

Experimentation, innovation, economics

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Example: Colombia's PACES voucher program

- Program provided over 125,000 vouchers to attend private secondary schools in the 1990s.
- Used data from 1995 Bogotá voucher program
 - Lottery when demand exceeded supply
 - 4,044 applicants, 59% awarded a voucher
- We link lottery data to various national administrative records to track multiple outcomes over time.

Results: Colombia PACES RCT

- **Education:**
 - PACES lottery winners are 16 percent more likely to complete secondary school on time. They are also 10 percent more likely to complete secondary school within six years after on-schedule completion.
 - PACES Program increases enrollment in tertiary education by 16% in the whole sample (3.1pp increase relative to 19.1% base).
- **Formal sector participation:**
 - No significant effect of winning a voucher on participation in formal sector in the full sample or by subgroup
- **Formal earnings:**
 - PACES Program increases formal annual earnings by 8% (p-value < 0.06) for winners in full sample. This represents \$210 USD increase in formal earnings relative to a baseline of \$2,508
 - In vocational sample, increase was 17% for winners (An increase of \$427 on a base of \$2,568.3)
 - Impacts strongest in the upper quantiles of the distribution.

The experimental method in development economics

Uses randomized control trials to assess impact, similar to approach in medicine.

Features of the experimental approach:

1. Causality
2. Rich context
3. Specific, practical problems
4. Collaborative
5. Iterative



Science

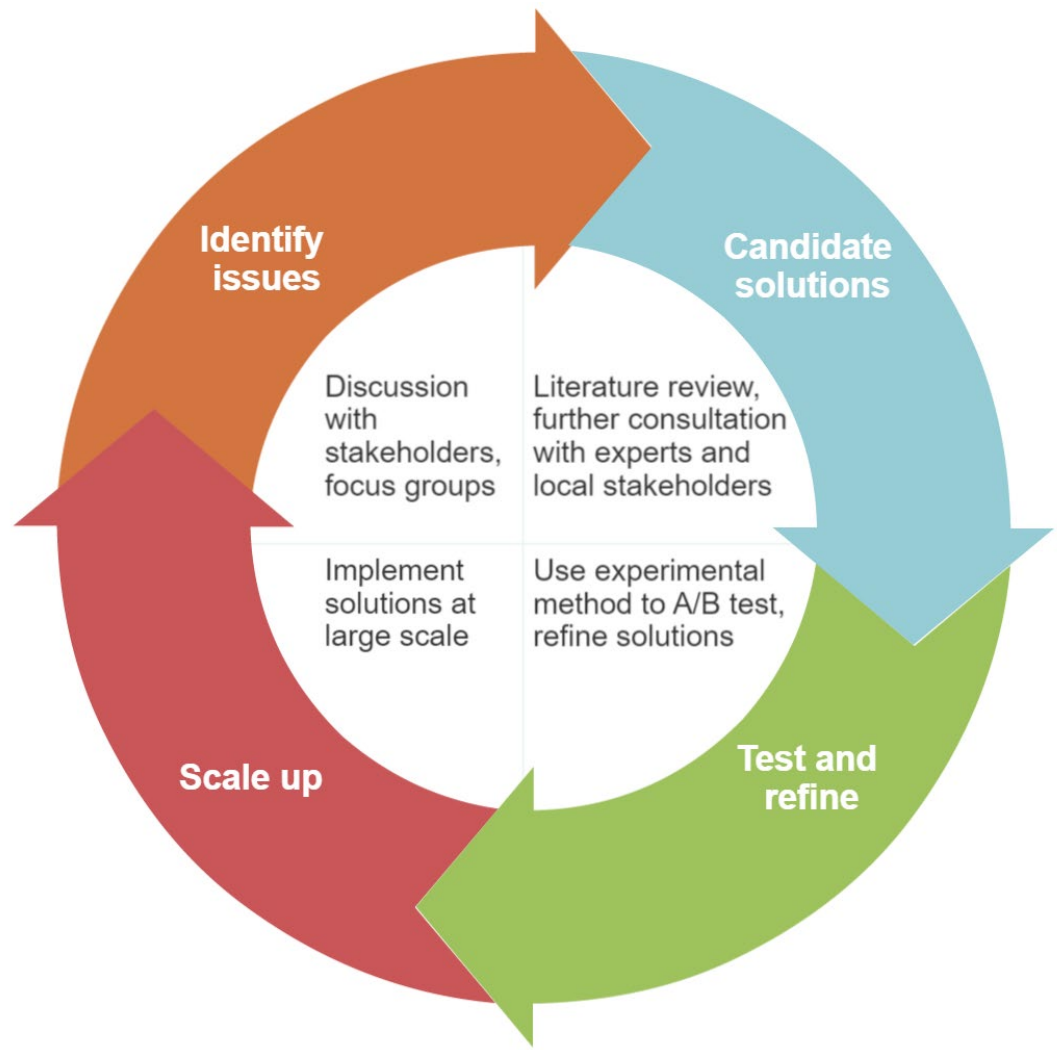
Policy

Innovation

Experiments as a tool for isolating program impacts, informing policy

- Example: School-Based Deworming study in Kenya
 - Reduced school absences by around a quarter (in the short-run)
 - Boost income and consumption by 7-14% in the long run (20 years later)
- In 2015 India introduced National Deworming Day, reaching hundreds of millions of children annually

Experiments as part of innovation cycle



Institutionalizing Social Innovation

Government Innovation Units

Innovations are developed and tested within governments in collaboration with researchers.

Government Innovation Units aim to:

1. Accelerate the process of government innovation
2. Enhance government efficiency by informing resource allocation

Examples:

- Experimental Policy Initiative (Chile)
- MineduLAB (Peru)
- 'Nudge units' in UK, US, India



Collaboration with Dominican Republic government

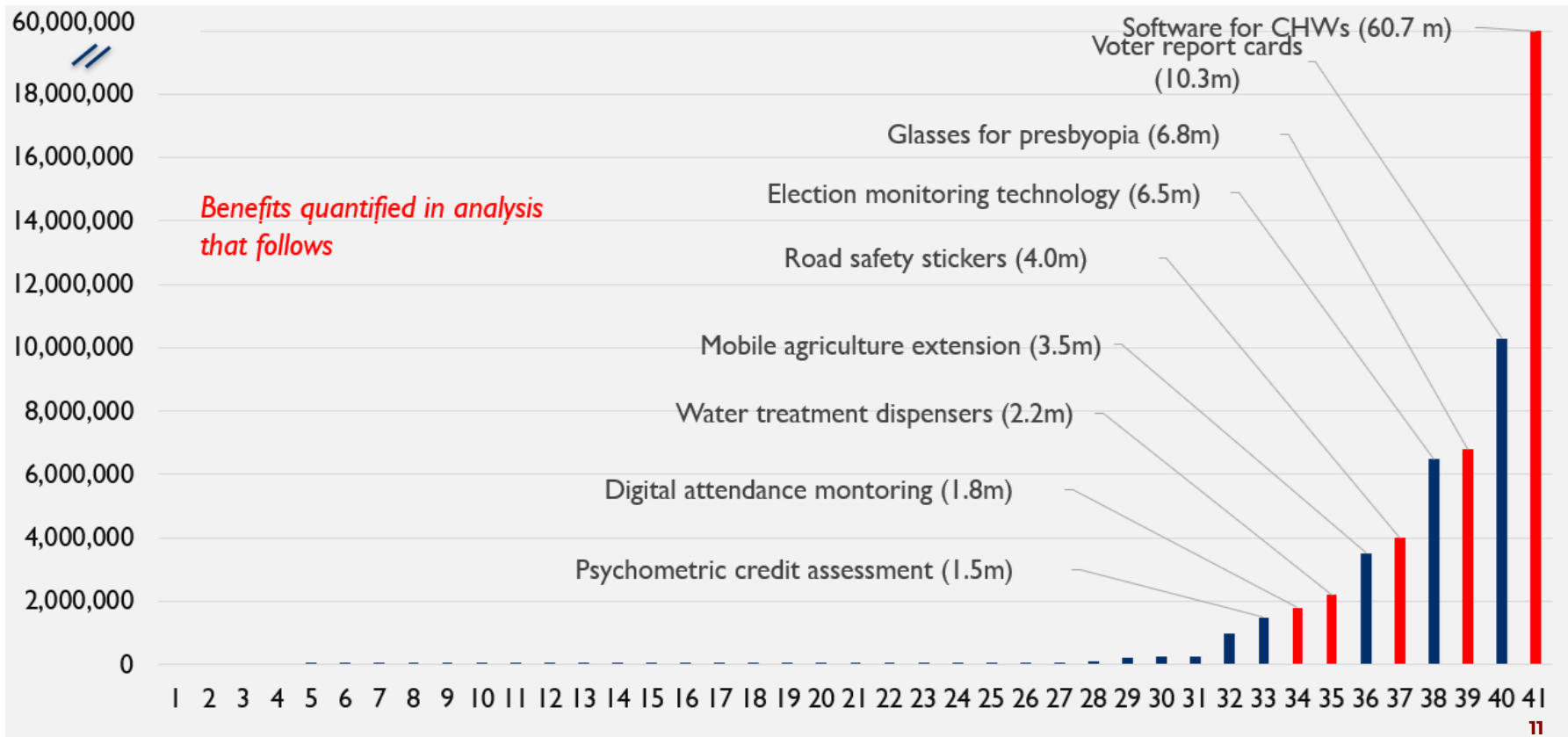
- The Ministry of Economy, Planning and Development's impact evaluation initiative:
 - Design of the RCT of Programa Oportunidad 14-24
 - Exploring an RCT for Inglés de Inmersión para la Competitividad
- The Ministry of Education
 - ESI En Valores
 - Robotics and STEAM program
 - Overage Program

Open, tiered, evidence-based social innovation funds

E.g. DIV in US, FID in France

- Open across sectors, countries, commercial vs public sector scaling
- Tiered funding:
 - ◆ Piloting
 - ◆ Rigorous testing
 - ◆ Transitioning to scale
- Which innovations scale?
- Is social innovation a good investment?
- Implications for design of social innovation funds

Number of direct beneficiaries as of May 2020



Example: Affordable glasses for presbyopia



- \$430,000 innovation investment by DIV
- Tea-picker productivity improved by 22% (Reddy et al. 2018). Assume 11% gain.
- 6.8 million glasses distributed in 43 countries
- DIV innovation investment share = 5%
- \$31.8 million in net benefits generated by DIV investment.

Road safety stickers in minibuses (Kenya)



- \$207,000 innovation investment by DIV
- Road accidents fell by 25% (Habyarimana and Jack 2015).
- Scaled to >40,000 minibuses
- DIV innovation investment share = 28%
- \$2.6 million in net benefits generated by DIV investment.

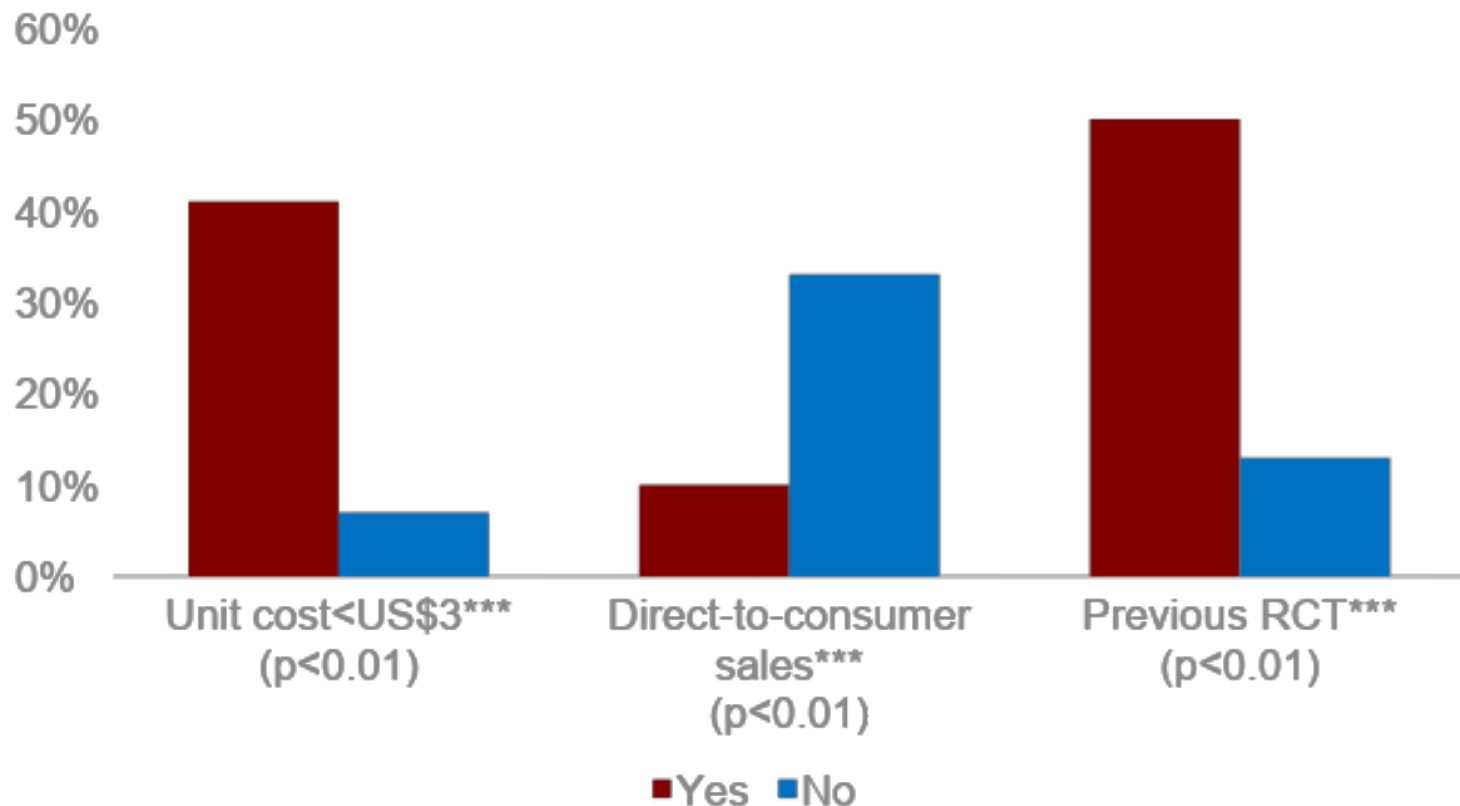
Rate of scaling by award stage

| Award Stage | # of awards | % that reached >1m | Awards value (millions) | People reached (millions) | People reached per dollar |
|---------------------------------------|-------------|--------------------|-------------------------|---------------------------|---------------------------|
| Stage 1, pilot (<\$100k) | 24 | 17% | \$2.4 | 19.9 | 8.3 |
| Stage 2, test (<\$1m) | 18 | 25% | \$9.6 | 77.3 | 8.1 |
| Stage 3, transition to scale (<\$15m) | 1 | 100% | \$7.4 | 2.2 | 3.3 |
| ALL | 43 | 22% | \$19.3 | 99.4 | 5.2 |

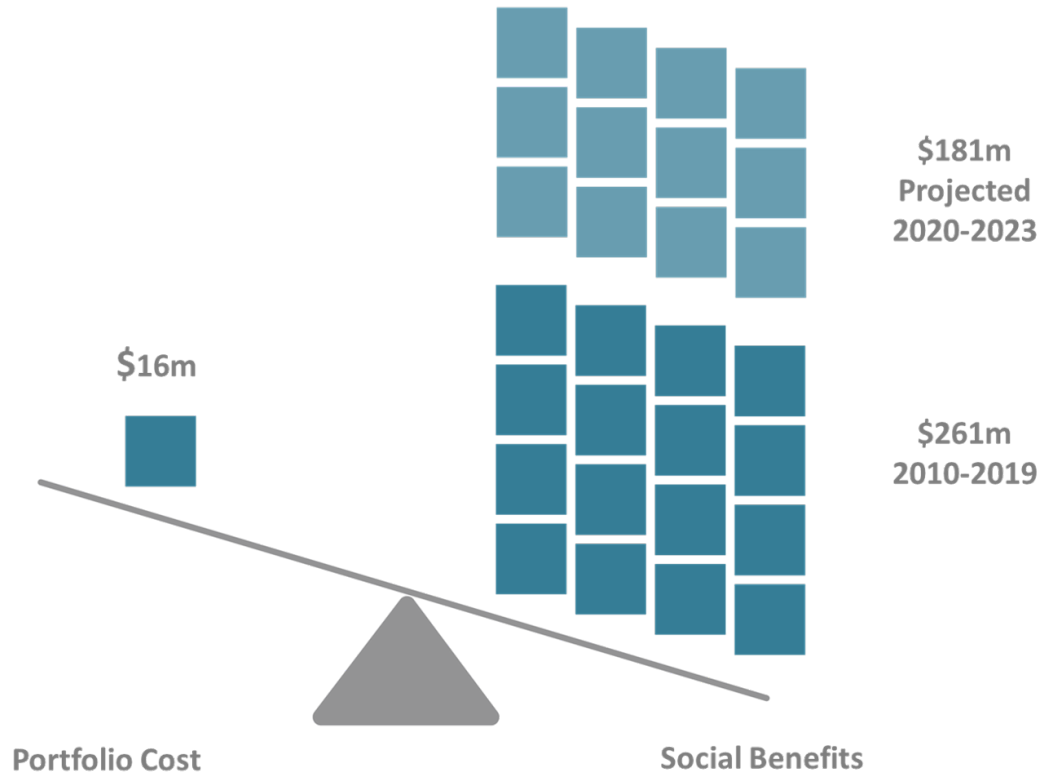
Difference between stages not statistically significant.

For multi-stage awards, reach allocated in proportion to award values.

Which innovations scale



DIV portfolio 2010 - 2012 cost-benefit



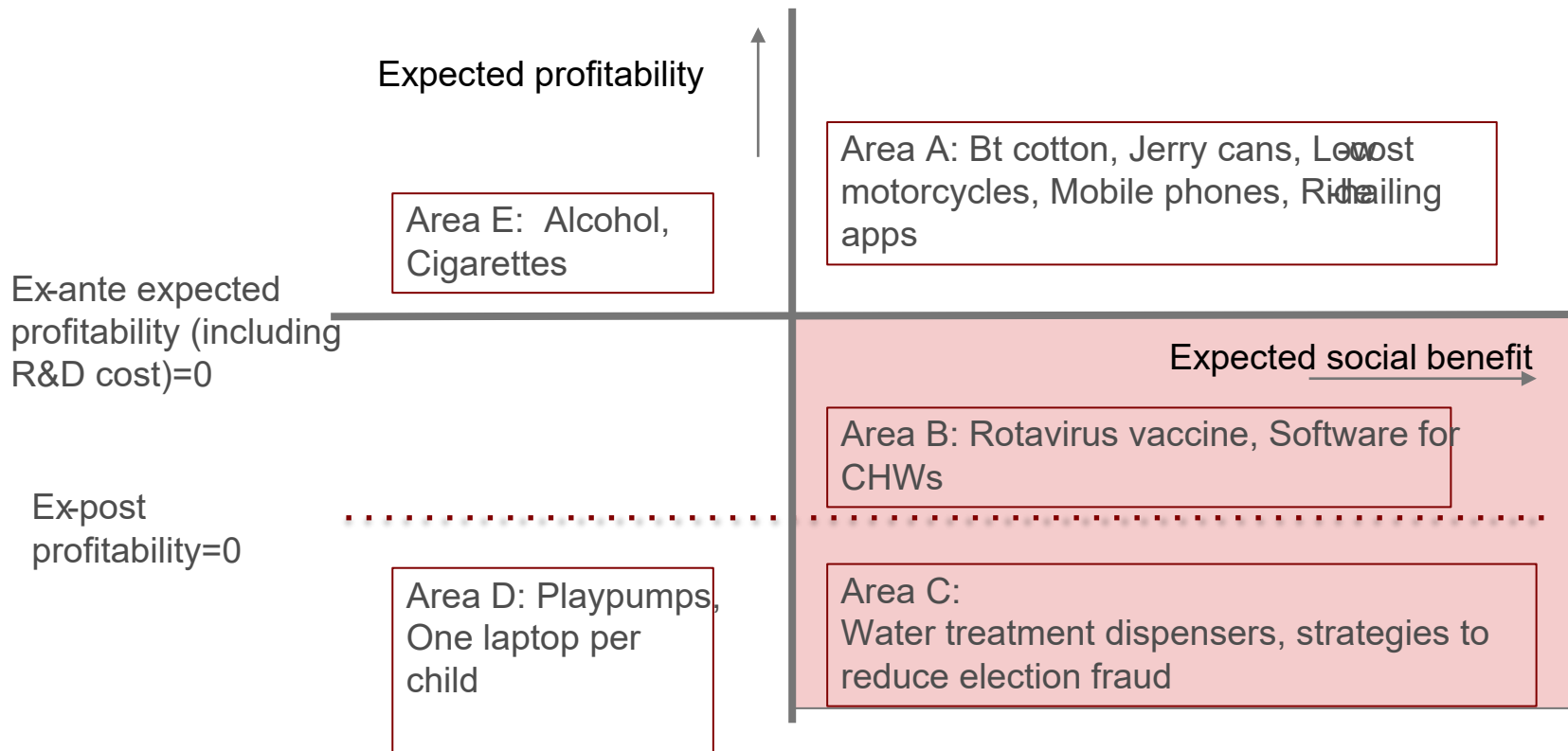
Why positive social returns when private investors more nimble?

Hypothesis: commercial investors leave arbitrage opportunities for socially-motivated investors where low (ex-ante) expected private returns, but high social returns

Low ratio of private to social returns when:

- Low barriers to entry
- Potential customer for innovation is government
- Consumer does not obtain full value of product

Where are the arbitrage possibilities and additionality?



Implications for design of social innovation funds

Some design features may generate social value in excess of private value

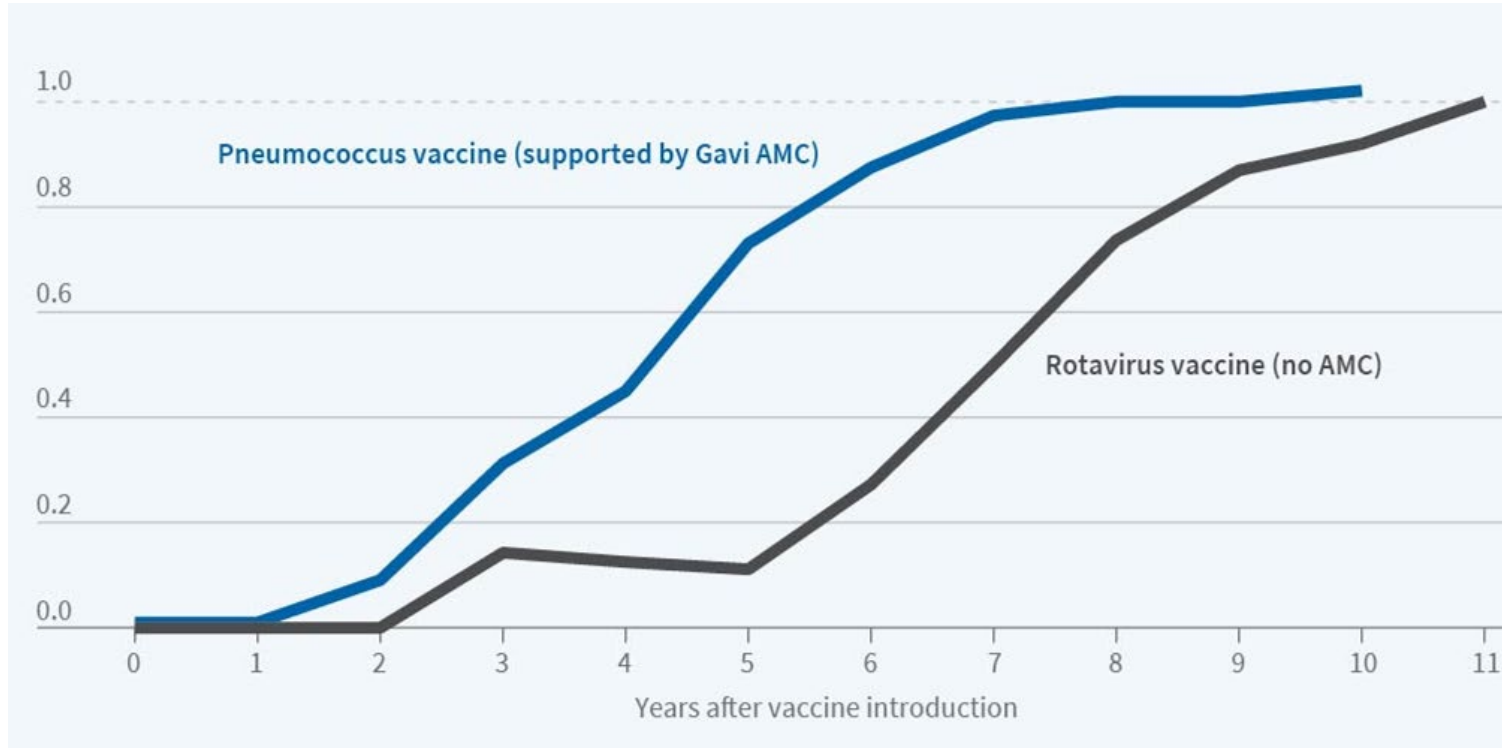
- Feedback for rejected applicants
- Extensive external peer review
- Researcher involvement
- Support for early-stage innovations
- Openness across sectors

Advance Market Commitments

- Legal commitments made by governments or donors:
 - Pay a fixed bonus per dose to companies that develop and produce needed quantity of new product meeting technical specifications and agree to sell at a specified price
- Incentivize research and ensure socially efficient amount produced
- AMC for pneumococcus vaccine
 - \$1.5 billion commitment
 - \$3.50/dose base price, + \$3.50/dose top-up.

AMC incentivising rapid roll-out

Ratio of vaccine coverage in GAVI-eligible countries to all countries





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