Institute for Health
Metrics and Evaluation

Karolinska
Institutet

IHME and the Global Burden of Disease Study

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Karolinska Institutet &

the Institute for Health Metrics and Evaluation

UNIVERSITY of WASHINGTON

Outline for today

- What is the Institute for Health Metrics and Evaluation (IHME) and Global Burden of Disease (GBD) Study

- Introduction of visualization tools and how they can support education in global health

Institute for Health Metrics and Evaluation (IHME)

Independent, population health research center, University of Washington, Seattle, US. Established in 2007 and the coordinating center for the GBD.

IHME's work is guided by three critical questions

1. What are the major health problems in the world?
2. How well are we addressing these problems?
3. How can we best allocate resources for a maximum health impact now, and in the future?

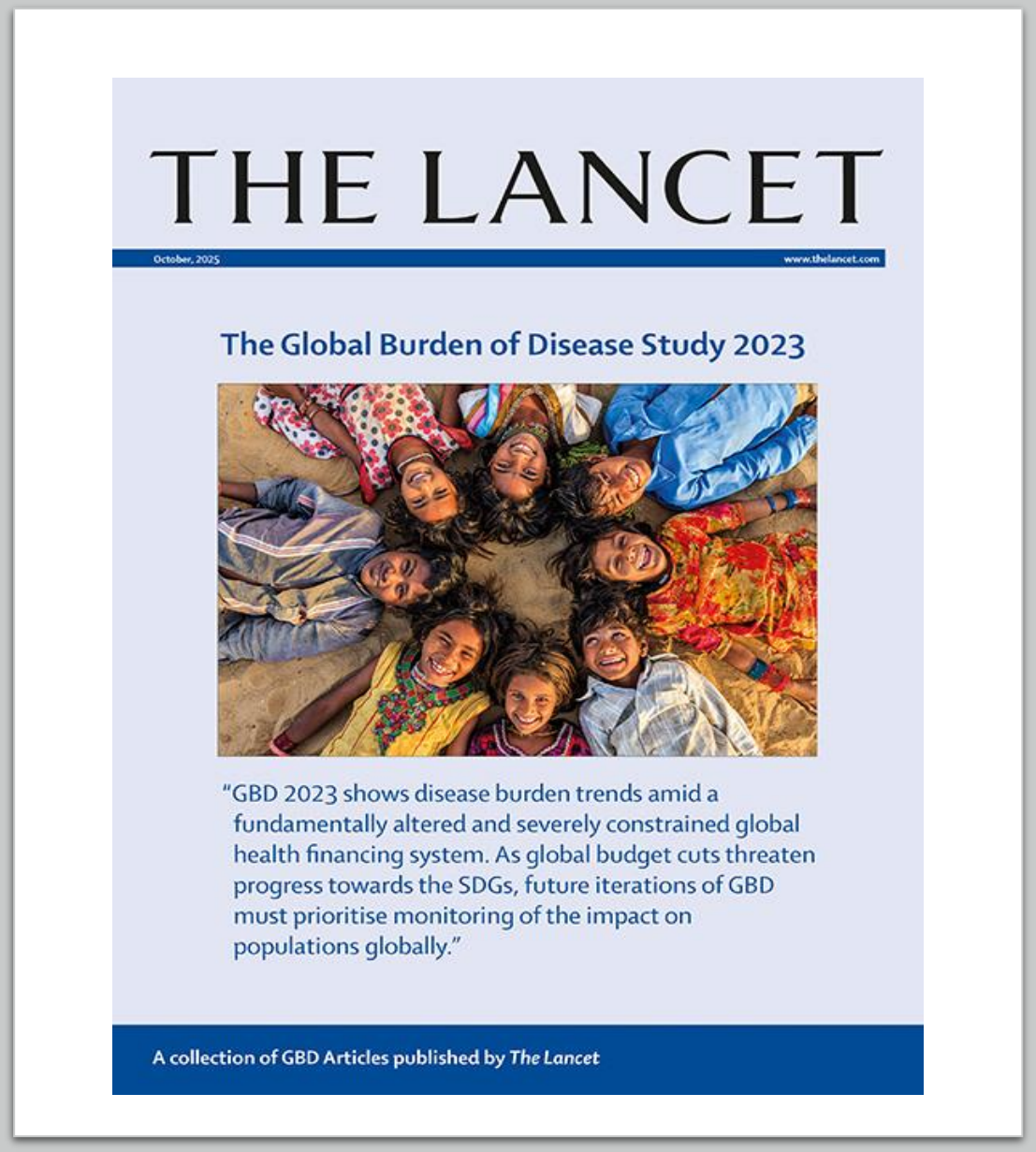
IHME

Measuring what matters

Ref. the Institute for Health Metrics and Evaluation

The Global Burden of Disease (GBD) Study

A **systematic, scientific** effort to quantify the **comparative** magnitude of **health loss** due to diseases, injuries and risk factors by age, sex, geographies for specific points in time.



Ref. the Institute for Health Metrics and Evaluation

The world’s largest catalog of health data

What IHME delivers

- Timely and scientifically valid evidence to improve health policy and practice.

How IHME works

- Estimates are continuously updated; all past estimates are revised in each new round.

When data are limited

- A best estimate is still produced by borrowing information from other locations, always with uncertainty included.

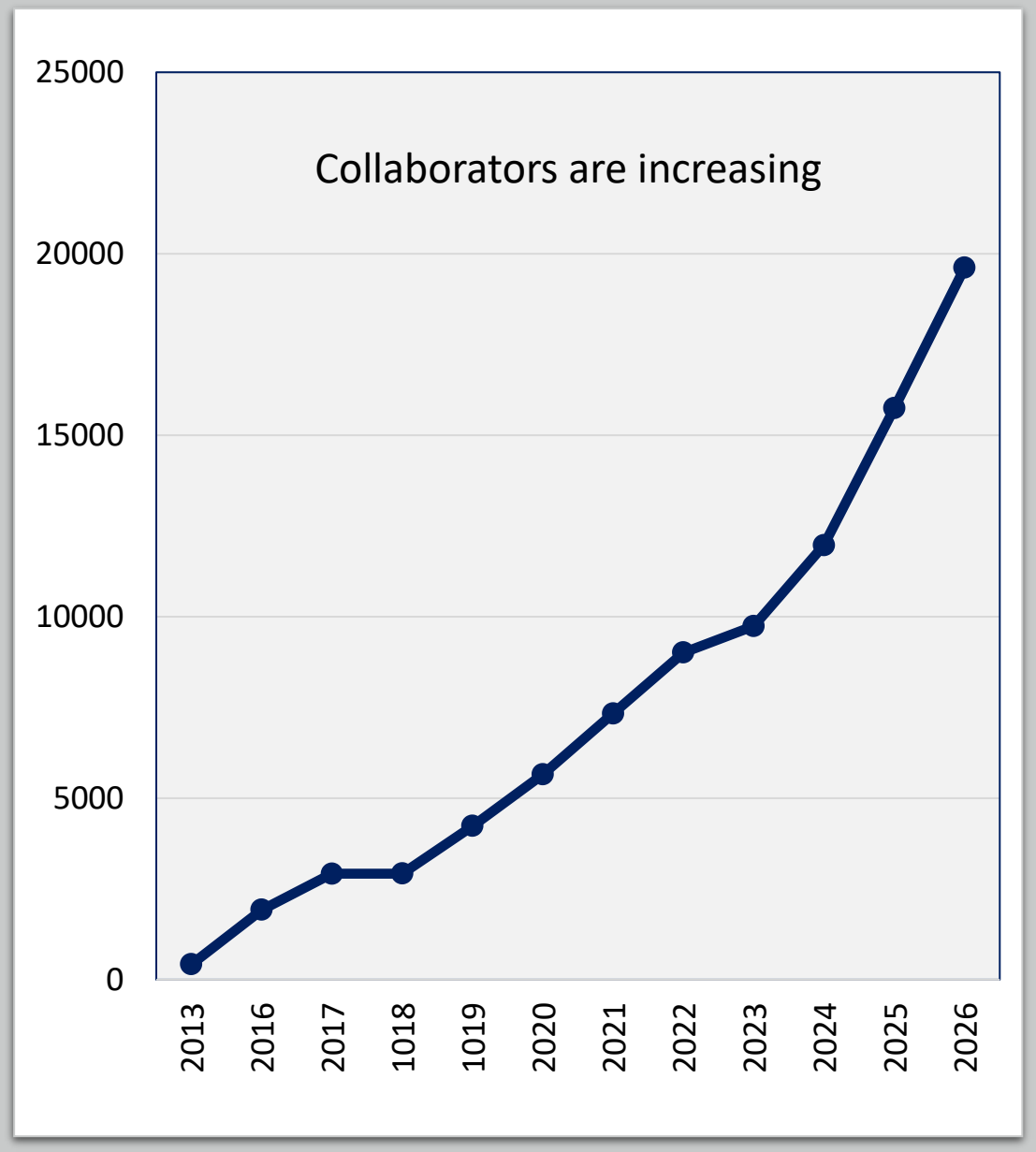
Ref. the Institute for Health Metrics and Evaluation

GBD is a collaborative undertaking

- The commitment to the network is as old as IHME.

- The network was created to diversify early GBD studies which involved few experts and little country representation.

- The network has grown from 422 individuals in 2013 to 19,612 collaborators in 2026.



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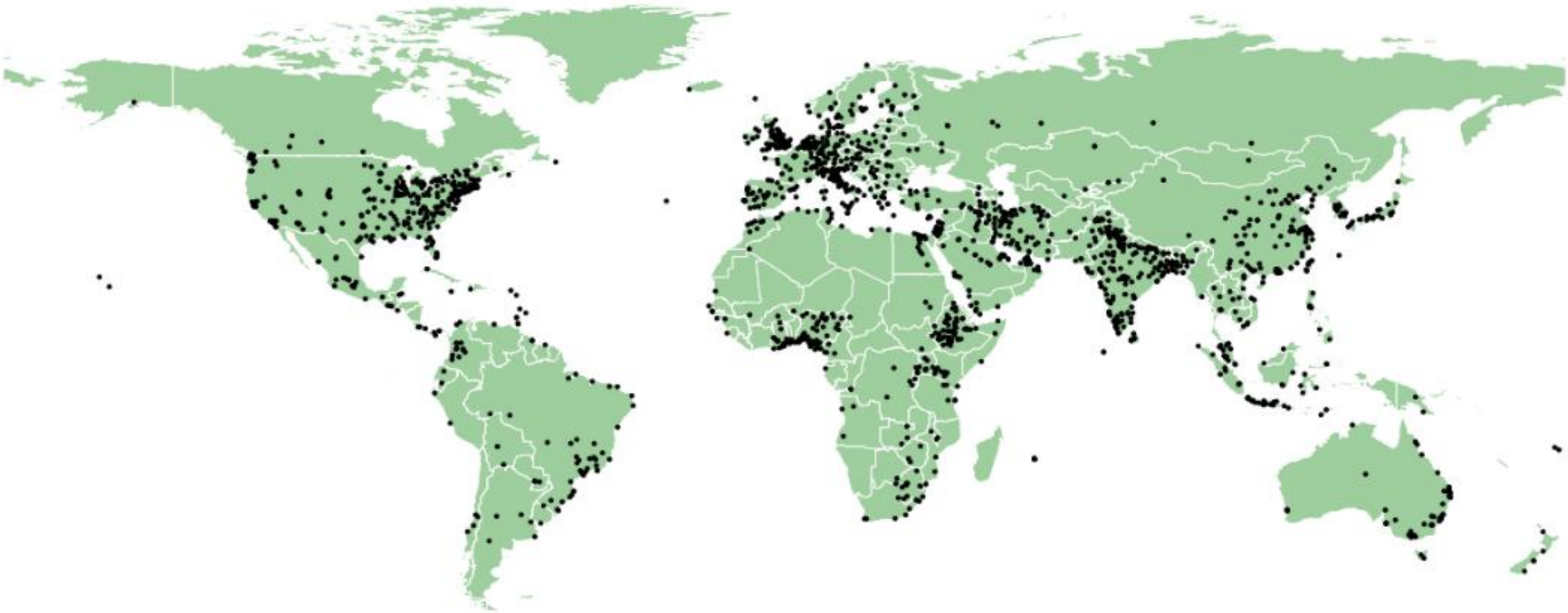
Individual collaborators come from over 2,536 institutions in 167 countries and territories



GBD in Sweden

Collaboration KI-IHME

- Sending aggregated data
- Reviewing measures
- Joint publications
- KI-IHME has a MoU

Research & teaching

- Swedish data and GBD methods to strengthen research on socioeconomic measures of health
- GBD visualization tool in global health education

Sweden have 96 (120) GBD collaborators

What are the major health problems in the world?

The world

- Locations estimated

Measuring health problems

- Key GBD measures

Visualizing the data

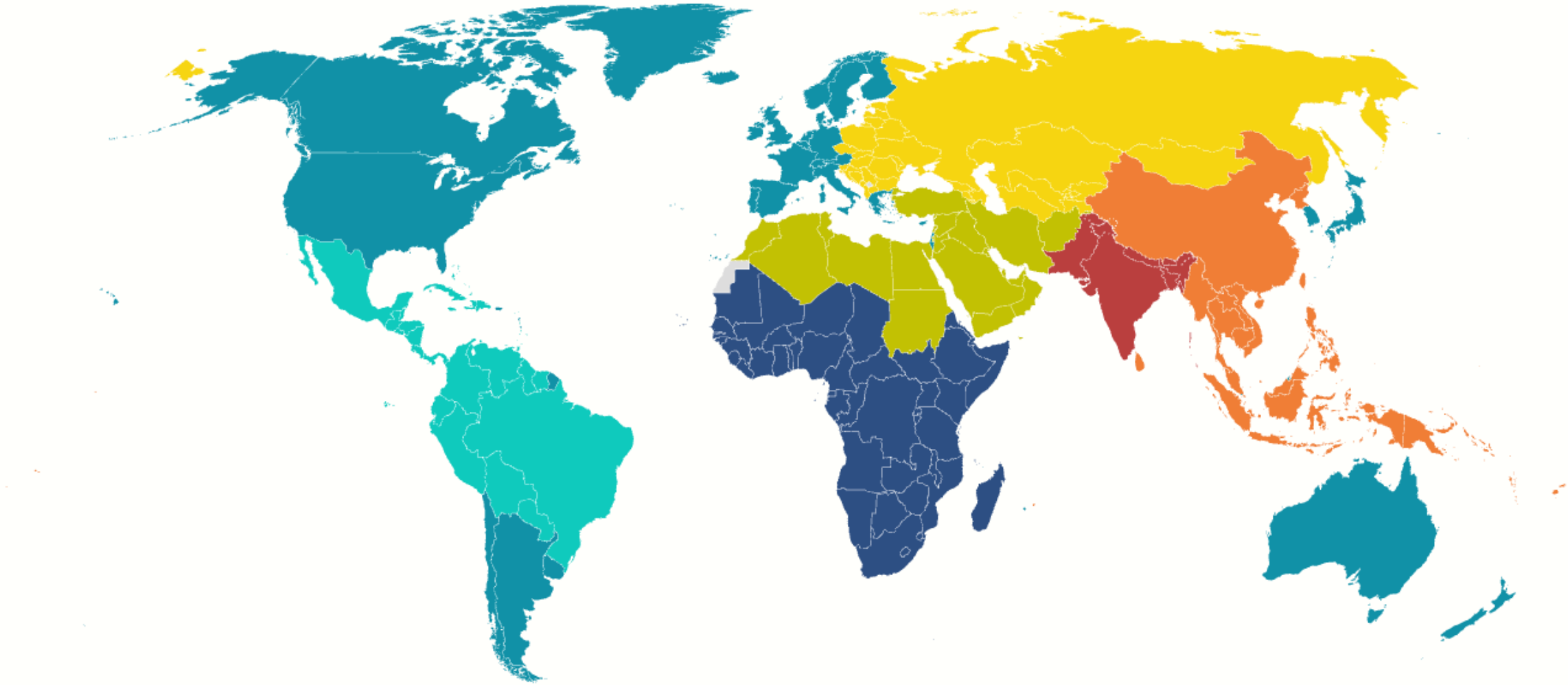
- Examples from GBD compare

Ref. the Institute for Health Metrics and Evaluation

Global Burden of Disease super-regions

Super-regions | Regions | Subnational

The seven GBD super-regions are grouped based on cause of death patterns.

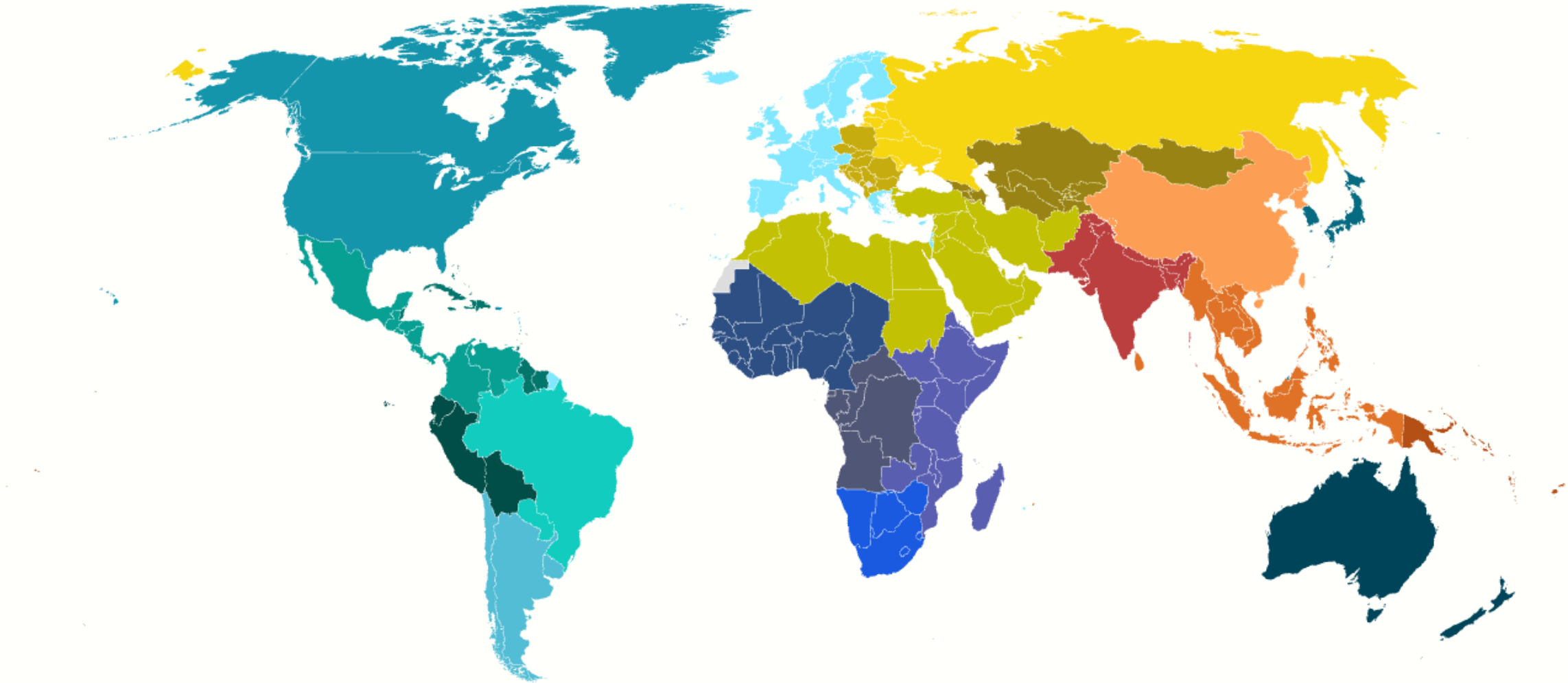


Source: GBD location hierarchy • Get the data • Created with Datawrapper

Global Burden of Disease regions

Super-regions | Regions | Subnational

The 21 GBD regions are grouped based on geographic proximity and epidemiological similarity.



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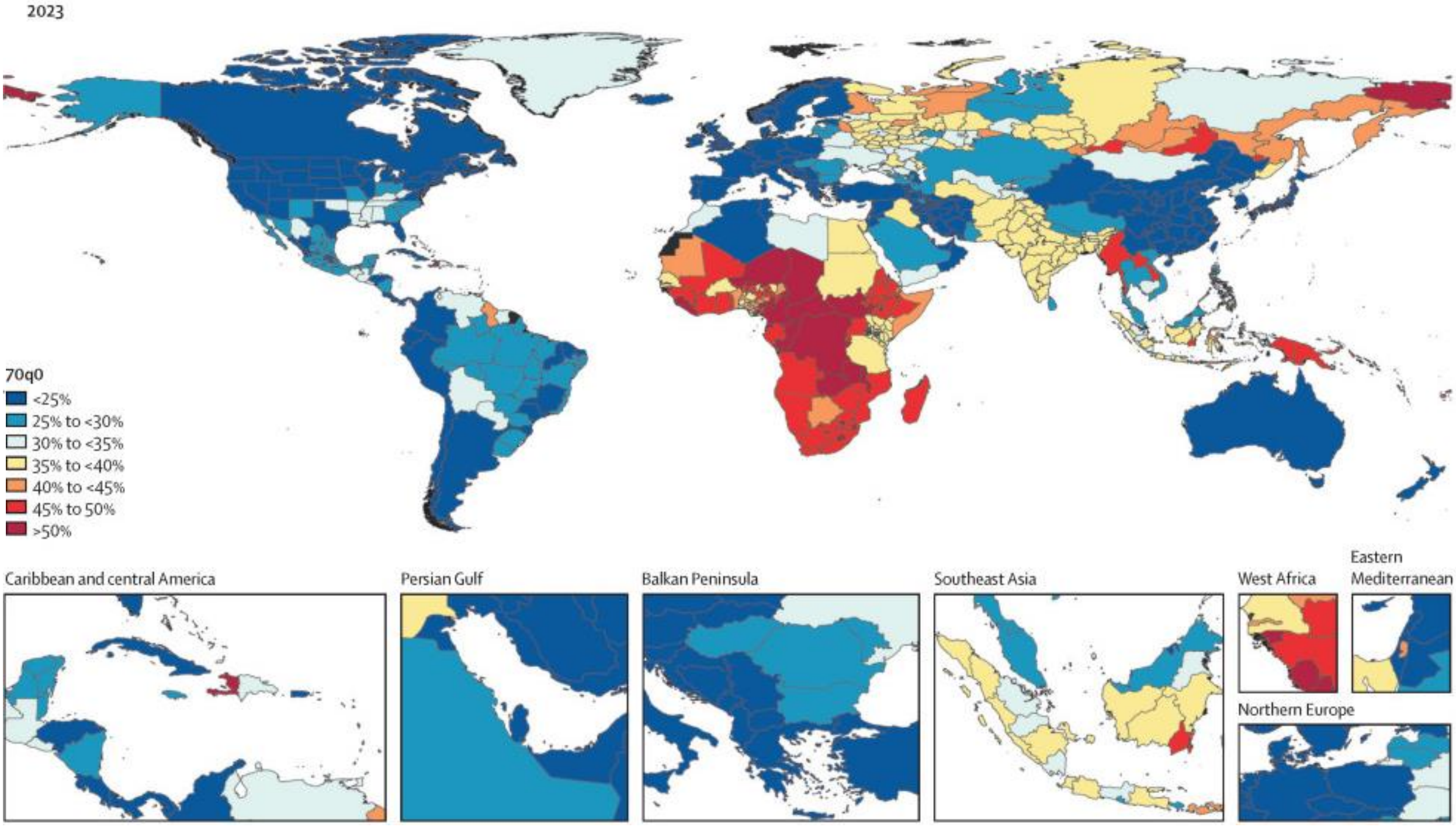
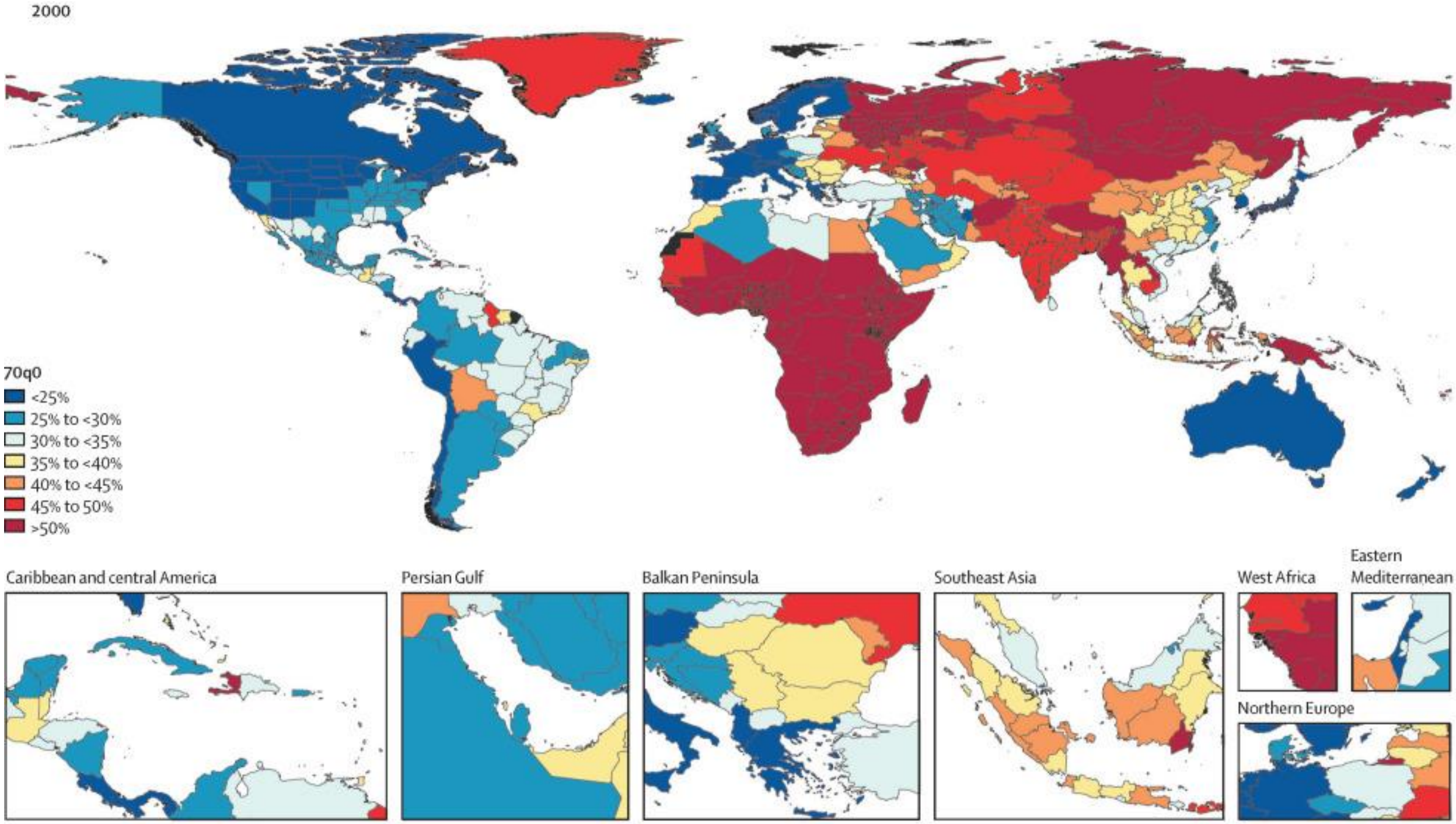

2023
70q0
<25%
25% to <30%
30% to <35%
35% to <40%
40% to <45%
45% to 50%
>50%
Caribbean and central America
Persian Gulf
Balkan Peninsula
Southeast Asia
West Africa
Eastern Mediterranean
Northern Europe


2000
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35% to <40%
40% to <45%
45% to 50%
>50%
Caribbean and central America
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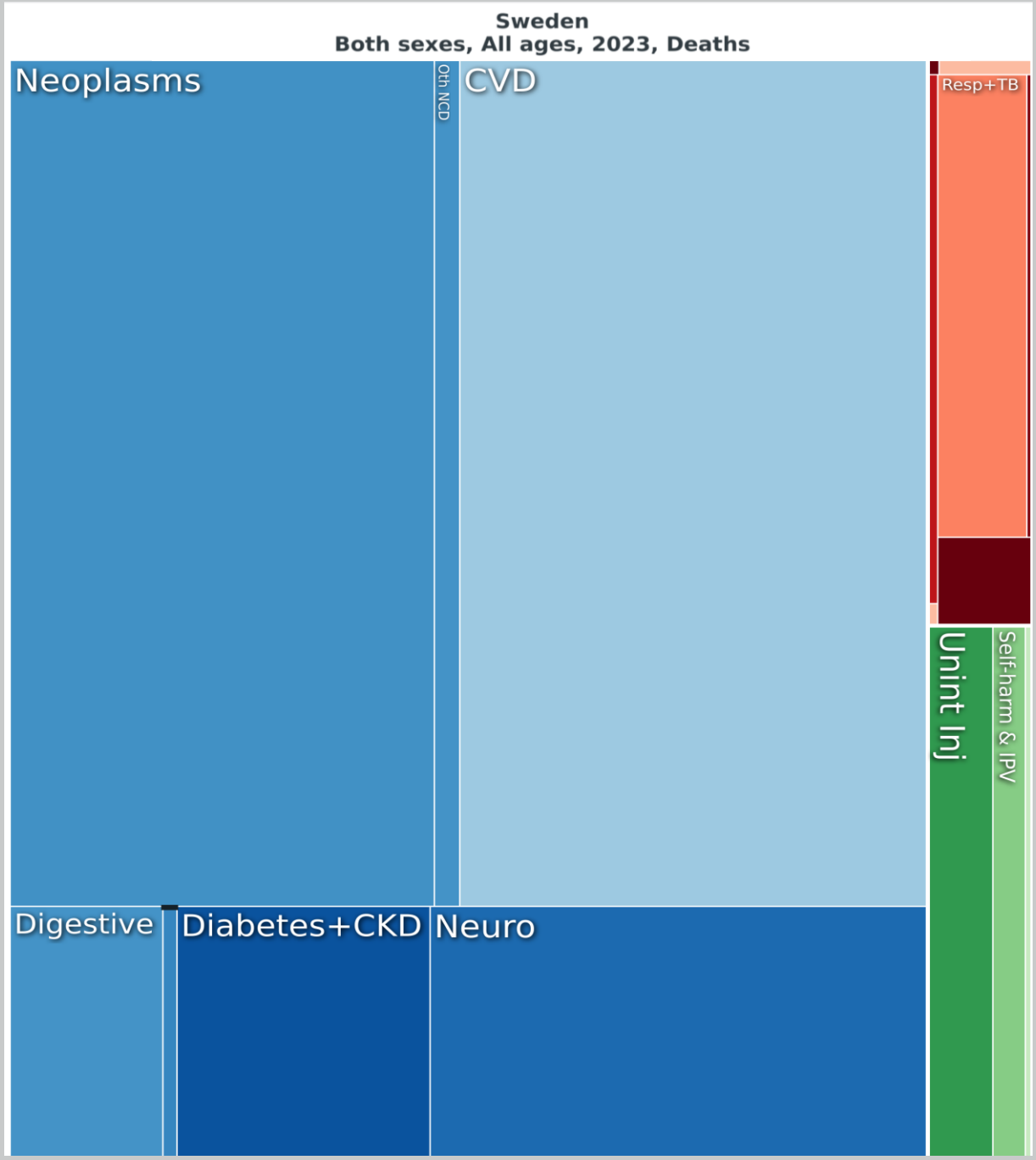
Key GBD measures

- Deaths
- Disability-Adjusted Life Years (DALYs)
- Years of Life Lost (YLLs)
- Years Lived with Disability (YLDs)
- Prevalence
- Incidence

Life Expectancy and Population Health
•Life Expectancy:
•Healthy Life Expectancy (HALE)

Risk Factor Measures
•Attributable Deaths/DALYs/YLLs/YLDs
•Summary Exposure Values (SEVs)
•Population Attributable Fractions (PAF)

Demographic and Additional Measures
•Socio-Demographic Index (SDI)
•Population:
•Fertility:
•Maternal Mortality Ratio:
•Probability of Death
•Disability Weights



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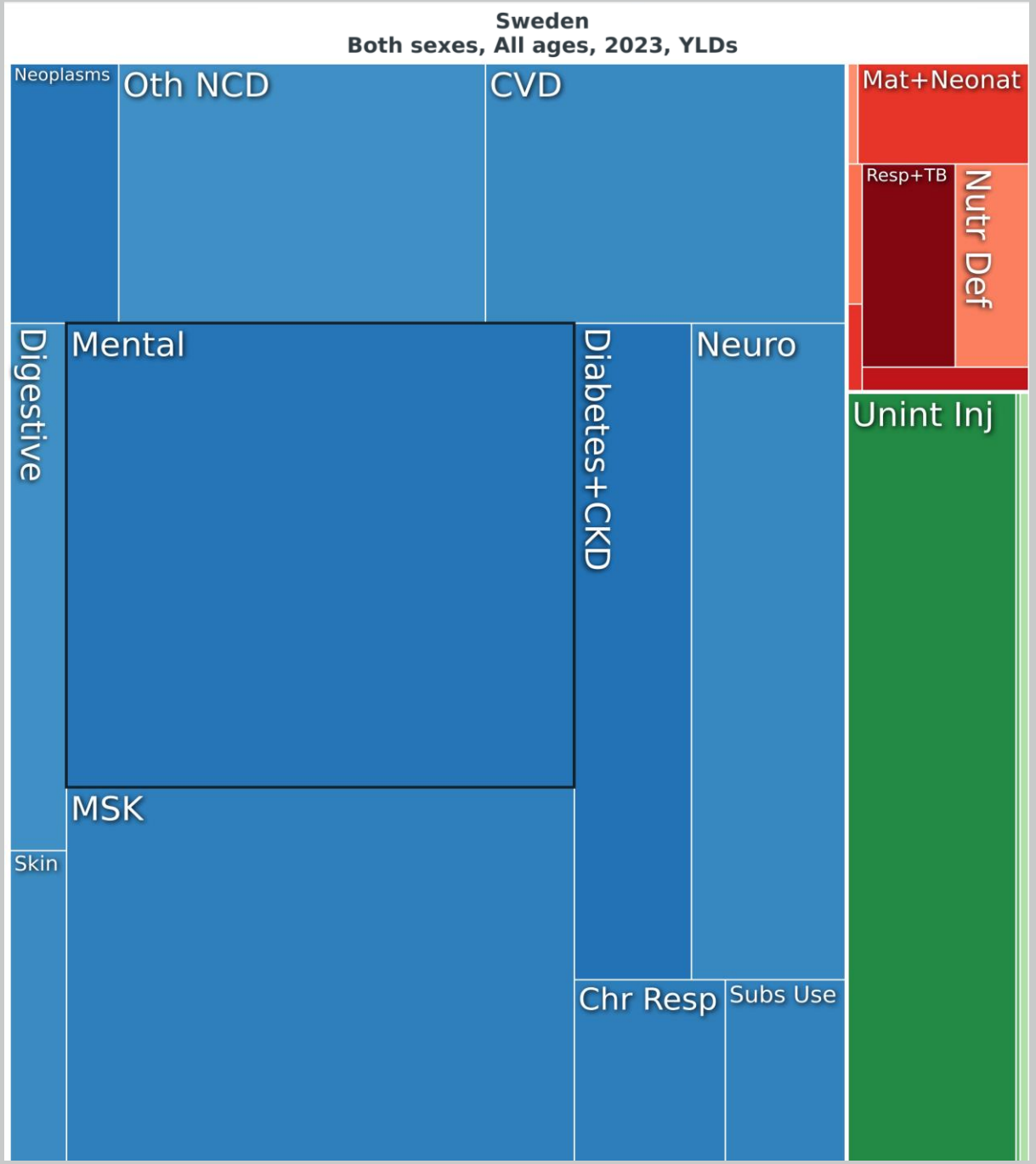

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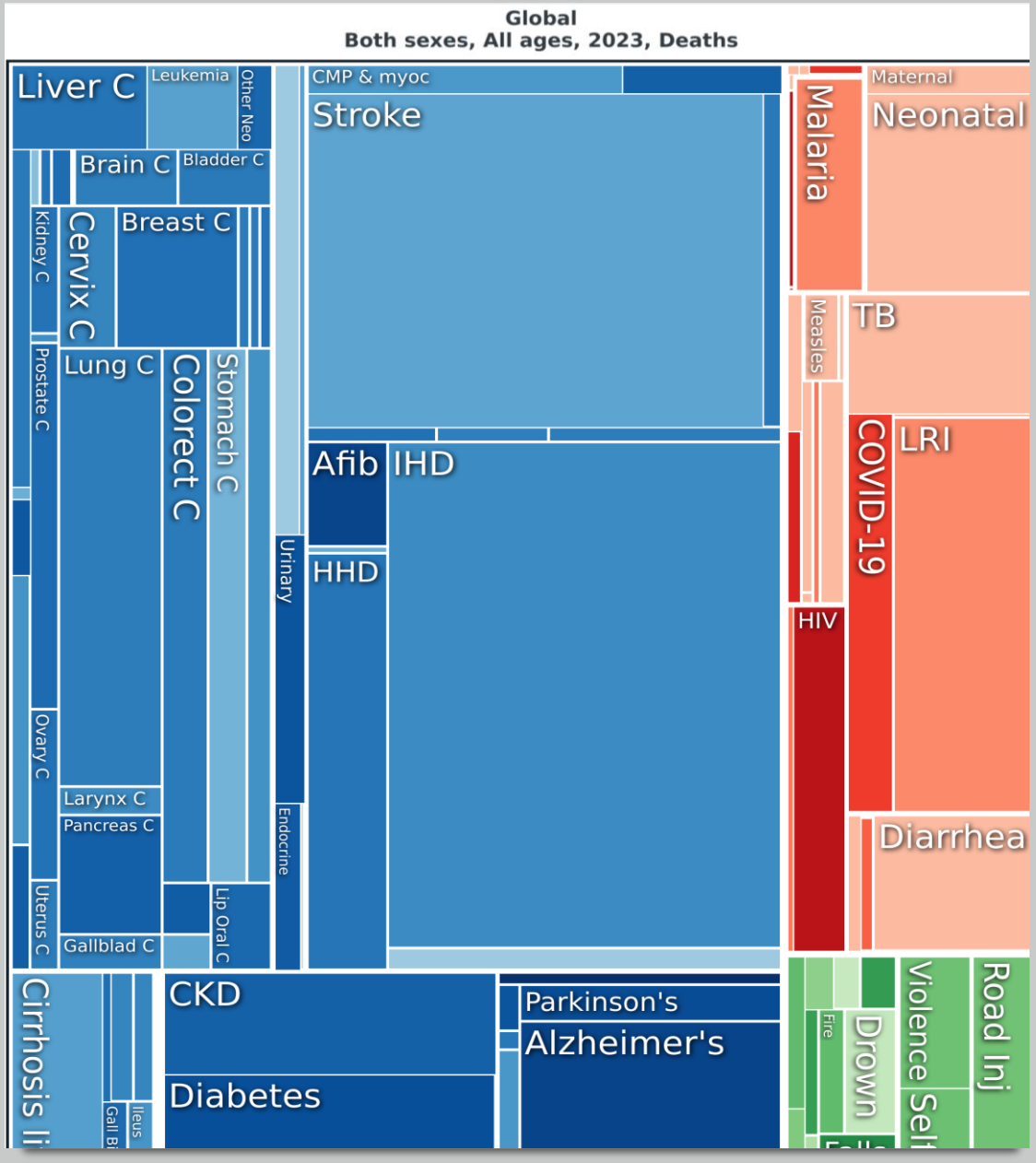
GBD Compare

Link to GBD Compare Viz tool

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

Learn how to use the tool

https://learn.healthdata.org/



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Motivating examples

1. Burden of Proof (BoP) Viz
   - Risk factors on diagnosis with Ischemic Heart Disease (IHD)

2. MICROBE Viz – Antimicrobial Resistance
   - E.coli resistant to aminopenicillin across Nordic countries

3. Population forecasting
   - Visualizing how the Swedish population changes over time

Invitation to collaborate

1. Our visualization tools are useful resources for estimates and learning tools for students and professors
2. They also function as invitations to collaborate: we invite you to use our estimates to generate further hypotheses, and we value your suggestions
3. Please contact us if you have questions or suggestions and we can help:
   - emilie.agardh@ki.se
   - vincent.mougin@ki.se
   - authia.gray@ki.se

Appendix

GBD key metrics: YLLs, YLDs, and DALYs

Years of Life Lost

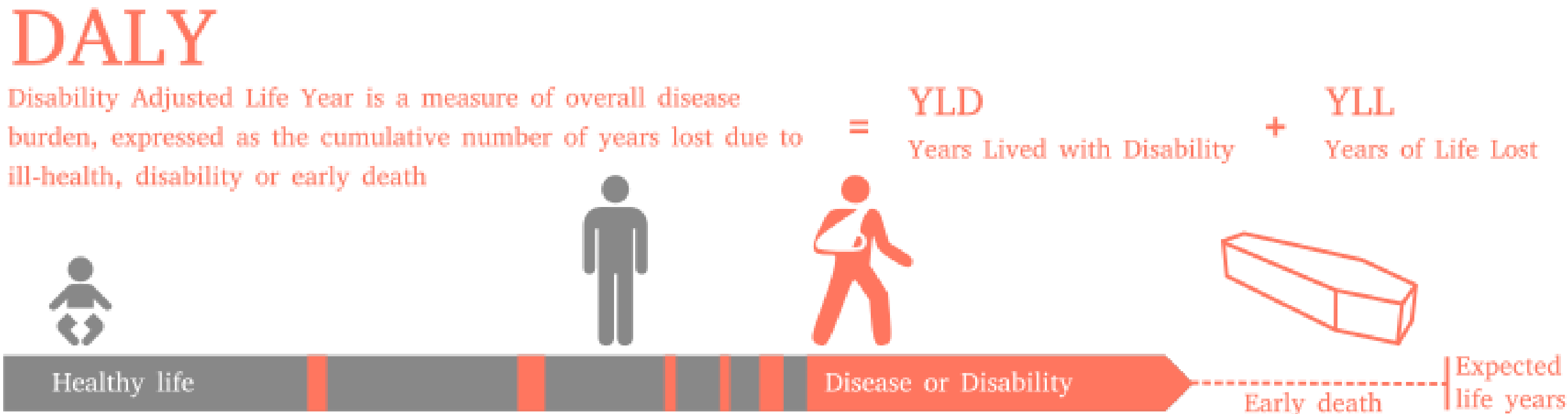
- YLLs: the difference between age at death and life expectancy

Years lived with disability

- YLDs: years of healthy life lost due to disease or injury

Disability-Adjusted Life Years

- DALYs: Combination of years of life lost to early death and disease or injury (YLLs + YLDs)



YLLs, YLDs, DALYs: an example

- A person in Sweden lives to 85 years of age, and dies of a stroke
- Expected life years: 96 (source: Japan)
- In the last 15 years of their life, they have Ischemic Heart Disease
  - 10 years of mild ischemic heart disease, disability weight: **0.033129**
  - 4 years of moderate ischemic heart disease, disability weight: **0.075904**
  - 1 year of severe ischemic heart disease, disability weight: **0.179067**
- What are the YLLs, YLDs, and DALYs for this individual?
- What do they contribute to the burden of IHD and Stroke in Sweden?