DCP3 Disease Control Priorities

economic evaluation for health

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Extended Cost-Effectiveness Analysis in DCP3

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ECEA Conceptual Framework

Aim:

ECEA advances on CEA by including policy and health system levers (inputs) and distribution of health gains, financial protection benefits (outcomes)

Rationale:

1. Includes policies and health system delivery approaches because they affect efficiency, equity, and effectiveness of interventions (moves away from a contextual interventions)
2. Includes financial protection because this is an aim of health systems
3. Includes distribution of health and financial effects to highlight equity impacts of interventions

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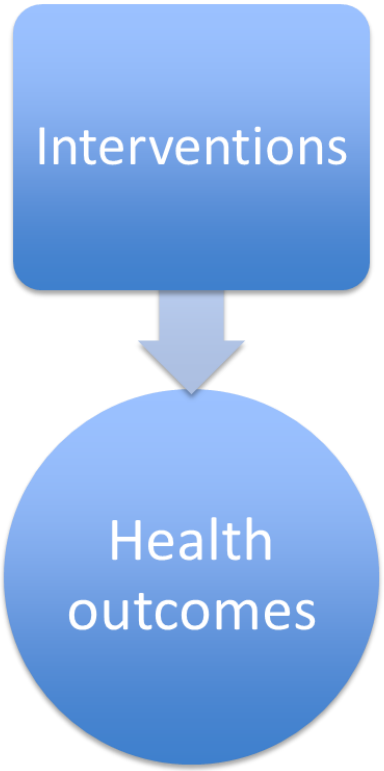
ECEA Conceptual Framework

Traditional CEA: “context free” interventions



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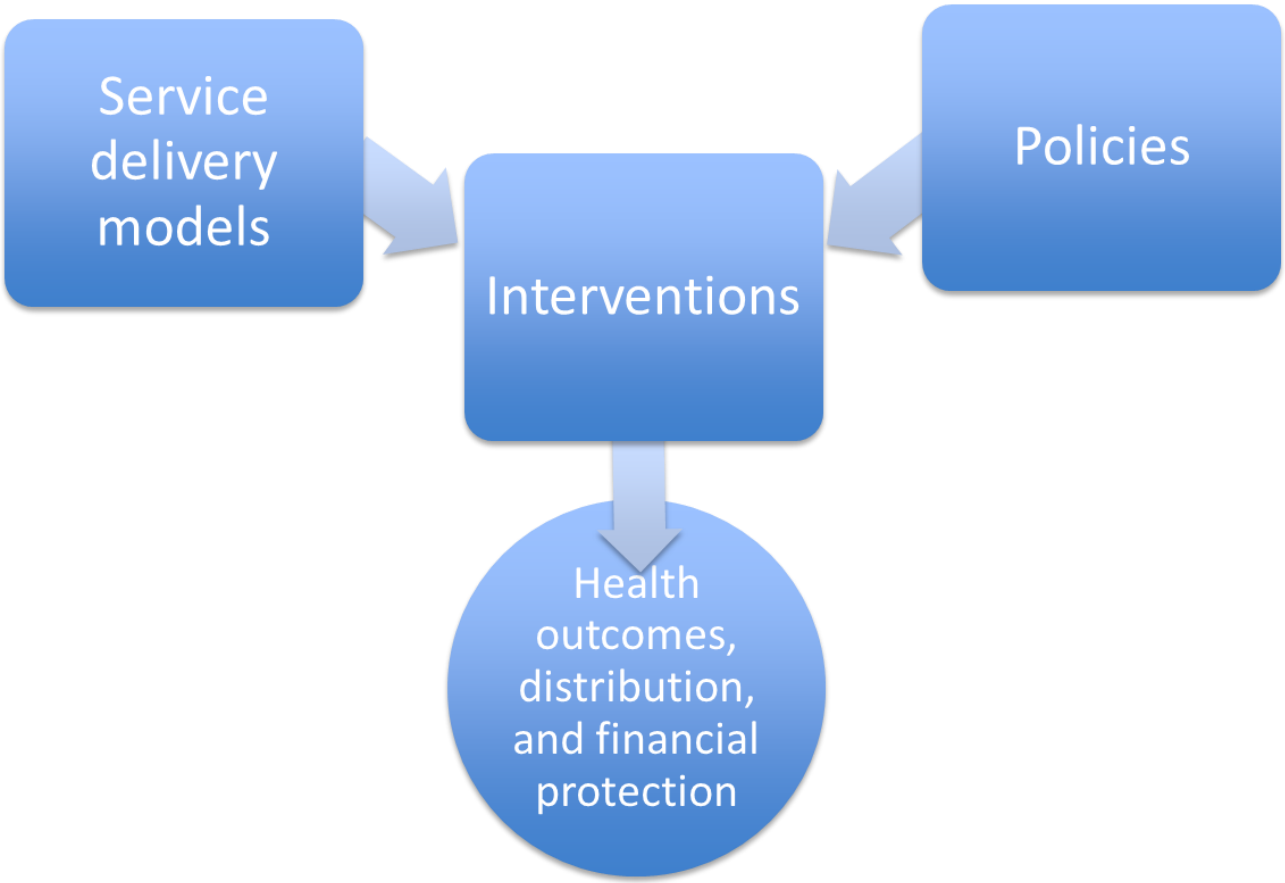

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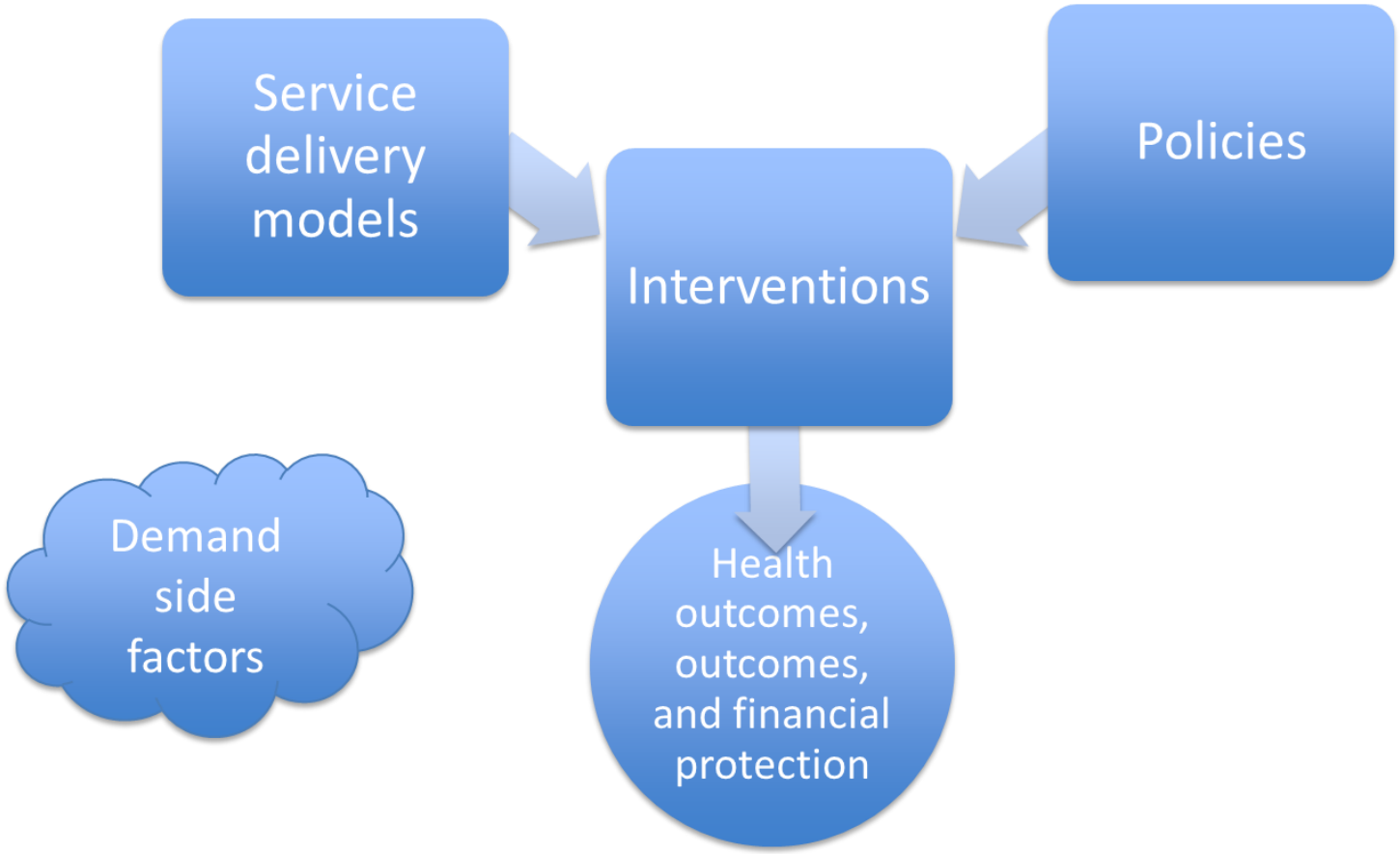

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Inputs

Policy and structural levers

- Public health policies (e.g., regulation of smoking, salt, food fortification)
- Behavior change communication (e.g., mass media campaigns)
- Pricing (e.g., user fees, negative user fees, partial public finance, universal public finance, taxation)
- Structural (e.g., infrastructure development, improved supply chain)

Service delivery models

- Organization and planning (e.g., level of the system interventions are delivered, referral guidelines, individual versus bundled interventions)
- Human resources (e.g., who delivers the service)
- Quality improvement interventions

Interventions

- Clinical services

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Outcomes

Outcomes

- Aggregate health outcomes (e.g., deaths averted, life years saved, DALYs)
- Distribution of health outcomes (e.g., by wealth quintile)
- Financial protection (e.g., net private expenditures averted, insurance value, cases of impoverishment averted, borrowing and/or asset sales averted)

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Example: Essential surgery in Ethiopia

Question: What is the cost-effectiveness of public financing of life-saving surgery and task shifting to non-physicians?

Rationale:

- Caesarian section in Ethiopia is 0.4% of births—surgery underutilized in most LICs
- 25% of households in 40 LMICs borrowed money or sell assets to pay for health care in past year; more common among poor
- Surgical technicians can provide high quality care

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Example: Essential surgery in Ethiopia

Analytic approach: sequential model

Step 1: Establish contents of basic surgical package

Step 2: Provide government financing

Step 3: Task shift to non-physicians to expand service availability

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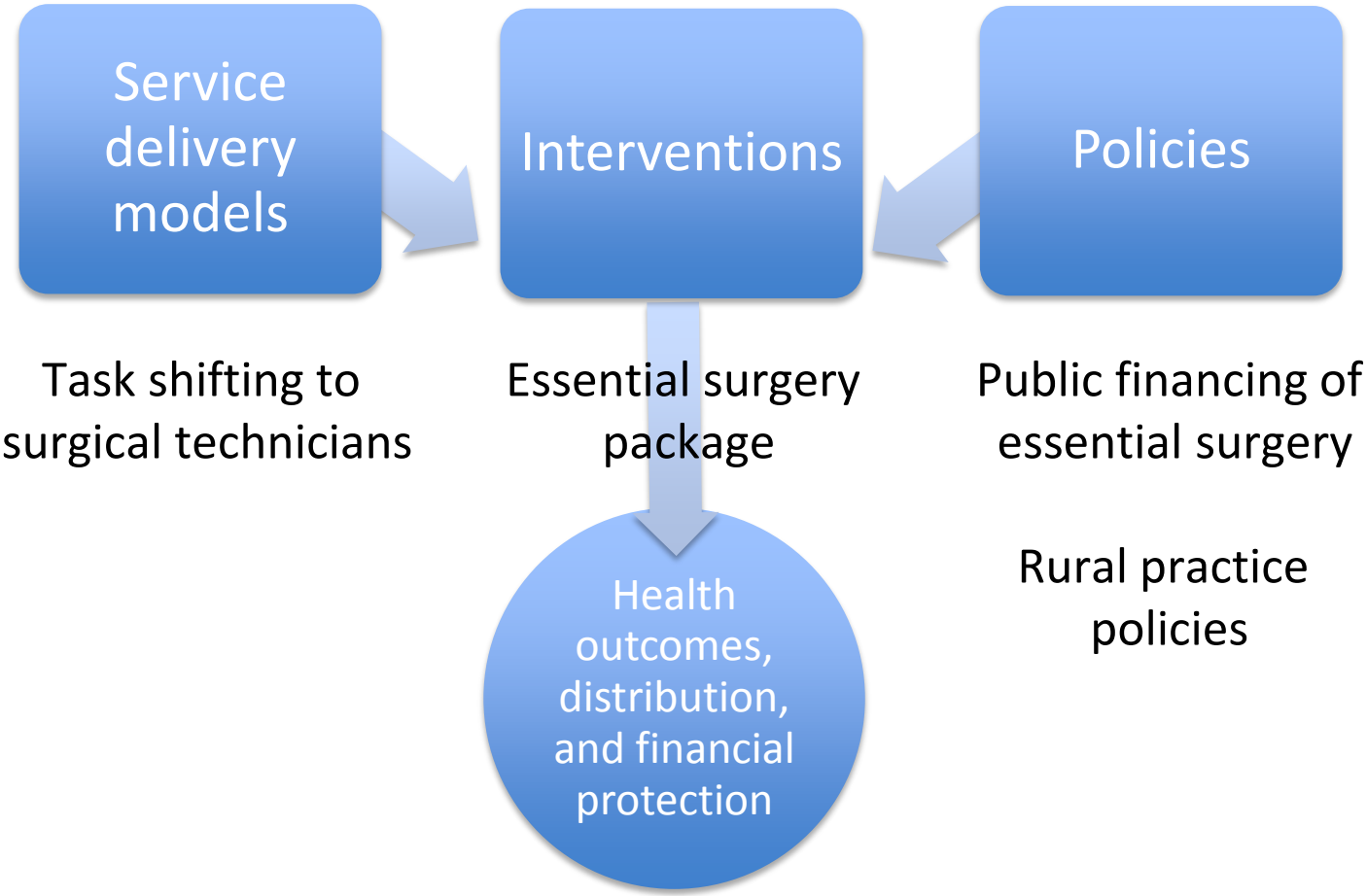
Surgery ECEA



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Intervention: life-saving surgeries

- Obstetric: D&C, C/S, hysterectomy, salpingectomy for ectopics
- General: Appendectomy, exploratory laparatomy for bowel obstruction/perforation
- Trauma: Tube thoracostomy, Traumatic amputation, Closed fracture repair

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Policies and delivery models

Policies

- Universal public finance of surgical package
- Rural practice incentives/restrictions, medical licensing reforms

Delivery models

- Non-physician surgeon (modeled on tecnico de cirurgia in Mozambique)
- Supervision system via regional hospitals

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Outcomes

- Deaths averted/DALYs averted
- Cases of poverty averted
- Asset sales/borrowing averted
- Distribution of health and financial outcomes across income levels

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Essential surgery in Ethiopia

Setting:

- Rural Ethiopia (69M, approximately 83% of total population)[1]

Model inputs:

- Incidence of disease
- Gradient of disease across income quintiles
- Disability weights for disease states
- Cost of surgical intervention in Addis vs. in district hospitals
  - Approximately 1.5x more expensive in Addis[2]
- Complication rates for surgeons vs. technicians
- Mortality rates:
  - Untreated disease (assumed to be 1 for most, but not all, conditions)
  - Disease treated by surgeons
  - Disease treated by techs

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Essential surgery in Ethiopia

Inputs:

- Demographic and financial variables
  - Proportion of the population women of reproductive age (0.23)[1]
  - Proportion below the poverty line (0.29 – 0.39)[2]
  - Average yearly income (USD 364)[3]
  - Inflation rate
  - Interest rate
- Utilization
  - 20%, with gradient across wealth quintiles[4]
- Attrition rate for surgeons and techs
  - Rural surgeons: 1 – 3 years
  - Techs: 10 years

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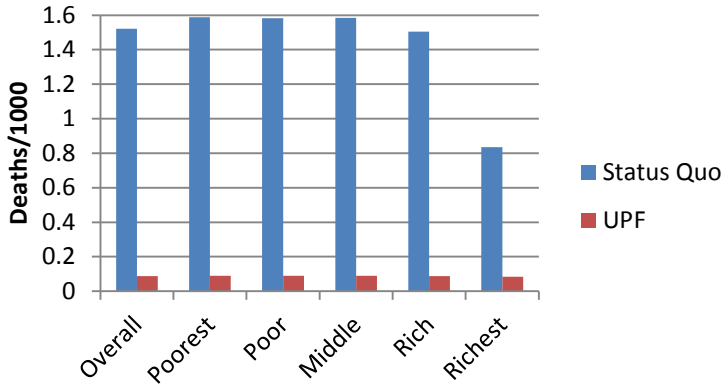
Results

- Universal public financing
  - All patients who desire care get it
  - All costs transferred to the government

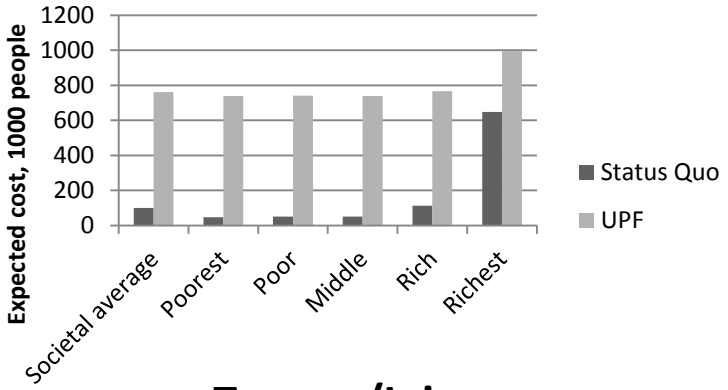
Mortality

Costs

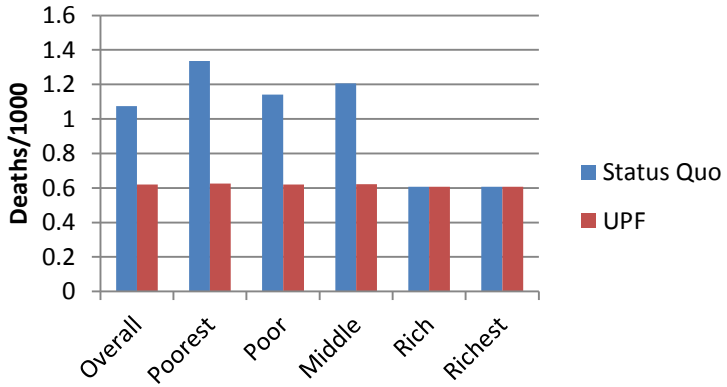
Maternal Mortality



Maternal Mortality



Trauma/Injury



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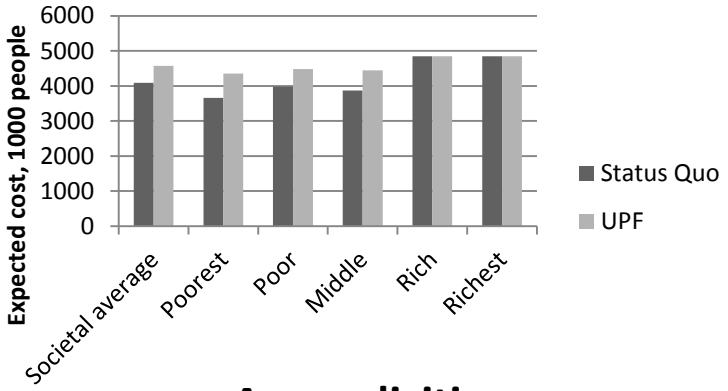

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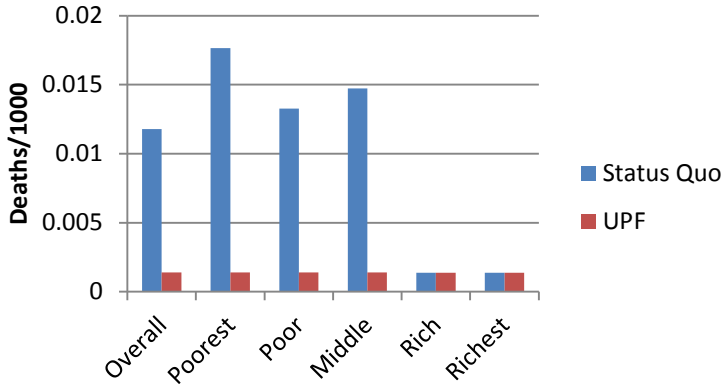

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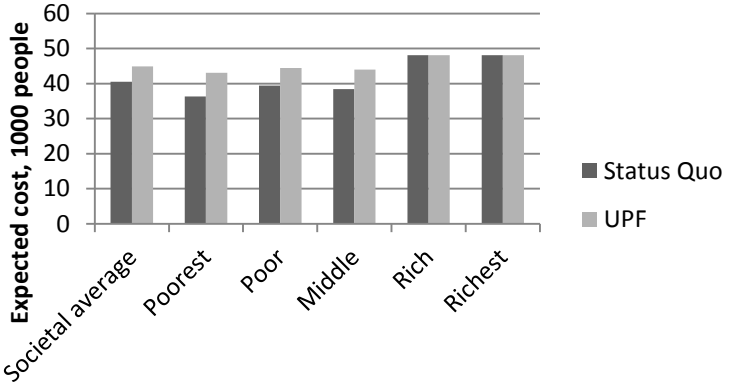

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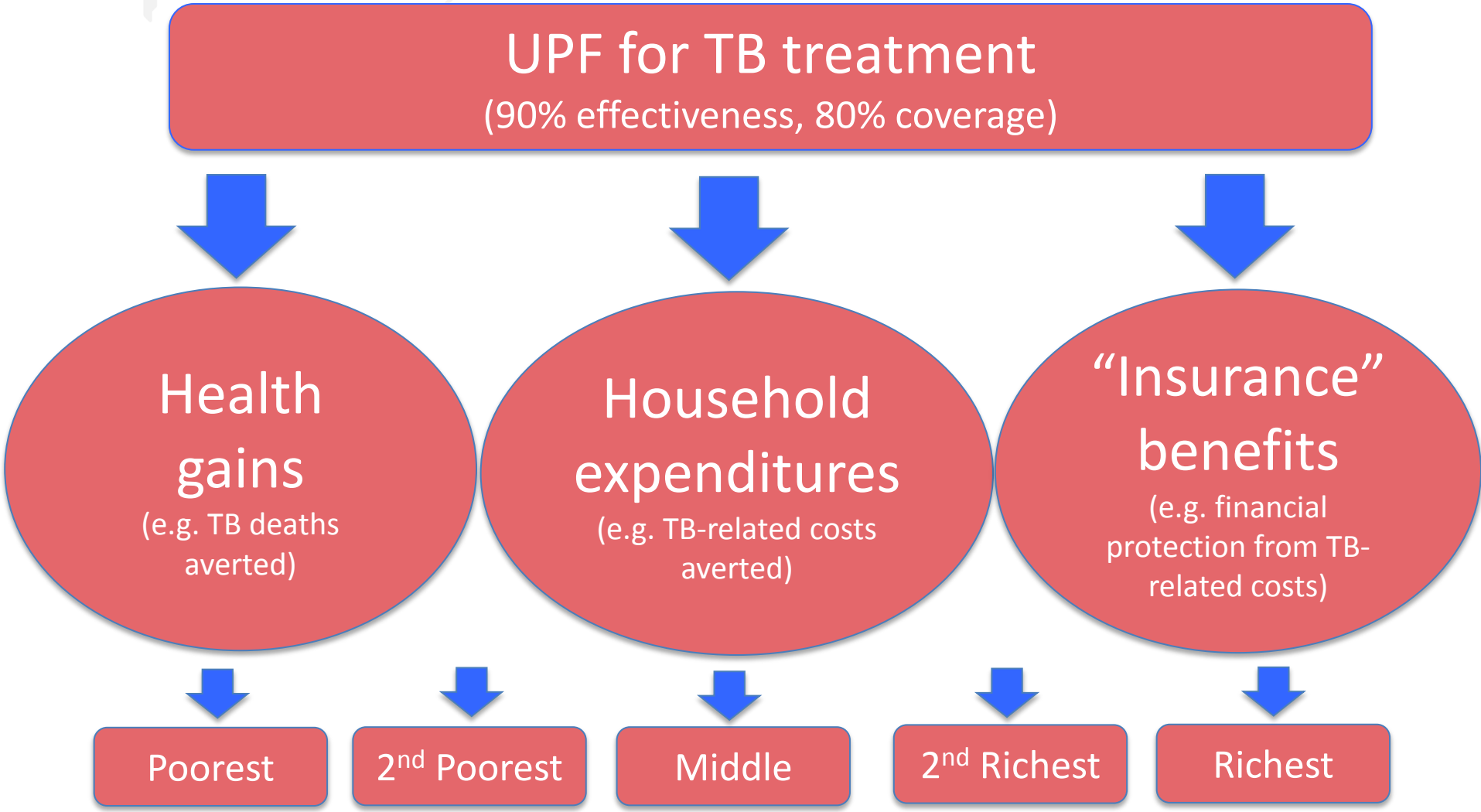
Another example: universal public finance for TB treatment in India



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Benefits over 1 year for 1 million Indians with UPF for TB treatment

	Outcome	Total	Income Quintile I (Poorest)	Income Quintile II (Poorer)	Income Quintile III (Middle)	Income Quintile IV (Richer)	Income Quintile V (Richest)
1	TB deaths averted	150	100	50	0	0	0
2	Private expenditures crowded out	$70,000	0	15,000	25,000	20,000	10,000
3	Money-metric value of insurance	$10,000	0	3,000	4,000	2,000	1,000

Total cost of public program of $130,000

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Conclusions (1)

- ECEAs
  - ➢ incorporate equity & financial protection, two important objectives of health systems (Murray & Frenk 2000)

- Case study: UPF of TB treatment in India
  - ➢ health gains concentrated among poor
  - ➢ financial protection benefits concentrated among poor, effectively replacing coping mechanisms
  - ➢ crowding out of bad treatment options = enhances quality