

EE468: Integrated Public Economics, Development and Political Economics

Lecture 5: Health

26 February 2014

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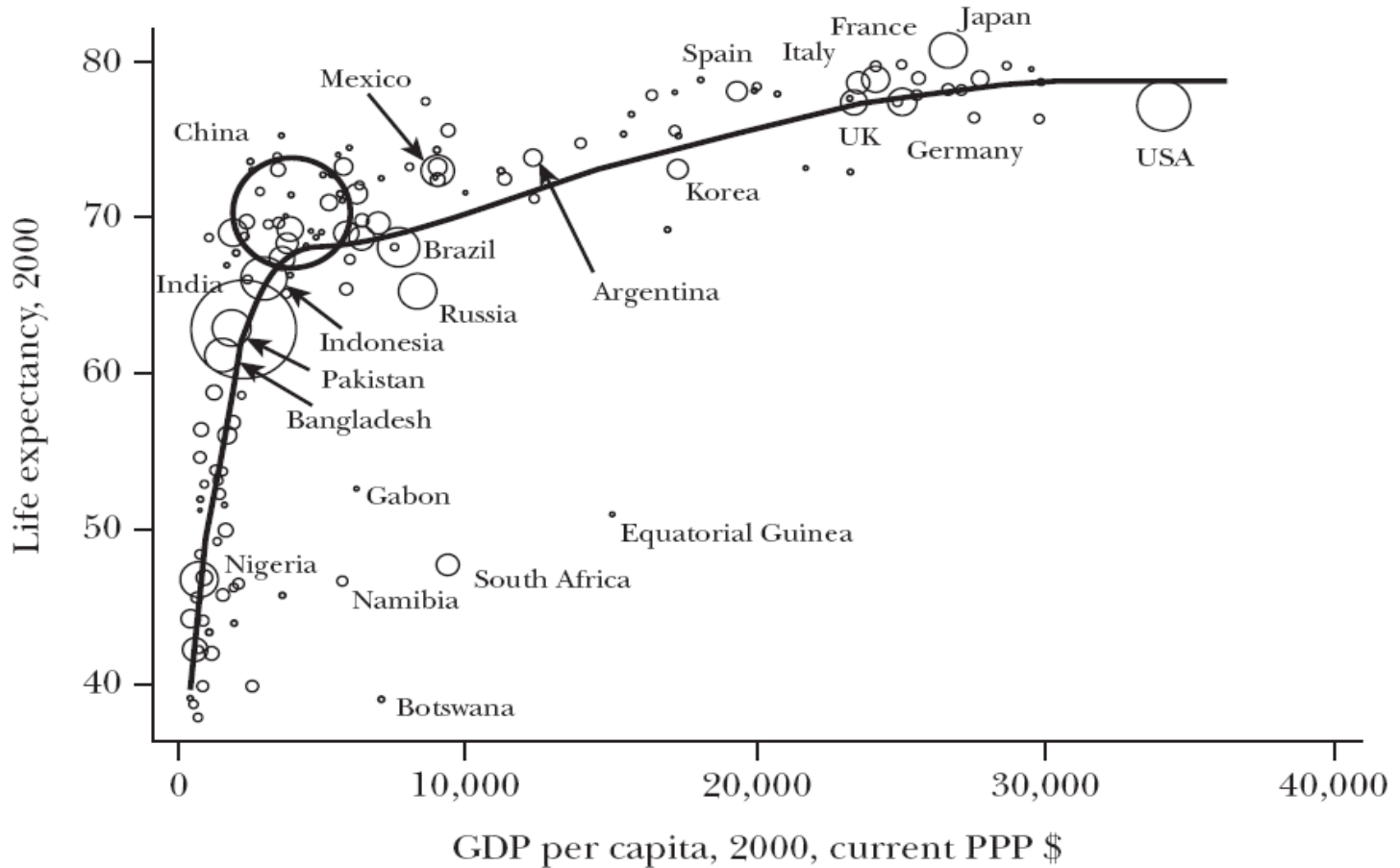
Outline

- Overview: Health, economic development and poverty
- Return to health and estimation problems
- Investment in (preventive) health care and policy implications

Motivating evidence and policy questions

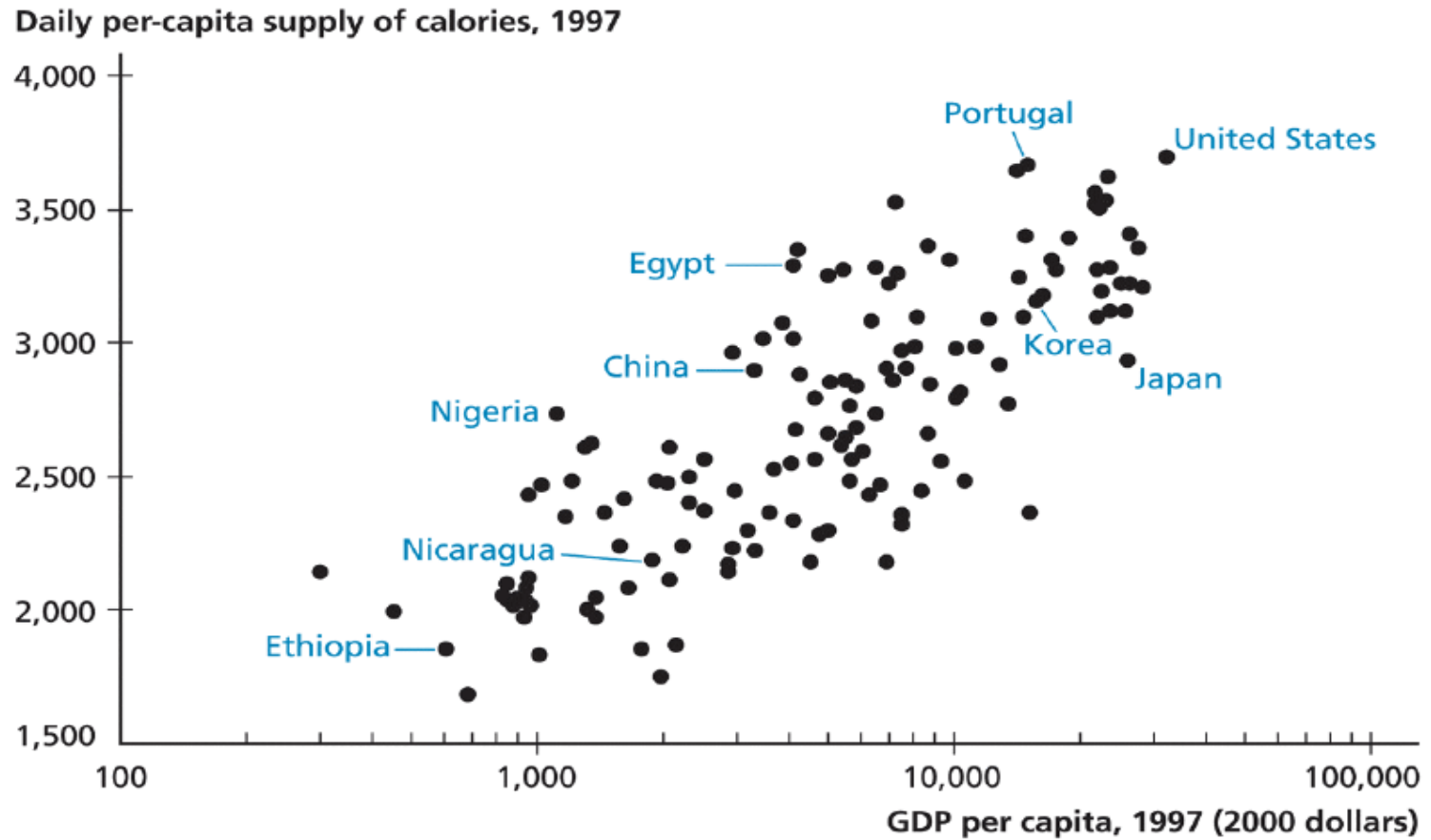
- **Health status in low-income countries are lower than that in rich countries**
 - Health could reinforce poverty traps
 - 3 out of 8 UN MDG relate directly to health
- **Literature show high return to investment in health**
 - Micronutrient (Thomas et al.), deworming programs, preventive cares
- **Underinvestment in health among the poor**
 - Earlier we see low $E_{n,y}$, low and highly elastic demand for preventive care
- **Key policy questions**
 - What's return to health investment?
 - How can we explain low investment to health?
 - What can we do to promote investment in health among the poor? Would subsidizing or free provision of health care be cost effective?

Health and economic development



Source: Cutler *et al.* (2006)

Health and economic development



Source: FAOSTAT database, Heston *et al.* (2002)

What do we mean by health?

- **Nutrition and physical (dis-)ability, disease prevalence**
 - Work capacity
 - Morbidity, longevity and mortality
- **Health is fundamentally multidimensional**
 - It is important to differentiate among these dimensions
 - It is difficult to measure
- **Health varies over course of life and depends on behavioral choices during childhood and adult life, and the (exogenous) environment**
- **Health has**
 - Stock components: lasting effects of past behaviour and shocks
 - Flow components: temporary disease, nutritional shortfalls, investments

How do we measure health?

➤ Health outcomes

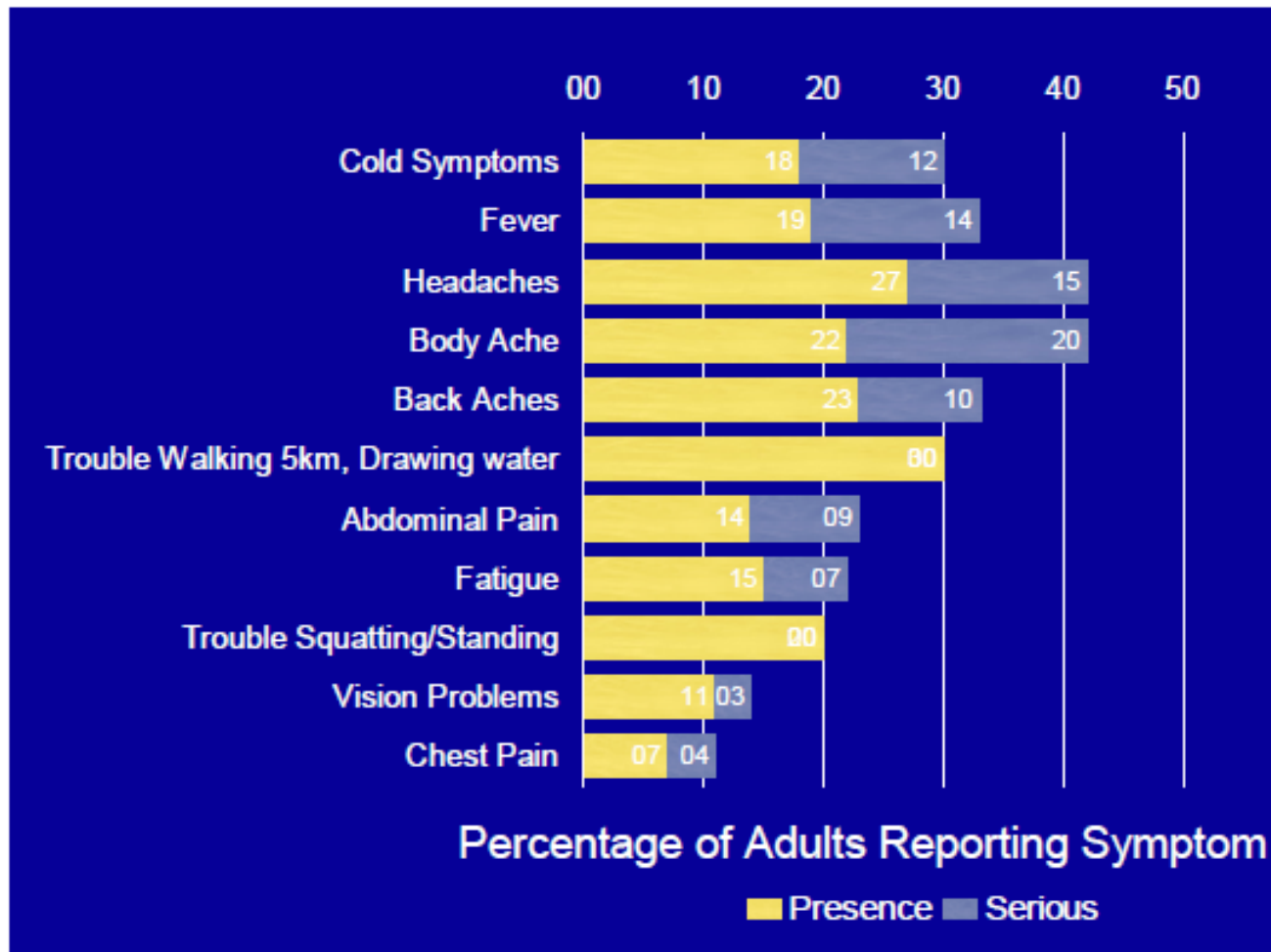
- Objective measures
 - Medical measures: e.g. blood pressure, prevalence of a disease
 - Anthropometric-based indicators: Body mass index (BMI), weight and height (WAZ, HAZ, WHZ)
 - Test of capacity to perform activities of daily life
- Self-reported measures
 - Capacity to perform activities of daily life
 - General health status (very healthy, healthy, ..., unhealthy), possibly relative to a reference group
 - Morbidity, illness and “normal” activity
- Predicted measures: life expectancy, infant mortality rate

➤ Health input

- Nutritional intakes (calories, nutrients)
- Access to and utilisation of health care and sanitation

How do we measure health?

- Example of self-reporting morbidity in Udaipa, Rajasthan, India



Source: Banerjee et al (2007)

How do we measure health?

- Health measures with respect to reference group

Figure 4.1 BMI for Adults in Vietnam, 1998

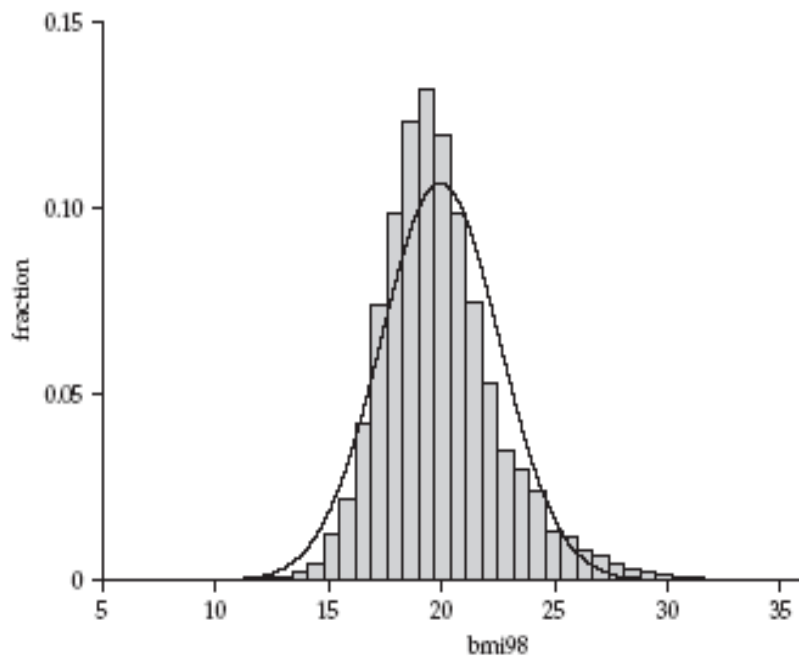
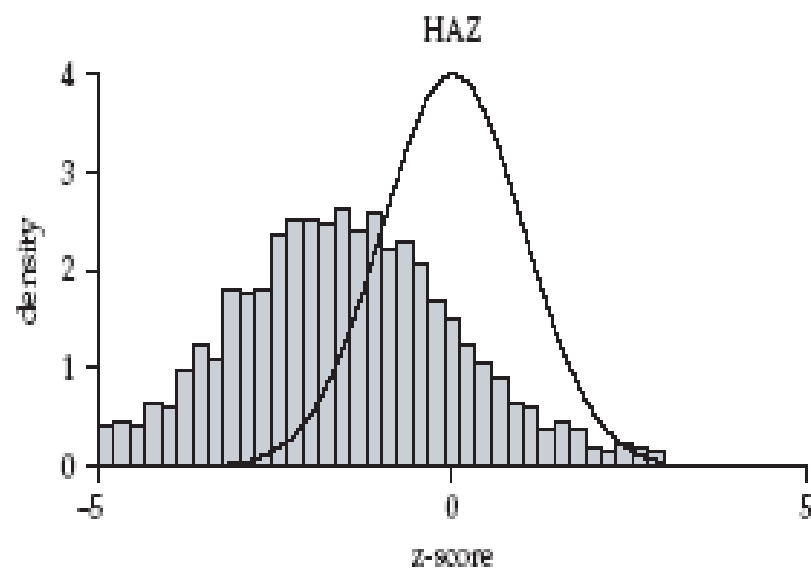


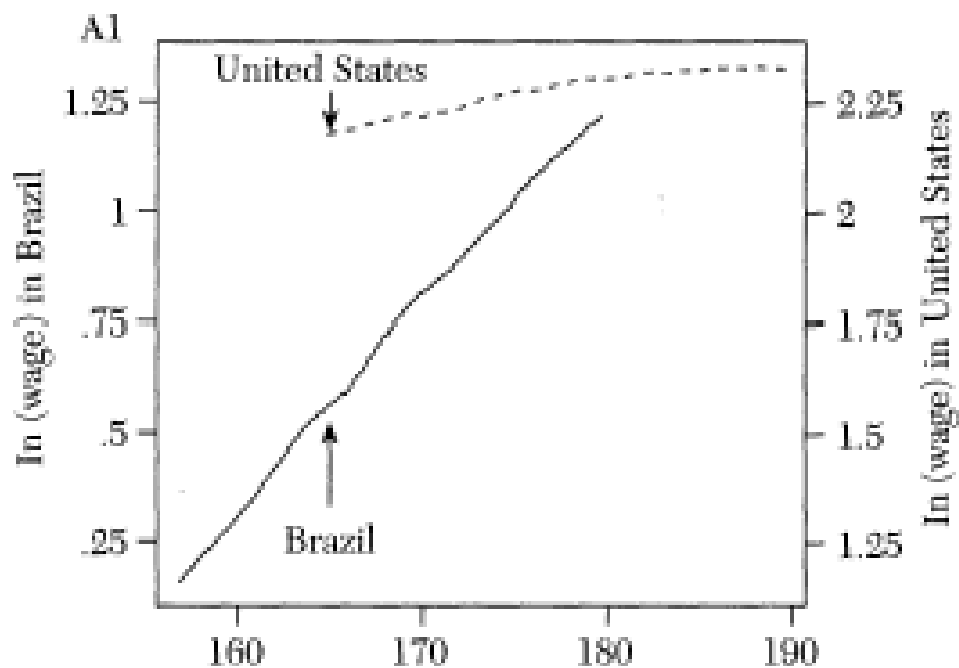
Figure 4.2 Distribution of z-Scores in Mozambique, 1996/97



Source: O'Donnell *et al.* (2007)

Health and productivity

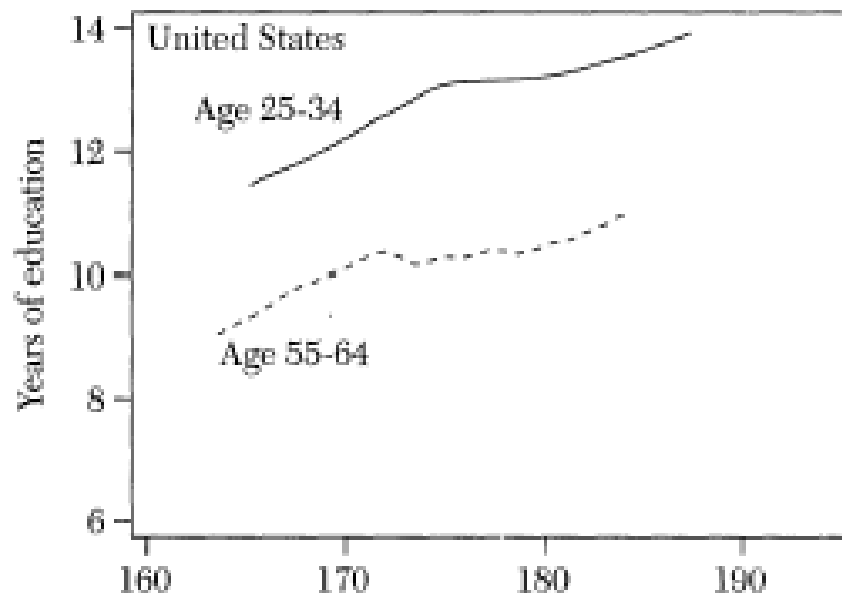
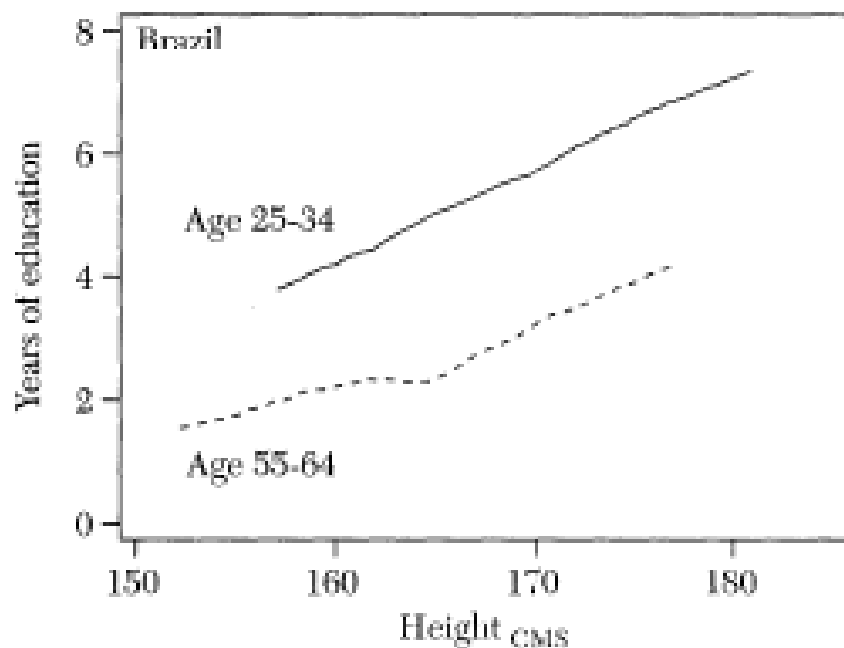
➤ Does health affect productivity?



- Tall men earn more!

Health and productivity

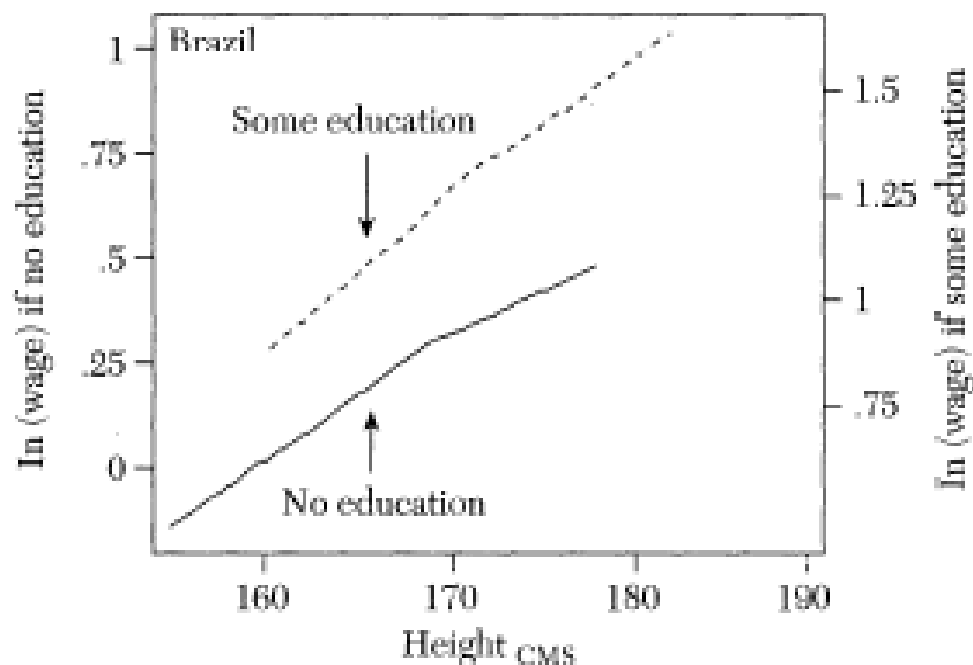
➤ Correlation with education



- Or are investments in health simply correlated with investments in education?
- Hence height is just a proxy for education?

Health and productivity

➤ Correlation with education

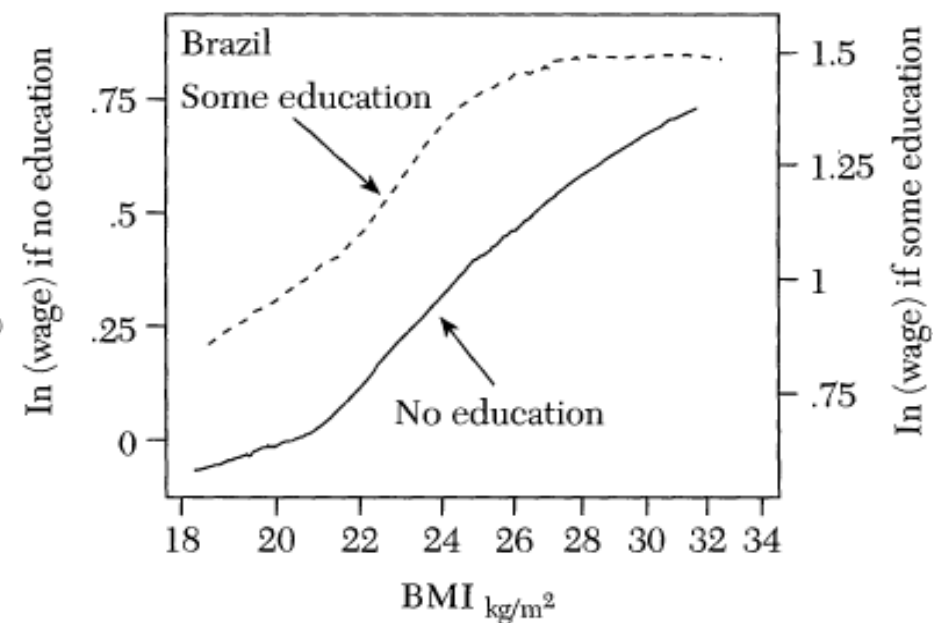
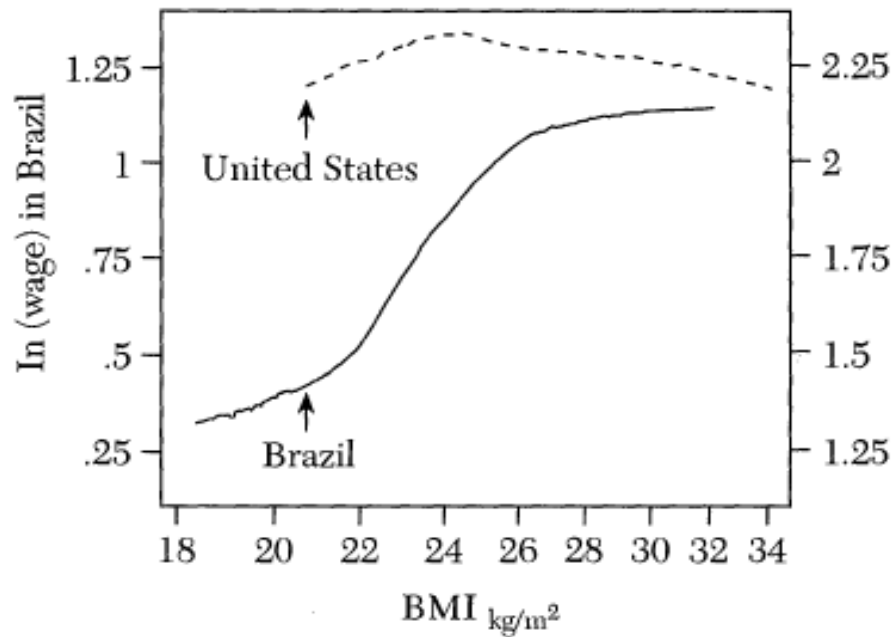


- No. - Controlling for education, height is still associated with higher earnings
- Maybe height is correlated with educational quality or parental time allocation?
- It is important to recognize that these correlations may reflect both rewards to human capital investments early in life and strength or robustness as an adult!

- Maybe interesting to look at BMI, which varies over the life-cycle ...

Health and productivity

➤ BMI and productivity



... but still it has a component that is linked to past investments:

- Energy can be stored

Health and productivity

➤ Health and labor

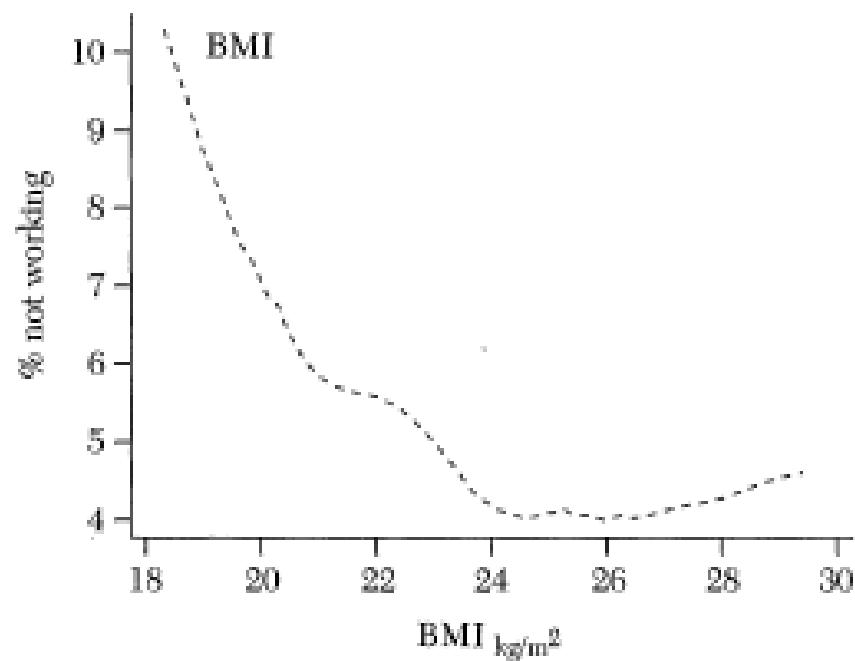
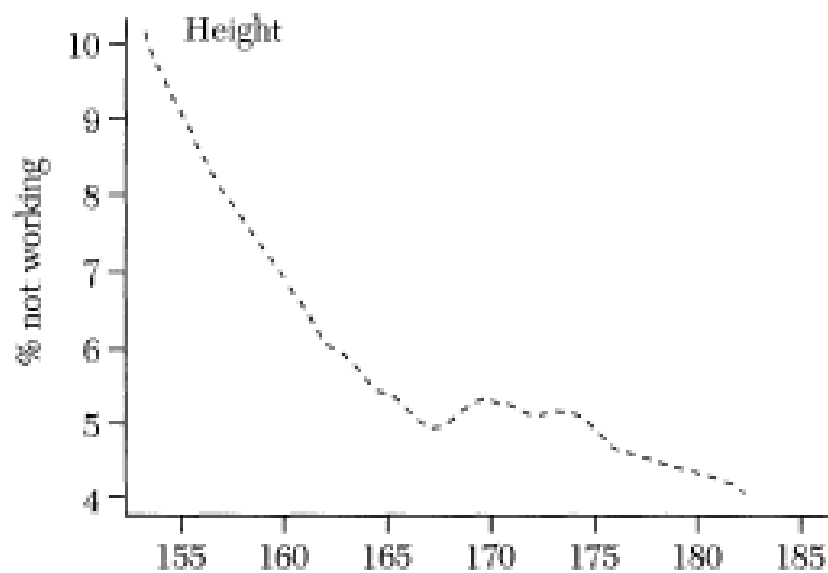


Figure 4. Height, BMI, and Percent Not Working (Males in Urban Brazil)

Health and productivity

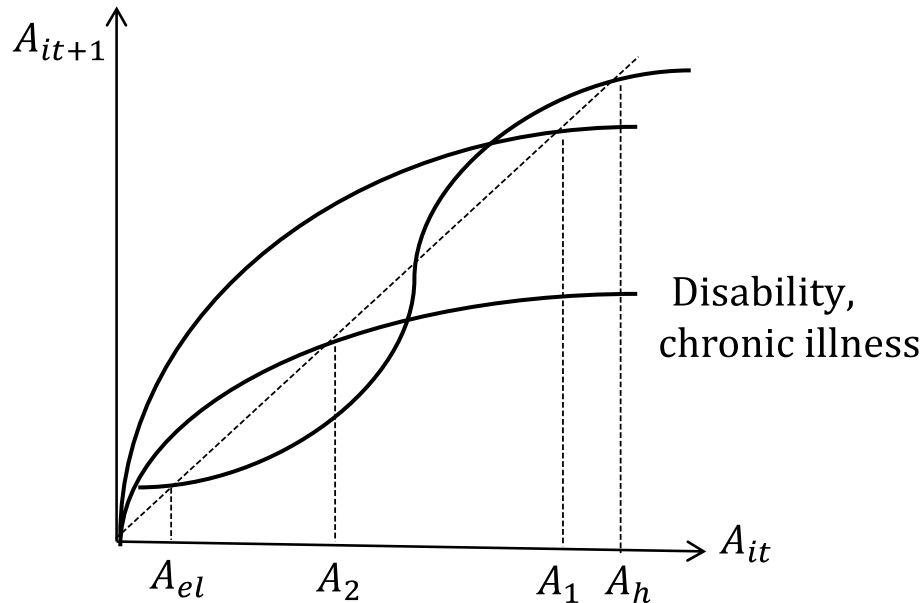
➤ Does health affect productivity?

- In sum: correlations between health and labor outcomes are interesting, plausible and suggestive, but one has to interpret them with caution

➤ Problem in estimating return to health

- Omitted variable bias
 - Parental decisions during childhood with respect to health investment and schooling are correlated with current health status and wages
 - Such unobservables lead to an upward bias of the returns to health
- Reverse causality
 - Better health results in higher productivity and more hours at work and this in turn leads to higher income and allows higher investments in health (quantity and quality of health inputs)
 - Health could affect utility function directly

Health and poverty traps



Single convergence poverty trap

- Disability, chronic illness

Multiple equilibria poverty trap

- Poor \rightarrow underinvestment in health \rightarrow low productivity \rightarrow low income
- Long-term impacts of shocks

➤ Policy implications

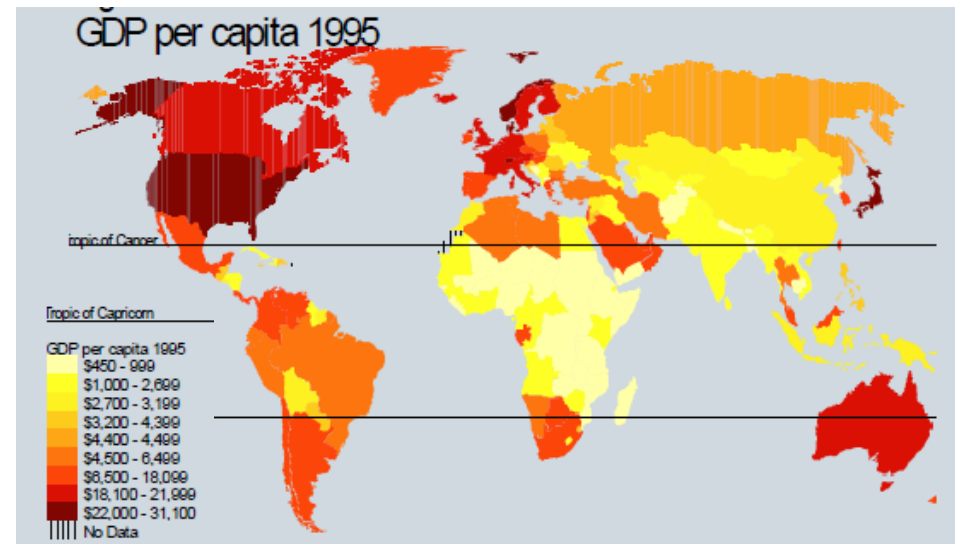
- Reducing direct costs of health may not be sufficient (e.g. subsidising preventive and curative health care, nutritional programs)
- Credit schemes, CCT programs to reduce indirect costs?
- Safety nets (insurance for health and assets)

A classic example: Malaria and poverty

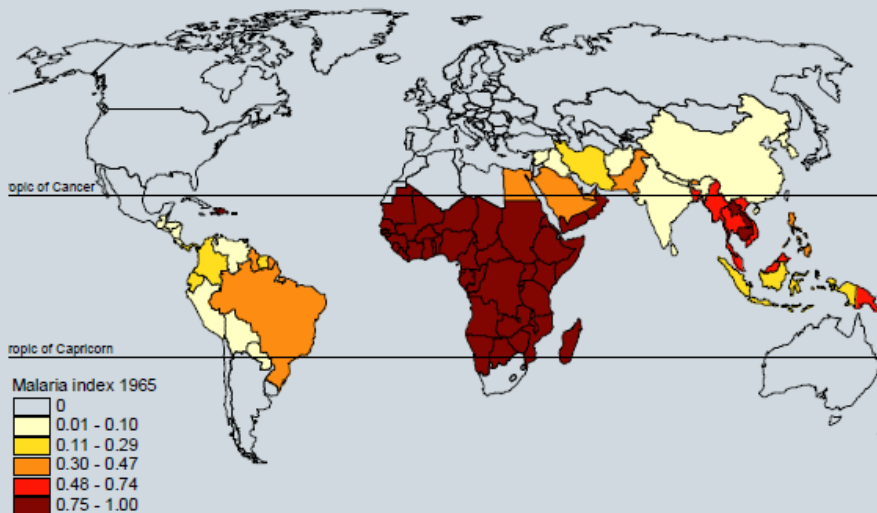
- Does malaria cause poverty or the other way around?

Gallup and Sachs (2001): Controlling for other factors, malarial countries GDP is 30% lower than no-malarial ones

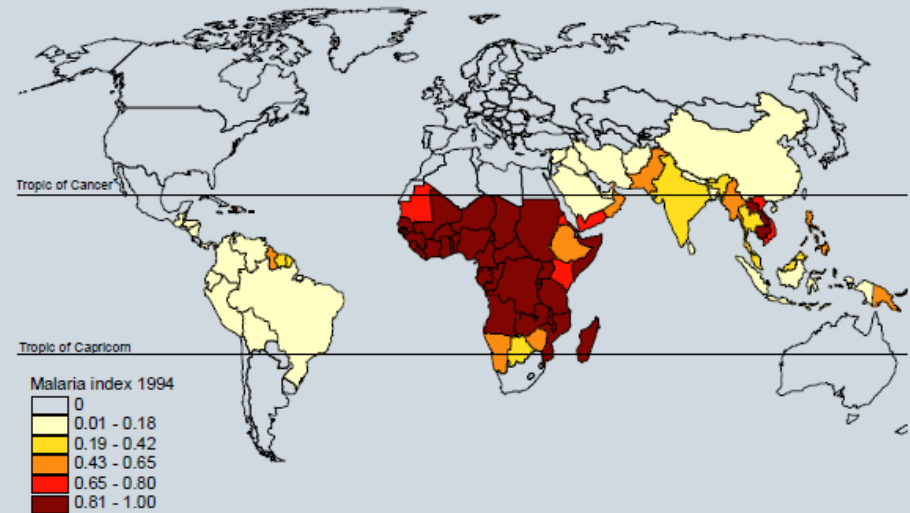
How one could argue the opposite?



Malaria Index 1965



Malaria Index 1994

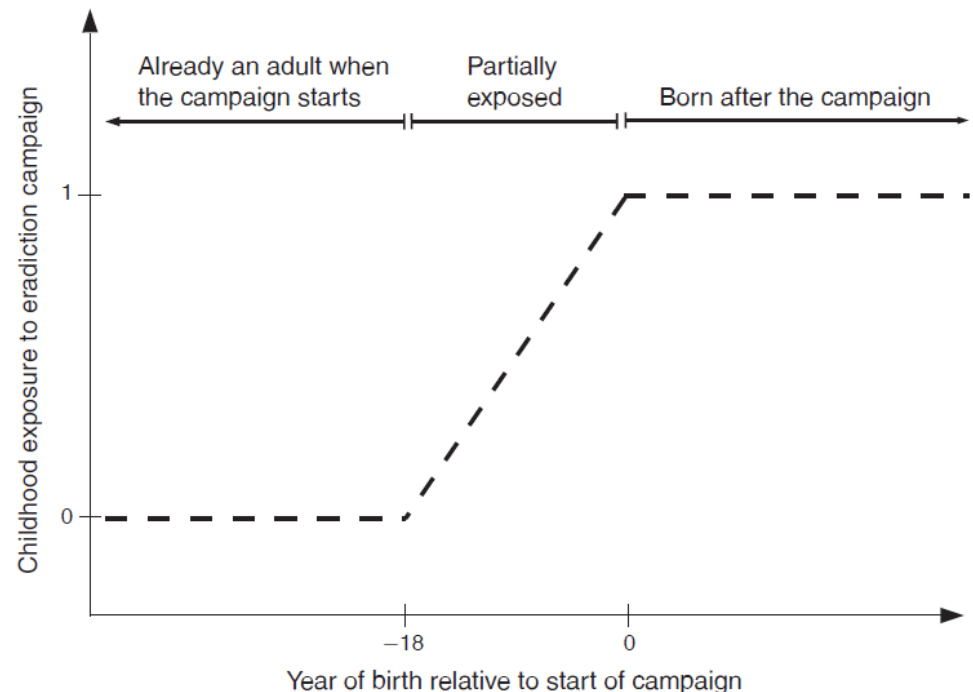


Malaria eradication programs in Latin America

- Bleakley (2010) uses DDT spraying campaign (circa 1955) in Latin America to measure impacts of childhood exposure to malaria on labor productivity
 - Campaign started around 1955 and widespread all over Brazil, Columbia and Mexico
 - Malaria is a parasitic disease transmitted through mosquito. Acute symptoms of infection include fever, headache, nausea, chronic anemia
 - Various evidence should large reduction in malaria incidence
- **Research questions:** what are the impacts of malaria campaign during childhood on income and education?
- **Data:** national census (DOB, ROB, income, education, no data on expose to campaign), malaria incidences from other sources,
- **Identification strategies**
 - The campaign is exogenous to outcome variables but rather relates to exogenous innovations to knowledge → resolve most of the endogeneity

Malaria eradication programs in Latin America

- **Identification strategies:** identify early childhood exposure to the campaign from two dimensions
- Variations in region of birth's malaria infection pre-campaign:
 - High malaria infected regions: have climates that support malaria transmissions → had more to gain from eradication → treatment group
 - Non-malarious areas: do not support transmission at the first place → control group, filling out common trends in national policy
- Variations in year of birth relative to timing of the campaign → different childhood exposure to program



Malaria eradication programs in Latin America

➤ Identification strategies

$$Y_{ijt} = \beta(H_j^{\text{pre}} \times \text{Post}_t) + \delta_t + \delta_j + X_{ijt}\Gamma + \epsilon_{ijt}$$

So program impact is identified by β

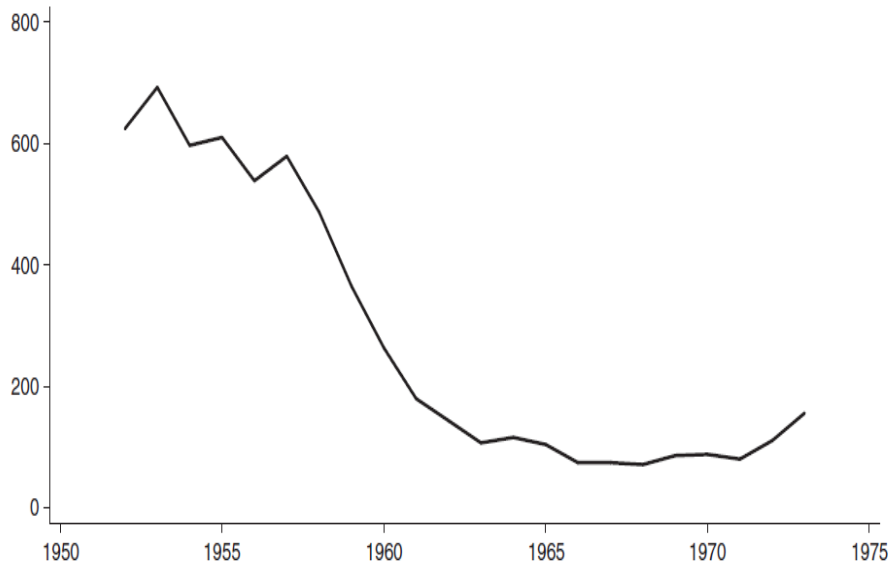
- Outcome of interest, y_{ijt}
- Pre-treatment Infection Rate, H_{pre_j}
- Indicator for those born and are in their childhood during treatment, $post_t$
- Time effects, δ_t
- Geographic effects, δ_j
- Vector with individual-level characteristics, X_{ijt}
- For individuals i , region j and year t

Malaria eradication programs in Latin America

➤ The overall impacts of the campaign

- Large decline in malaria cases in Columbia
- How realistic is the assumption that high malaria areas benefit more from the campaign → greater decline in regions with high infection rates

Panel A. Large decline in malaria following onset of spraying campaign



Panel B. Highly infected areas saw greater declines in malaria

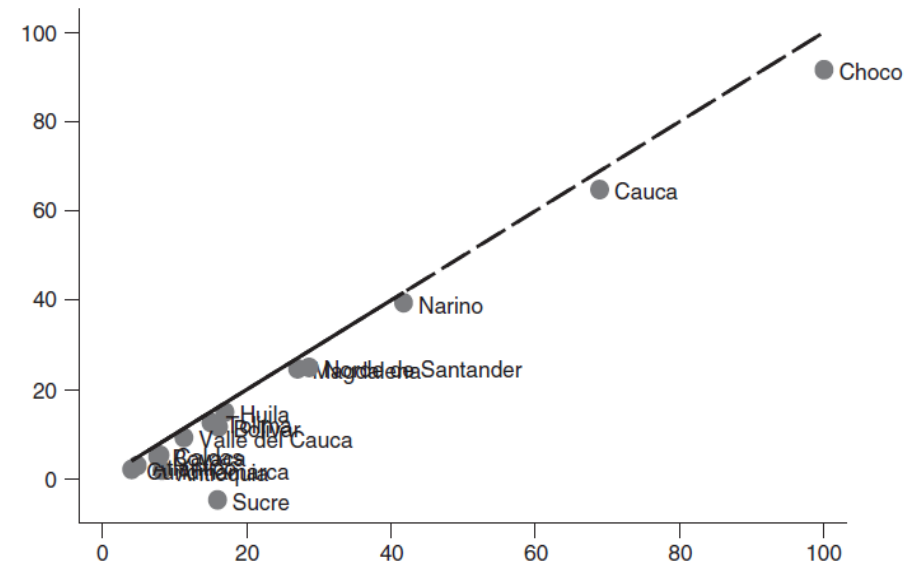


FIGURE 1. MALARIA INCIDENCE BEFORE AND AFTER THE ERADICATION CAMPAIGN, COLOMBIA

Malaria eradication programs in Latin America

- Childhood exposure to malaria eradication campaign could significantly result in up to 43% increase in income in Brazil and up to 30% in Mexico

$$Y_{ijt} = \beta(H_j^{\text{pre}} \times \text{Post}_t) + \delta_t + \delta_j + X_{ijt}\Gamma + \epsilon_{ijt}$$

TABLE 2—CROSS-COHORT DIFFERENCES AND MALARIA: BRAZIL AND MEXICO

Dependent variables: Differences across cohorts in...	Brazilian states ($N = 24$)				Mexican states ($N = 32$)		
	Literacy	Education	Log total income	Log earned income	Literacy	Education	Log earned income
<i>Panel A. Estimates using ordinary least squares</i>							
Specification:							
Basic	0.063 (0.063)	0.555 (0.607)	0.351** (0.173)	0.267** (0.131)	0.116*** (0.032)	0.058 (0.298)	0.292*** (0.112)
Include infant mortality	0.063 (0.063)	0.576 (0.581)	0.366** (0.147)	0.262* (0.136)	0.119*** (0.032)	0.138 (0.237)	0.286** (0.112)
Include sectorial shares	0.131*** (0.042)	1.288** (0.597)	0.434** (0.183)	0.283*** (0.094)	0.032 (0.039)	-0.234 (0.247)	0.196 (0.135)
Full controls	0.147*** (0.042)	0.995** (0.487)	0.393** (0.178)	0.283* (0.147)	0.035 (0.035)	-0.247 (0.260)	0.254* (0.148)

Malaria eradication programs in Latin America

- Each dot indicates the strength of relationship between income and pre-campaign malaria infection.
- Those who were already adult when campaign starts, pre-campaign malaria rate largely reduce income
 - Those who were childhood during the campaign so benefit from campaign and so effect of pre-campaign malaria rate on income decreases
 - Those born after the campaign already significantly reduce malaria, pre-campaign malaria rate have no impact on income

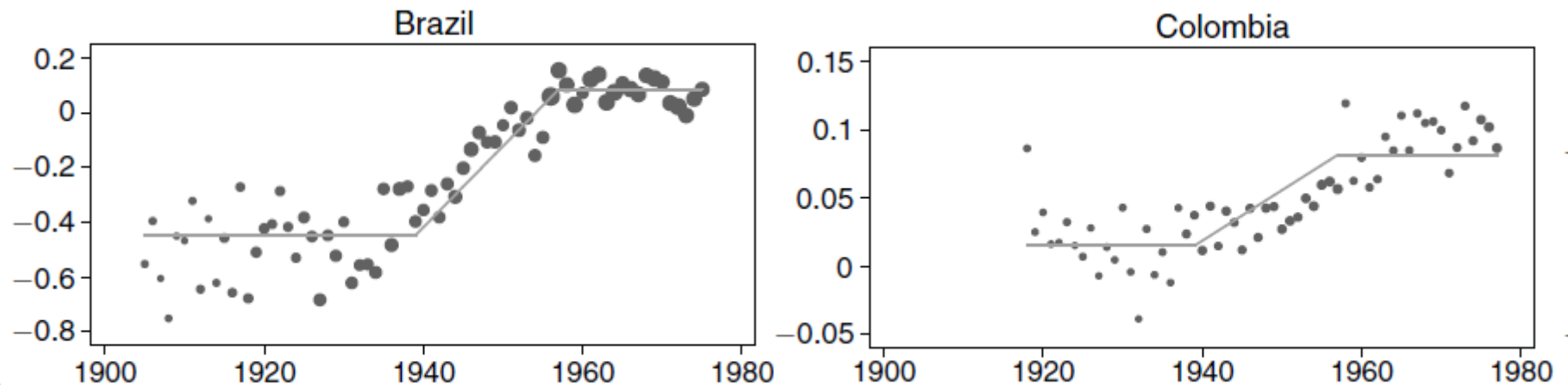


FIGURE 4. COHORT-SPECIFIC RELATIONSHIPS: INCOME AND PRE-CAMPAIGN MALARIA

Malaria and poverty: The bottom line

- Bleakley (2010) found that a child not exposed to malaria in childhood would have up to 50% higher income than those exposed to malaria
 - Similar results in India (Cutler et al. 2010) and also on education in Paraguay and Sri Lanka (Lucas 2010)
- We will also learn this Wednesday about the even more impressive health intervention → deworming program
- So investments in malaria control measures (and others) seem highly cost effective

Why are some countries, communities and households not doing it?

Worm in Kenya

- Intestinal helminths are among most widespread diseases in less developed countries
 - 1.3 billion people infected with roundworm, 1.3 billion with hookworm, 900 million with whipworm, 200 million with schistosomiasis
- Particularly concentrated in school-age children and sub-Saharan Africa
- Severe infections cause anaemia, malnutrition, stunting, wasting, listlessness and abdominal pain
- Light infections often asymptomatic
- Hypothesized that children with intense infections are less attentive in school and hence have lower educational achievement
- However, research inconclusive in estimating impact

De-worming Programs

➤ Transmitted through

- Poor sanitation, poor hygiene
- Bathing in infected water

➤ Treatment

- Low-cost single-dose oral therapies, every 6 months
- Virtually no side effects
- Girls over 12 excluded because drug is toxic for embryo

➤ Prior findings

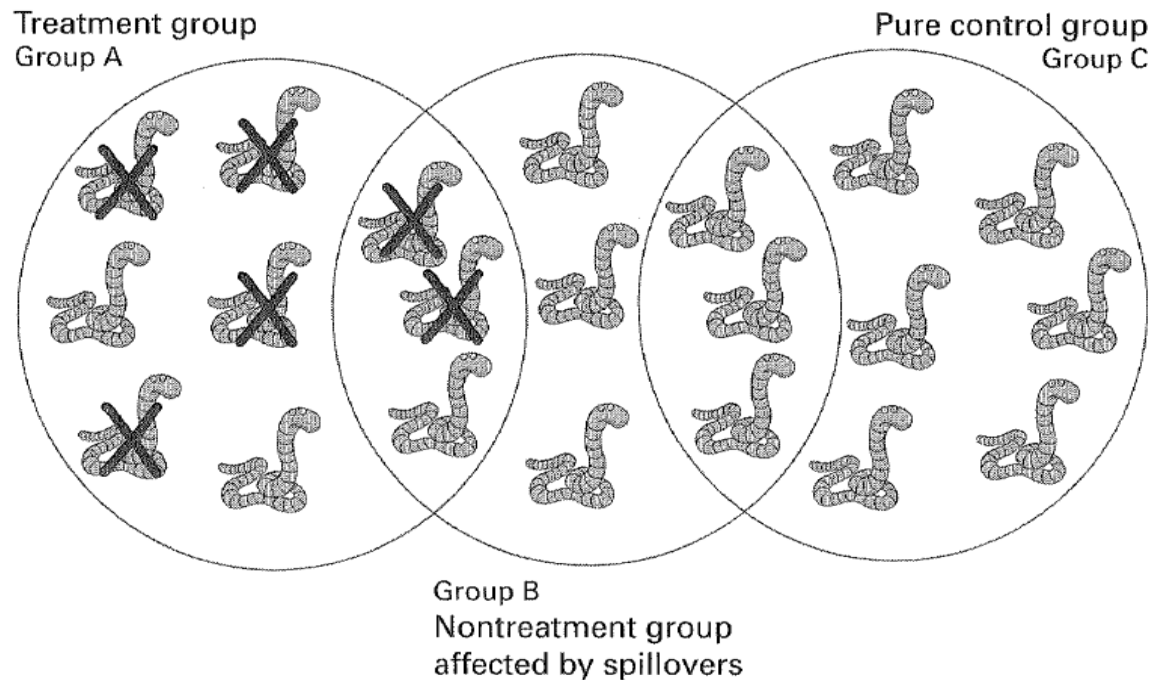
- Few randomized studies
 - Evidence on impact of de-worming on cognition is inconclusive
 - Main problems
 - Randomization within schools
 - Ignores spill-over effects: reduced transmission to controls
- Underestimate treatment effect

De-worming Program in Kenya

- 30,000 school children in rural western Kenya (Busia)
- **75 schools randomized**
 - Group 1 gets treatment in 1998, 1999 and 2000
 - Group 2 gets treatment in 1999 and 2000
 - Group 3 gets treatment in 2000
- **Treatment**
 - All schools with geohelminth prevalence over 50% were mass treated with albendazole
 - All schools with schistosomiasis prevalence over 30% were mass treated with praziquantel
 - Below these thresholds infected pupils were treated individually
 - Education on worm prevention, hygiene and sanitation
- **Survey:** NGO came 4 times per year unannounced and took attendance

Key to evaluation

- Transmission through playgrounds
- Control group schools closer to treatment schools effectively treated more than those far from treatment schools



Summary statistics

How do we know if this randomization is appropriate?

→ Schools in all three groups should have similar characteristics pre program!

TABLE I
1998 AVERAGE PUPIL AND SCHOOL CHARACTERISTICS, PRE-TREATMENT^a

	Group 1 (25 schools)	Group 2 (25 schools)	Group 3 (25 schools)	Group 1 – Group 3	Group 2 – Group 3
<i>Panel A: Pre-school to Grade 8</i>					
Male	0.53	0.51	0.52	0.01 (0.02)	-0.01 (0.02)
Proportion girls <13 years, and all boys	0.89	0.89	0.88	0.00 (0.01)	0.01 (0.01)
Grade progression (= Grade – (Age – 6))	-2.1	-1.9	-2.1	-0.0 (0.1)	0.1 (0.1)
Year of birth	1986.2	1986.5	1985.8	0.4** (0.2)	0.8*** (0.2)
<i>Panel B: Grades 3 to 8</i>					
Attendance recorded in school registers (during the four weeks prior to the pupil survey)	0.973	0.963	0.969	0.003 (0.004)	-0.006 (0.004)
Access to latrine at home	0.82	0.81	0.82	0.00 (0.03)	-0.01 (0.03)
Have livestock (cows, goats, pigs, sheep) at home	0.66	0.67	0.66	-0.00 (0.03)	0.01 (0.03)
Weight-for-age Z-score (low scores denote undernutrition)	-1.39	-1.40	-1.44	0.05 (0.05)	0.04 (0.05)
Blood in stool (self-reported)	0.26	0.22	0.19	0.07** (0.03)	0.03 (0.03)
Sick often (self-reported)	0.10	0.10	0.08	0.02** (0.01)	0.02** (0.01)
Malaria/fever in past week (self-reported)	0.37	0.38	0.40	-0.03 (0.03)	-0.02 (0.03)
Clean (observed by field workers)	0.60	0.66	0.67	-0.07** (0.03)	-0.01 (0.03)
<i>Panel C: School characteristics</i>					
District exam score 1996, grades 5–8 ^b	-0.10	0.09	0.01	-0.11 (0.12)	0.08 (0.12)
Distance to Lake Victoria	10.0	9.9	9.5	0.6 (1.9)	0.5 (1.9)

Simple result

Treated schools have great reduction in worm infection and some improvement in health outcome in 1998!

Does this result reflect overall impact of the program?

→ This only includes direct effect and within school externality.

→ This does not include across school externality just yet!

TABLE V
JANUARY TO MARCH 1999, HEALTH AND HEALTH BEHAVIOR DIFFERENCES BETWEEN GROUP 1 (1998 TREATMENT) AND GROUP 2 (1998 COMPARISON) SCHOOLS^a

	Group 1	Group 2	Group 1 – Group 2
<i>Panel A: Helminth Infection Rates</i>			
Any moderate-heavy infection, January–March 1998	0.38	–	–
Any moderate-heavy infection, 1999	0.27	0.52	–0.25*** (0.06)
Hookworm moderate-heavy infection, 1999	0.06	0.22	–0.16*** (0.03)
Roundworm moderate-heavy infection, 1999	0.09	0.24	–0.15*** (0.04)
Schistosomiasis moderate-heavy infection, 1999	0.08	0.18	–0.10* (0.06)
Whipworm moderate-heavy infection, 1999	0.13	0.17	–0.04 (0.05)
<i>Panel B: Other Nutritional and Health Outcomes</i>			
Sick in past week (self-reported), 1999	0.41	0.45	–0.04** (0.02)
Sick often (self-reported), 1999	0.12	0.15	–0.03** (0.01)
Height-for-age Z-score, 1999 (low scores denote undernutrition)	–1.13	–1.22	0.09* (0.05)
Weight-for-age Z-score, 1999 (low scores denote undernutrition)	–1.25	–1.25	–0.00 (0.04)
Hemoglobin concentration (g/L), 1999	124.8	123.2	1.6 (1.4)
Proportion anemic (Hb < 100g/L), 1999	0.02	0.04	–0.02** (0.01)
<i>Panel C: Worm Prevention Behaviors</i>			
Clean (observed by field worker), 1999	0.59	0.60	–0.01 (0.02)
Wears shoes (observed by field worker), 1999	0.24	0.26	–0.02 (0.03)
Days contact with fresh water in past week (self-reported), 1999	2.4	2.2	0.2 (0.3)

Estimating overall impacts of de-worming program in Kenya

To estimate the overall effect of the program and cross-group externalities, they estimate the following equation:

$$y_{ijt} = \alpha + \beta_1 T_{1it} + \beta_2 T_{2it} + \sum_d \gamma_d N_{dit}^T + \sum_d \varphi_d N_{dit} + X'_{ijt} \delta + u_i + e_{ijt}$$

T_{1it}, T_{2it} : indicators of treated in 1998, 1999

N_{dit}^T : total pupils in treated schools at distance d

N_{dit} : total pupils in schools at distance d

So γ_d represents an estimate of cross-school externalities.

How can we imply from this equation an average effect of treatment on the treated schools?

Overall impacts on worm infection rates

What can we imply on the impacts of the program on worm infection rates?

TABLE VII
DEWORMING HEALTH EXTERNALITIES WITHIN AND ACROSS SCHOOLS, JANUARY TO MARCH 1999^a

	Any moderate-heavy helminth infection, 1999			Moderate-heavy schistosomiasis infection, 1999			Moderate-heavy geohelminth infection, 1999		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Indicator for Group 1 (1998 Treatment) School	-0.25*** (0.05)	-0.12* (0.07)	-0.09 (0.11)	-0.03 (0.03)	-0.02 (0.04)	-0.07 (0.06)	-0.20*** (0.04)	-0.11** (0.05)	-0.03 (0.09)
Group 1 pupils within 3 km (per 1000 pupils)	-0.26*** (0.09)	-0.26*** (0.09)	-0.11 (0.13)	-0.12*** (0.04)	-0.12*** (0.04)	-0.11** (0.05)	-0.12* (0.06)	-0.12* (0.07)	-0.01 (0.07)
Group 1 pupils within 3–6 km (per 1000 pupils)	-0.14** (0.06)	-0.13** (0.06)	-0.07 (0.14)	-0.18*** (0.03)	-0.18*** (0.03)	-0.27*** (0.06)	0.04 (0.06)	0.04 (0.06)	0.16 (0.10)
Total pupils within 3 km (per 1000 pupils)	0.11*** (0.04)	0.11*** (0.04)	0.10** (0.04)	0.11*** (0.02)	0.11*** (0.02)	0.13*** (0.02)	0.03 (0.03)	0.04 (0.03)	0.02 (0.03)
Total pupils within 3–6 km (per 1000 pupils)	0.13** (0.06)	0.13** (0.06)	0.12* (0.07)	0.12*** (0.03)	0.12*** (0.03)	0.16*** (0.03)	0.04 (0.04)	0.04 (0.04)	0.01 (0.04)
Received first year of deworming treatment, when offered (1998 for Group 1, 1999 for Group 2) (Group 1 Indicator) * Received treatment, when offered		-0.06* (0.03)			0.03** (0.02)			-0.04** (0.02)	
		-0.14* (0.07)			-0.02 (0.04)			-0.10*** (0.04)	
(Group 1 Indicator) * Group 1 pupils within 3 km (per 1000 pupils)			-0.25* (0.14)			-0.04 (0.07)			-0.18** (0.08)
(Group 1 Indicator) * Group 1 pupils within 3–6 km (per 1000 pupils)			-0.09 (0.13)			0.11 (0.07)			-0.15 (0.10)
Grade indicators, school assistance controls, district exam score control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2328	2328	2328	2328	2328	2328	2328	2328	2328
Mean of dependent variable	0.41	0.41	0.41	0.16	0.16	0.16	0.32	0.32	0.32

Overall impacts on school participation

Dramatic gains in school participation

→ Increase average school participation by upto 6% after one year

→ Total effect: 0.14 extra year of education per child treated!

BUT there is no effect on test scores

→ Increase congestion in schools from enhanced impacts on participation?

TABLE IX
SCHOOL PARTICIPATION, DIRECT EFFECTS AND EXTERNALITIES^a
DEPENDENT VARIABLE: AVERAGE INDIVIDUAL SCHOOL PARTICIPATION, BY YEAR

	OLS (1)	OLS (2)	OLS (3)	OLS (4) May 98– March 99	OLS (5) May 98– March 99	OLS (6) May 98– March 99	IV-2SLS (7) May 98– March 99
Moderate-heavy infection, early 1999						-0.028*** (0.010)	-0.203* (0.094)
Treatment school (T)	0.051*** (0.022)						
First year as treatment school (T1)		0.062*** (0.015)	0.060*** (0.015)	0.062* (0.022)	0.056*** (0.020)		
Second year as treatment school (T2)		0.040* (0.021)	0.034* (0.021)				
Treatment school pupils within 3 km (per 1000 pupils)			0.044** (0.022)		0.023 (0.036)		
Treatment school pupils within 3–6 km (per 1000 pupils)			-0.014 (0.015)		-0.041 (0.027)		
Total pupils within 3 km (per 1000 pupils)			-0.033** (0.013)		-0.035* (0.019)	0.018 (0.021)	0.021 (0.019)
Total pupils within 3–6 km (per 1000 pupils)			-0.010 (0.012)		0.022 (0.027)	-0.010 (0.012)	-0.021 (0.015)
Indicator received first year of deworming treatment, when offered (1998 for Group 1, 1999 for Group 2)					0.100*** (0.014)		
(First year as treatment school Indicator) * (Received treatment, when offered)					-0.012 (0.020)		
1996 district exam score, school average	0.063*** (0.021)	0.071*** (0.020)	0.063*** (0.020)	0.058 (0.032)	0.091** (0.038)	0.021 (0.026)	0.003 (0.023)

Overall impacts on school participation

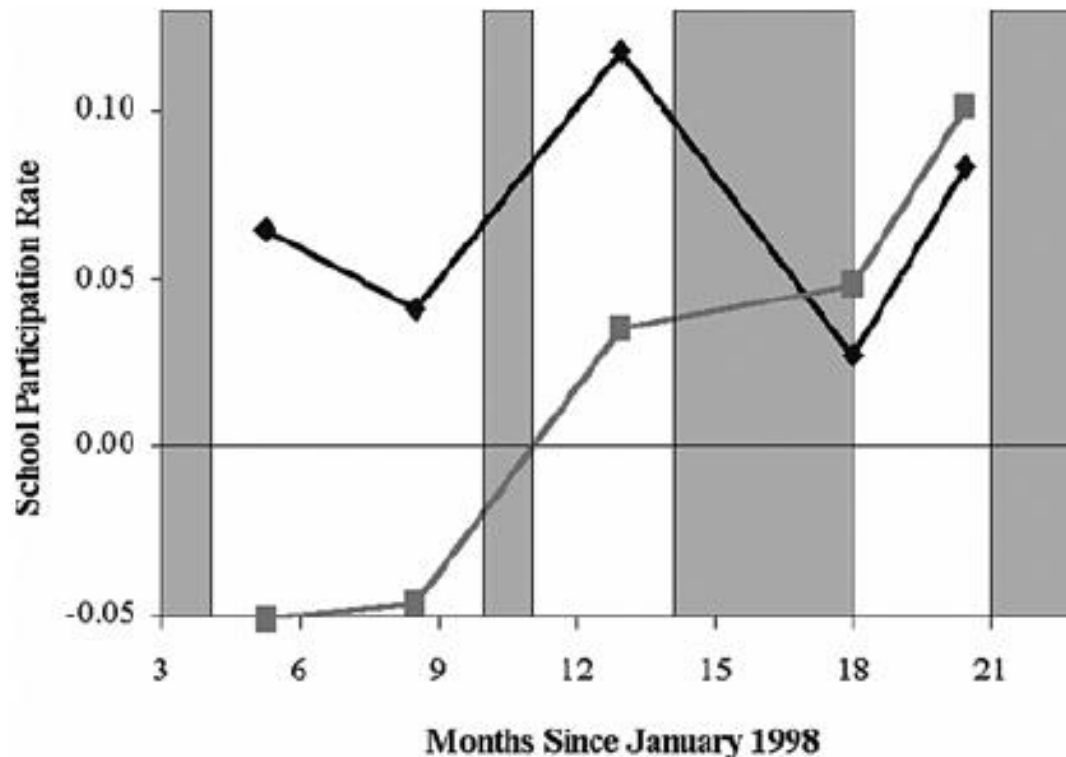


FIGURE 1.—School participation rate May 1998 to November 1999 for girls under 13 years old and for all boys (difference between Group 1 and Group 3 (diamonds), and difference between Group 2 and Group 3 (squares)).^a

^aThe shaded regions are periods in which medical treatment was being provided (in March–April and November 1998 to Group 1 schools, and March–June and October–November 1999 to Group 1 and Group 2 schools).

De-worming program: Cost benefit analysis

Overall, is de-worming program a cost effective intervention for health intervention and overall human capital investment?

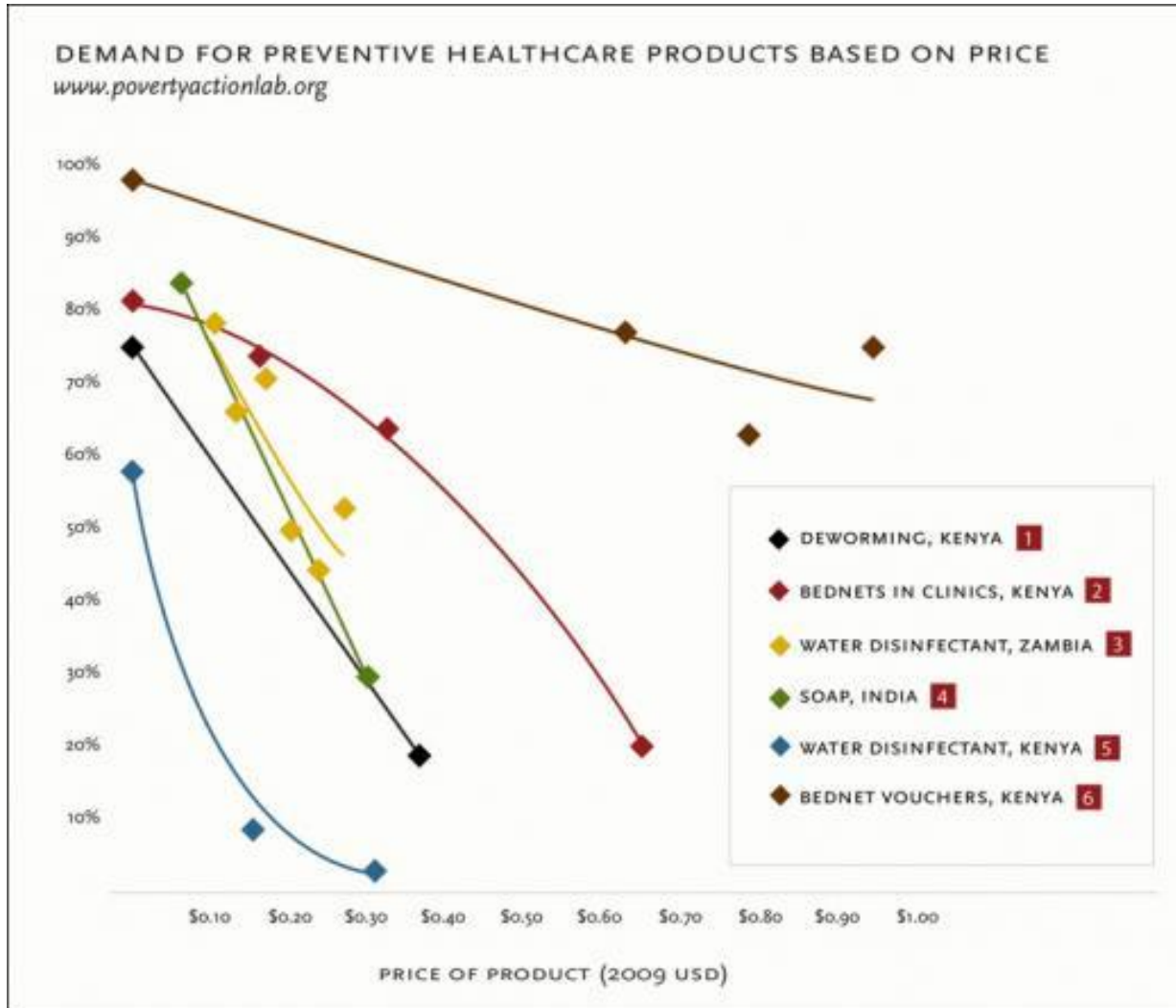
- Annual government health expenditures per capita in Kenya is \$5 per child
- Treatment cost \$0.49 per child
- Effect: 0.14 extra school years per child treated
- Overall, deworming program results in total cost of $\$0.49/0.14 = \3.50 per additional year of schooling
- Much cheaper than alternative interventions that increase schooling
- Other interventions, like the school input projects in Busia imply \$99 per additional year of schooling!

Should de-worming program be subsidized? Would there be enough demand in the market?

Problems with demand for preventive care

- Many preventive cares are proved to be effective and cheap way to promote good health and economic return
 - Most of which even have spillover effects to non-users
- Demand is low
 - Demand drops from 78% to 0% when deworming is no longer free in Kenya
- Very highly price elastic
 - Positive price effects (with small price increases)
 - Bednets (Kenya, Uganda, Madagascar)
 - Deworming program (Kenya)
 - Chlorine (Kenya, Zambia)
 - Negative price effects (great encouraged uses with small rewards)
 - Immunisation (India and many African countries)
 - HIV aids test (Malawi)

Dramatic drop in demand with small price increase



Source: Poverty Action Lab

- Deworming (Kremer and Miguel 2005)
- Bednets (Cohen and Dupas 2000, Dupas 2003, 2009, Bhattacharya 2013)
- Chlorine (Ashraf et al. 2008)

Great encouraged demand with small incentives

➤ Immunisation in India

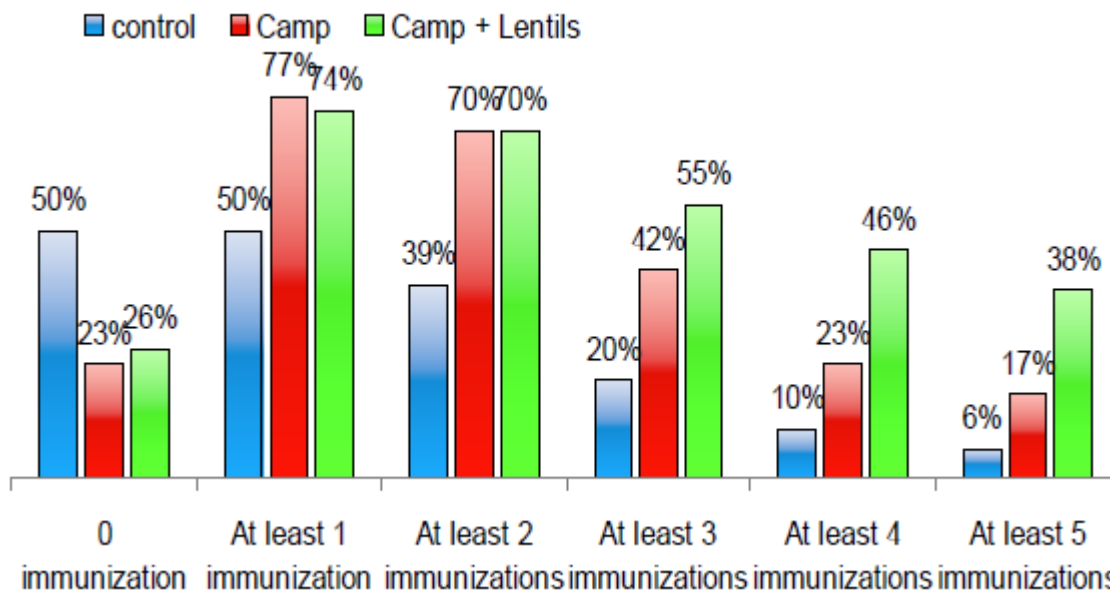
- Banerjee et al. (2003) study in 134 villages of Udaipur district in India
 - Free immunisation available at the district health center
 - In 2003, 58% of children had received no immunisation at all. Only 2.63% of children aged 1-5 were fully immunised.
- Intervention: improve both supply and demand for immunisation service
 - Supply: In 60 villages, immunised camps were organised monthly and availability and timing of camps were advertised by a local well known NGO, Seva Mandir, operating health facility in the villages
 - Demand: In 30 villages, 1kg of lentil were given for each immunisation

Great encouraged demand with small incentives

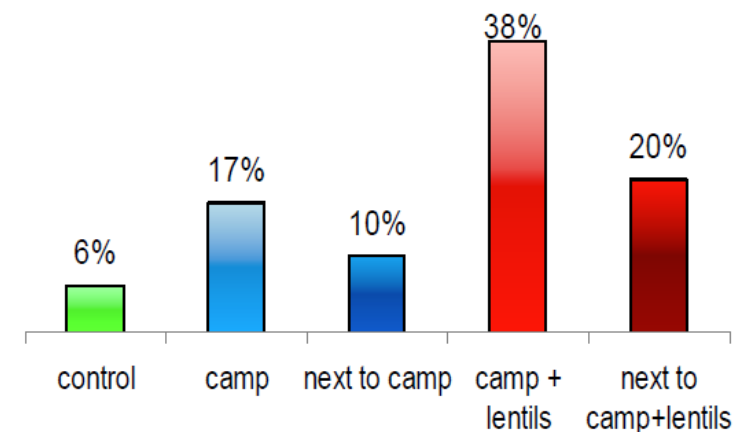
➤ Immunisation in India

- Large impact of small lentil incentive, especially in getting more than one of the needed shots
- Spillover effect of the encouraged demand

Fraction of children receiving different number of immunisations



Spillovers to other villages



Great encouraged demand with small incentives

- **Small incentives on learning HIV-Aids status in Malawi**
 - Thornton (2008) study Voluntary Counseling and Testing (VCT)
 - VCT as counterstone in fighting against HIV in Africa
 - Low uptake, psychological and social barriers are assumed very strong
 - Intervention: As part of the survey, 2,812 respondents were tested for HIV-Aids
 - A few weeks later, they could pick up their results if they wanted to from a tent set up in the village
 - Cash vouchers (\$0-3) randomly given to respondents for picking up their tests
 - Tent location also randomised within the village, either far or close

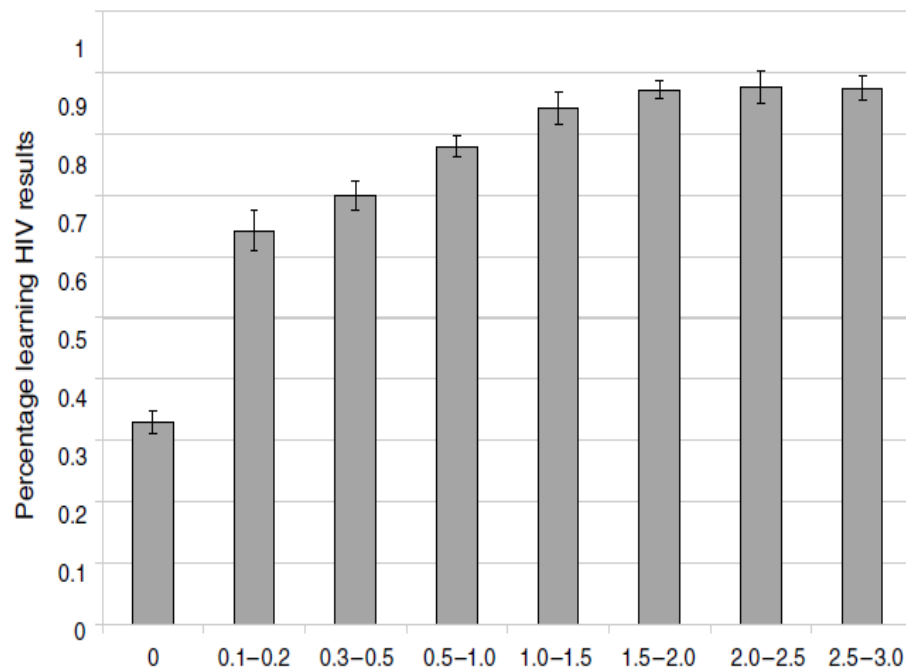


Great encouraged demand with small incentives

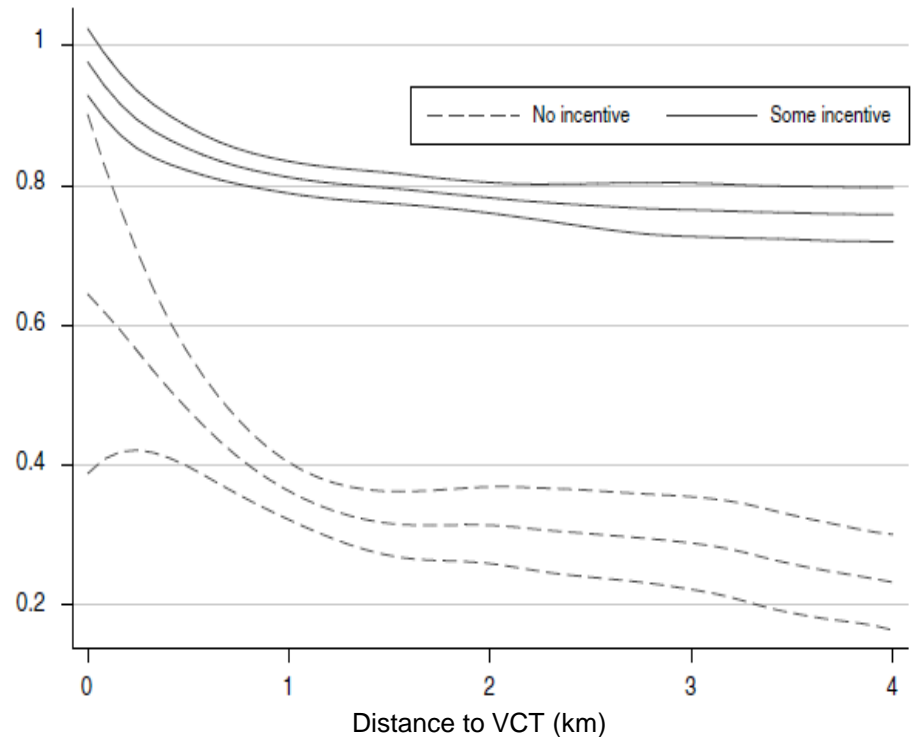
➤ Small incentives on learning HIV-Aids status in Malawi

- Small rewards strongly encourage take up
- Fear or stigma may not explain the low take up rate of VCT!

Impact of incentive on percentage learning results



Impact of incentive and distance



Why is demand for preventive care so sensitive to price?

- In a standard model of investment in health → individual should invest when NPV benefit outweighs NPV of cost
 - Given the high (lifetime) return of those investments, demand should be high
- Effect of fear, stigma, lack of trust?
 - But in that case, small change in prices should not have much effect
- **Two more explanations:**
 - Time inconsistent preference
 - Learning problem: the perceived benefit of those preventive cares is low (even if the real benefits are high)

Time inconsistent preference and demand for preventive care

- Cost of preventive care is incurred today (direct cost, discomfort, side effects) but the benefits are in the future
- O'Donoghue and Rabin: individual could discount future significantly

- Simple form of utility when individual discount entire future at rate β

$$V(c) = u(c_0) + \beta \sum_{t=1}^T \delta^t u(c_t)$$

- We have a tendency to postpone small costs to future...But when the future ones, the cost again seems large! (sound familiar?)
 - People spend on curative care as the benefit is also realised now!
 - Small incentives could induce demand as benefit to off set with cost now
- **The role of commitment device**
 - Help people to commit in advance to behave in a certain way in the future
 - Ex) Commitment contract to smokers by microcredit in the Philippines

Learning problem and demand for preventive care

- **People could tend to understate the benefit of preventive care**
 - Action now to prevent something from happening in the future → It could be hard to learn what work
 - Positive externality → you can see un-immunised people not get sick
 - In contrast to curative care → overstate benefit → overmedication common!

- **How can we improve learning about preventive health care?**
 - Well-targeted information (e.g., HIV-Aids education in school)
 - Education as a health policy
 - Learning by doing, and role of norms and social learning

- **Should we make preventive care cheap, free or even rewarding to get people to learn how it works? ...but**
 - Will people mis-use a good they got for free?
 - Will they continue to buy when the subsidy is removed?
 - Will others be discouraged from buying or will they also learn?

The effect of subsidy on usage, private and social effects

➤ Dupas (2013) experiment with bednets in Kenya

What might be the effects of short-run subsidy to bednet on usage, learning and future adoption when subsidy is removed? What might be the effects on others?

Experiment design: 644 households

- Round 1: distribute vouchers for reduction in price of a bednet at local store (\$0-\$3.8), full price at \$5
 - check purchase, random visits to check usage of hhs and neighbours
- Round 2: one year later, second voucher at mean price (\$2.5) to everyone
 - check purchase by hhs and neighbours

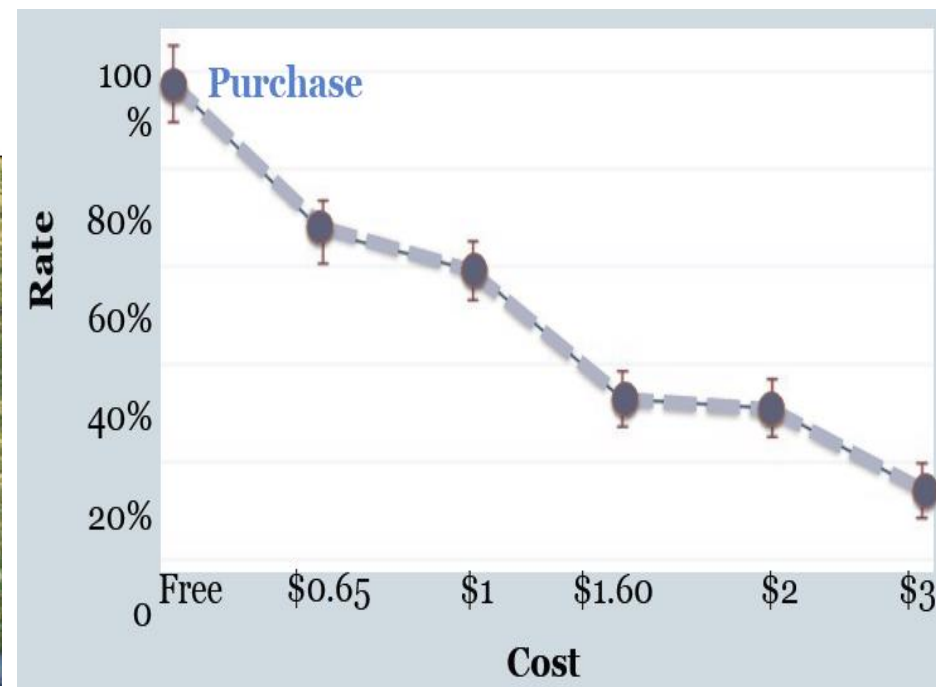
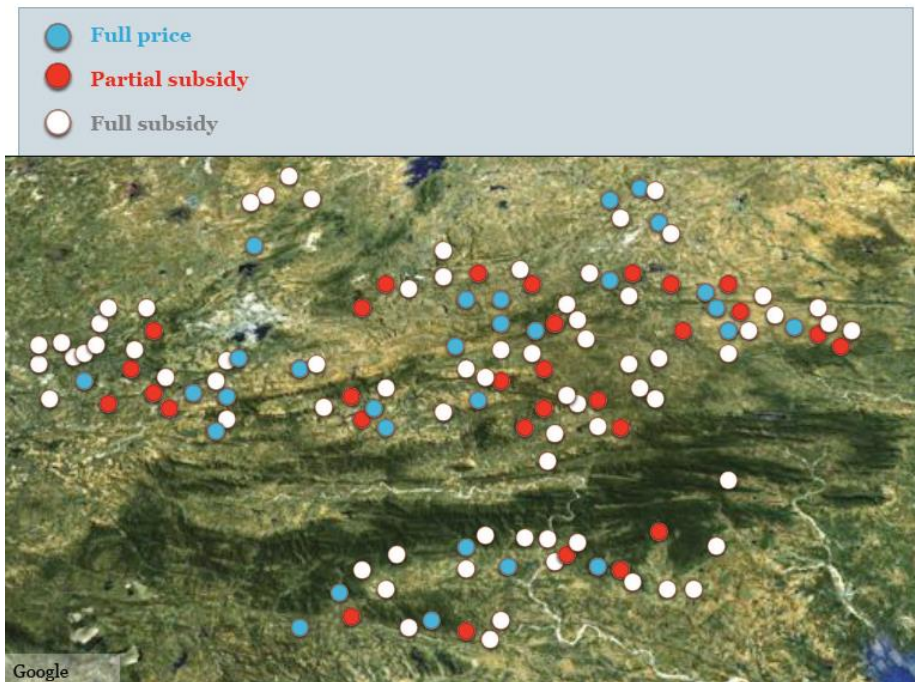


Photo: Minakawa et al. 2008,
"Unforeseen misuses of bed nets in
fishing villages along Lake Victoria,"

The effect of subsidy on usage, private and social learning

➤ Dupas (2013) experiment with bednets in Kenya

- If people must pay for bednets, will they purchase them?



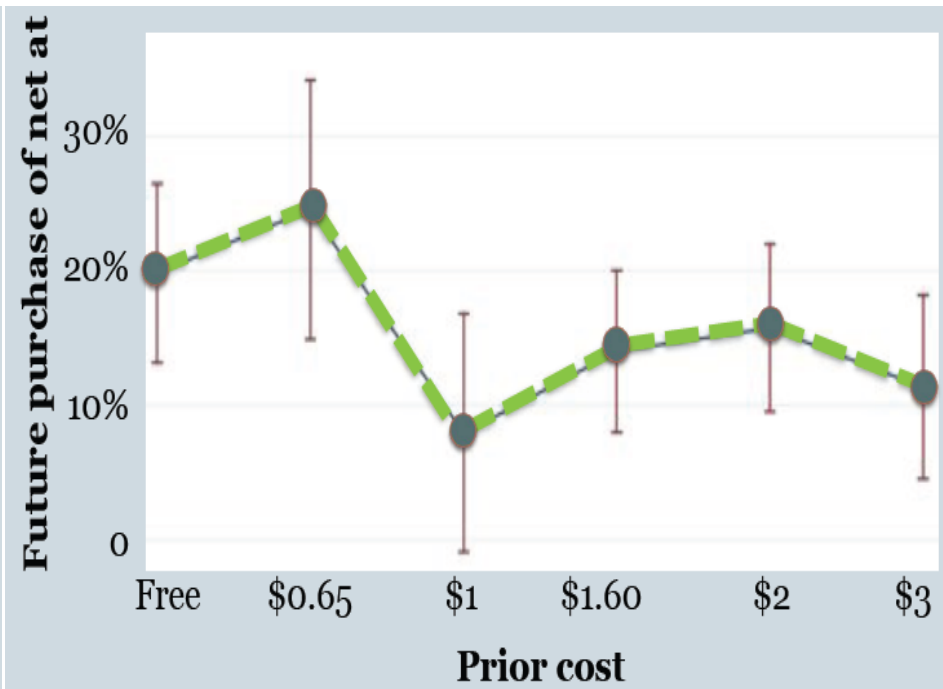
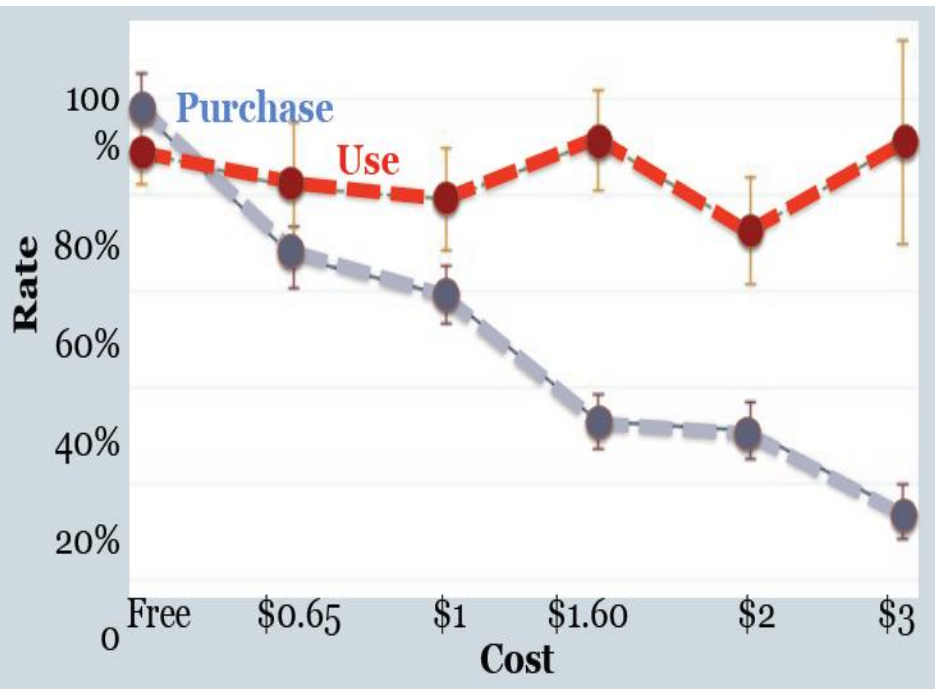
The effect of subsidy on usage, private and social learning

➤ Dupas (2013) experiment with bednets in Kenya

- People are likely to use and more like to buy another one even when they get it for free

When people get bednets for free, will they use them?

Do free bednets discourage purchase?



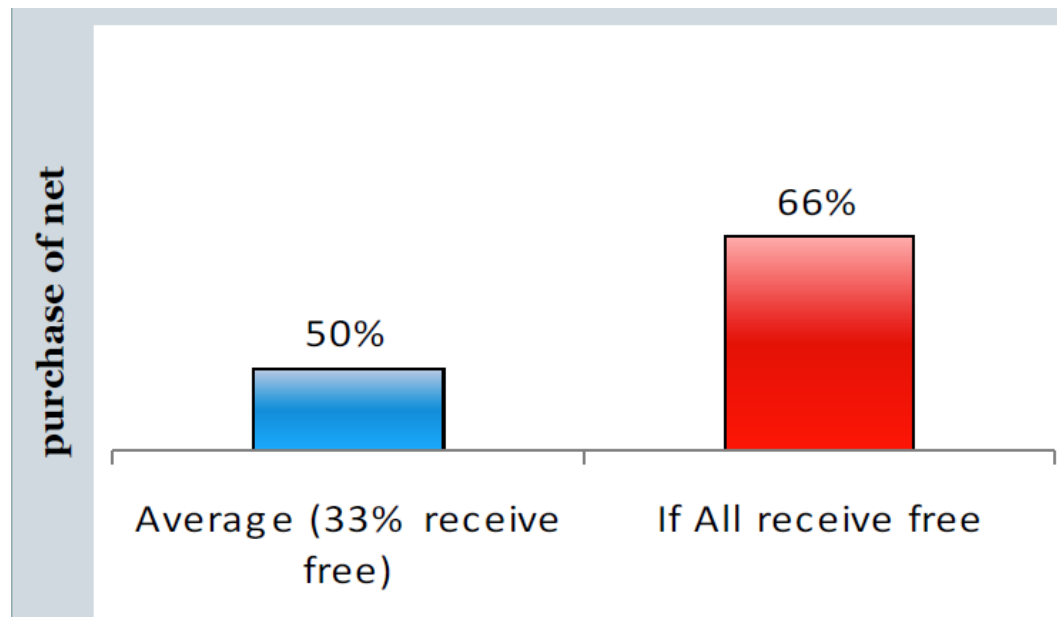
Source: Dupas (2013)

The effect of subsidy on usage, private and social learning

➤ Dupas (2013) experiment with bednets in Kenya

- Social learning: Neighbours more likely to buy the second offer if they know more people who get it for free
- The opposite effect was found on deworming program in Kenya, however!

Do neighbours buy bednets if others got them for free?



Source: Dupas (2013)

Policy implications

- Health interventions, especially preventive care with positive spillovers, can yield high return with low cost
- The market, however, will not naturally lead to outcome where these health interventions are delivery or demanded
 - Key demand constraint: Time inconsistent preference/ learning problems
 - Supply constraint? Availability and quality can be conditional on demand
- Public intervention to encourage demand is critical
 - Free provision, high subsidy or incentives will be critical in short run to stimulate private and social learning and behaviour change

→ The encouraged learning and behaviour effects could outweigh direct and indirect costs (disincentive effect)

- Need to enhance health education and communication

