

# Sanitation and health in Delhi Slums

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IGC conference, Lahore, Pakistan

March 19, 2014

# Conclusions

- If water enters your home from the street during the year, people in your house, especially infants, will get sick a lot.
- If your neighbors defecate in the open, you and your children will get sick a lot.

# If causal, obvious policy implications

- Water comes into your house where there are no or badly maintained sewers. Well maintained sewers in cities are public goods.
  - Do you really think a connection with illness isn't causal?
  - Who wants street water coming into their house anyway?
- People defecating in the open is an externality, particularly near you.
  - Causality is harder to prove but the relevant policy in cities may be the same anyway.

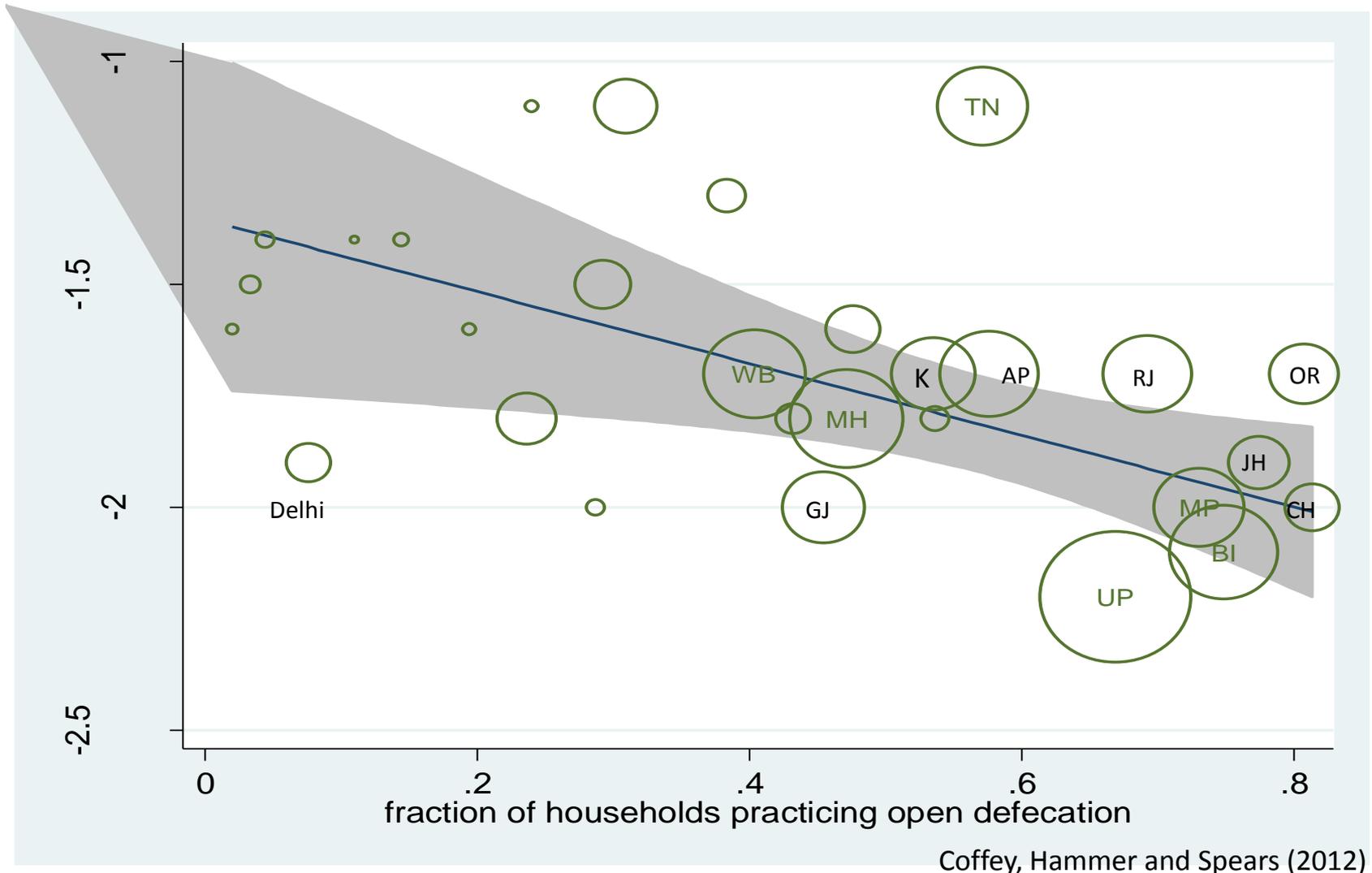
# I only have two things to say about policy (Any policy. Ever.)

- Provide public goods before private goods.  
(Or: fix really bad market failures first.)
- Do things you can do before trying those you can't. (Or: take constraints on government seriously.)
  
- You'd be surprised how bizarre these sound in health policy discussions

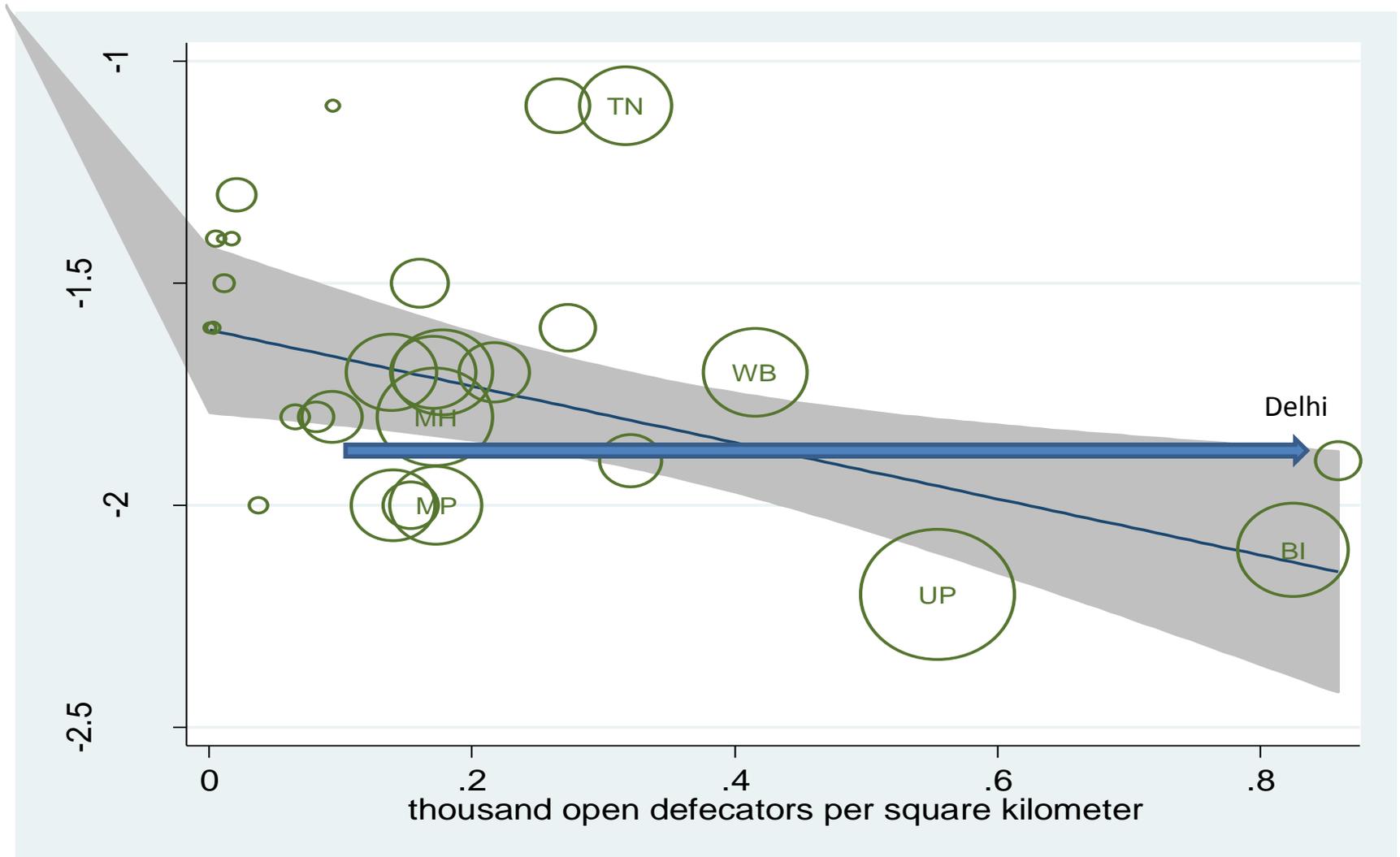
# How does this play out in health?

- Relative priorities of publicly funded medical care versus publicly funded public goods.
  - Public goods handled in rich countries in the late 19<sup>th</sup>/early 20<sup>th</sup> century are still not done
  - Some 20<sup>th</sup> century innovations increase the number of things governments in currently poor countries can usefully do but some seem to have prematurely displaced things that should come first
- Emerging evidence on the salience of sanitation, particularly in densely populated areas

# Open defecation and height

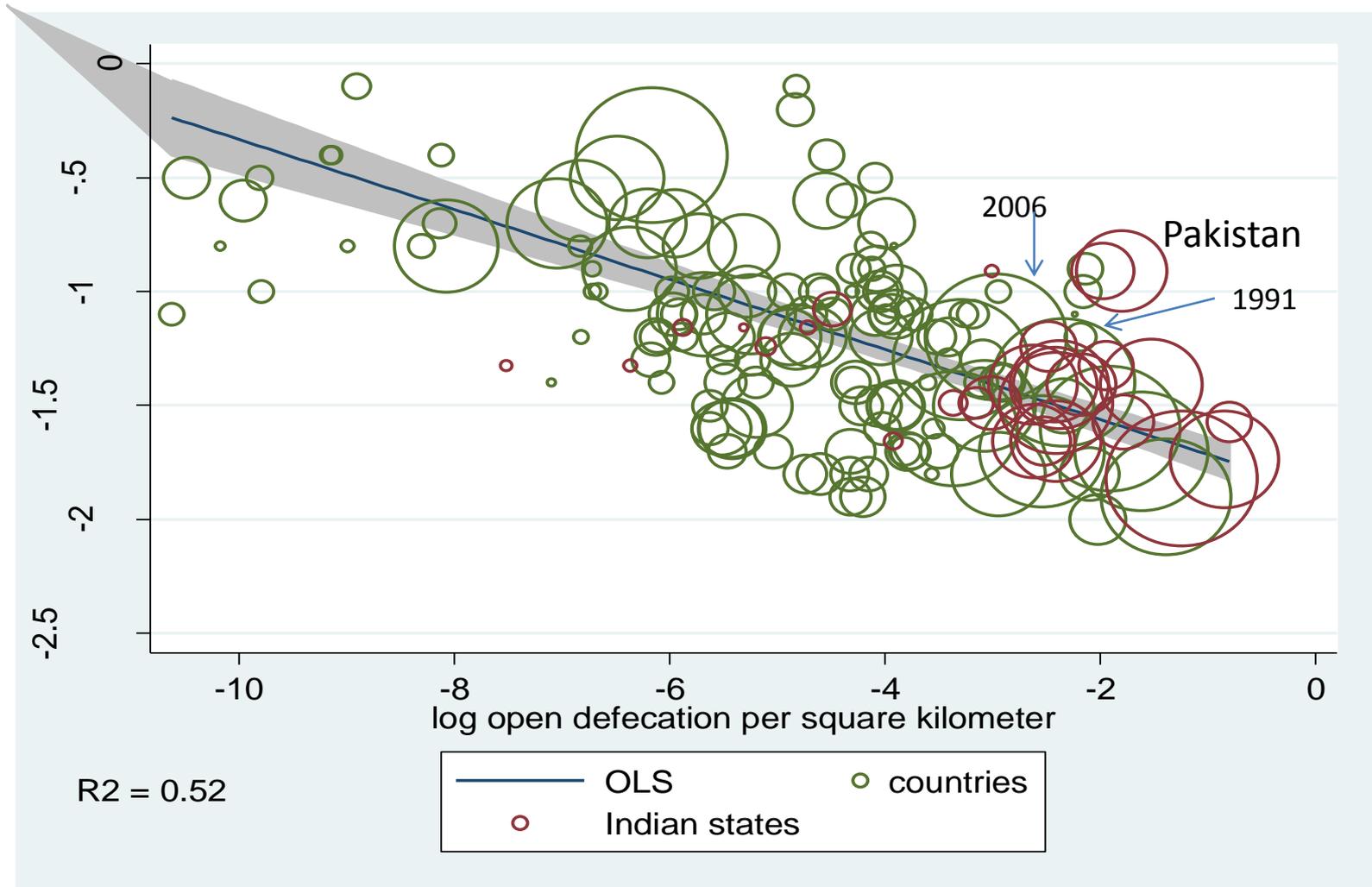


# Density of open defecation and height



Not so impressed with the wide  
scatter?

# Indian states in international comparison

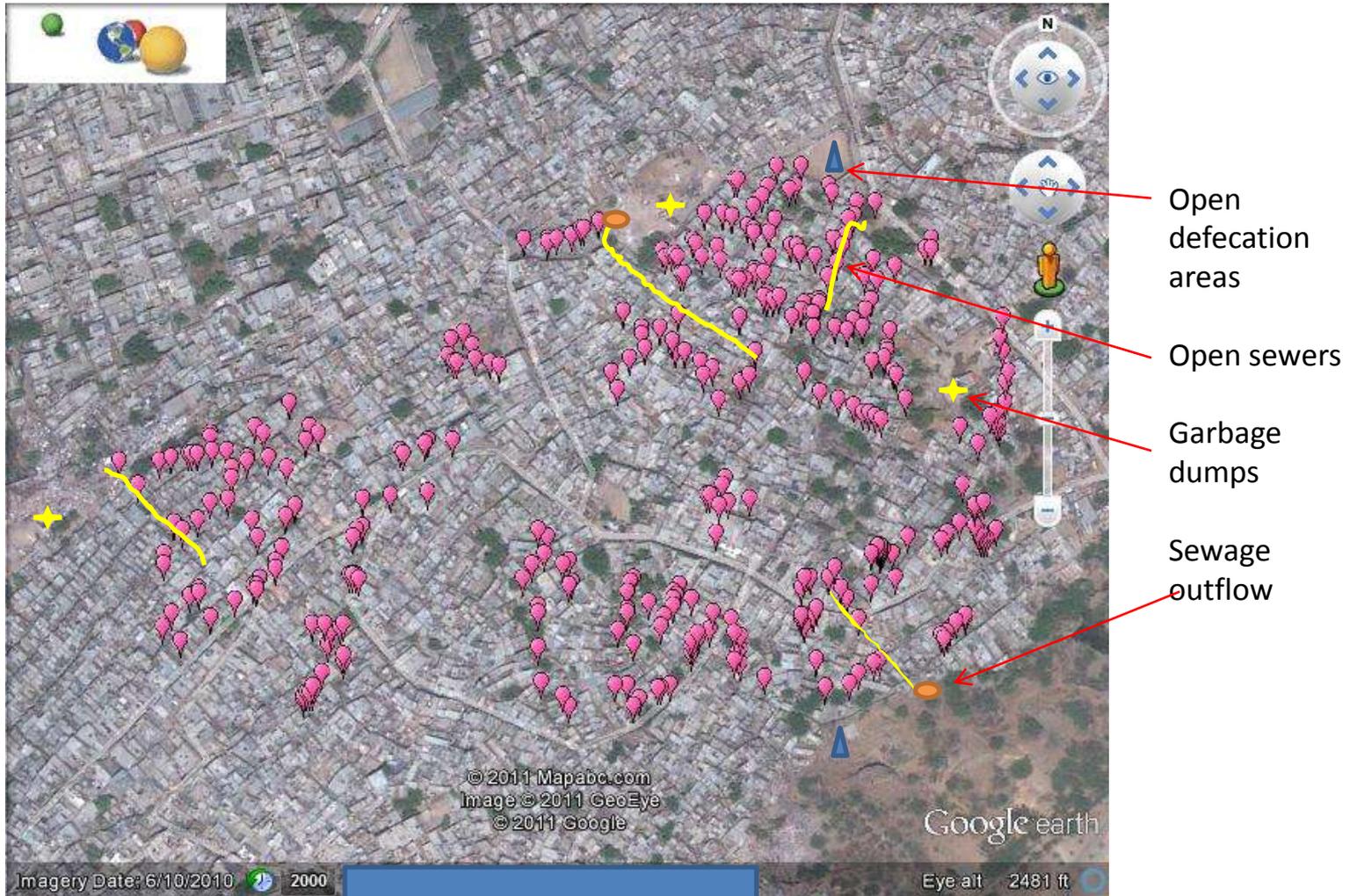


Both overall impact and “urban-ness”  
imply a closer look at Delhi

# Nature of sample

- Clusters of street blocks rather than simple random sample of neighborhood
- Needed to sample in groups so that we might find neighbors (mostly for the collective action motive of the study)

# Health and S...tuff



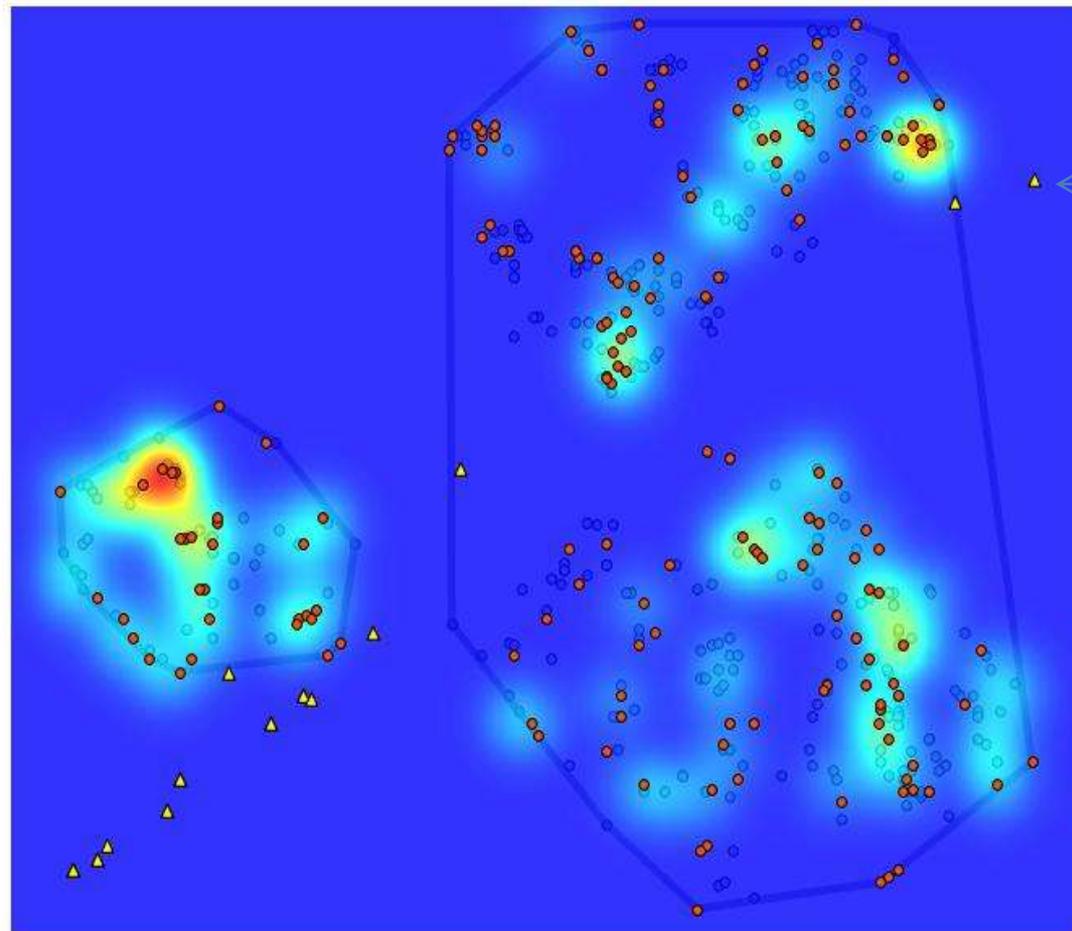
# Some descriptive statistics

	Punjabi Basti	Kathputli	Noida 5	Noida 8
N	2024	1297	354	2207
HH's - someone with diarrhea in past 2 weeks	13%	32	36	32
Individuals with diarrhea	2.7%	6.3	7.3	6.6
General caste	59%	16	17	37
SC/ST	24%	25	72	28
OBC	17%	59	11	35
"Wealth" (not%)	1.68	-0.65	-0.75	-0.84
(Others too complicated to show but never come up in any regression anyway)				
Water enters home sometime during year	7.10%	47.6	47.4	55.4
Someone in HH sometimes openly defecates (OD)	6.4%	85.6	48.4	13.4
# of Neighbors < 2.5 meters away who OD (not%, range: 0 to 3)	.05	.62	.45	.10

# Open defecation and cases of diarrhea, Noida 8

“Heat” map –  
background  
color is derived  
from weighted  
average of  
people who  
openly defecate

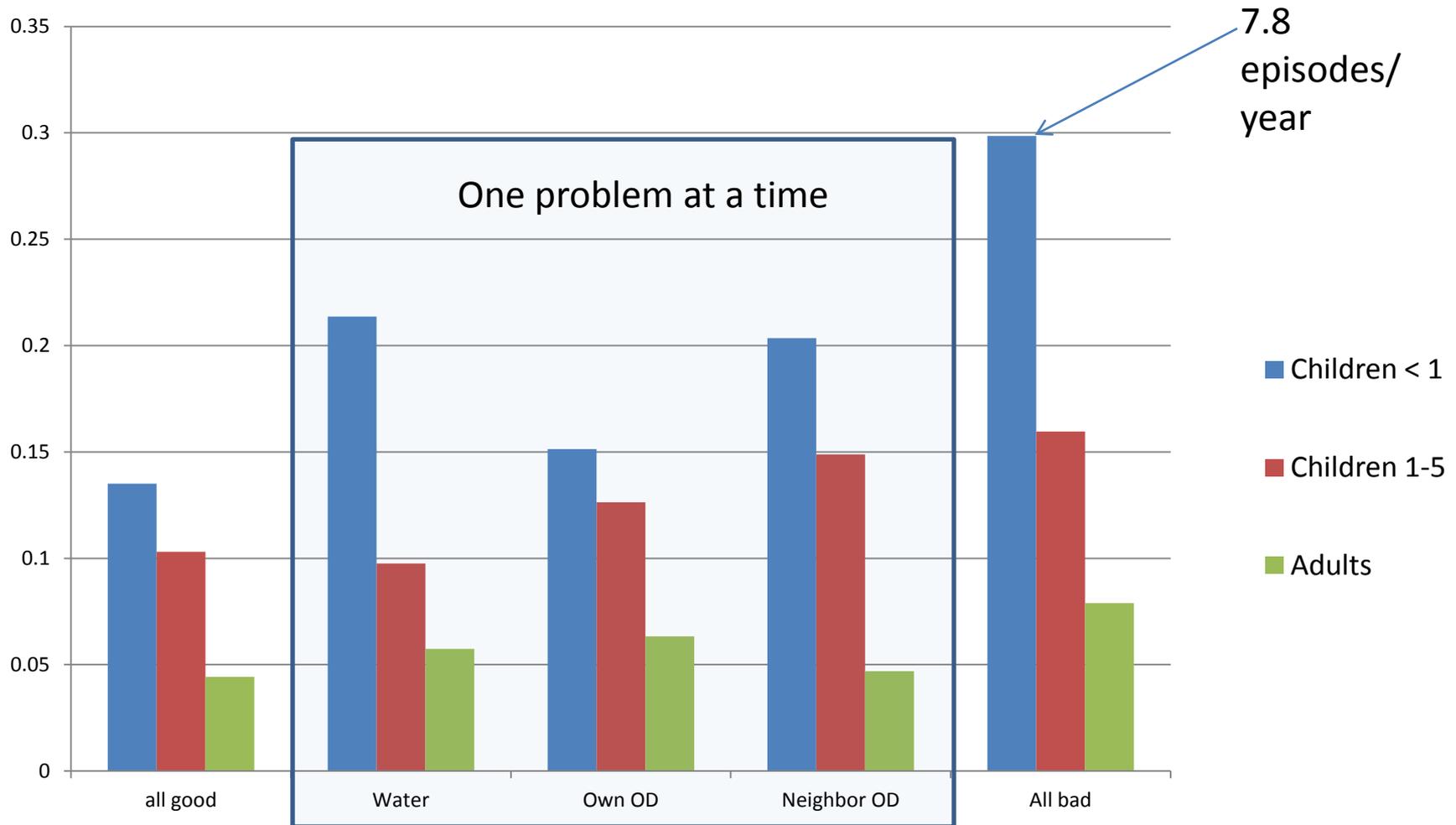
Red dots are  
households  
with cases of  
diarrhea,  
Open dots are  
households  
without



These  
slipped in  
from a  
different  
diagram



# Results in pictures: Diarrhea in two week period



# Falsification

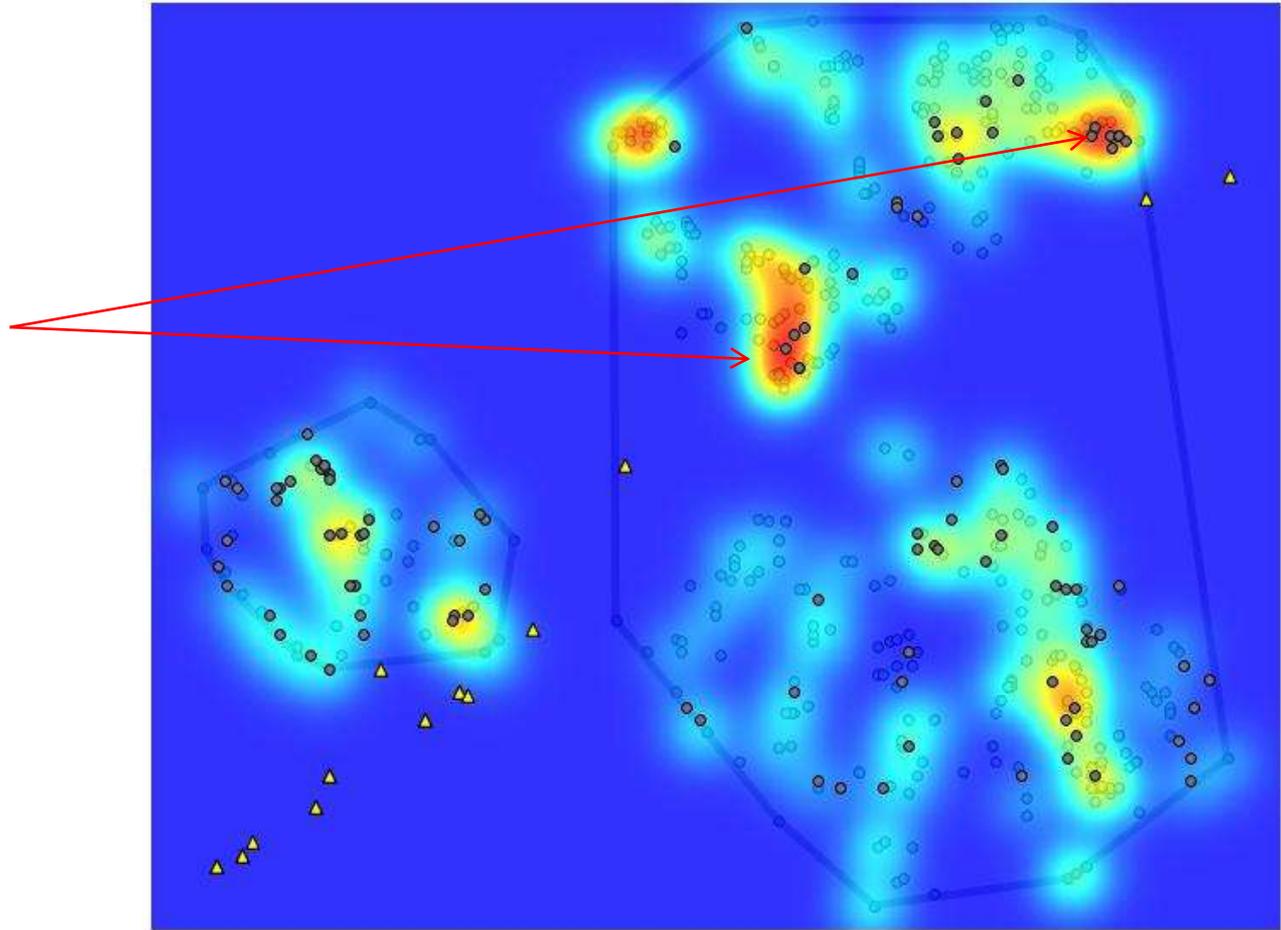
- These results do not hold for any other health condition (fever, cough, accidents, childbirth)
- The sanitation variables only affect water borne disease.
- So it's not “poverty that ‘wealth’ mis-measures” or proxy for “constitutionally unhealthy people”. Or endogenous location of sick people (unless people with gastro-intestinal illness – but no other illnesses – gravitate toward unhygienic neighbors).

# One more loose end

- Maybe it isn't just other peoples' habits that matter but whether they also have diarrhea
- Yes, that's a real possibility...

# “Heat” map of diarrhea incidence

Clusters of diarrhea incidence match individual episodes of diarrhea even better than open defecation



# Policy impact (including politics)

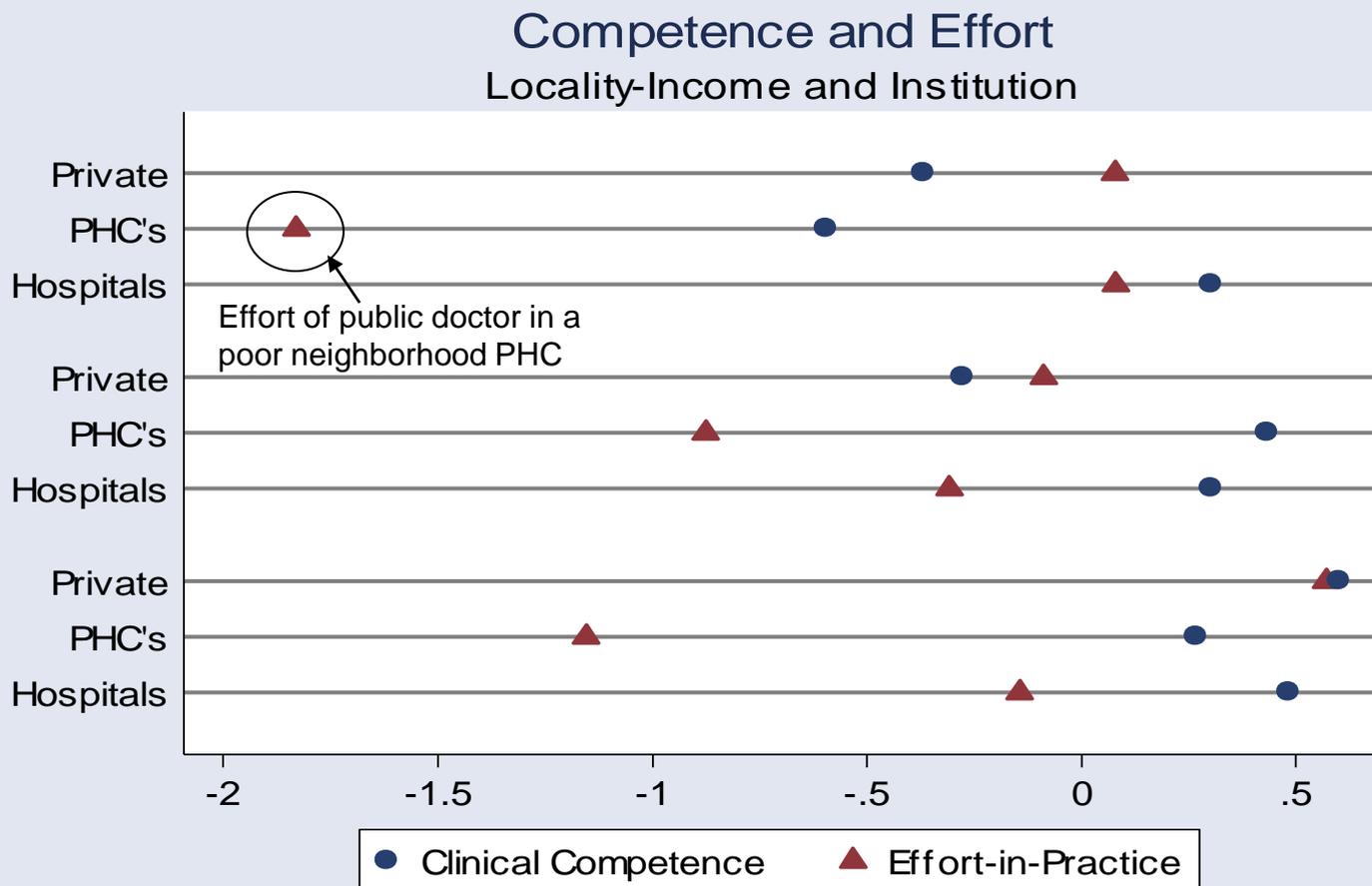
- Early results (not exactly right but qualitatively the same) shared with neighborhood associations
  - They knew water came into their houses but they didn't know it could make them sick
  - They then talked to their representative (MLA) about clearing out existing drains and extending the system (Whether anything changed as a result, I can't say).
  - This was the reaction only in the richer neighborhood
- When the neighbors' habits were discussed they were less clear what to do about it – as is the problem with all policies requiring behavior change

# Where will the money come from?

- Don't know
- But how come this question is asked so rarely?
- I have one suggestion

# Quackery and crookery for the poor in Delhi

- no matter where they go



# Conclusions

- If water enters your home from the street during the year, people in your house, especially infants, will get sick a lot. (Sewers are public goods.)
- If your neighbors defecate in the open, you and your children will get sick a lot. (Other people's behavior is an externality.)

Oh, right, you saw this already