New report recommends research agenda for effective science communication

December 14 2016, by Dana Korsen

A new report from the National Academies of Sciences, Engineering, and Medicine highlights the complexity of communicating about science effectively, especially when dealing with contentious issues, and proposes a research agenda to help science communicators and researchers identify effective methods. The most widely held model of what audiences need from science communication—known as the "deficit model," which focuses on simply conveying more information—is wrong, the report says.

A major research effort is needed to understand the complex factors that affect science communication – for example, the ways people process the scientific information they hear, and the individual and social factors that influence people's trust in science and in sources of information about it. Research is also needed to help science communicators identify the right communication approach for their particular goals, determining which approaches are effective for whom, when, and under what conditions, the report says.

"Science communication is a complex task and acquired skill. There is no obvious approach to communicating effectively about science, particularly when it is a contentious issue such as climate change, stem cells, vaccines, or hydraulic fracturing," said committee chair Alan Leshner, chief executive officer emeritus, American Association for the Advancement of Science. "More research needs to be conducted to strengthen the science of science communication and work toward evidence-based practices."

Using the popular deficit model, it is frequently assumed that a lack of information or an incomplete understanding of science explains why people don't accept a scientific finding or make choices consistent with the scientific evidence. However, research shows that audiences may already understand the science but for diverse reasons don't agree or act in ways consistent with science. People rarely make decisions based only on scientific information; they typically also take into account their own goals and interests, knowledge and skills, and values and beliefs. A focus on knowledge alone often is not enough to achieve communication goals, the report says.

Particular complexities arise when communicating in the face of controversy, when conflicting beliefs, values, and interests become central to a debate. The voices of organized interests become amplified, making it difficult for authoritative voices from science to be heard. More also needs to be known on how to effectively convey scientific consensus as well as scientific uncertainty.

Engaging the public in formal dialogue about science is important for sharing information needed for a decision and for finding common ground among diverse stakeholders, the report notes. While research shows that undertaking public engagement as early as possible in a public debate and having repeated deliberations over time to build trust among diverse participants can lead to effective public participation, additional study is needed to examine ways to best effectively communicate science to the public.

Science communication also needs to keep pace with changes in media, the report notes. Today, people encounter scientific information from a wide variety of media sources, including blogs, social media feeds, and podcasts. Research is needed to understand how individuals and groups derive and evaluate information from the various media outlets, and communicators must take advantage of new opportunities and find

effective approaches in this competitive and complex environment.

Going forward, research needs to take a systems approach, one that understands that science communication is a complex system of many interrelated parts – the content to be communicated, the communicator, the audience, and the communication channel. Research should be focused to simulate real-world communication environments; conduct randomized controlled field experiments to assess the impact of a particular approach to communicating science on changes in understanding, perception, or use of science; and use large data sets to assess changes in response to science communication.

The report also identifies some specific communication practices that need more research—for example, how science communicators approach debunking misinformation and correcting information that is inconsistent with the weight of scientific evidence. Under most circumstances, doing so is difficult: Repeating false information can reinforce belief in that information, even if it is followed by a correction. More study is needed to determine for whom and under what conditions the current understandings about debunking apply. Other practices that need more study include framing, which presents information in a certain light to influence what people think, believe, or do, and using narrative to explain complex issues.

The committee identified several areas to enhance the infrastructure of science communication research. Researchers and practitioners of science communication should partner to translate what is learned through research into practice and develop detailed research agendas. In addition, researchers from diverse disciplines need to work together. New or refocused journals for science communication research and other forums would support these collaborations. The report calls for the recruitment of more scientists, particularly in the social and behavioral sciences, to examine science communication. Also, the mechanisms to

ensure the rapid review and funding of certain science communication research are needed when issues such as the Zika virus emerge suddenly and important messages from science need to be communicated.

More information: Communicating Science Effectively: A Research Agenda (2016). www.nap.edu/catalog/23674/comm … ly-a-research-agenda

Provided by National Academies of Sciences, Engineering, and Medicine