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Economic and Health Outcomes of Salt Reduction in South Africa (and so much more)

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Acknowledgements: David Watkins, MD, Zachary Olson, MA, Stephane Verguet, PhD, Dean Jamison, PhD

We are grateful to the Bill & Melinda Gates Foundation for support of the Disease Control Priorities Network

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An economics & policy discussion in 3 parts

Part 1: What is DCPN?

Part 2: Choices with Limited Resources

Part 3: Salt reduction in South Africa

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Disease Control Priorities Network

- DCP3
- DCP Country and Region Network

UW DGH

- Country Costing
- Optimization Models
- Institutional Network

IHME

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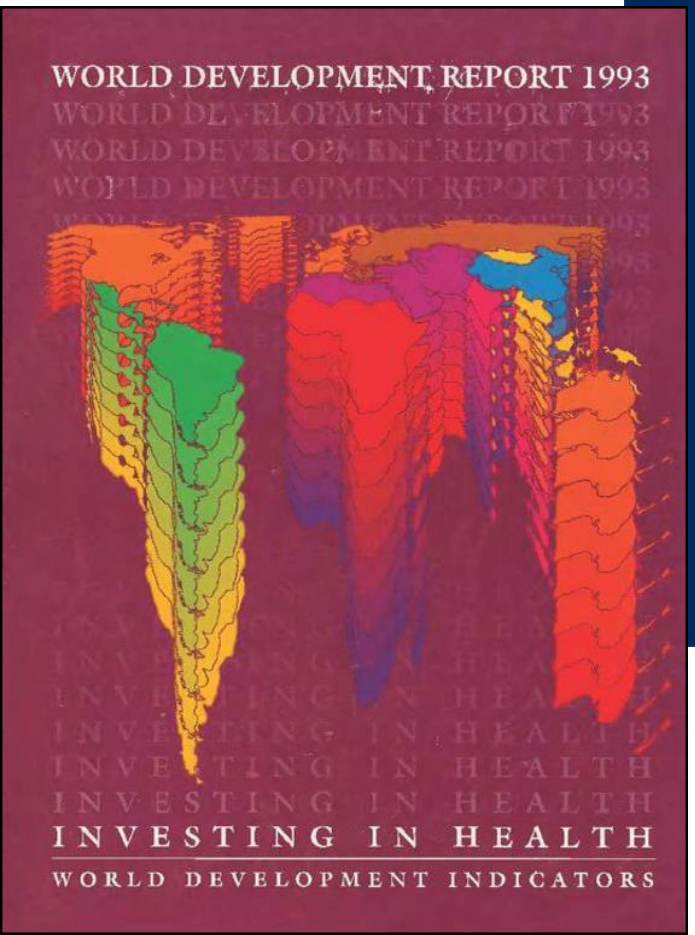

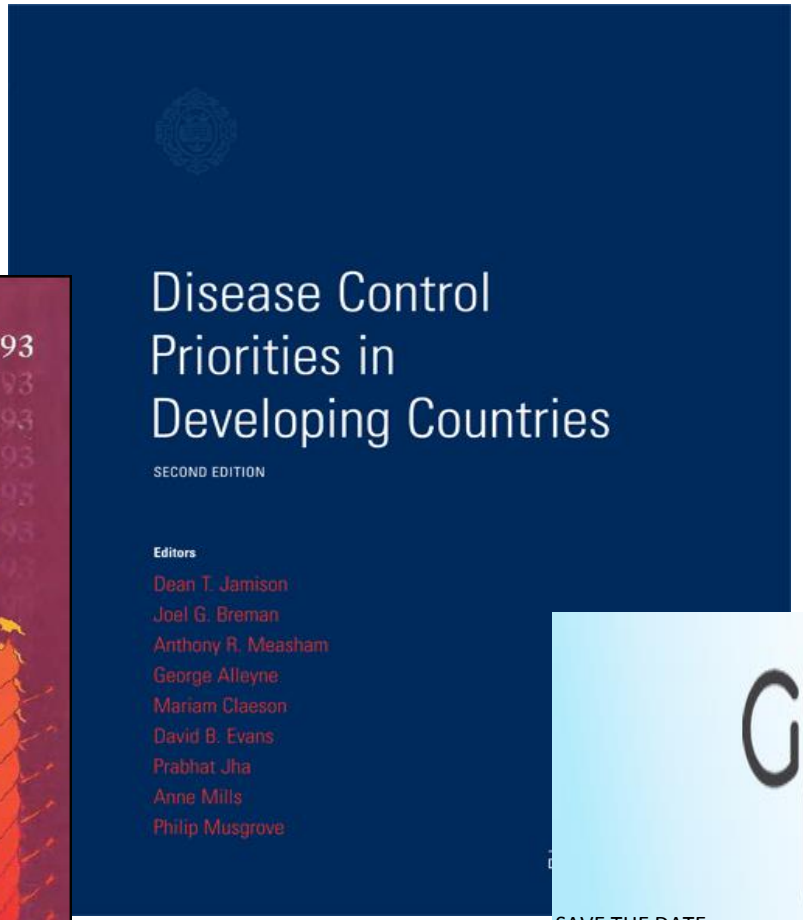

GLOBAL HEALTH 2035

SAVE THE DATE

Launch of the report by *The Lancet* Commission on Investing in Health Global Health 2035: A World Converging within a Generation

On December 3, *The Lancet* will publish Global Health 2035: A World Converging within a Generation, a major new report by the Commission on Investing in Health. The Commission is chaired by Lawrence H. Summers, President Emeritus and Charles W. Eliot University Professor of Harvard University and co-chaired by Dean T. Jamison, Professor at the University of Washington. The report is being released on the 20th anniversary of the 1993 World Development Report. The Commission,

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Disease Control Priorities, 3rd Edition

DCP3 Volume Topics
1. Disease Control Priorities in Developing Countries
2. Reproductive, Maternal, Newborn and Child Health
3. Child and Adolescent Development
4. AIDS, STIs, TB and Malaria
5. Cardio-metabolic and Respiratory Diseases
6. Cancer
7. Environmental Health and Injury Prevention
8. Mental, Neurological and Substance Use Disorders
9. Essential Surgery

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Disease Control Priorities, 3rd Edition

9 → Number of volumes

5 → Number of years

30 → Number of editors

135 → Number of chapters

400 → Number of authors

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Production Timeline

2013/14 ⟶ Writing of chapters, web publication

2014/15 ⟶ Editing and peer-led review

2014/15 ⟶ Volume production

2014/16 ⟶ Dissemination

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Objectives of DCP3

- Inform allocation of resources across interventions and health service delivery platforms.
- Provide a comprehensive review of the efficacy and effectiveness of priority health interventions.
- Advance knowledge and practice of analytical methods for economic evaluation of health interventions.

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Overview

Background

- Health spending decisions are about packages, platforms, policies
- Need to broaden the results of economic evaluation
- CEA ……ECEA……CBA

Multiple Health System Outcomes

- Equity

  Definitions
- Financial risk protection

  Definitions

Example

- Salt reduction policy in South Africa

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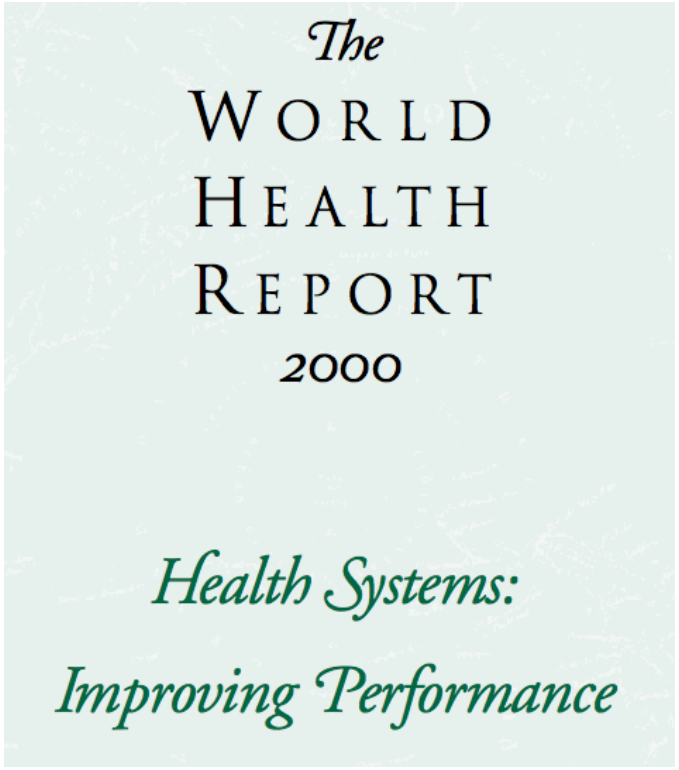
Health system objectives

- **Improving health and the distribution of health in the population**
- **Prevention of medical impoverishment**
- **Fairness in the financial contribution toward health**



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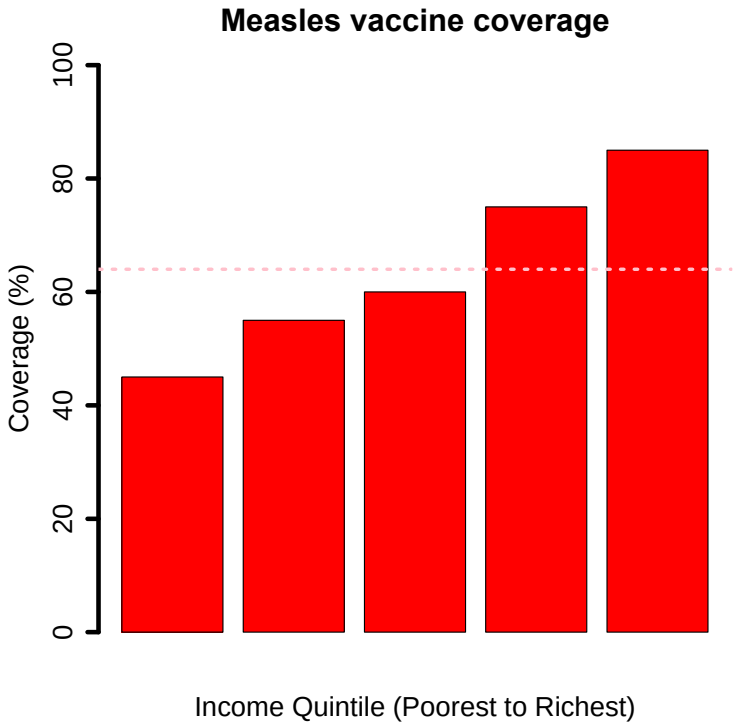
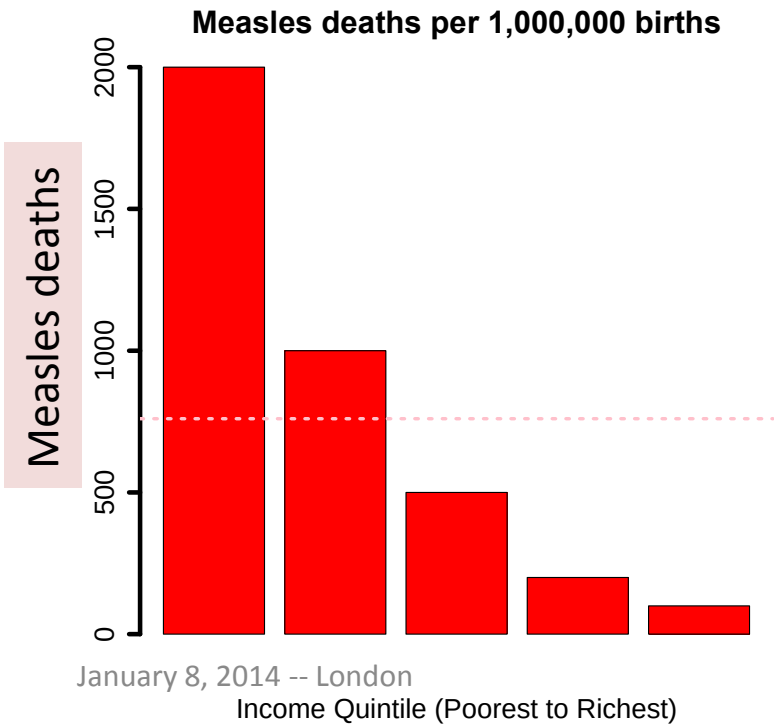
Measures of equity

- Fairness in the distribution of health coverage (ex: measles vaccine coverage)





- Fairness in the distribution of health outcomes (ex: measles deaths)

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Measures of medical impoverishment

- When confronted with medical expenditures and inadequate financial protection, people can face high out-of-pocket (OOP) payments and fall into poverty
  - Threshold-base approach
  - Poverty cases averted
  - Forced Borrowing and Asset Sales
  - Money-metric value of insurance

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Mechanisms of financial risk protection

- **Moving from out-of-pocket payments to prepayment mechanisms reduces catastrophic expenditures**

  (Xu et al. 2007; cross-country study)

- **Public finance & social insurance packages bring significant risk reductions**

  México's Seguro Popular in 2004 (Knaul et al. 2006)

  Medicare in the US (Finkelstein and McKnight 2008)

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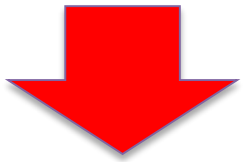
From CEA to ECEA

Cost Effectiveness Analysis (CEA)



Extended Cost Effectiveness Analysis (ECEA)

(1) Distributional consequences across wealth strata of populations

(2) Financial risk protection benefits for households

Verguet, Laxminarayan & Jamison, *Health Economics* (in press)

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Economic Evidence for Making Choices

A thought experiment

*You are the minister of health in Cambodia. You have **$35 million** to spend on NCDs. Which of these do you choose? Who is covered for what?*

Population prevention Low-cost: Tobacco taxation High-cost: food regulations [pushback from industry]	**Population screening** What diseases? HTN?, DM? What target groups? [unclear guidelines, costly]
Individual prevention Which meds are covered? How do you deliver care? - Buy more HCWs? - Redistribute HCWs?	**Individual treatment** Low-cost: ACEI, BB, ASA? High-cost: - Acute, e.g., CABG - Chronic, e.g., dialysis??

<u>Some data snippets</u>

822,080 – 1,423,960 cases of diabetes (2/3 unaware)

1,783,200 – 3,715,000 cases of hypertension

No data on prevalence of CAD, CKD

48% of men and 3.6% of women use tobacco

King H. Lancet 2005; 366:1633

Singh PN. Bull WHO 2009; 87(12):905

Cost-benefit returns from selected investments

Priority Area	Indicative Benefit-Cost Ratio	Annual Costs ($ billions)	Annual Benefits
1. Cancer, heart disease, other: tobacco taxation	40:1	0.5	1 million deaths averted or 20 million DALYs
2. Heart attacks (AMI): acute management with low-cost drugs	25:1	0.2	300,000 heart attack deaths averted each year or 4.5 million DALYs
3. Heart disease, strokes: salt reduction	20:1	1	1 million deaths averted or 20 million DALYs
4. . Heart attacks and strokes: secondary prevention with 3-4 drugs in a "generic risk pill"	3:1	32	1.6 million deaths averted or 108 million DALYs averted

Source: Jha, Nugent, Verguet, Jamison, (2013) "Global Problems, Smart Solutions – Costs and Benefits", Oxford University Press

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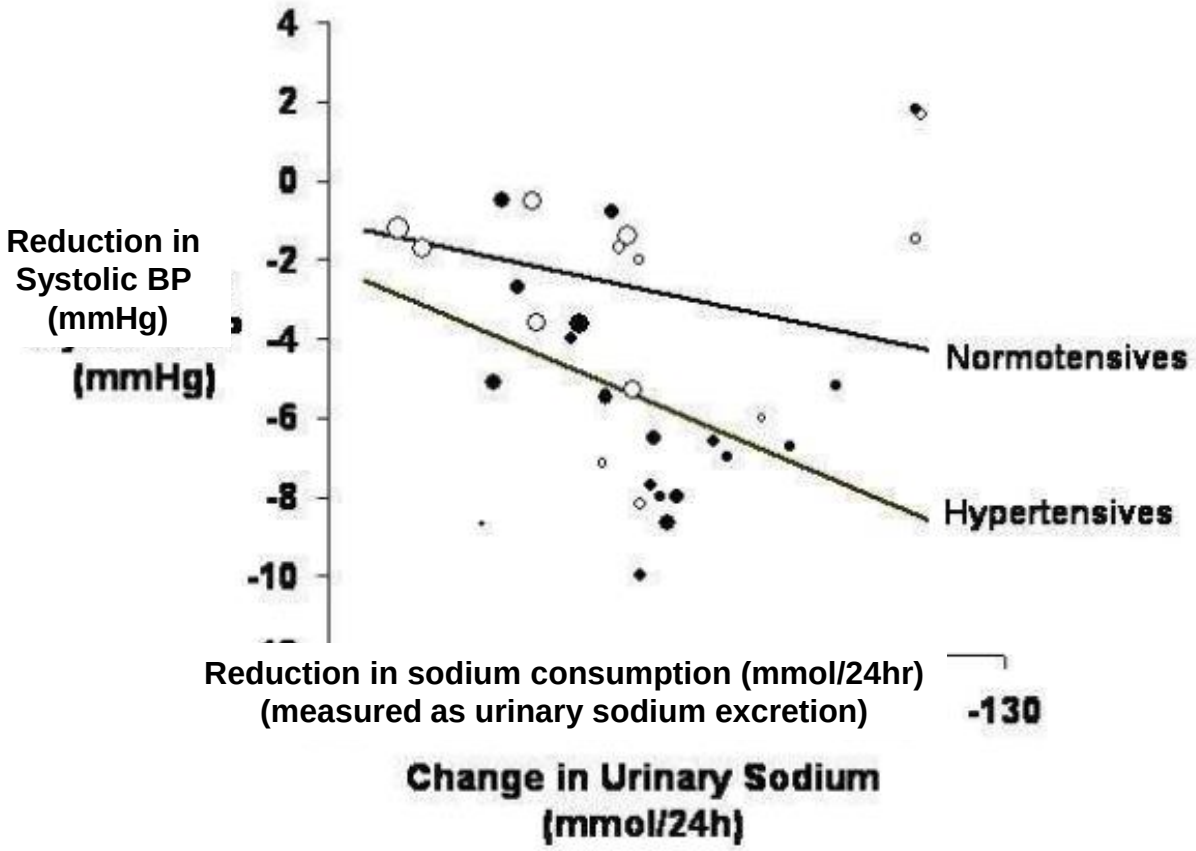
Economic Evaluation of Salt Reduction in South Africa

- Burden of heart disease and stroke is increasing in low- and middle-income countries, due in part to spread of "Western" dietary habits (e.g., salty foods)
- South Africa is developing legislation to curb salt intake by regulating content in certain processed foods and educating public about discretionary salt use
- Policy will not only have health impacts, but financial and distributional effects
- Economic analysis is necessary to provide insight into how the policy will function in the context of the South African healthcare system

Lower salt intake means lower BP

(By inference, this means a lower risk of long-term CVD)



He FJ, MacGregor GA. Effect of longer-term modest salt reduction on blood pressure. *Cochrane database of systematic reviews* 2004. CD004937.

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Extended Cost-Effectiveness Analysis (ECEA)

Effects of Salt Reduction Policy

- Health gains (burden of disease averted)
- Financial consequences for household expenditures
- Where applicable, "crowding out" of private expenditures
- Financial protection benefits
  - Catastrophic expenditures or cases of poverty averted
  - "Insurance value"
- Distributional consequences (across income groups)

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Salt reduction ECEA in South Africa: Methods

Baseline Salt Consumption, Blood Pressure

- Hypothetical cohort with diet, health, and income status from literature and National Income Dynamics Survey (NiDS)

Impact of Salt Reduction on Blood Pressure

- Linear relationship between lower salt consumption and lower blood pressure, based on recent meta-analysis, estimated at the individual level and aggregated by income group

Impact of Reduced Blood Pressure on CVD

- Published hazard ratios describe the impact of lower blood pressure on mortality from stroke and ischemic heart disease (CVD)

Impact of Reduced CVD on Treatment Costs

- Calculated the amount of reduced expenditures on CVD hospitalization and chronic care

Disaggregation of Results by Income Group

The South African health system structure influences cost of treatment

	Stroke	IHD
PUBLIC H0	10	11
PUBLIC H1	24	26
PUBLIC H2	356	512
PUBLIC H3	1996	2184
PRIVATE INSURED	831	1161
PRIVATE UNINSURED	5775	7946

Average out-of-pocket costs on acute CVD events (2012 USD)

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Salt reduction ECEA in South Africa: Results

Estimates for a cohort of 1,000,000 South Africans over the age of 40

	Quintile I	Quintile II	Quintile III	Quintile IV	Quintile V
Deaths Averted	39	60	65	54	61
Aggregate Private Expenditures Averted (2012 USD)	1641	5109	65,535	136,679	202,493
# Cases of Catastrophic Expenditures Averted	3	6	17	40	26

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Findings

- Health gains relatively evenly distributed across income groups
- Because of South Africa's dual public-private healthcare system, Quintiles I-III receive less financial protection; private expenditures averted are concentrated in the uninsured and underinsured in Quintiles IV-V
- Reduction in catastrophic expenditures skews toward the wealthy

- For the entire SA population, during **each year** of the policy:
  - **3696 deaths** averted
  - **$11.45 million in govt subsidies** and **$5.57 million in private expenditures** averted
  - **3038 cases of poverty** and **750 cases of catastrophic health expenditure** averted

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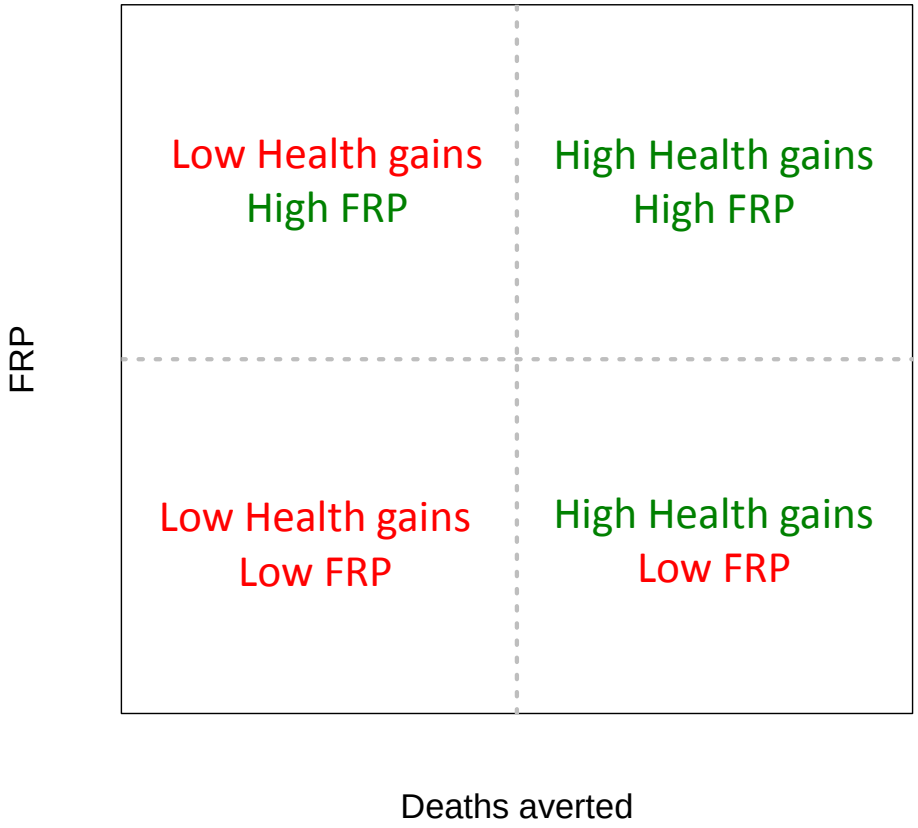
Priority setting & UHC

Goal: Design basic insurance packages, taking into account burden, costs, equity, medical impoverishment



FRP = financial risk protection (prevention of medical impoverishment)

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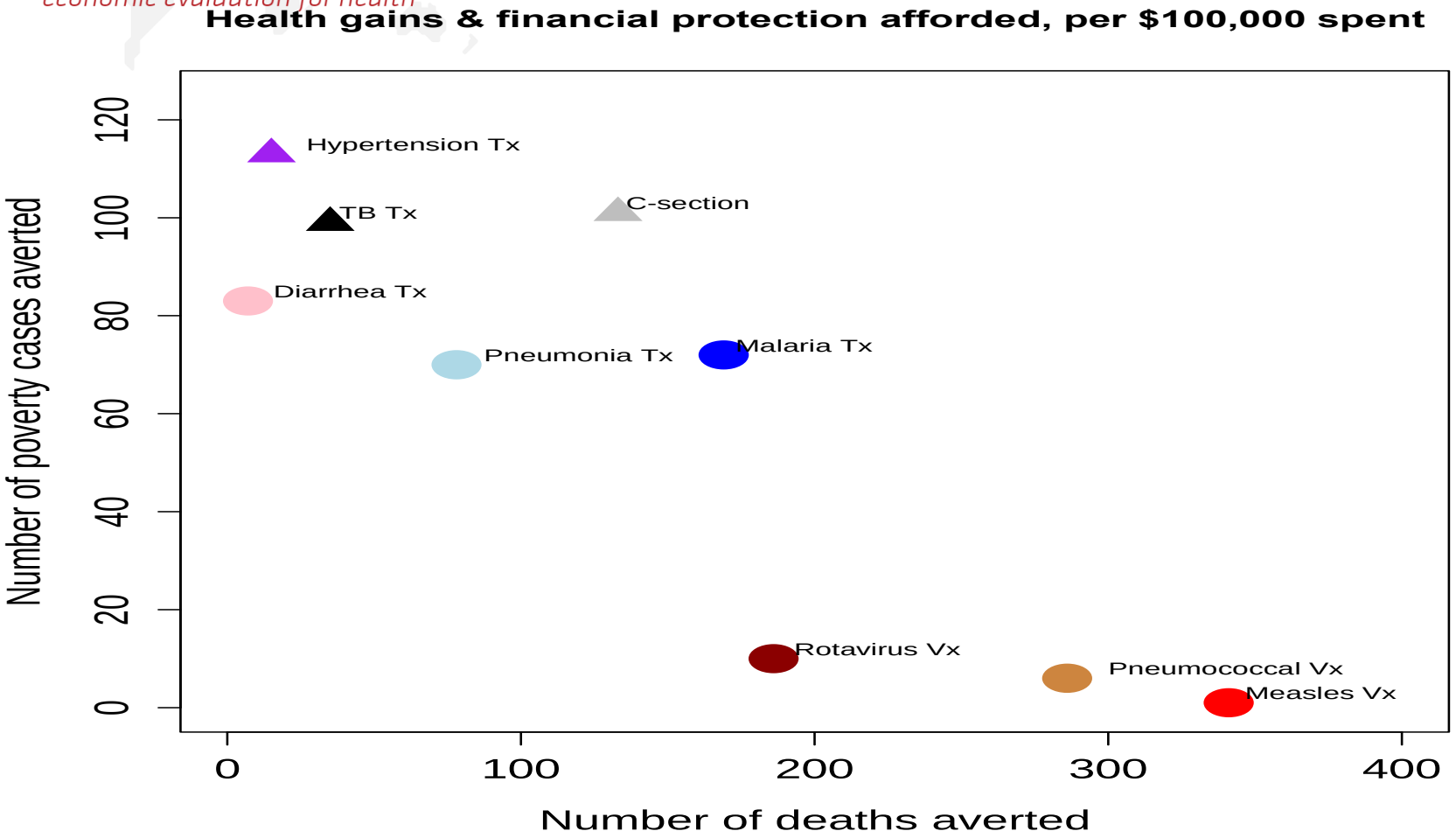
ECEA – Comparison across diseases/policies



Public finance for health interventions in Ethiopia. Verguet, Olson, Babigumira et al. (under review)

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Summative observations

- Comparable quantitative measures are very powerful
- Precarious tension between complex contextualized model and generalized analysis
- Difficult to get data sufficiently broadly across disease/health topics, levels of health system, and population characteristics in a given country
- Importance of working with people who **know** their health systems, population, and policy priorities

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THANK YOU

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Acknowledgements

DCPN-UW Team

- Dean Jamison
- Stéphane Verguet
- Rachel Nugent
- Carol Levin
- Elizabeth Brouwer
- Zach Olson
- Shane Murphy

ECEA Collaborators

- Jane Kim
- Monisha Sharma
- Rick Rheingans
- Roger Glass
- Ben Anderson
- Kjell Arne Johansson
- Clint Pecenka

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Examples of policy instruments

- Public finance for a specific technology (ex: UHC)
- Social insurance packages (ex: México's Seguro Popular)
- Conditional cash transfers (ex: India's JSY)
- Taxation (ex: tobacco)
- Regulatory policies (ex: salt reduction legislation)
- Disease elimination (ex: measles)