Data From Expanded Surveillance Shows the Value of Information

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Coronavirus has illustrated the critical, growing importance of surveillance in managing public health risks. The governments that implemented timely, aggressive testing of their populations — such as South Korea — were able to craft targeted containment measures to limit the infections in their societies, while those governments that lagged dramatically in the scope and speed of testing found their people bearing greater health risks and their economies experiencing more precipitous falls in output. These stark differences illustrate the value of information produced through surveillance, which also motivates an array of monitoring, reporting, and related data compilation efforts in the environmental realm. This promotes sound policy, provided there are adequate privacy safeguards.

Countries that quickly deployed testing did better in response to the COVID-19 virus

Surveillance represents the systematic collection and analysis of information that can provide the evidence for effective responses to environmental and health risks. Let me illustrate the value of such information in a variety of environmental policy contexts.

In implementing the Clean Air Act, EPA identifies health risks by integrating air quality data from its monitoring of ambient concentrations of ozone, fine particulate matter, and other pollutants with an epidemiological understanding of the health risks posed by these pollutants. Based on this evidence, EPA has implemented regulations — technology standards, performance standards, and cap-and-trade programs — that target the communities across the country experiencing high and unhealthy levels of air pollution.

In reviewing the performance of these air quality rules, researchers have compiled and analyzed data to show that these regulations have reduced pollutant emissions, ambient concentrations, premature mortality, and medical expenditures, while increasing labor force participation and labor compensation. Both the targeted design and the evaluation of policy performance requires a robust system of monitoring and data collection across environmental, health, and economic domains.

Publicizing environmental quality and public health information can facilitate behavioral changes that reduce exposure to health risks. Consider two examples. Lori Bennear of Duke University and Sheila Olmstead of the University of Texas evaluated a requirement under the Safe Drinking Water Act that community water suppliers have to inform their customers of their compliance with water quality standards. The two evaluated a wrinkle in the rule to assess the role of information. Small servers only have to post notice in public places (e.g., the town hall), while larger utilities have to mail this information annually to every customer. The researchers found that after larger suppliers began mailing notices, their violations of health standards fell by half. Such publicity empowered customers to hold accountable their water companies.

Combining monitoring data with models has enabled governments around the world to predict the next day's air quality. In response, individuals change their behavior, as evident both in reduced outdoor recreation in response to Los Angeles smog alerts as well as increased online search activity for masks in response to Beijing air quality forecasts. Such actionable information that allows individuals to reduce their exposure to a risk complements well government regulations.

Surveillance plays a critical role in multilateral efforts to address global challenges, such as climate change. Countries report on their greenhouse gas emissions and their policy efforts to mitigate those emissions, which are then subjected to both expert review and peer review. Publicizing such performance can build trust in multilateral climate agreements, identify those countries with effective efforts that could be emulated, and shame laggards.

Opportunities for new tech and related data sources can further enhance the information about environmental and health risks. For example, remote sensing and drone monitoring can improve our understanding of pollution concentrations well beyond the proximity of an in situ monitor. Statistical and machine-learning tools can exploit big data sets to extract information signals about emerging risks. Social media activity, such as tweets and online searches, can likewise provide information about how individuals perceive or respond to environmental risks.

As the response to the coronavirus has shown, surveillance of environmental and health risks can ensure that policymakers have the information they need to craft effective public policy. With the potential for new, unexpected risks, as well as the prospect that some regulations and policies don't work as well as envisioned, a robust surveillance system with appropriate safeguards is important to mitigate environmental and health risks. Making such information available to the broader public can also increase the likelihood that policymakers will be held accountable for implementing policies to protect the public health.