

# What part of “Public health” is “Public”?

## Comparing sanitation and health care

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# Simple argument

- Some health policies address massive market failures and some don't
  - "Real" public health (a la 19<sup>th</sup> century Europe), particularly sanitation, address genuine public goods and goods with big externalities
  - Hospitals are a second – best way of dealing with universal insurance market failures
  - Primary health care ???
- Some health policies are particularly important for the poor and some aren't
- Some health policies are hard to implement, some are even harder
- Policy should be strategic and get the most welfare improvement possible given money AND implementation constraints

OK, OK maybe it isn't SO simple

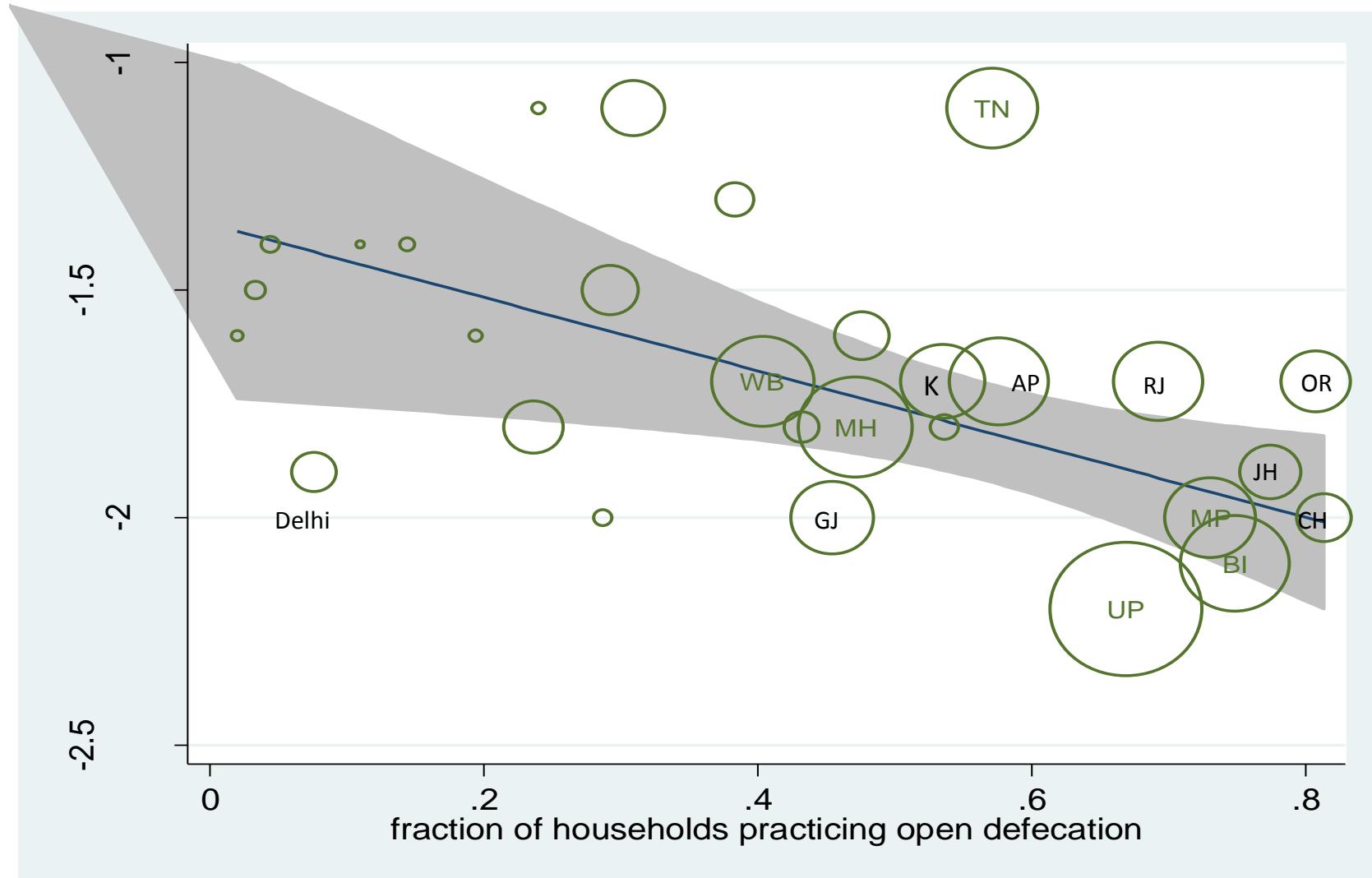
# Three studies on sanitation

(and quick comparisons with primary health care)

- Cross state illustration of the damage done by poor sanitation
- A randomized control trial of the Maharashtra Total Sanitation Campaign
- Some preliminary results on drainage and health in Delhi slums

What kinds of policy-related things contribute to good health?

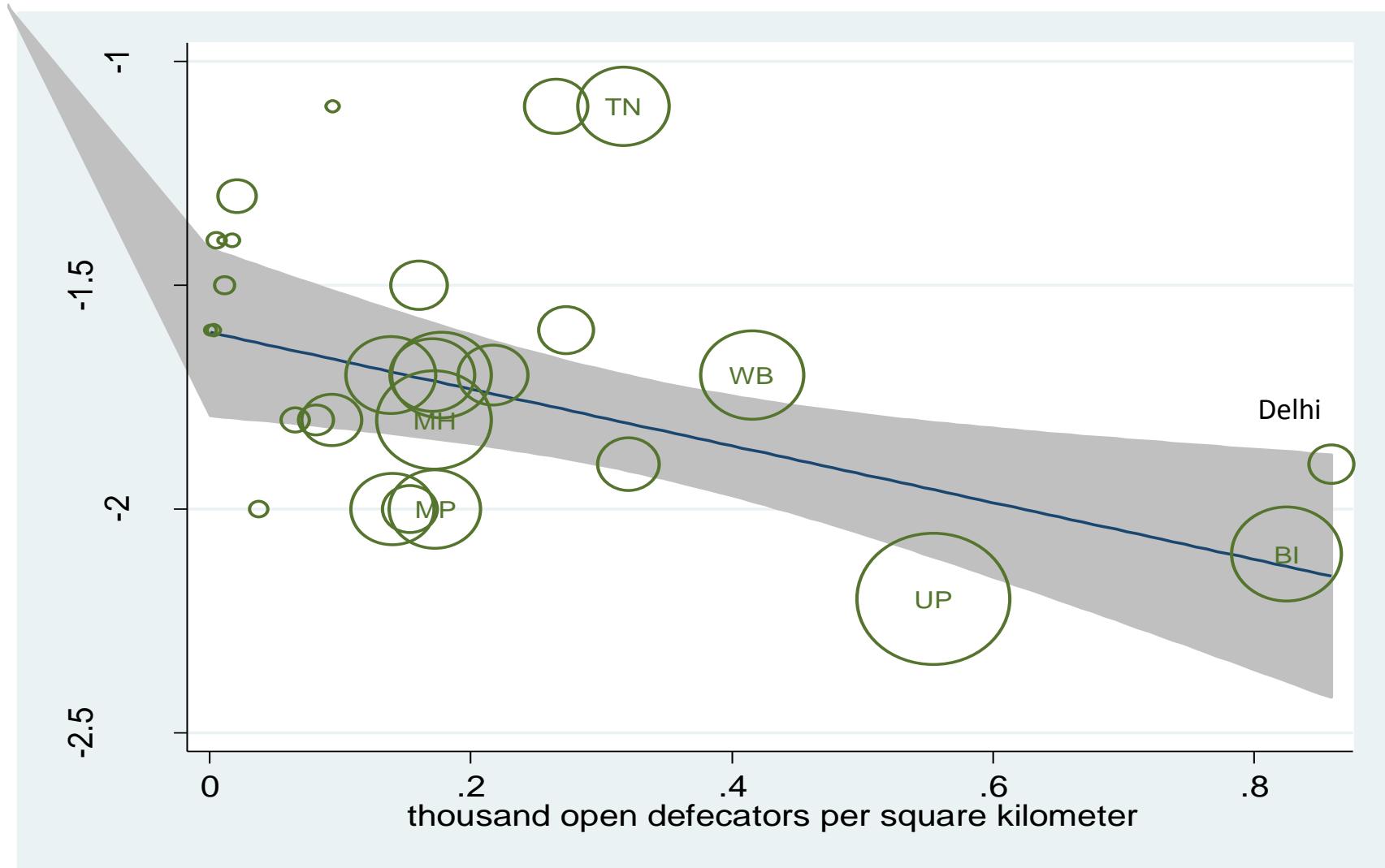
# Open defecation and height



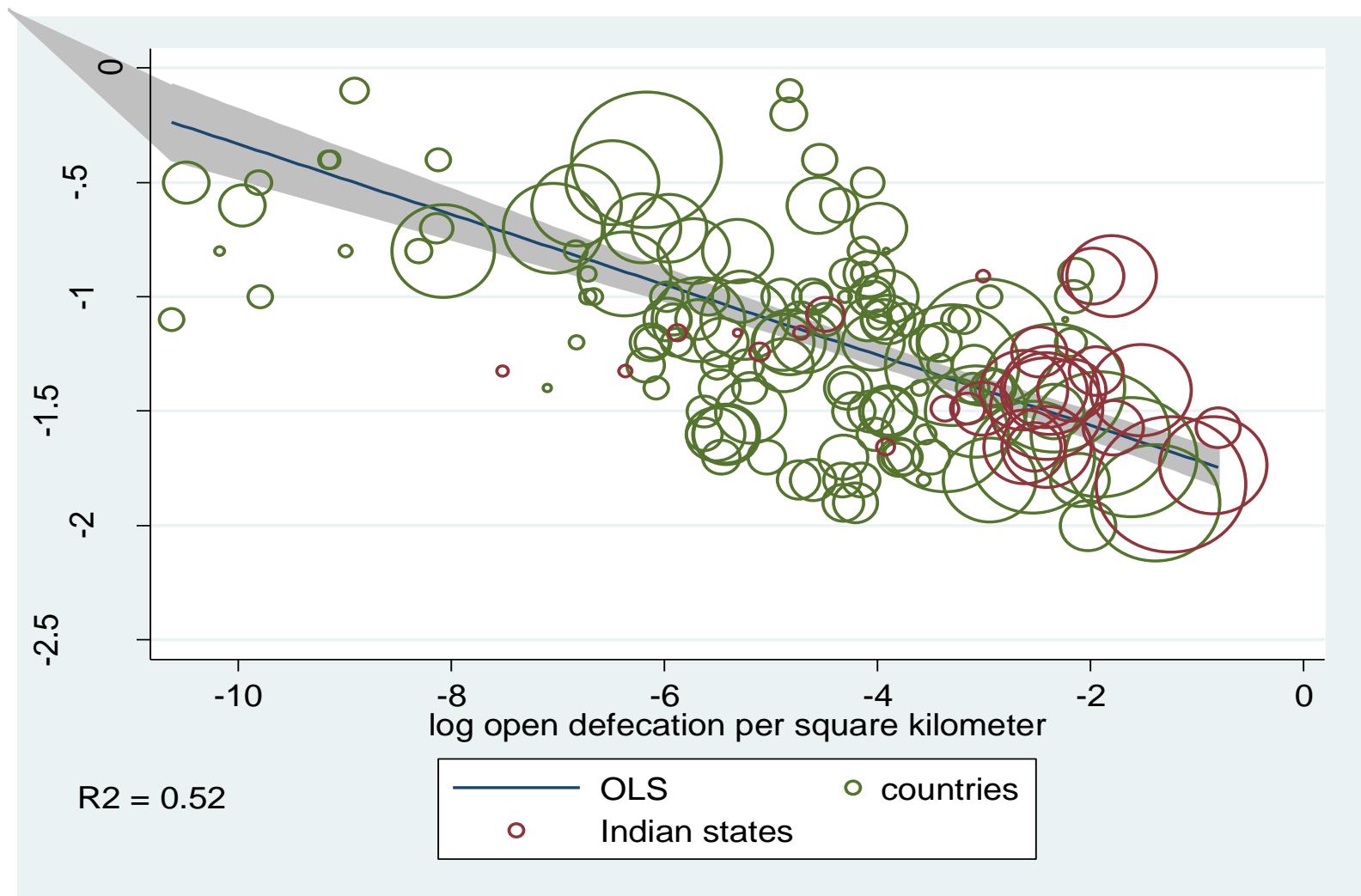
# Density of open defecation and height



# Density of open defecation and height



# Indian states in international comparison



# A horserace of determinants of height-for-age: open defecation practices, income and public health care coverage

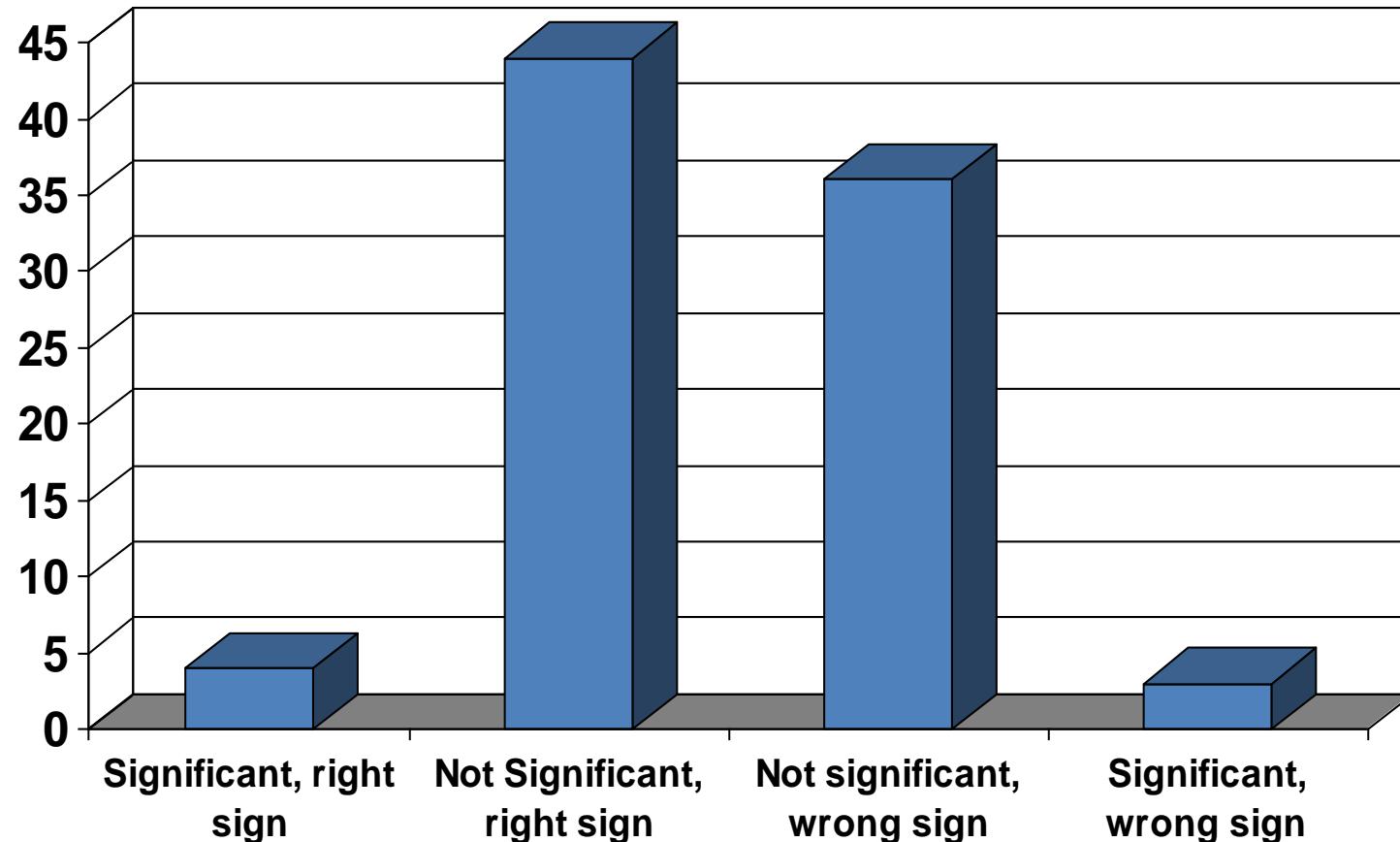
	(1)	(2)	(3)	(4)	(5)	(6)
	average height-for-age of children under five					
<b>open defecation</b>	-0.635**			-0.479**	-0.537*	-0.485**
(1,000 / km <sup>2</sup> )	(0.215)			(0.149)	(0.230)	(0.171)
<b>SDP per capita</b>		9.297+		1.529	0.518	4.792**
		(4.881)		(3.895)	(5.982)	(1.633)
<b>no government</b>			-0.0196*	-0.0156	-0.0159	-0.00562
<b>facility</b>			(0.00872)	(0.0104)	(0.0106)	(0.00419)
<b>population density</b>					0.0000144	
					(0.0000385)	
<b>intercept</b>	-1.605***	-2.066***	-0.908*	-0.974+	-0.927	-1.495***
	(0.0822)	(0.165)	(0.396)	(0.553)	(0.592)	(0.206)
<b>n (states)</b>	29	29	29	29	29	29
<b>weight</b>	population	population	population	population	population	none

Note: I'm cheating here. Only "no government facility" is directly controlled by policy even a little bit. I will come back to this, though.

# Over time, same story

	(1)	(2)	(3)	(4)
NFHS:	1, 2, & 3	1, 2, & 3	1, 2, & 3	2 & 3
	height for age, children under 3			
open defecation	-0.737** (0.111)	-0.868** (0.122)	-0.664** (0.134)	-0.751** (0.129)
state FEs		•	•	•
round FEs			•	•
n (state- years)	75	75	75	55
R <sup>2</sup>	0.334			

# But not for primary health care



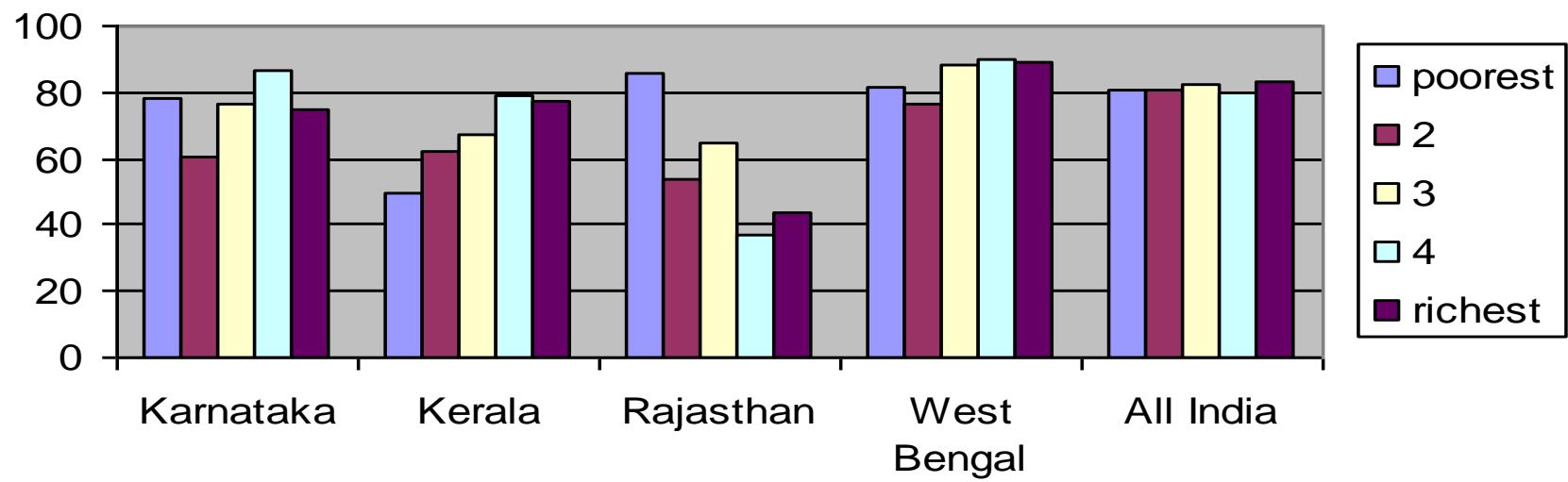
Distribution of t-tests of the variable “any public facility in village” on rural infant and child mortality. All states, NFHS 1992, 1998 (propensity score matching)

# And not only that...

- Externalities
  - Sanitation has a lot (as with almost all infectious disease control)
  - Health care – some must (like TB treatment) but a direct effect is elusive, so finding an externality...
- All infectious diseases disproportionately hurt the poor; and poor people don't use public primary care any more than anyone else
- Robustness of results
  - No measure of “coverage of population with publicly supplied healthcare” works on height
  - No outcome of interest (infant mortality for example) shows an effect of care regardless of measure: NFHS 1 &2, DLHS/RCH

# Are public PHC's really for the poor?

**Share of the private sector in number of visits for primary care services - rural areas**



Mahal et al, 2001

Note: this is from the 1995 NSS, the 2005 NSS health module didn't measure income even remotely credibly (unbelievable, no?) but no data of any kind indicates much change in 20 years.

# A closer look at Maharashtra

- The Total Sanitation Campaign – early tests
- It looks like the government can make progress on sanitation
  - This time, in some places
  - Wasn't always the case in the past (CRSP)
  - And they've changed the policy so it may not work as well in the future, either

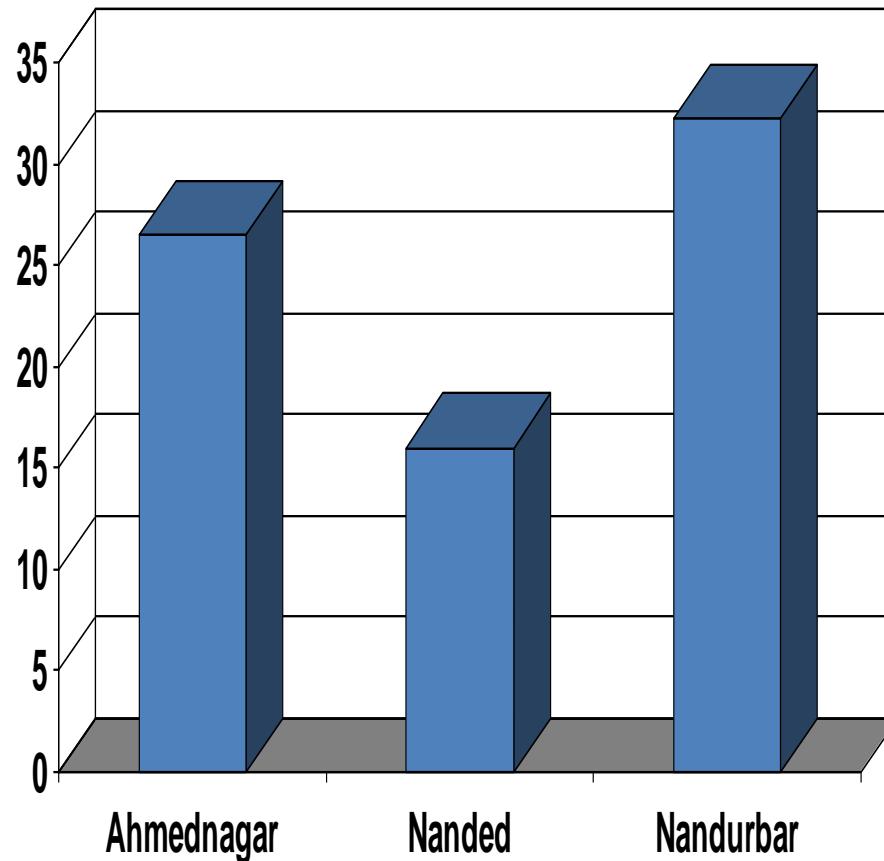
# What was supposed to happen?

A collaboration between the World Bank and the government of Maharashtra to evaluate a sanitation intervention with an RCT

- three survey rounds:
  - baseline: February 2004
  - a village-level intervention - basically India's Total Sanitation Campaign but a little more intense.
  - midline: August 2004
  - endline: August 2005

# Why more intense? Need to change behavior

## Latrine ownership ≠ usage



Percentage of people who defecate in open despite owning toilets (2004)

# What was supposed to happen?

A collaboration between the World Bank and the government of Maharashtra to evaluate a sanitation intervention with an RCT

- three districts: Ahmednagar, Nanded, Nandurbar
  - 60 villages (*gram panchayats*) in each district
  - randomized into 30 treatment, 30 control
  - intentionally chosen for remoteness and poverty
- one outcome: height-for-age z-score of children under 5
  - scaled according to WHO 2006 reference norms

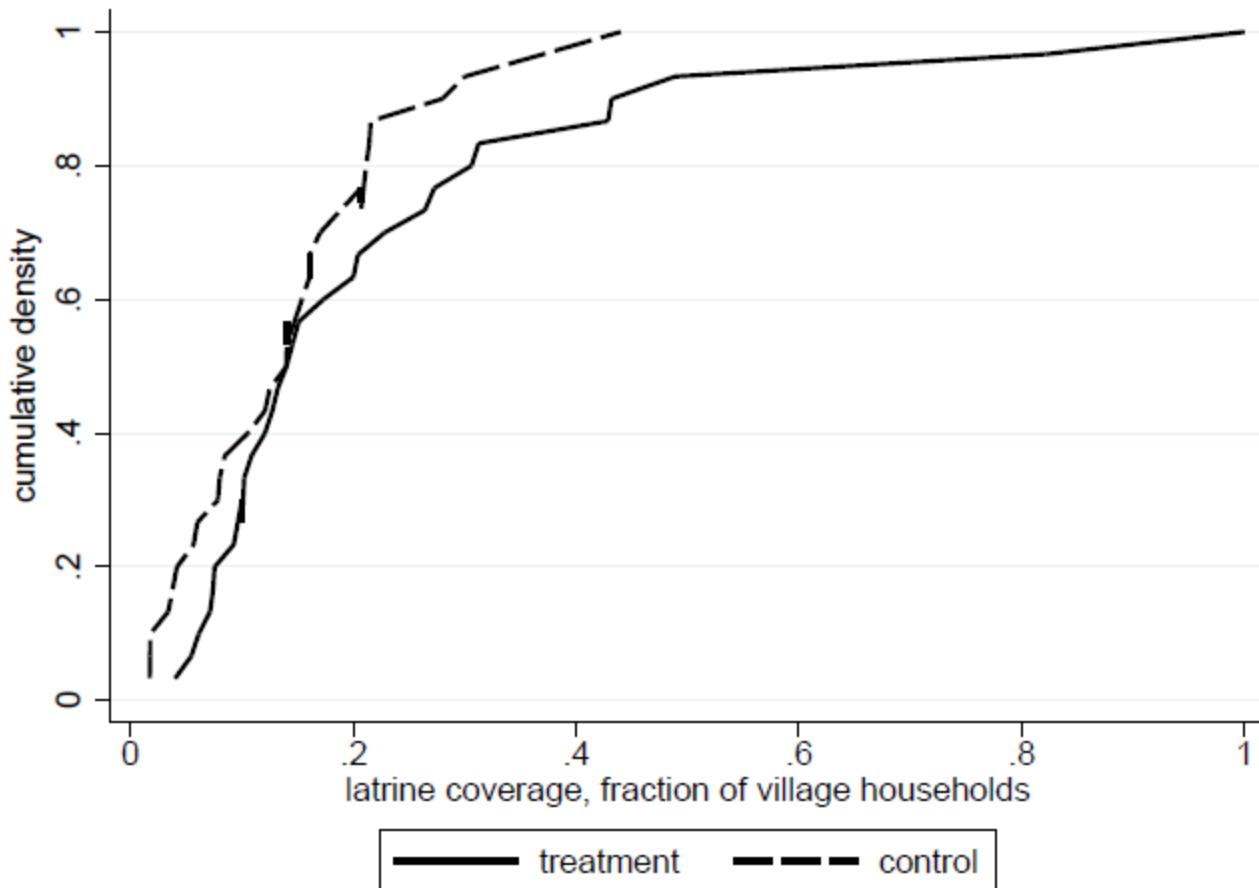
# What did happen?

- Well, the surveys were done but...
  - the government of Maharashtra only implemented the experimental program in one district, Ahmednagar
    - this is the richest of the three (poor) districts
    - the other two have a higher Scheduled Tribe population
    - the other two have lower population density, which would presumably lead to a lower health cost of open defecation
- The TSC has not been implemented in many places where it should have been.

# How does this change our analysis?

- Internal validity of causal estimates for Ahmednagar is unaffected
  - Estimates will be double difference (before and after, treated and not, only in Ahmednagar)
- The fact that things didn't work out in Nanded and Nandurbar means that we have a larger comparison group –
  - Estimates will be TRIPLE difference (before/after, intended for treatment and not, Ahmednagar versus the other two districts)

# Well, something happened



Only in Ahmednagar

# What about the effect on height?

- double difference (only Ahmednagar):

$$z_{ivt} = \beta_1 \text{treatment}_v + \beta_2 \text{treatment}_v \times \text{period2}_t + \beta_3 \text{treatment}_v \times \text{period3}_t + \theta A_{it} \times \text{sex}_i + \alpha_v + \delta_t + \varepsilon_{ivt}.$$

- triple difference (all districts):

$$\begin{aligned} z_{ivdt} = & \beta_1 \text{treatment}_{vd} \times \text{Ahmednagar}_d + \\ & \beta_2 \text{treatment}_{vd} \times \text{period2}_t \times \text{Ahmednagar}_d + \\ & \beta_3 \text{treatment}_{vd} \times \text{period3}_t \times \text{Ahmednagar}_d + \\ & \gamma_1 \text{treatment}_{vd} + \gamma_2 \text{treatment}_{vd} \times \text{period2}_t + \\ & \gamma_3 \text{treatment}_{vd} \times \text{period3}_t + \theta A_{it} \times \text{sex}_i + \alpha_{vd} + \delta_t + \varepsilon_{ivdt}. \end{aligned}$$

# Regression results for height: double difference

	(1)	(2)	(3)	(4)
	OLS	OLS	vil. FE	Tobit
round × district FEs	✓	✓	✓	✓
age × sex		✓	✓	✓
village FEs			✓	

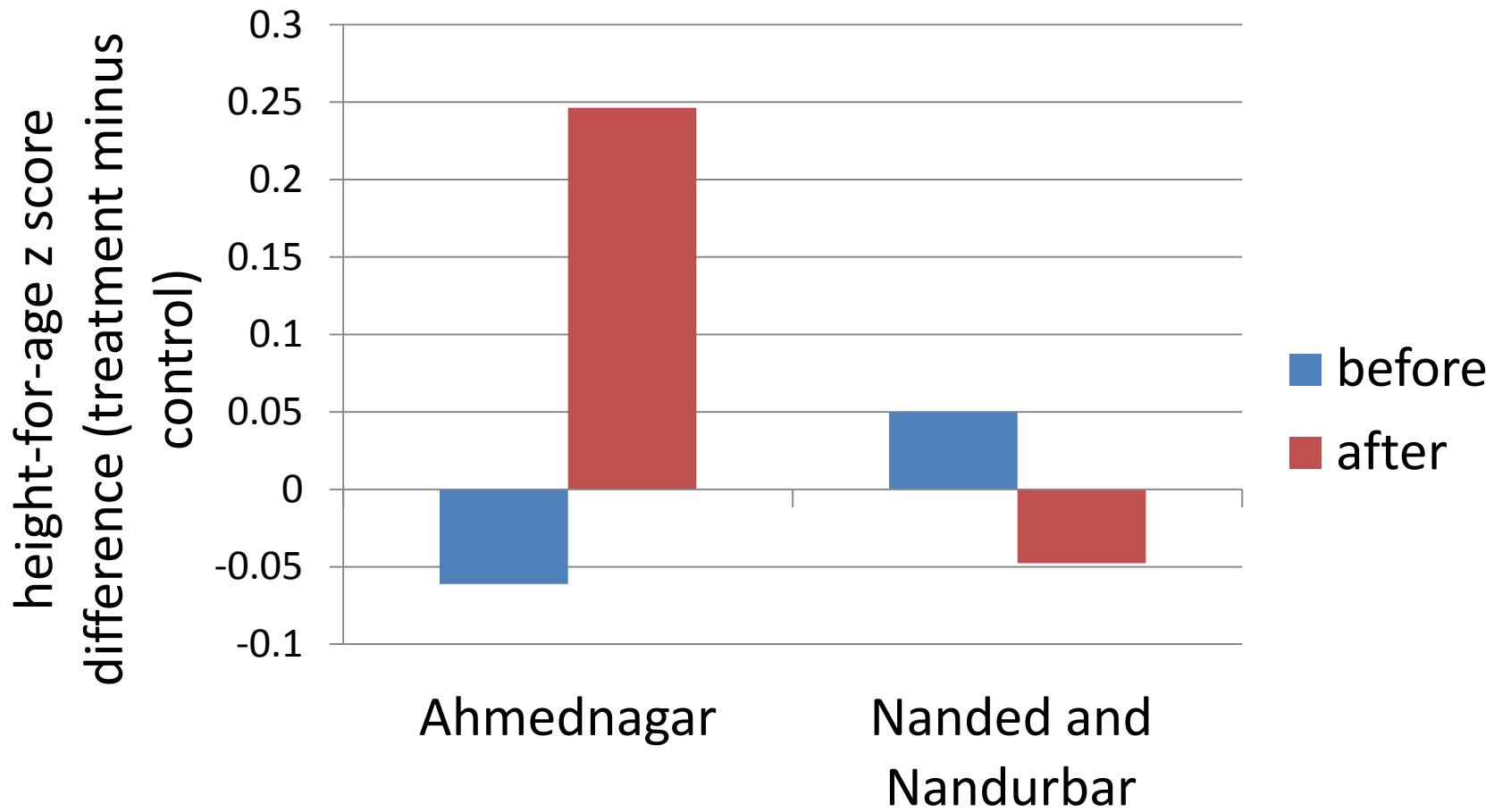
## Panel A: Double difference, midline & endline

treatment	-0.105 (0.129)	-0.0984 (0.129)		-0.0984 (0.126)
treatment × midline	0.304+ (0.156)	0.255+ (0.141)	0.292* (0.138)	0.255+ (0.138)
treatment × endline	0.368+ (0.211)	0.409* (0.195)	0.438* (0.191)	0.409* (0.192)
<i>n</i> (children)	3,440	3,440	3,440	3,440

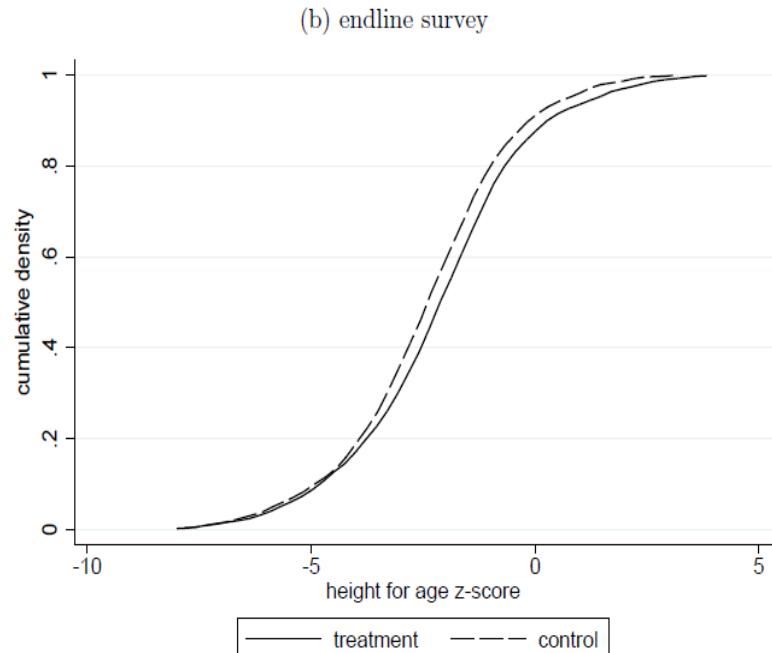
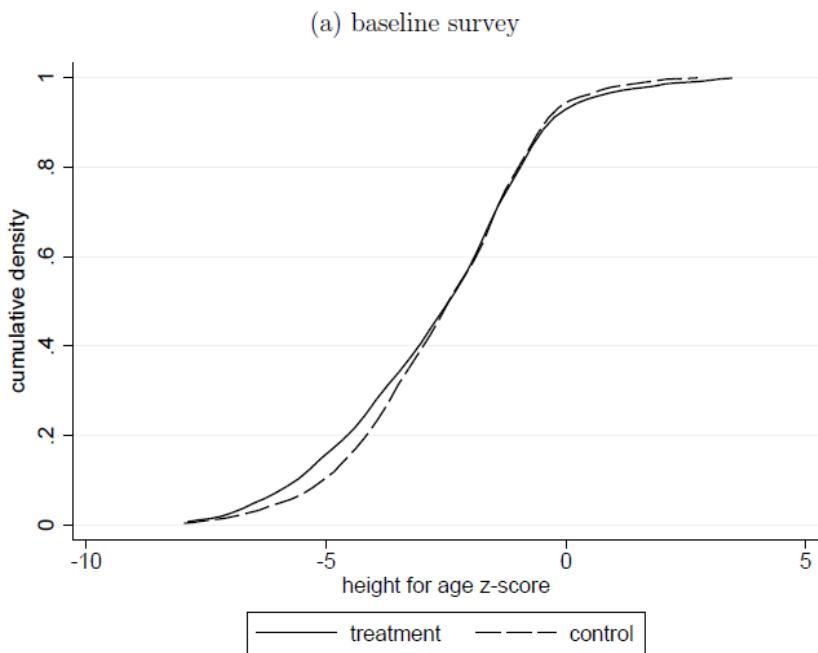
Standard errors clustered by village. Two-sided p values: + p < 0.10; \* p < 0.05.

# Effect on height

(all you're going to see about triple differences)



# More height (just Ahmednagar)



# What about primary health care?

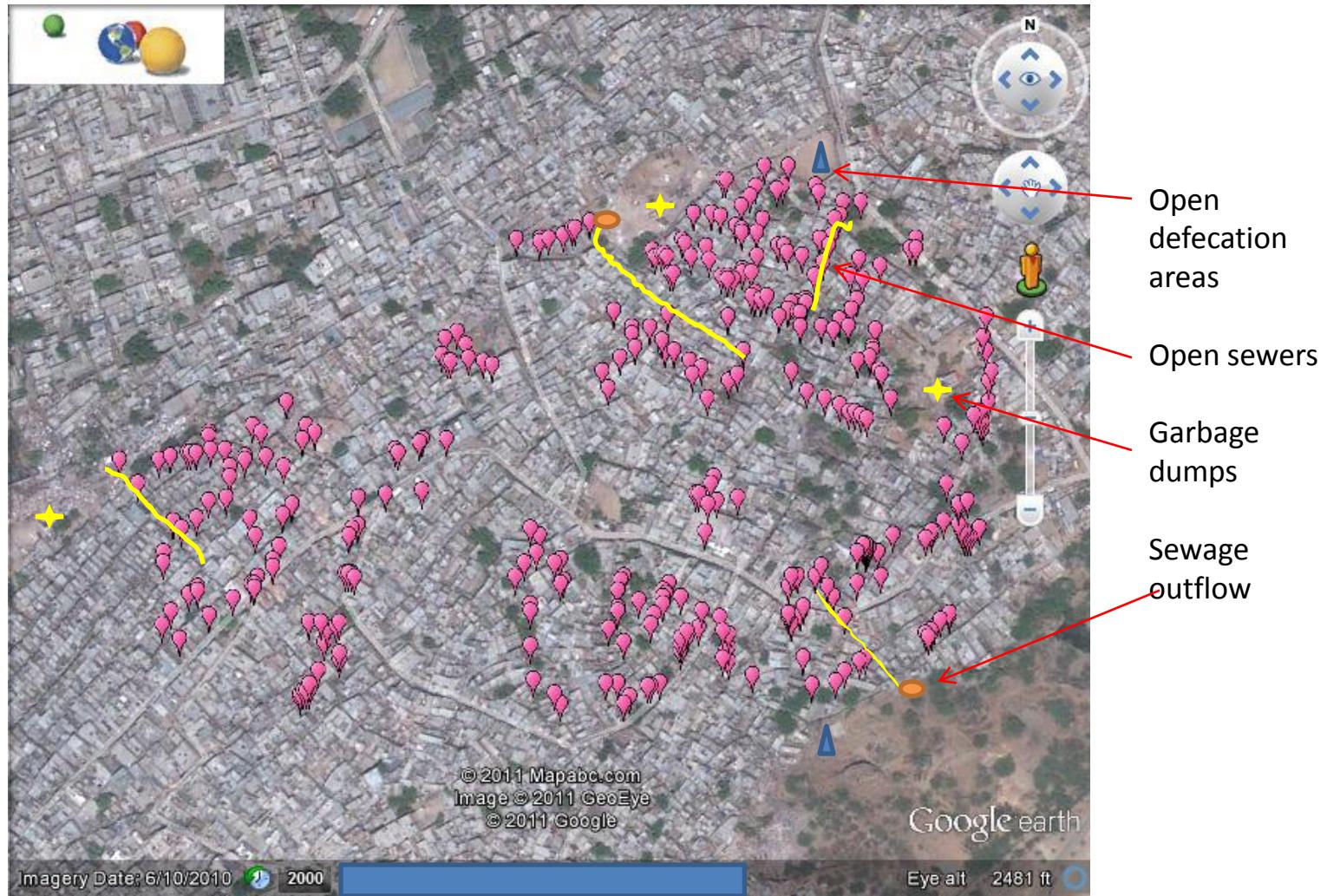
- Doesn't seem to work
- Why?
  - Vacancies
  - Absenteeism
  - Low capability of medical providers
  - Abysmal effort of medical providers
  - Many substitute providers of comparable quality care in private sector (combining knowledge and effort -- even if they are quacks) (evidence from Eastern MP)

quality

# A closer look at Delhi

- Why might “stick to your knitting” and ensure true public health interventions like sanitation be a good idea?

# Health and S...tuff



# Regression: dependent variable= “person had diarrhea in past 2 weeks”

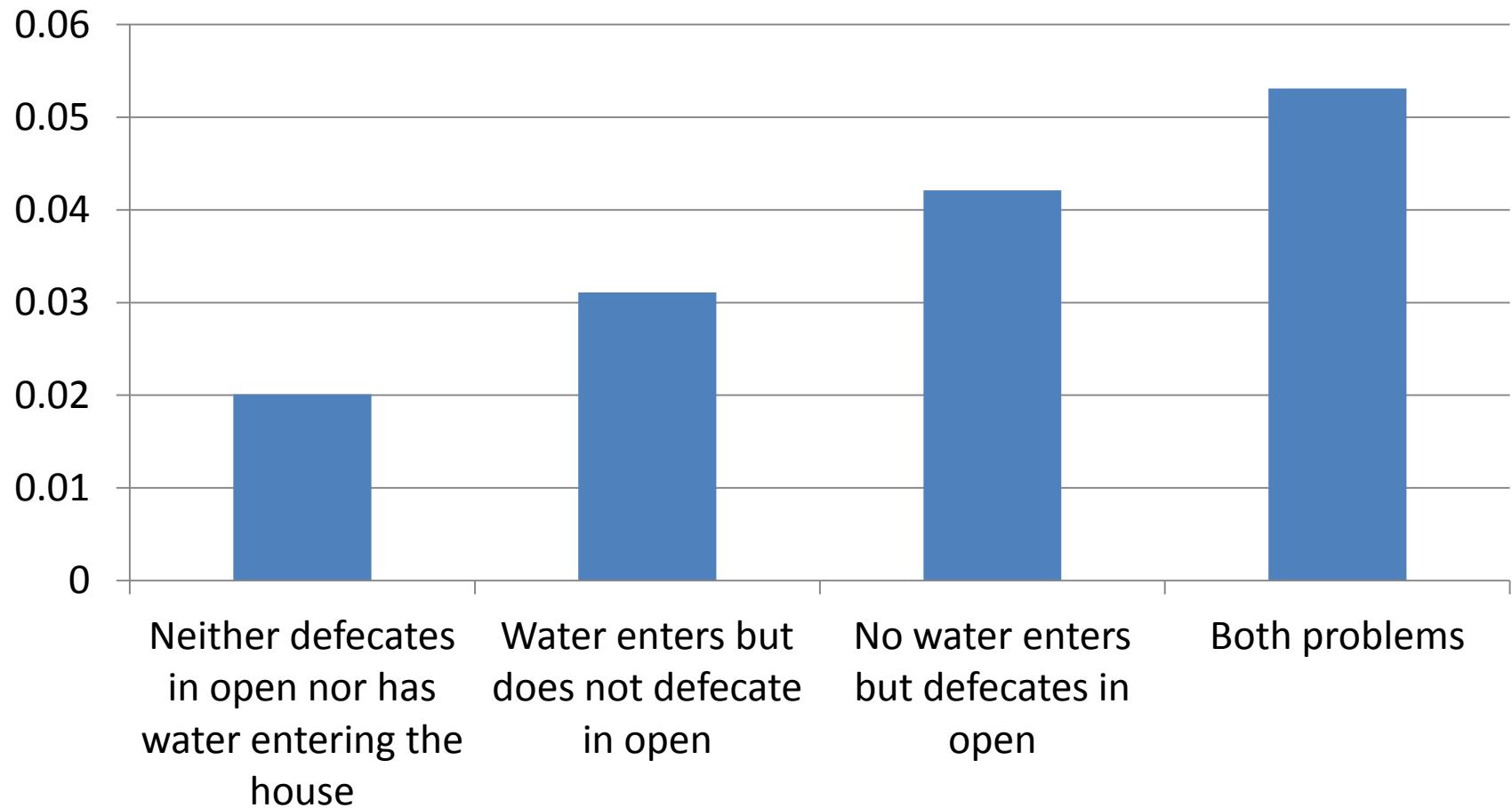
Independent variable	Coefficient (dF/dx)	Standard error
Water from street has come into the house this <u>year</u>	.011***	.004
Household wealth	-.003***	.0005
Household has private toilet	-.001	.003
Someone in household sometimes defecates in open	.023***	.003

N= 5882

Errors clustered by neighborhood, \*\*\*= significant at 1% level

Other variables: education, person is infant, person is child, gender, water source, caste, neighborhood

# Hygiene and Diarrhea in Delhi Slums



# Falsification

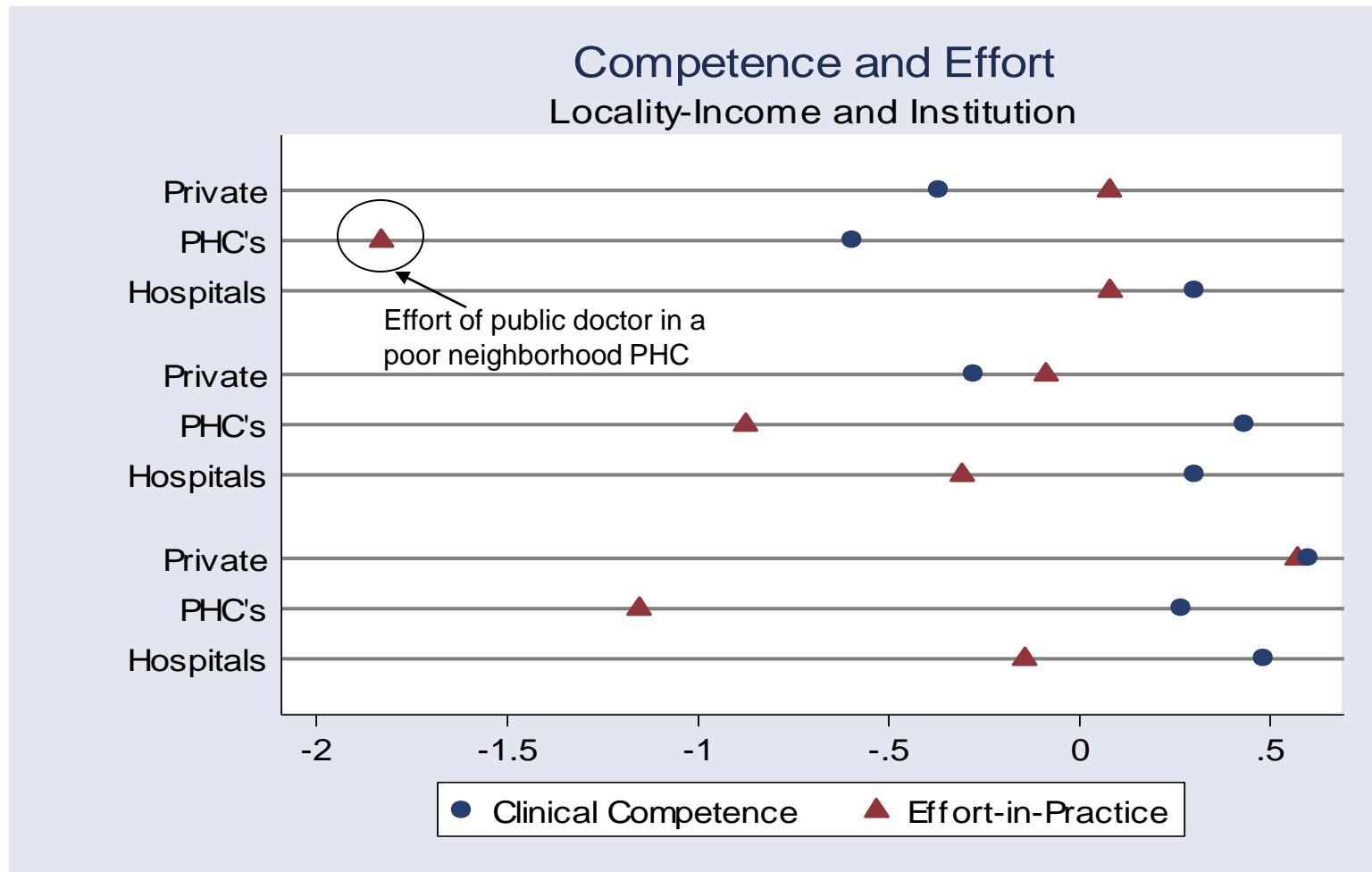
- These results do not hold for any other health condition (fever, cough, accidents, childbirth)
- So it's not “poverty that ‘wealth’ mis-measures” or “constitutionally unhealthy people”.
- The sanitation variables only affect water borne disease.

# A closer look at Delhi

- Why might publicly provided health care not work?

# Quackery and crookery for the poor in Delhi

- no matter where they go



# So, let's look at market AND government failures

- Real public health includes real public goods
  - Old-fashioned problems of the 19<sup>th</sup> century are still amongst us
  - It doesn't matter how bad government is at doing it, there is no choice and there is some evidence that it might work.
- Primary care has we're-not-sure-which market failure
  - and the government has a really hard time providing it.
  - Directives from the WHO (or the HLEG) promoting primary health care for all should not be taken on faith. So far, it is all on faith. (Jeff: mention NRHM meeting)
  - And it's not clear it is much use to the poor

# Weighing market and government failures

- Right comparison is with the way policy is actually implemented OR the way it can practically be improved (with explicit, concrete steps for correction)
- Wrong comparison is with policies as we wish they could be implemented

# Policy recommendations (all things considered)

- Do public goods before private
- Do things you can do before things you can't
- Sanitation
  - Clear market failure
  - Could work
- Primary Health Care
  - Ambiguous market failure
  - Incredibly hard to do

Why worry about sending doctors into the middle of nowhere and expect them to perform before you finish (or barely start) cleaning up the place?