**Communicating Health Risks from Nuclear Accidents**

An open seminar was held on 15 October 2014 featuring a talk by Prof. Gerry Thomas (Professor of Molecular Pathology at Imperial College London). The seminar was co-organized by the Fukushima Global Communication (FGC) programme of UNU-IAS and the British Embassy Tokyo, with the aim of exploring the challenges of communicating health risks from nuclear accidents.

In opening remarks, Prof. Kazuhiko Takeuchi (Senior Vice-Rector, UNU) outlined the difficulties associated with understanding the risks of radiation and communicating these in an understandable manner to a broad range of stakeholders. He highlighted frustrations among the general public with determining which sources of information to trust. The human-centered approach adopted by the FGC seeks to address such concerns, among other things through an improved understanding of how people perceive radiation threats.

Prof. Gerry Thomas began her talk by explaining how people's fear of radiation can be traced back across decades of negative reporting. Fears of nuclear fallout from the use of atomic weapons have been compounded more recently by careless reporting of health risks associated with nuclear accidents in Chernobyl and Fukushima. Crucially, she noted that there is a range of types of radiation, including natural radiation and medical radiation, the risks of which are broadly accepted.

A further complicating factor noted by Prof. Thomas is that health effects from radiation always involve a combination of exposure and tissue dose. Exposure, in turn, can be either external (e.g. wave forms like gamma or X-rays), or internal (e.g. through the ingestion of particulates with □, □ radiation). The tissue dose resulting from the ingestion of radioactive isotopes likewise depends on the type of isotope, the body's ease in absorbing it, and the length of time it remains in the body.

Building on this complex typology, Prof. Thomas then introduced the linear no-threshold (LNT) hypothesis relating dose to increased cancer risk due to radiation. She explained that the plot is well-defined at its upper

limits, but that few data points exist for the lower-end of the graph, leading to scientists taking a precautionary approach in extrapolating the remainder of the lines and curves. Despite the limited amount of data available regarding these lower thresholds, Prof. Thomas noted that it is precisely these low-level doses that are most prevalent in the Fukushima and Chernobyl nuclear accidents.

Adding further emphasis to her explanation of the low doses associated with the Fukushima and Chernobyl nuclear accidents, Prof. Thomas juxtaposed the quantities of cesium and iodine isotopes released in these two accidents with the total release from nuclear testing conducted in the 1960s, which was multiple powers of magnitude higher.

In a more detailed comparison of the Fukushima and Chernobyl nuclear accidents, Prof. Thomas pointed out that crucial steps towards limiting exposure were taken in both cases in terms of moving populations away from the source of radiation. The response in Japan was more successful at limiting exposure by telling people to stay indoors (to limit inhalation of particulates) and by stopping the ingestion of contaminated foodstuffs.

Prof. Thomas likewise juxtaposed the suffering and death that directly resulted from the tsunami as well as the subsequent stress-related illnesses, with the absence of radiation-related deaths. She emphasized the psychological harm caused due to evacuation and fears of radiation, as well as the huge economic effects that continue to impact Japan.

In addition, Prof. Thomas introduced statistics regarding extensive screening and health surveys being conducted in Japan. These include ultrasonography thyroid screening for 360,000 residents under 18. She noted that this is a high-precision screening tool that can detect tumors that would not have been found otherwise, perhaps leading to incorrect assumptions of increased rates of thyroid cancer due to comparison of incompatible datasets derived from different screening procedures.

Prof. Thomas pointed out that official reports on the Fukushima accident by UNSCEAR and WHO had concluded that there would be negligible long-term health effects due to the radiation, but considerable

psychological effects on public health. She finished her presentation by outlining a number of pathways to increasing understanding of the risks of radiation and putting them in perspective through comparison with health risks due to other factors (e.g. smoking, obesity, etc.).

In the subsequent open discussion session, Prof. Thomas responded to audience questions, the first of which dealt with how things have changed in Fukushima since the accident. Prof. Thomas described a highly charged atmosphere during her first visit six months after the accident, and explained how her more recent visits to local communities have been characterized by active dialogue and people starting to come to terms with the situation. In some cases, she said, personal radiation monitoring devices had given people peace of mind, while in many other cases, there is still a strong atmosphere of distrust.

Responding to another question about rebuilding the public's trust in the administration, Prof. Thomas explained that participatory processes aimed at helping people to manage their own risk would be helpful. If the public is aware of the risks of living, for example, by a chemical plant or nuclear plant, and has been actively involved in developing a strategy or plan for emergency situations, this can be a source of comfort, particularly if such plans are developed in cooperation between the government and the public.