



**EVIDENCE FOR POLICY DESIGN**

Center for International Development  
*at Harvard University*



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Beating the odds for Air Pollution  
IHC, April 8 2015

# **THREE QUESTIONS TO ASK RESEARCHERS AND REGULATORS ON THEIR ANALYSIS**



# Three questions to keep in mind

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1. Are you describing data, or making a claim on program impact?
2. When talking about impact, what is the counterfactual used?
3. What assumptions hold for the method to be appropriate?

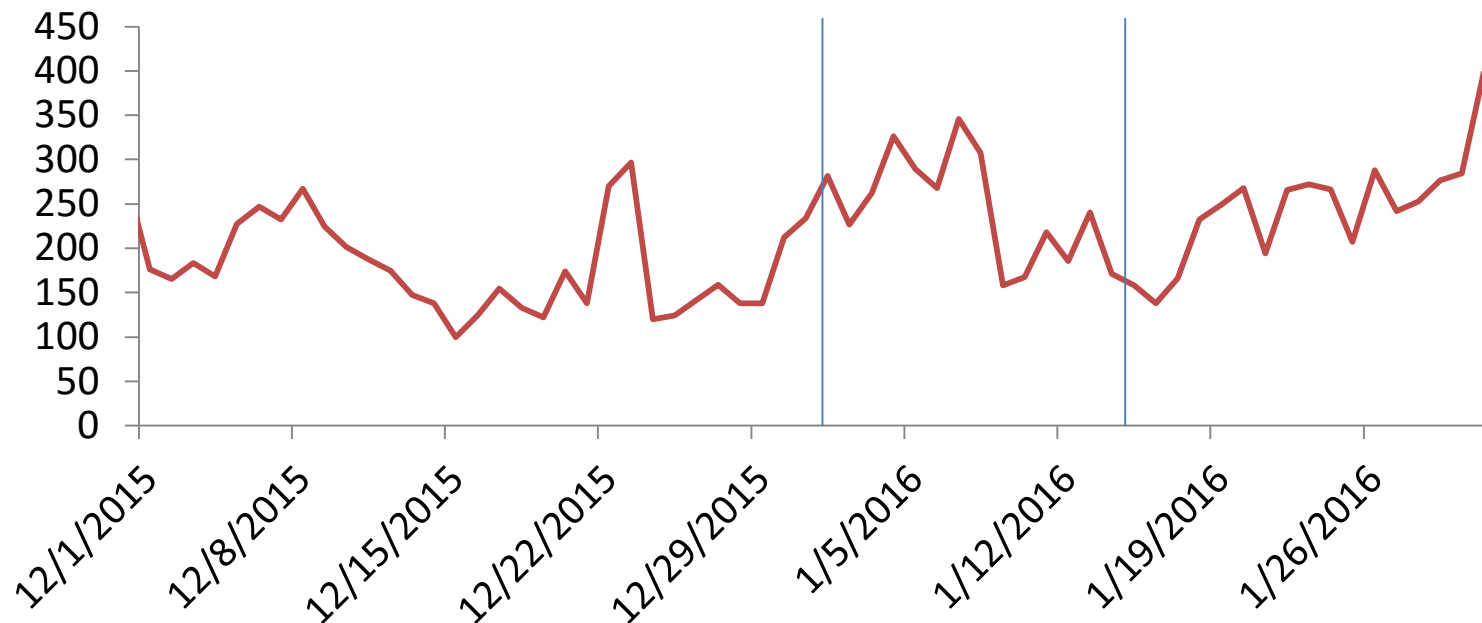
# 0. Are average PM concentration levels useful?

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1. ... in terms of composition
2. ... with season
3. ... with time of day
4. ... with weather

# 1. Are you describing data, or making a claim on policy impact?

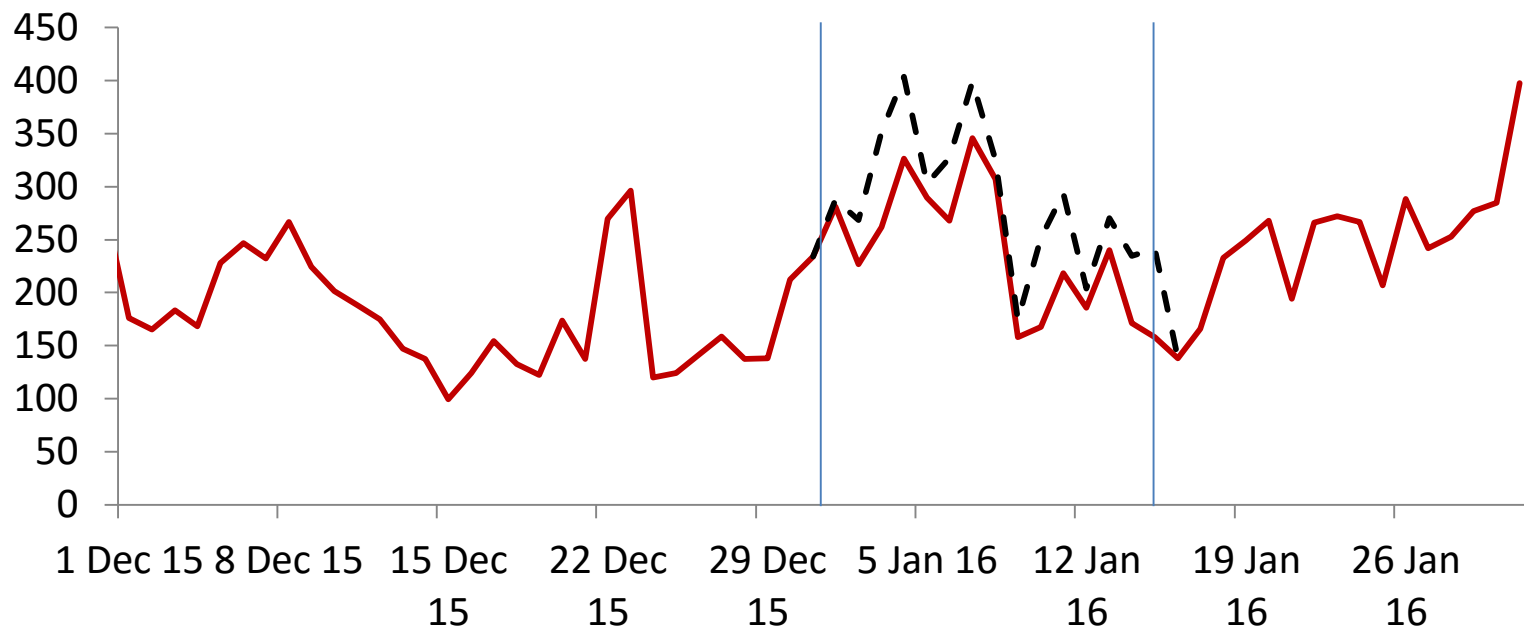
“No clear trend...” - CPCB (PTI Jan 24, 2016)



**What would the narrative have been had concentrations halved during the weeks, once again largely due to weather conditions?**

## 2. When talking about impact, what is the counterfactual used?

**What would Delhi's pollution levels have been during Jan 1-15 2016, in the absence of the program?**



## 2. When talking about impact, what is the counterfactual used?

- What would Delhi's pollution levels have been had the program not been implemented?
  - Compare with before (e.g. December, Jan 2015, etc) OR “Trends”
  - Compare with outside Delhi during the same period
  - Statistically ‘control’ for weather conditions
  - Compare before-after with neighboring regions where pollution levels are a function of similar external factors

# 3. What assumptions are being made?

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- Before- After / Trends
  - The only difference is the program (all other factors are time invariant-almost never true)
- Within Delhi - Outside Delhi (“Simple Differences”)
  - Only difference is the program (difficult: monitors within Delhi show very different levels on any given day)
- Regressions using historical data, within
  - Your model accounts for the relationship with weather precisely enough (Really difficult!)
- Difference in differences
  - The comparison group changes in the same way Delhi’s levels would have changed had the program not been implemented

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# Thanks!

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