How science can best service policymakers

Keynote Session: Science Advice to Government

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Panelists: **Maryse Lassonde**, President elect, Scientific Director, Royal Society of Canada, Fonds de Recherche du Quebec-Nature et Technologies; **Alan Bernstein**, President & CEO, Canadian Institute for Advanced Research; **Arthur Carty**, Executive Director, Waterloo Institute for Nanotechnology at the University of Waterloo; **Sir Peter Gluckman**, Chief Science Advisor to the Prime Minister of New Zealand; **Remi Quirion**, Chief Scientist Officer, Government of Quebec

Takeaways and recommendations

- ✓ Establish a sound science advisory system based on best practices in other countries
- ✓ Reinstate a national or chief science advisor and chief scientists in key science-based departments
- ✓ Commit to an open dialogue with scientists and the public on a long-term vision for science, technology and innovation
- ✓ Establish firm principles prescribing science-government relations and the use of evidence into the policymaking process
- ✓ Create a Parliamentary Office of S&T
- ✓ Ensure science advice is independent
- ✓ Create direct reporting lines to decision-makers
- ✓ Focus on evidence to inform policy, distinguishing that from policy for science
- ✓ Honest brokerage is not advocacy
- ✓ Acknowledge the limits of knowledge and report in probabilistic terms
- ✓ Trust in science advice is critical

The policy issue: Canada's new Liberal government has promised that science, facts and evidence will inform future policies. "This will not come easy," said Carty, "because practices such as control over messaging and restricting federal scientists from communicating with the public and their community are now embedded in the (Canadian) system."

Countries everywhere face challenges when it comes to collecting, presenting and ensuring the effectiveness of scientific advice in the policymaking process. In particular, what is the best approach to ensure that scientific advice is integrated within decision making at the highest political levels?

"It will require a fundamental change in attitude, philosophy and transparency within government and by the bureaucracy as well as a commitment to a dialogue with scientists and the public on science issues," said Carty, who served as Canada's science advisor from 2004-08.

Different countries have adopted different models: some have chief science advisors (U.K., U.S., India and New Zealand), while other countries rely on an advisory board or have both. In Canada the national science advisor was replaced with the Science and Technology Innovation Council. The new Liberal government has since established a Science Minister.

Globally, there has been an upsurge of interest and debate on issues of science advice to governments, science advisory systems and the role of chief science and scientific advisors within those systems. This interest is being driven by complex societal questions around human health and the environment and unprecedented advances in life sciences and computational sciences. "We're moving into areas with inevitable unknowns" and "areas where governments most want our help", said Gluckman.

Policymaking is changing as well with decision-makers under increasing pressure to deliver policy decisions faster, noted Gluckman. "The 24-hour news cycle, social media, the expectations of hyper-informed and often misinformed public, means that the concise policy cycle you see written about in textbooks just doesn't exist."

Gluckman also prefers the term "evidence-informed" rather than "evidence-based" decision-making since policymakers and politicians need to balance myriad interests and trade-offs in reaching decisions, including fiscal priorities, public opinion, diplomatic considerations and political ideology.

The options: All panelists shared several suggestions for improving both the quality of science advice and the best mechanisms for sharing this advice with decision-makers (see Takeaways list).

Regardless what model for science advice is chosen, Quirion said personal relationships and trust are paramount. "Where this really counts is with informal advice", which accounts for the majority advice he's called upon to provide.

To help scientists better communicate their findings, he encourages them to keep their presentations to elected officials short, just four-or-five minutes. Those presentations prompted a group of MPPs to recently create a working group that will call on scientists as issues arise. First on their list: gene editing.

In Quebec, the Chief Scientist Officer is not a political appointment. The position currently reports directly to the minister of Higher Education, Research and Science, not to the premier. In addition to providing science advice, the mandate includes increasing the visibility of Quebec scientists through international partnerships and finding better ways to link science and society. He also chairs the board of the province's three research granting agencies and encourages inter-sectoral research on issues like climate change and an aging population.

"There was no job description for this when I started four years ago. That's the beauty of it. You write your job description as you go along," said Quirion.

Bernstein pointed out that it's all well and good to provide science advice, "but someone has to want it and want to hear it". "We have some capacity building to do to get that advice listened to." That requires a strong and coordinated science advisory mechanism to avoid giving decision-makers conflicting advice.

Advisors should also look beyond their own borders for answers. "Canada is four to five percent of the world's scientific literature which means 95 to 96 percent of the science outside of this country … As (Louis) Pasteur said, 'science knows no country."

There's no shortage of global expertise Canada can tap into, including CIFAR fellows, the International Network for Government Science Advice and the APEC Chief Science Advisors and Equivalents, the latter co-chaired by Gluckman.

"In Britain for example, when they are asked for science advice during an emergency, they will, where appropriate, call on other international experts," said Gluckman.

References:

Sir Peter Gluckman's Top 10 Principles of Science Advice, Nature, March 2014; www.nature.com/news/policy-the-art-of-science-advice-to-government-1.14838