

# Environmental Justice? Activist Judges, Water Quality and Infant Mortality in India

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# Motivation and Overview

Polluted water kills more than 1 million people a year (WHO and UNICEF, 2021)

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⇒ **Potentially limited effects of judicial environmental policies in high pollution settings such as India.**

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**Caveat:** We examine the impact of green rulings, conditional on the presence of environmental cases



## Contribution to the literature

**Role of policies in regulating water quality at scale** - sewage systems (Alsan and Goldin 2019), piped water systems (Galiani, Gertler, and Schargrodsky 2005; Ashraf, Glaeser, Holland, et al. 2021), disinfection programs (Bhalotra et al. 2021), regulatory systems (Zhang and Xu 2016), judicial policies (Do, Joshi, and Stolper 2018; Zhang, Yu, and Kong 2019)  
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**Role of courts in sustainable economic development** - Djankov et al. 2003; Visaria 2009; Papaioannou and Karatza 2018; Chemin 2020; Rao 2021; Behrer et al. 2021; ...

⇒ Expand to the complex realm of water; study recent innovations within the judiciary (public interest litigation; creation of separate environmental courts)

# Outline

- 1** Data
- 2** Empirical Strategy
- 3** Results
- 4** Conclusion

# Three Data Sources

**Universe of orders** from Supreme Court, High Court and Green Tribunal

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- ▶ Chemical-oxygen-demand (COD) → industrial pollution
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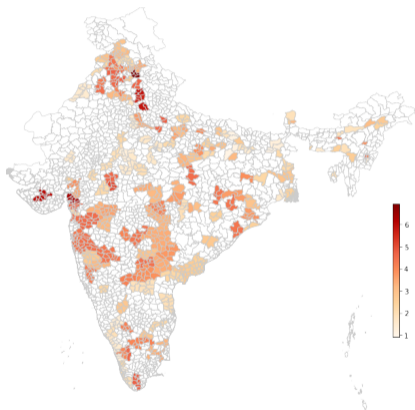
## **Infant mortality:** district-month, 1986-2016

- ▶ Died < 1Y: infant died during first year?
- ▶ Died < 1M: infant died during first month?
- ▶ Died < 1Y|1M: infant died during first year, cond. on surviving first month?

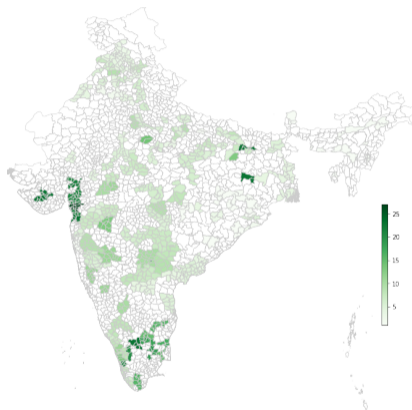


# Maps of Available Data

A: Max log(BOD mg/l) / District



B: River Pollution Cases / District



▶ Order Characteristics over Time

▶ Orders per State

▶ Appeals per State

▶ Impact per State

▶ Summary Case Data

▶ Summary Pollution + Mortality Data

▶ Summary Merged Data

# Impact of Green Judgments on River pollution

Basic model:

$$Y_{dt} = \beta_1 + \beta_2 \text{FracGreenVerdicts}_{dt} + \beta_3 \mathbb{1}\{|C_{dt}| > 0\} + X'_{dt}\theta + \epsilon_{dt} \quad (1)$$

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Where:

$$\text{FracGreenVerdicts}_{dt} = \begin{cases} \frac{1}{|C_{dt}|} \sum_{c \in C_{dt}} \text{Green}_c & \text{if } |C_{dt}| > 0 \\ 0 & \text{if } |C_{dt}| = 0. \end{cases} \quad (2)$$

## Concern: rulings may be endogenous to outcomes

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**Assumption:** cases are randomly assigned to judges in courts (Ash et al. 2021)

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- ④ Average over vectors of all orders in a district-year

▶ Visualization of the Instrument

▶ Judge randomization check

▶ Randomization check Maharashtra

▶ Random Assignment

# Contemporaneous Impacts on Water Pollution (Yearly)

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Fraction of Green Orders	-0.130 (0.124)	-0.241** (0.103)	-0.0421 (0.520)	-0.0694 (0.144)	-0.0209 (0.0247)
Dummy for Presence of an Order	0.241* (0.131)	0.0619 (0.118)	0.159 (0.494)	-0.0711 (0.143)	0.0000132 (0.0377)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	7.816	8.856	9.015	7.895	8.401
N	3053	5649	5057	5475	5541

[▶ Build Up](#)
[▶ First Stage](#)
[▶ 3-year MA](#)
[▶ AR CIs](#)
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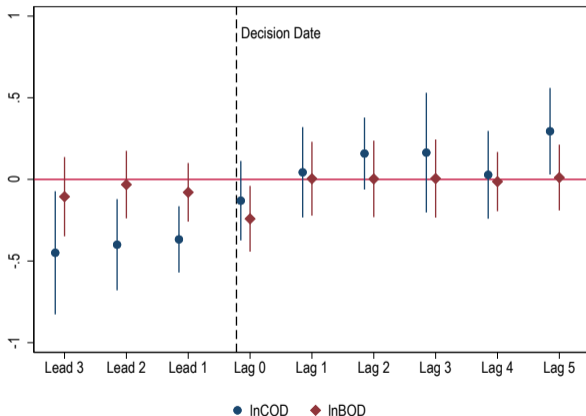
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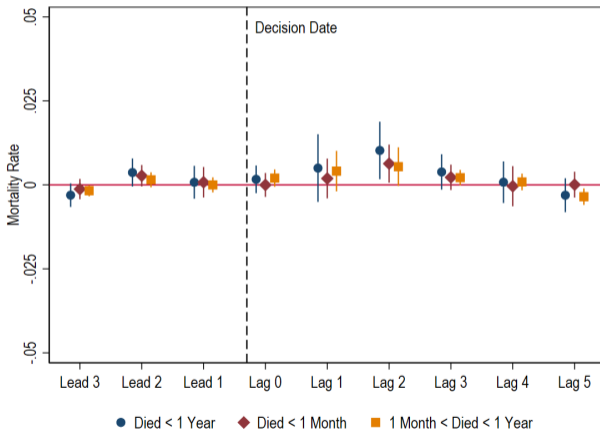
# Dynamic Impacts of Green Orders on Pollution

- ▶ Pollution *decreases* prior to / right after decision, then back to normal
- ▶ Potential *increase* in long-term



# Impact on Infant Mortality (aggregated)

- ▶ No effect prior to / at time of decision
- ▶ Infant mortality *increased* several years after decision



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- ▶ Conclusion: **Judiciaries can lower short-term pollution, but maybe it takes more to truly clean water?**

Comments & Suggestions?  
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# Indian Environmental Governance: Shared Responsibility, Weak Accountability

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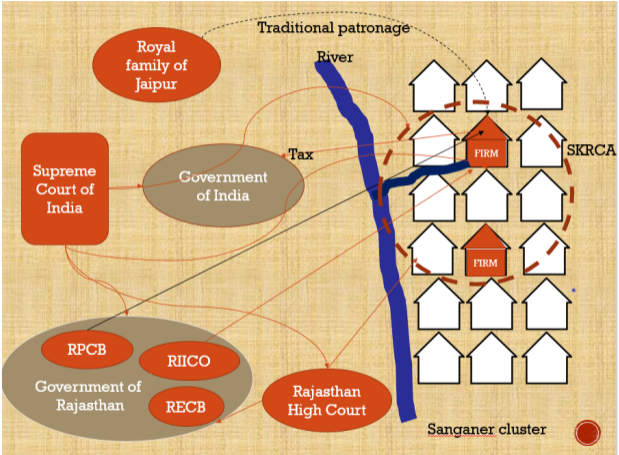
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- ▶ India's **judiciary** has taken activist stance towards environmental conservation



# A Small Firm Typically Faces Many Regulators

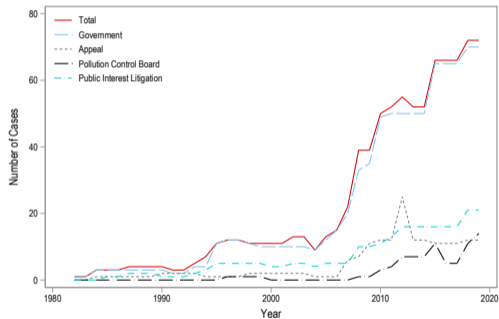


## Details about Green Orders

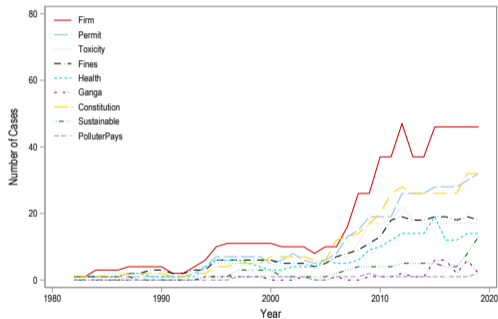
- ▶ The average order in our sample has a green score of 0.35 (the range is -2 to 2).
- ▶ 21 percent of cases are constitutional cases
- ▶ 81 percent feature the government as the respondent
- ▶ The average number of judges on an order is 1.6
  - ▶ We found judges for 966 of the 978 orders
  - ▶ 489 orders had 1 judge, 431 orders had 2 judges, and 37 had 3+

# Varieties of Orders

## A. Order overview

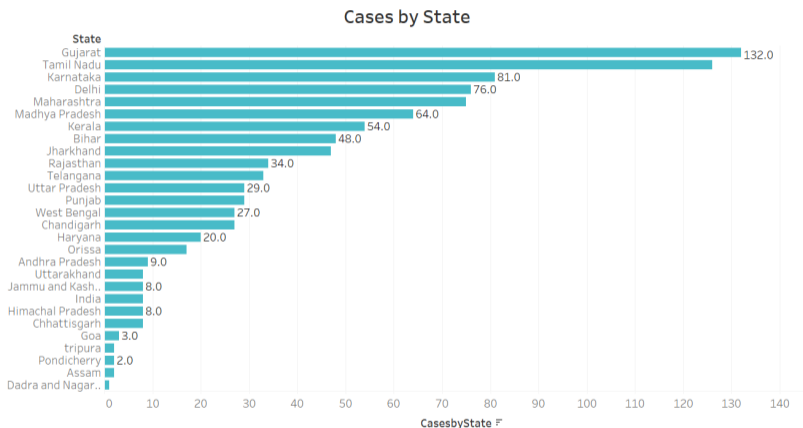


## B. Keywords



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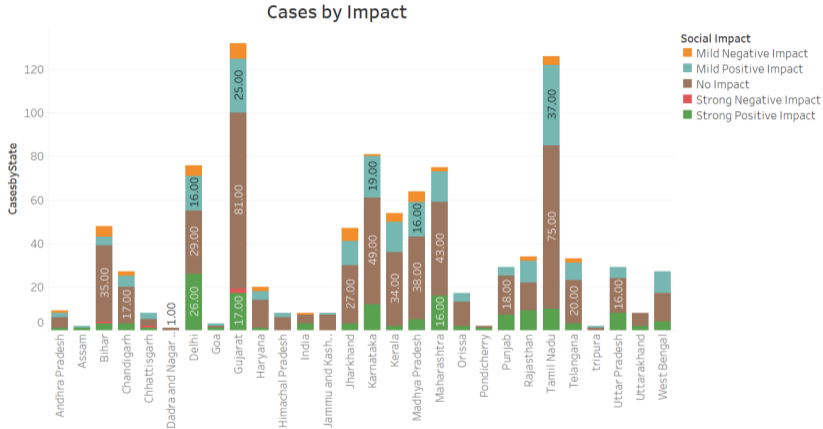
# Distribution of Orders Across States



CasesbyState for each State. The marks are labeled by CasesbyState.

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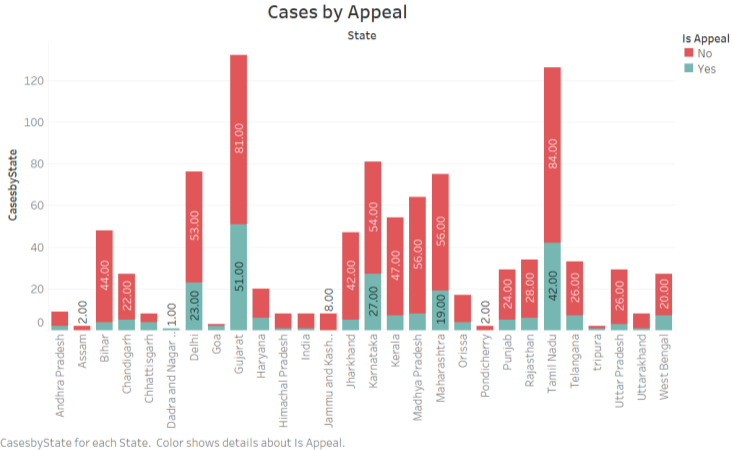
# Distribution of Orders by Impact



CasesbyState for each State. Color shows details about Social Impact. The marks are labeled by CasesbyState.

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# Distribution of Orders by Type



▶ Back

# Summary Statistics

	N	Mean	SD	Min	Max
<i>Pollution (Monitor-Year)</i>					
Max BOD (mg/l)	23,413	9.57	38	0	1820
Max COD (mg/l)	6,089	39.95	63	0	1750
Max Total Coliform (mpn/100 ml)/106	19,628	7	322	0	23,000
Max Temperature (°C)	24,623	29	6	0	269
Max Conductivity (µmhos/cm)	22,843	2,281	9440	0	513,000
<i>Case Level Data - Pollution</i>					
Appeal	516	0.25	0	0	1
Constitutional	516	0.21	0	0	1
Government is Respondent	516	0.82	0	0	1
Government is Petitioner	516	0.14	0	0	1
Number of Judges	516	2	1	0	3
Environmental Impact (Median Coding)	516	0.34	1	-2	2
Maximum Forest Cover	286	24.04	15	4	66
Total Forest Cover	286	70,997.99	354796	161	2198364
Maximum Nightlights	176	16.16	17	1	63
Total Caliberated Nightlights	176	4,048.10	16031	3	88983
<i>Case Level Data - Mortality</i>					
Appeal	777	0.25	0	0	1
Constitutional	777	0.22	0	0	1
Government is Respondent	777	0.86	0	0	1
Government is Petitioner	777	0.11	0	0	1
Number of Judges	777	2	1	0	3
Environmental Impact (Median Coding)	777	0.35	1	-2	2
Maximum Forest Cover	557	25.42	15	1	72
Total Forest Cover	557	65,954.68	295902	119	2737216
Maximum Nightlights	331	23.07	23	0	63
Total Caliberated Nightlights	331	12,542.39	32648	1	261839
<i>Judge Level Data (Pollution Sample)</i>					
Male	302	0.97	0	0	1
Graduate Level Education	302	0.39	0	0	1
Post-Graduate Level Education	302	0.13	0	0	1

## Case Data - Summary Statistics

<i>District-Year Level Data - Orders</i>	N	Mean	SD	Min	Max
Order Present	6270	0.16	0.37	0.0	1.0
Number of Green Orders	6270	0.24	0.75	0.0	13.0
Fraction of Green Orders	6270	0.04	0.18	0.0	1.0
Average Number of Judges / Order	6270	0.29	0.72	0.0	3.0
Share of Appeal Cases	6270	0.03	0.16	0.0	1.0
Share of Constitutional Cases	6270	0.05	0.22	0.0	1.0
Share of Cases w/ Government as Petitioner	6270	0.02	0.12	0.0	1.0
Share of Cases w/ Government as Respondent	6270	0.14	0.34	0.0	1.0

▶ Back



## Pollution and Mortality Data - Summary Statistics

<i>District-Year Level Data - Pollution Sample</i>	N	Mean	SD	Min	Max
Max BOD (mg/l)	5650	12.53	33.86	0.0	1,025.0
Max COD (mg/l)	3053	55.65	80.25	1.1	1,750.0
Max Total Coliform (mpn/100 ml)/10 <sup>6</sup>	5057	15.09	514.20	0.0	23,000.0
Max Temperature (°C)	5614	29.69	6.29	0.0	269.0
Max Conductivity (µmhos/cm)/10 <sup>3</sup>	5476	1.94	7.33	0.0	81.8

<i>District-Year Level Data - Mortality Sample</i>	N	Mean	SD	Min	Max
Infants dying aged < 1 Year (%)	15982	0.05	0.04	0.0	0.4
Infants dying aged < 1 Month (%)	15982	0.04	0.03	0.0	0.3
Infants dying, cond. survived first month (%)	15982	0.02	0.02	0.0	0.3

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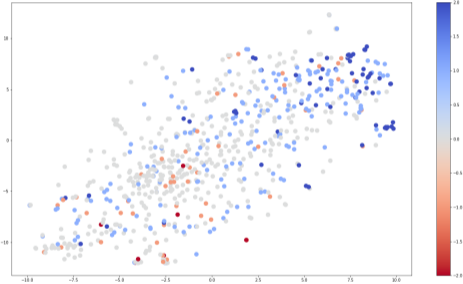
## Case Data Merged with Pollution and Mortality

<i>Case Data - Pollution Merge</i>	N	Mean	SD	Min	Max
Appeal	516	0.25	0.44	0.0	1.0
Constitutional	516	0.21	0.40	0.0	1.0
Government is Respondent	516	0.82	0.38	0.0	1.0
Government is Petitioner	516	0.14	0.34	0.0	1.0
Number of Judges	516	1.68	0.76	0.0	3.0

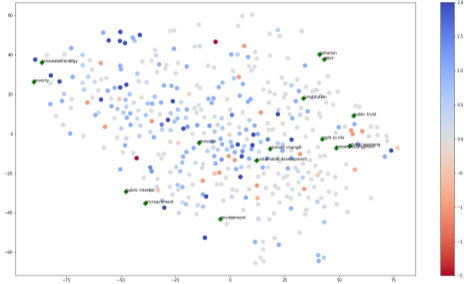
<i>Case Data - Mortality Merge</i>	N	Mean	SD	Min	Max
Appeal	777	0.25	0.43	0.0	1.0
Constitutional	777	0.22	0.42	0.0	1.0
Government is Respondent	777	0.86	0.35	0.0	1.0
Government is Petitioner	777	0.11	0.32	0.0	1.0
Number of Judges	777	1.75	0.76	0.0	3.0

# Writing Style Variations

A. Case-Level



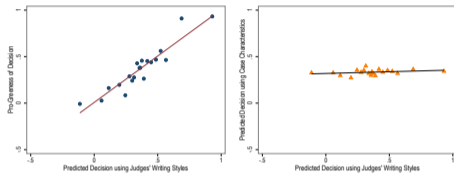
B. Judge-Level



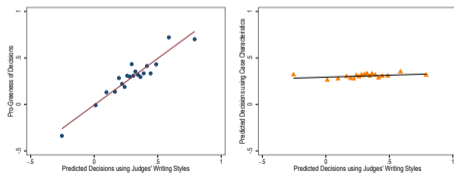
▶ Back

# Judge randomization check

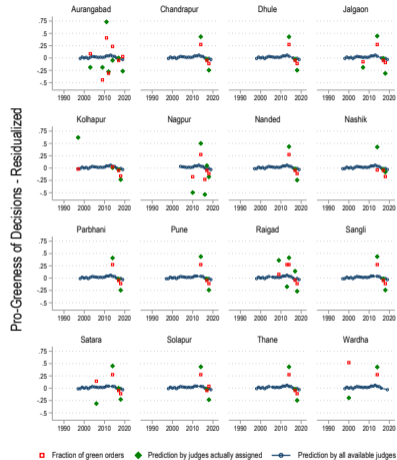
## A. Order-Level



## B. District-Year-Level: With Orders



# Randomization Check - Maharashtra



# Key assumption: Judges are randomly assigned

- ▶ Pipeline of justice:
  - ▶ A petitioner files a case against a respondent
  - ▶ Both have legal representation through advocates
  - ▶ The case is assigned to a judge by the Chief Justice based on the roster system
  - ▶ There is a public “not before me” list

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- ▶ Pipeline of justice:
  - ▶ A petitioner files a case against a respondent
  - ▶ Both have legal representation through advocates
  - ▶ The case is assigned to a judge by the Chief Justice based on the roster system
  - ▶ There is a public “not before me” list
  
- ▶ Two previous papers:
  - ▶ No in-group bias based on caste, religion and gender (Ash et al. 2021)
  - ▶ Detailed analysis of names and networks at the Patna high court finds no evidence of “matching” on the basis of caste, religion or gender (Bhupatiraju et al. 2021)

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- ▶ Pipeline of justice:
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- ▶ Two previous papers:
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- ▶ We do not see the same judge appear in our data more than 3 times!



## First Stage, Judge Level

<b>Panel A: Judge Level</b>	Median Coded Environmental Impact			
	(1)	(2)	(3)	(4)
Judge has a Post Graduate Degree	0.0842 (0.111)	0.262* (0.143)	0.187** (0.0873)	0.175** (0.0890)
Other Instruments	25 D2V vectors			
Assigned districts	One	All	All	All
District + year FEs	-	-	Yes	Yes
Case-level controls	-	-	-	Yes
Eff First Stage F	2.535	4.047	2.595	2.683
N	764	3313	3313	3313

# First Stage, Order Level

<b>Panel B: Order Level</b>	Median Coded Environmental Impact			
	(1)	(2)	(3)	(4)
Majority Judges have a Post Graduate Degree	0.184*	0.402	0.185*	0.194*
	(0.104)	(0.254)	(0.0969)	(0.0997)
Other Instruments		25 D2V vectors		
Assigned districts	One	All	All	All
District + year FEs	-	-	Yes	Yes
Case-level controls	-	-	-	Yes
Eff First Stage F	1.639	3.709	4.960	5.122
N	518	2795	2795	2795

## First Stage, Order Level

<b>Panel C: Order Level</b>	<b>Green Order</b>			
	(1)	(2)	(3)	(4)
JudgePostGrad	0.133*	0.285**	0.157***	0.157***
	(0.0716)	(0.132)	(0.0558)	(0.0567)
Other Instruments		25 D2V vectors		
Assigned districts	One	All	All	All
District + year FEs	-	-	Yes	Yes
Case-level controls	-	-	-	Yes
Eff First Stage F	1.505	4.575	6.583	5.560
N	518	2795	2795	2795

# First Stage, District-Year Merged with BOD

<b>Panel D: District-Year Merged with BOD</b>	Fraction of Green Orders			
	(1)	(2)	(3)	(4)
Majority Judges have a Post Graduate Degree	0.276*** (0.0928)	0.276*** (0.0915)	0.268*** (0.0861)	0.284*** (0.0861)
Dummy for Presence of an Order		0.126** (0.0627)	0.129** (0.0600)	0.0753 (0.0736)
Other Instruments		25 D2V vectors		
Assigned districts	All	All	All	All
District + year FEs	-	-	Yes	Yes
Case-level controls	-	-	-	Yes
District-years with no orders	Dropped	Dummied	Dummied	Dummied
Eff First Stage F	6.567	10.24	8.413	8.856
N	859	5649	5649	5649

# First Stage, District-Year-Month Merged with Mortality

Panel E: District-Year-Month Merged with Mortality	Fraction of Green Orders			
	(1)	(2)	(3)	(4)
Majority Judges have a Post Graduate Degree	0.229** (0.113)	0.229** (0.112)	0.229** (0.111)	0.219** (0.111)
Order Dummy		0.181 (0.124)	0.180 (0.123)	0.0152 (0.141)
Other Instruments		25 D2V vectors		
Assigned districts	All	All	All	All
District + Year + Month FEs	-	-	Yes	Yes
Case-level controls	-	-	-	Yes
District-years with no orders	Dropped	Dummied	Dummied	Dummied
Eff First Stage F	3.491	5.484	5.566	6.243
N	1931	260876	260876	260876

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## Impact on all Pollutants - 3-year MA

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Fraction of Green Orders	-0.130 (0.124)	-0.241** (0.103)	-0.0421 (0.520)	-0.0694 (0.144)	-0.0209 (0.0247)
Dummy for Presence of an Order	0.241* (0.131)	0.0619 (0.118)	0.159 (0.494)	-0.0711 (0.143)	0.0000132 (0.0377)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	7.816	8.856	9.015	7.895	8.401
N	3053	5649	5057	5475	5541

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# Contemporaneous Impact on Biological-Oxygen-Demand (BOD)

	Log of Yearly Maximum BOD per District (mg/l)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Fraction of Green Orders	0.177 (0.127)	0.209 (0.175)	0.177 (0.127)	0.209 (0.175)	-0.183*** (0.0709)	-0.270** (0.106)	-0.162** (0.0706)	-0.241** (0.103)
Dummy for Presence of an Order			0.202*** (0.0710)	0.194** (0.0763)	0.0814* (0.0473)	0.107* (0.0556)	0.0366 (0.113)	0.0619 (0.118)
District-years with no orders	Dropped	Dropped	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs					Yes	Yes	Yes	Yes
Covariates							Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC
Eff. First Stage F		6.567		10.24		.		8.856
N	859	859	5649	5649	5649	5649	5649	5649

# Impact on BOD - AR CIs

	Log of Yearly Maximum BOD per District (mg/l)							
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV	(7) OLS	(8) IV
Fraction of Green Orders	0.177	0.209	0.177	0.209	-0.183	-0.270	-0.162	-0.241
	[-0.0719; 0.425]	[-0.234; 0.580]	[-0.0714; 0.425]	[-0.228; 0.574]	[-0.322; -0.0438]	[-0.437; -0.102]	[-0.300; -0.0231]	[-0.494; -0.0701]
Dummy for Presence of an Order			0.202	0.194	0.0814	0.107	0.0366	0.0619
District-years with no orders	Dropped	Dropped	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs					Yes	Yes	Yes	Yes
Covariates							Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC
Eff. First Stage F		6.567		10.24		.		8.856
N	859	859	5649	5649	5649	5649	5649	5649

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# Contemporaneous Impacts on Water Pollution (Yearly) - AR CIs

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Fraction of Green Orders	-0.130 [-0.465; 0.235]	-0.241 [-0.494; -0.0701]	-0.0421 [-1.028; 0.814]	-0.0694 [-0.255; 0.291]	-0.0209 [-0.0964; 0.0207]
Dummy for Presence of an Order	0.241	0.0619	0.159	-0.0711	0.0000132
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	7.816	8.856	9.015	7.895	8.401
N	3053	5649	5057	5475	5541

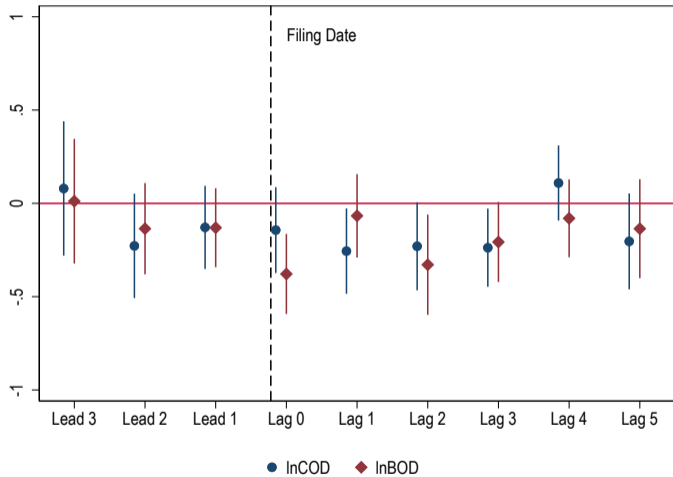
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## Impact on all Pollutants - 3-year MA - AR CIs

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Fraction of Green Orders	-0.158 [-0.268; 0.0404]	-0.183 [-0.450; -0.00469]	-0.0511 [-0.940; 0.632]	0.0406 [-0.0876; 0.370]	-0.0333 [-0.101; 0.0142]
Dummy for Presence of an Order	0.168	0.0667	0.290	-0.0446	0.00317
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	-	-
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	7.331	7.910	8.189	7.908	7.897
N	5742	6254	5888	6237	6185

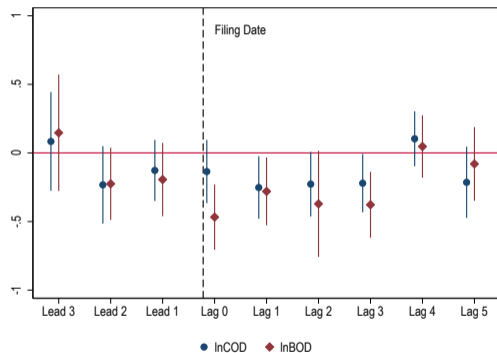
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# Pre-Trends Pollutants

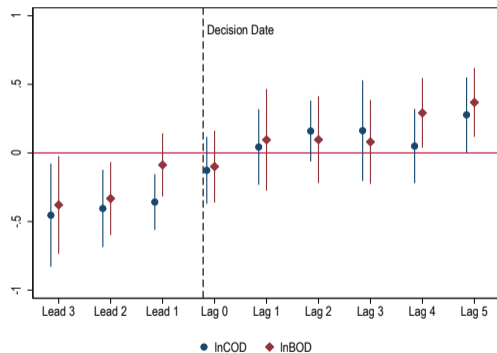


# Dynamic Impacts on Pollution - Common Support I

## A. Filing: Common Support BOD + COD



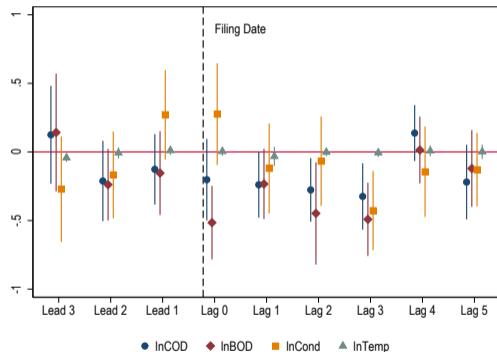
## B. Decision: Common Support BOD + COD



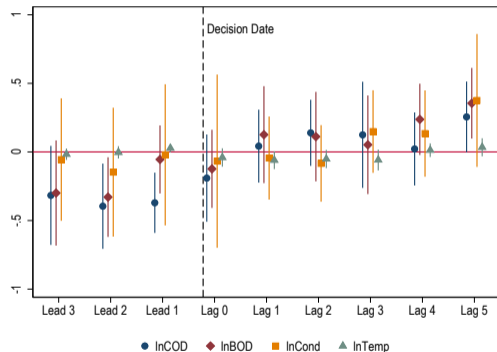
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# Dynamic Impacts on Pollution - Common Support II

## A. Filing: Common Support All Indicators



## B. Decision: Common Support All Indicators



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# Impact on Neighboring Districts

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Neighboring Fraction of Green Orders	-0.242* (0.129)	-0.0911 (0.0865)	-0.131 (0.428)	-0.0808 (0.112)	0.00163 (0.0194)
Order Dummy	0.224** (0.110)	0.0240 (0.0990)	0.190 (0.384)	-0.124 (0.127)	-0.0316 (0.0200)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	11.80	14.09	13.38	13.67	14.09
N	3053	5649	5057	5475	5541

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# Impact on State Level

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Fraction of Green Orders per State	-0.168 (0.119)	-0.226** (0.113)	0.113 (0.514)	-0.0441 (0.125)	-0.00502 (0.0213)
Order in State	0.0173 (0.0584)	0.0630 (0.0478)	0.0164 (0.184)	-0.0358 (0.0482)	0.00205 (0.00886)
Order in District	0.171** (0.0793)	0.0723 (0.0585)	0.238 (0.245)	0.0449 (0.0763)	-0.000642 (0.0154)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Covariates	Yes	Yes	Yes	Yes	Yes
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	21.81	14.15	14.93	13.80	13.86
N	3049	5619	5055	5446	5510

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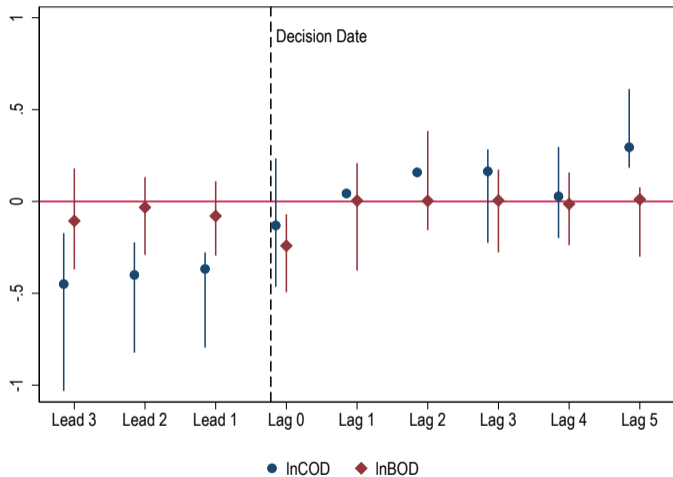
## Impact on Neighboring Districts, no Cities

	(1) ln(COD)	(2) ln(BOD)	(3) ln(TCOLI)	(4) ln(Conductivity)	(5) ln(Temperature)
Neighboring Fraction of Green Orders	-0.273** (0.124)	-0.0155 (0.0991)	-0.120 (0.409)	-0.0683 (0.0955)	-0.0159 (0.0205)
Order Dummy	0.227* (0.118)	0.00257 (0.105)	0.0457 (0.421)	-0.192 (0.132)	-0.0291 (0.0215)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	-	-
Clustering	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	10.15	11.54	11.17	12.00	11.45
N	2908	5383	4810	5219	5282

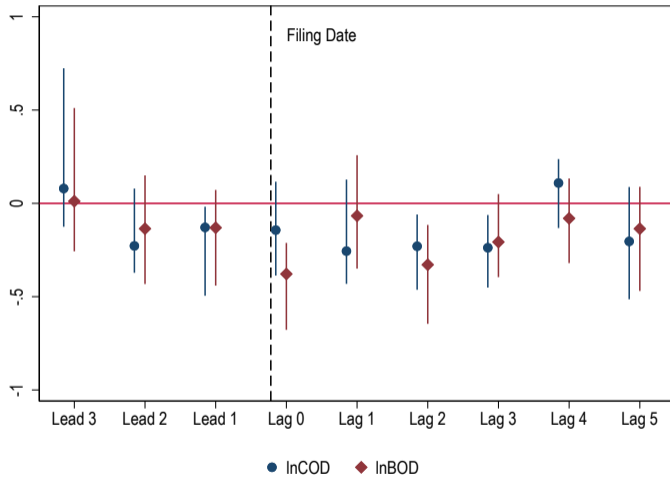
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# Dynamic Impacts on Pollution - AR CIs

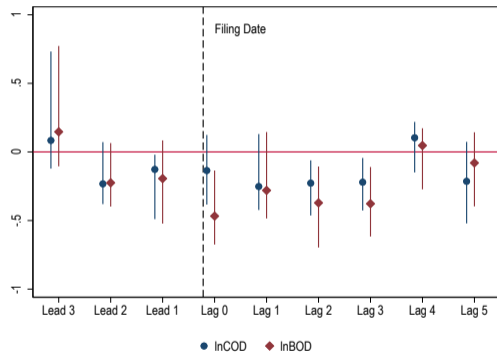


# Pre-Trends Pollutants - AR CIs

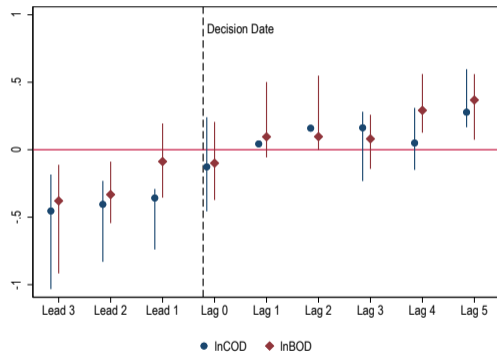


# Dynamic Impacts on Pollution - Common Support I - AR CIs

A. Filing: Common Support BOD + COD



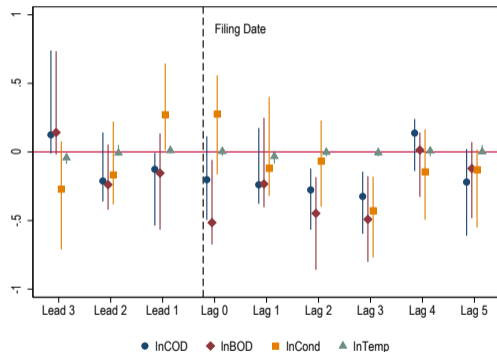
B. Decision: Common Support BOD + COD



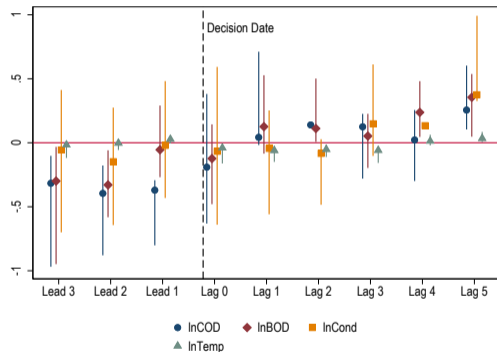
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# Dynamic Impacts on Pollution - Common Support II - AR CIs

## A. Filing: Common Support All Indicators



## B. Decision: Common Support All Indicators



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# Contemporaneous Impacts on Infant Mortality (Monthly)

	Baseline Regressions			With Air Pollution Controls		
	(1) Died<1Y	(2) Died<1M	(3) Died<1Y   1M	(4) Died<1Y	(5) Died<1M	(6) Died<1Y   1M
Fraction of Green Orders	0.00198 (0.00619)	-0.000875 (0.00633)	0.00504 (0.00350)	-0.000556 (0.00800)	-0.00663 (0.00751)	0.00873** (0.00363)
Order Dummy	-0.0112* (0.00590)	-0.00827 (0.00522)	-0.00338 (0.00251)	-0.00613 (0.00776)	-0.00387 (0.00763)	-0.00217 (0.00239)
District-year-months with no orders	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Month, Year and District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	PM2.5	PM2.5	PM2.5
Clustering	IOC	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	6.17	6.17	6.15	5.86	5.86	5.84
N	188,298	188,298	188,183	101,096	101,096	101,029

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# Impact on Mortality - Sample Selection with Air Pollution Control

	Full Sample			Only if PM2.5 Available			Including PM2.5		
	(1) Died<1Y	(2) Died<1M	(3) Died<1Y  1M	(4) Died<1Y	(5) Died<1M	(6) Died<1Y  1M	(7) Died<1Y	(8) Died<1M	(9) Died<1Y  1M
Fraction of Green Orders	0.00198 (0.00619)	-0.000875 (0.00633)	0.00504 (0.00350)	-0.000563 (0.00800)	-0.00661 (0.00751)	0.00870** (0.00364)	-0.000556 (0.00800)	-0.00663 (0.00751)	0.00873** (0.00363)
Order Dummy	-0.0112* (0.00590)	-0.00827 (0.00522)	-0.00338 (0.00251)	-0.00611 (0.00776)	-0.00390 (0.00762)	-0.00212 (0.00239)	-0.00613 (0.00776)	-0.00387 (0.00763)	-0.00217 (0.00239)
District-years with no cases	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	-	-	-	PM2.5	PM2.5	PM2.5
Clustering	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	6.173	6.173	6.154	5.862	5.862	5.837	5.862	5.862	5.837
N	188298	188298	188183	101096	101096	101029	101096	101096	101029

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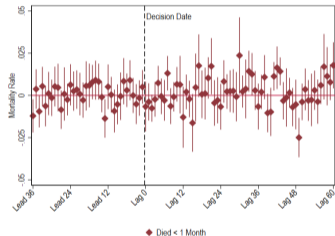
# Contemporaneous Impacts on Infant Mortality (Yearly)

	Baseline Regressions			With Air Pollution Controls			With Air Pollution + Shrug Controls		
	(1) Died<1Y	(2) Died<1M	(3) Died<1Y  1M	(4) Died<1Y	(5) Died<1M	(6) Died<1Y  1M	(7) Died<1Y	(8) Died<1M	(9) Died<1Y  1M
Fraction of Green Orders	0.000607 (0.00307)	-0.000351 (0.00266)	0.00103 (0.00123)	0.00106 (0.00334)	-0.000127 (0.00281)	0.00128 (0.00121)	-0.00107 (0.00386)	-0.00139 (0.00296)	0.000313 (0.00160)
Order Dummy	0.00461* (0.00279)	0.00321 (0.00253)	0.00148 (0.00118)	0.00490* (0.00290)	0.00334 (0.00259)	0.00165 (0.00116)	0.00458 (0.00310)	0.00390 (0.00269)	0.000708 (0.00132)
District-years with no orders	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Year and District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	PM2.5	PM2.5	PM2.5	PM2.5 + Shrug	PM2.5 + Shrug	PM2.5 + Shrug
Clustering	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	7.360	7.360	7.360	7.373	7.373	7.373	6.788	6.788	6.788
N	8482	8482	8482	8482	8482	8482	6776	6776	6776

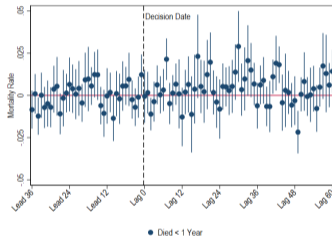
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# Dynamic Impacts on Monthly Mortality

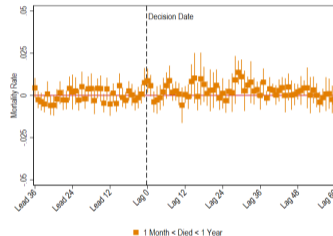
## A. Died < 1 Year



## B. Died < 1 Month



## C. 1 Month < Died < 1 Year

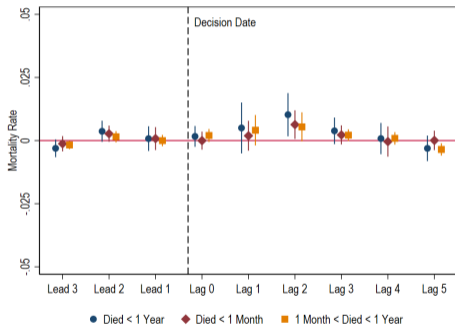


▶ Back

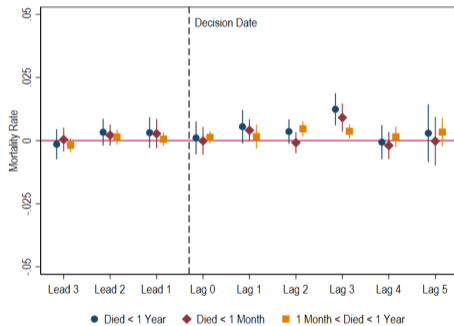


# Dynamic Impacts on Yearly Mortality

## D. Monthly Aggregated



## E. Yearly



▶ Back

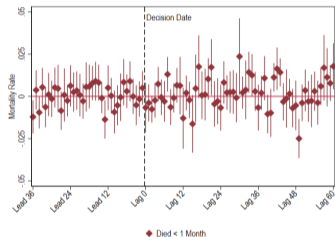
# Contemporaneous Impacts on Infant Mortality (Monthly) - AR CIs

	Baseline Regressions			With Air Pollution Controls		
	(1) Died<1Y	(2) Died<1M	(3) Died<1Y  1M	(4) Died<1Y	(5) Died<1M	(6) Died<1Y  1M
Fraction of Green Orders	0.00198 [.; .]	-0.000875 [-0.0135; 0.00857]	0.00504 [0.00269; 0.0161]	-0.000556 [-0.0119; 0.0118]	-0.00663 [.; .]	0.00873 [0.00782; 0.0193]
Order Dummy	-0.0112	-0.00827	-0.00338	-0.00613	-0.00387	-0.00217
District-year-months with no orders	Dummied	Dummied	Dummied	Dummied	Dummied	Dummied
Month, Year and District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Case Controls	Yes	Yes	Yes	Yes	Yes	Yes
District Controls	-	-	-	PM2.5	PM2.5	PM2.5
Clustering	IOC	IOC	IOC	IOC	IOC	IOC
Eff First Stage F	6.17	6.17	6.15	5.86	5.86	5.84
N	188,298	188,298	188,183	101,096	101,096	101,029

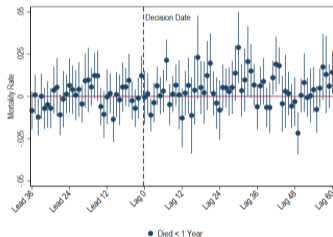
▶ Back

# Dynamic Impacts on Monthly Mortality - AR CIs

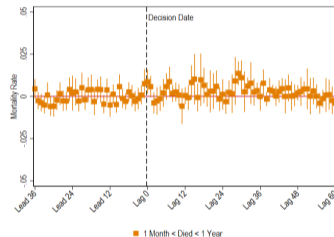
A. Died < 1 Year



B. Died < 1 Month



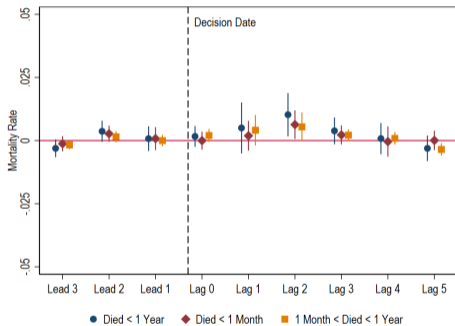
C. 1 Month < Died < 1 Year



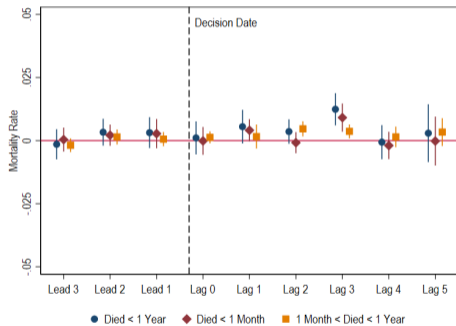
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# Dynamic Impacts on Yearly Mortality - AR CIs

## D. Monthly Aggregated



## E. Yearly



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