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Risk Perception and Risk Acceptance: The Need of Effective Communications to Fill the Critical Gaps between Society and the Scientific Community

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Effective nuclear science communications can inform people about benefits and risks, allowing them to make decisions and choices. Nevertheless, regarding radiological protection, controversies and misinformation distort public's perceptions of radiation risks. This paper offers an overview of ineffective mass media communication and its impacts on citizens´ perceptions of nuclear technology. There seem to be a gap between society and the scientific community. The general public do not read high-specialized articles written by scientists. In Knowledge Society, where Internet and social media are the most common source of information, opinion makers seem to privilege sensationalistic rumors about the harmful effects of ionizing radiation, environment contamination and accidents. Moreover, available information about the biological effects of the exposure to ionizing radiation confuse public's perceptions of radiation risks and benefits. Whether experts agree that radiation causes observable health effects at high doses, Internet highlights controversies on the biological effects of low-dose radiation. Internet reports that the exposure to indoor radon is a risk factor for lung cancer. Internet reports that the radioactive monazitic sand brings health benefits. It is not easy for the general public to understand contradictions and to identify reliable sources. This article presents and discusses examples of pseudo-scientific information, newspapers errors, fake news, and anti-nuclear didactic material, where basic concepts are manipulated, and omission of vital information leads the public to mistrust and fear. Unfounded prejudices, misconceptions and misinformation are delivered in TV news, Internet articles, social media, TV series, cartoons and even through science journals. The general public, most often, do not have trustful information about radiological protection regulations and recommendations regarding human health, environment protection, management of radioactive waste or safe transport of radioactive material. Finally, this paper emphasizes the importance for scientists to be able to communicate to the public, developing science-based communication programs, evaluating the adequacy of those communications, investing in properly scientific divulgation about the risks and benefits of nuclear sciences that impact in citizens´ everyday life, such as medical applications, industrial applications, public safety and nuclear power generation. The balance between risk perception and risk acceptance depends on effective, trustworthy and understandable information. It is essential to educate educators and opinion-makers, combating fake pseudo-scientific information, social networks sensationalism and omissions of the media.

Keywords: Radiological protection, Risk perception, Public acceptance