



From Monitoring to Mitigating: a first glance at the role of Localized Data in Reducing Air Pollution Levels

1.
What about
air
pollution
&
what are
we doing?

There is an urgent need to reduce air pollution levels around the world, with low- and middle- income countries disproportionately affected. Air Quality Monitoring (AQM) has been proposed as a first measure to reduce air pollution levels.

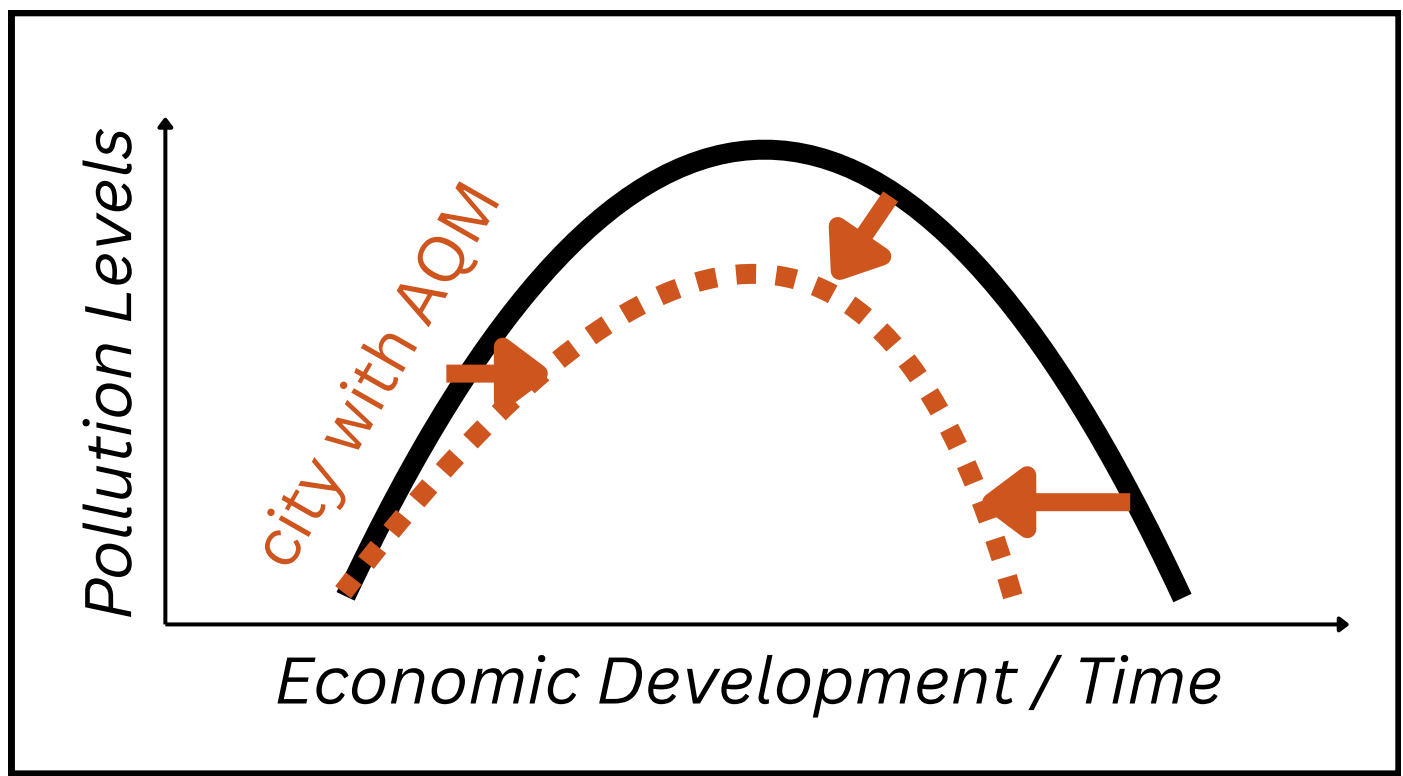
We assess whether the presence of AQM influences trends of air pollution levels at the city level, globally, over the last 20 years.

We use remotely sensed air pollution trends over time for 8000 cities around the globe, a global dataset of AQM locations and city- or country-level datasets to isolate the effect of the presence of AQM.

3.
What do we
expect?

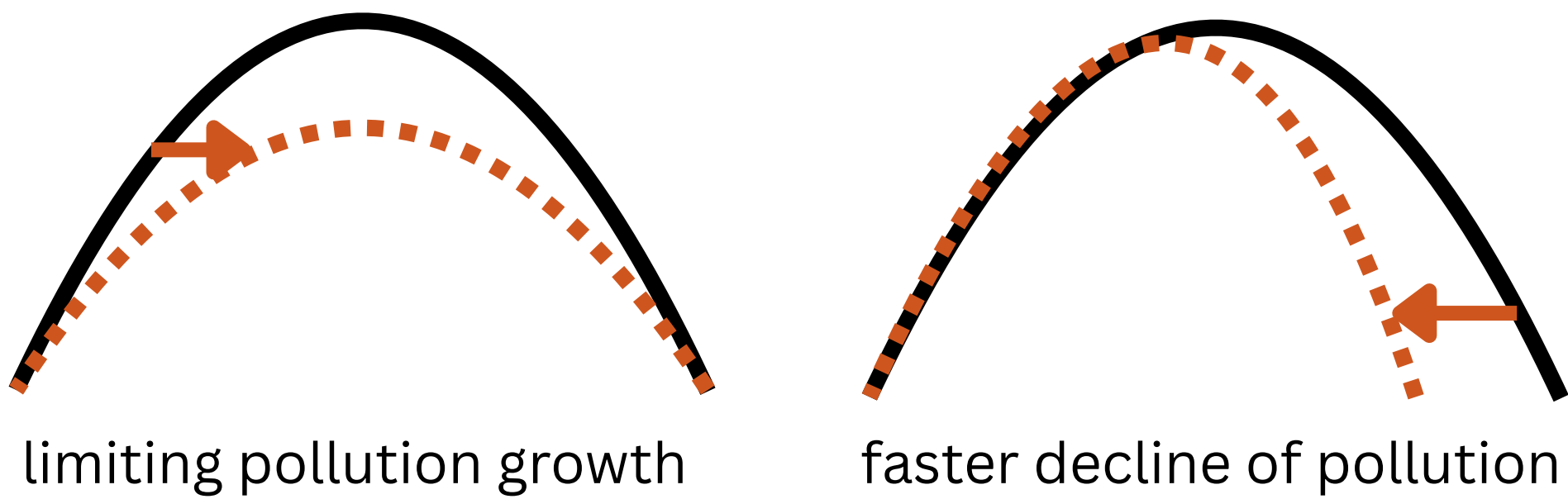
Over time, pollution levels often follow a bell curve—rising with economic growth then falling thanks to cleaner technologies and economic activities. Localized AQM may increase public awareness and put pressure on authorities, while fine-grained data help policymakers design more effective policies.

Example of pollution trends in cities with AQM:



AQM could influence trends on 3 levels:

- promoting the transition to curb pollution levels at earlier levels of development
- limiting pollution growth
- leading to a faster decline of pollution

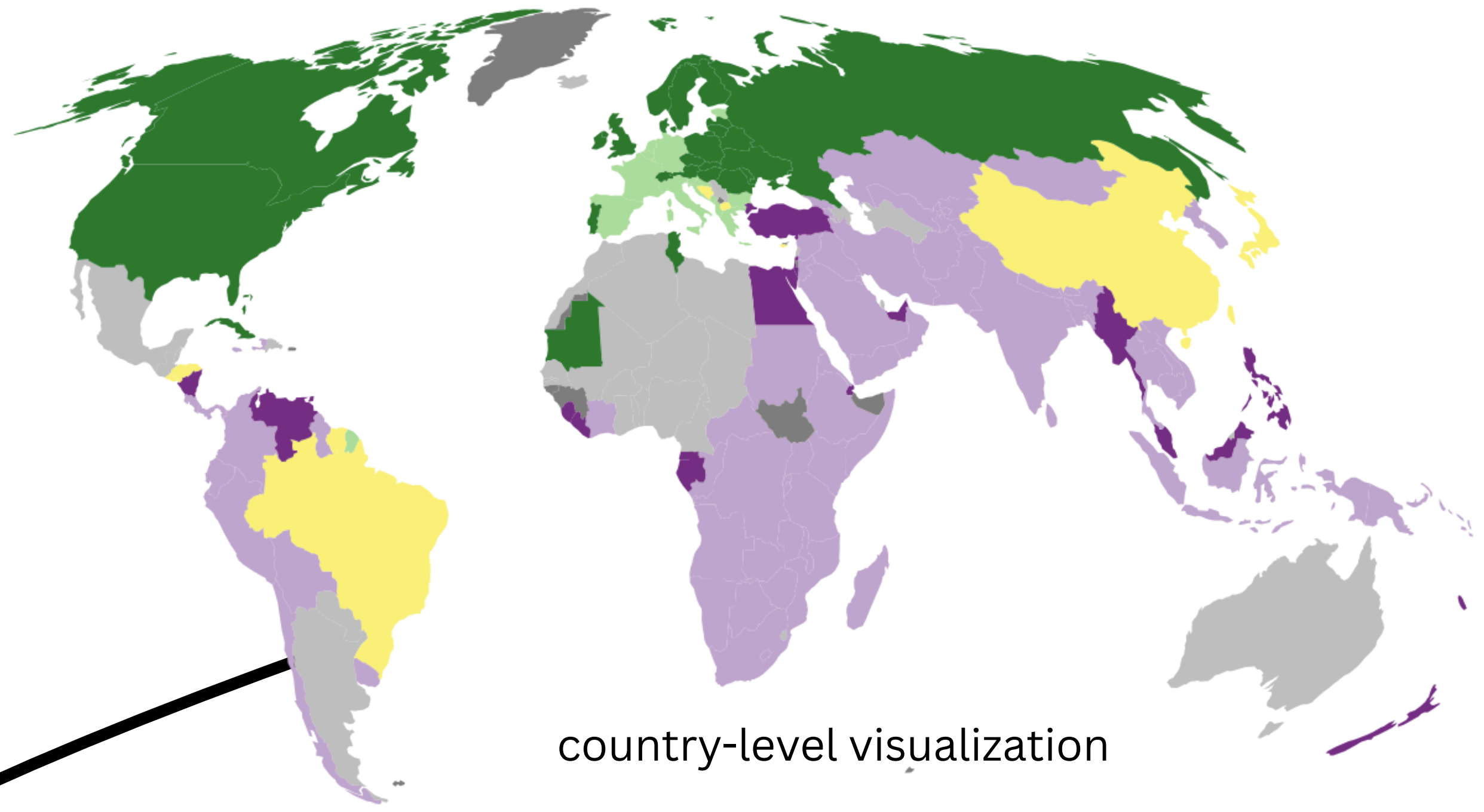
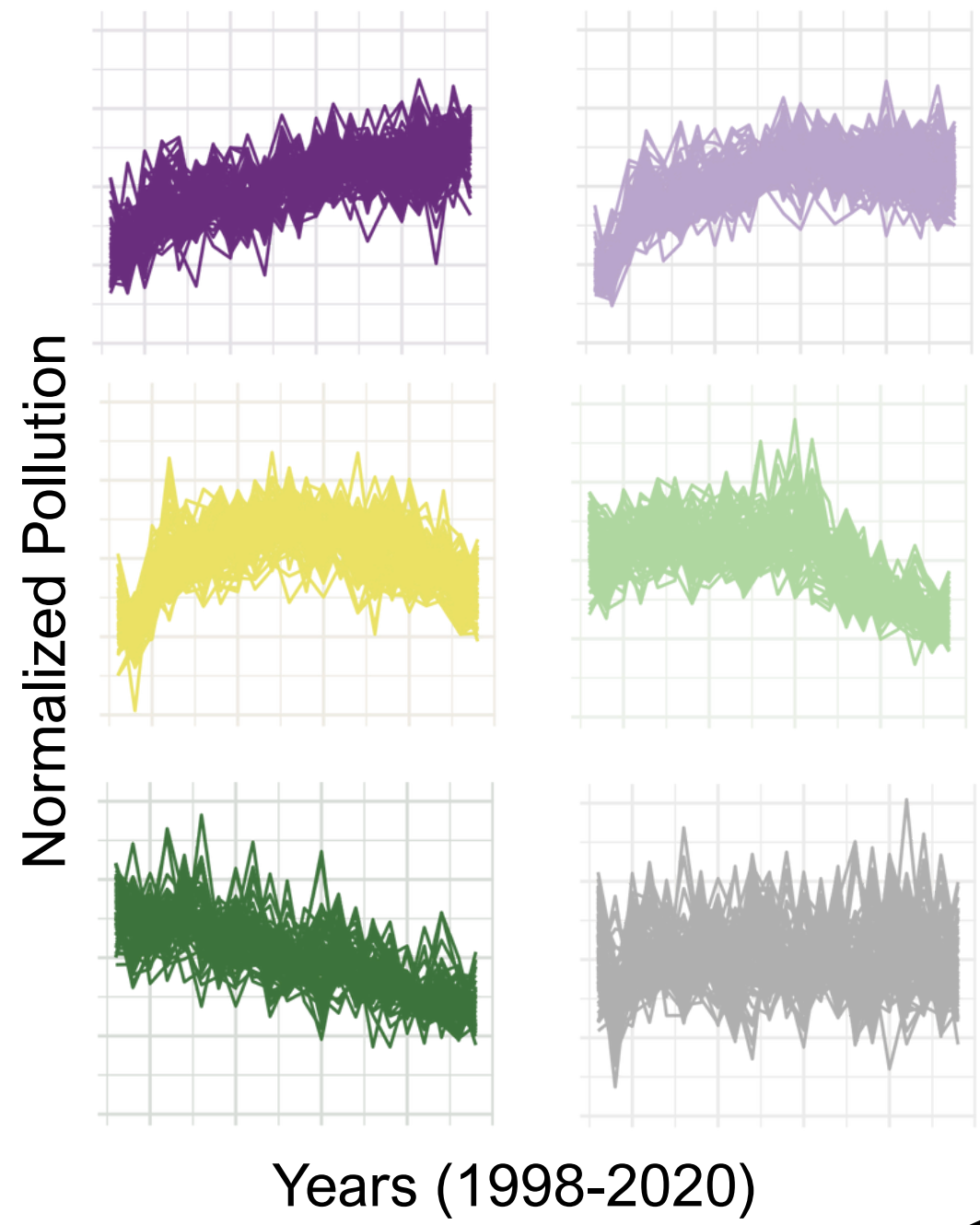


testing this requires further analysis

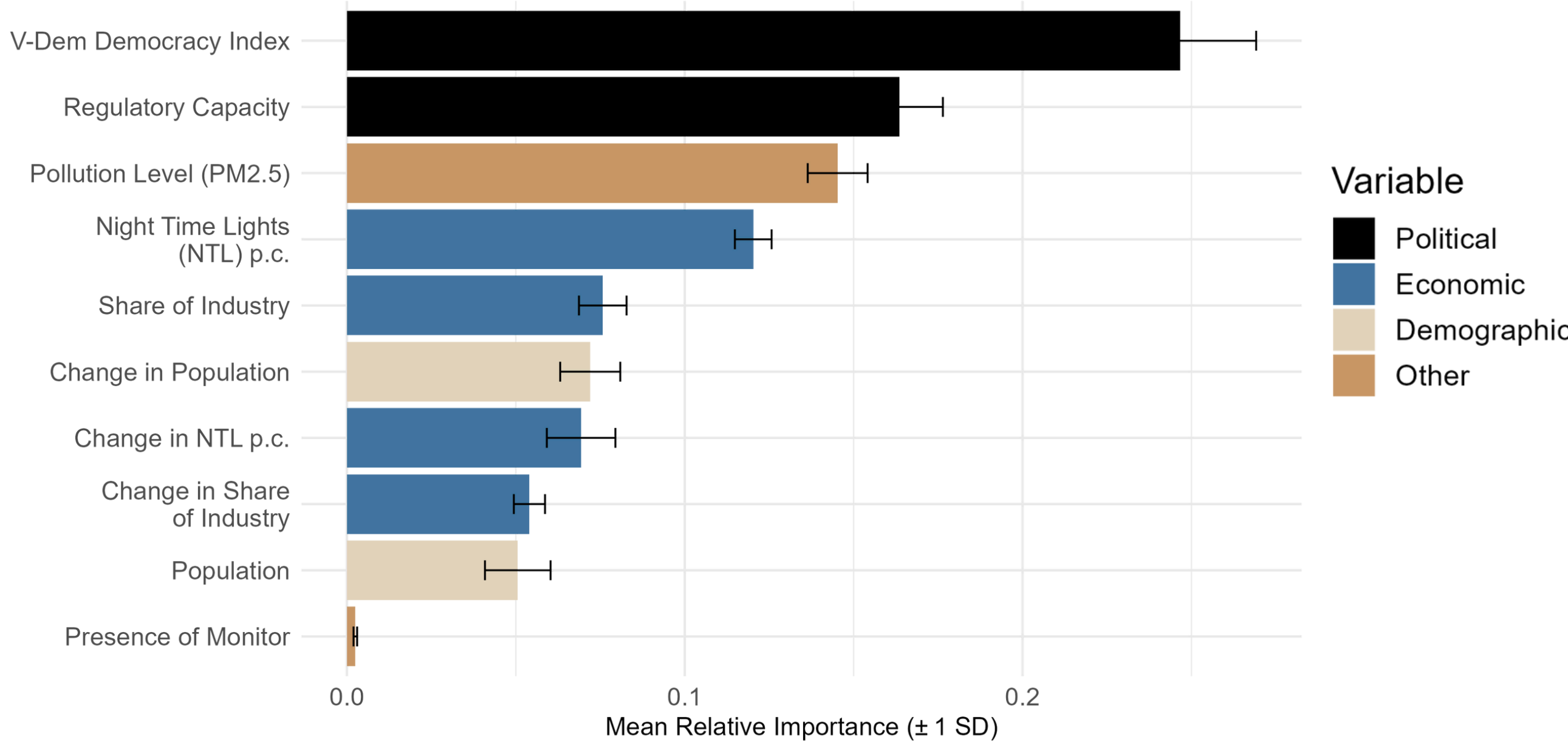
2.
How do we
do it?

Air Pollution Trend Classification

- 1. Positive Linear
- 2. Inverted U-Shaped Positive Quad
- 3. Inverted U-Shaped Shifting
- 4. Inverted U-Shaped Negative Quad
- 5. Negative Linear
- No Trend
- NA



4.
Using an XGBoost model accounting for economic, demographic & political factors (84% accuracy), we find that only 1% of cities are classified differently when tuning the AQM variable to 0 or 1.

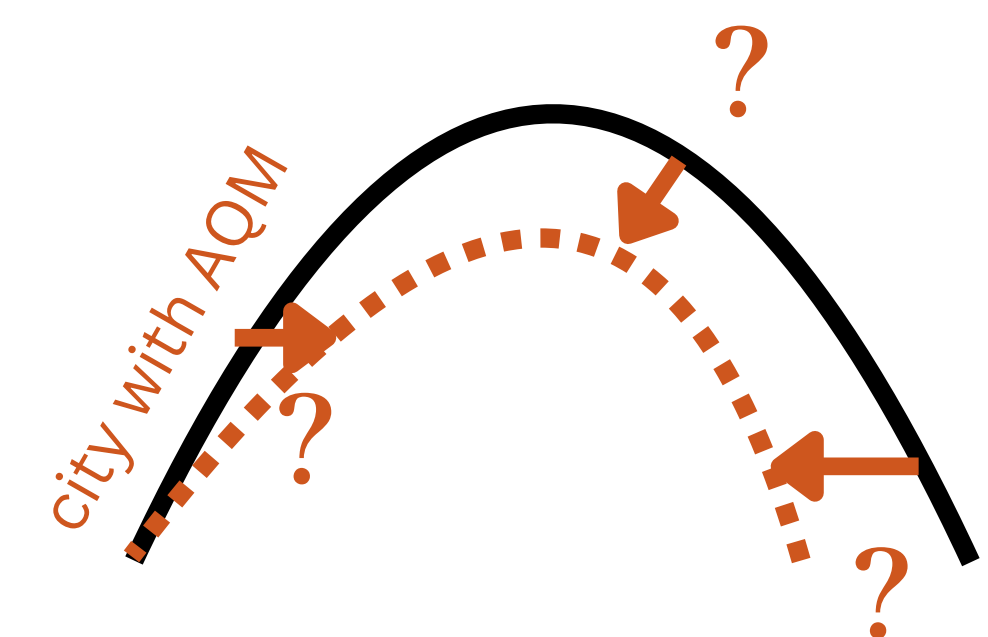


5.
Takeaways
and next
steps

When controlling for covariates, AQM is not associated with a city being in a more advanced stage of their pollution trajectory. Nevertheless, cities in a similar phase may behave differently with AQM, which will be explored in a second analysis.

The robustness of the analysis can be improved: e.g. including synthetic controls, refining the definition of AQM, looking at case-studies in specific countries.

More work is needed to understand the mechanisms through which AQM leads to reductions in air pollution levels.



Curious to know how this and other related work will develop? Follow the first author on LinkedIn

This is still early work, if you would like to share ideas on how to improve it, contact the first author: cfournier@ethz.ch