GLOBAL CHALLENGES/ RESEARCH INSIGHTS

Strengthening Health Systems for Pandemic Preparedness and Other Emerging Challenges

POLICY RESEARCH TALK

Damien de Walque

Development Research Group, DECHD

February 6, 2024

DEVELOPMENT RESEARCH

Disclaimer: The findings, interpretations, and conclusions expressed in this talk are entirely those of the speaker. They do not necessarily represent the views of the World Bank and its affiliate organizations, or those of the Executive Directors of the World Bank or the governments they represent.

The Anatomy Lesson of Dr. Nicolas Tulp
Rembrandt, 1632, Mauritshuis, The Hague

COVID-19: Anatomy of a pandemic

Outline

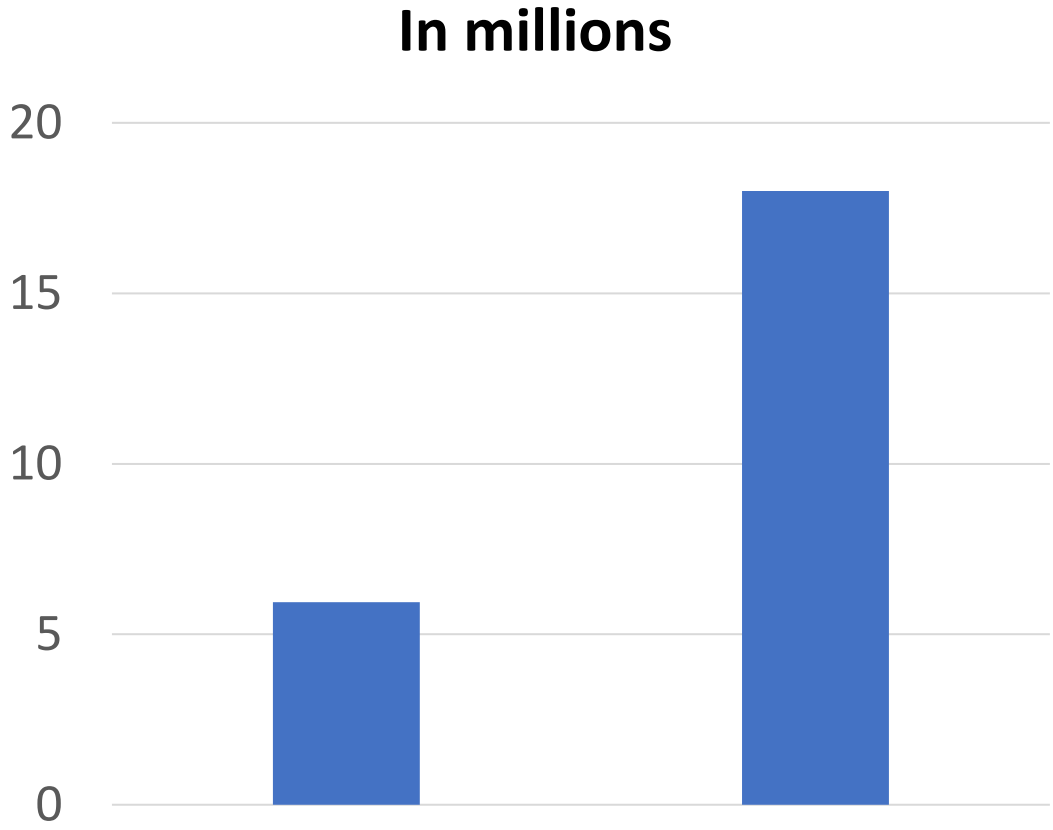
- A retrospective look at the COVID-19 pandemic
- Some questions and lessons about health investments from the COVID-19 experience
- Current transitions in the burden of disease (rise of Non-Communicable Diseases)
- How to invest in health to minimize amenable deaths?
  - Expanding health care coverage
  - Importance of prevention and public health measures
  - Importance of quality of care → Effective coverage

Contrast two numbers

- 5.94 million

Vs

- 18.2 million



What are these two numbers?

Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020–21

*COVID-19 Excess Mortality Collaborators**

Summary

Background Mortality statistics are fundamental to public health decision making. Mortality varies by time and location, and its measurement is affected by well known biases that have been exacerbated during the COVID-19 pandemic. This paper aims to estimate excess mortality from the COVID-19 pandemic in 191 countries and territories, and 252 subnational units for selected countries, from Jan 1, 2020, to Dec 31, 2021.

Lancet 2022; 399: 1513–36

Published Online March 10, 2022 https://doi.org/10.1016/S0140-6736(21)02796-3

Findings Although reported COVID-19 deaths between Jan 1, 2020, and Dec 31, 2021, totalled 5·94 million worldwide, we estimate that 18·2 million (95% uncertainty interval 17·1–19·6) people died worldwide because of the COVID-19 pandemic (as measured by excess mortality) over that period. The global all-age rate of excess mortality due to the

Excess Mortality Calculations

- Excess mortality methods compare the number of deaths to the number of expected deaths during a period of interest:
  - Expected deaths = projection based on number of deaths in immediately preceding years + linear trend because number of deaths tends to increase for aging populations

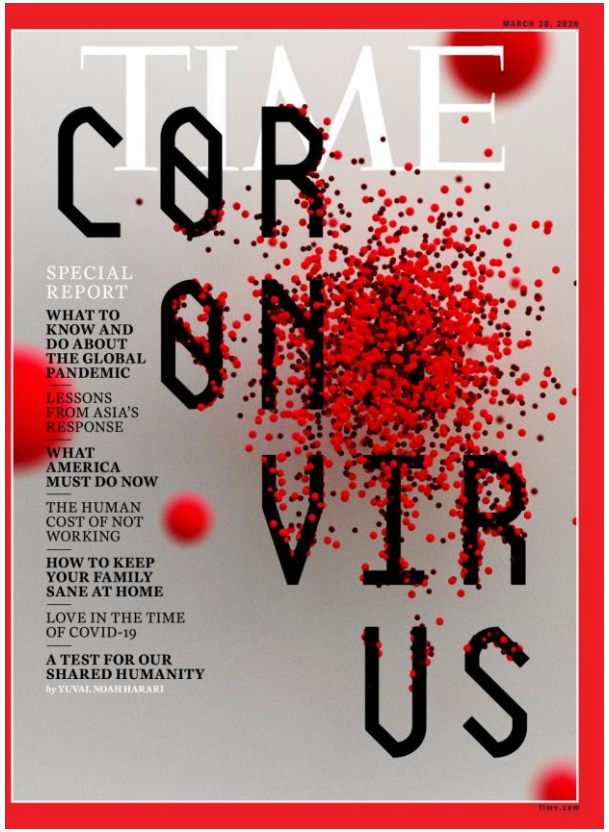
- Considered as the “gold standard” in the analysis of COVID-19 mortality

Excess Mortality Calculations

- Represents a combination of effects:

Excess mortality = (Direct COVID-19 deaths) + (Indirect COVID-19 deaths) – (Averted deaths)

- Direct COVID-19 deaths: due to infection with the virus
- Indirect COVID-19 deaths: due to congestion of health systems, delay in care-seeking, mental health, etc.
- Averted deaths: would have taken place in the absence of the pandemic but did not occur because of pandemic-induced measures. Example: traffic injuries, violence, other infectious diseases

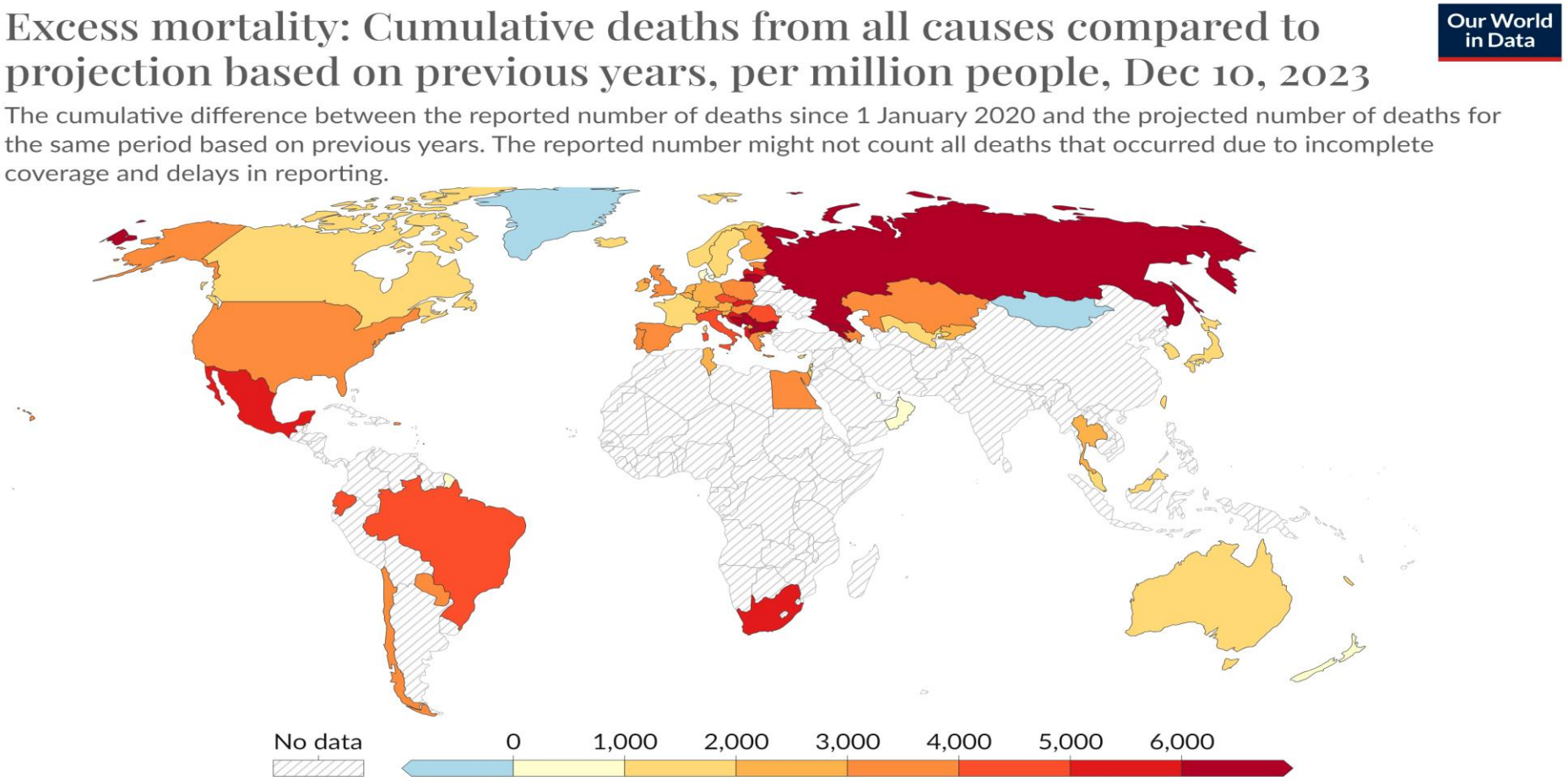


The impact of COVID-19 went beyond mortality: delayed care, mental health burden, school closures, learning losses, lockdowns, economic and political shock

Some lessons and questions about these two numbers

1) Excess mortality is more than 3 times higher than officially reported COVID-19 deaths: even in the 21st century our health and civil registration systems are still not very good at measuring the impact of such a major health event
   - Lesson: Step-up efforts to mainstream civil registration systems (many benefits beyond accurate measure of mortality)
2) How were the deaths distributed around the world?
3) How big of a number is 18.2 million?
   - Compare to past events
   - Compare to other recent health events

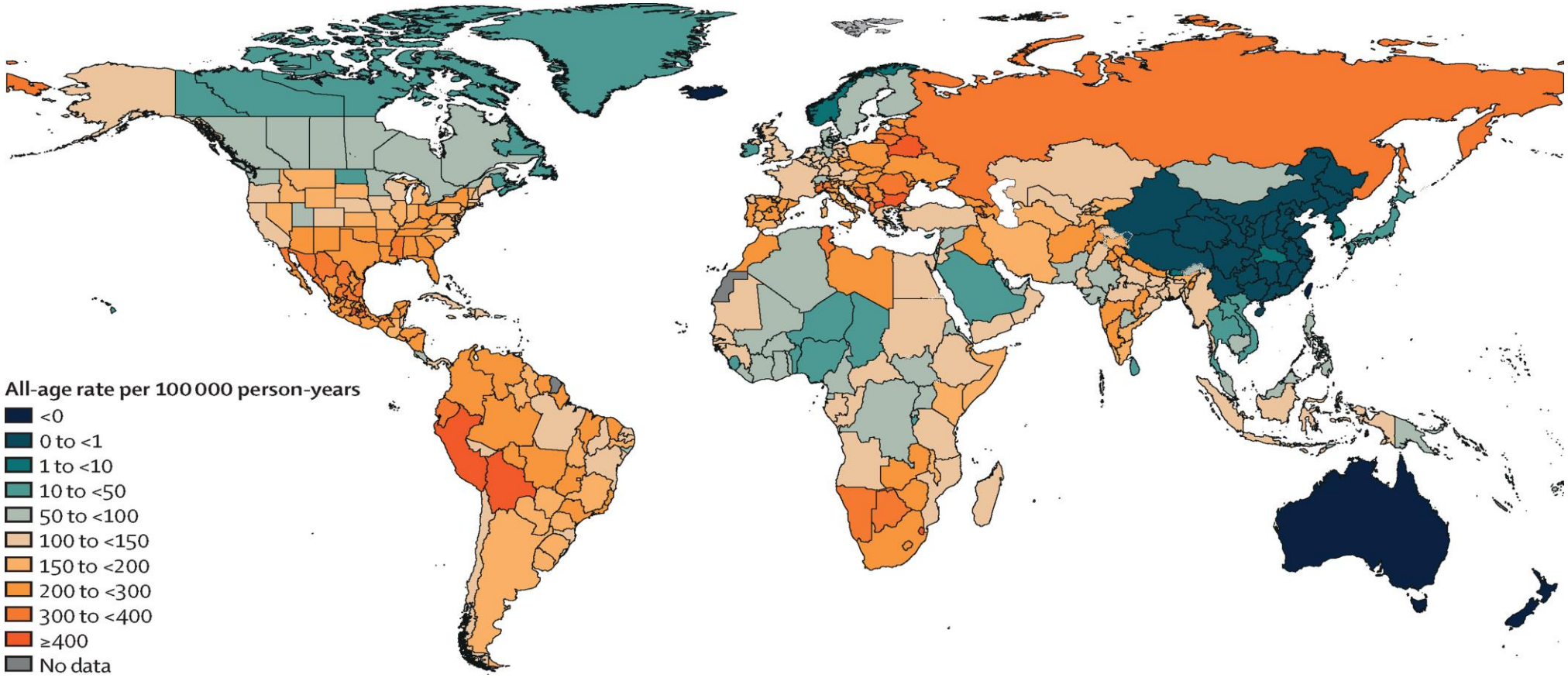
Excess mortality (using vital statistics where available)



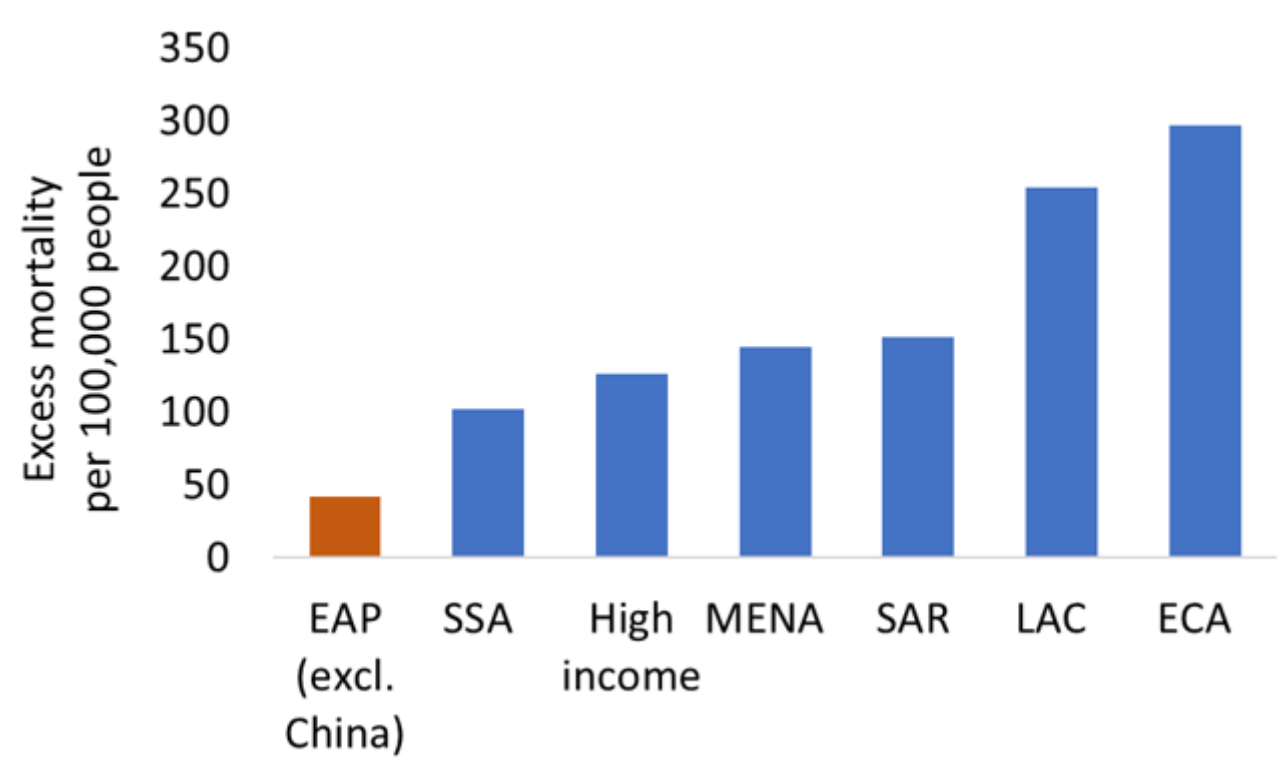
Excess mortality 2020-21

(using vital statistics when available and otherwise modeling)

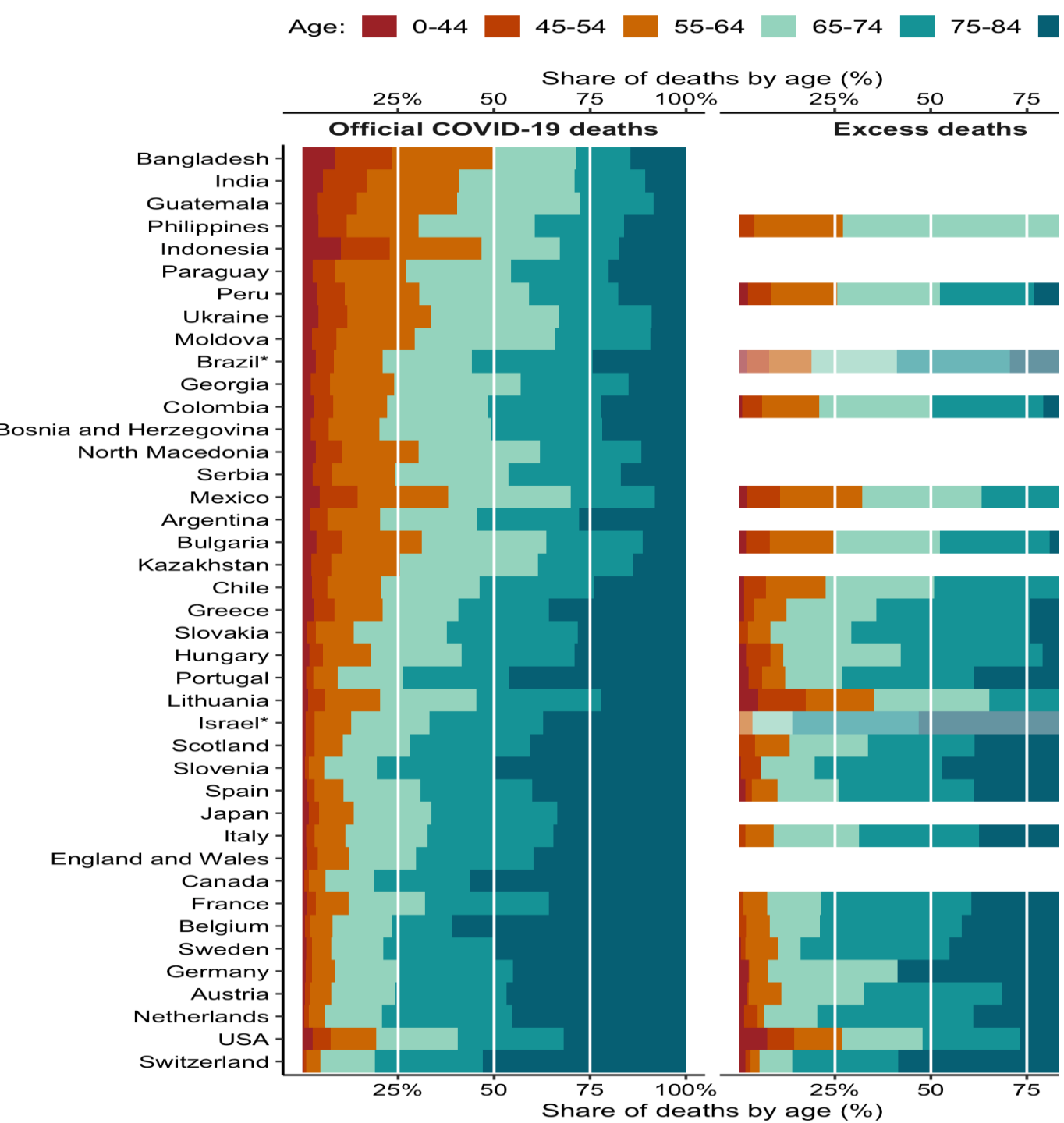
Source: [COVID-19 Excess Mortality Collaborators, Lancet, 2022]



Estimated excess mortality rate per 100 000 population during the COVID pandemic, 2020-21



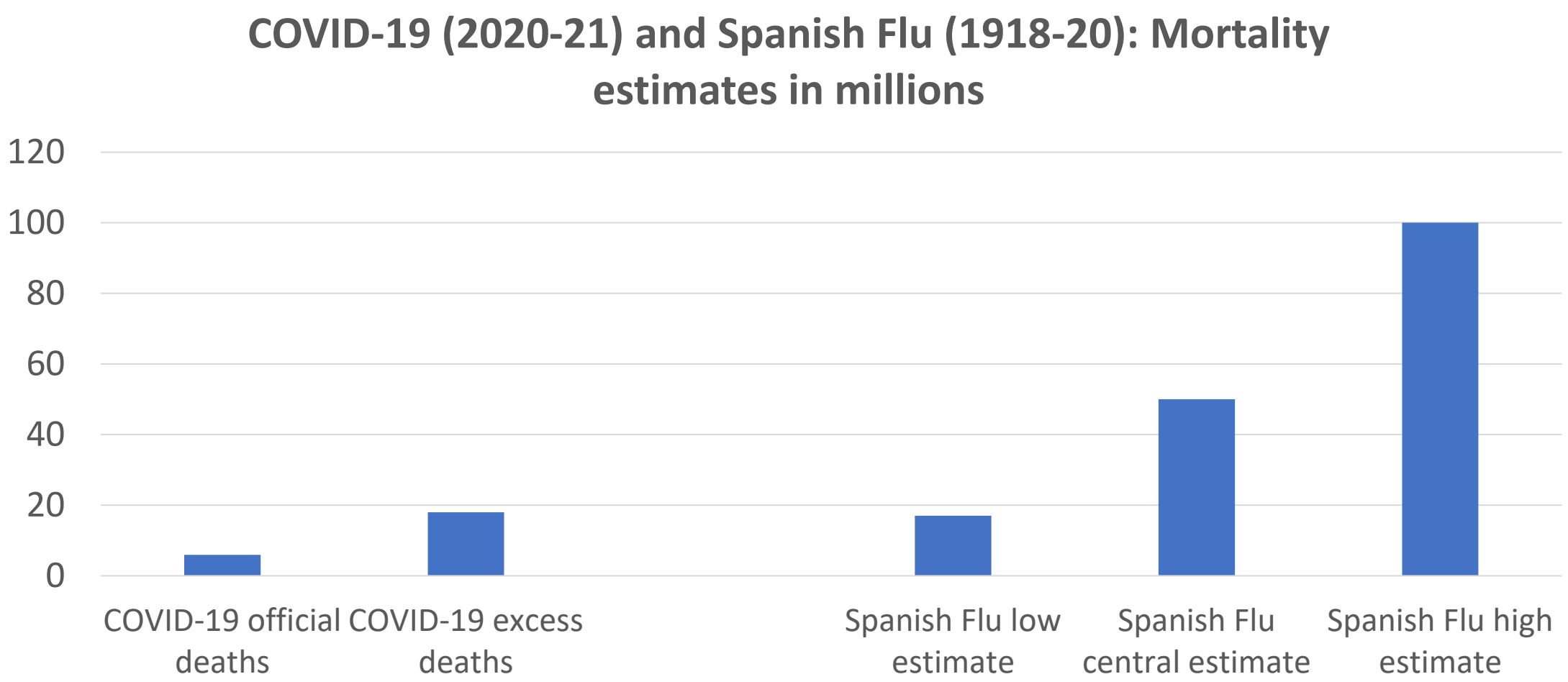
Source: “Reimagining primary health care in East Asia and the Pacific” Forthcoming and COVID-19 Excess Mortality Collaborators, 2022



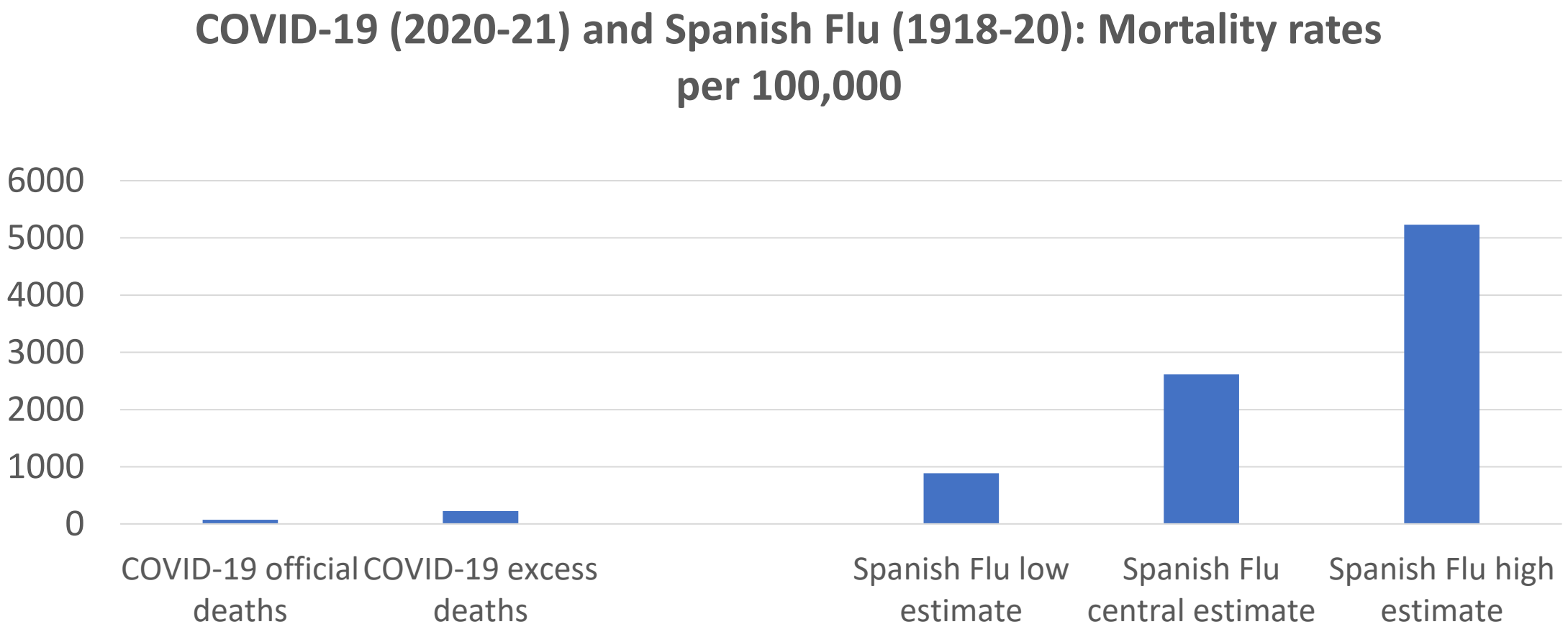
- COVID-19 Mortality more concentrated at younger ages in middle income countries
- Controlling for the age structure of the population

(Demombynes, de Walque, Gubbins, Urdinola and Veillard. 2022)

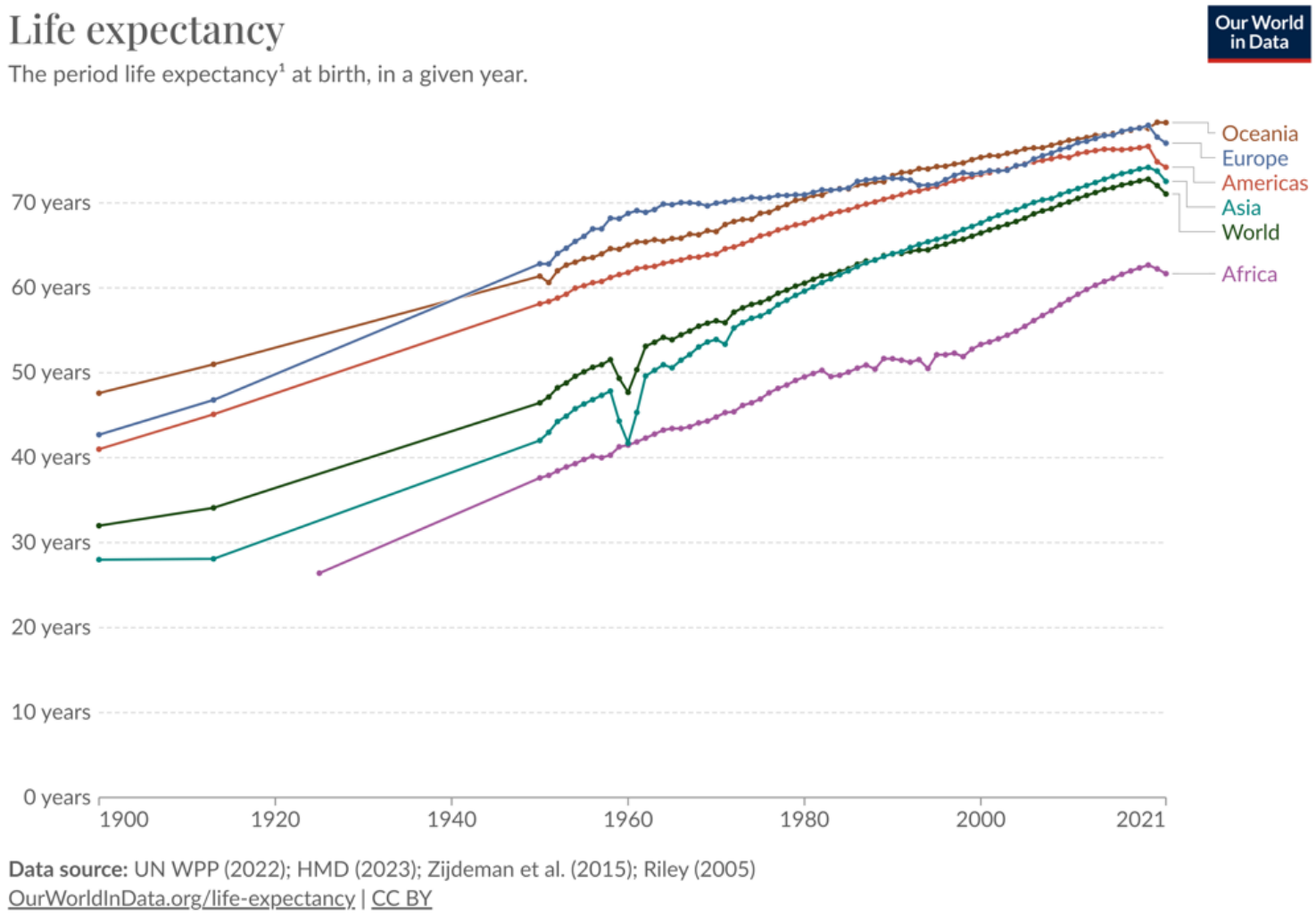
How did the COVID-19 pandemic compare with the Spanish Influenza?



Of course, world population was much smaller 100 years ago (1.9 vs. 7.9 billion)



But of course: we should have done better (over 100 years progress in life expectancy)



Still, we did much better than 100 years ago

- Role of vaccine (incredibly rapid: 326 days from genomic sequence)
- Watson et al. 2022: Global impact of the 1st year of COVID-19 vaccination (Dec. 2020 to Dec. 2021)
  - Based on official reported COVID-19 deaths: vaccination prevented 14.4 million additional deaths
  - Based on excess mortality estimates: vaccination prevented 19.8 million additional deaths
  - Basically, vaccination more than halved COVID-19 mortality despite being introduced one year after the start of the epidemic

Returns on Investment (ROI) from COVID-19 vaccination (Sah et al. 2022)

- New-York City COVID-19 Vaccination Campaign (12/2020-01/2022)
- Costs: Direct ($2.44 billion) and Indirect ($2.39 billion) = $4.83 billion
- Benefits:
  - Averted $27.96 billion of additional direct and indirect health care costs
  - Averted deaths led to additional savings of $26.27 billion using the value of a statistical life (VSL) methodology
- Including VSL = $1 spent saved $10.19 (ROI = 1019%)
- Without VSL = $1 spent saved $4.27 (ROI = 427%)

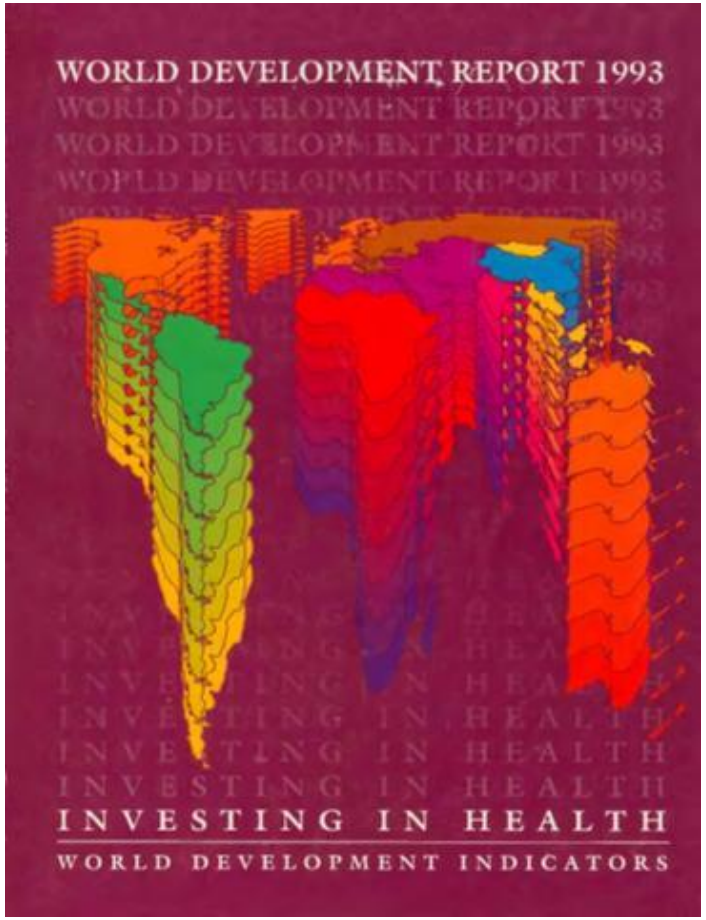
  (ROI in the technology sector was 16% in 2022)
- Does not account for costs of lockdowns, school and business closures in case of no vaccination

COVID-19 vaccines were a game changer

- But globally we encountered problems with equitable manufacturing and distribution. (See Tristan Reed's Policy Research Talk).
- Also, vaccine hesitancy, linked to trust in health systems, which, if not addressed, might have lingering effects including for other diseases.
  - Important to verify whether and to what extent vaccine hesitancy has "spread" to other, well-established vaccines, including childhood immunizations.
    - E.g., recent measles outbreak in Kazakhstan

Important lessons from COVID-19 pandemic (1)

- It pays to invest in health
- Something we knew at the World Bank at least since the World Development Report 1993: Investing in health
- And our institution delivered on this premise:
  - From April 2020 to March 2021, the WBG committed over $200 billion to public and private sector clients to fight the impacts of the pandemic.



Important lessons from COVID-19 pandemic (2)

- Governments play an important role:
  - Lockdowns
  - Social support during lockdowns
  - Essential services maintained during crisis even if under stress (e.g., hospitals)
  - Vaccine purchasing and distribution
- Private sector also:
  - Vaccine development and manufacturing
- Individual behaviors still matter a lot:
  - We went to be vaccinated, but there was also vaccine hesitancy
  - We followed lockdowns and mask mandates, but there was some resistance (e.g.,Abaluck et al. 2021 on persuading people to wear masks in Bangladesh)

Important lessons from COVID-19 pandemic (3)

- Trust matters
- In 14 countries (low to high-income), greater health care use, having a regular and high-quality provider, using other preventive services, confidence in the health system and in the government positively correlated with COVID-19 vaccination (People Voice Surveys, Arsenault et al. 2024)
- Evidence that countries which had been confronted and responded to previous epidemic (SARS in East Asia in 2003 and Ebola in West Africa in 2014-16) were better prepared (Hanson-DeFusco et al. 2023)
- Role of politics in building trust (or not): e.g., Brazil (Cabral et al. 2021), US (Bursztyn et al. 2020)

How does COVID-19 compare with other recent health events?

Epidemic	Period	Deaths
COVID-19 (Global)	2020-21	18.2 million
HIV/AIDS (Global)	1991-2022	40.4 million
Ebola (West-Africa)	2014-2016	11,325
SARS (East Asia)	2003	774

How does COVID-19 compare with other recent health events?

Epidemic	Period	Deaths
COVID-19 (Global)	2020-21	18.2 million
HIV/AIDS (Global)	1991-2022	40.4 million
Ebola (West-Africa)	2014-2016	11,325
SARS (East Asia)	2003	774

- COVID-19 excess deaths in LMIC:

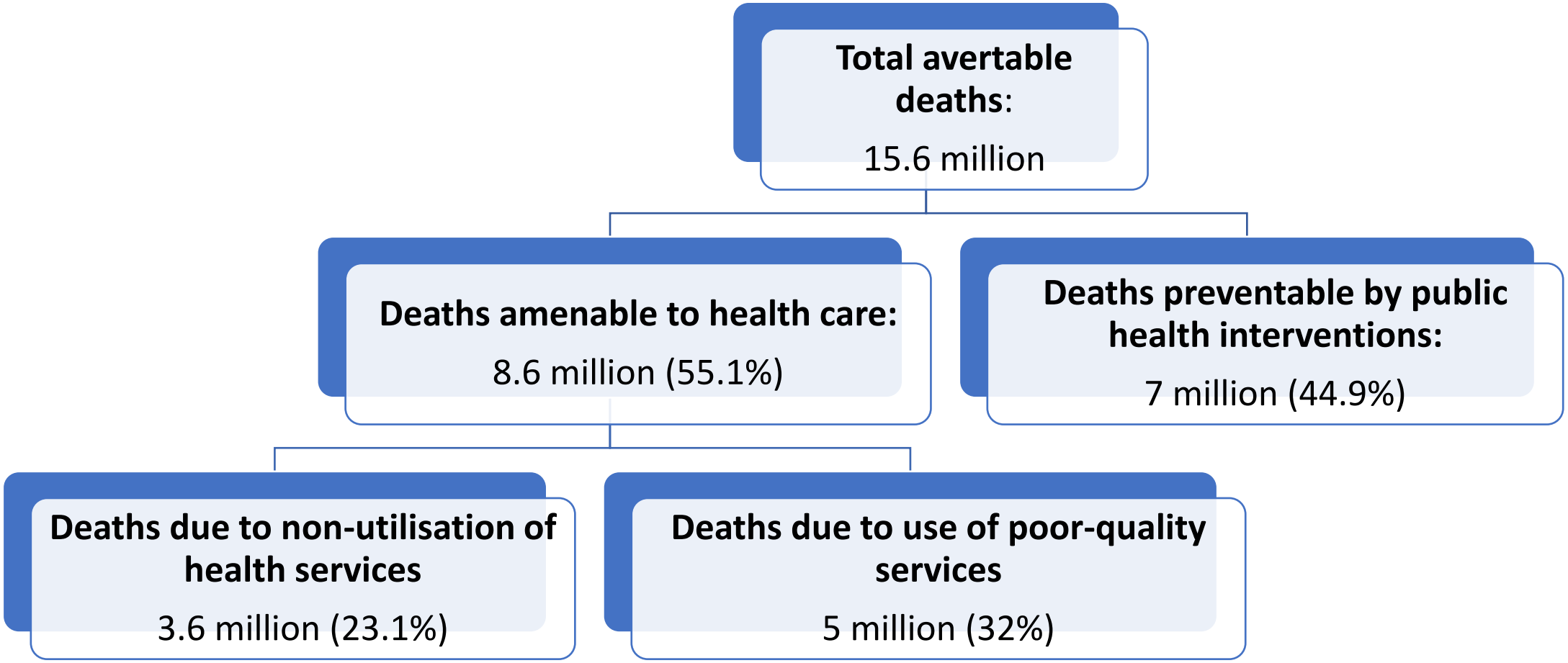
  15.6 million (2020-2021)

- Total avertable deaths in LMIC in 2016 (Kruk et al. 2018):

  15.6 million

(a few years before COVID)

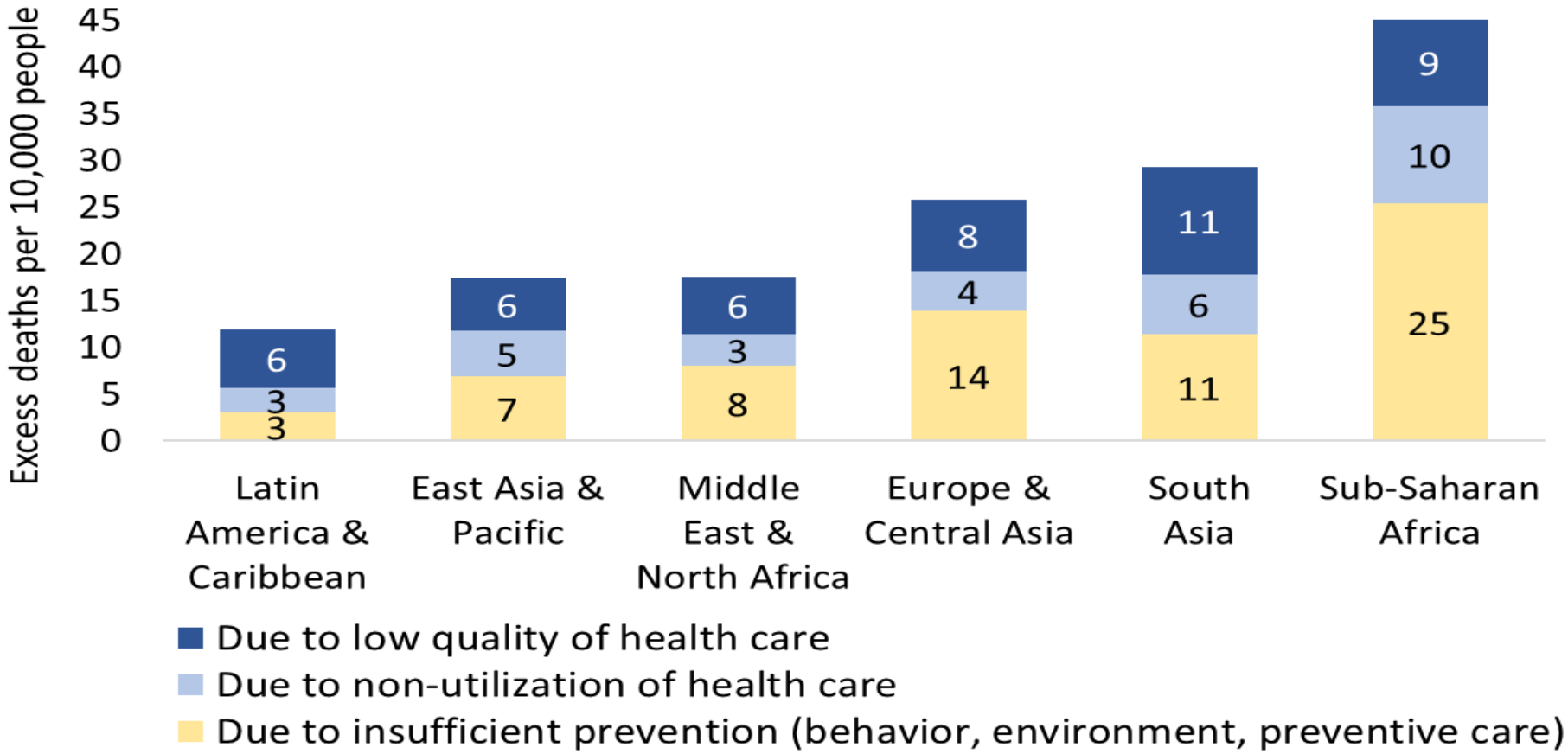
Excess deaths in LMIC, 2016 (Pre-COVID) (Kruk et al. 2018)



Methodology: another use of excess mortality

- Using data from the 2016 Global Burden of Disease study, the authors calculated mortality amenable to personal health care for 61 SDG conditions by comparing case fatality between each LMIC with corresponding numbers from 23 high-income reference countries with strong health systems.
- Used data on health-care utilization from population surveys to separate deaths due to non-utilization and deaths due to poor quality.

By region



Source: “Reimagining primary health care in East Asia and the Pacific” Forthcoming and Kruk et al. 2018

Two main messages

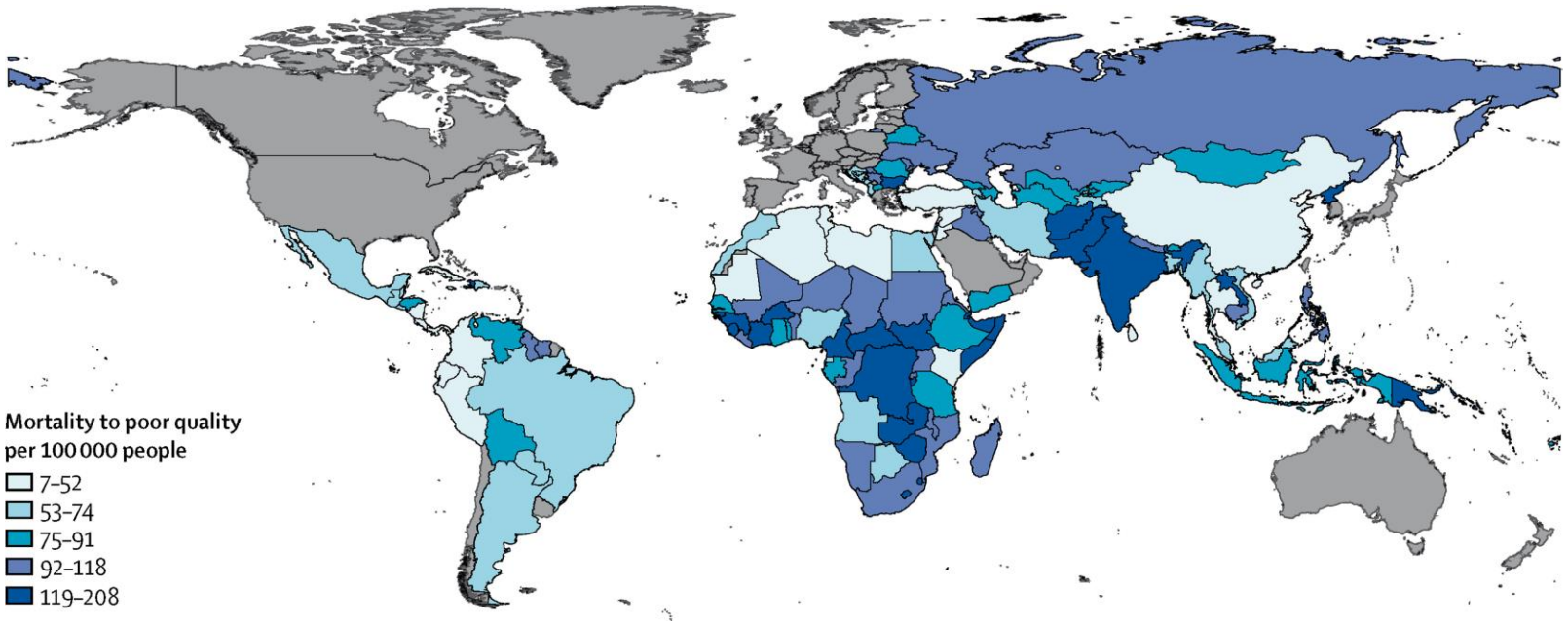
Authors' conclusions:

- In low-income countries, expanding health care coverage does not necessarily result in better outcomes, even for conditions highly amenable to medical care.
- Health system quality must be improved

Two main messages

- Quality of care matters
- Prevention and other public health interventions matter

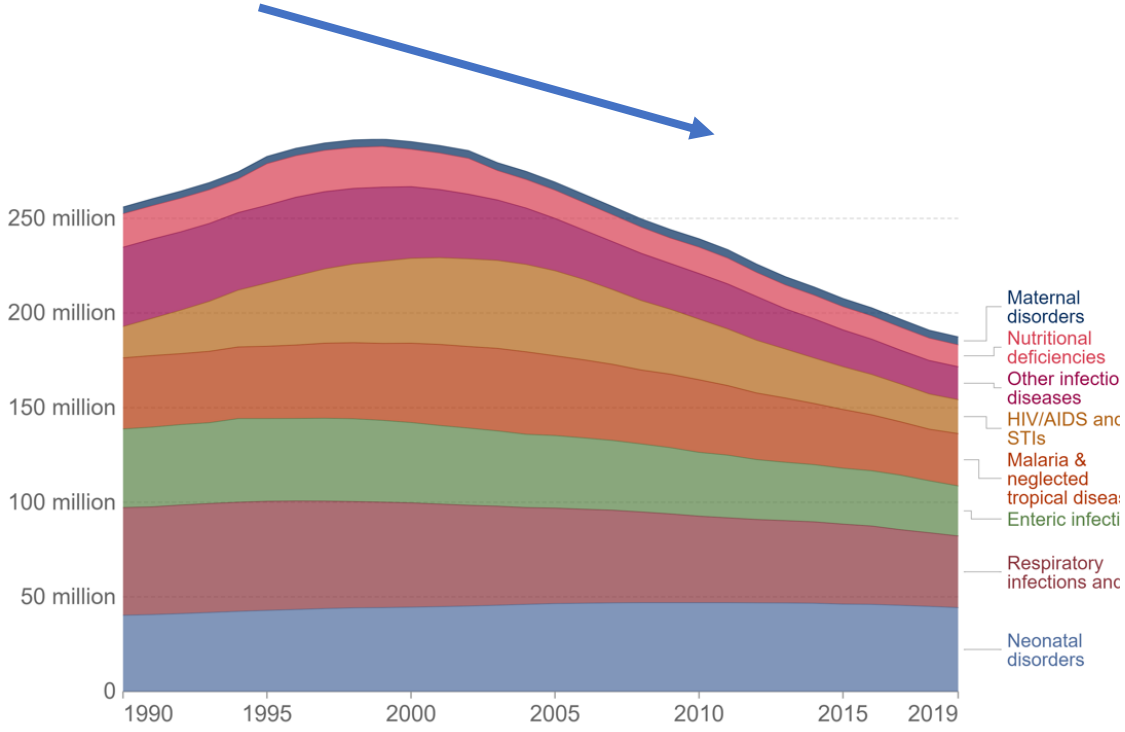
Mortality due to poor health care quality (Kruk et al. 2018)

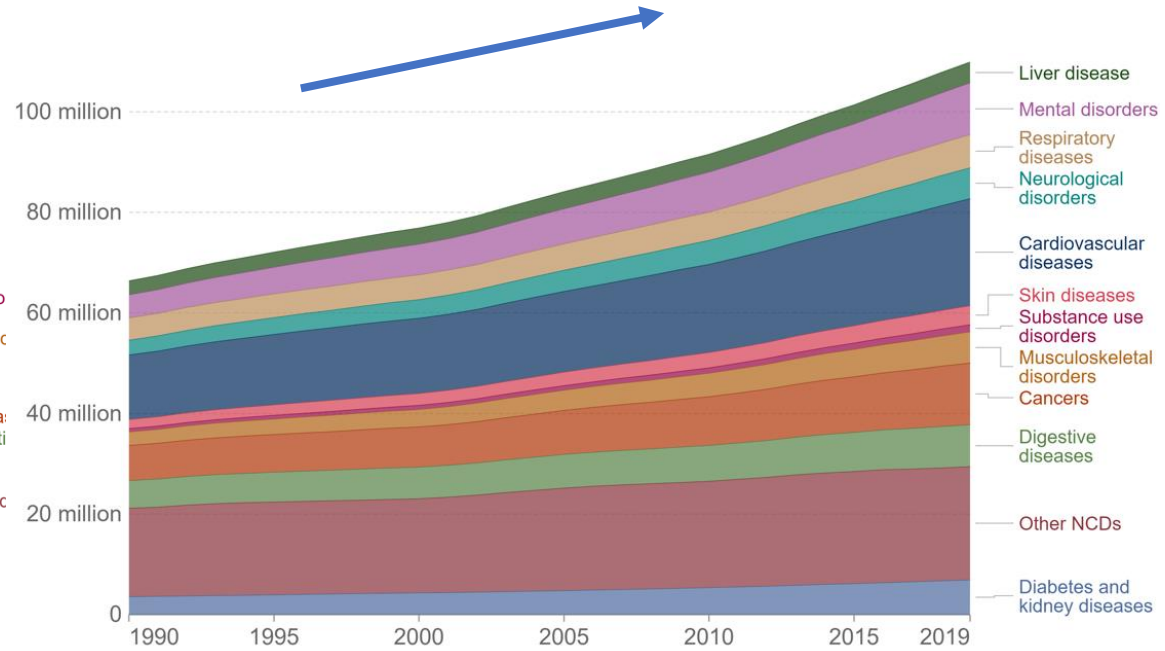


COVID-19 occurred in the middle of transition in the burden of diseases

- Overall, rise of non-communicable or chronic diseases (NCDs): cancer, diabetes, hypertension, heart conditions.
  - Long duration, importance of early detection
- NCDs will become even more prevalent with aging populations
- Noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally
- Each year, 17 million people die from a NCD before age 70; 86% of these premature deaths occur in low- and middle-income countries (WHO 2023).
- Consequences of climate change on health: air pollution, droughts, etc.

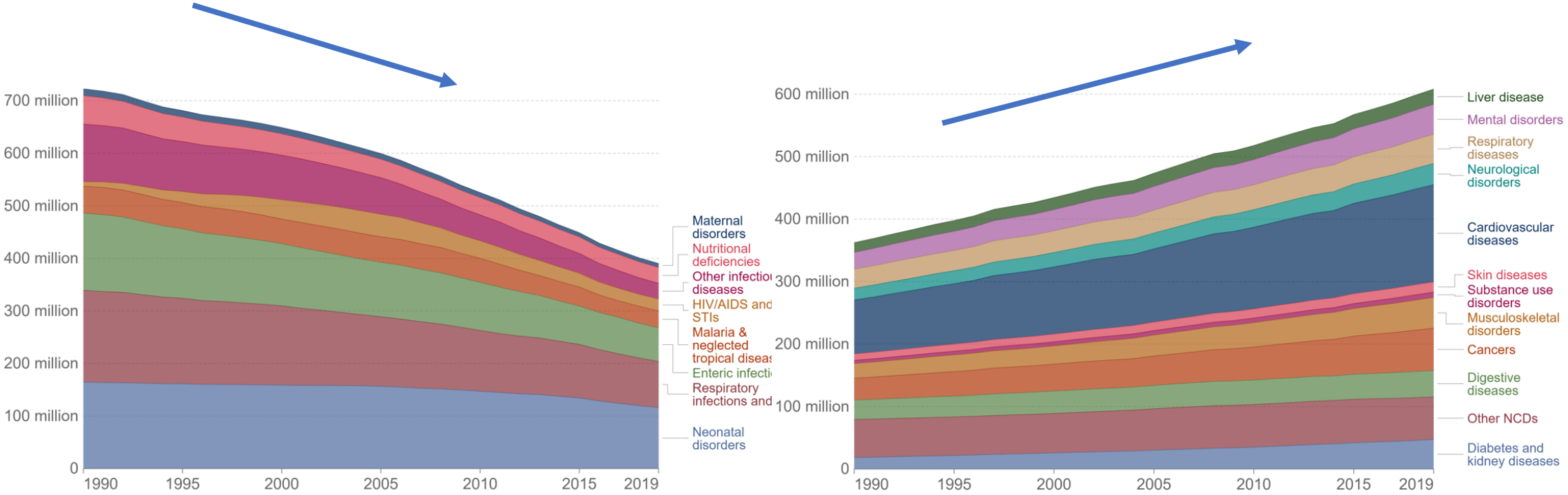
Low-income countries: Communicable vs. NCD (in Disability-Adjusted Life –Years -DALYs)





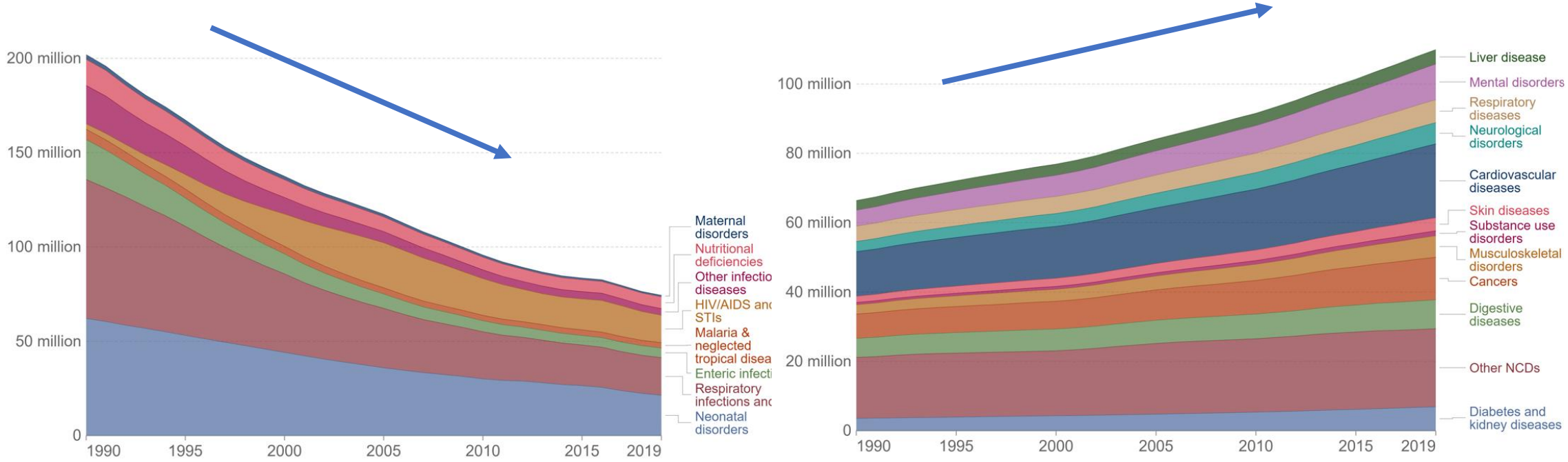
Source: IHME, Disease of Burden 2019 and Our World in Data

Lower Middle-income countries: Communicable vs. NCD (in DALYs)



Source: IHME, Disease of Burden 2019 and Our World in Data

Upper Middle-income countries: Communicable vs. NCD (in DALYs)



Source: IHME, Disease of Burden 2019 and Our World in Data

But COVID-19 was a very strong shock caused by a new communicable disease.

Interaction between COVID-19 and NCDs:

- People suffering from NCDs are more vulnerable when infected by COVID-19
- Long COVID: a new chronic condition
- (Mental) health consequences of lockdown
- Non health consequences: poverty, education

It pays to invest in health

- COVID-19 reminded us of this

- Since it pays to invest in health, how best to invest, given the transition in the burden of diseases?

Transitions in the burden of disease stress the importance of prevention

- Prevention is more effective in terms of Disability-Adjusted Life Years (DALYs) saved and more cost-effective than treatment
- Prevention takes place both at:
  - Population-level:
  - Interaction between population and health systems (both demand and supply side play a role)

Interventions at the population level (public health interventions)

- Reduce risk factors: smoking, alcohol and drugs consumption, unsafe sex, bad eating/drinking habits.
- Increase good habits, e.g., exercise, healthier nutrition
- Hygiene, mask wearing during epidemics: benefit for self but also others.
- Also environmental exposure: e.g., reduce unsafe water, pollution
- Pandemic preparedness (epidemiologic surveillance, One Health, i.e. human and animal health and their interaction).

- Mainly demand-side interventions: information, but when not sufficient, financial incentives (potentially cash transfers but foremost and most efficient instrument for bad habits, when feasible, is taxation)
- Also some role for supply-side interventions: e.g., vaccinations

Interaction between population and health systems (both demand and supply side play a role)

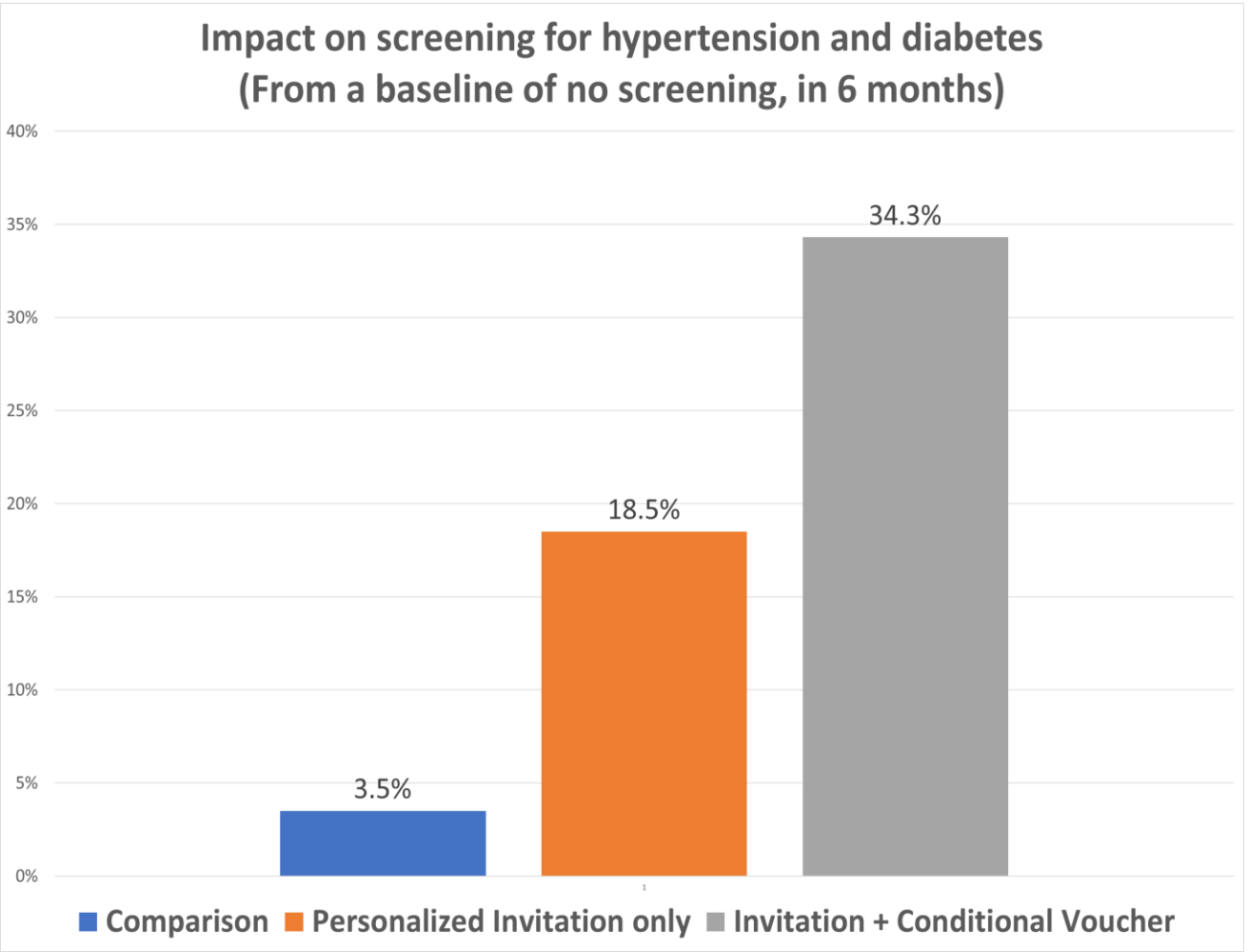
- Antenatal care
- Immunizations (child immunizations but also adult ones like COVID and flu vaccines)
    - Let's celebrate the introduction of the new malaria vaccine in child immunization calendar in Africa (Cameroon) on January 22, 2024.
- Early detection of NCDs : e.g. cancers, hypertension, diabetes, high cholesterol
- Address antimicrobial resistance due to misuse or overuse

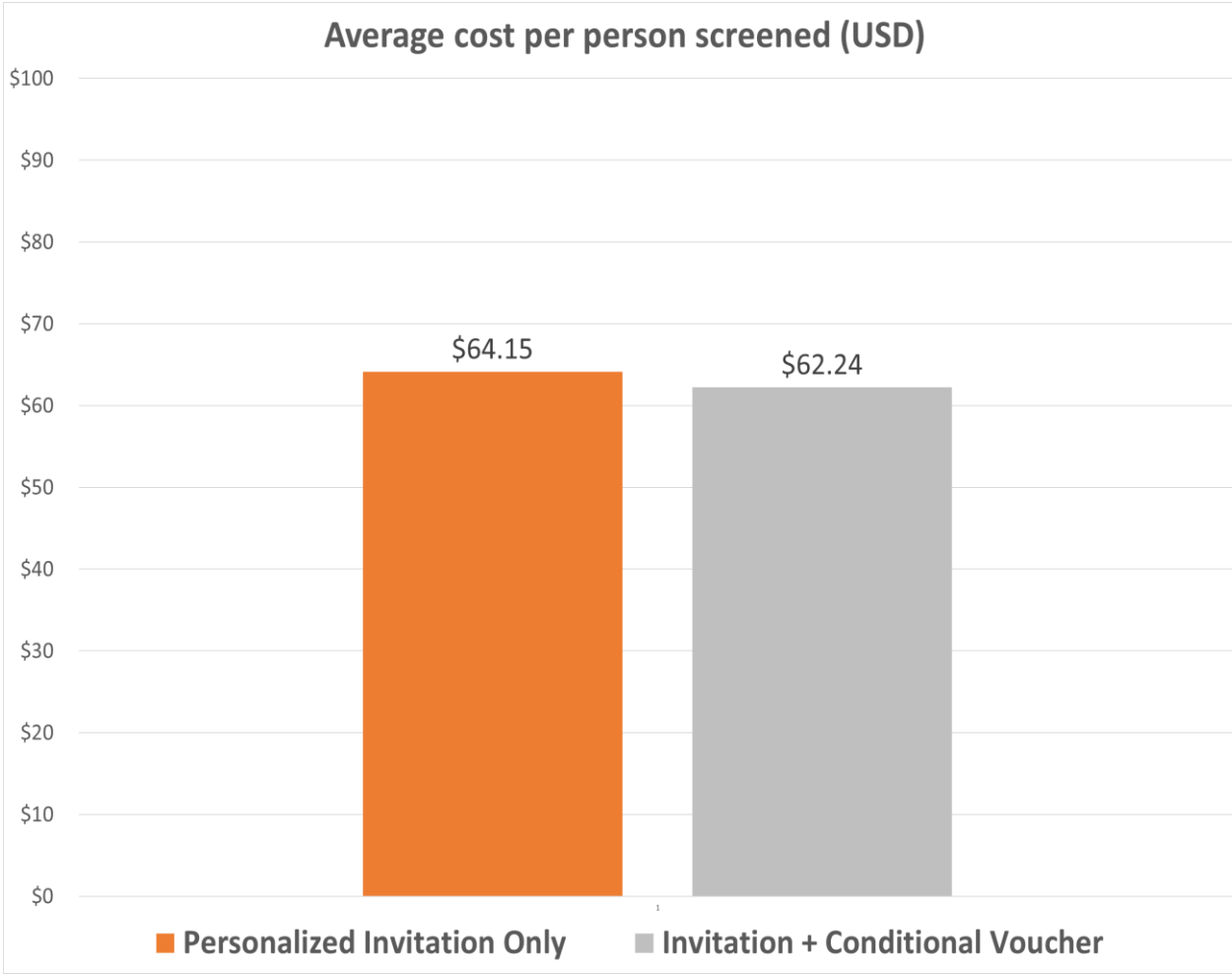
- Information on the need of preventive care (e.g. early screening of chronic diseases)
- But when not sufficient, financial incentives could be used, potentially cash transfers. But simpler and cheaper interventions such as personalized invitations can be as cost effective.

Encouraging early screening of NCDs

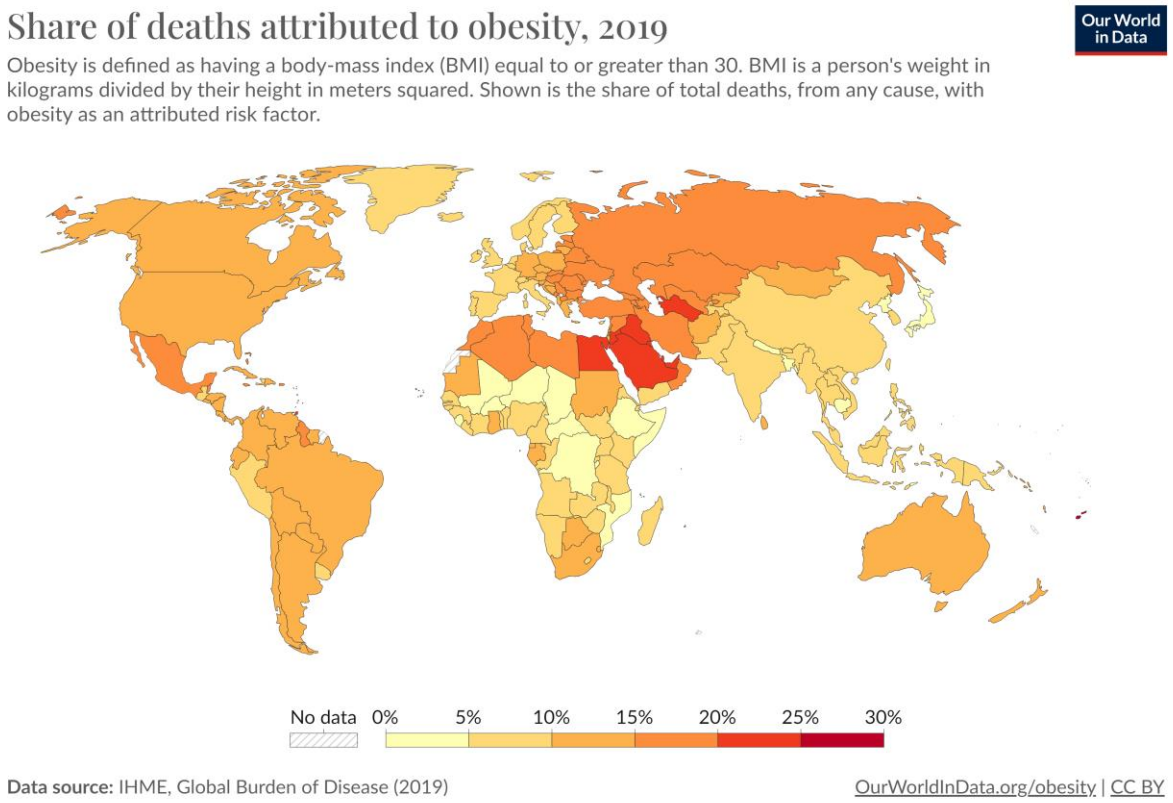
Example: Personal invitations and cash vouchers to encourage hypertension and diabetes screening in Armenia.

([de Walque, Chukwuma, Ayivi Gedehoussou and Koshkakaryan 2022](#)).





Obesity: is Semaglutide (Ozempic/Wegovy) a game changer?

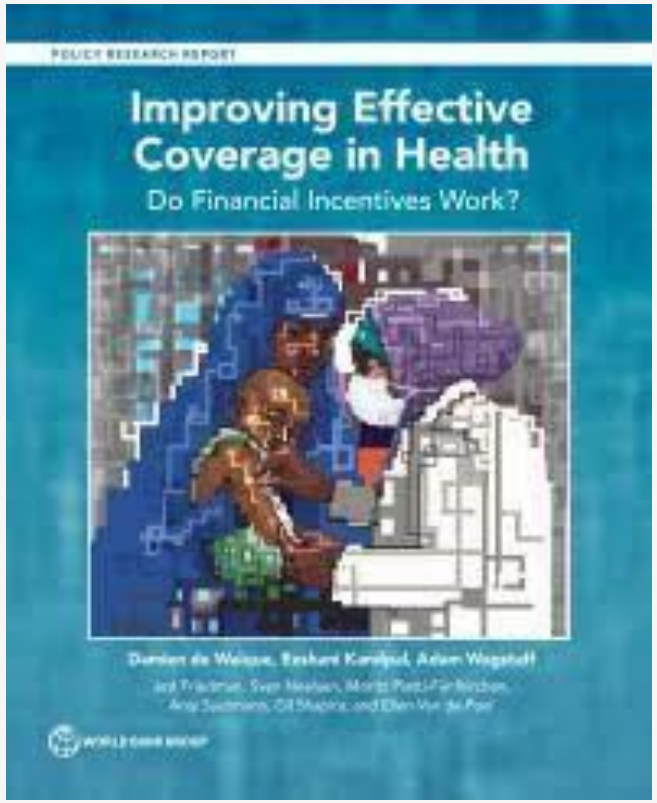


- At current prices ($215-700/month), way too expensive for LMIC countries
- Isn't it better to focus on prevention and behavior change?

- Maybe, but in the early 2000s, same reasoning for antiretroviral treatment (ART) for HIV/AIDS.
- Now ART is available everywhere and saved 18.6 million lives between 2000 and 2021 (WHO 2022).

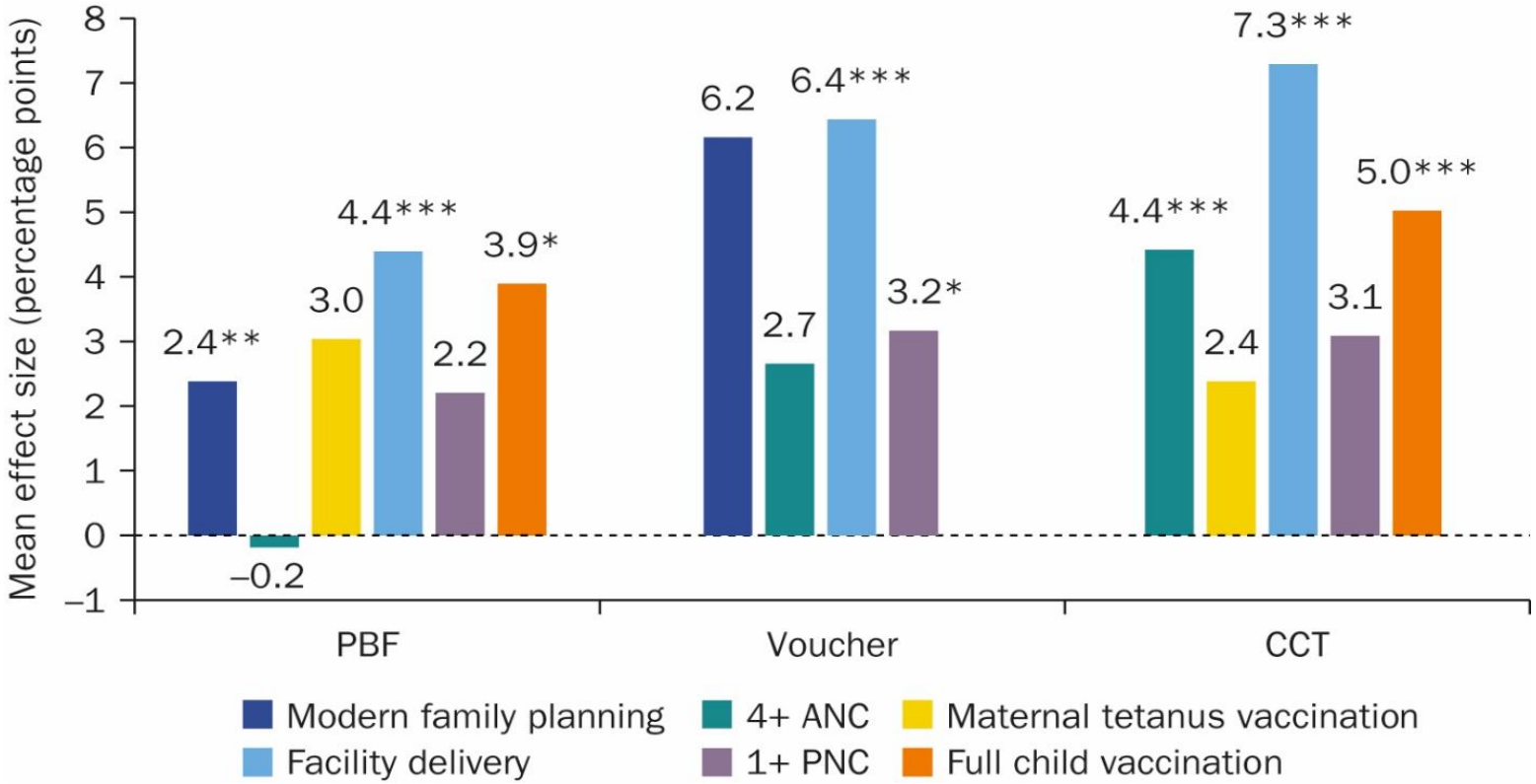
Interventions at health care level: quantity of health care (health coverage)

- First a supply-side issue: number of health centers, doctors and nurses, equipment, etc…
- Even when well staffed and equipped health centers are available:
  - Staff must provide sufficient effort: intrinsic motivation, extrinsic motivation (salaries but also potential role of performance-based financing)
  - Patients must come to receive health care, including for preventive care (vaccination, health screenings).
    - **For uncomplicated cases, financial incentives for patients to visit primary care facilities**



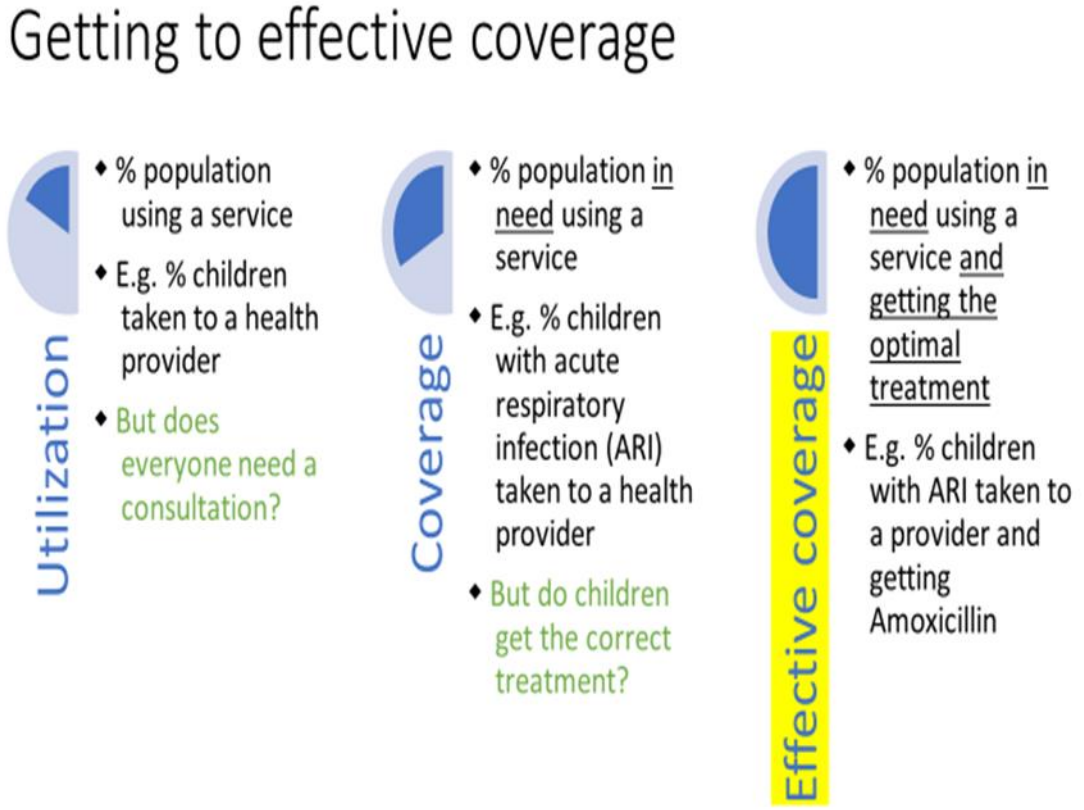
Presented at Policy Research Talk in May 2022

- How do financial incentives offered to patients to visit clinics (demand side) compare to incentives offered to the providers to increase and improve service delivery (PBF –supply side).
- Results from a systematic-review of the impact of supply- and demand-side incentives on maternal and child health services. (de Walque, Kandpal et al. 2022).



Effective Coverage

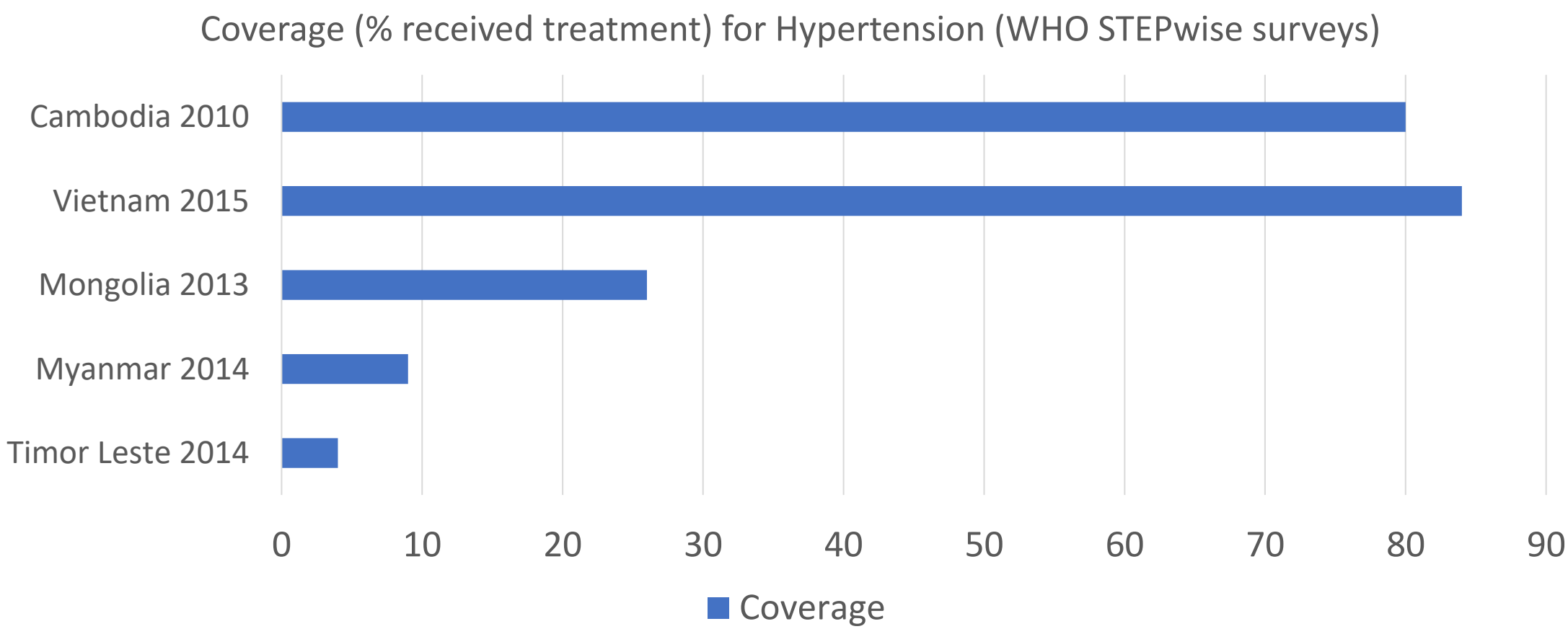
- **Effective coverage** requires that everyone in need of a particular health service is getting it in a timely manner and at the quality necessary to obtain the desired effect and potential health gains.



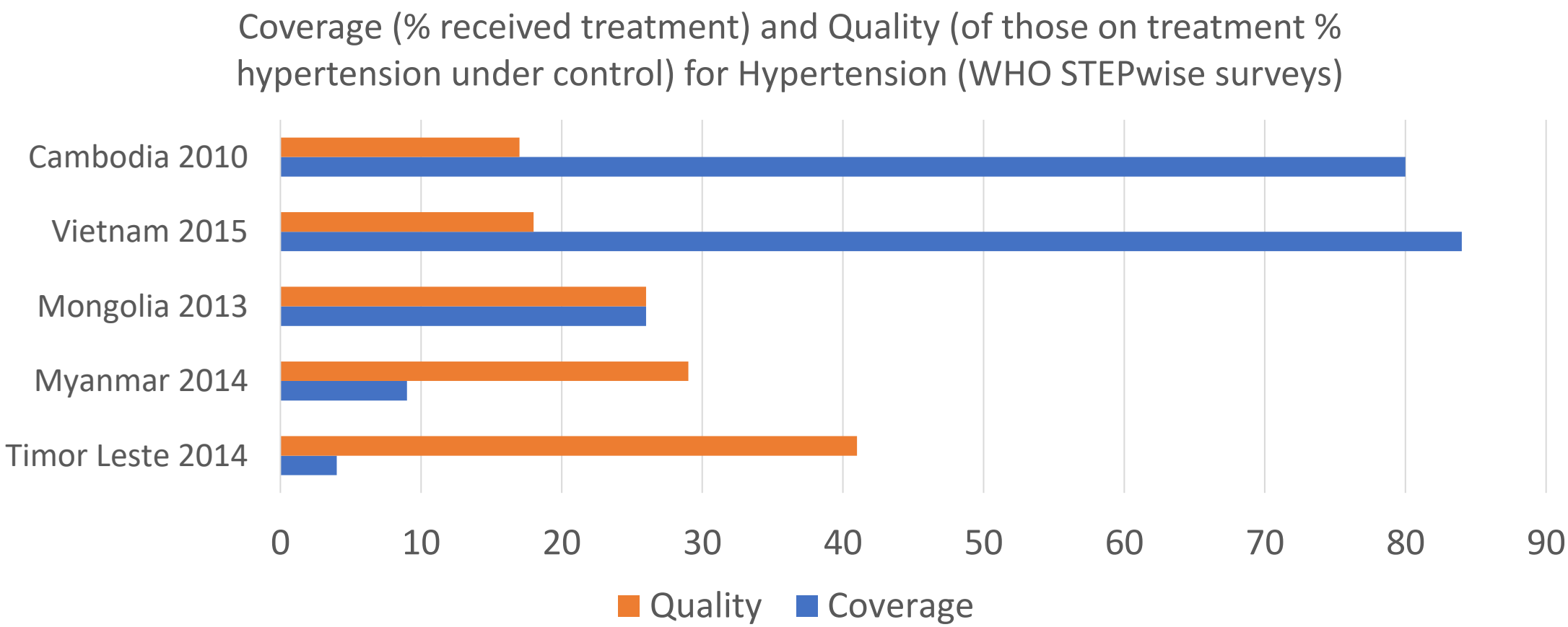
Source: de Walque, Kandpal et al. 2022

We can miss an important part of the picture if we focus only on **coverage** or only on **quality of care**

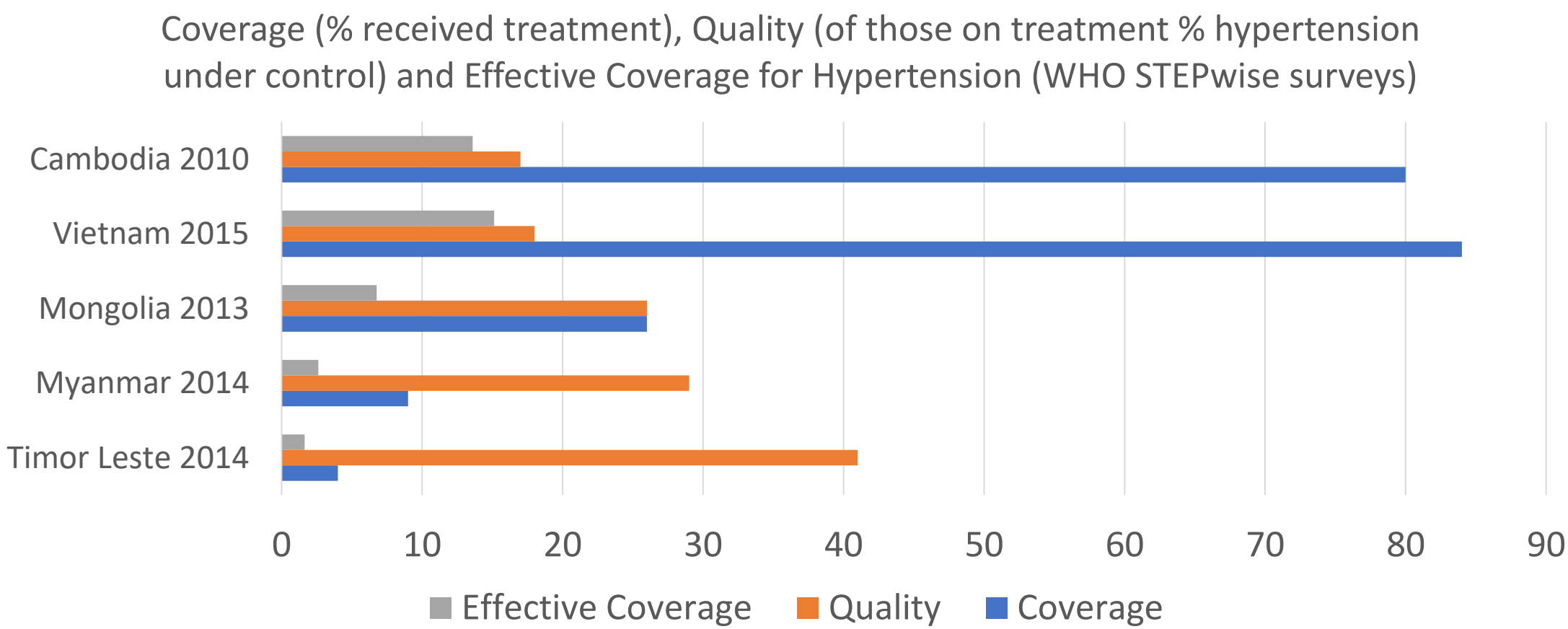
Illustrating effective coverage with hypertension



Illustrating effective coverage with hypertension



Illustrating effective coverage with hypertension



Interventions at health care level: quality of health care (effective health coverage)

- First a supply-side issue: quality of doctors and nurses training, of equipment, etc…
- Even when well trained staff and well equipped health centers are available:
  - Staff must provide sufficient effort to reach minimum quality: intrinsic motivation, extrinsic motivation (salaries but also potential role of performance-based financing)
  - Patients could be better informed of what minimum quality standards are and which facilities satisfy them
    - Information interventions

Lessons from COVID-19 and for Universal Health Coverage

- It pays to invest in health
- Governments play an important role, but individual behaviors still matter
- Trust matters
- No dichotomy between pandemic preparedness and primary care:
  - Thailand and Vietnam offered one of the best response to COVID-19 because they had strong primary care systems in which the population trusted.
- Quantity/coverage of health care provided remains important, but:
  - Prevention and public health measures could help avoid large share of burden of diseases, especially with growing share of NCDs.
  - Quality of care is at least as important as quantity.

Main policy messages

- Prevention is key (especially but not only given the rise of NCDs):
  - vaccination
  - public health measures (information, taxes on unhealthy behaviors)
  - early screening
- Quality of care must be an essential component of universal health coverage
- Quality of care builds trust in health systems
- Strong primary health care systems are the foundation of pandemic preparedness

Thank you!