

“Disparities in PM_{2.5} air pollution in the United States”

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joint work with Ian Hardman,
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Disadvantaged communities are disproportionately exposed to greater environmental risks

Much of our understanding is based on:

- Stationary sources of pollution, e.g. toxic waste plants
- Local case studies
- Snapshots in time

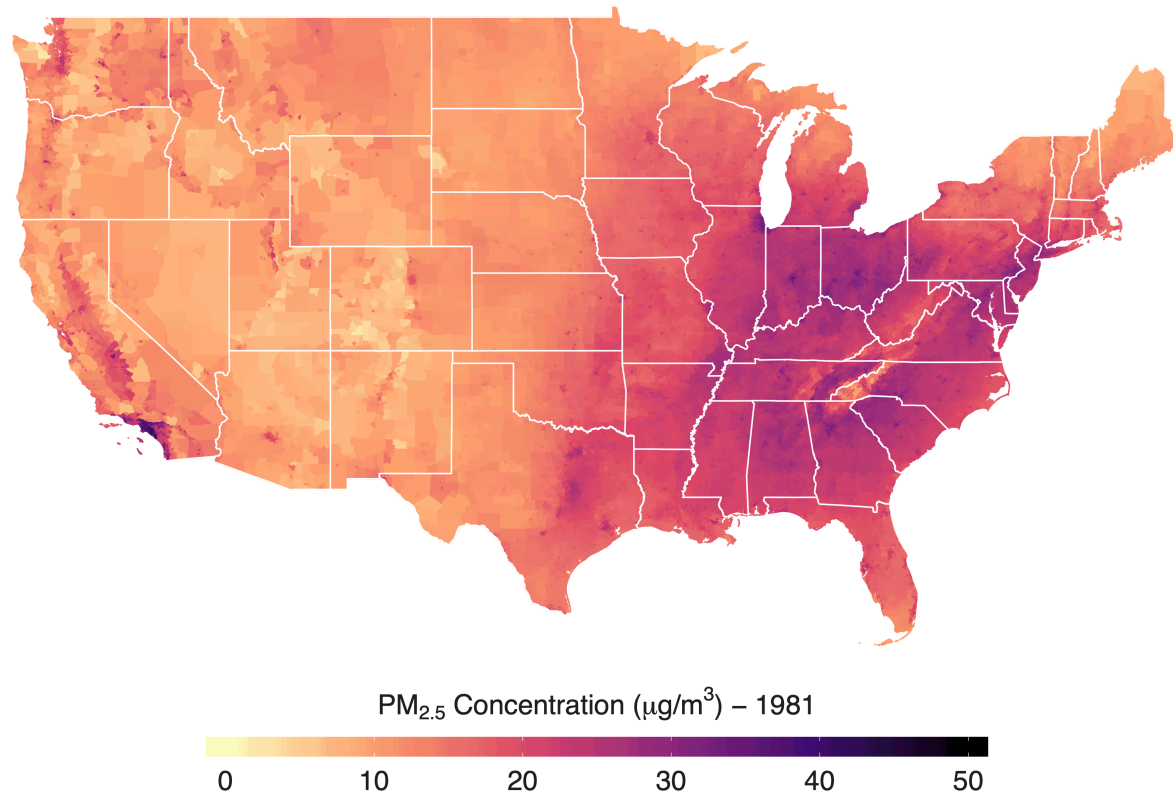
Our work focuses on building systematic evidence of environmental inequality across time and space

New Data

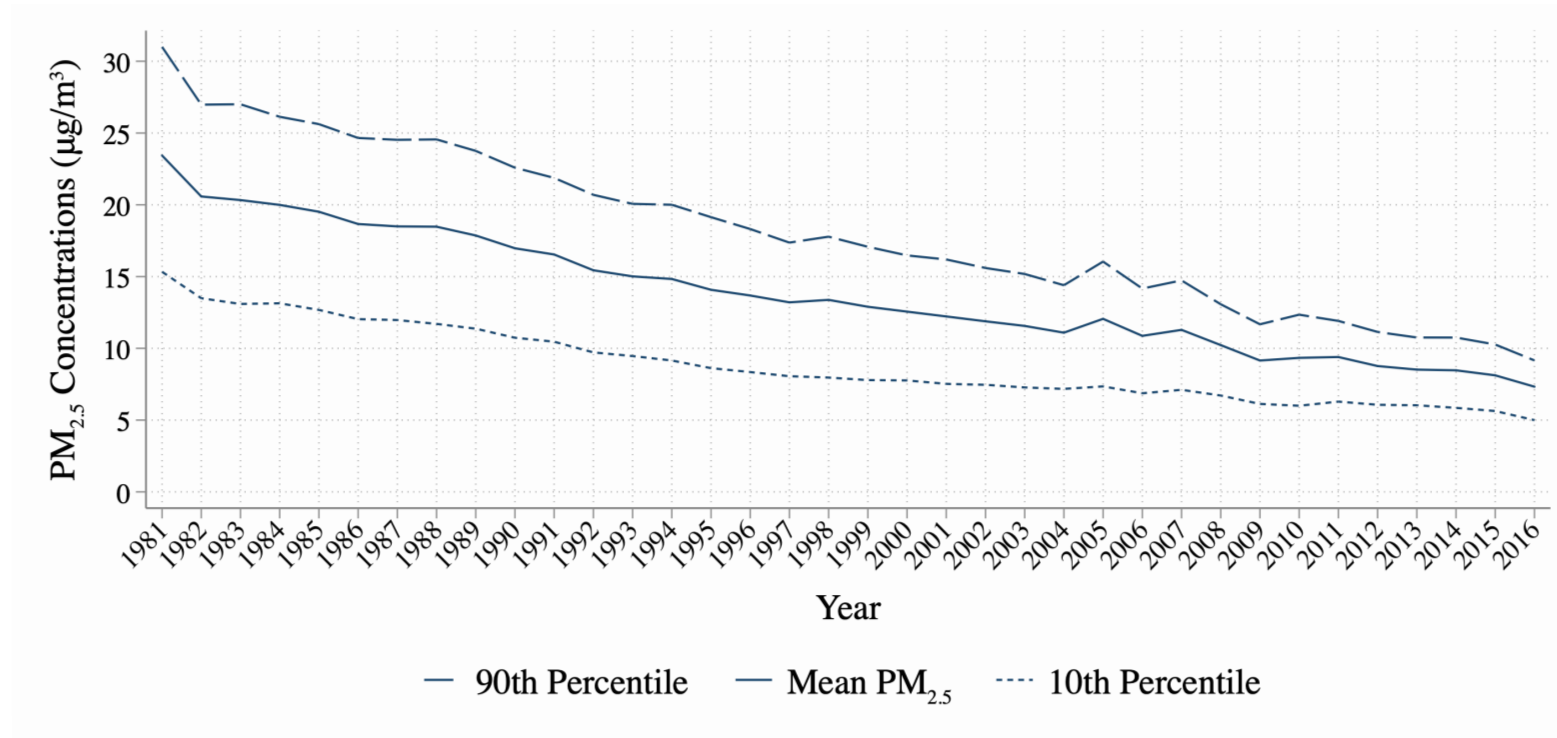
Historical PM_{2.5} concentrations in the U.S. produced by Meng et al. (2019)

- More than 8.6 million distinct locations
- Every year for nearly four decades (1981-2016).
- Derived from remote-sensing products, ground station data, and chemical transport models.

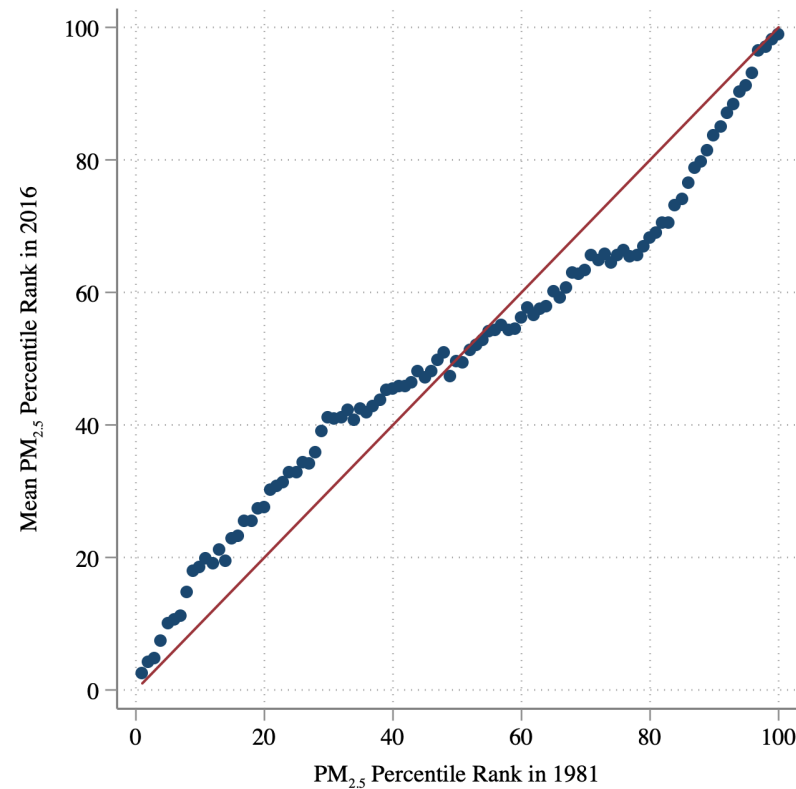
New Data



Fine particulate matter air pollution has fallen 70% since 1981

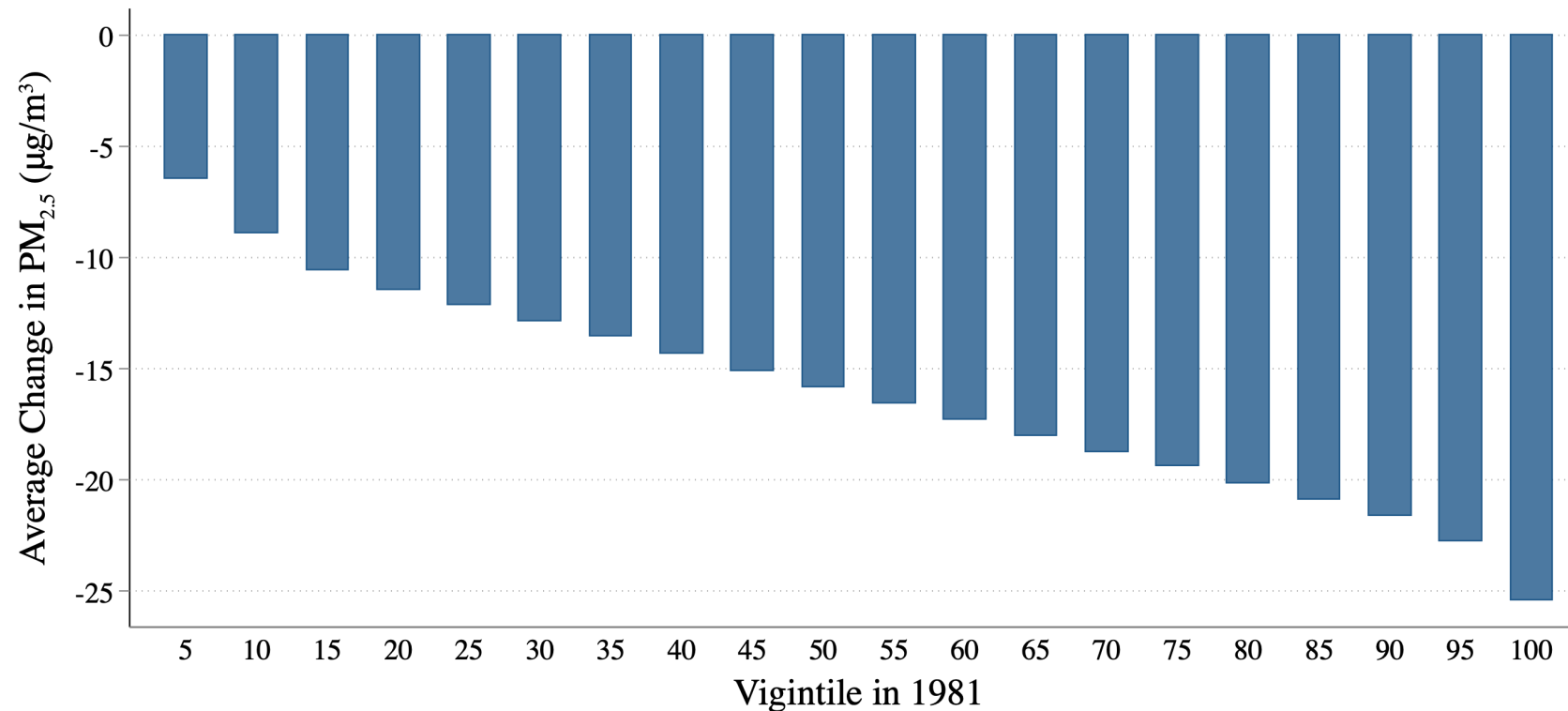


We measure the persistence of disparities using an area's rank (from least to most polluted)

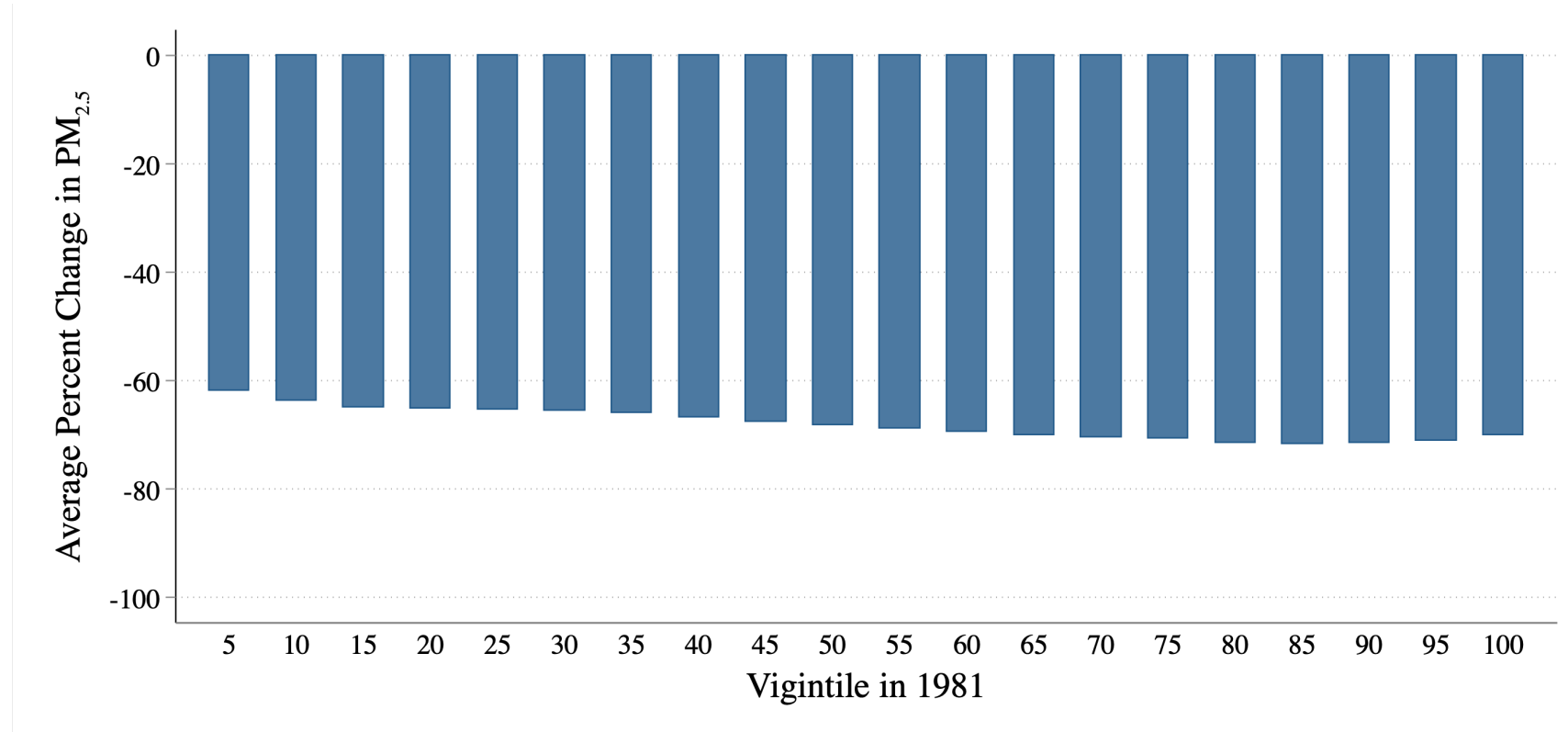


An area's rank in 1981 is a very strong predictor of its rank in 2016.

Fine particulate matter air pollution fell more in areas that were more polluted in 1981

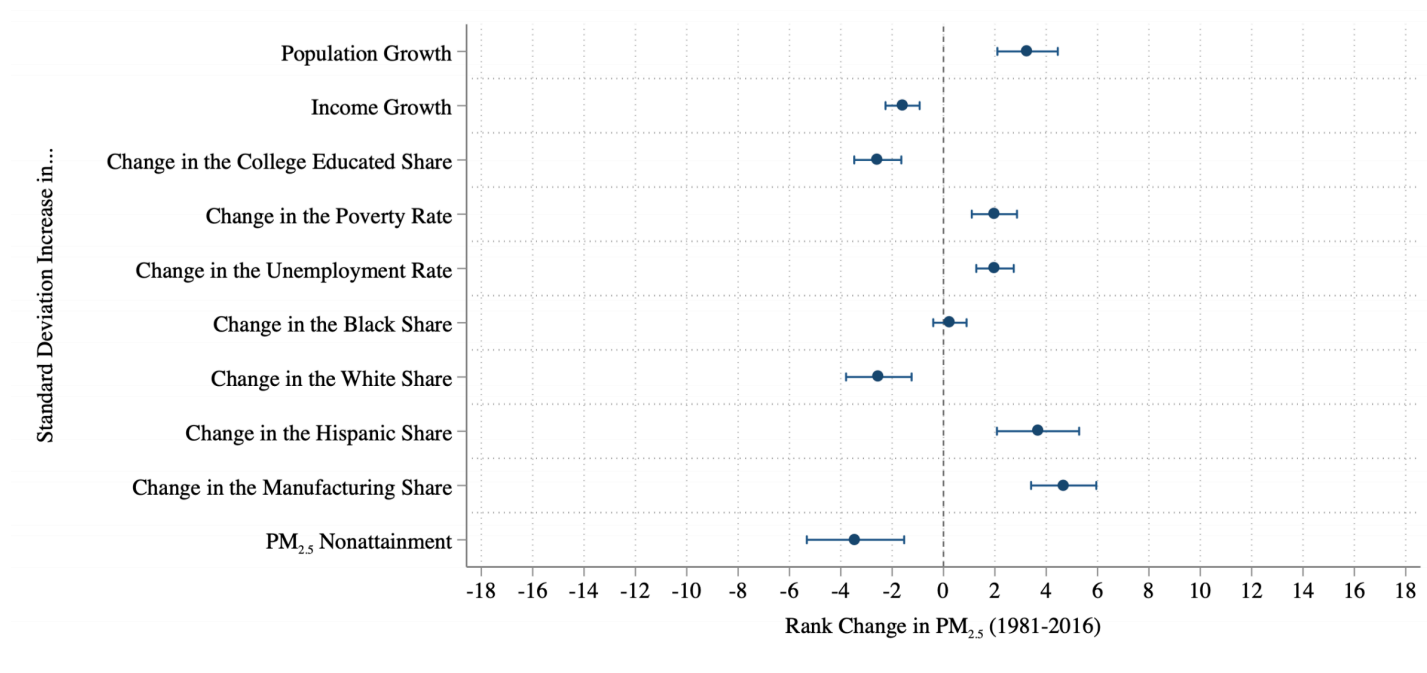


But reductions were \approx proportional.



Larger reductions happened from a much higher baseline.

Who Bears the Burden?



(b) Change in Population Characteristics (1981-2016)

Pollution has fallen, shouldn't we just take the win?

Fairness, equity, and justice are inherently comparative.

We care about who is advantaged and who is disadvantaged.

Our findings suggest that who is disadvantaged and who is advantaged remains remarkably constant through time.

Environmental Inequality and Public Policy

Federal and state policy require that all people and places enjoy the same degree of environmental protection.

No group should bear a disproportionate burden from pollution.

While real progress has been made in reducing air pollution, policy has been less successful in reducing relative disparities.

Why?



The Environmental Inequality Lab

- We need to gain a better understanding of exactly why environmental disparities exist and why they have persisted.
- We need to understand how environmental inequality contributes to economic opportunity, poverty, and inequality.