



SCIENCE COMMUNICATION IN THE 21ST CENTURY: RESPONSIBILITIES, SOCIAL MEDIA, AND FAKE NEWS?

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Interview

Do you also have a relative still believing that diet products cause cancer? Or that vaccinations will cause autism? And how many of your friends have asked you whether the COVID-19 virus was indeed created in a lab? Science myths like these can be sturdy and widespread, even in this era of information abundance. While information has never been this accessible and fast-spreading, the same applies to misinformation. Especially in light of the ongoing pandemic, it is often stated that “science communication is more important now than ever” [1]. But is there really an ever-increasing urgency to communicate science more and better? And how should this be addressed?

The communication of science

Science can be communicated in many forms and for many reasons. Any activity, skill, media, or dialogue may be used to invoke public awareness, enjoyment, interest, opinion-forming, or understanding of science [2]. While scientific discoveries are expected to contribute to the growth and welfare of society, one could say that “a scientific discovery is only as good as its communication” [3]. Plain facts alone often do not bring about changes in behaviour, and only a well-informed society can make meaningful choices about the benefits and risks of scientific developments [4, 5]. The importance of science communication has become even more apparent during the ongoing pandemic, where public misbeliefs about topics such as vaccination may hinder the efforts to control the pandemic [6]. While a shift from conventional to online and social media is enabling a rapid spread of misinformation, it also

offers opportunities for science communicators to reach a wide public [7]. In order to discuss these challenges and opportunities, RAMS interviews two enthusiastic science communicators, Shweta Mahajan and Anne van Kessel. Mahajan, currently a master's student in Molecular Mechanisms of Disease, communicates science through her podcast “Science with Shweta” and recently also started a Youtube channel and Instagram page for this purpose. Van Kessel is a freelance science journalist, communicating science through a variety of platforms, including news articles, television, radio, and books.

Science journalism

The majority of scientists seem to endorse the importance of science communication. For example, a recent survey among 3,700 researchers in Sweden showed that nine out of ten researchers were



Shweta Mahajan, MSc (Master's student molecular mechanisms of disease)



Anne van Kessel, MSc (Science journalist)

positive about communicating their science to the public, with the most important reason being that the results should be utilised by society [8]. Yet, not all scientists communicate science (effectively), and, at the same time, not all science communicators are scientists. Van Kessel points out that science journalism, which is a branch of science communication, is performed by journalists, not by active scientists. After all, journalism should be unbiased and independent [9]. "Of course, you could still discuss whether these journalists should have some background in that scientific area as well or whether the job could also be done by general journalists. Some may say that not having this background knowledge will help you in identifying with the reader and [identifying with] what the reader wants to know. At the same time, having this [scientific] background as a journalist will help you to better understand what you are writing about. You will be able to read and understand the original papers better, and you will know if something is truly groundbreaking."

The role of scientists

While science journalism may be reserved for objective journalists, active scientists can communicate their own research in many other ways. Mahajan believes that scientists themselves indeed have an important responsibility to fulfil. "I think that communication merely between science communities belongs to the old days. Right now, scientists should really be reaching out to the people. They [the scientists] play a big role in passing on information as they know the scientific basis. They can bust the myths existing in people's minds and in society." However, not all scientists might actually have the motivation to communicate their research or lack the right skills or time to do so. "I think it is a combination of all those factors," says van Kessel. "It does not fit every scientist. You need to have a certain feeling for it, and you have to enjoy it. It really is a specific skill and not everyone can do it naturally, but I do believe that anyone can learn it. Yet, scientists and physicians are already busy. They should get the time to engage in science communication activities. Having to do all that in your spare time, does not make it very attractive, of course."

So it seems that in order to let scientists fulfil their role in communicating science, they should be provided with the right motivations, skills, and time. "It is more and more often a requirement for science funds to show how you communicate your research to the general public and how you will engage the public," confirms Van Kessel. "In that sense, scientists are stimulated to be involved in science communication. At the Radboud Institute for Health Sciences, for example, all starting PhD candidates also get an introduction on science communication, which includes training on how to sell your science." Mahajan agrees that the right training and rewards are important and emphasises that this could already start at the level of the student: "We should already try to engage students more through such education; tell them why science communication is important and to reach out. Because they will be the next generation of scientists."

The rise of social media

In today's society, social media play an important role in the way people interact and communicate with each other. Mahajan and Van Kessel both see the potential of using social media in science communication. Mahajan mentions, "If we are already using it for all other purposes, why do we not make the best out of it?" "I see it as a chance; you can discuss your results or research with a broad audience," says Van Kessel. Around 2013, widespread adoption of social media was not yet present among scientists, and it was mainly used for communicating and networking with other scientists [10]. Currently, social media are being used more and more by scientists from all disciplines to communicate their work [11]. Van Kessel

mentions that individual researchers are different in their social media use. "Some researchers really like it and want to invest time in it, whereas for others it is not their cup of tea and [they] do not invest the time." Twitter seems to be the preferred medium as it has the potential for quick and broad engagement [12]. If the scientist has a sufficient number of followers, the reach will increase exponentially, breaking the barrier between scientists and the public [13, 14]. "Right now, [when you search for a scientist], they have their own website but they also have their own Twitter account, and a lot of them are really active on Twitter," mentions Mahajan. Van Kessel notes, "There are several accounts, like NLwetenschap and NLzorg, that let doctors and researchers show their daily life. That is really nice for the public to follow." To reach young adults, Facebook seems to be more effective than Twitter [15]. "A lot of young people are on social media, and if we want to reach them, then it [social media] is a good platform," says Mahajan. She also notices a shift in her audience: "There is a lot of difference between now and three years ago. Many more people are reaching out to me and following other people that are into science communication."

However, as every coin has two sides, there are downsides to the use of social media. Scientists should be aware of their role on social media, according to Van Kessel. "If a doctor publishes a politically sensitive post on their personal account, while he/she is an employee of the Radboudumc, for example, people will make a connection. So you have to carefully decide what to put on your social media." The rapid nature of social media makes this even more important as it is difficult to rectify mistakes as they rapidly spread to a wide audience [12].

Misinformation and fake news

Social media use is increasing and with it the fear of misinformation and fake news. Misinformation in the public can disconnect the public opinion from the scientific consensus [16]. With an increasingly polarised political environment and changes in how information is shared by the media, misinformation and fake news are a real threat [16]. The World Economic Forum has recently called on scientists to provide the public with factual information via social media to prevent and decrease fear of COVID-19 among the public in the light of the current pandemic [17].

Unfortunately, there is little research on the prevalence and impact of fake news [18]. On Twitter, fake news travels far more rapidly than true information [19]. Automated bots can magnify the spreading of fake news by liking, sharing, and searching for information [18]. One effort estimated that 9 to 15 per cent of Twitter accounts were bots [20]. Van Kessel says: "I think that it is hard to prevent fake news from being distributed because there is no limit to what people can post on the internet." People can become misinformed due to a lack of understanding of science, conspiratorial beliefs, and selective exposure [16]. "[As a science communicator], you should be wary of spreading fake news. So, your sources should be on point and you should have spoken to an expert who was not involved in the research," Van Kessel notes. Hype and overclaims in press releases and other scientific communication might lead to misinformation of the public [16]. According to Van Kessel, every press release is prone to overclaims. "With a press release, the scientists and PR department want to bring the news into the media. So, in some way they are selling the research, making it prone to exaggerations."

Conclusion

Scientists are aware of the importance of science communication, yet not all scientists do communicate their science. While the specific area of science journalism is reserved to objective journalists,

scientists can reach out to the public and share their results and research themselves. However, lack in, for example, motivation, time, and skills seem to be discouraging scientists. Over the last few years, social media are increasingly used by scientists to communicate about science. Although this trend provides opportunities, social media should be used with caution. With the increase in social media use, misinformation and fake news are also becoming more of a problem. The risk of disconnection with the public opinion is present, making it more important than ever for scientists to share the correct information. Above all, 'a scientific discovery is only as good as its communication' [3].

Recommendations on science communication

Recommendations from the authors/RAMS editors

Science Cafe Nijmegen - Monthly meeting with scientists in the Irish Pub named Shamrock.

Museum for Anatomy and Pathology - Museum within the Faculty of Medicine concerning the human anatomy and pathology.

Recommendations from Shweta Mahajan

Richard Dawkins - The Selfish Gene

Stephen Hawking - A Brief History of Time

Stuff You Should Know - A science podcast that explains everything in layman terms

Science Vs - A casual podcast busting science myths

Recommendations from Anne van Kessel

NRC Podcast - Onbehaarde apen over wetenschap

Tijs Stehmann - Dokter ik las in de krant dat...

Ionica Smeets - Het exacte verhaal

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