECTURE FOR HEALTH

"Hospital & the City"
A holistic approach to hospital planning in the urban context

Population health, need for hospital care & implications for hospital planning

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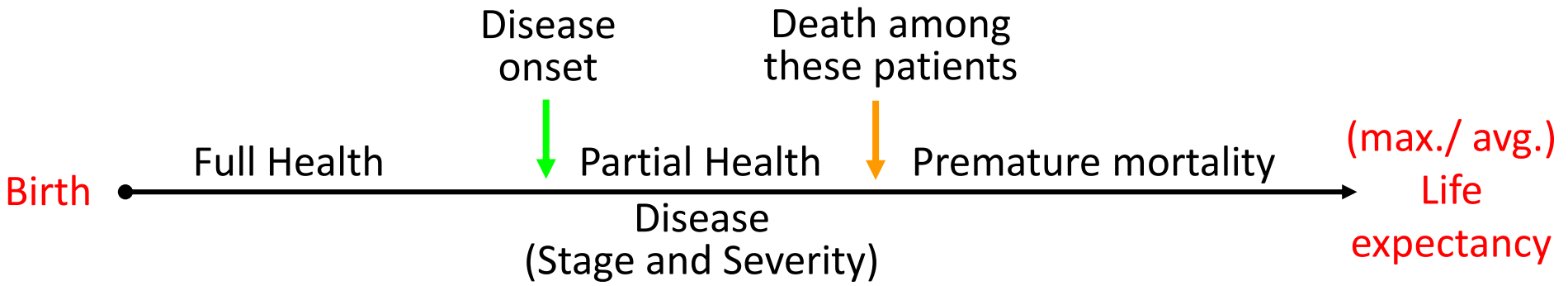
European Observatory on Health Systems and Policies

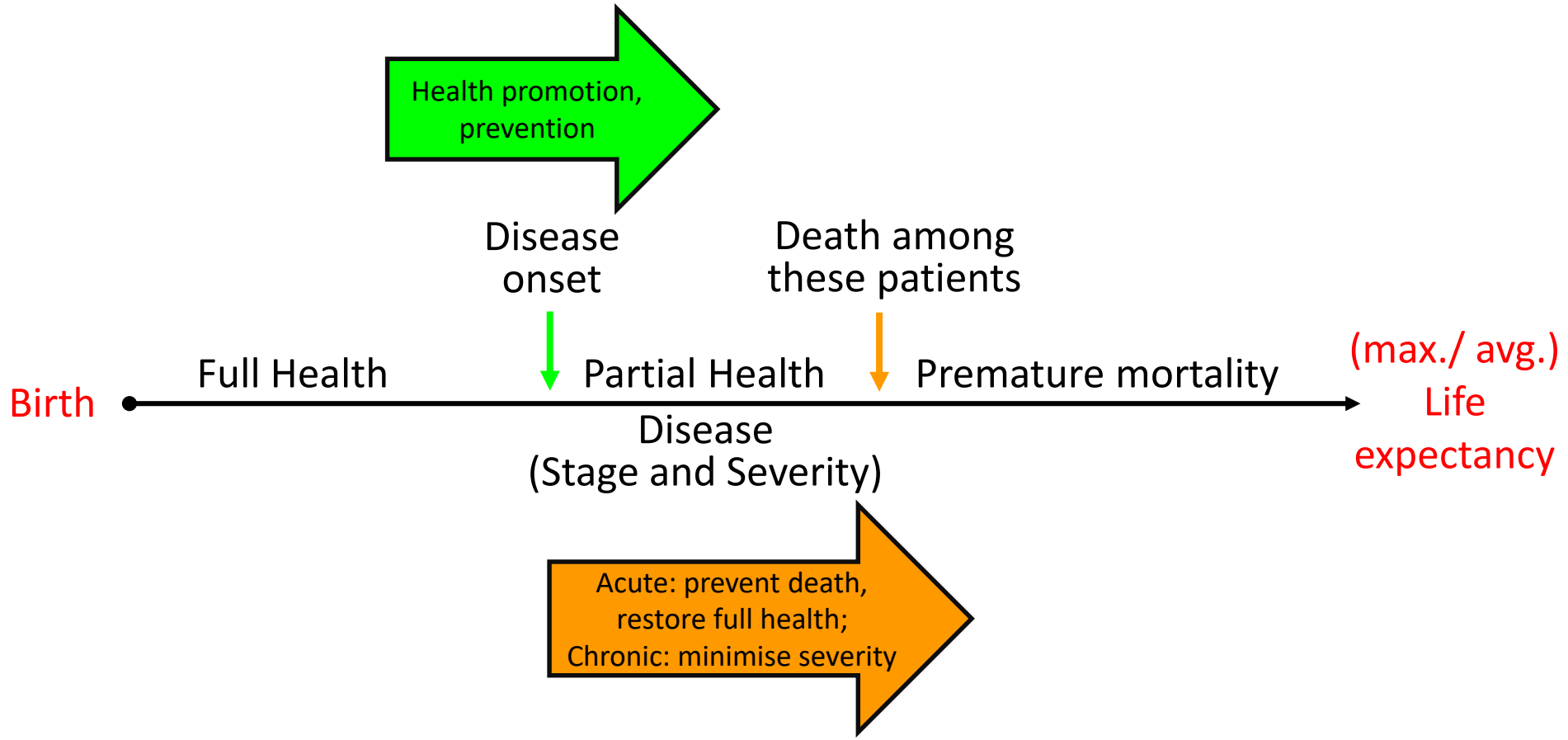
MiG Management im Gesundheitswesen

European Observatory on Health Systems and Policies

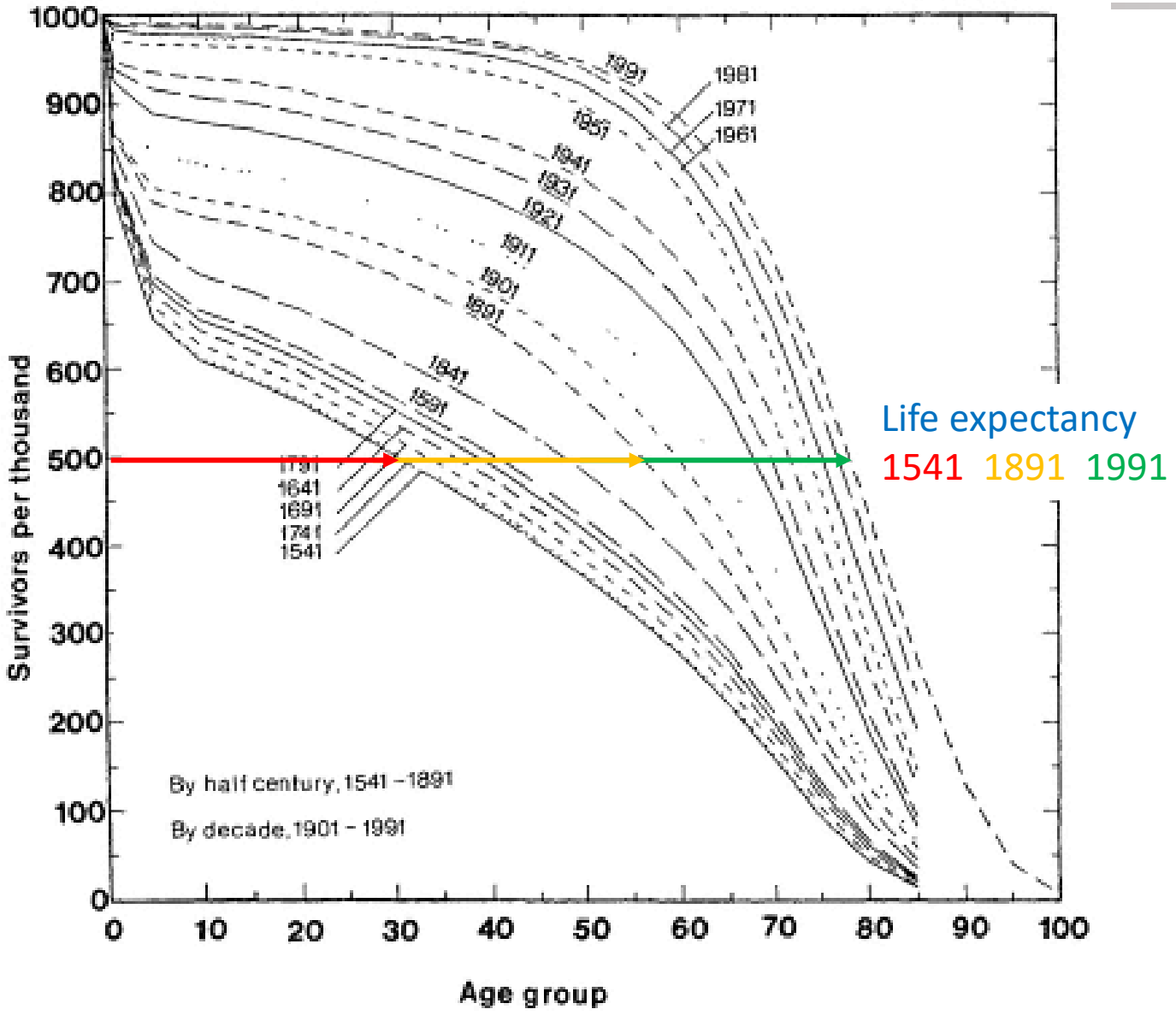
How can we measure/ express population health?



How can we intervene?



Survival curves, England, 1541-1991



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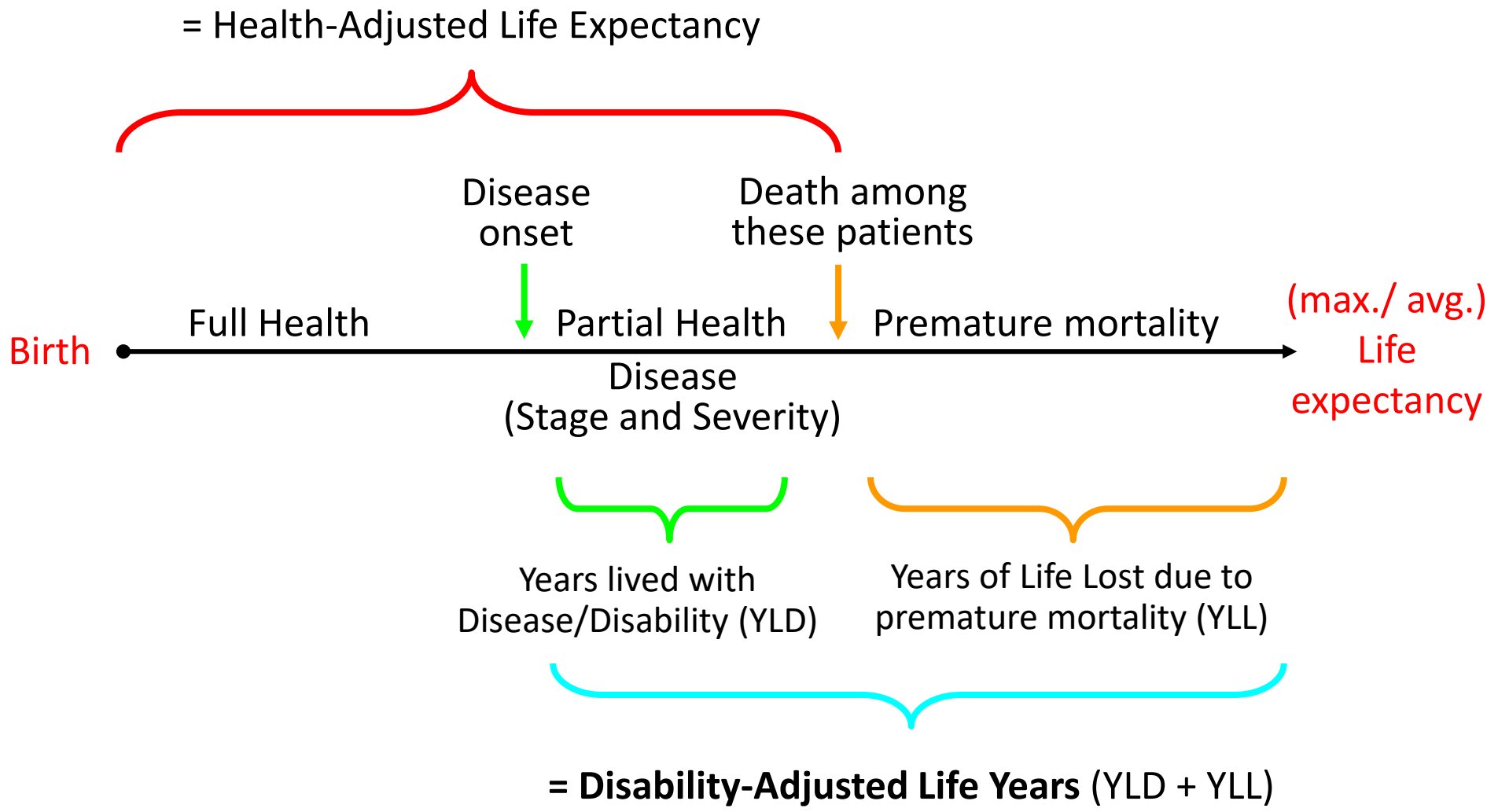
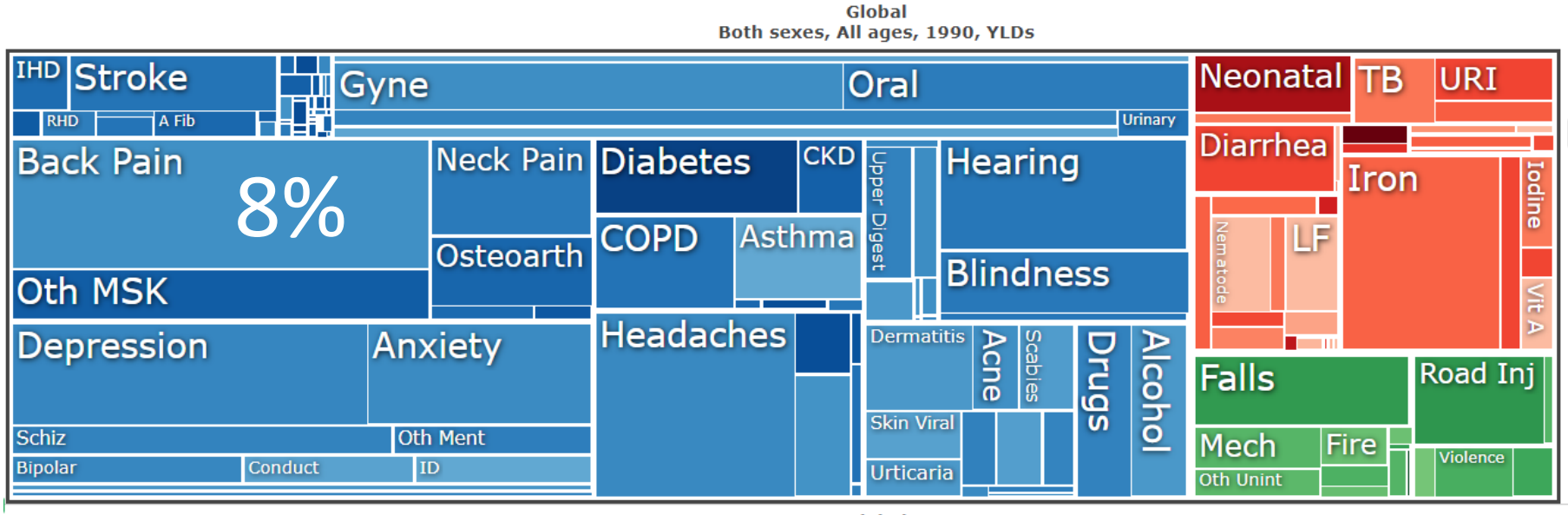
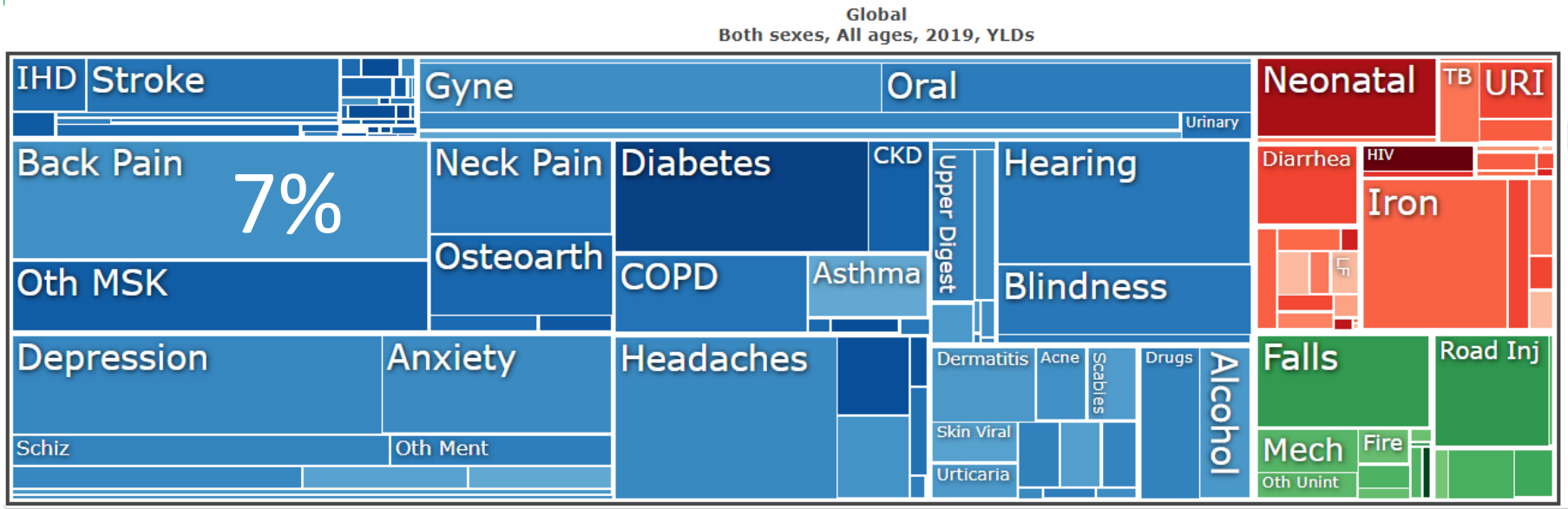


Concept of Disability-adjusted Life Years (DALYs)

- Take a societal perspective
- Aim to measure the burden of disease
- Integrate both mortality and morbidity
- Years of Life of Life (YLL) lost are determined in relation to the calculated maximum life expectancy (currently 86.6 years)
- Disability weights were originally determined by experts – but 2010 Global Burden of Disease (GBD) study updated weights to include surveys about 220 health states
- Based on assumption that one year in full health is as good as two years in a health state with a weight of 0.5
- Disability weights are multiplied with prevalence → YLD

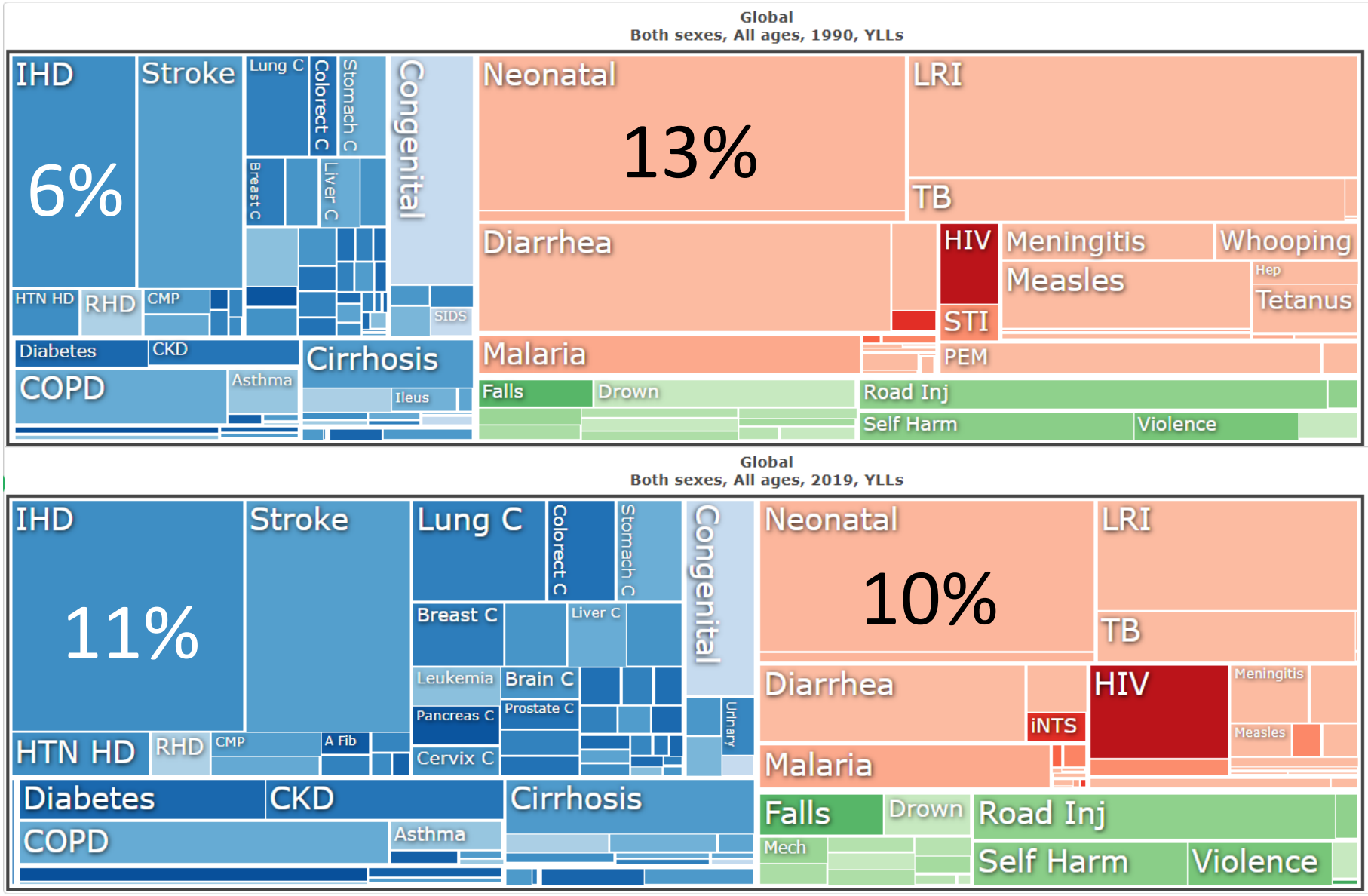
Global Burden of Disease: YLD, 1990, 2019, % by cause





http://vizhub.healthdata.org/gbd-compare/

Global Burden of Disease: YLL, 1990, 2019, % by cause



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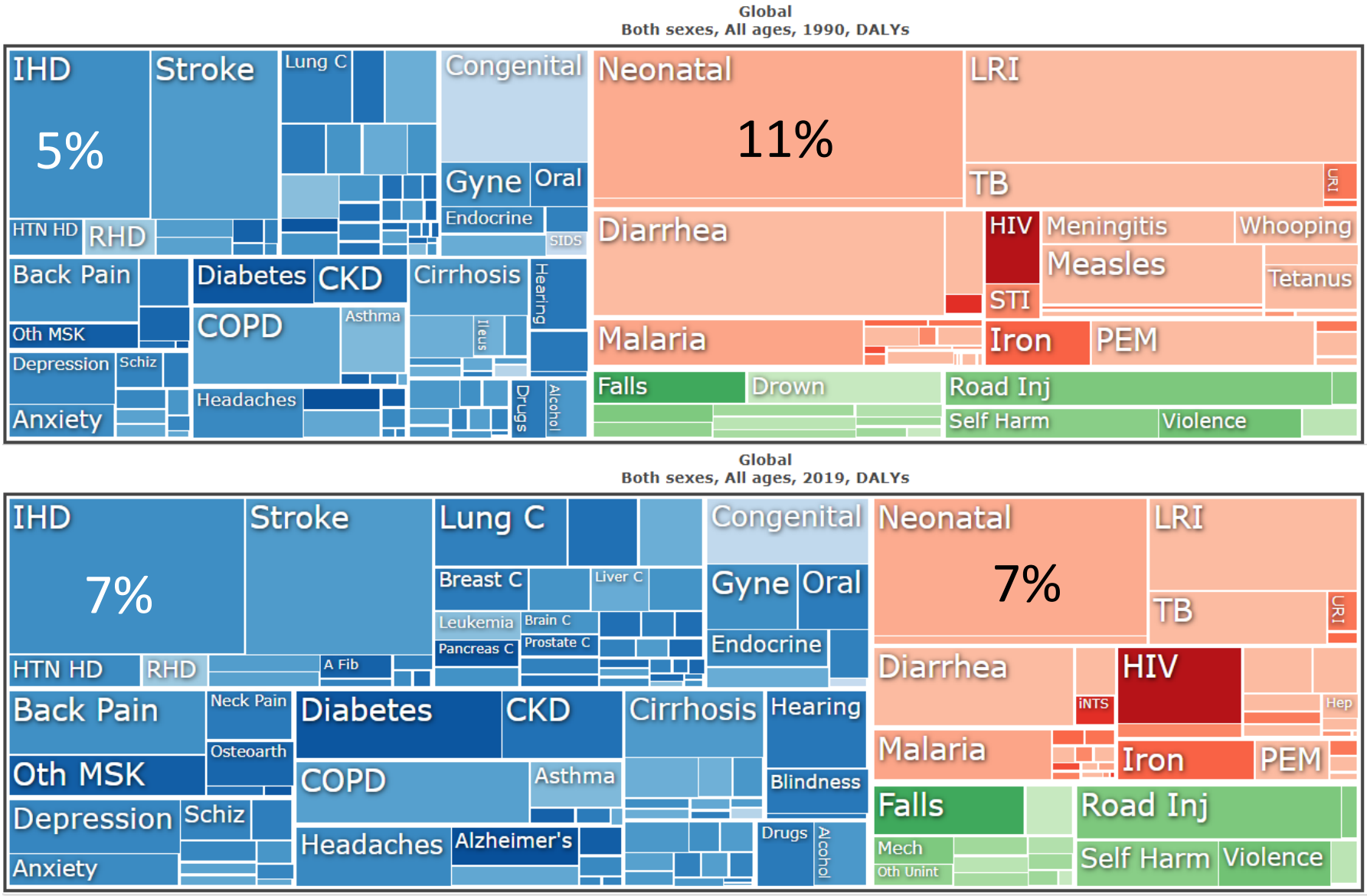
Global Burden of Disease: DALYs, 1990, 2019, % by cause



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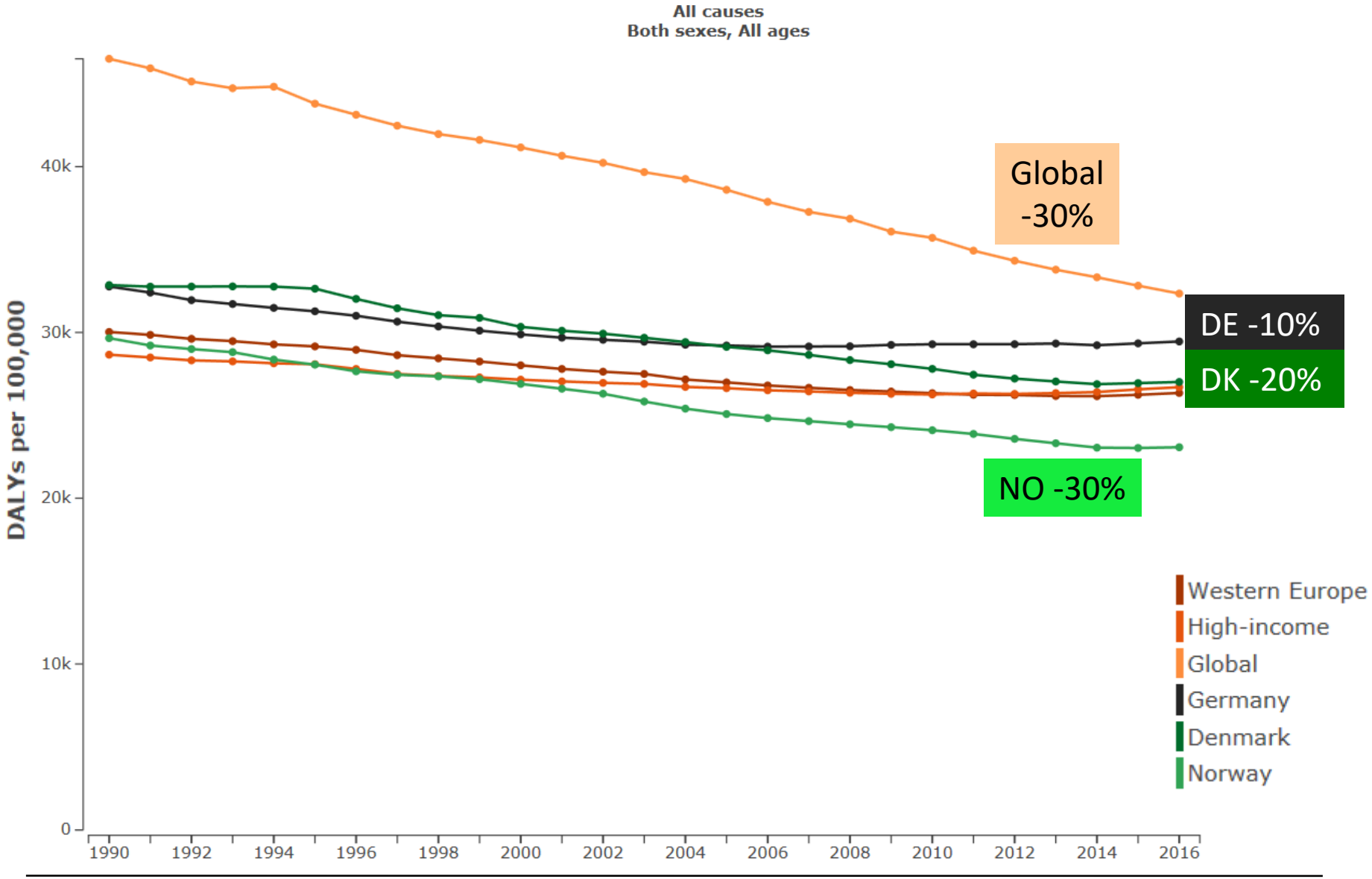
Development of DALYs/ 100,000 over time

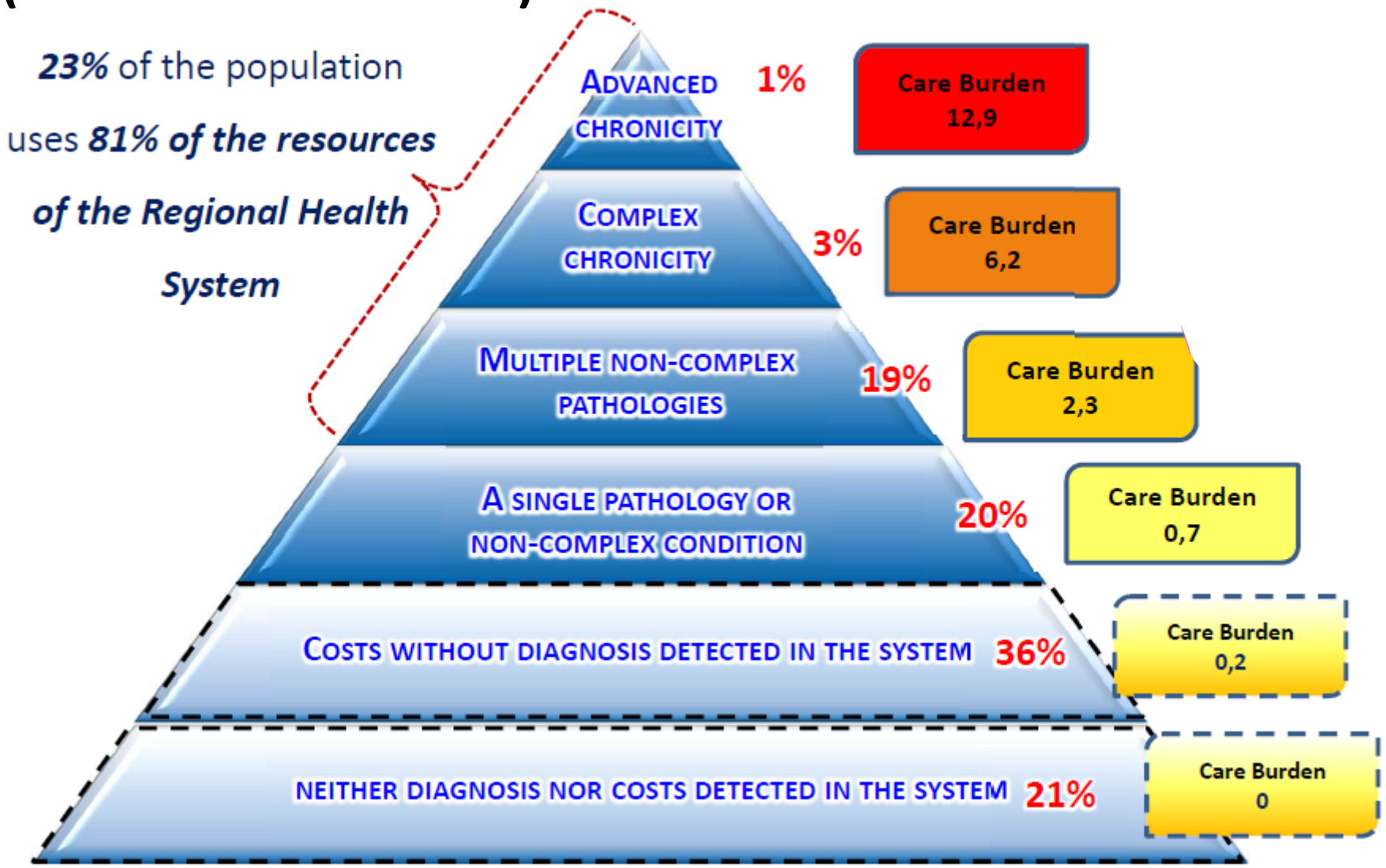


But 100 DALYs could mean

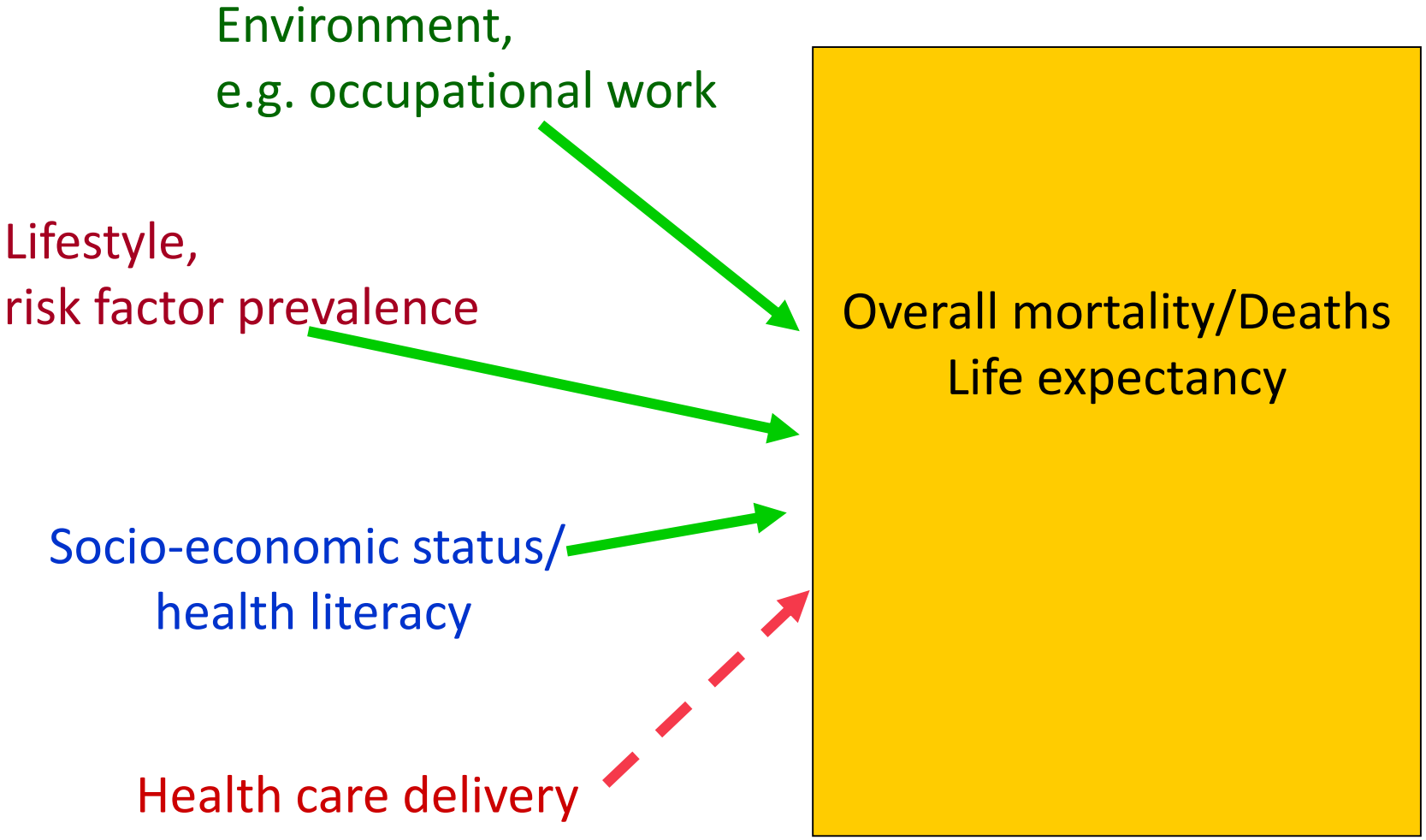
- 1,000 persons with 0.1 DALY each
- 100 persons with 1 DALY each
- 10 persons with 10 DALYs each

→ same overall burden of disease in population
but very different severity per person (medical view)

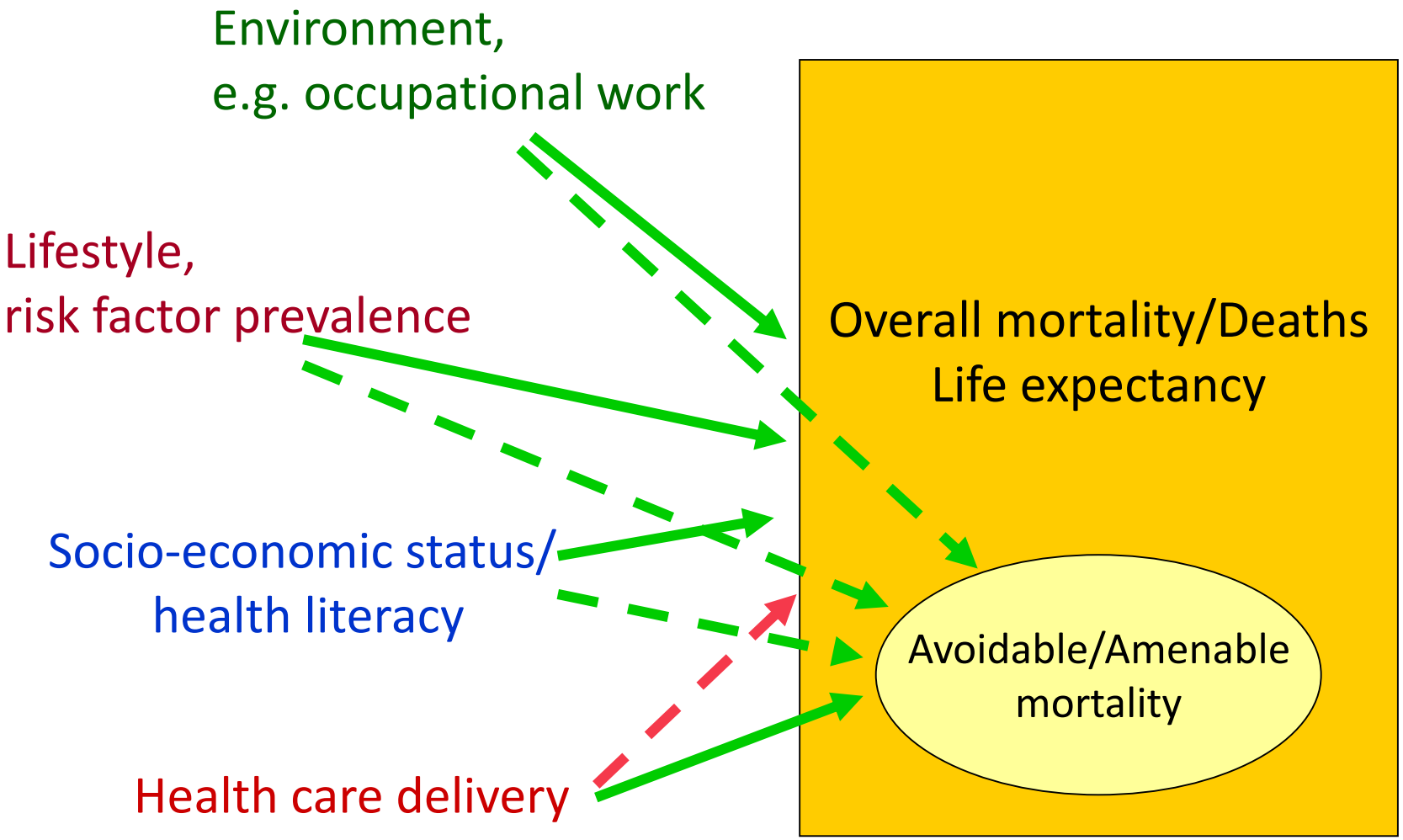
Another way of looking at population health (and associated costs)



But neither high burden of disease (DALYs) nor severity mean that health system/ care can make a difference … need to look for something more specific



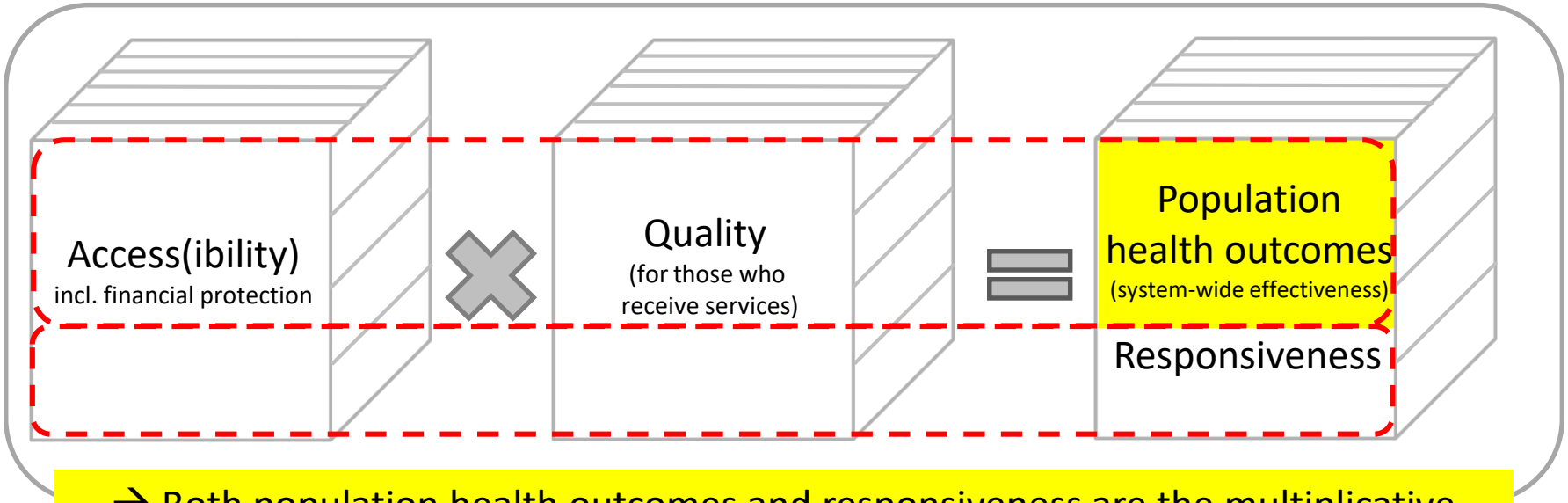
… diagnoses where health system/ care makes a difference: “avoidable mortality”



Concept of Avoidable Mortality

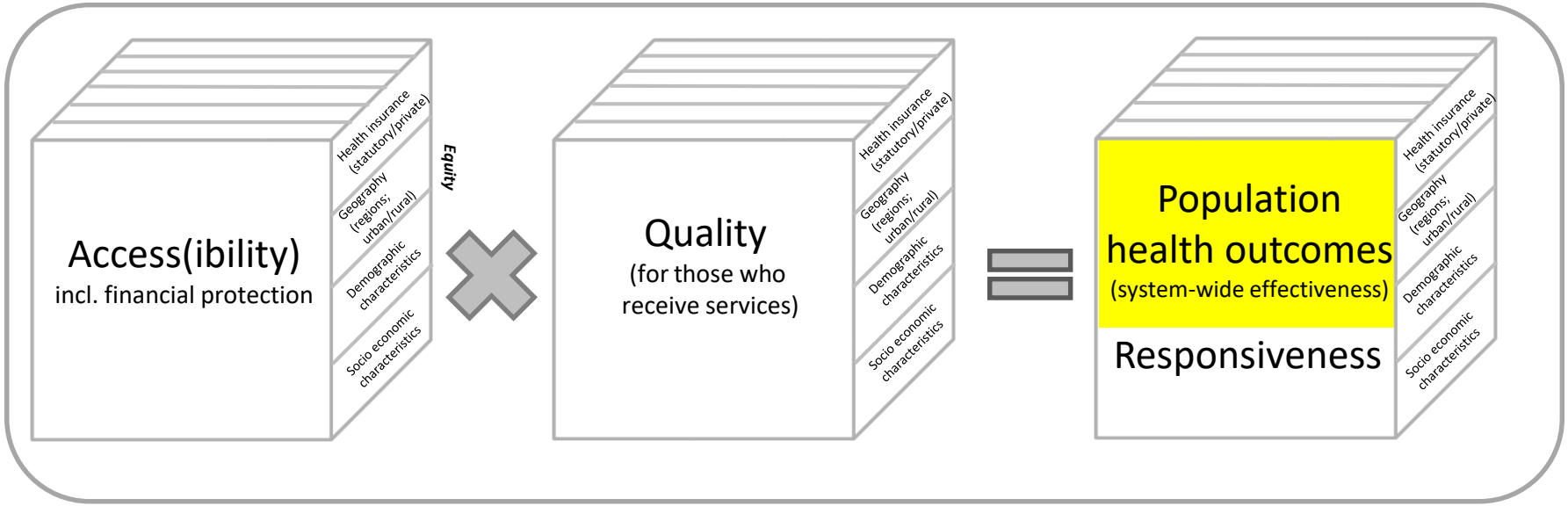
- Mortality from certain causes of death, where death is avoidable according to current medical knowledge, practice and public health interventions in a defined age/sex group of the population, developed by Rutstein et al. 1976, Charlton 1983
- List of avoidable deaths based on expert opinion and consensus
- Used as a measure of health system performance
- These deaths are interchangeably referred to as “avoidable” or “amenable to health care” in the literature.
- Since 2019, differentiation of “avoidable” into “preventable” and “treatable (amenable)” by Eurostat and OECD.

But how does the health system make a difference?
The performance assessment framework

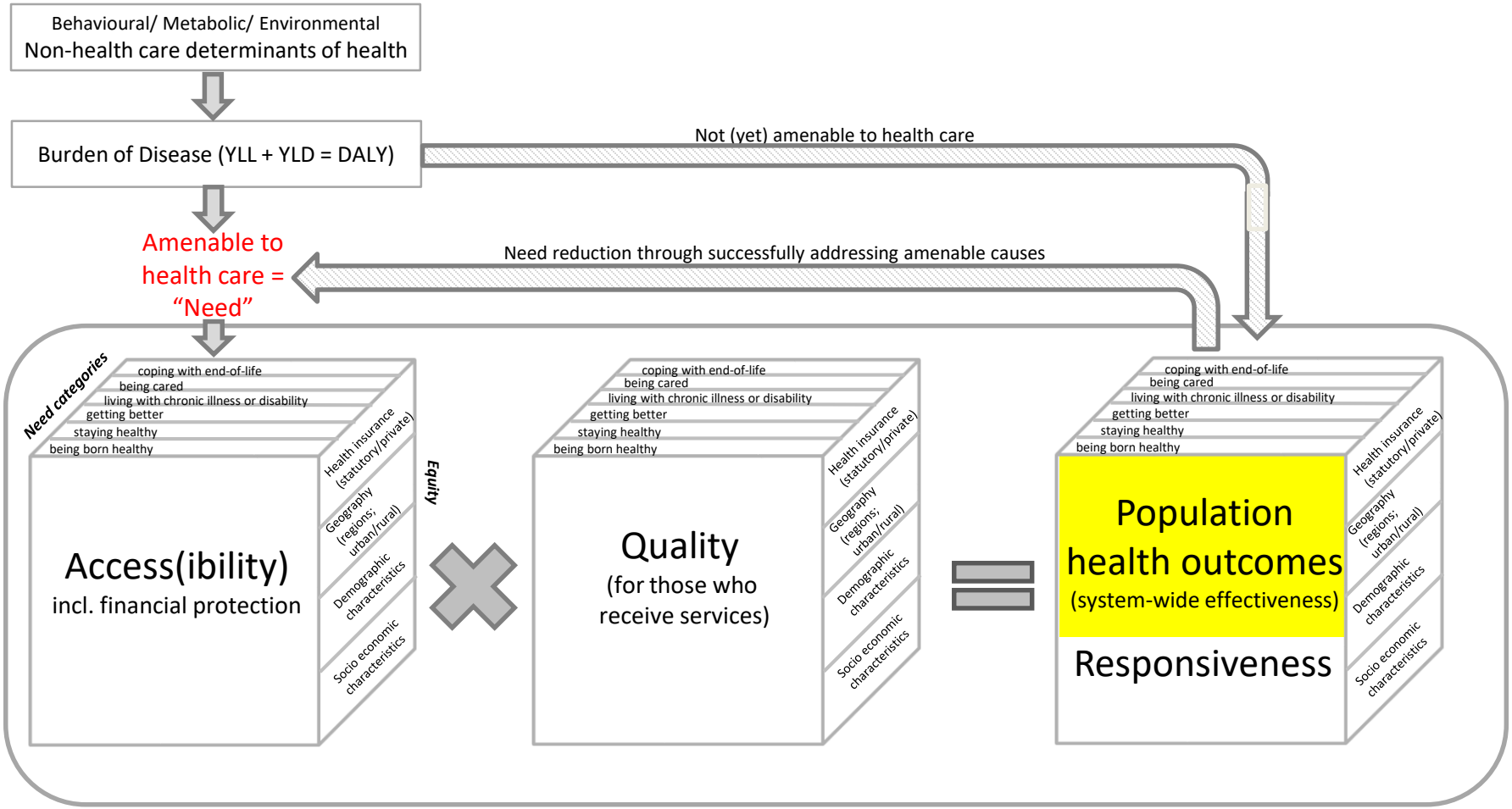


→ Both population health outcomes and responsiveness are the multiplicative effect of accessibility and quality: High accessibility but bad quality as well as low accessibility but high quality lead, on the population level, to inferior outcomes.

The performance assessment framework

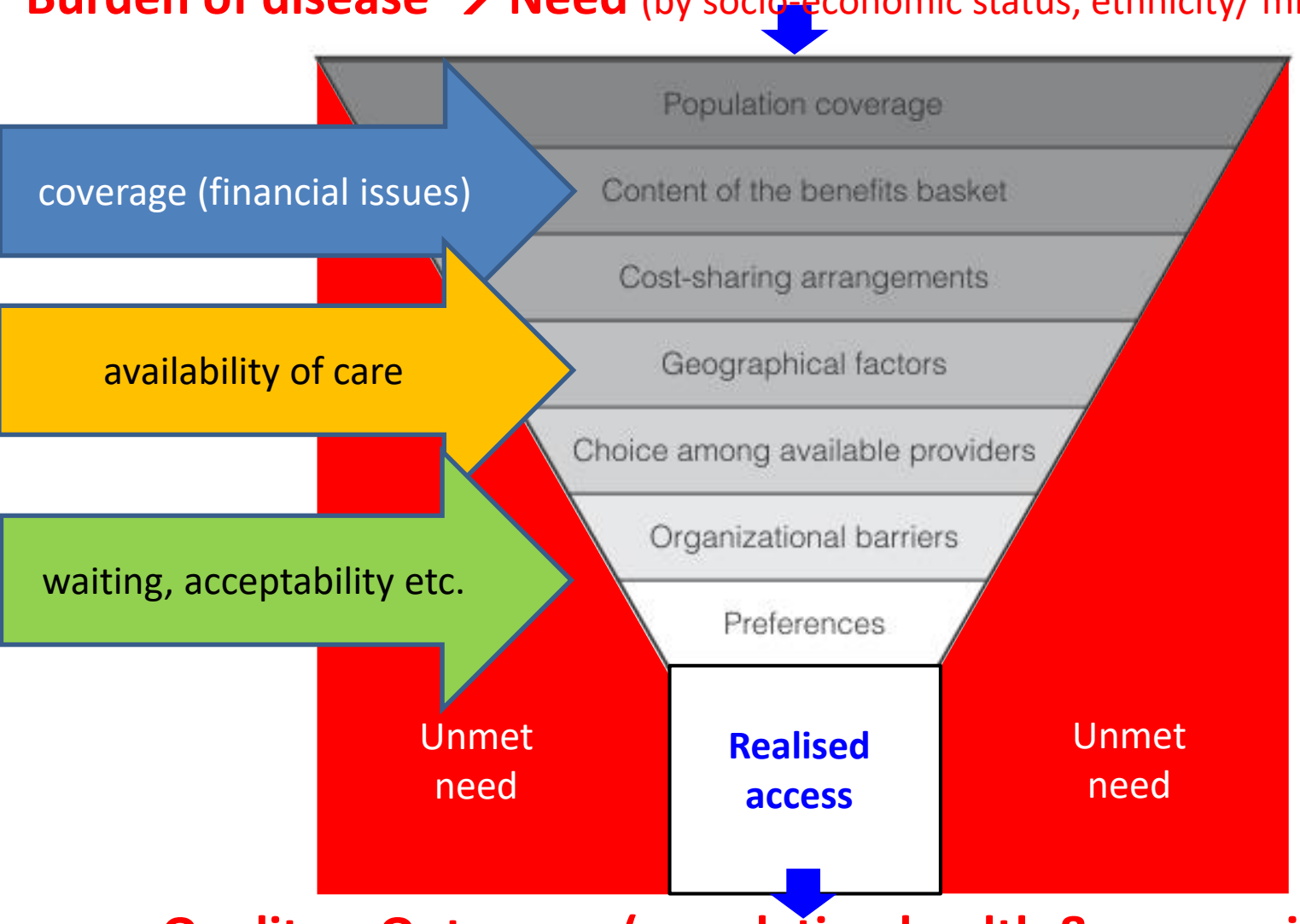


The performance assessment framework



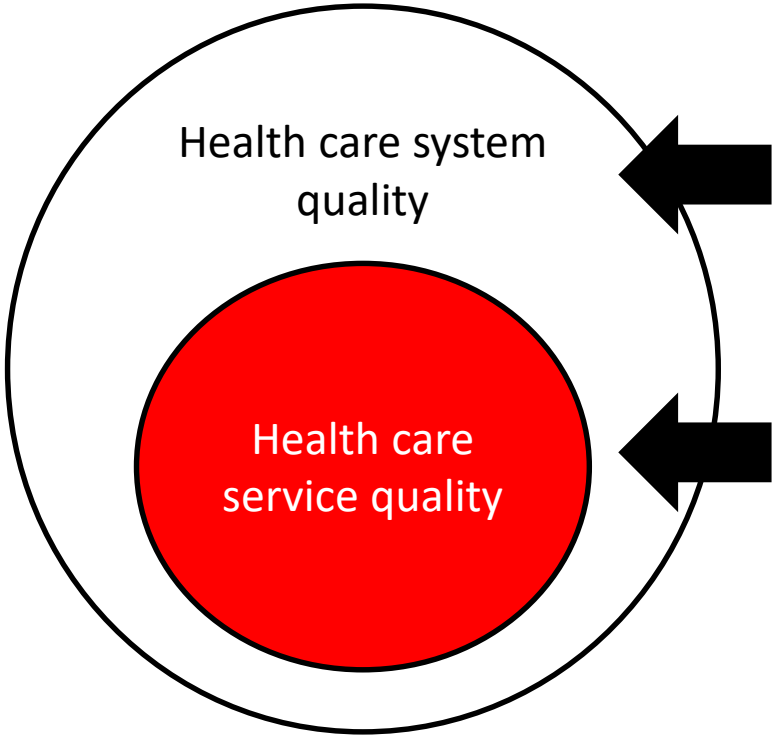
Access(ibility)

Burden of disease → Need (by socio-economic status, ethnicity/ migration status etc.)



x Quality = Outcomes (population health & responsiveness)

Quality: narrow vs. broad definition



= Health system performance (the degree to which health systems achieve their goals)

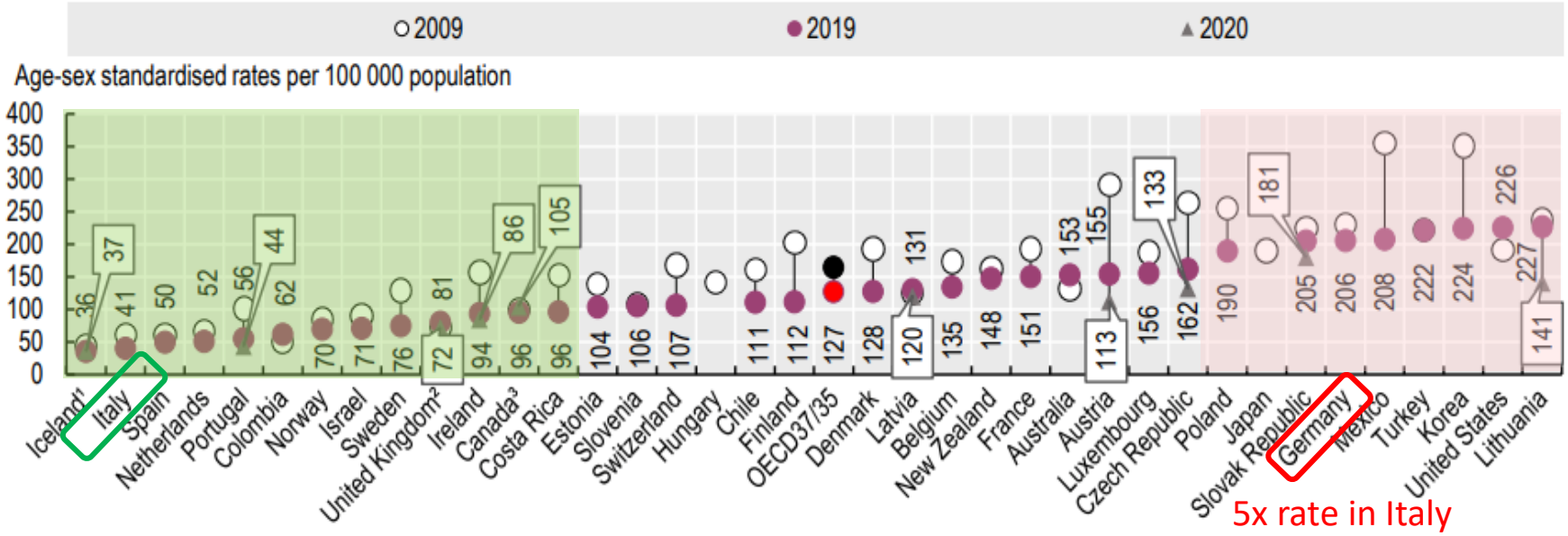
= Health care quality: "the degree to which health services for individuals and populations are (1) effective, (2) safe, and (3) people-centred"

HOW CAN WE ASSESS THE QUALITY OF AMBULATORY CARE?

A major patient-relevant outcome:

Not being hospitalised in case of chronic conditions ("avoidable hospital admissions", here: diabetes)

Figure 6.12. **Diabetes hospital admission in adults, 2009, 2019 (or nearest year) and 2020**



1. Three-year average. 2. 2020 data are provisional and include England only. 3. 2020 estimate based on provisional 1 April to 30 September data from all jurisdictions except Quebec.

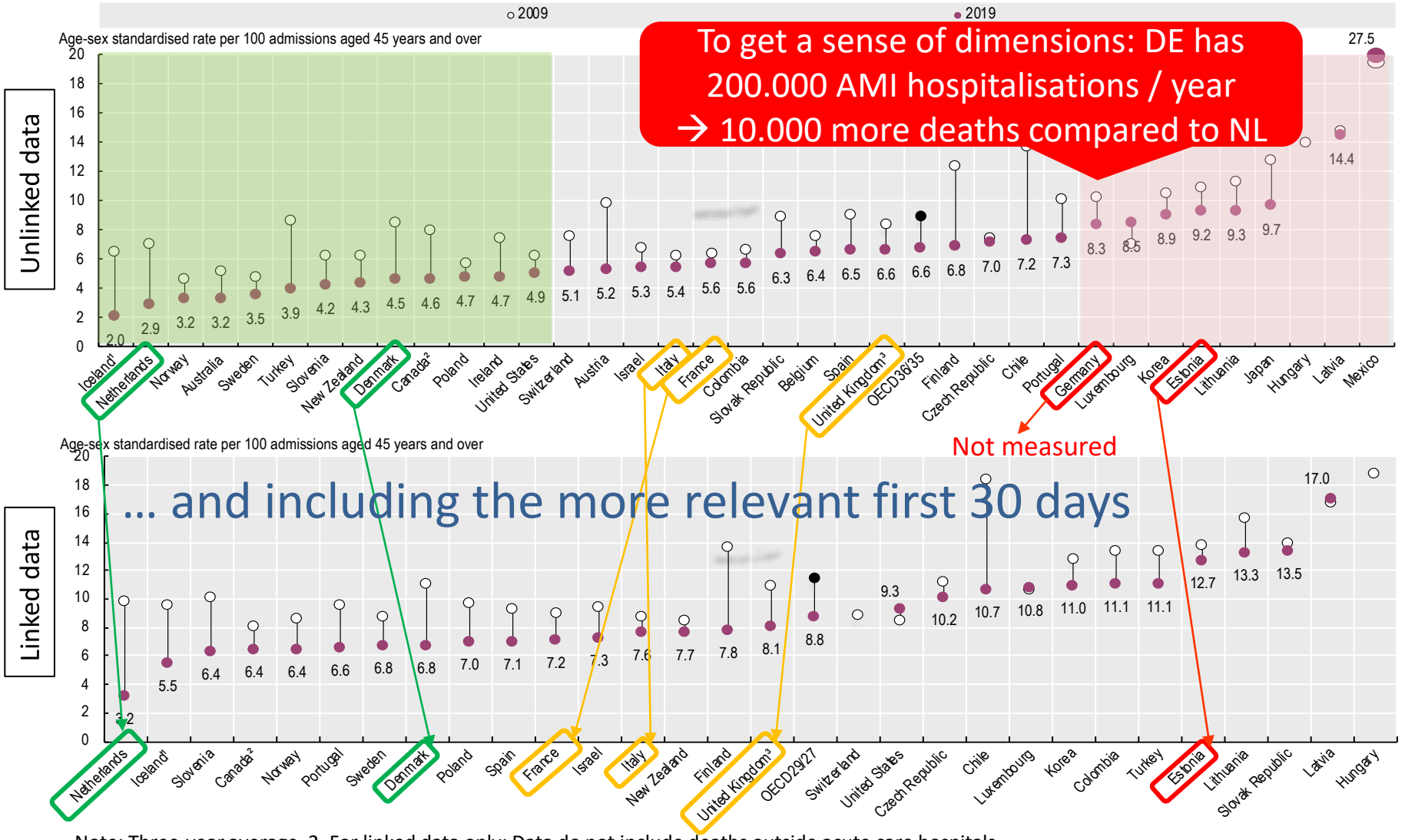
Source: OECD Health Statistics 2021.

StatLink https://stat.link/ozbin2

Source: *OECD (2021)*

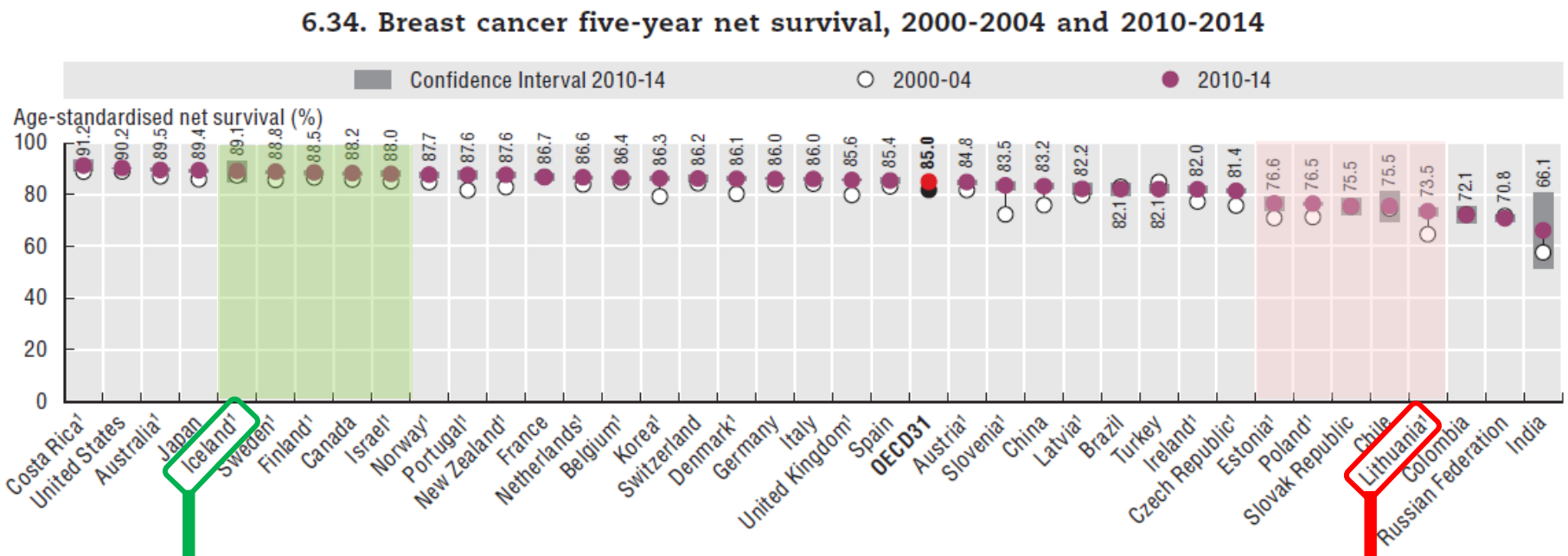
HOW CAN WE ASSESS THE QUALITY OF INPATIENT CARE?

AMI case fatality of inpatients … during hospitalision only



Note: Three-year average. 2. For linked data only: Data do not include deaths outside acute care hospitals.
Source: OECD Health Statistics (2021b)

Extending the time horizon to 5 years for cancer patients



Note: 95% confidence intervals have been calculated for all countries, represented by grey areas. Expected updates in the data may reduce the survival estimate for Costa Rica.

1. Data with 100% coverage of the national population.

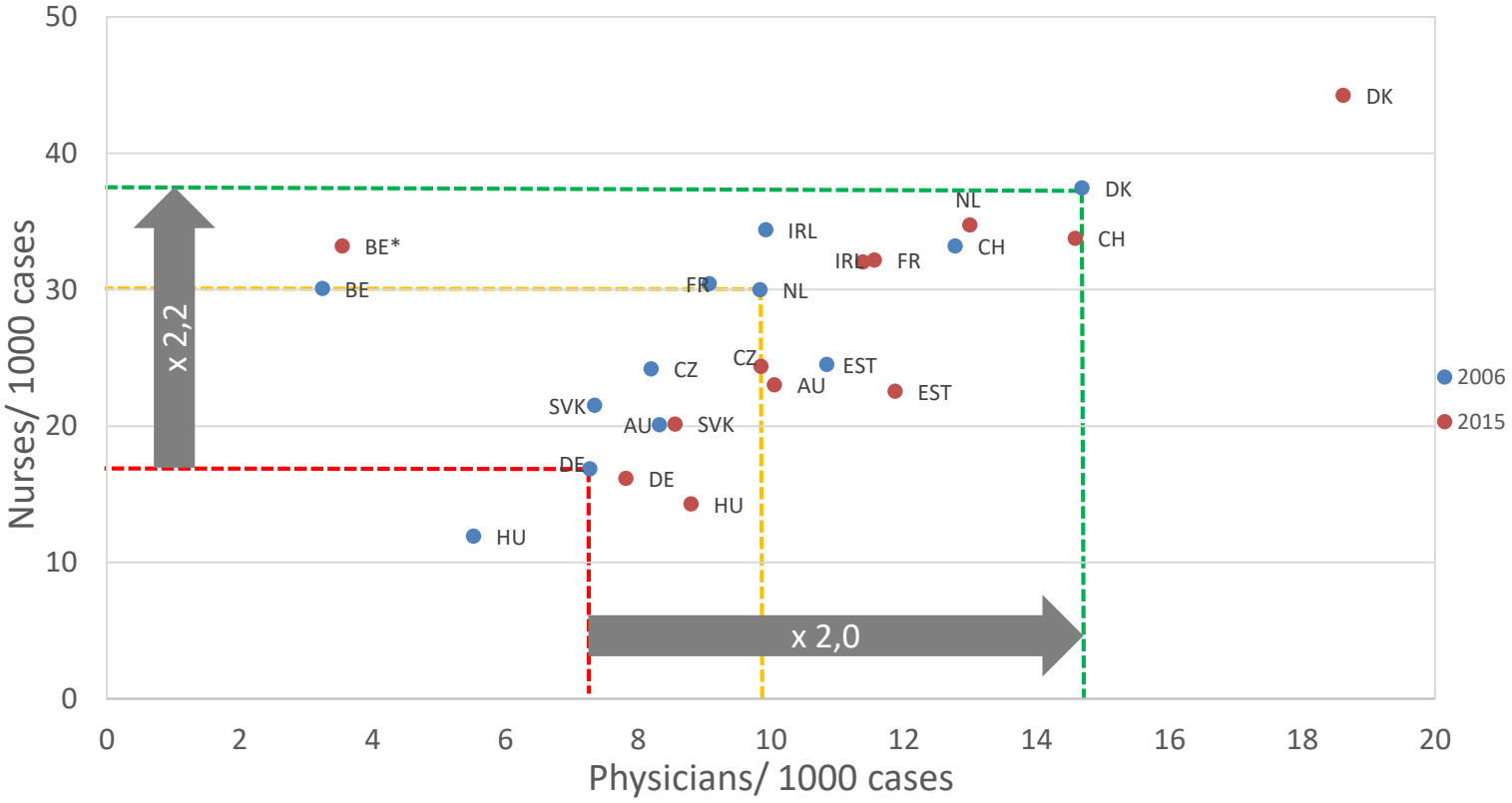
Source: CONCORD programme, London School of Hygiene and Tropical Medicine.

10.9% die within 5 years

26.5% die within 5 years

Why does quality differ between countries?

An important factor is clinical personnell, in numbers … (2006)

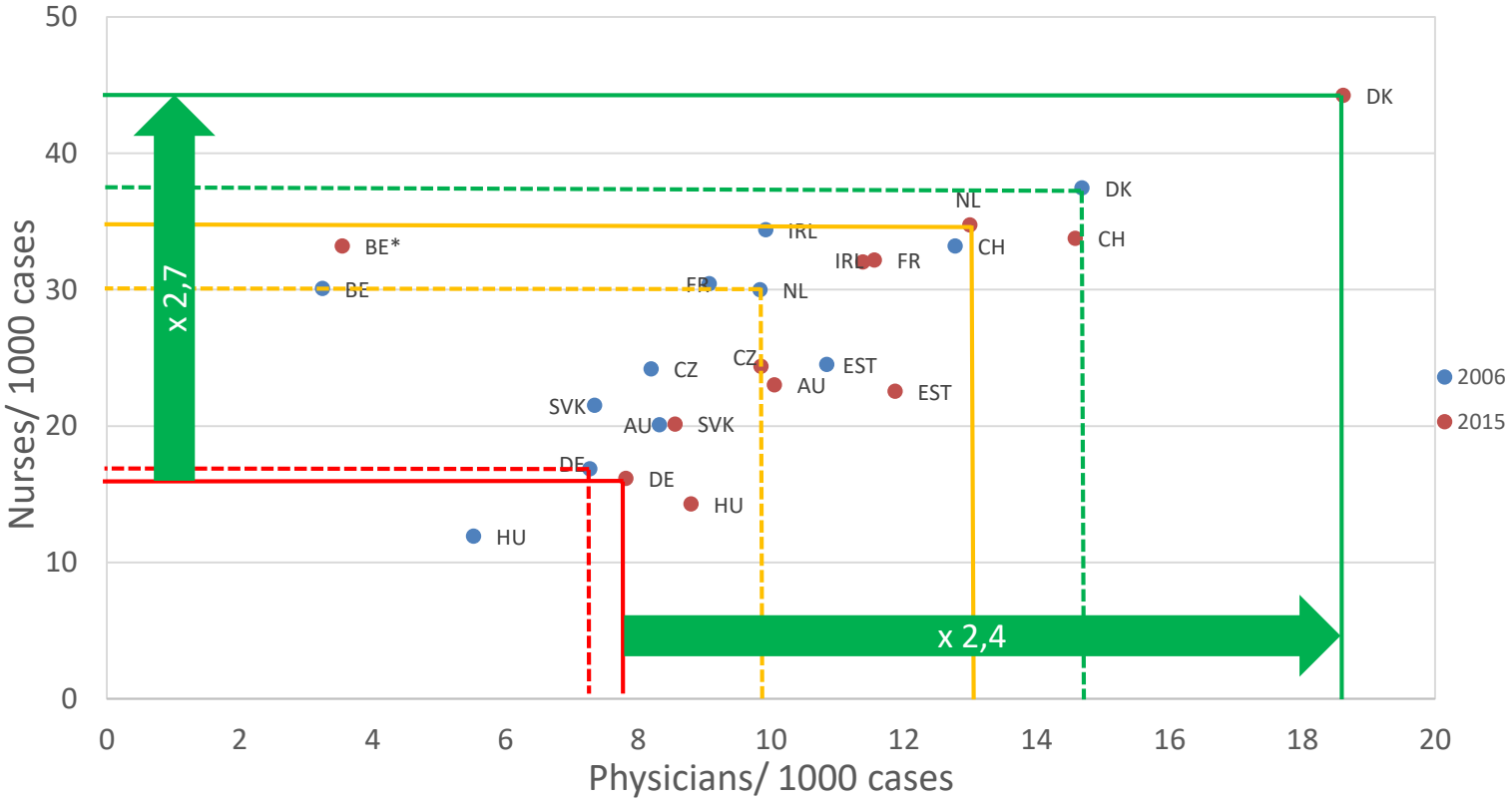


Eigene Auswertung mit OECD Health Statistics

Why does quality differ between countries?

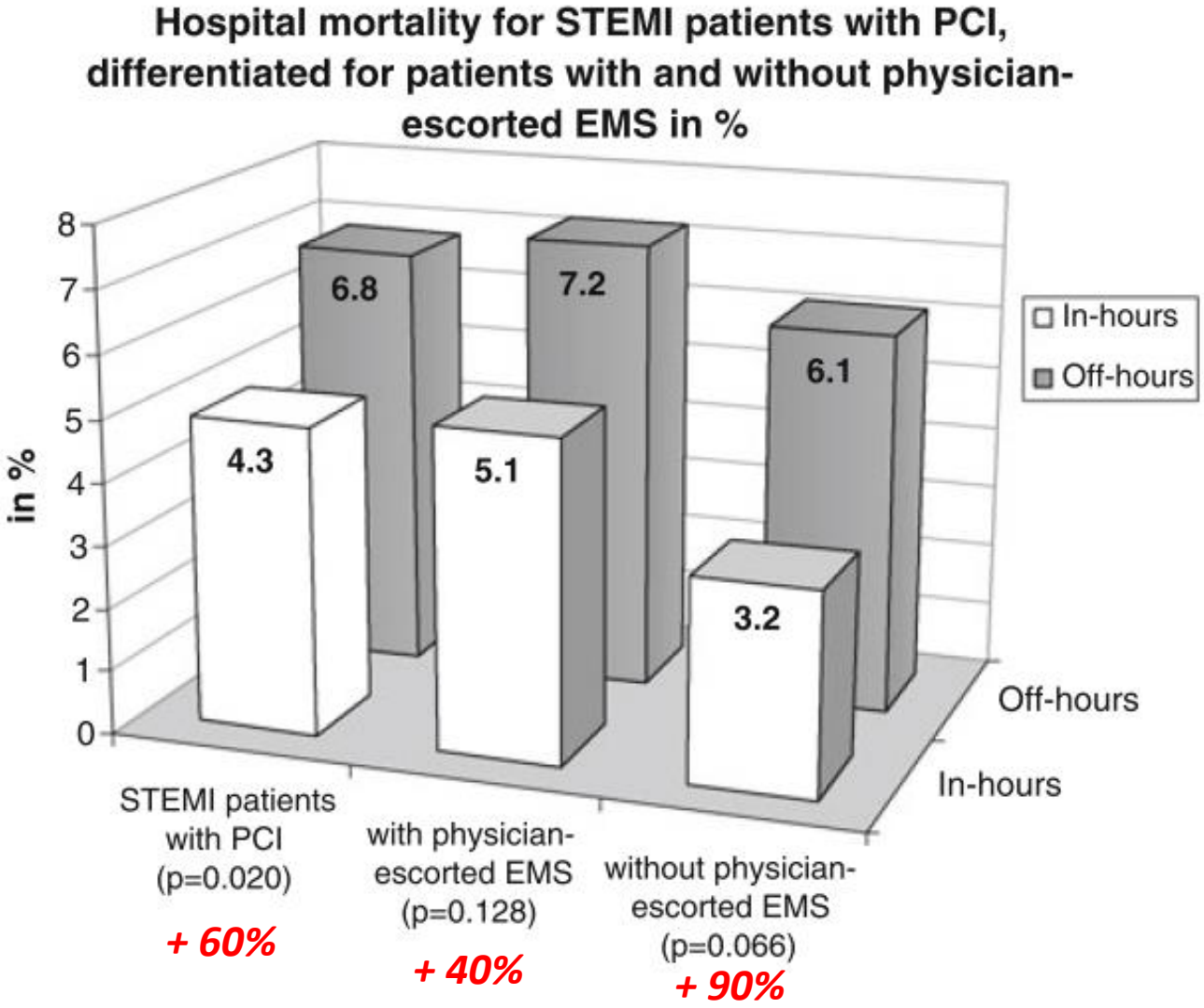
An important factor is clinical personnell, in numbers …

(2015)



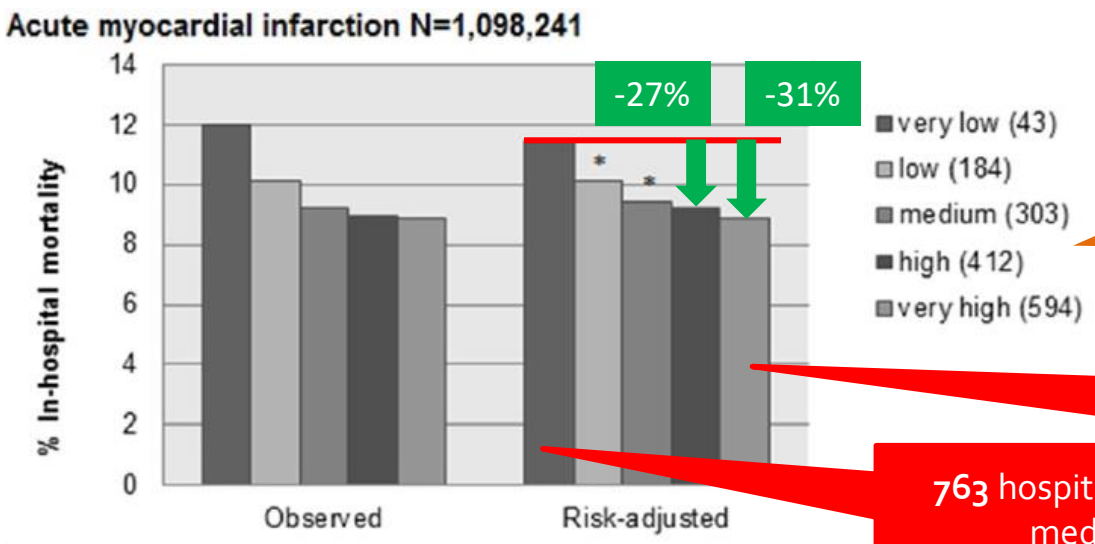
Eigene Auswertung mit OECD Health Statistics

… and availability at night-time/ weekends



Maier B, Behrens S, Graf-Bothe C et al. (2010) Time of admission, quality of PCI care, and outcome of patients with ST-elevation myocardial infarction. Clin Res Cardiol 99: 565–72

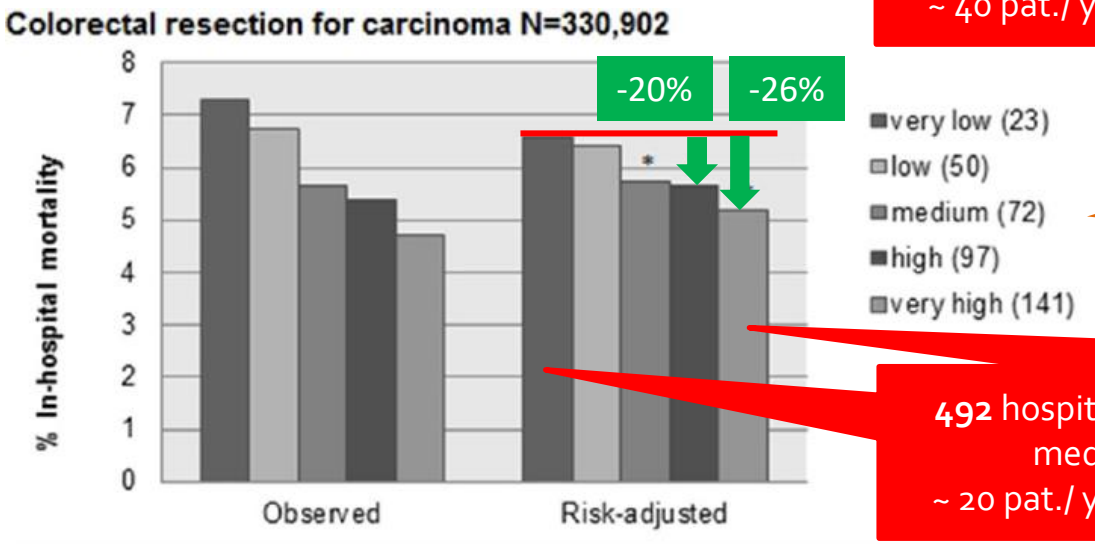
Hospital size (or rather: number of patients treated with a certain condition) also makes a big difference



Implication for hospital planning:
500 patients/ day in Germany
(1 / 160.000 pop.)
--> 330 to 500 hospitals
(1-1.5 pat./ day)
would be optimal for quality

54 hospitals,
median
~ 600 pat./ year

763 hospitals,
median
~ 40 pat./ year



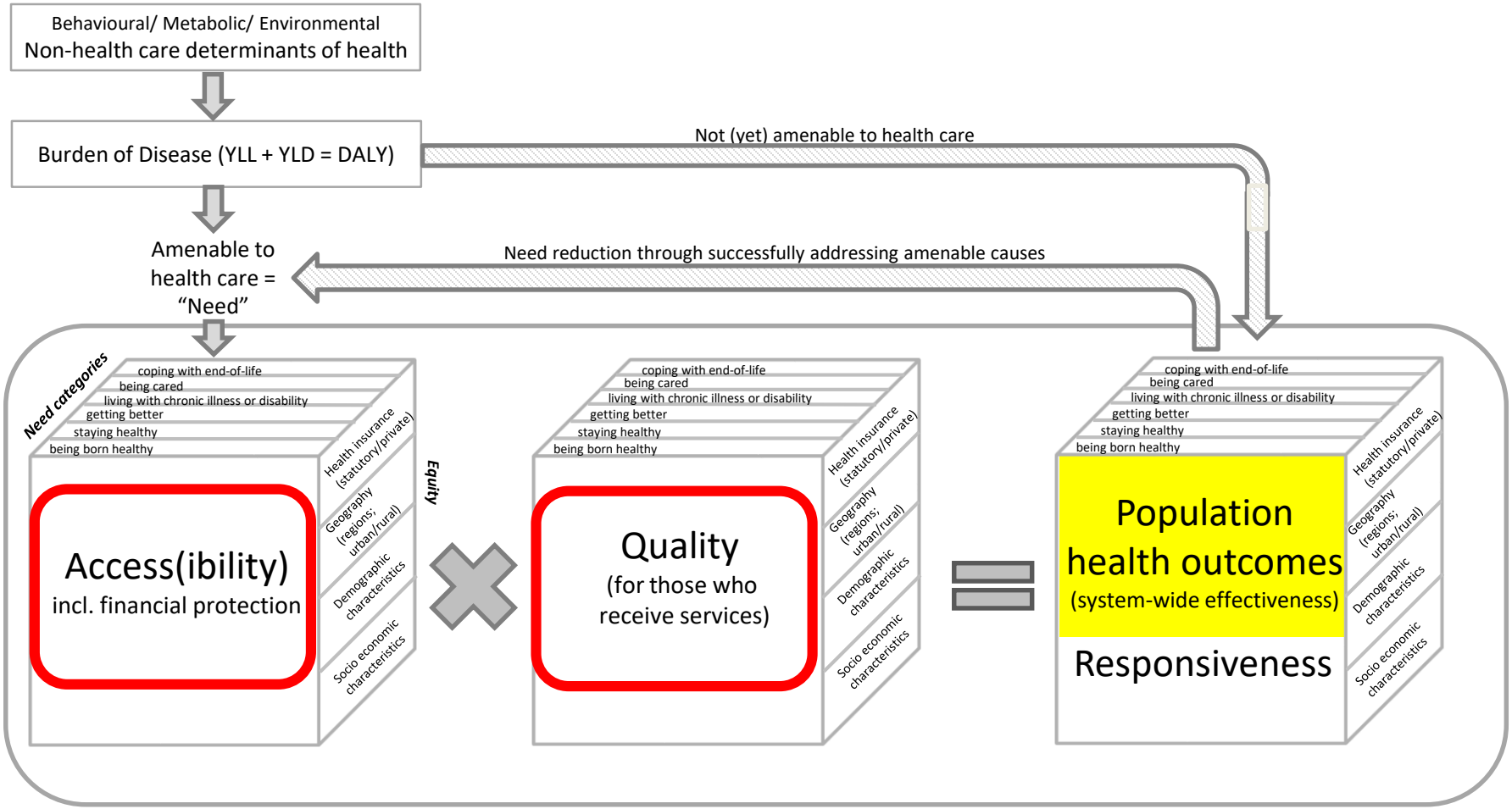
Implication for hospital planning: 55.000 patienten/ year (1 / 1.500 pop.)
--> 370-550 hospitals (100-150 pat./ year) would be optimal

71 hospitals,
median
~ 140 pat./ year

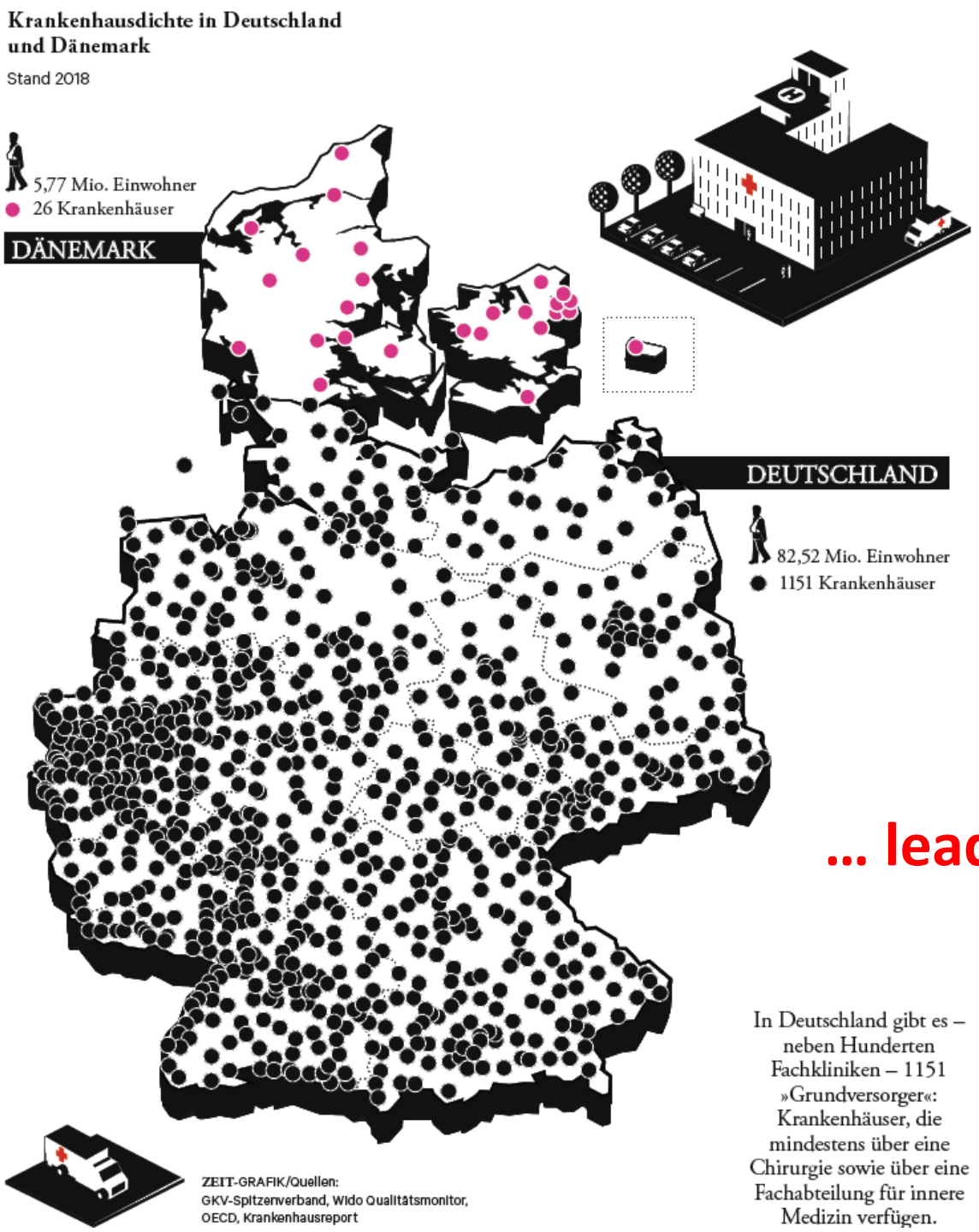
492 hospitals,
median
~ 20 pat./ year

Nimptsch U, Mansky T (2017): Hospital volume and mortality for 25 types of inpatient treatment in German hospitals: observational study using complete national data from 2009 to 2014 BMJ Open 2017;7:e016184.

The performance assessment framework



Trade-off between access(ibility) and quality …

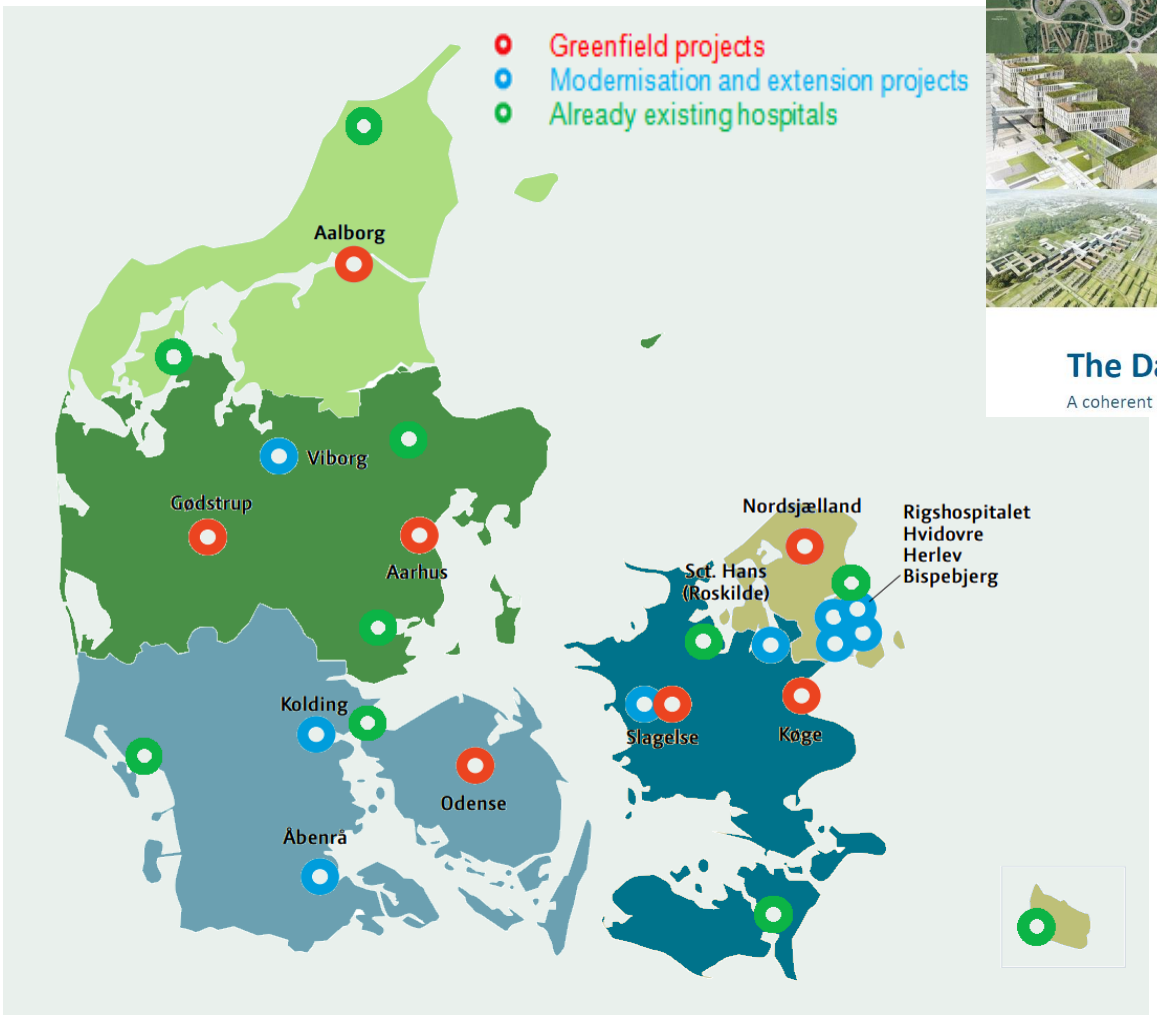


In Berlin alone,
23 hospitals do complex pancreas surgery, even though only **7** have a **pancreatic carcinoma center**

… leading to very different hospital structures

The Danish Super Hospital Programme

A coherent investment in connected, trustworthy and sustainable health care



In 2000, 56 acute care hospitals (1/ 100.000 pop.), currently 26 (1 / 220.000) – goal: 21, i.e. 1 per 270.000 (in Germany: 1 / 70.000)!