Health effectiveness: from newborn care to cancer screening

Bjorn Lomborg, Copenhagen Consensus Center

Johannesburg, July 2026

Where can we do most good?

The relevant question

If money scarce, where biggest “bang”?

- Benefit-cost analysis
  - **Some things deliver**
    - Huge benefits for small costs
  - **Some things deliver**
    - Small benefits for huge costs
  - **Many things**
    - We just don’t know how to fix

Great Investments

Maternal and Newborn health

Maternal and Newborn mortality

Nyovani Madise, African Institute for Development Policy, AFIDEP
Arindam Nandi, Center for Disease Dynamics, Economics & Policy, CDDEP
Brad Wong, Copenhagen Consensus Center
Saleema Razvi, Copenhagen Consensus Center

- Each year
  - **295,000 women die in childbirth**
  - **2.3 million children die in their first month**

Maternal and Newborn mortality

- Using WHO LIST model
  - **Estimate costs and benefits across a wide range of policies**
  - **Best combination of high-impact and high-BCR**
    - Basic Emergency Obstetric and Newborn Care (BEmONC)
    - Family Planning
  - **For 55 low and lower-middle income countries**
  - **From 68% to 90% coverage**

Basic Emergency Obstetric and Newborn Care (BEmONC)

- Health facility delivery
- Clean birth environment
- Immediate drying and additional stimulation
- Thermal protection
- Clean cord care
- Uterotonics
- Controlled cord traction/removal of placenta
- Parenteral administration of anti-convulsants
- Antibiotics for preterm or prolonged premature rupture of membranes
- Parenteral administration of antibiotics
- ~~Assisted vaginal delivery~~
- Neonatal resuscitation
- ~~Removal of retained products of conception~~
- Induction of labor for pregnancies lasting 41+ weeks
- Antenatal corticosteroids for preterm labor

Birth Asphyxia

- Kills 700,000+
- Neonatal resuscitation
  - **5% need it in Europe**
  - **Hand pump resuscitator costs $65**
  - **If used 25 times**
    - $2.60 plus health care worker time
    - About $5 to save a life



Maternal and Newborn mortality

- Costs per year
  - **Provider costs $2.7bn**
  - **Women's time $2.1bn**
  - **Incentives $0.2bn**
- Total costs: $4.9bn

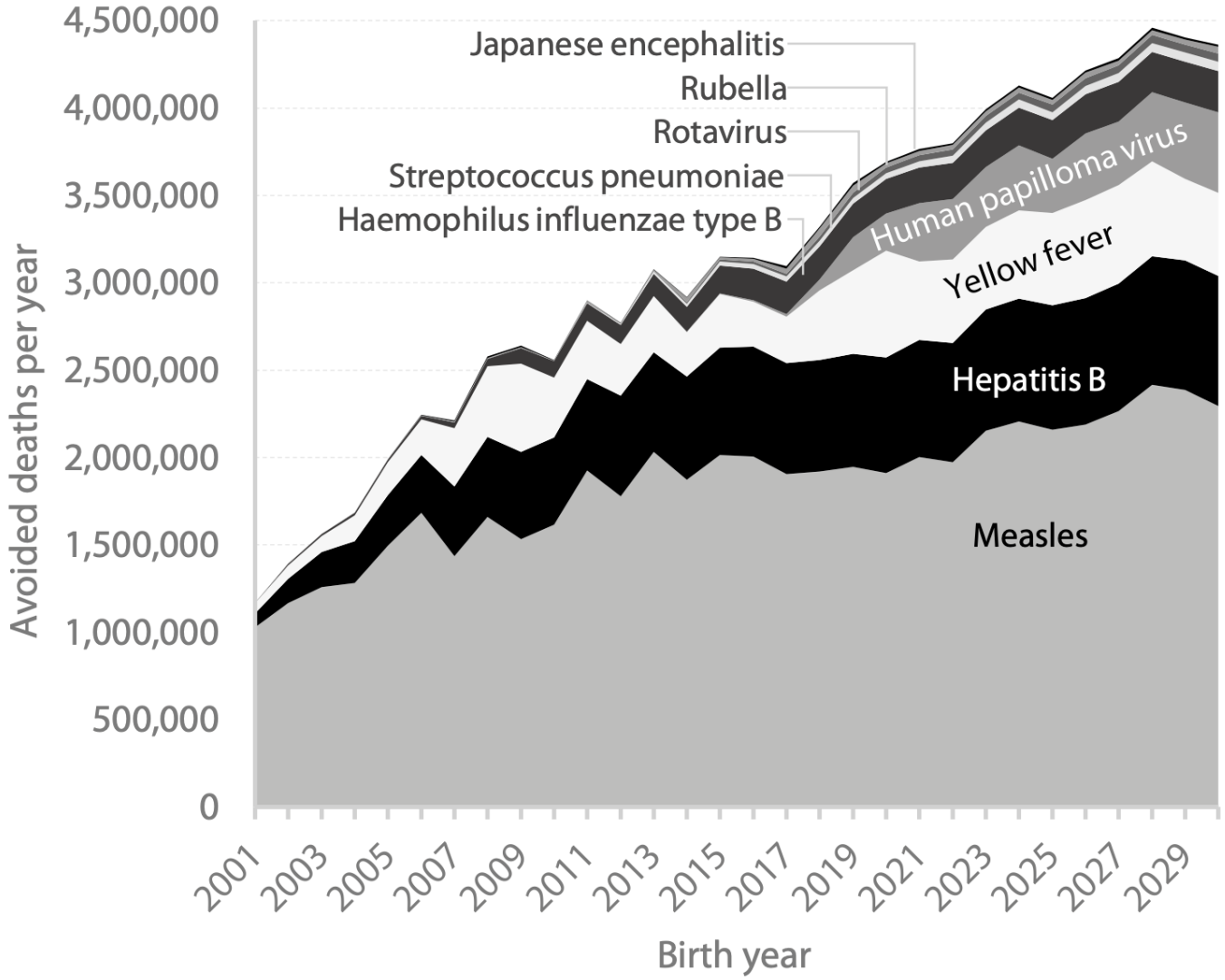
- Benefits
  - **Save 166,000 mothers, $32bn**
  - **Save 1.2 million children, $482bn**
  - **Demographic dividend, $41bn**
- Total benefits, $559bn

- BCR is **114** (=$559/$4.9)

Great Investments

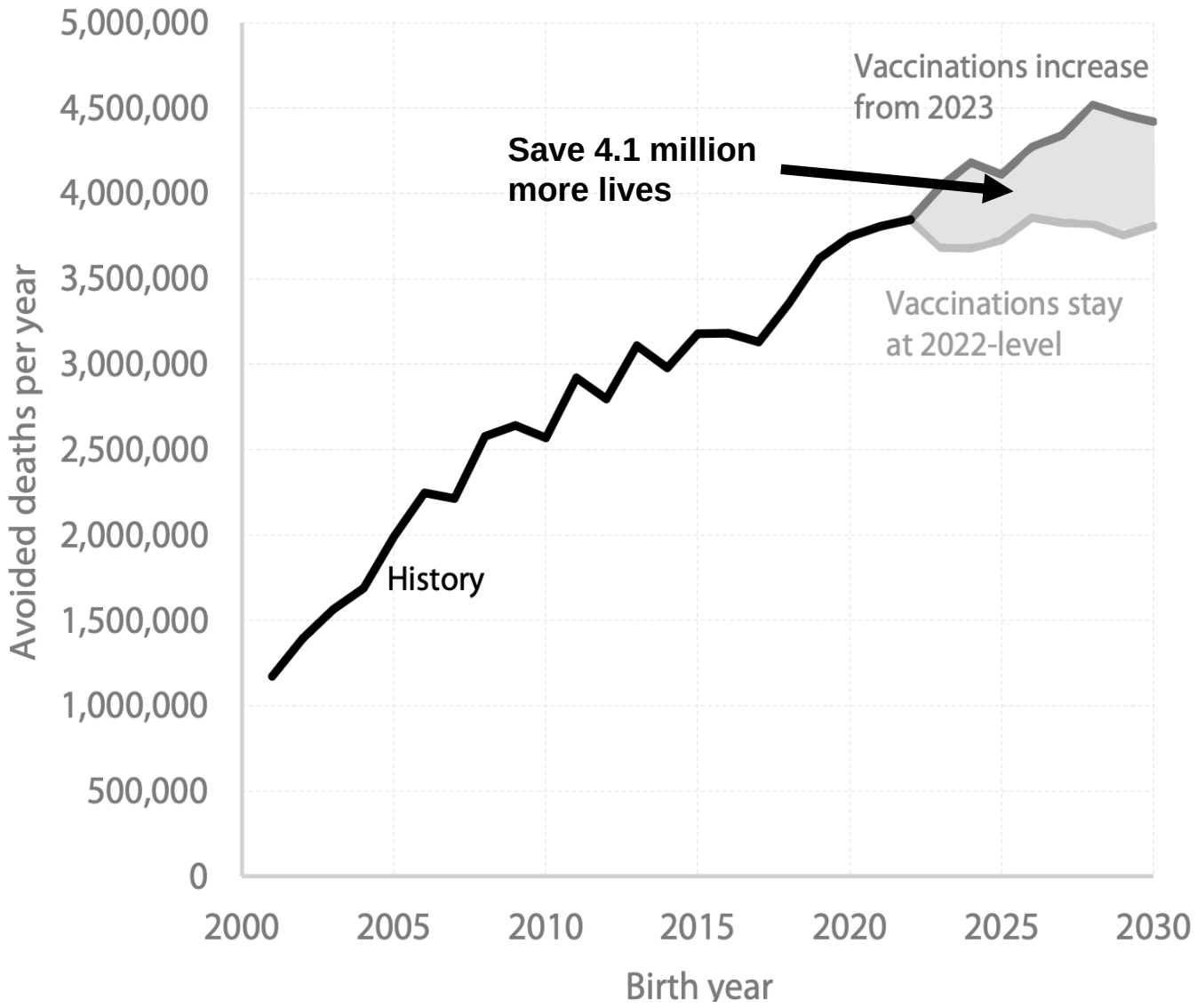
Childhood Immunization

Vaccines save lives



COPENHAGEN CONSENSUS CENTER

Save more lives



COPENHAGEN CONSENSUS CENTER

Cost-Benefit of Vaccinations

	Additional vaccinations	Baseline vaccination program, 2022-levels
Benefit	$167	$1,070
Cost	$1.7	$3.7
BCR	101	286

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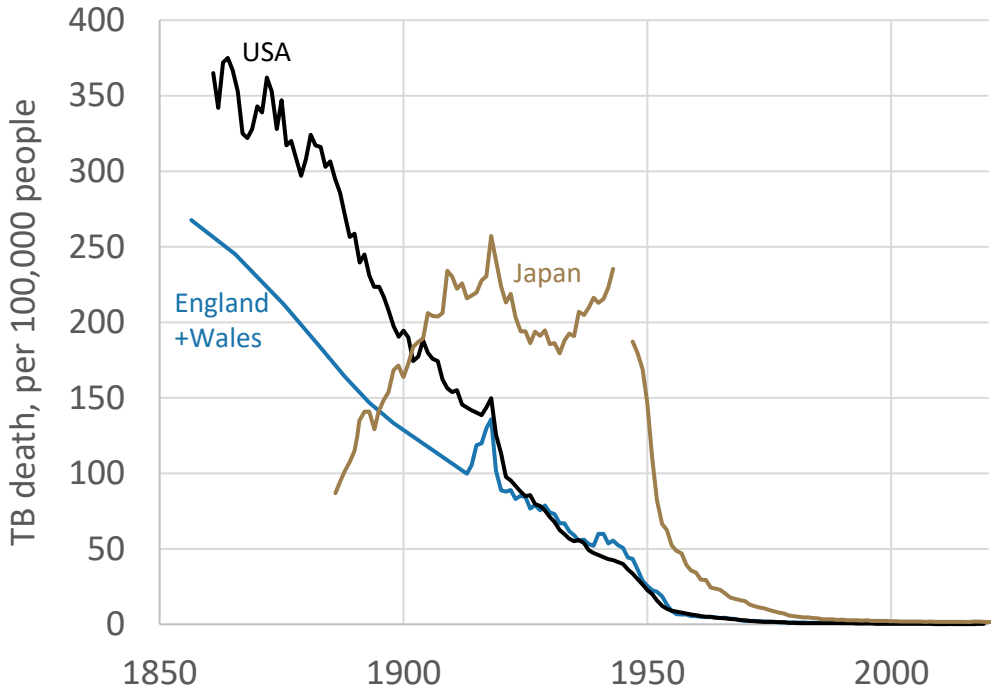
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Tuberculosis

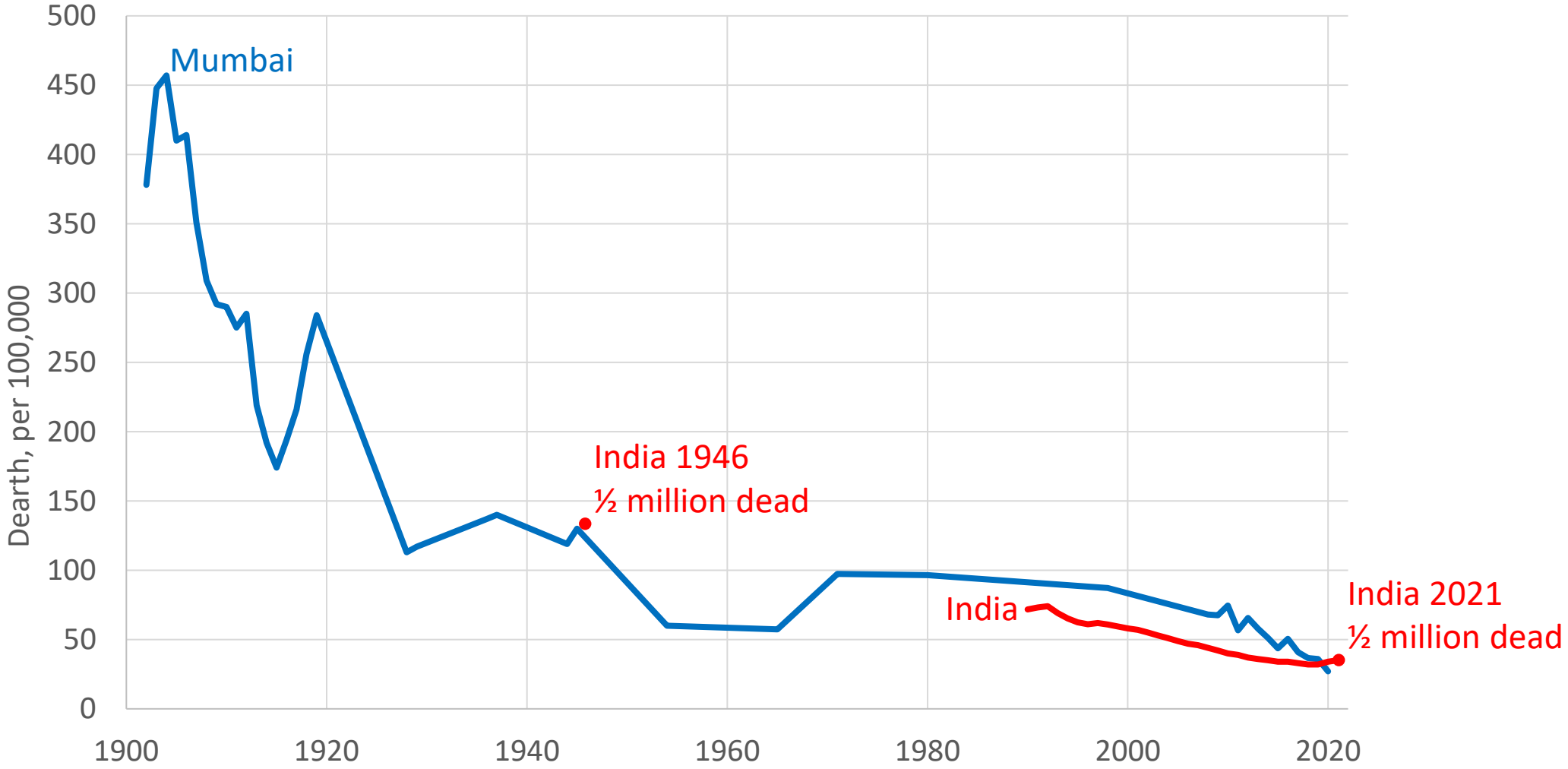
Carel Pretorious, Avenir Health
Nim Arinaminpathy, Imperial College
Sandip Mandal, Indian Council of Medical Research Suvanand Sahu, Stop TB
Madhukar Pai, McGill University
Roland Mathiasson, Copenhagen Consensus
Brad Wong, Copenhagen Consensus

Tuberculosis

- Again, world's leading infectious disease killer
- Killed a billion people over past 2 centuries
- Killed every 4th person in Europe in 1800s
  - **But fixed**

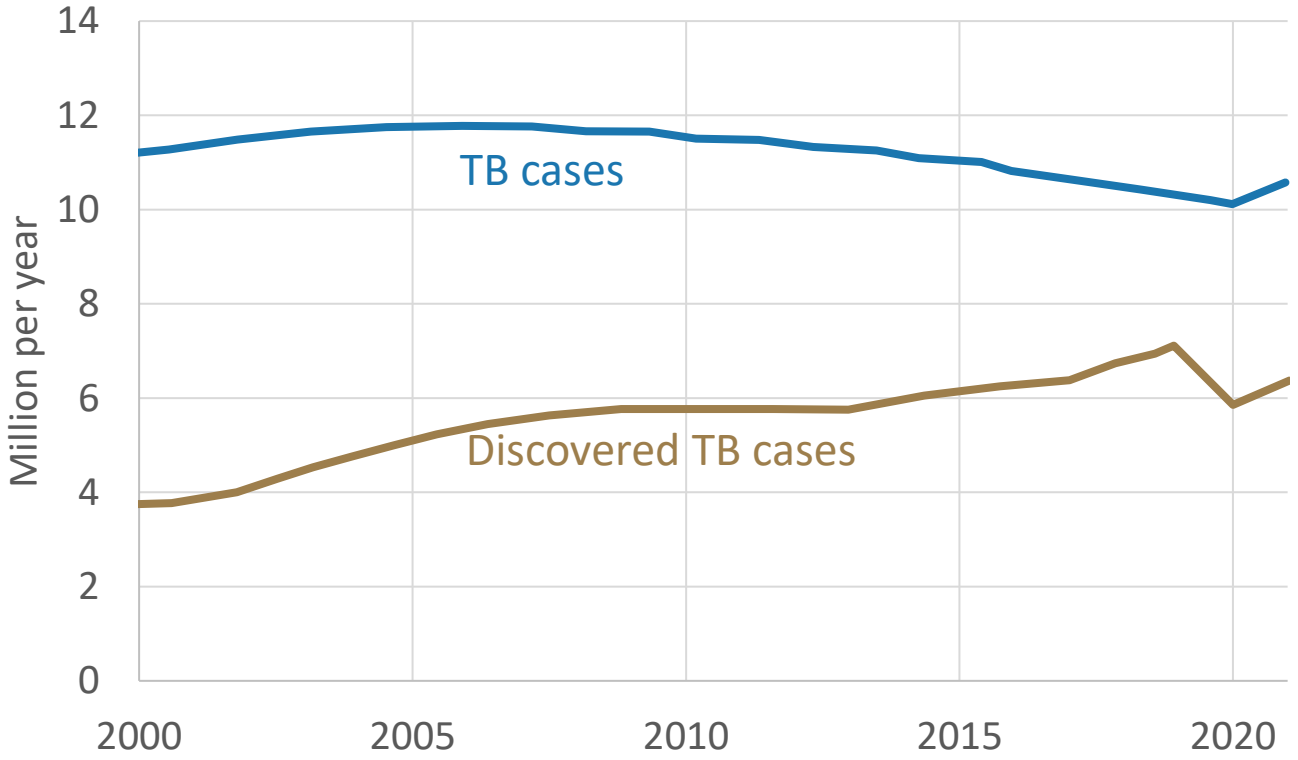


Tuberculosis – not fixed in poorer world

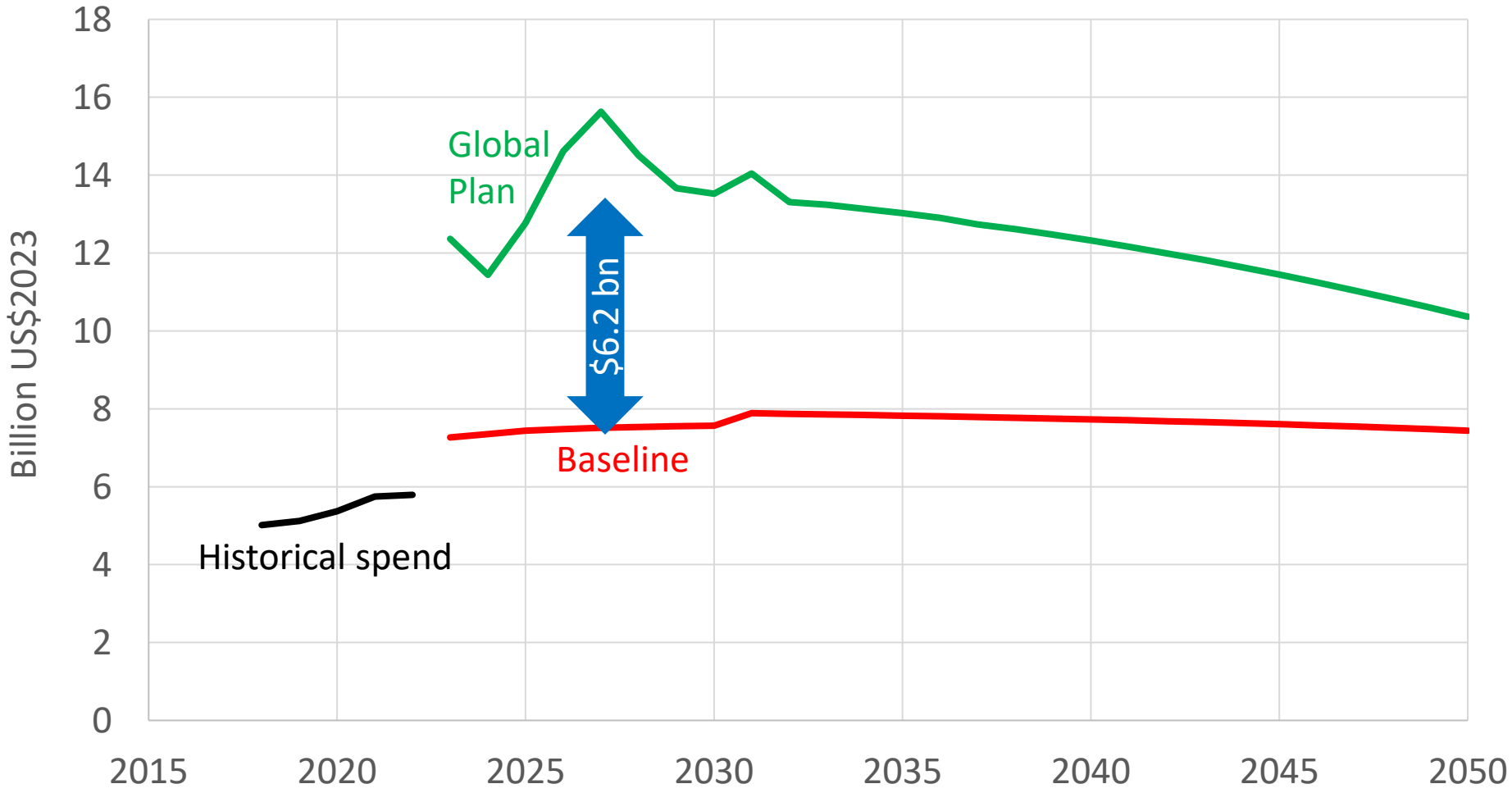


Tuberculosis: Two main problems

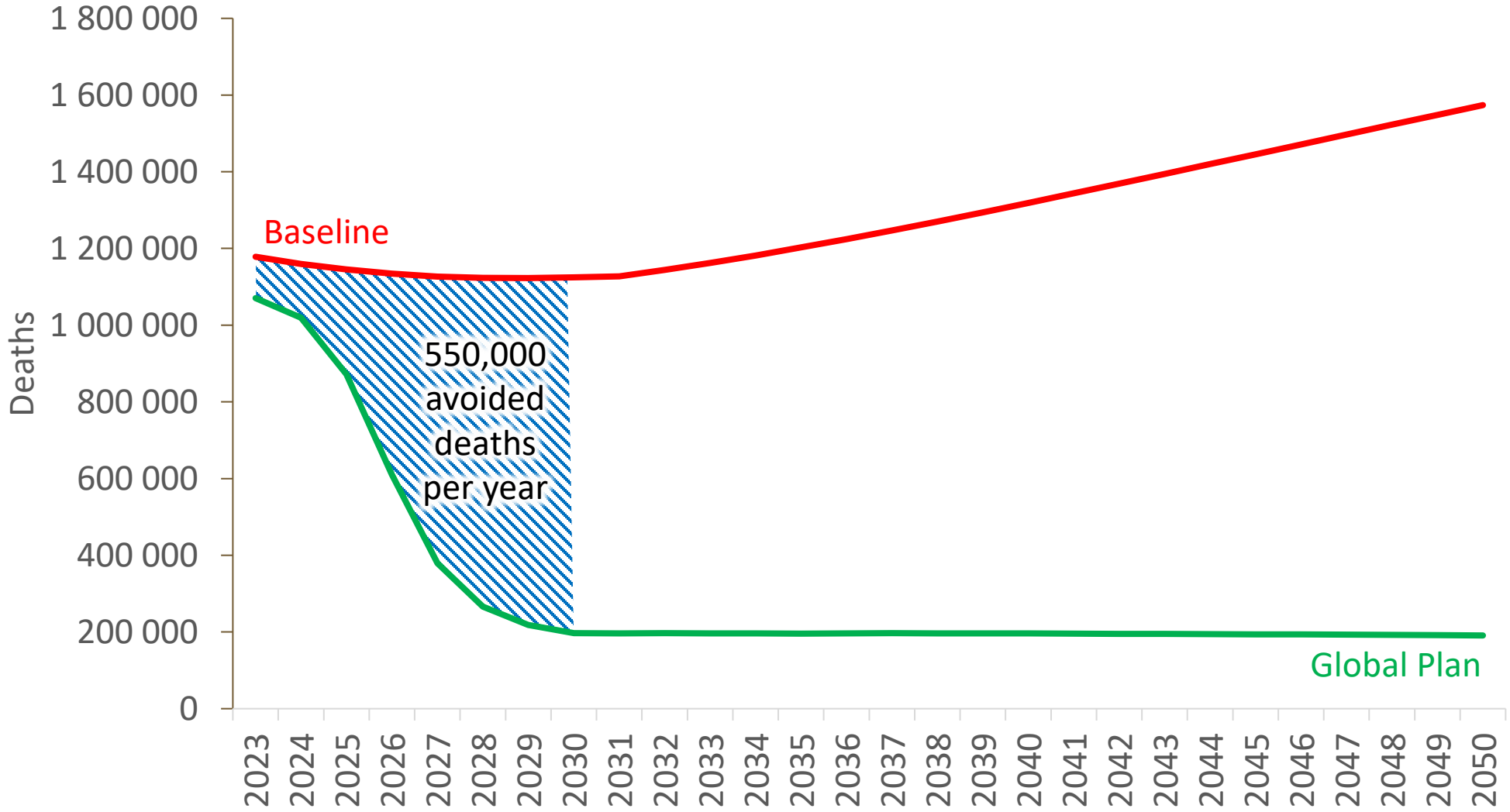
- Getting people to take medication
- Finding everyone with tuberculosis



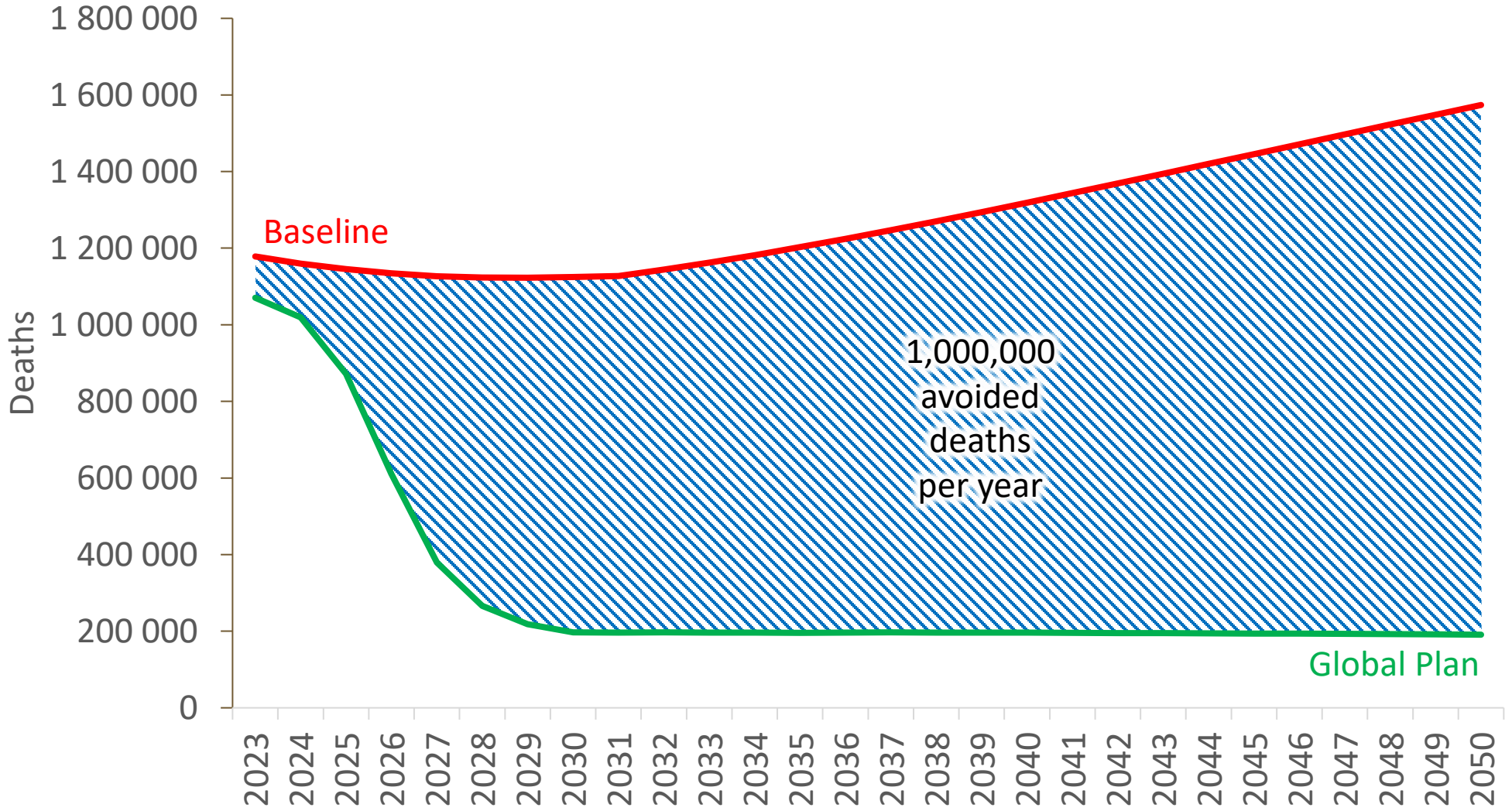
Cost of fixing tuberculosis



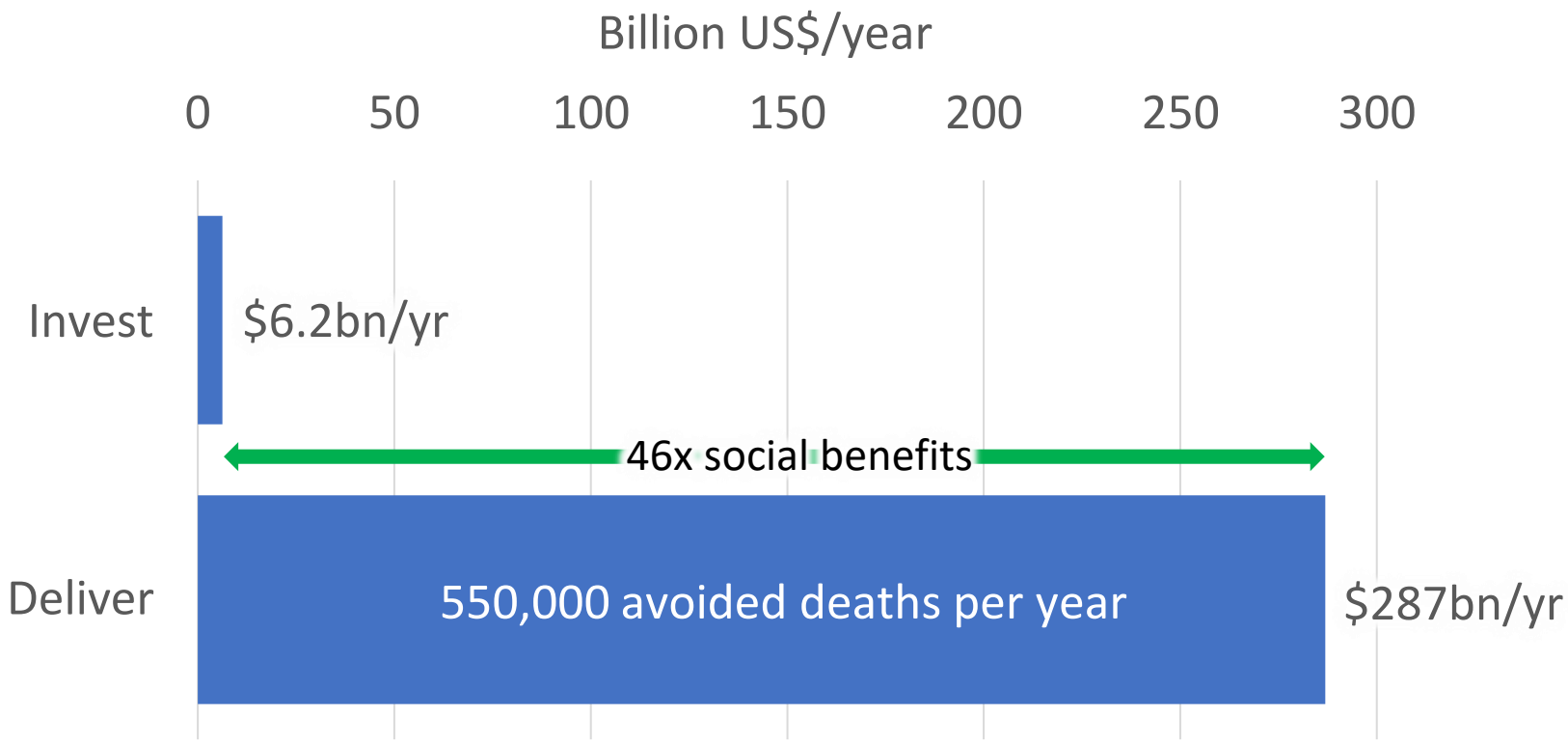
Benefits of fixing tuberculosis



Benefits of fixing tuberculosis



Tuberculosis: one of world's best solutions



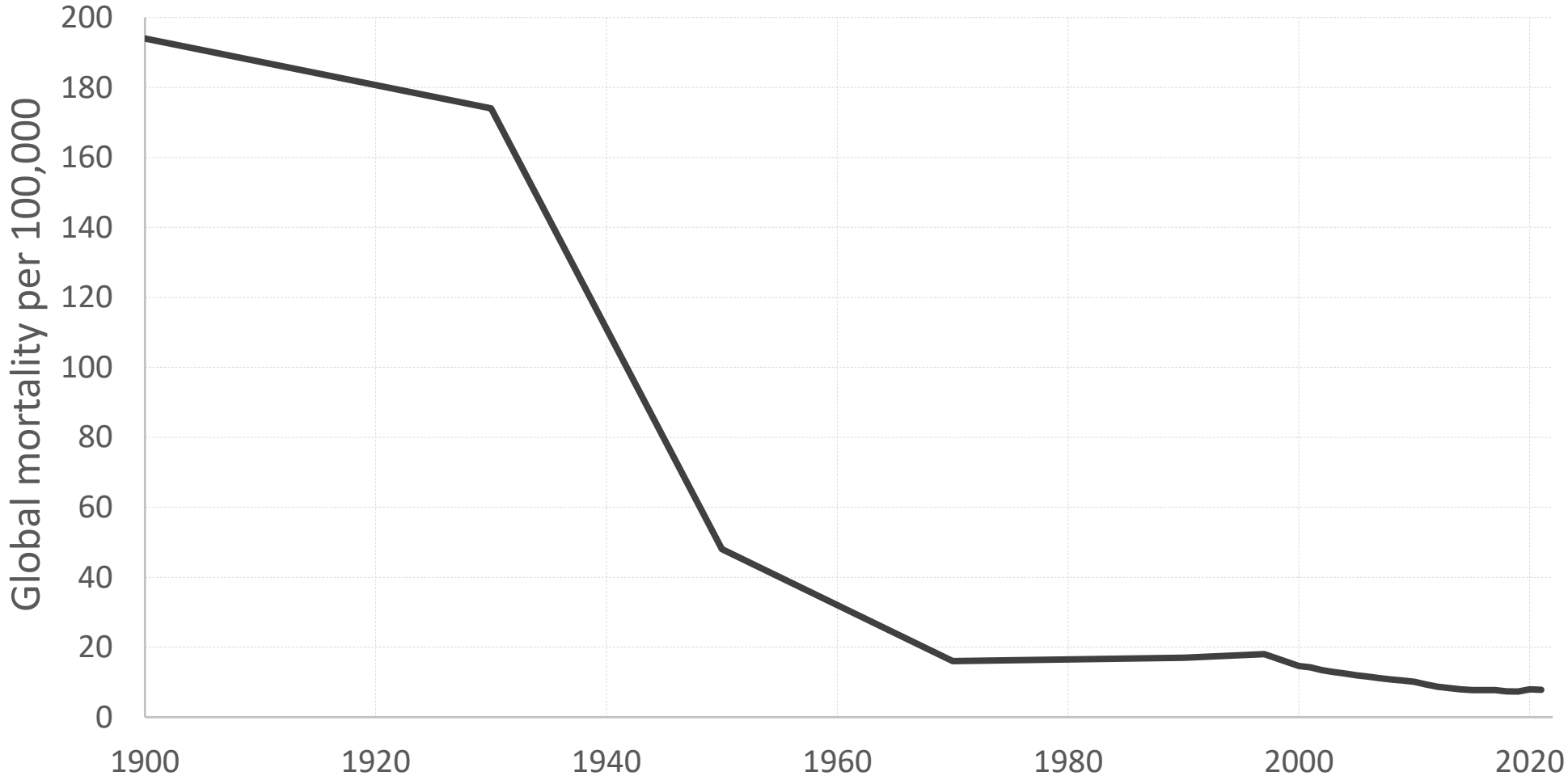
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Malaria

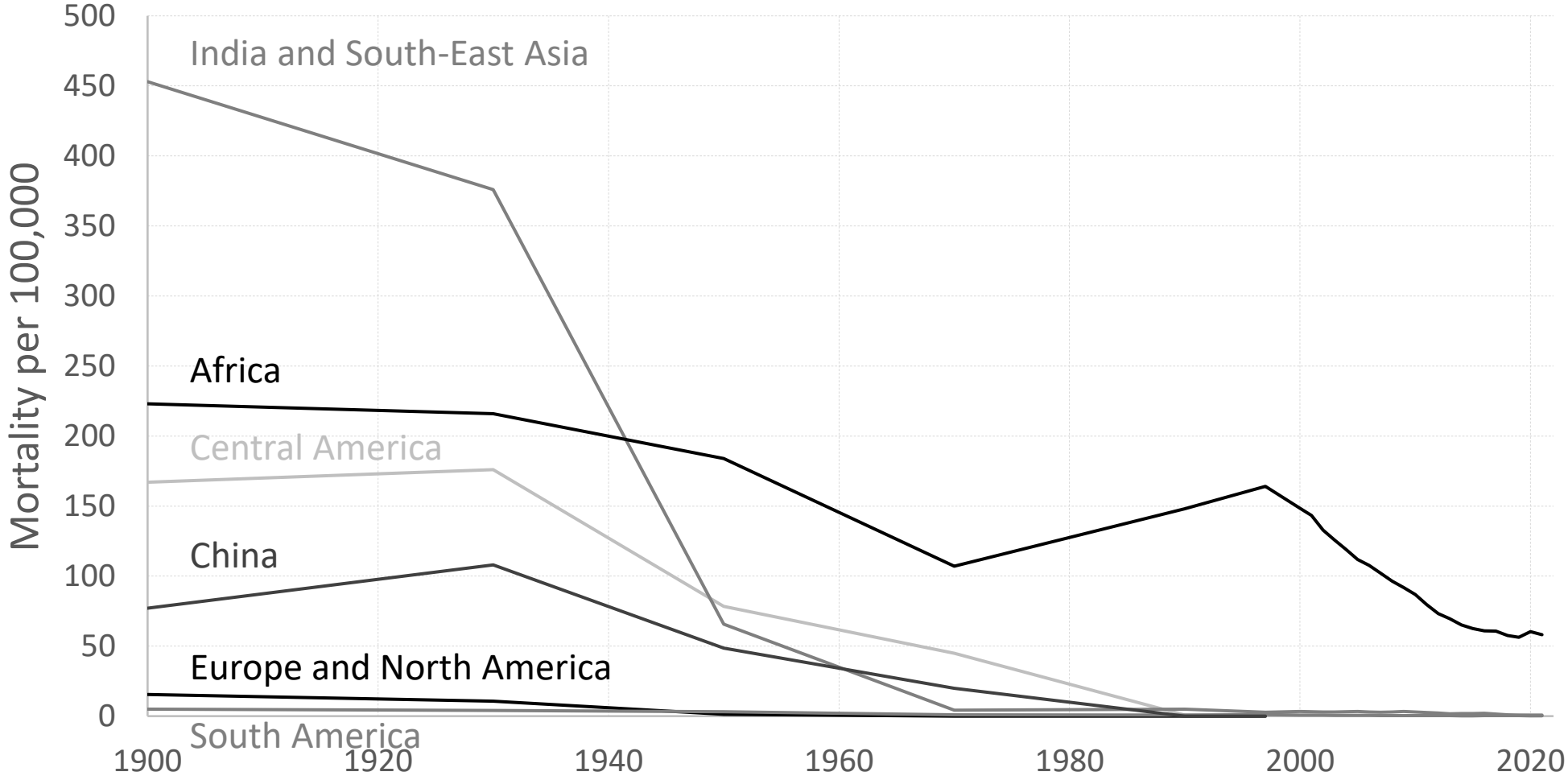
Malaria

- Incorrectly think of it as a tropical disease
- Thrived in Siberia and the Arctic Circle
  - **1924, 5.5 million annual cases in Soviet Union**
  - **During WWII, Moscow still 20% annual malaria**
- Endemic in 36 states up to 1940s, including
  - **Michigan, New York, Oregon, Washington and Wisconsin**
- From 1900-1930, killed 90 million people
  - **More than both world wars**

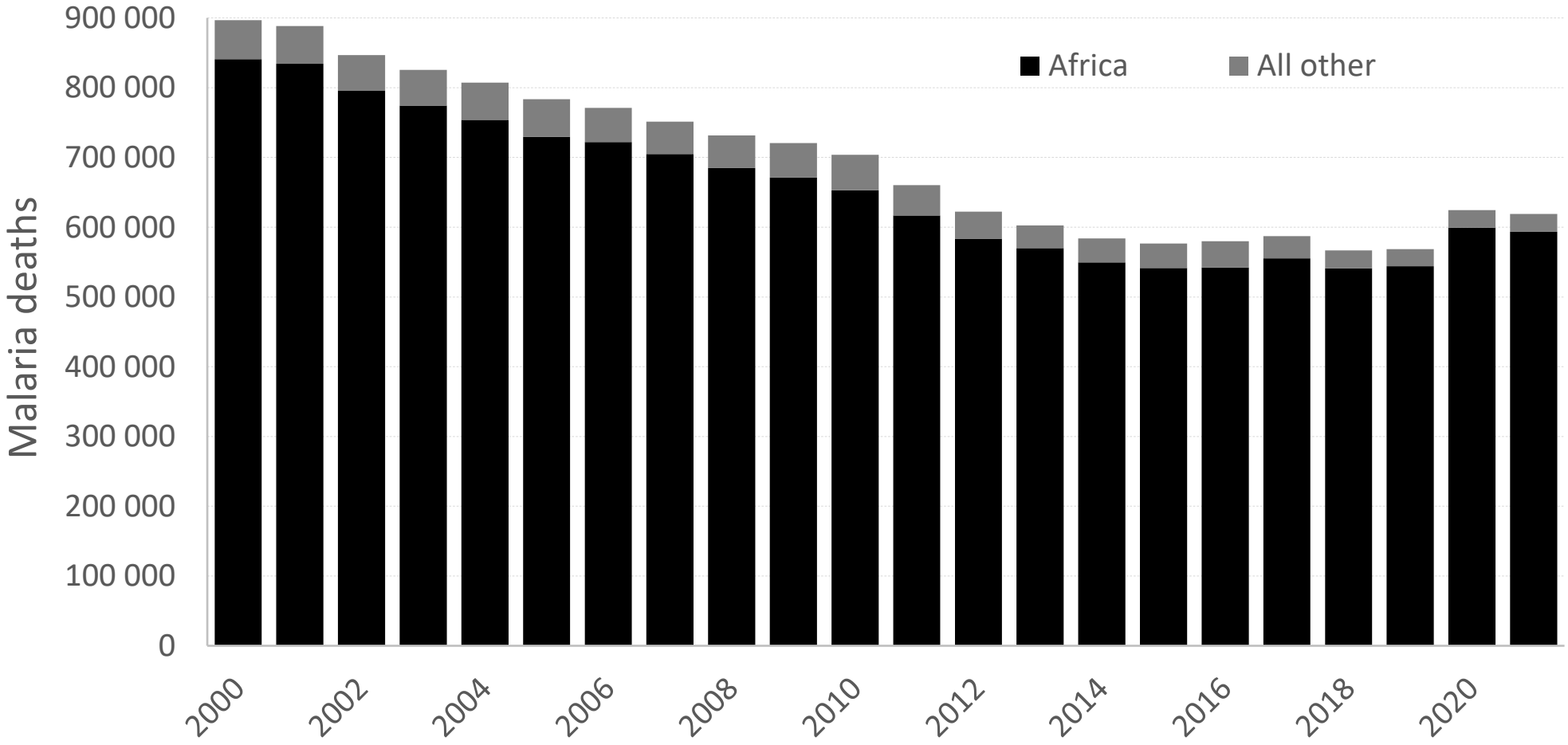
Global malaria death rate 1900–2021



Regional malaria death rates 1900–2021



Malaria deaths 2000–21 for Africa and all other regions.



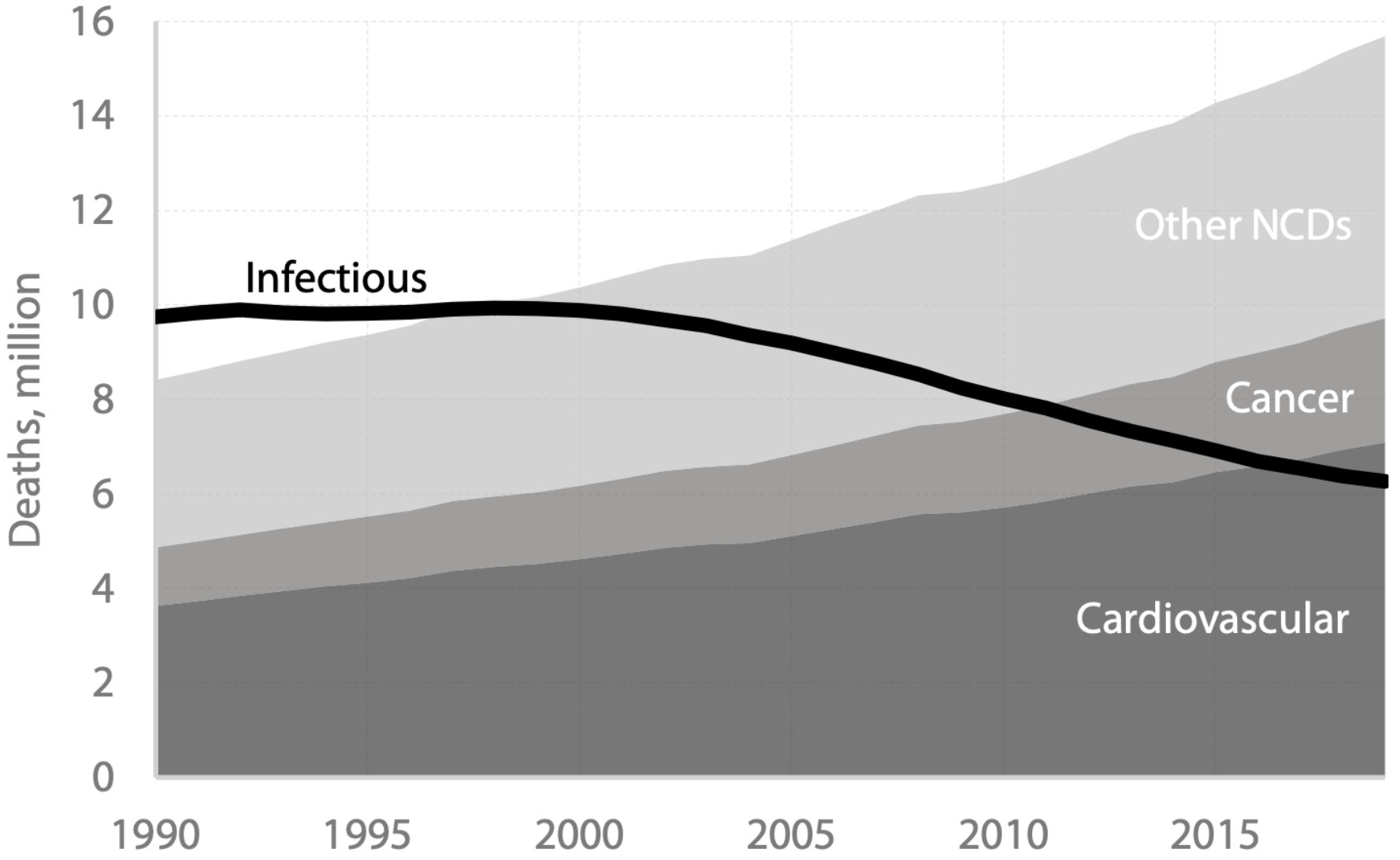
More bednets: Benefits and costs

Benefits		
	Avoided healthcare costs	$8.9
	Avoided productivity loss	$47.9
	Avoided death	$259.3
	Total benefits	**$316.0**
Costs		
	Nets and campaign	$6.6
Benefit-Cost Ratio		**48**

Great Investments

Chronic Diseases

Chronic and infectious disease, low- and lower-middle income countries



Chronic and infectious disease, low- and lower-middle income countries

	Deaths avoided	Costs	BCR
Aspirin for suspected heart attack (ACS)	2,949	$3	63
Heart failure chronic treatment	346,556	$551	41
Early-stage breast cancer treatment	7,130	$20	39
Epilepsy: Acute and chronic treatment	8,297	$220	32
Injection drug use harm reduction	3,647	$119	30
Depression: Chronic treatment	2,819	$141	23
Pulmonary rehabilitation	16,528	$52	21
Cardiovascular: Primary prevention	931,401	$3,467	16

	Deaths avoided	Costs	BCR
Heart failure: Acute treatment	756,387	$4,096	12
Appendicitis management	5,705	$116	8
Medical management of heart attack	262,231	$2,185	7
Asthma/COPD: Acute treatment	288,465	$3,641	6
Cardiovascular: Secondary prevention	640,195	$6,864	6
Repair of gastrointestinal perforations	1,744	$35	4.4
Cervical cancer screening and treatment	57,989	$1,522	4.2
Bowel obstruction management	38,304	$1,488	3.1
Early-stage colorectal cancer treatment	5,855	$160	3.0
Alcohol use screening/brief intervention	8,340	$1,314	1.8
Acute ventilatory failure management	3,217	$147	1.6
Schizophrenia: Chronic treatment	23	$763	1.4
Asthma/COPD: Chronic treatment	18,032	$1,659	1.2
Hernia repairs	25,559	$6,797	1.0
Unclogging heart arteries	19,132	$1,474	1.0
Bipolar disorder: Chronic treatment	84	$2,425	0.8
Diabetes: Screening and treatment	103,882	$20,124	0.6

CBA toolkit:
Value of Statistical Life and DALYs

Value of Human Life in Cost-Benefit Analysis

- How do we value lives saved in CBA?
- Critical for health, safety, and social interventions
- Key concepts:
  - **Value of Statistical Life (VSL)**
  - **Disability-Adjusted Life Years (DALY)**
  - **Value of Statistical Life Year (VSLY)**
  - **Global Burden of Disease (GBD)**

Why Value Human Life?

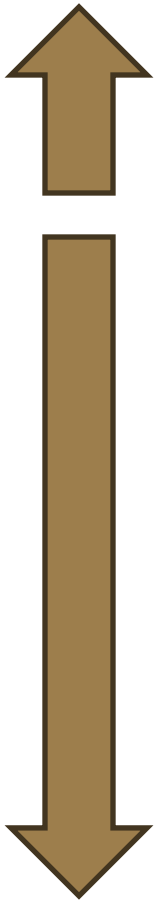
- Policy decisions involve life-death trade-offs
  - **Healthcare: Which treatments to fund?**
  - **Safety: How much to spend on road safety?**
  - **Environment: Air pollution controls?**
- Need consistent, evidence-based approach
- Two main frameworks:
  - **1. Value of Statistical Life (VSL)**
  - **2. Disability-Adjusted Life Years (DALY)**
- Both widely used in cost-benefit analysis

Disability-Adjusted Life Years (DALY)

- Measures the overall burden of disease by capturing both premature death and reduced quality of life due to illness or disability.
- DALY = Years of Life Lost (YLL) + Years Lived with Disability (YLD)
- Years of Life Lost (YLL):
  - Death at age 30, life expectancy 80 → YLL = 50 years
- Years Lived with Disability (YLD):
  - 10 years with disability (weight 0.5) → YLD = 5 years
- Example: Person dies at 30 after 10 years of illness
  - YLL = 80 - 30 = 50 years
  - YLD = 10 years × 0.5 = 5 years
  - Total DALY = 50 + 5 = 55 DALYs
- 1 DALY = 1 year of healthy life lost

Loss of health = Disability Weights

0 DALY = healthy



0.004 - Anemia, mild

0.006 - Infectious disease, acute episode, mild

0.015 - Controlled asthma

0.030 - Mild anxiety disorders

0.099 - Moderate malaria with moderate anemia

0.237 - Decompensated cirrhosis of the liver; Heart failure, moderate

0.451 - Metastatic phase of cancer

0.495 - Tuberculosis, HIV infected and anemia, severe

0.584 - Stroke, long-term consequences, severe; Heart failure, moderate

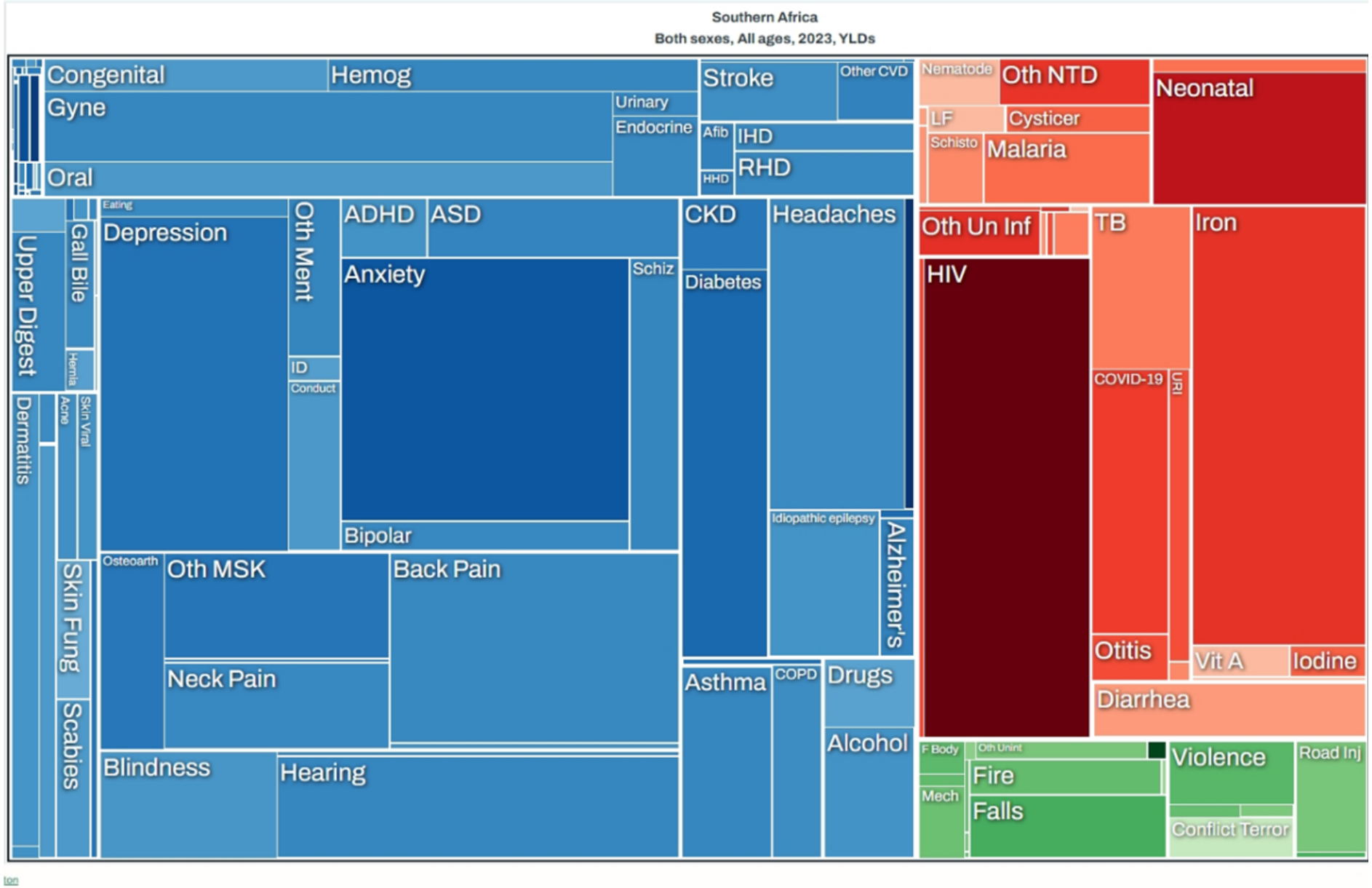
0.719 - Severe multiple sclerosis

0.790 - Chronic ischemic stroke severity level 5, with severe heart failure, with severe dementia

1 DALY = dead

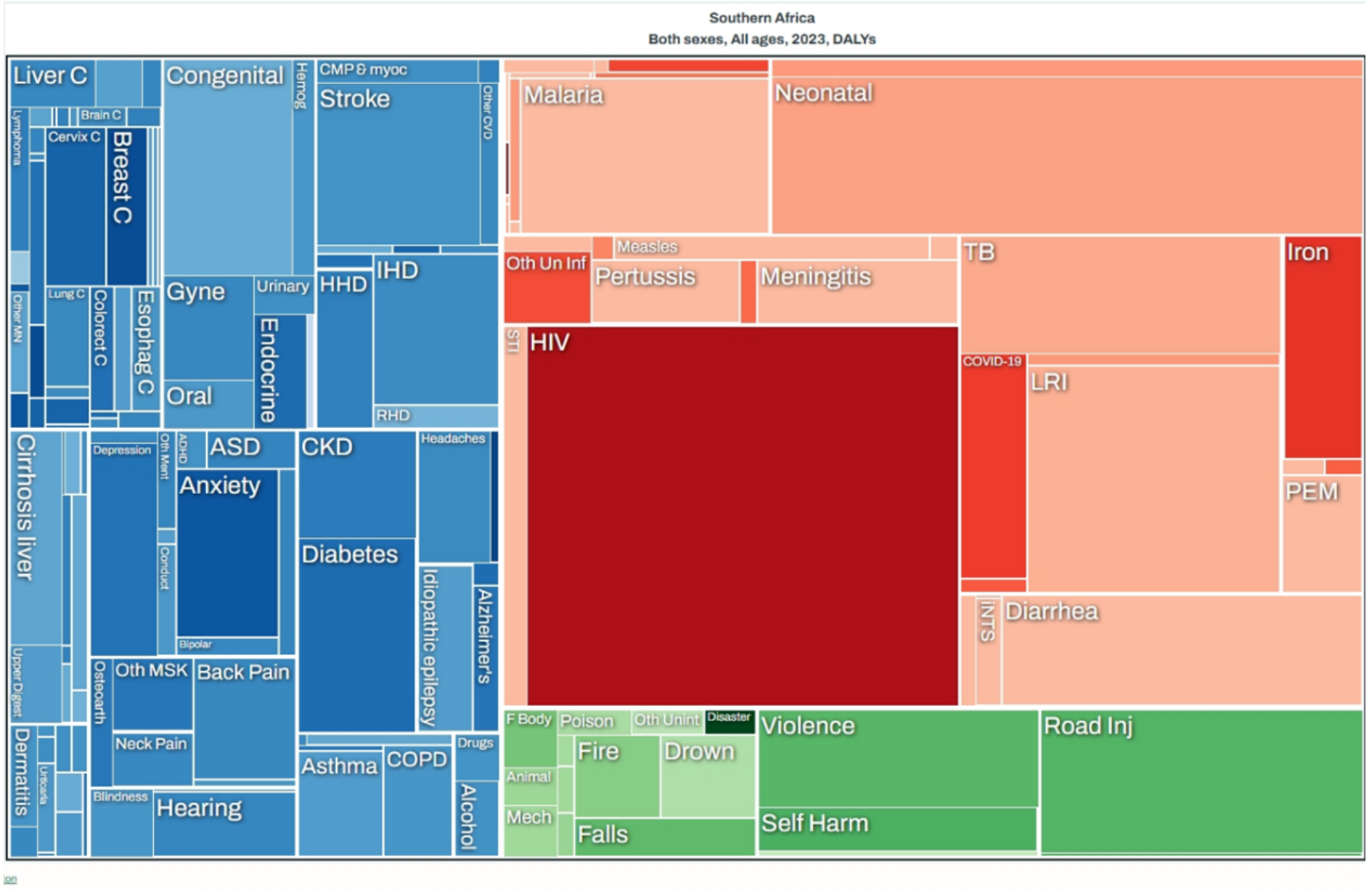
Global Burden of Disease Study 2023 (GBD 2023) Disability Weights | GHDx

Morbidity: loss from living with disease



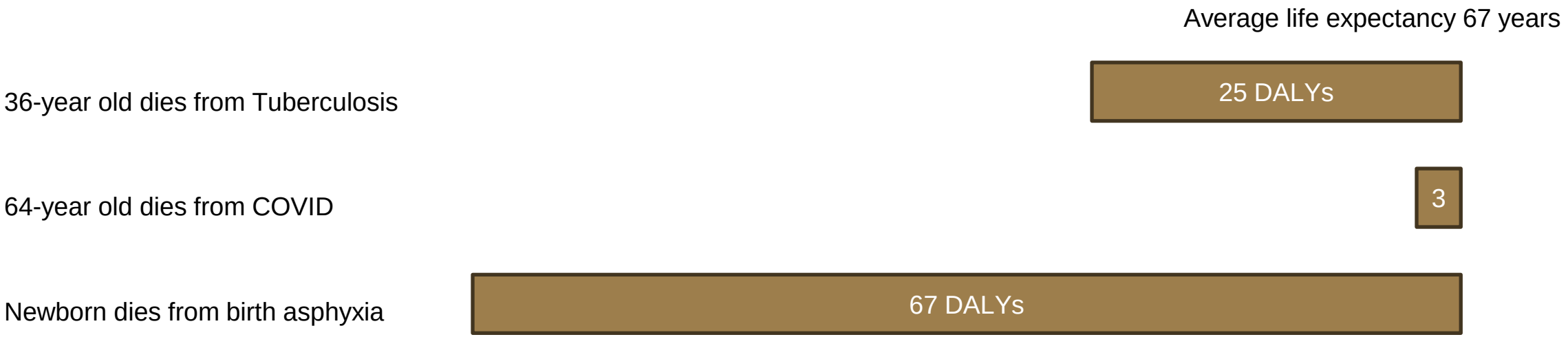
http://ihmeuw.org/7mjg

DALYs lost to disease and premature death



http://ihmeuw.org/7mjf

Mortality: life-years lost



DALY effect metric for health interventions

- Diagnose and treat 10% of total depression cases in a region of 2 million
  - **Prevalence 600 per 100,000**
  - **Reduction 10% x 600/100,000 x 2 million = 1,200 fewer cases**
  - **1,200 x 0.4 DALYs per depression = 480 DALYs avoided**
- Avoid one death from birth asphyxia
  - **67 DALYs**

Value of statistical life

- Definition: What people are willing to pay for small risk reductions
  - **NOT the value of an identified life**
  - **VSL measures willingness to pay (WTP) for safety**

- Three main methods to estimate VSL:
  - **1. Wage-risk studies (labor market)**
  - **2. Consumer purchase analysis (revealed preference)**
  - **3. Contingent valuation (stated preference)**

Method 1: Wage-Risk Studies

- Approach: Observe extra pay for risky jobs
- Compare wages for similar jobs with different risks
  - **Construction worker vs office worker**
  - **Mining vs manufacturing**
- Control for:
  - **Education, experience, location, etc.**
- Measure risk
- Calculate wage premium
- Estimate VSL

- Example calculation:
  - **Risky job: 5 deaths per 10,000 workers**
  - **Safe job: 1 death per 10,000 workers**
  - **Wage premium: $2,000/year for extra risk**
  - **Additional risk is 4/10,000**
  - **VSL = $2,000 / (4/10,000) = $5 million**

Method 2: Consumer Purchase Analysis

- Approach: How much people spend on safety items
- Identify risk-related products
  - **Revealed preference through purchases:**
  - **Motorcycle helmets**
  - **Car airbags and safety features**
  - **Smoke detectors**
  - **Home security systems**
- Observe price premiums
- Estimate risk reduction

- Calculate implied VSL
  - **Example: Airbags**
  - **Extra cost for airbag: $500**
  - **Risk reduction: 1 in 10,000 (0.01%)**
  - **VSL = $500 / 0.0001 = $5 million**
- Advantage: Real behavior (not hypothetical)
- Limitation: Limited to marketed safety goods

Method 3: Contingent Valuation (Surveys)

- Approach: Ask people what they'd pay for risk reduction
- Survey questions:
  - **"How much would you pay for 1 in 10,000 risk reduction?"**
- Present scenarios with different risk levels
- Elicit willingness to pay (WTP)

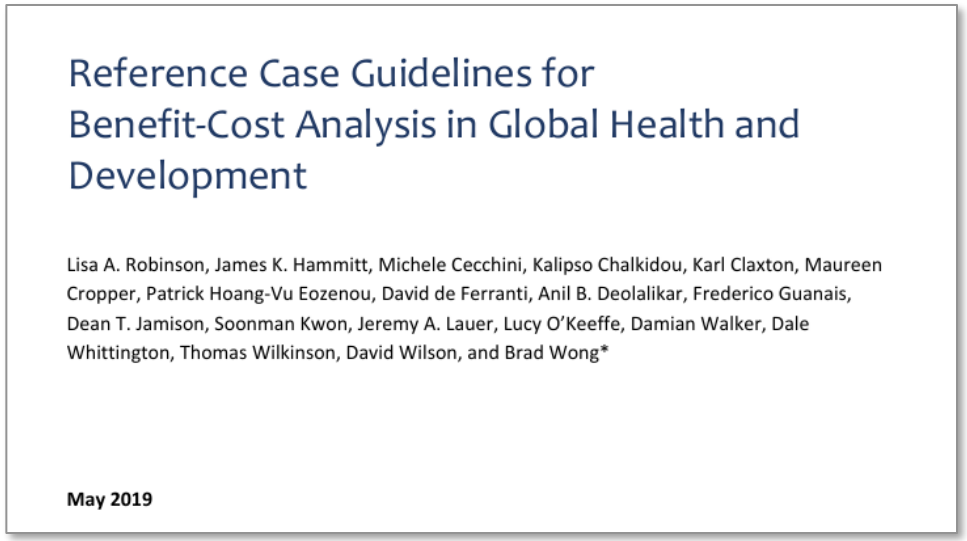
- Example:
  - **Average WTP: $500 for 1/10,000 risk reduction**
  - **VSL = $500 / 0.0001 = $5 million**
- Advantages:
  - **Can estimate for any risk**
  - **Flexible, can target specific populations**
- Limitations:
  - **Hypothetical (not real behavior)**
  - **Sensitive to framing**

VSLY: Value of Statistical Life Year

- VSLY: useful for evaluating health and social interventions that extend life expectancy or improve quality of life rather than preventing immediate death.
  - **Monetary value for one DALY averted**
- Relationship: VSLY = VSL / Life Expectancy

Review of VSL studies

- Most studies in high and middle-income counties
  - **If there is a high-quality VSL for the population, use it**
- US studies converge at 160 x GNI per capita in 2015
  - **Gold standard**
- OECD average 100 x GNI per capita
- Positive income elasticity
  - **People give up a larger fraction of their income to avoid small risks as income rises**



Reference Case Guidelines for Benefit-Cost Analysis in Global Health and Development

Lisa A. Robinson, James K. Hammitt, Michele Cecchini, Kalipso Chalkidou, Karl Claxton, Maureen Cropper, Patrick Hoang-Vu Eozenou, David de Ferranti, Anil B. Deolalikar, Frederico Guanais, Dean T. Jamison, Soonman Kwon, Jeremy A. Lauer, Lucy O'Keeffe, Damian Walker, Dale Whittington, Thomas Wilkinson, David Wilson, and Brad Wong*

May 2019

- Formula for transferring US evidence to low and middle income countries
  - **Current GNI or GDP per capita x**

    160 x (2015 GNI per capita PPP in US$ / US$57,820)^(1.5 - 1) x

    (1 + GNI or GDP per capita growth 2015 to current year)^1.5

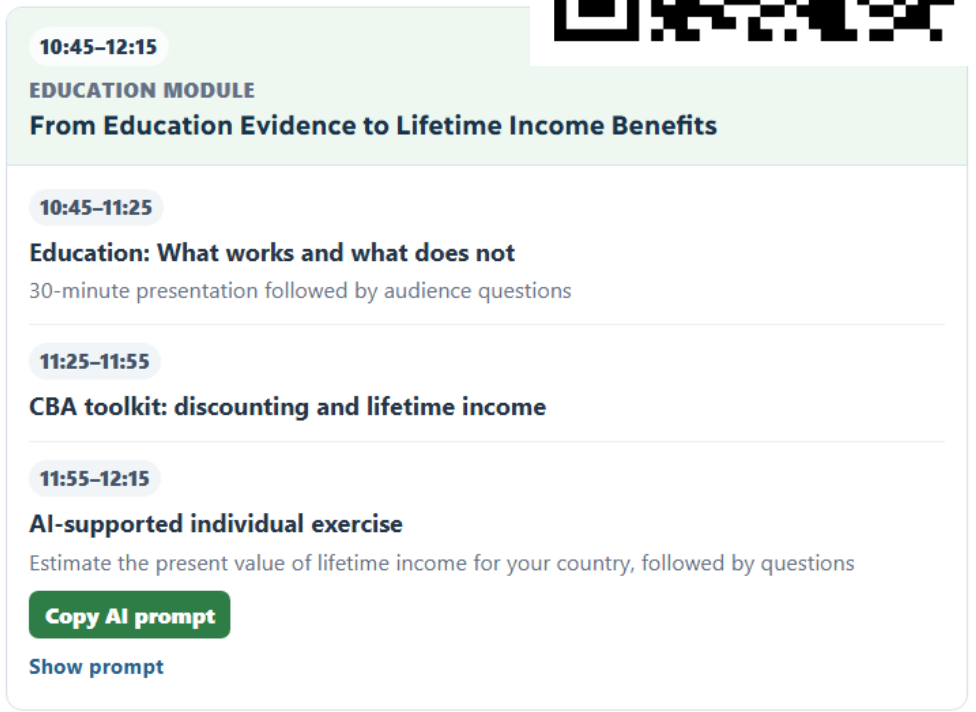
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4015886

Generate VSL and VSLY (the value of a DALY) for my country

AI guided exercise

Copy prompt in the conference program

- Use QR code or go to
  - **copenhagenconsensus.com/johannesburg-july-2026**
- Scroll down to HEALTH
  - **Day 1 at 11:55**
- Click on “Copy AI prompt”
- Open your favorite AI app
- Paste the prompt



Copy prompt in the conference program

I am conducting a cost-benefit analysis and need to estimate the value of a statistical life (VSL) and the value of a statistical life year (VSLY) in my country. If you cannot identify my country from the conversation, ask me to specify it before calculating.

Transfer the 2015 United States VSL estimate of 160 times GNI per capita to my country using an income elasticity of 1.5, following the recommendations of Robinson et al. Cite and link the Robinson et al. source used.

For the 2015 transfer, use the World Bank's 2015 GNI per capita, PPP (current international $) for my country and the United States from the same data series. Use US$57,820 for the United States value, but verify it against the cited series and disclose any discrepancy. Let Y_country_2015 be my country's value and calculate: 2015 VSL multiple = 160 * (Y_country_2015 / 57,820)^(1.5 - 1)

Explain that the exponent is income elasticity minus one because this calculation transfers the VSL-to-income multiple rather than VSL itself.

Update the VSL multiple from 2015 to the current year using cumulative real GNI per capita growth for my country from 2015 to the current year. If GNI per capita growth data are missing, use real GDP per capita growth or a credible GDP per capita growth forecast and clearly label the substitution. Let G be the cumulative real per-capita income growth factor from 2015 to the current year. Calculate: Current-year VSL multiple = 2015 VSL multiple * G^(1.5 - 1)

Also show that VSL itself grows with G^1.5 while the VSL-to-income multiple grows with G^(1.5 - 1). Provide the annual growth rates and the cumulative growth calculation so the update can be audited.

Find current-year annual GNI or GDP per capita for my country in local currency from an official national source. If a current-year observation is unavailable, update the latest reported value using inflation and forecast real per-capita growth, showing each adjustment. As an alternative, use the World Bank's GDP per capita (current US$) estimate for the current year. Do not use PPP or international-dollar income for the final monetary VSL valuation; PPP data are used only for the international transfer ratio. Calculate: Current-year VSL = current-year VSL multiple * current-year GNI or GDP per capita

To calculate VSLY for valuing DALYs, find the current life expectancy at birth for my country from a credible source and calculate: VSLY = VSL / (0.5 * current life expectancy at birth)

Report: (1) the estimated VSL and VSLY; (2) the currency and price year; (3) current GNI or GDP per capita and its source, with a link; (4) the 2015 PPP inputs and sources; (5) all inflation, growth, forecast, or data-substitution adjustments; and (6) the formulas and calculation steps, including enough year-by-year detail to audit the results. Clearly distinguish sourced data from assumptions and label all limitations.