

Bridging the Science-Policy Divide

Prolonged negotiations and insufficient policies to mitigate climate change and biodiversity loss are often attributed to policymakers' lack of understanding of the relevant science. Conversely, what do scientists need to understand about the policymaking process in order to engage policymakers productively and communicate their research effectively in this context?

Certainty amid Uncertainty



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Arresting climate change and averting the worst of the sixth extinction are immense global challenges that often seem beyond the scope of decision authority. On the short cycles of politics and finance, these challenges are too often regarded as something that will happen to someone else, somewhere else.

We crave certainty—especially amid uncertainty. And it is in this context that scientists and technical experts are often called upon for insight and guidance. As scientists navigate this balancing act, it is important that they understand the time frames, constraints, and risk matrices within which a policymaker or decision taker works.

This is apparent during the coronavirus disease (COVID-19) pandemic as we rely upon scientific advisors and institutions for expert advice amid uncertainty. In some countries, we see experts cowed by needing to feed politicians what they want to hear. The present crisis demonstrates that it is essential to protect independence and to be clear about where certainty can be found. Here, scientists and experts can learn lessons from public health and the military, where the practice of grading outcomes—low, medium, or high probability—has become routine and is readily understood by those in command (<https://doi.org/10.1098/RSOS.181870>).

In our post-truth world, mutual understanding between expert and policymaker has been complicated by the erosion of trust in expert individuals and institutions. Adhering to principles of greater transparency could allow coalitions to form and action to be taken. There is also inspiration in the pleas of young people around the world that experts be listened to, that science be put back at the heart of decision making, and that governments tell their peoples the truth.

Learn the Rules of Their Game



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When thinking about the policy relevance of their work, researchers tend to address imagined rather than actual policymakers. They need to gain a better understanding of real-world policymaking. Everyday life in governments doesn't always resemble textbook knowledge about how it is supposed to be working (the same goes for research organizations).

Looking at climate policy, it is clear that insufficient action cannot be explained by a lack of knowledge. 30 years after the Intergovernmental Panel on Climate Change's First Assessment Report, every government knows that halting climate change requires drastic cuts in emissions—which doesn't mean it is an easy thing to do. But overcoming the various barriers is not so much a question of more evidence but of clever politics.

In governments and parliaments, consistency of talk, decisions, and action is more the exception than the rule. Because organizations strive to enhance legitimacy and external support, scientific evidence is just one of many factors affecting political decisions, such as voter preferences, available funds, competing interests, and path dependencies. "Evidence-informed" rather than "evidence-based" policymaking is the best we can hope for.

There are no silver bullets in how to achieve that. Too much focus on framing or storytelling from the start risks undermining the integrity of research itself. Furthermore, much depends on different types of political systems, policy domains, and organizational cultures. Maybe the best way to learn what you are dealing with is to switch sides temporarily. After a 3- to 6-month secondment to a government ministry, you will have a much clearer picture of what policymakers really need—and whether you are willing to deliver it in the future.

Science, COVID-19, and Climate



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Whether in the COVID-19 pandemic or the climate crisis, society depends on scientists to diagnose, prevent, and treat our predicament. Allow me to propose a few early lessons from the COVID-19 pandemic on the essential role of science for a measured and adequate policy response:

First, things can spin out of control very quickly, and distant events can alter our lives profoundly. Neither a pandemic nor global heating is a linear event. Exponential growth of an infectious disease leads to a global plague within weeks. Climate-change impacts are erratic and can trigger feedback loops that alter our environment within a few years.

Second, small numbers can have tremendous effects. Whether the case fatality ratio of COVID-19 is 0.5% or 3% results in hundreds of thousands of additional deaths. Whether climate change will be contained at 1.5°C, 2°C, or 3°C will determine how livable life on this planet will be.

Third, preparedness matters, and underinvestment hurts. Institutions need to be built in times when the crisis still seems distant, and research requires stable and strategic funding. Emergency readiness needs to be systemic and achieved at both national and global levels.

Fourth, changes in society and behavior are possible. However, climate change demands behavioral change that needs to be built and sustained over long periods and requires a strategic cooperation among politicians and social science.

Fifth, international cooperation—both among governments and within the scientific community—is essential to ensure synergies in the search for responses and an efficient and effective use of resources. Politicians can learn from the research model of international collaboration and shared interest in results.

These days, politicians turn to virologists for advice—they have quickly advanced to become the most trusted persons in public life. This crisis provides us with an opportunity to raise the profile of scientists defending other public goods, most notably a stable climate.

Scientists, Focus on Science



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I am no longer convinced that it is the scientist's job to *actively* try to influence policy. Too many such attempts end in (1) scientists being co-opted, (2) research being seen as complicit, or worst of all, (3) science being compromised.

Except in a few very exceptional cases, scientist playing policymaker is a doomed enterprise. It confuses the very distinct—and, yes, different—roles that the makers of policy and the purveyors of science are supposed to play. Also, it is no less arrogant than policymakers trying to play-act as scientists.

Importantly, the fundamental paradigm of doing science and doing policy can often be at odds. Science privileges knowledge over all else; policy gives that place of prominence to action and, therefore, often to expedience. Science is about understanding things; policy is about getting things done. Science is driven by a search for the best answer; policy is a quest for the workable. Even in knowing that it will never find it, science seeks the perfect answer; for policy, good enough is better than nothing. Good policy might sometimes require necessary compromise; good science never does.

The two, therefore, are bound to clash.

Science *should* influence policy, and it does so best by recognizing this dichotomy. It should not be the scientist's job to morph to the complications and convulsions of the policy process. Clear communication is a scientific virtue, but the audience must never compromise the message.

The scientist's job is to do good science and then agitate for it. Much as truth speaks to power, science (and scientists) must learn to speak to policy on its own terms: clearly, honestly, without compromise, and without apology.

Knowing the Stakes



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Scientists need to know that making policy decisions often involves tough trade-offs with winners and losers. Policymakers operate in a world of competing interests and uncertainty. Scientists need to provide clarity: what we know and how to connect that to options, interests, and outcomes. What scientists do best is warn us of threats before they fully materialize and guide decision makers on which pathways avoid the greatest risks. Scientists in academia and industry have known about the risks of climate change for over half a century. But facts don't make change; people do. And the same set of facts can mean different things to different people. Let's take air pollution as an example: scientists need to distinguish between science questions and policy questions. How many people will be hospitalized as a function of air pollution? How many hospitalizations are too many? The first is a science question that sets the playing field and lays out the stakes. The second is a policy question—and not an easy one. No elected official wants to say on the record that it's okay for thousands of kids to be hospitalized. Rarely are science and policy questions so clearly distinguished. Scientists need to understand the context in which policymakers are working and provide them with clarity: what are the stakes? What will the proposed solutions deliver in terms of avoided risks and benefits and to whom? By making the stakes and consequences clear, scientists can help us hold our policymakers accountable both for policy delay and for proposed actions.

Science-Policy-Society Nexus



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"Science without policy can be scattered and often fruitless. Policy without science usually fails to accomplish the immediate goal, and undermines confidence that the next policy will be any better. When science and policy unite, the chances of success increase greatly," wrote the Scientific Advisory Board of the UN Secretary-General, of which I was a member, in 2016 (<https://unesdoc.unesco.org/ark:/48223/pf0000245801>). Comprising 26 scholars from around the world, the board provided advice on science, technology, and innovation for sustainable development. Effective engagement of society, we found, will be critical to solving global problems of human and planetary health. Scientists and policymakers operate on different priorities and time frames and carry different levels of accountability. Policymakers are often driven by short-term directives that pay little if any attention to the more fundamental, long-term view that science articulates. Many scientists, on the other hand, produce highly specialized research for peer-reviewed journals and are not familiar with the complexities or practical problems of policymaking and implementation. For scientists to affect policy, it is critical that they take on current societal challenges, communicate with political leaders and societal groups in language that is accessible, and systematically engage in the policy process. Being in the room where negotiations take place and decisions are made takes time and patience. It requires humility and respect for the process and the people carrying it out. Decision makers who would benefit from scientific knowledge should, in turn, make science and scientists an integral part of the policy process from the outset. A functioning science-policy-society interface will ensure that people trust scientific experts, citizens trust policymakers, and governments implement science-informed policies.