



## Public versus private air quality information in Lahore, Pakistan

Isra Imtiaz, Shotaro Nakamura, Sanvan Nasim, and Arman Rezaee

- Lahore's severe pollution requires action for health gains.
- We conducted a randomised controlled trial with 1,000 residents, offering daily air forecasts for two months and testing willingness to pay and belief influences.
- We find that residents value air pollution info, willing to pay PKR 238, regardless of the information source. The source (government or private) doesn't impact willingness to pay but influences beliefs about forecast accuracy. Beliefs about air pollution levels remain unaffected by the information source.
- Policy considerations include that Lahore residents value air data. Policymakers should collaborate with private sources (e.g., PAQI) for improved public welfare through better air quality information.

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## Overview

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Lahore—Pakistan’s second most populous city and the capital of Punjab province—ranks as one of the most polluted cities in the world. Reducing Lahore’s particulate matter (PM2.5) levels to the World Health Organization’s (WHO’s) standards would lead an average resident to gain 7.5 life years. Responding to local pressure, the Environmental Protection Department Punjab (EPD) has attempted to provide residents with air quality data, but it remains unreliable and inaccessible to a vast majority.

To fill the data void created by the EPD, the Pakistan Air Quality Initiative (PAQI)—a private citizens group—has begun offering residents alternative air quality information. PAQI crowd-sources low-cost air pollution monitors across the city, reporting hourly readings on Twitter and a mobile app at no charge.

Private sources such as the PAQI may improve access to air quality information, but their efficacy depends on how accurate citizens find the information and how these citizens’ beliefs on accuracy shape which sources they prefer. Given competing information sources, we don’t know whether actual service quality or beliefs about the sources’ quality drive the demand for such information.

We study Lahoris’ beliefs about and demand for air quality information by asking the following questions:

- Are Lahoris willing to pay for air quality information regardless of its source?
- Does their willingness to pay for air quality information vary by source?
- Does the source affect their beliefs about service quality and the state of air pollution?
- Does exposure change their preferences for sources?

## Experimental design

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To answer our questions, we conducted a randomised controlled trial with roughly 1,000 residents of a lower-middle-income Lahori neighbourhood. We first developed a forecast model of day-ahead air pollution using data from both government and private sources. We then provided the forecasts through SMS to all our respondents daily for two months. But we randomised the disclosed source of information—in one treatment arm, we informed respondents that we constructed the forecasts using a government source (EPD), while in the other treatment arm, we informed respondents that we constructed the forecasts

using data from a private source (PAQI). Thus, we provided respondents with identical forecasts while varying the attributable information source.

## Findings

We find that:

- Lahoris value air pollution information. Our respondents—residents of a working-class neighbourhood—are willing to pay Pakistani Rupees (PKR) 238 on average to continue receiving air pollution forecasts for another two months. This amount roughly translates into the cost of monthly prepaid mobile and data services.
- Source of information doesn't matter. Telling respondents that the forecasts they receive stem from a government source or a private source doesn't lead to differences in willingness to pay for the forecasts.
- Source of information doesn't change respondents' beliefs about air pollution levels, but it does slightly shift beliefs about the accuracy of the forecasts. Respondents who receive forecasts attributed to the government expect a 12 percent higher error in the forecast relative to the private arm.
- Recipients prefer the source that we assign to them. They split a PKR 100 endowment roughly 75:25 in favour of the source assigned to them.

## Policy takeaways

Our work demonstrates that:

- Lahoris value air pollution information and that the source of information doesn't change their willingness to pay for it—even if they believe that the government provides low-quality data relative to private sources.
- Private firms have an opportunity to sell air quality information to residents.
- Policymakers can leverage private sources to scale up the provision of air quality information, which would considerably enhance public welfare.