

# Measuring Poverty and Vulnerability in Real-Time

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## Abstract

In wealthy nations, novel sources of data from the internet and social media are enabling new approaches to social science research and creating new opportunities for public policy. In developing countries, by contrast, fewer sources of such data exist, and researchers and policymakers often rely on data that are unreliable or out of date. Here, we develop a new approach for measuring the dynamic welfare of individuals remotely, and in near real-time, through analyzing their patterns of mobile phone use. To benchmark these methods, we conducted high-frequency panel surveys with 1,200 Afghan citizens, and with the respondent's consent, matched each individual's responses to his or her entire history of mobile phone-based communication, which we obtained from Afghanistan's largest mobile operator. We show that mobile phone data can be used to accurately estimate the social and economic welfare of respondents, and that machine learning models can be used to infer the onset and magnitude of positive and negative shocks. These results have the potential to transform current practices of policy monitoring and impact evaluation.

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