



# Equity is where the smart money is

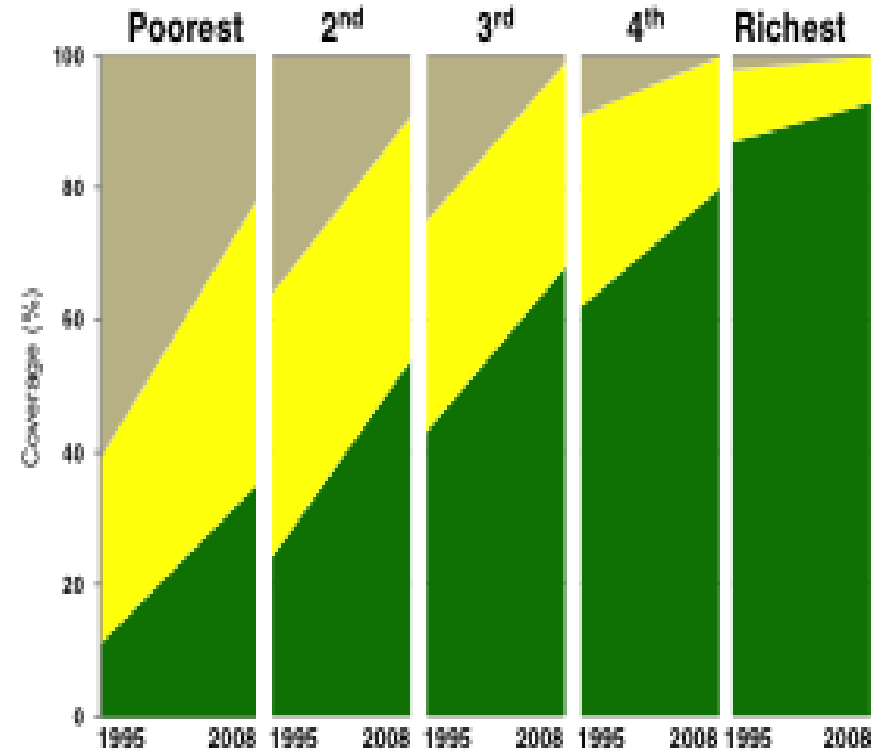
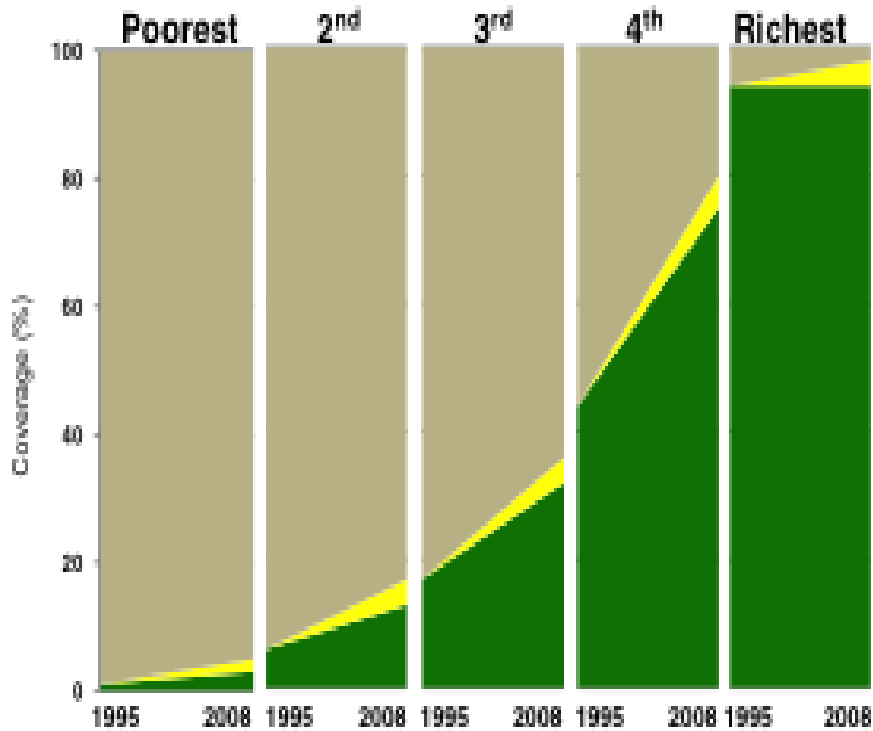
Oliver Cumming

London School of Hygiene and  
Tropical Medicine

LONDON  
SCHOOL of  
HYGIENE  
& TROPICAL  
MEDICINE



# You've heard this story...



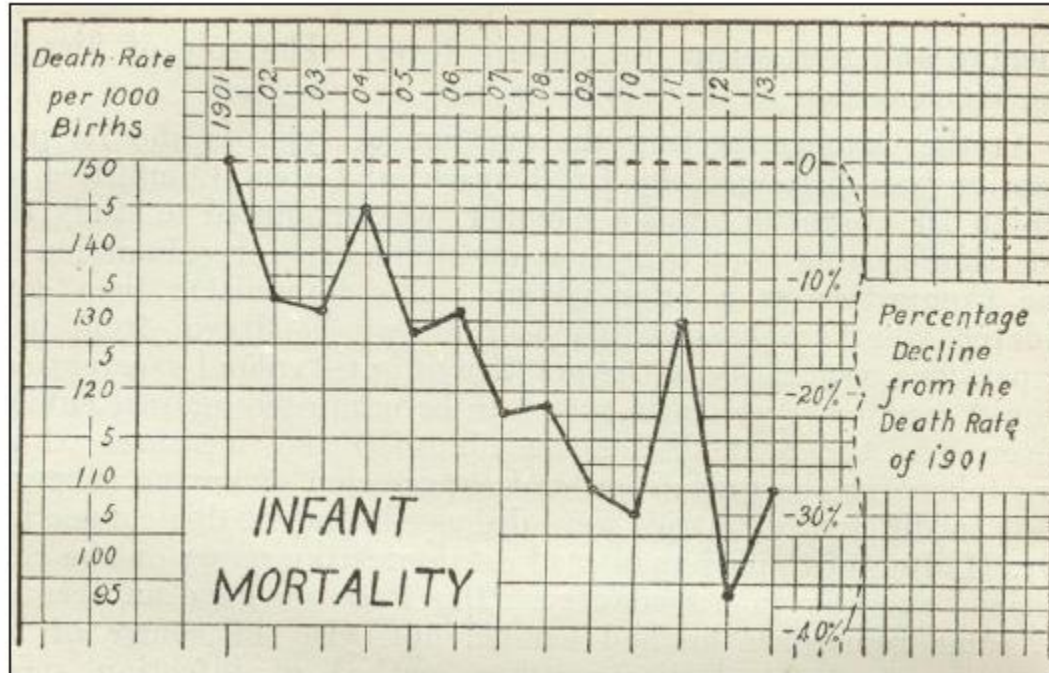
Source: UNICEF 2010





**So what –  
We're building toilets aren't we**

# Disparities matter





# The poor have, and always will, get screwed

It's not fair but is it smart?

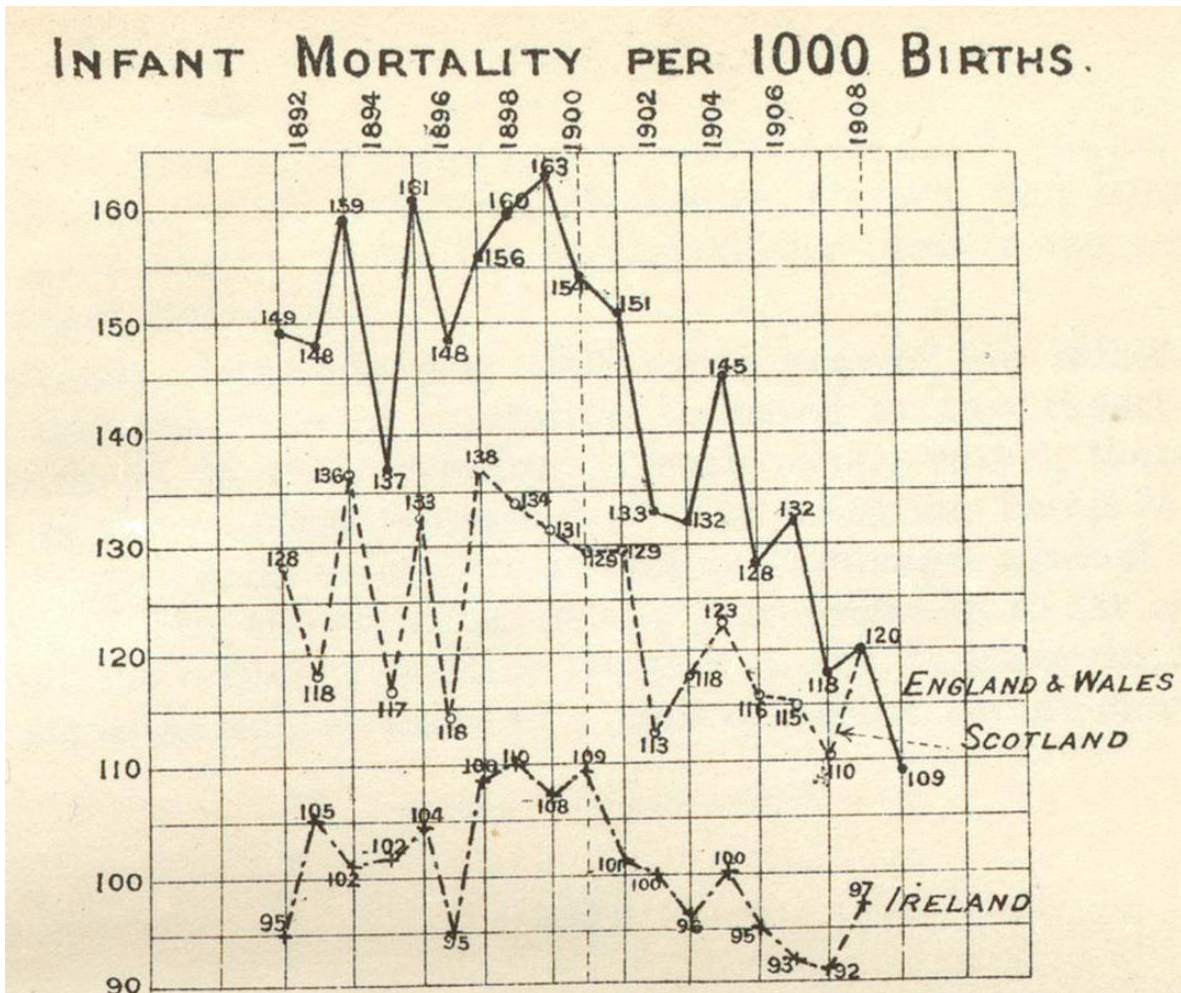
Do the poor differ in relation to sanitation?

Should the poor be served at the same rate?

Should the poor be served first?



# Regionally



# Administratively

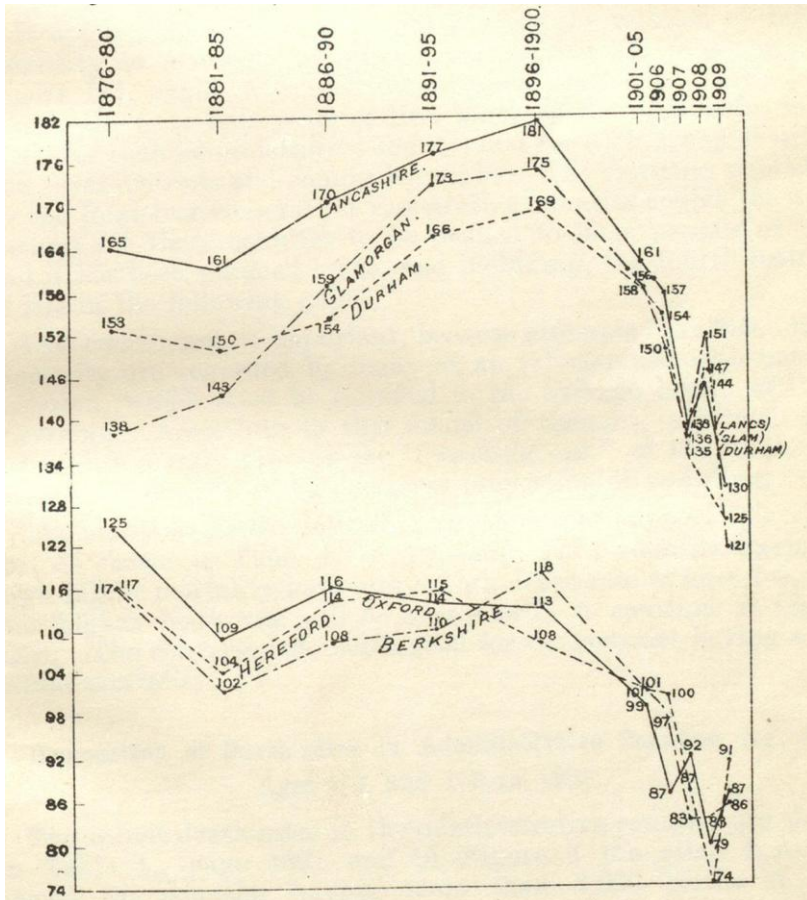
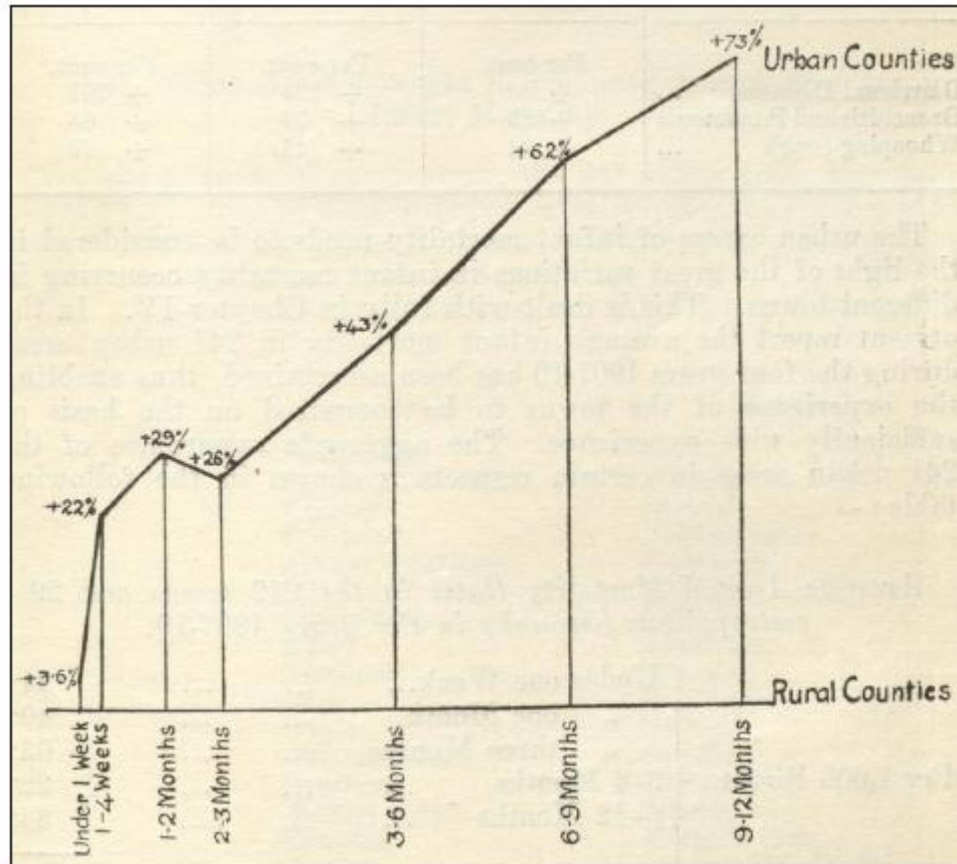


FIG. 2

Infant death-rates in the six Registration Counties having the highest and the lowest infant death-rates in 1908, in quinquennial periods 1876-80 to 1901-05 & single years afterwards.



# Rural and urban







# Sanitation Disparities: Risk, Burden and Impact

## Rationale

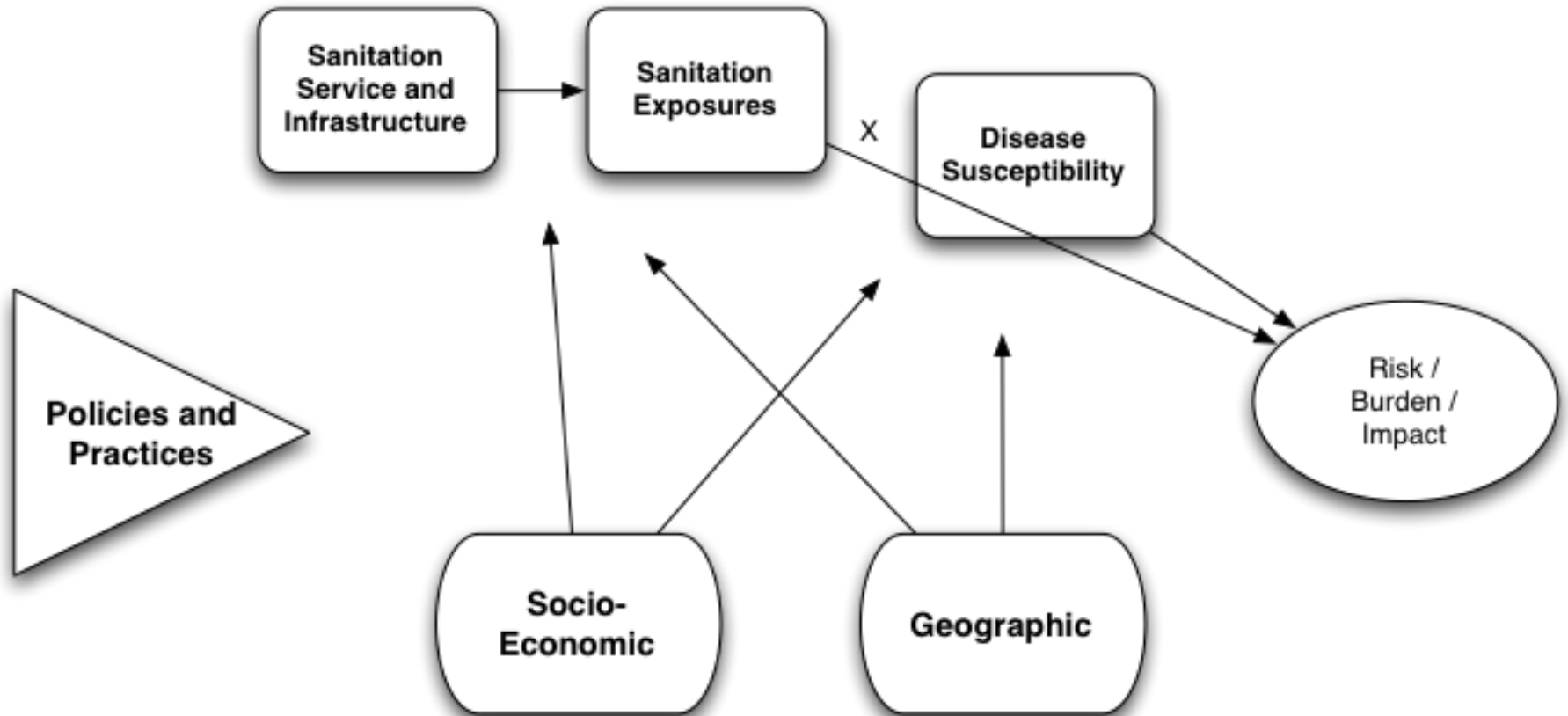
- Increasing attention to disparities in access to sanitation and performance of investments
- Where is the greatest health burden associated with poor sanitation?
- Where is the greatest impact of sanitation improvement?



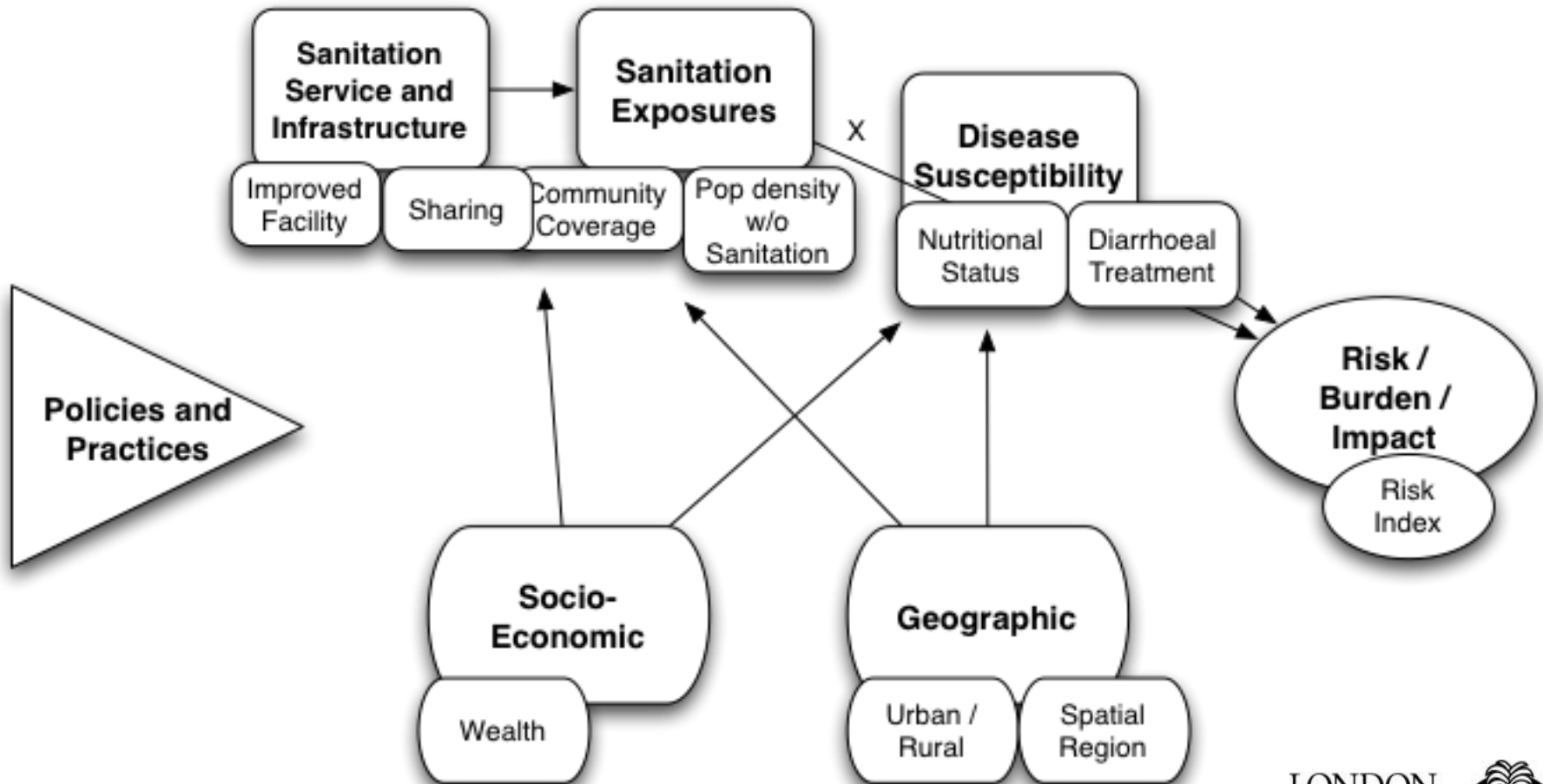
# Methods: General

1. Use existing household data (DHS) to estimate the relative distribution of sanitation-related exposure, risk and burden for 10 countries; nationally representative but may under-represent certain groups (eg. informal settlements)
2. Model the impact of providing sanitation to different populations (wealth quintile, urban/rural, regional)
3. Corrected Wealth Index calculated without water and sanitation as assets, and urban and rural quintiles separated
4. Unit of analysis is children under-5 not household to mitigate potential under-estimation

# Conceptual Model



# Conceptual Model





# Methods: Developing an Exposure Index

Defined per child, 3 components:

1. **Any facility** - Improved facility (including shared)
2. **Private facility** - Improved sanitation (excluding shared)
3. **Community coverage** - Population without sanitation per km<sup>2</sup>



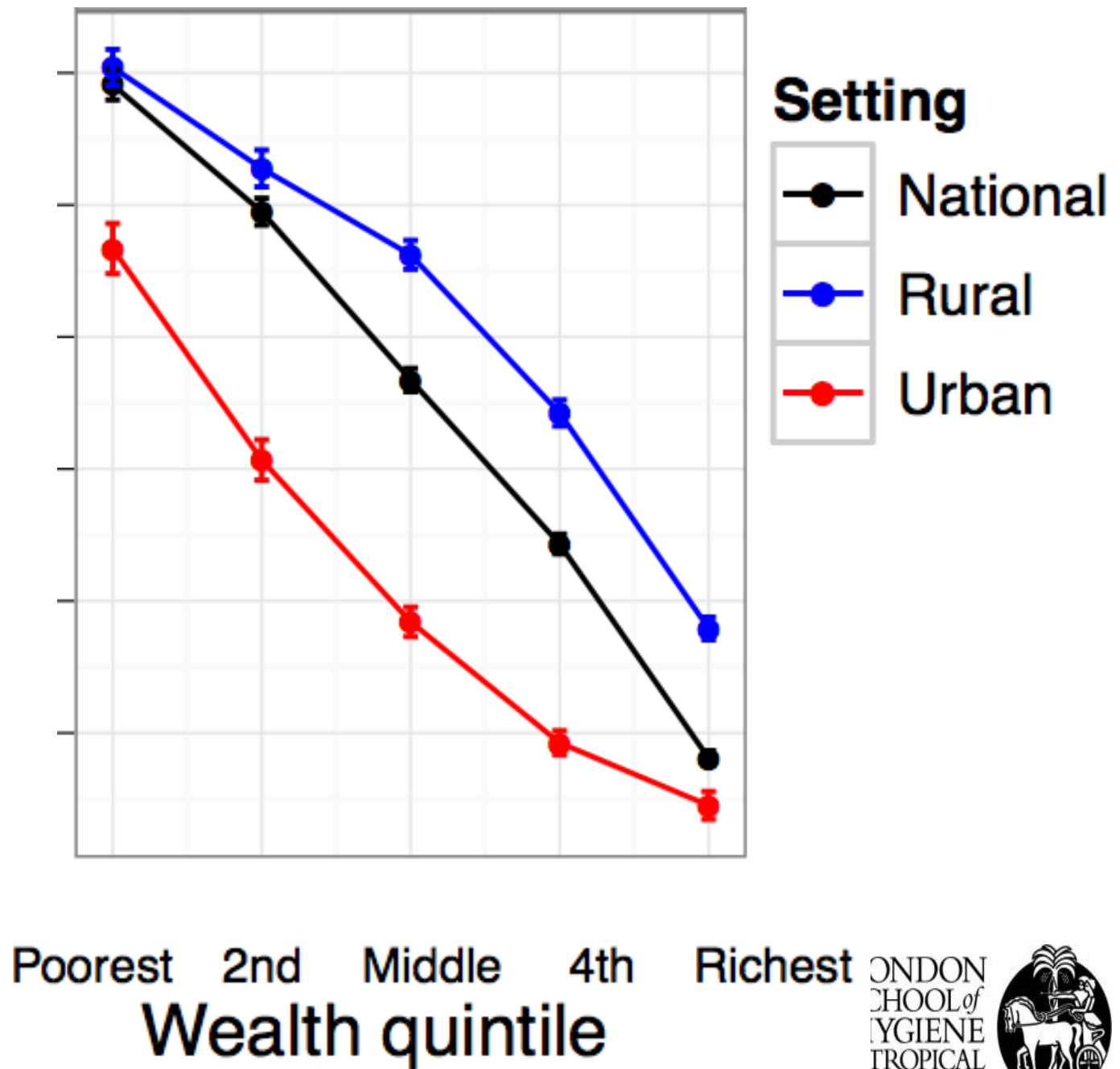
# Methods: Health risk & burden

## Health Risk:

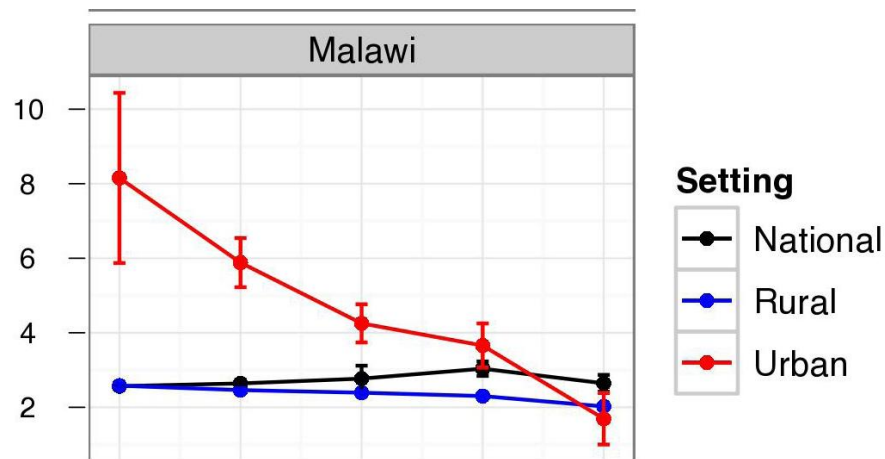
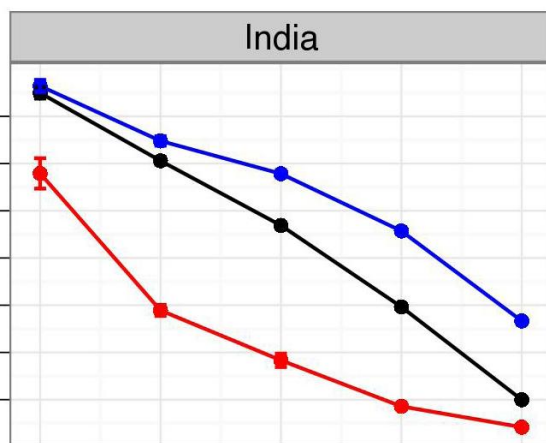
Exposure Index \* Susceptibility Index = SANITATION RISK INDEX

## Health burden:

- National estimates for diarrhoeal mortality (Liu et al 2012)
- PAF for mortality (exp = JMP and RR of 35% sanitation)
- NOTE: other health effects are not included



# Results: Exposure Index

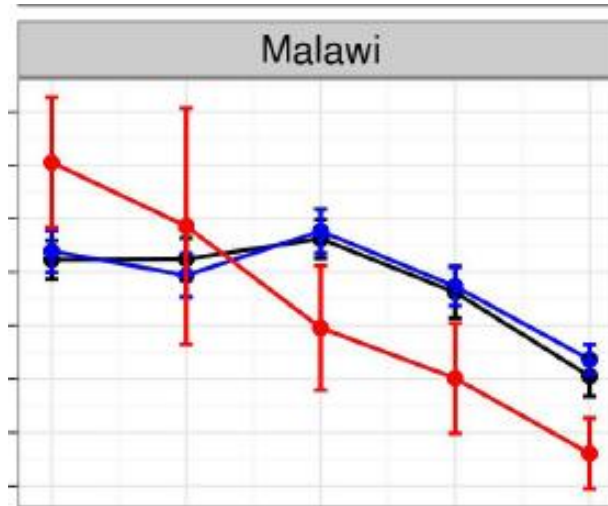
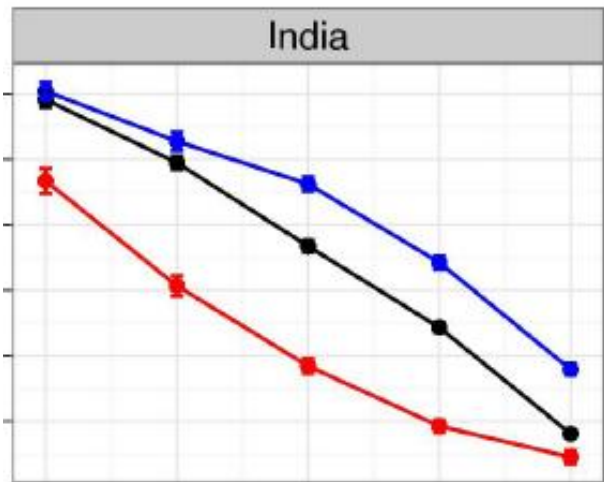


Highest exposures among poorest children.

Urban poor often but not always hit hardest (most exposed)



# Results: Susceptibility Index



## Setting

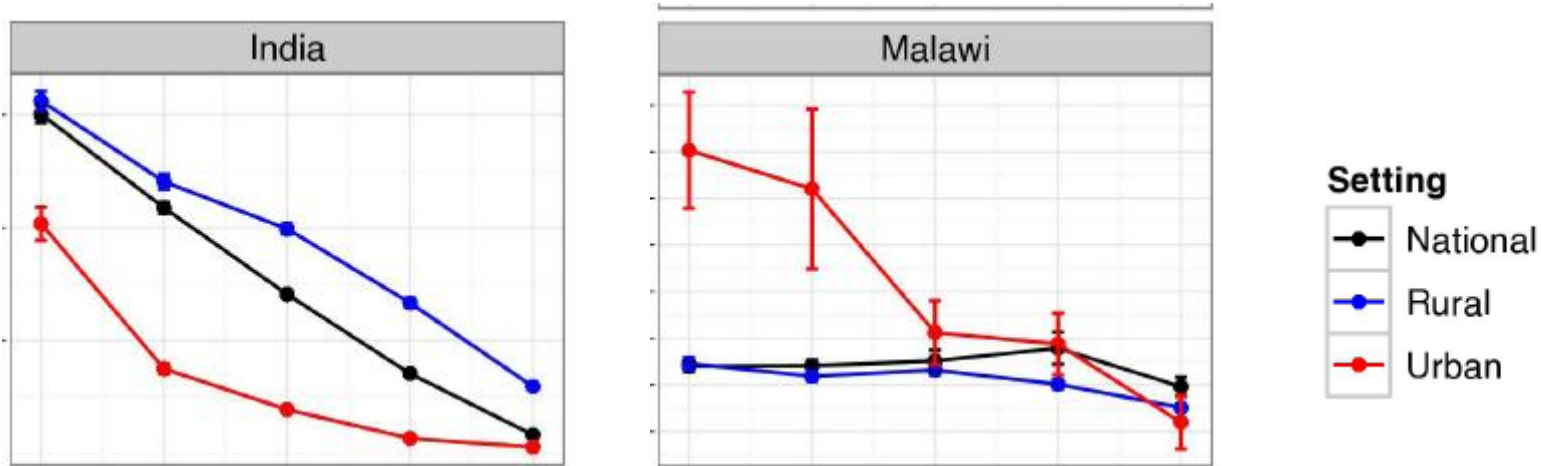
- National
- Rural
- ◆— Urban

Highest among the poorest children


Rural often higher but not always (more susceptible)

# Results: Risk Index

NB: Exposure \* Susceptibility = Risk



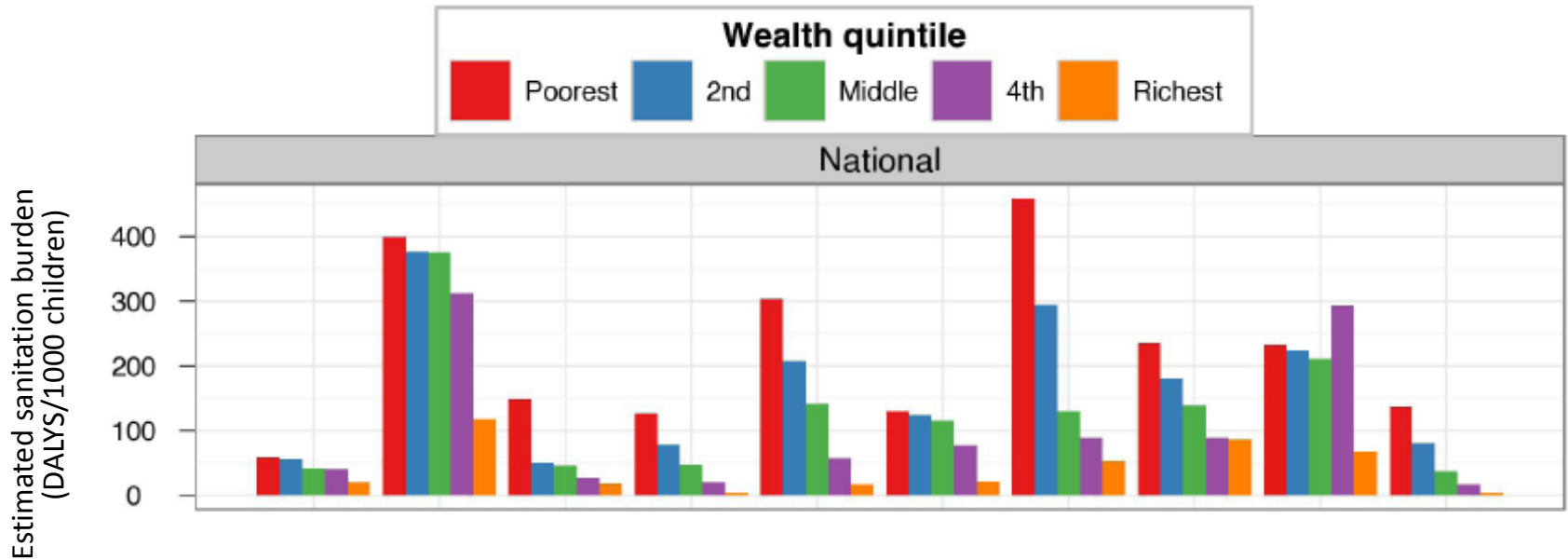
Consistently greatest risk among the poorest children  
Greatest disparities often for poor urban children



**What does this mean for the distribution of disease burden (diarrhoeal mortality) and potential impacts?**



# Burden of disease



**Urban:** up to 65 times greater burden among the poorest children

**Rural:** Up to 8 times greater burden among the poorest children



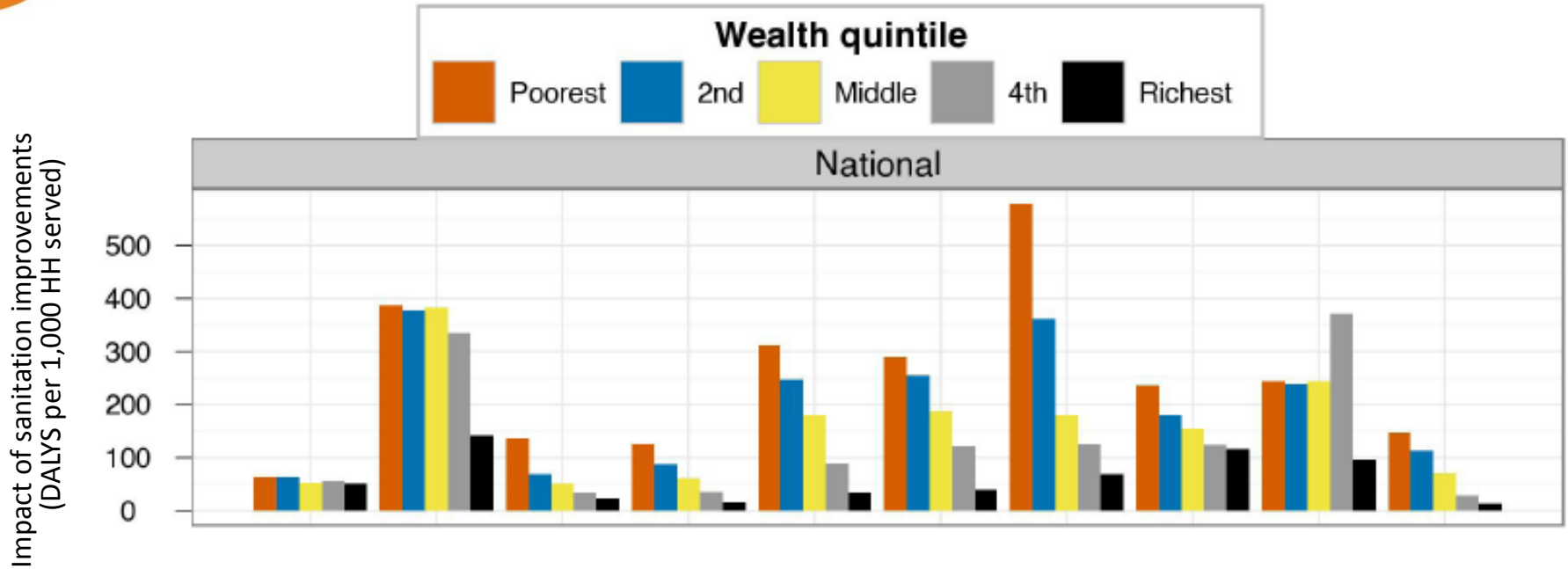


# Estimating potential health impacts

1. Estimate national health burden from sanitation, DALYs / 1000 children (WHO/CHERG 2010 mortality estimates)
2. Distribute deaths based on sanitation risk index
3. Simulate providing complete coverage to each quintile separately
4. Recalculate exposure and risk indices based on complete coverage
5. Recalculated DALY burden by quintile based on complete coverage



# Potential impact estimates



**Urban:** 2-17 times greater impact in most settings

**Rural:** 2-5 times greater impact in most settings



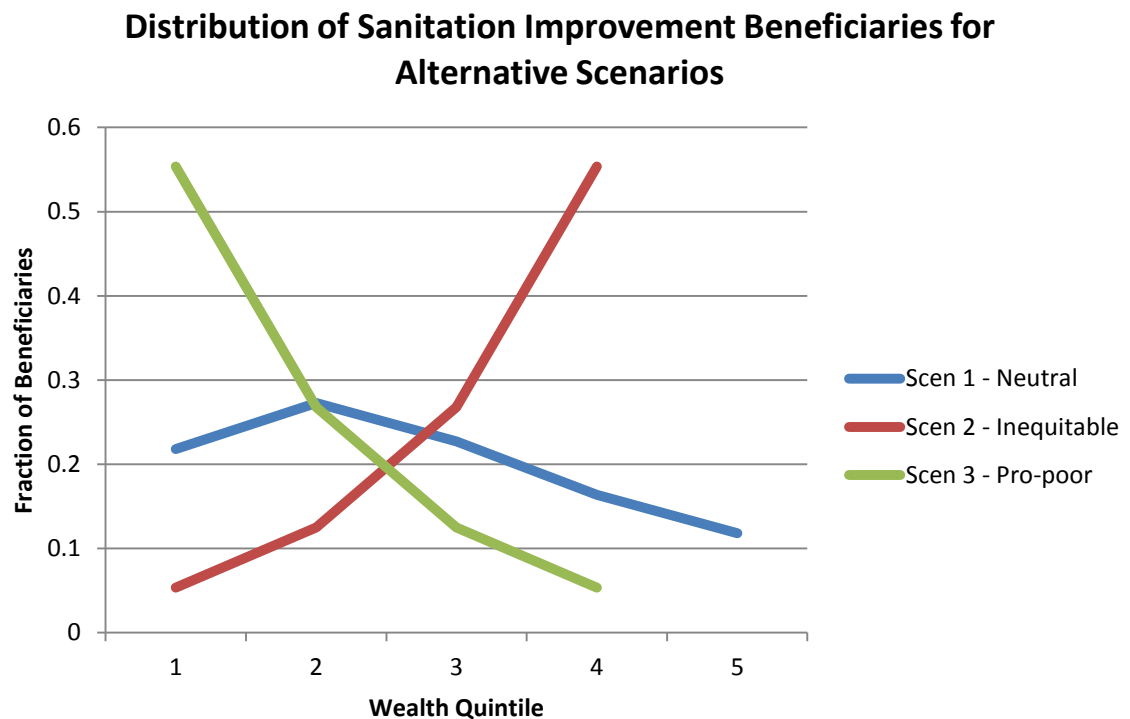
# Why does pro-poor sanitation have a greater impact?

1. Poor households have more children under-5
2. More likely to go from no sanitation to improved, rather than shared to improved
3. Children in poor households are more vulnerable (low weight for age and less access to prevention and treatment)
4. Poor household improvements reduce exposures for neighboring households with vulnerable children
5. How important is population density without?



# Does it matter who benefits from sanitation improvements?

1. Consider alternative profiles of which quintiles receive benefits over time
2. Profile 1 and 2 based on UNICEF analysis of specific countries
3. Profile 3 is a pro-poor distribution







# Implications: for the sanitation sector

1. **Planning & Investment** - Identify and target high risk areas with the greatest burden and potential impact
2. **Urban and rural disparities** – greatest risk may be urban poor but often lower priority for aid and national financing
3. **What counts?** - Indicators and incentives need to align with impact and burden (focus on poor, at risk children)
4. **Integration** – quantitative means to link sanitation to other health sectors and broader human development (LiST)
5. **Research** – Need to build our understanding of the relative importance of exposure variables (population density without sanitation) and susceptibility factors; and predicative power





[www.SHAREresearch.org](http://www.SHAREresearch.org)



This material has been funded by UK aid from the Department for International Development (DFID). However, the views expressed do not necessarily reflect the Department's official policies.

