

# How can policymakers cope with ambiguity?

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How might policymakers make reasonable decisions when they have limited information?

That's the question Northwestern University's Charles F. Manski explores in his new paper, "Vaccination With Partial Knowledge of External Effectiveness." The paper is published online by the [Proceedings of the National Academy of Sciences](#) (*PNAS*).

"Let's say you're a public health official from the Centers for Disease Control, and you don't really know how much disease is going to be averted by vaccinating different fractions of the population," said Manski, the Board of Trustees Professor in Economics in the Weinberg College of Arts and Sciences. "Then how should you choose a policy? That's really what the paper tries to address."

In his paper, Manski sets up the following scenario: "You can look back over the last year and say we vaccinated 30 percent of the population, and this is what happened. But the question you want to answer is whether 30 percent is a good fraction to vaccinate [from a public health perspective] because you don't observe what would have happened if last year you had vaccinated 40 percent, 20 percent or 80 percent."

In this case, Manski, whose research spans econometrics, judgment and decision, and the analysis of social policy, said there are at least two sources of partial knowledge. First, the policymaker may only partially know how effective the vaccination will be in generating an immune response. Second, the policymaker may only partially know how

effective the vaccination will be in preventing transmission of the disease to members of the public.

Applying ideas developed in research on decision-making under ambiguity, Manski recommends that the planner or policymaker first determine which vaccination rates are inferior and eliminate them. Focusing on the remaining possibilities, Manski then shows what vaccination rate the planner should choose if he applies one of two decision criteria. Both criteria protect the planner from poor outcomes, but in different ways.

Manski became interested in vaccination policy in light of H1N1. However, he said his paper is more relatable to a disease that occurs in the same way every year, like the regular seasonal flu, measles or mumps. Not enough is known about H1N1 to have long-term observable data. "If we get H1N1 next year, what I did in this paper would become more relevant," he said.

Manski said the issue of making public policy with limited information applies to many other issues that are currently in the headlines.

"Take one that's very controversial today - global warming," he said. "We have limited information on what exactly is happening. There's a lot of disagreement, and yet we have to make some decisions now."

**More information:**

<http://www.pnas.org/content/early/2010/02/05/0915009107.full.pdf+html>

Provided by Northwestern University

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