

Household Responses to Personalized Risk Information

Benjamin Krebs^{1,*}, Matthew Neidell^{2,3,4}

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Abstract

We study how personalized information affects household responses to environmental risk. Using data from residential air quality monitors, we exploit the timing of monitor installation and high-frequency fine particulate matter (PM_{2.5}) readings to identify responses to new information about indoor pollution risk. We find that indoor PM_{2.5} concentrations decline by 2.5 $\mu\text{g}/\text{m}^3$ over the 12 weeks following installation, conditional on contemporaneous outdoor pollution, with effects significantly larger among households with high initial indoor pollution. The indoor-outdoor pollution gradient declines over time, indicating that households become increasingly effective at mitigating exposure when marginal health damages are highest. Using machine learning techniques to infer cooking activity and air purifier adoption, we show that households respond primarily through durable defensive investments rather than reductions in pollution-generating behavior, with back-of-the-envelope calculations implying positive net benefits. Our results suggest that personalized monitoring transforms air pollution from an external threat to avoid into an internal risk that households can control.

Keywords: indoor air quality, pollution monitoring, pollution information, avoidance behavior, defensive investments

JEL codes: D81, D83, I12, Q53, Q55

¹ Faculty of Business and Economics, University of Basel, Switzerland

² Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY, USA

³ National Bureau of Economic Research, Cambridge, Massachusetts, USA

⁴ IZA Institute of Labor Economics, LISER, Luxembourg

* Corresponding author: benjamin.krebs@unibas.ch

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