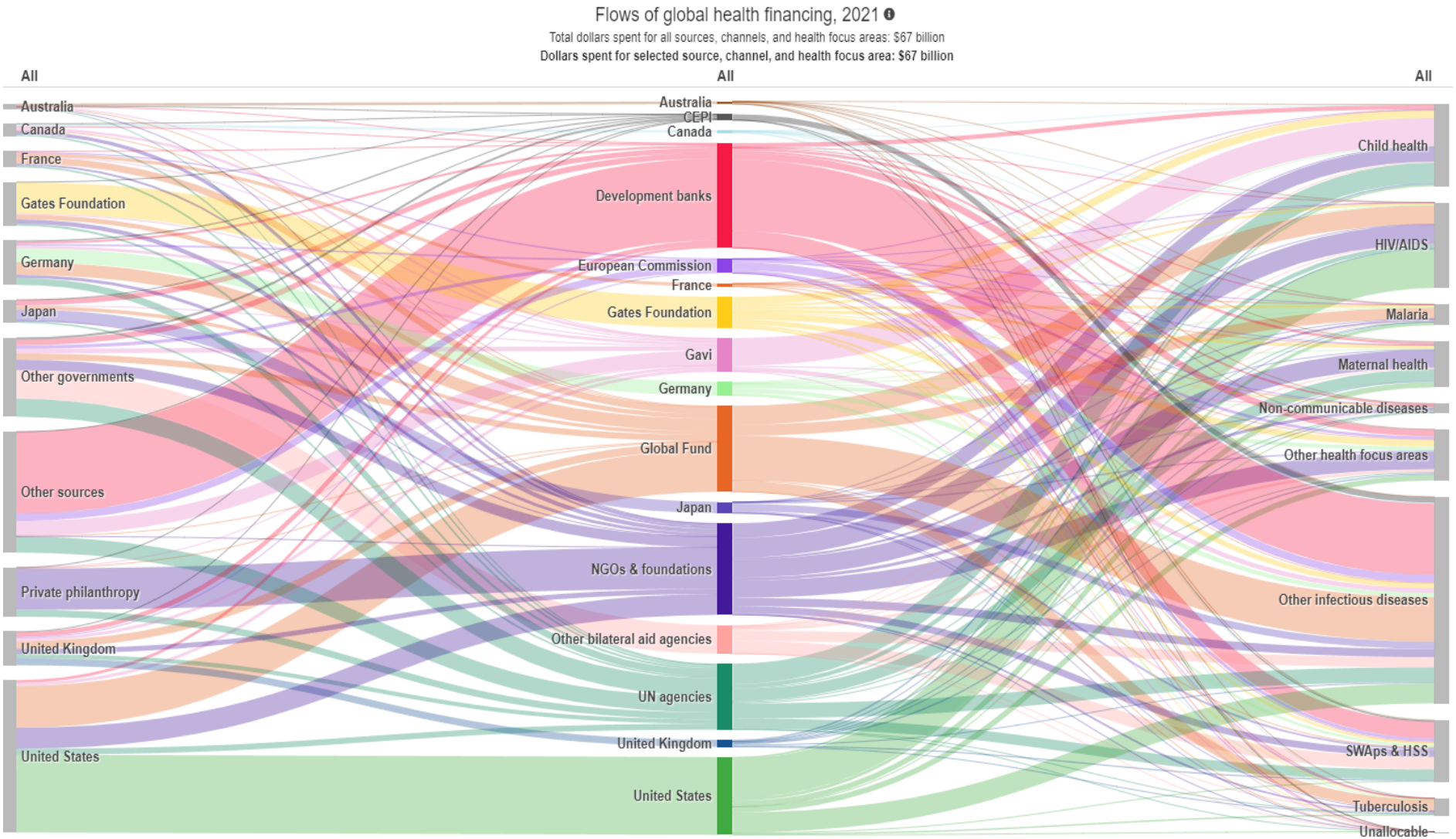
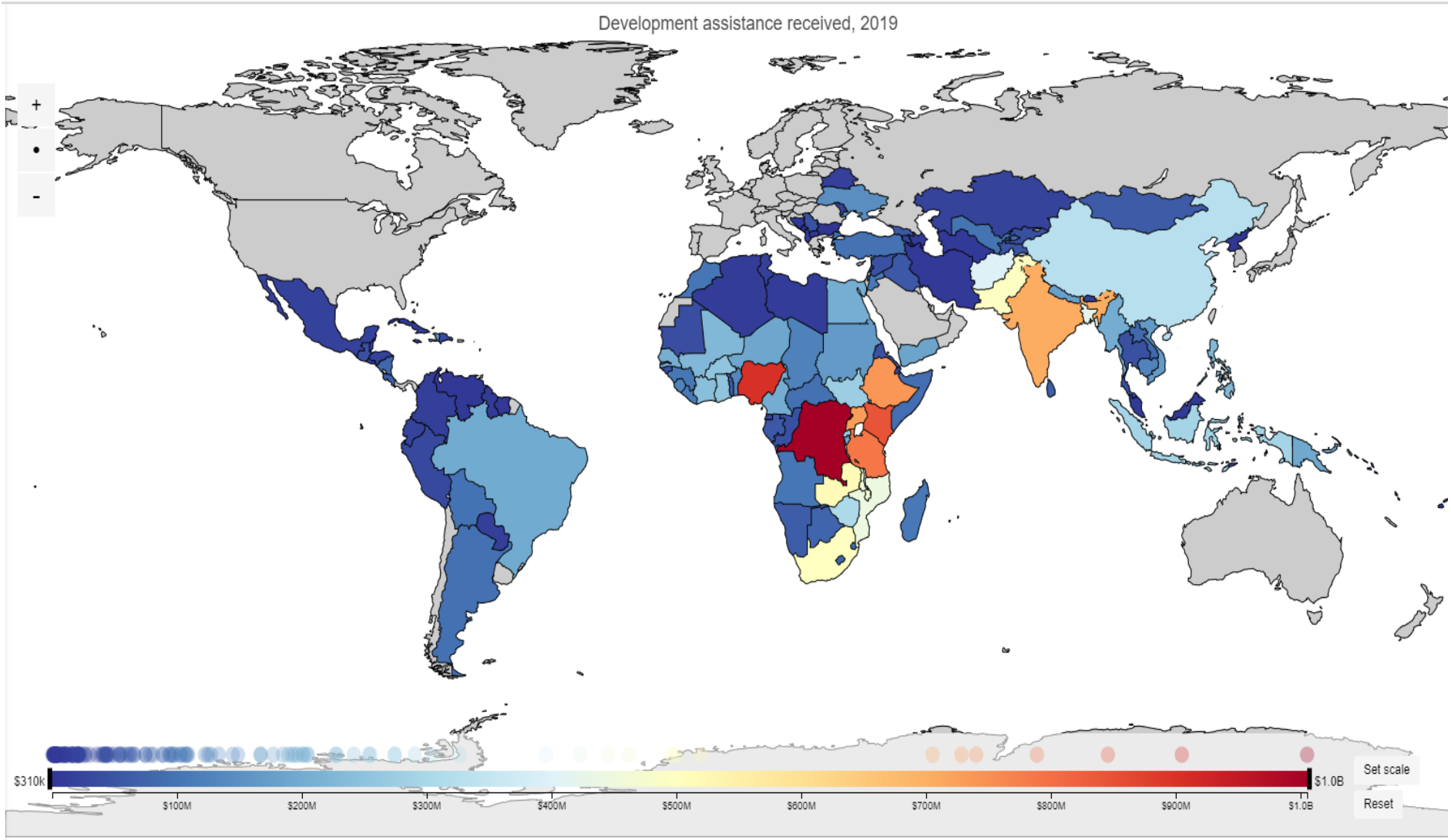
Health Economics
Global Health Economics

Funding Flow - Donors and Issues



Source: https://vizhub.healthdata.org/fgh/ (Accessed 30 Mar 2023)

Funding Flow - Recipients



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Economics of Early Childhood Investment

1. While the economics literature has traditionally focused on education as main predictor of individual incomes, **early childhood experiences** have recently received much more attention
2. Following the initial work by Heckman, the **economics of cognitive and non-cognitive skill formation** is slowly emerging as a new field
3. "Accounting for the early emergence of abilities, personality parameters and health stocks redirects the attention of health economists to the early years" (Heckman, 2006)

Economics of Early Childhood Investment

1. Since initial differences are multiplied through a variety of social, genetic and environmental interactions, **the returns to investing in the earliest stages of life appear particularly large**
2. While special education programs have been shown to be highly effective in helping children, full "catching up" is generally not considered possible after age 3 "Never too early, never too late" (Jack Shonkoff)
3. On the global level, early childhood programs are still very low on the priority list

Graham-McGregor: Child Development in Developing Countries

Background

1. Children under 5 face multiple risks: poverty, malnutrition, poor health, lack of stimulation

The Question

1. How many children fail to fulfil their developmental potential, and what fraction of income lost is attributable to poor child development?

Methods

1. Use public data sources to come up with a global estimate for child underdevelopment

Graham-McGregor: Main Results and Findings

1. Early under-nutrition, iron-deficiency, environmental toxins, and other stress have lasting developmental effects ("early childhood adversity" or "toxic stress")
2. Longitudinal studies show that early stunting predicts later cognition and school progress
3. Estimate of number of children stunted or living in poverty: **219 million**
4. Estimate that the loss of human potential is associated with **20% deficit** in adult income and will have implications for national development

Bleakely: Disease and Development ⋆

Background

1. There is substantial interest in identifying the **causal impact of health on economic development**.
2. A substantial amount of the benefits is likely to accrue in later life, so that long-term studies are needed to quantify these effects

Methods

1. Major hookworm eradication efforts in the South of the US from 1910-1915 (Rockefeller Sanitary Commission for the Eradication of Hookworm Disease)
2. Prior to the campaign, **over 40% of children infected** in some areas $\rightarrow$ low energy, anaemia, limited ability to learn
3. Explore differences in trends: **if health is important, we should observe more rapid improvements in educational outcomes in areas highly exposed to hookworms** prior to the campaign

Bleakely: Findings 1

1. School enrolment in highly infected areas increased by 3-5 percentage points.
2. The program appears to have had a large effect on **adult incomes**: 40% income increase with zero exposure.

1. While adult health affects productivity (short term absenteeism; long-term chronic disease), the effects of adult morbidity on output per worker are generally small
2. The principal mechanism through which we expect health to affect adult outcomes may be schooling, which increases due to:
   - 2.1 increased ability to walk to (or get to) school
   - 2.2 decreased absenteeism
   - 2.3 increased energy and knowledge absorption

Baird, Hicks, Kremer, Miguel: Worms at Work[1]

Background:

1. Intestinal helminths (hookworms, roundworms, whipworms, schistosomiasis) affect and infect more than one-quarter of the world's population
    1. Treatment is cheap: <US$ 1 per dose
    2. In 1998, the Primary School Deworming Program (PSDP) was rolled out in 75 primary schools in the Busia District in Kenya
    3. In 2004, Kremer&Miguel showed large effects on school participation.

Question:

2. How has the PSDP affected adult labour, health, and educational outcomes for children in treated schools and schools in close proximity?

Methods

3. Staggered rollout of deworming project: some (randomly selected) schools received treatment earlier than others. Children aged 19-26 at follow-up

[1] **Baird2016**.

Baird, Hicks, Kremer, Miguel: Worms at Work

Results: Schooling:

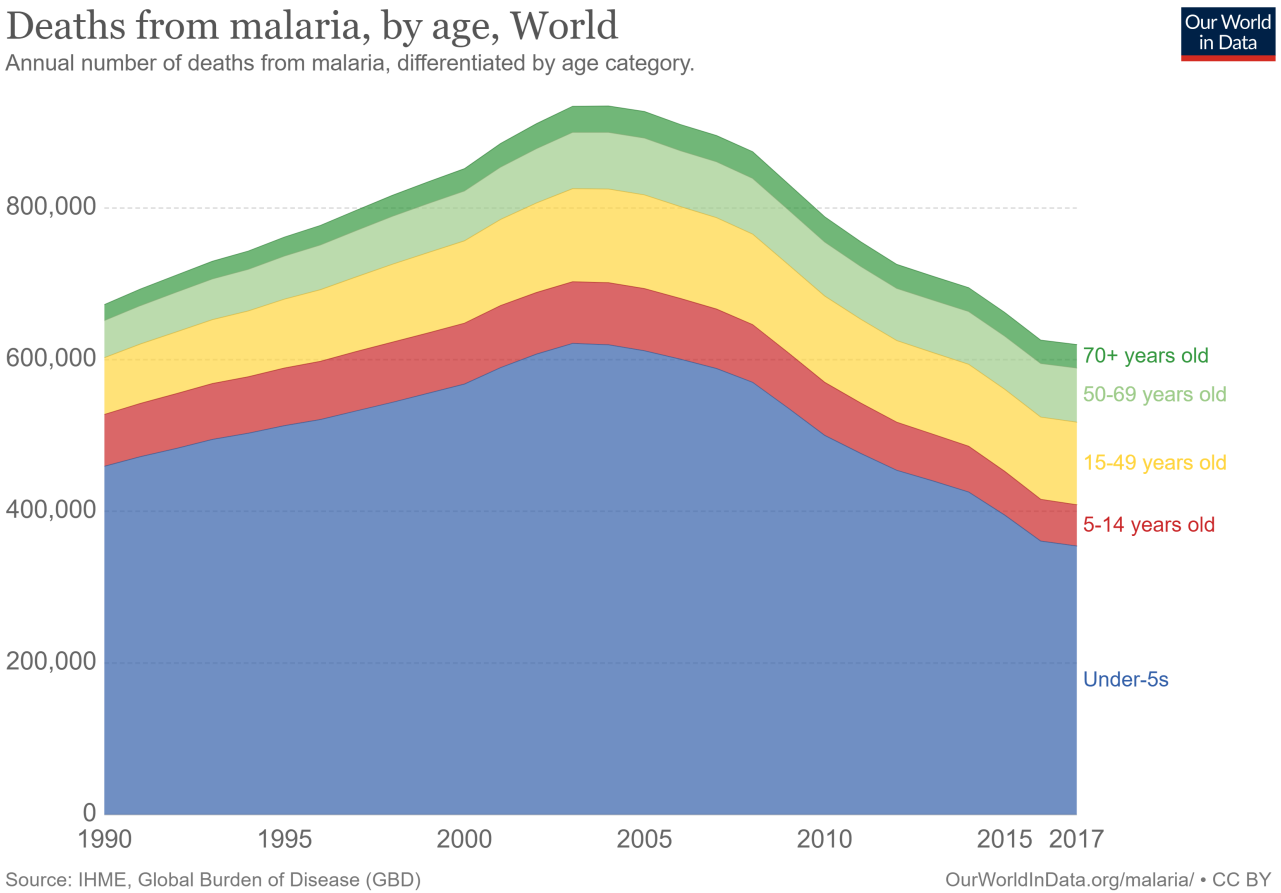
1. Total schooling attendance gains: 0.129 years of schooling.
2. No impact on total grades of schooling completed or likelihood of attending some secondary school.
3. Statistically insignificant gains in test scores.
4. **Strong, positive externalities** for other individuals attending schools within 6 km of the treated schools

Results: Productivity:

1. Wage earners in the deworming treatment group **earned about 20% more** than wage earners in the control group.
2. Change in occupation (manufacturing jobs) accounts for nearly all the earnings gains in the treatment group
3. IV estimates show that having fewer worm infection in childhood **increases hours worked**
   $\rightarrow$ Overall, treated appear more productive

Malaria: Overview

1. $\approx$ million deaths per year. Mostly in children under-5



Malaria: Prevention and Treatment

Prevention

1. Destroying breeding sites (puddles, water drains)
2. Killing mosquitoes through insecticides (DDT spraying)
3. Use Indoor Residual Spray (IRS) in densely populated (urban) places
4. Preventing mosquito bites by sleeping under a bed net
5. Chemoprophylaxis (mostly for visitors or high-risk individuals such as pregnant women)

Treatment

1. Artemisin-based combination therapy (ACT): combined with other drugs to make it harder for parasite to develop resistance.
2. However, Resistant-strains have already been found in South-East Asia.

Source: IRS: https://www.cdc.gov/malaria/malaria_worldwide/reduction/irs.html

Nájera, González-Silva, Alfonso (2011): Lessons[2]

DDT

1. Global Malaria Eradication Program (GMEP) initiated by the WHO in 1955 to fight and eradicate malaria
2. The discovery and successful implementation of **DDT spraying** made the world confident with respect to malaria eradication
3. 20 years after program start, most national programs had failed, leading to massive rebounds in many countries

Lessons:

1. Local expertise and infrastructure was widely ignored
2. GMEP only provided funds to countries adopting the goal and methods set by the WHO expert committees, and thus favored countries with existing health infrastructure

[2] **Najera2011**.

Insecticide Treated Bed Nets (ITN)

1. Significant effect on reduction in mosquito bites.
2. Issues of:
   - 2.1 Seasonality
   - 2.2 Utilization
   - 2.3 Pricing: Free, Subsidised, Market Price

Sedlmayr et al (2013): Health Impacts[3]

Background

1. Most current campaigns are run by government agencies
2. **Private sector companies** often have large distribution networks which could be used to **support and complement larger efforts**

Methods

1. Cluster-randomized controlled trial with 81,597 cotton farmers in rural Zambia
2. One **free net** for about 50% of all households in Dec 2010
3. Follow-up survey with approximately 900 farmers in June/July 2011

[3] **Sedlmayr2013**.

Sedlmayr et al (2013): Health Impacts

Results

1. **94% of nets successfully delivered**
2. Additional net appears to benefit household members of all ages
3. **42% reduction in the odds of fever, and 49% reduction in the odds of (self-reported) confirmed malaria**
4. The cost per death averted was estimated between US$55 and US$210

Tarozzi et al (2014): Micro-loans, Insect Treated Bednets, RCT in India[4]

Background

1. Free distribution is costly, and may induce low usage by recipients
2. **Demand for many health products is very low without subsidies**
3. One of the primary reasons are lacking financial resources and **credit constraints**
4. **Microcredit organizations have large networks which can be used to allow people to purchase health goods**

Methods

1. RCT in 141 villages in rural Orissa implemented in collaboration with Bharat Integrated Social Welfare Agency
2. 3 Groups: Control, free nets, and nets on loans; additional purchase offers against cash (25 old, plus 15 new)

[4] **Tarozzi2014**.

Tarozzi et al (2014): Micro-loans, Insect Treated Bednets, RCT in India

Results

1. Under the loan programs, net coverage was about 45% of the free net group (1.2 vs. 2.7 nets) – 52% of households bought at least one net; with cash sales, average was only 0.16 nets
2. **Usage rates are higher** than in control areas, and particularly high in the free net group
3. Malaria prevalence was 18% in the control, and 22% in the two treatment groups (difference not significant); no difference in anaemia
4. Some reductions in self-reported malaria, but small rates overall

Cohen and Dupas: Free Distribution or Cost-Sharing (2010) Subsidies[5]

Background

1. Cost-sharing: just means charging a price
2. Cost-sharing models have been promoted to better target the populations who benefit most (screening)
3. Cost-sharing lowers overall coverage, so that aggregate effects are uncertain (especially with externalities)
4. ITNs have been found to reduce child mortality in regions of Africa by 20%, so determining the most effective process of distribution is important

Question:

1. **What is the optimal price** for distributing nets from a social perspective?
   - 1.1 Do higher prices cause lower use?
   - 1.2 Do higher prices select those with greater (health) need?

[5] **Cohen2010**.

Cohen and Dupas: Free Distribution or Cost-Sharing (2010) Subsidies

Methods

1. RCT to estimate relation between price paid and demand for bed-nets
2. Two stage: clinics randomized to price
3. Where price is positive: women who were willing to pay were eligible for randomized discount.

Results

1. **High elasticity of demand for ITNs**: Demand not sensitive to small price increases above zero, but **even small cost-sharing leads to large decreases in demand**.
2. Self-reported usage similar to observed usage, however - usage appears low
   2.1 Wait for child to be born or mosquito season
3. Cost-effectiveness: under "medium"externality threshold, **free distribution is equally and potentially more cost-effective than cost-sharing**.

Cohen, Dupas, Schaner (2015): Price Subsidies[6]

Background

1. Call for "global ACT subsidy" to improve access $\rightarrow$ piloted through the AmFm
2. Critical to find the right balance between **affordability and overuse of medicines**

Question

1. How do subsidies for ACTs affect treatment behaviour?
2. Can the addition of rapid diagnostic tests improve outcomes?

Methods

1. RCT with 2,700 households in rural Kenya to study behavioural responses to changes in ACT prices and RDT vouchers

[6] **Cohen2015**.

Cohen, Dupas, Schaner (2015): Price Subsidies

Results

1. ACT **subsidy increases overall treatment seeking**, with a shift of treatment seeking towards drug shops
2. ACT subsidy **increases the use of ACTs** (from 19-41%), particularly among poor households
3. Only 21% of adults who take a subsidized ACT test positive for malaria; fraction goes up with lower subsidies

Recommended Policies:

1. Partial cost-sharing may encourage proper use
2. ACT subsidies should be made conditional on prior testing: "free drugs" only for those testing positive for malaria

HIV: Pepfar

1. The President's Emergency Plan For AIDS Relief (PEPFAR) was launched by President Bush in 2003 with a total commitment of $15 billion over five years to treat up to 2 Million patients in sub-Saharan Africa
2. The program is estimated to have averted more than a million deaths up to now
3. In July 2008, PEPFAR was renewed, with an increased budget of US$39 bn over a five year period
4. Largest international health project

Failed HIV Prevention

Background

1. Existing technologies not practical
   - 1.1 Condoms are the only prevention
   - 1.2 Other prevention focuses on abstinence, partner selection, and delay marriage fertility.
2. Even new technologies (pre-exposure prophylaxis), RCTs show inconsistent results
   - 2.1 80% reduction in new infections among discordant couples
   - 2.2 Ineffective among populations of young women
   - 2.3 Hypothesized to be because of low adherence
3. **Behaviour change campaigns have not been very effective**
4. 5 people infected for every 2 enrolled into treatment

Why incentives influence HIV prevention

1. In a classic rational model, individuals should respond to life-threatening risks by increasing prevention
2. Oster (2011) argues that low prevention efforts in Africa can be explained by **high rates of non-HIV mortality**

Rationales for incentives

1. Individuals may under-invest in prevention for behavioural reasons
2. Prevention efforts may be low because of low bargaining power of women
3. Incentives could be justified if private prevention efforts are not efficient because of externalities

Conditional Cash Transfers

1. **Conditional Transfers**: typically have been cash awards to households conditioned on some verifiable behavior or choices

2. Logic of CCTs is that we care about health
   - 2.1 Health is co-produced by individual choices
   - 2.2 **Incentivizing behaviour (input) not always the most direct way to get to what we want (outcome)**
   - 2.3 E.g.: incentives to go to the doctor: no guarantee they will lead to improved health

3. CCTs for health outcomes takes this one step further
   - 3.1 Most **direct way of incentivizing outcome** we care about
   - 3.2 Idea: private information about the most efficient ways to improve health outcomes

De Walque et al: Incentivising Safe Sex

Background

1. Evidence that risky sexual behaviour is responsive to financial concerns
   - 1.1 Sex workers going without condoms when payments are higher
   - 1.2 Increased transactional sex when there are economic difficulties

Question

1. **Can incentives reduce rates of sexually transmitted infections (STIs)**?

De Walque et al: Incentivising Safe Sex

Methods

1. RCT in Tanzania
2. Cash transfers for testing negative for curable STIs (testing every 4 months)

Results

1. CCTs reduced the prevalence of STIs
2. CCTs to incentivise safer sexual practices are a potentially promising tool in HIV and sexually transmitted infections prevention

Controversy: Conditional Cash Transfers

1. Some concern that conditional transfers could reduce intrinsic motivation
2. Evidence from psychology that when you take something that people do on their own and start paying them they start to do it only for the money
3. However, many would argue we shouldn't get crowding out if there is little intrinsic motivation to begin with (Promberger and Marteau 2013)