

Incentives for R&D on Health Problems of the Developing World

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Incentivizing R&D

- The disease burden
- The need for R&D
- Push and pull strategies
- Design of pull programs

The Problem

- More than one million people die of malaria each year
- Two million die of tuberculosis
- No adequate vaccines

The Potential Role of New Vaccines

- Vaccines are highly cost-effective.
- Existing vaccines save 3 million lives/year.
- 74% of children receive some vaccines.
- Efforts to expand coverage

Explaining the Lack of Research

- Insufficient R&D
 - Potential purchasers are poor
 - Vaccine developers capture only small fraction of benefits of research

Historically Weak IPR

- After vaccines developed, pressure for low prices
- Research is global public good

Components of Strategy to Promote Vaccine Research

- Push: payment for research inputs (grants, etc.).
- Pull: payment for research output (e.g. guarantee price for a usable vaccine).

Role of Push

- Well suited to basic research
- Several initiatives exist - NIH, MMV, IAVI

Role of Pull

Public pays nothing unless and until an acceptable vaccine is developed.

- Avoids questions of whether science is ready, picking winners
- Aligns goals of funder, firms
- Improves access for poor
- Minimizes budgetary conflict with current priorities

Design of a Pull Program

- Vaccine eligibility rules
 - technical specifications
 - demand indication (price guarantee)
 - independent adjudication committee
- Multiple Products

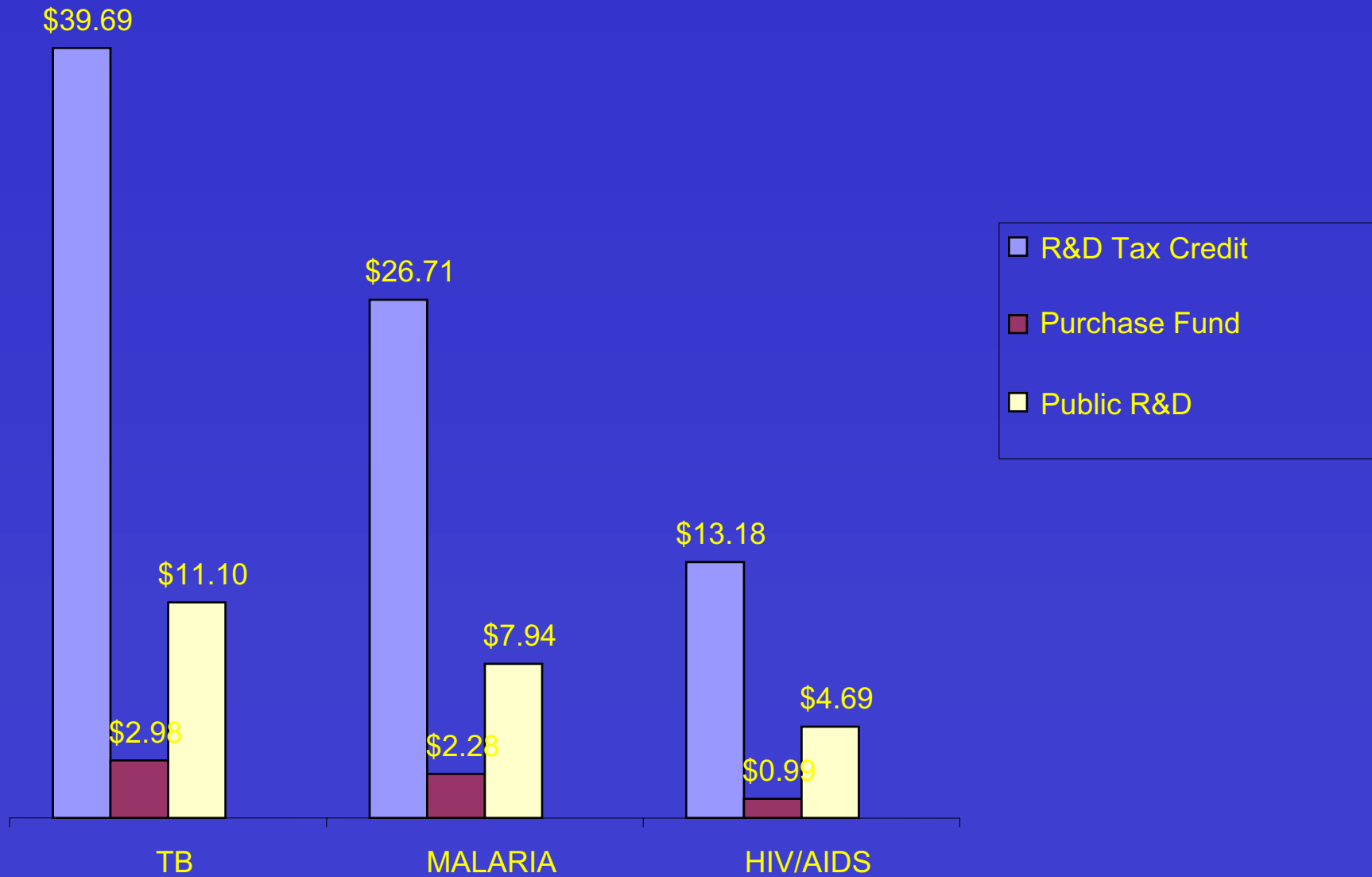
How Large a Commitment is Needed?

- Substantial R&D effort is generated by private market of \$250-500 million/year per product.
- 10 year commitment
- Larger commitment = shorter wait
- Cost < \$10/DALY saved

Conclusion

- Commitment to purchase vaccines complements existing efforts.
- If no vaccine developed, little money spent.
- If vaccines developed, millions of lives saved, at a few dollars each.

Cost Per DALY saved



Excludes delivery costs

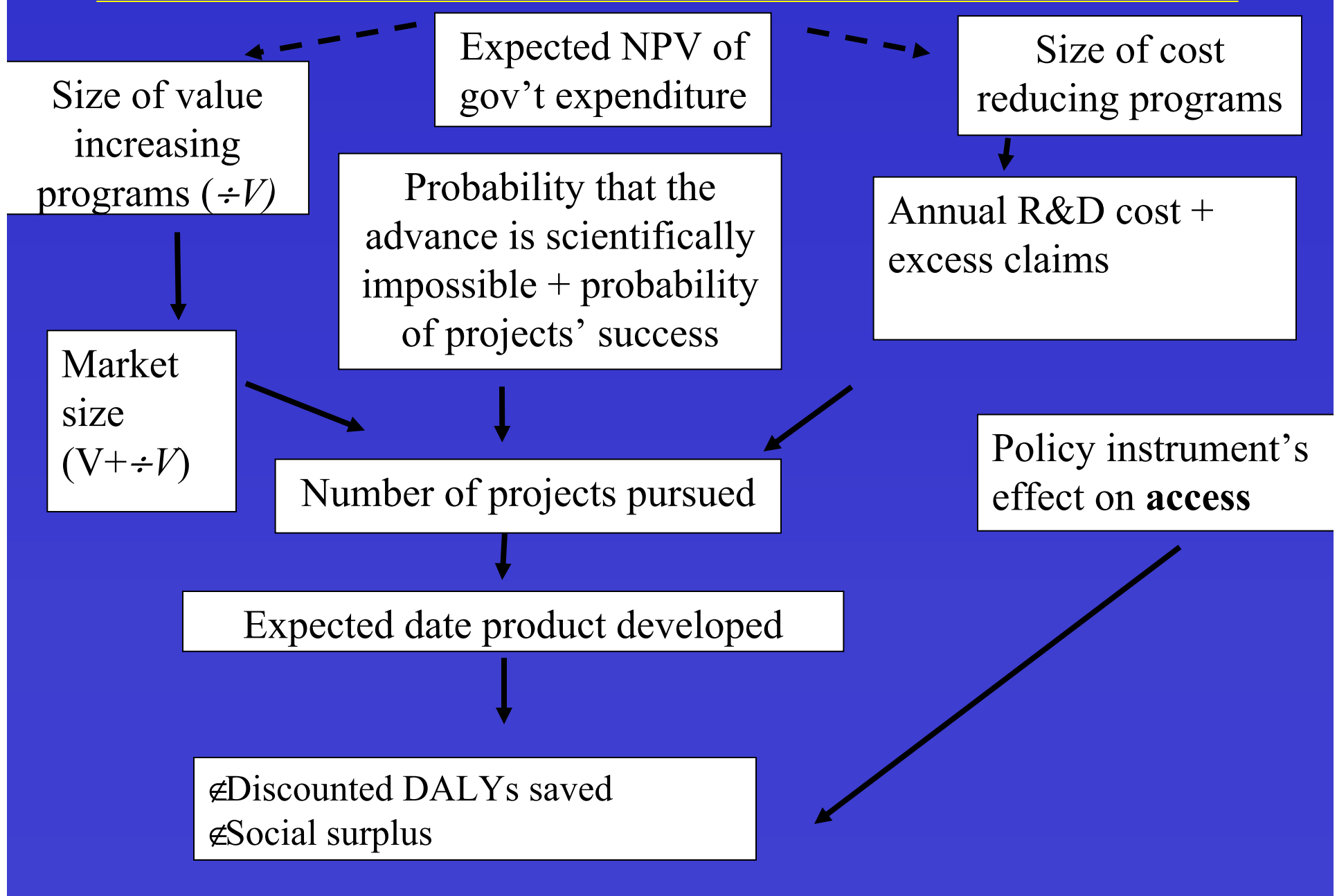
Modeling Approach

- Simple model puts policies on comparable basis with similar assumptions about scientific opportunities
- Users can enter own assumptions

R&D Model: Purpose and Methodology

- Basic Framework
 - Science may or may not be ready
 - Firms have access to different potential research projects, which vary in chance of success

Model



Assumptions

- The model should be used to compare the *relative* effectiveness of instruments under consistent assumptions, rather than estimate the precise time until vaccine development.

General Assumptions

- 1/3 probability that science is not ready to develop a vaccine

Assumptions on R&D Credit

- Firms may claim credit for research on targeted diseases aimed at developed world
 - Strains of diseases are different enough that developed world vaccines may not be appropriate
 - For example, existing BCG TB vaccine provides 80% protection in UK, but close to zero in India
- Difficult to distinguish R&D projects, so firms may overstate actual research expenses
 - Expenses in vaccine research may be shared among several projects
 - E.g., adjuvants, biofermentation facilities

Specific Assumptions

- R&D Tax Credit
 - 2.5% of existing R&D expenditures can be counted in tax credit
 - For every \$1 claimed for R&D for appropriate product, \$1 claimed for products aimed at developed countries
- Clinical Trials Tax Credit
 - 0.1% of existing R&D expenditures can be counted in tax credit
 - For every \$1 claimed for appropriate product, \$0.20 claimed on products aimed at developed countries
 - 35% of total R&D cost spent on clinical trials

Specific Assumptions

- Publicly-supported R&D
 - 20% cost premium for government-managed R&D projects
 - 10% wasted (politicization, failure to shut down bad projects, etc.)
 - Government R&D partially crowds out private investment

Cost-Effectiveness - Results

Disease	Cost/DALY Saved	Vaccine price per person
Malaria	\$5	\$3
TB	\$8	\$2
HIV/AIDS	\$3	\$3