



Impact evaluation for small n

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Impact evaluation of programs that address global environmental change

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Earth Institute (EI) International Research Institute for Climate and Society (IRI)

- *Nothing improves research design so much as having a clear idea about what is being investigated. An important function of theory in research design is to help researchers ensure that they are playing in the right ballpark to begin with—that is, to help them avoid studying the wrong thing. (Lipsey 1993)*

Methods for causal analysis with small N

- Observation
- General Elimination Methodology (GEM)
- Modus Operandi
- Process tracing
- Comparative case studies

Observation



GEM Example

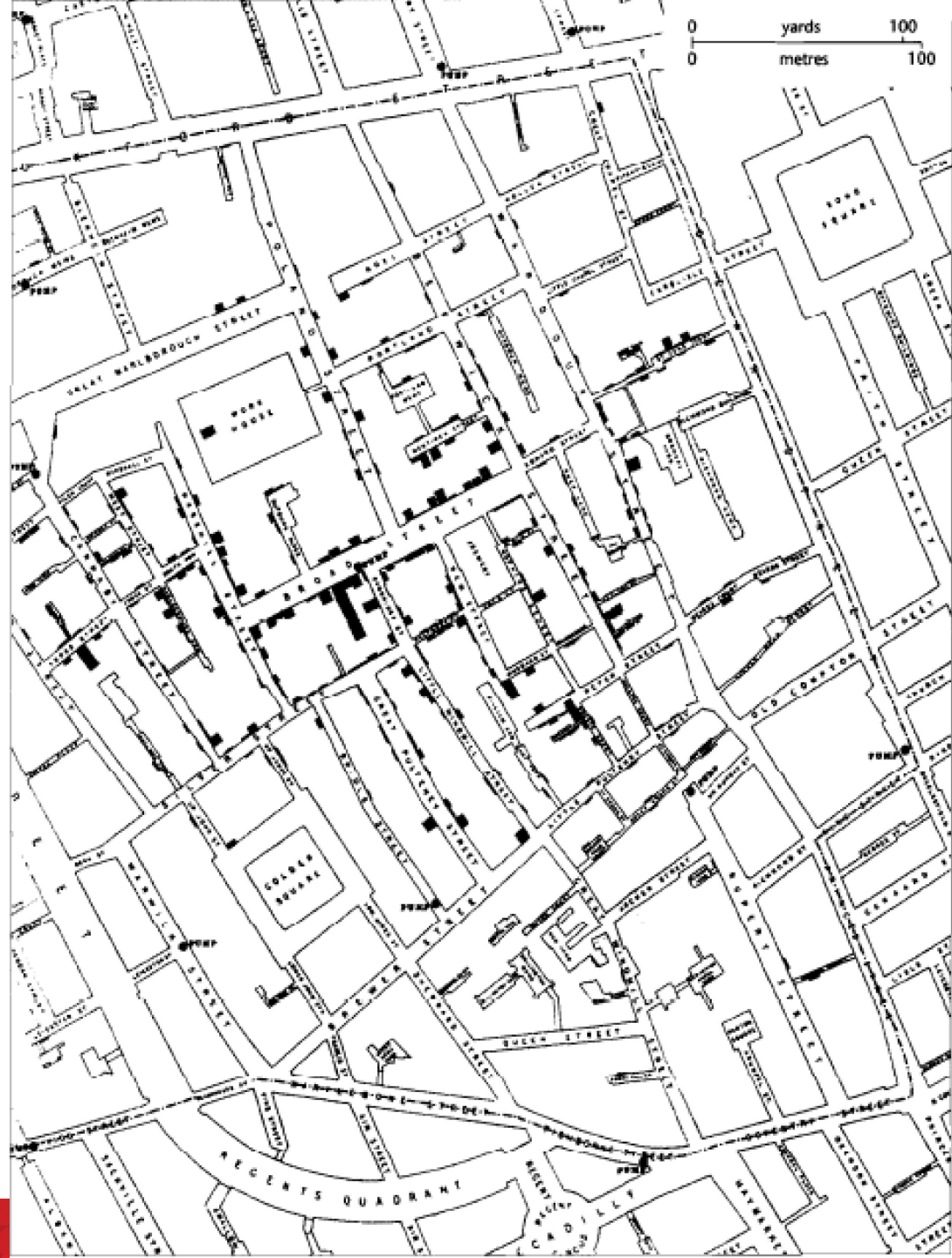
Using observational data and iterative analysis: John Snow and cholera in London

- The problem
 - Four cholera pandemics in London in the 1800s
 - 14,600 deaths in London (6.2 per 1,000)
- Alternative theories as to cause
 - Airborne spread of disease
 - Waterborne spread of disease

Koch, T. (2004) The Map as Intent: Variations on the Theme of John Snow. CARTOGRAPHICA, 39, # 4, WINTER 2004: 1-14.)

Analysis

Cholera deaths
in Soho
mapped
“It might be
noticed that the
deaths are
most
numerous near
to the pump in
Broad Street”.



Looking for exceptions

- Deaths in streets nearer to the Rupert Street pump
 - “some streets which are nearer to it on the map are in fact a good way removed on account of the circuitous road to it”.
- Few deaths in the workhouse near the Broad Street pump:
 - Surrounded by houses with cholera deaths but only 5/535 inmates died from cholera
 - Had its own pump well on the premises and “the inmates never sent to Broad Street for water”

Looking for exceptions

- Few deaths among workers at the brewery near the epicentre of cholera deaths
 - No cholera among 70 workers
 - Had its own private deep well on-site
 - Workers never drank from the Broad Street pump
- Deaths of 4 school children who did not live near the Broad Street pump
 - Drank from the pump on their way to school
- Deaths of 2 adults living further away
 - One temporarily living in Broad Street
 - One nursing a dying friend from Broad Street

Eliminating alternative explanations leads to the conclusion about the water borne nature of cholera and hence ability to address problem.

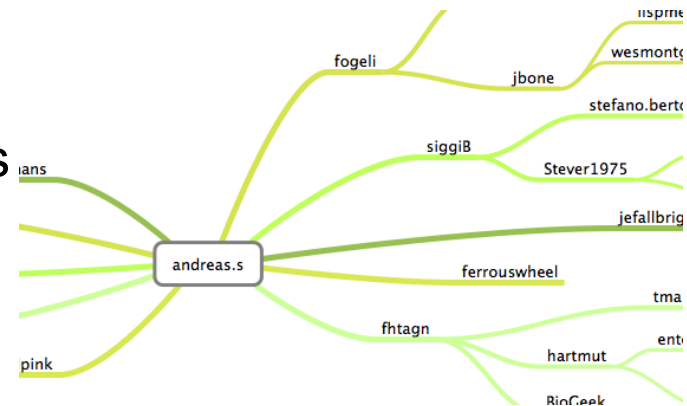
Modus Operandi

- Enticing but often a challenge to implement
- Looking at the conditions for each event
- Looking for « signatures »
- Requires professional knowledge
- Implementation processes not always known
- Causal inference can be considered: does timing of interventions make sense, does content of intervention match outcome, look for distinctive effect patterns
- Policy Study at IDRC to investigate the influence of research on public policy: Mapping the modus operandi



Process Tracing

- Similar to historical explanation
- Tracing the list of possible processes
- Equifinality is considered
- Leads to a repertoire of causal pathways
- Theory emerges over time
- Reduces indeterminacy by pushing for a link to any variables to identify them as part of the causal pathway
- Hypothesis has to explain all steps in the process or be modified





Process Tracing - 2

- **Forms:**

- Detailed narrative
- Use of hypotheses
- Analytic explanation

- **Uses:**

- Formation, development and testing of theories
- Generating and assessing evidence on causal mechanisms
- Deliberately seeks out equifinality
- Explaining deviant cases (often ignored in large-n studies)

- **Limits:**

- Needs to establish uninterrupted causal pathway
- More than one mechanism related to the evidence: choice?

Comparative Case Method

- Within and across cases
- Many approaches
- Case method has entered the mainstream in explanation
- Explore beyond success and failure to types of success and failure:
 - Why did deterrence work? Enriches policy alternatives
- IDRC Study on policy influence of research
- 23 cases on whether, how and in what ways research influences policy
- Identified key factors in the general context and the decision contextt that were critical to success; and identiifed key mechanisms that could be manipulated by the researcher & her supporters to influence choice
- No menu or prescription by rather a typological explanation of what could work, in what contexts and for who

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