

# The Cost of Air Pollution for Workers and Firms: Evidence from Sickness Leave Episodes

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# Why I like this paper

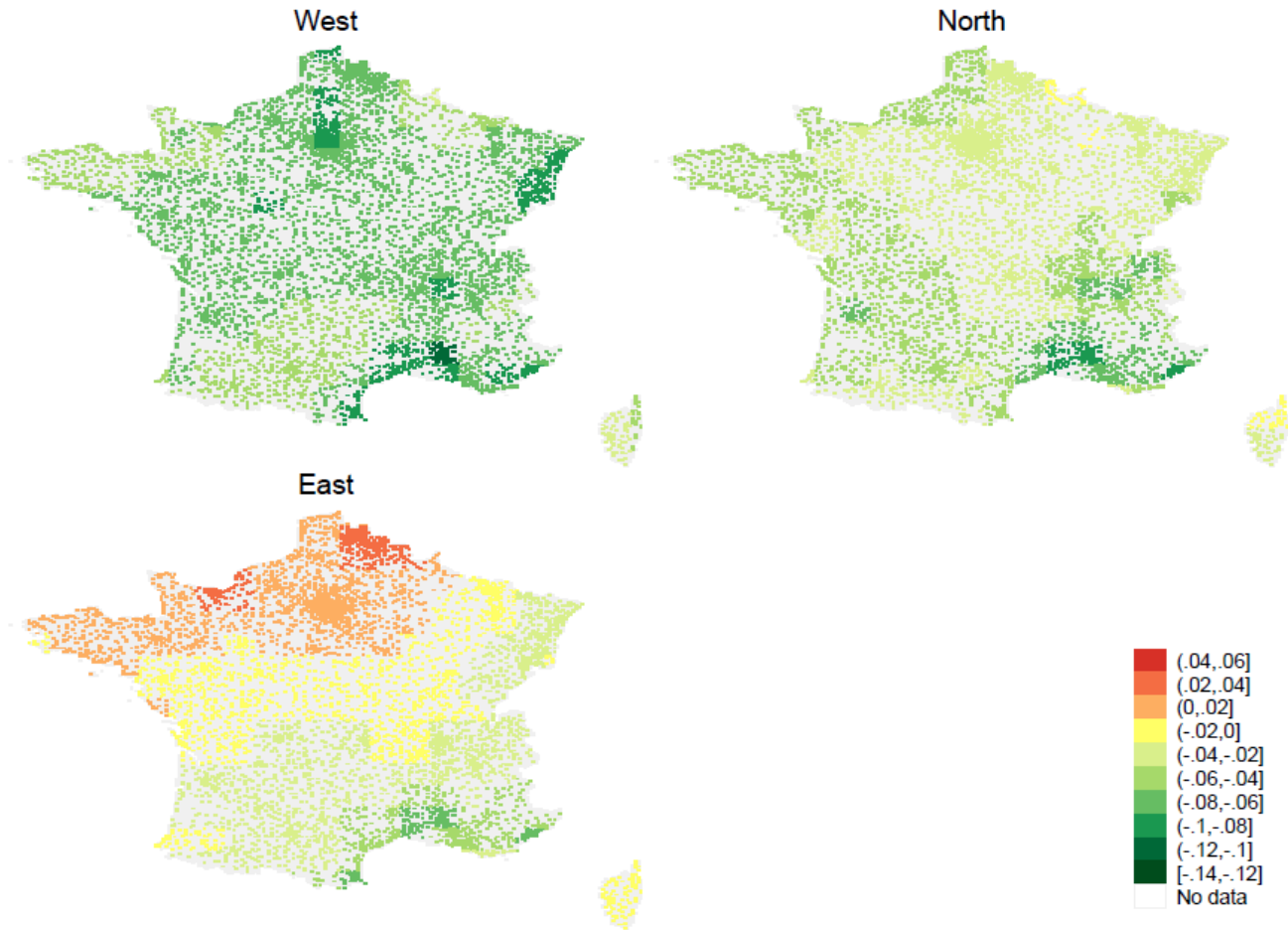
- Setting is one where workers do not have a strong incentive to work if sick
- Impressive sample: follow over 400,000 employees for 7 years
- Excellent identification strategy
- 1.3% reduction in sick leave pay if France met WHO pollution guidelines

# Is measurement error a problem?

- Differences between  $PM_{2.5}$  at place of residence versus place of work + unobserved distribution of where people spend time = measurement error in ambient pollution levels
- But ***if the instruments affect place of residence, place of work, and other places visited in the same way***, measurement error concerns are eliminated
  - Condition should be met if instruments are picking up long-range transport
  - New measurement error could arise if instrument picks up local pollution transport: could happen if first-stage coefficients allowed to vary arbitrarily

# Wind direction versus $PM_{2.5}$

- Continuity of first-stage coefficients across space makes it likely that instruments are picking up non-local transport
- Checking robustness of results to further aggregation would be helpful



# Interpreting the estimates

- Median sick leave duration of 9 days suggests undercounting of absences due to sickness?
  - Alternatively/additionally, would these workers have gotten sick later anyway?
- Workers are insured, so cost to them may be lower than the cost to taxpayers and/or the firm
  - Makes it more important to understand welfare costs of  $PM_{2.5}$
- Firm-level analysis: how to separate (1) effect of worker being sick from (2) the productivity losses of workers still coming into work from (3) pollution-induced changes in demand?

# Why does hiring decrease?

- Pollution interrupts firms' hiring logistics?
- Or sick people would have quit and are now not being replaced?
- Or productivity loss & fewer salespeople needed?
- Or loss in demand? Consider firms producing tradeable versus non-tradeable goods?

Table 5: Pollution and workers' inflows - IV

|                          | (1)                  | (2)                           | (3)                            | (4)                  |
|--------------------------|----------------------|-------------------------------|--------------------------------|----------------------|
|                          | Total                | Temporar<br>contract<br>hires | Permanent<br>contract<br>hires | Transfers            |
| PM <sub>2.5</sub>        | -0.204**<br>(0.0747) | -0.0327<br>(0.0499)           | -0.0159*<br>(0.00686)          | -0.156**<br>(0.0561) |
| Weather controls         | Yes                  | Yes                           | Yes                            | Yes                  |
| Holiday and flu controls | Yes                  | Yes                           | Yes                            | Yes                  |
| Quarter by Year FE       | Yes                  | Yes                           | Yes                            | Yes                  |
| Chimere grid FE          | Yes                  | Yes                           | Yes                            | Yes                  |
| Dependent variable mean  | 6.8                  | 5.3                           | 1.0                            | 0.5                  |
| <i>N</i>                 | 255,500              | 255,500                       | 255,500                        | 255,500              |
| 1st stage F-statistic    | 1,036                | 1,036                         | 1,036                          | 1,036                |

# Offline comments

- Grid cell level clustering probably insufficient, cluster at Merra grid cell
  - Possible reason for super high F-statistic; alternatively, may wish to report non-heteroskedasticity-robust F-statistic (if lower)
- Month-by-year, week-by-year fixed effects for robustness (quarter-by-year may be too coarse)
- Test for autocorrelation in wind direction and control for lags/leads if substantial autocorrelation exists
- Is past health spending a proxy for age?
- Higher-income less likely to take sick leave more generally, may be healthier