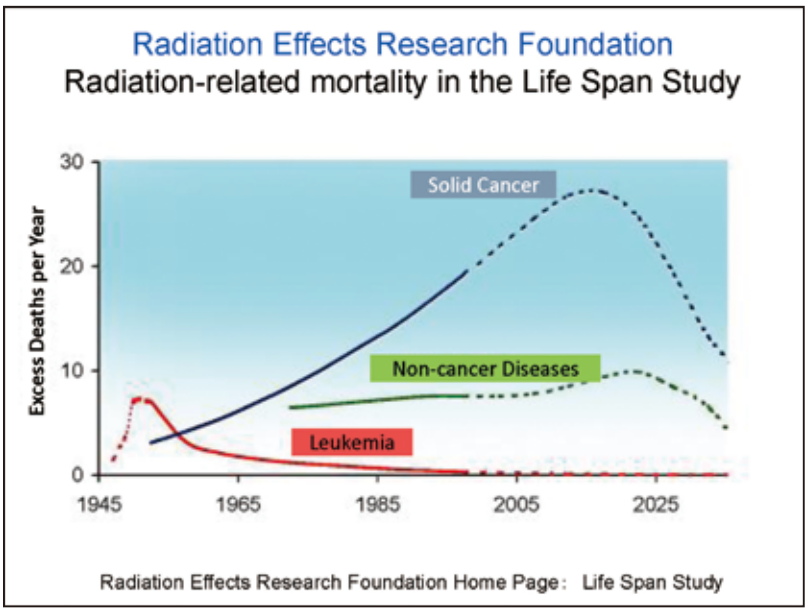
Contribution of Hiroshima in the Fukushima Nuclear Accident

Research Institute for Radiation Biology and Medicine, Hiroshima University
Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University **Kenji Kamiya**

It has been almost five years since the Fukushima Daiichi Nuclear Power Plant accident occurred. As a result of the committed efforts of the residents, government, Fukushima Prefecture as well as many other persons involved, we have seen steady steps towards recovery. However, there are still many problems that should be solved, such as the situation of many residents, who still live as evasuees. We need to make efforts for bringing them home, restoring agriculture and industry and maintaining the infrastructure. Here, I will talk about how the lessons learnt from Hiroshima can be used in the Fukushima Daiichi Nuclear Power Plant accident, particularly about health management, radiation emergency medicine and risk communication.

1. Health management in a nuclear disaster

Health management and health promotion of the residents is one of the most important issues in the Fukushima recovery. Health management after radiation hazard requires expert efforts such as measuring the residents' radiation dose determining the health effects as well as taking measures for residents' health. Fukushima Prefecture is repeatedly carrying out "Fukushima Health Management Survey" to measure the external radiation dose of residents and observe their health condition. Hiroshima has specialized institutions for health care after radiation exposure, which have spent many years analyzing effects by atomic bomb radiation on the health of A-bomb survivors and taking care of their health management including diagnosis and treatment of diseases induced by radiation exposure. These specialized institutions have many years of experience and have cultivated knowledge and technology. Many experts from these institutions offered their support in the planning of Fukushima Health Management Survey for the residents.



1

The Radiation Effects Research Foundation has carried out long-term epidemiological studies for A-bomb survivors over the years, and has been reporting the most comprehensive and accurate data on the effect of radiation on the human body in the world. These data became the basic materials for international agencies, such as the UNSCEAR, ICRP, and IAEA to evaluate the effects of radiation on the human body. Also those are the most important data in constructing an international radiation protection system. Hiroshima University, primarily through the Research Institute for Radiation Biology and Medicine, has examined the mechanism by which leukemia, cancer, and other conditions which are induced by atomic bomb radiation, and has also developed early diagnosis and treatment for these conditions. Furthermore, the Hiroshima Atomic Bomb Casualty Council has many years of experience in health examinations and health management for A-bomb survivors, and the Hiroshima Red Cross Hospital & Atomic-bomb Survivors Hospital has experience in diagnosing and treating various diseases that occur in the A-bomb survivors. Both of medical associations of Hiroshima Prefecture and Hiroshima City have

many doctors who have been engaged in health care of A-bomb survivors for many years. These results and experiences are indispensable for Fukushima Prefecture residents for the long-term health management and early diagnosis of diseases, so continued support from Hiroshima is still required in various areas.

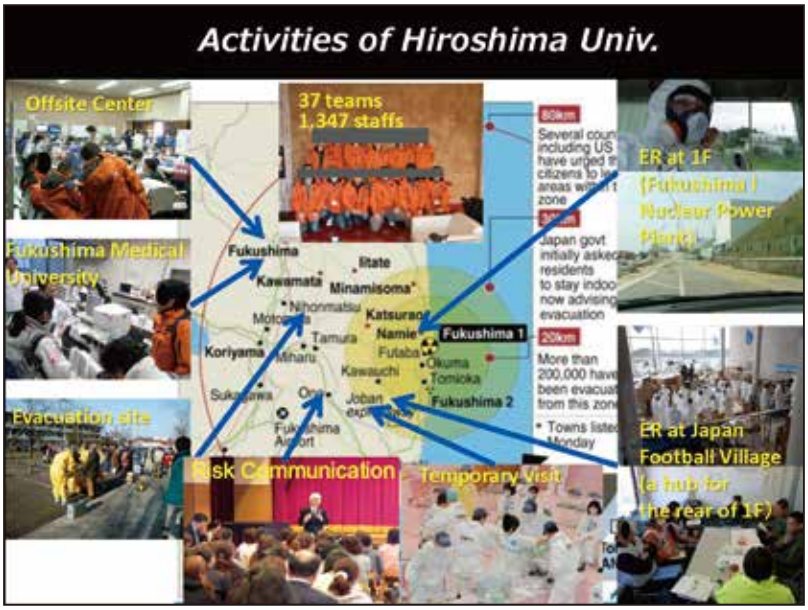
2. Dysfunction of the radiation exposure medical system and activities of radiation emergency medical support team

2

In 2004, Hiroshima University was designated a tertiary radiation medical institution by the government as a hub for radiation emergency medicine in case of radiation disasters in Japan. Since then, it has implemented projects to construct and maintain the radiation emergency medical system in charge of western Japan. As a part of this system, a network for related parties was constructed and the human resources required for radiation emergency medicine were developed primarily at regional secondary radiation emergency medical institutions. This system was prepared to be able to immediately dispatch experts through this network in the event of a nuclear accident. In the development of human resources, training seminars and drills for radiation emergency medicine and radiation dosimetry were conducted, as well as for decontamination methods, transportation of patients and their treatment.

This is the way in which the radiation emergency system was designed when the Fukushima Daiichi Nuclear Power Plant accident occurred. The accident was the first complex disaster experienced by humanity, where a nuclear disaster occurred in addition to the giant earthquake and tsunami. The infrastructure, such as water, electricity, roads, and means of communication were destroyed by earthquake and tsunami. As a result, the primary radiation emergency medical institutions lost their abilities to function. Additionally, they were located within 10 km from the explored nuclear power plant of TEPCO, and those hospitals themselves became subject to evacuation, which made it impossible for them to play their role in emergency situation. In this way, the fact that the accident was a complex disaster added further confusion, and the radiation emergency medical system did not function as designed. The situation was further complicated by refusals to transport contaminated persons, refusals for acceptance at hospitals, and uncertainty about how to respond to contamination levels from screening of residents. However, even in this turmoil, experts trained in the radiation emergency medical network came to Fukushima as quickly as possible to reconstruct the emergency radiation medical system.

As a tertiary radiation medical institution, Hiroshima University dispatched 37 groups as radiation emergency medical support team consisting of over 1,300 people who supported various activities on the site. First, we organized the "Radiation Emergency Medical Coordination Council", laying out a plan so that groups dispatched from all over Japan could support contamination screening, aggregate and manage the data. We also offered experts for health consultations and contamination screening for residents. Following that, we provided support at the off-site center, the government's local response headquarters, to make a patient transport flowchart in order to determine the transportation methods, transportation routes, and accepting medical institutions for exposed patients. At the same time, we supported the acceptance of patients at the emergency intensive-care unit which was constructed in J-village to cover the destroyed primary radiation emergency medical system. Residents were temporarily allowed into the evacuated area. At that time, we were engaged in progress management, guidance and treatment for sick persons on the site, at a base which was established so that this could be done safely. Furthermore, we supported Fukushima Medical University, a secondary radiation emergency medical institution, in conducting internal radiation dose measurements by using whole body counter (WBC) to police officers and fire fighters, and providing health consultations to residents. HICARE and other organizations also dispatched radiation medical teams, supporting Fukushima in various ways.



3

3. Residents' concerns and risk communication

In a nuclear disaster, naturally, residents are very concerned about the effects radiation could have on their health. In particular, guardians with children and expecting or nursing mothers are very concerned, and expert support may even be required. At the first stage of the accident, people don't have enough knowledge about radiation itself and the health risks by radiation. In addition, all kinds of information was spreading through various means of mass media, the Internet and even rumors. It was difficult for residents to decide what information they should believe. As a result, they ended up having feeling of even more concern and confusion. Even now, the residents of Fukushima are suffering the consequences of incorrect information and misunderstanding. A typical example of damage from harmful rumors is refusal to buy local farm produce. In order to lessen these concerns even a little bit, as well as to control and prevent damage by rumors, risk communication is critically important.

Many experts from Hiroshima went to Fukushima and engaged in risk communication for the residents. Fukushima residents were eager to know the experiences of Hiroshima, which has recovered from the atomic bomb disaster, and the knowledge about health risks from radiation we learned from A-bomb survivors. In many cases, they welcomed the experts from Hiroshima and Nagasaki. I was appointed a radiation health risk management advisor by Fukushima Prefecture, so that I can convey the lessons from Hiroshima by giving lectures throughout the prefecture about radiation health risks, and explained the effects of radiation based on science.

Phoenix Leader Education Program (Hiroshima Initiative) for Renaissance from Radiation Disaster

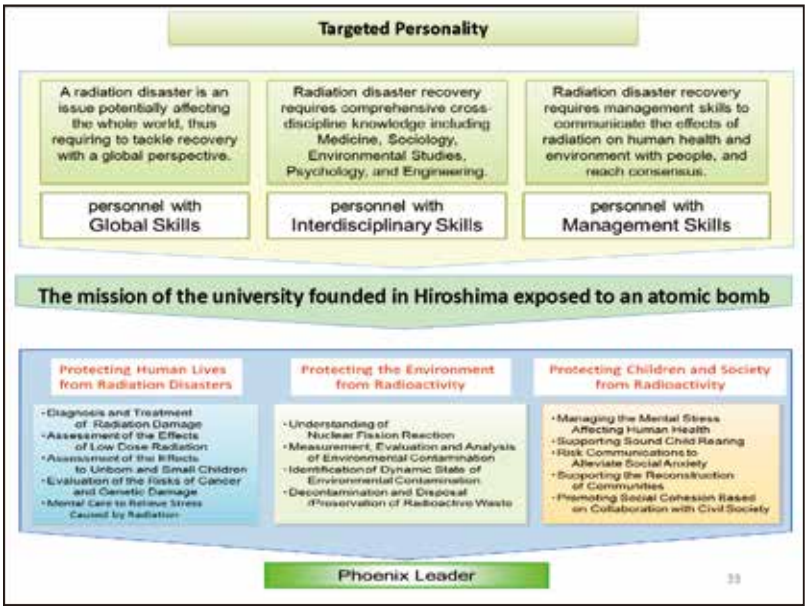
Research Institute for Radiation Biology and Medicine, Hiroshima University
Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University
Kenji Kamiya

Because of the Fukushima Daiichi Nuclear Power Plant accident, many residents are concerned about their health, and the communities from evacuated areas are in danger of collapsing. Farmland and mountain forests were devastated by environmental contamination, and to make things even worse, sales of farm produce declined due to Fukushima's damaged reputation. Peoples' lifestyles and the regional communities were split due to varying individual priorities. The nuclear disaster gravely affected and damaged every aspect of peoples' lives.

1

Hiroshima University dispatched many staff members, supporting Fukushima's recovery. Through these activities, we not only saw again that a nuclear disaster gravely affects and damages health, the environment, and society, but we also became painfully aware that we are lacking leaders who can give guidance for recovery from multi-faceted and compound disasters.

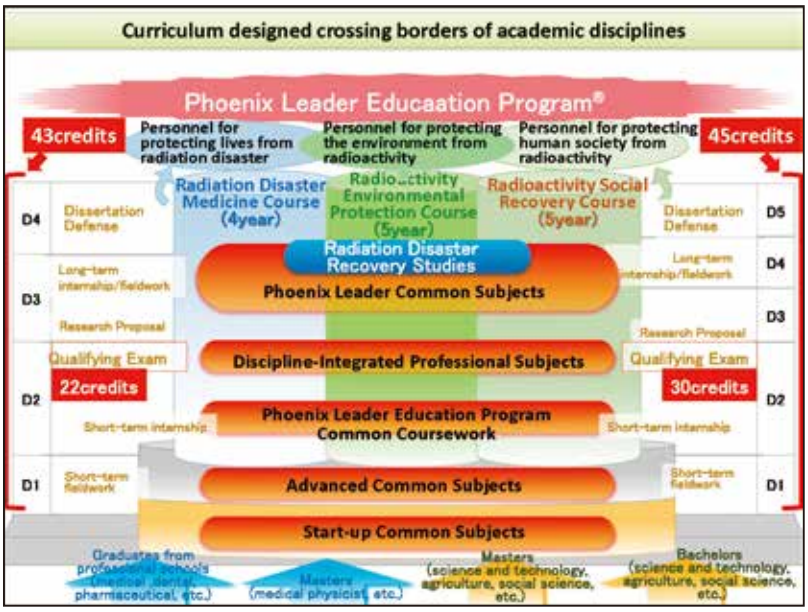
To recover from a nuclear disaster, we need not only medical science, but also a wide range of cross-sectional science and technology, including radiation science, environmental science, social science, social psychology, educational science, and engineering science. However, this kind of cross-sectional, interdisciplinary education is not offered by the graduate schools we have now, and not only in Japan; this kind of human resource education is not carried out even internationally. As an integrated university in a bombed area, Hiroshima University has the history and experience of giving academic support to the recovery from the atomic bombing, and we have cultivated the expertise, materials, and technology in radiation medicine, radiation environmental science, and bombing recovery social sciences, which are needed to educate these kinds of leaders. Considering this leadership education to be Hiroshima University's mission, we established the "Phoenix Leader Education Program (Hiroshima Initiative) for Renaissance from Radiation Disaster," a Hiroshima University graduate education program. Fortunately,



2

this program was selected as a "Program for Leading Graduate Schools" by the Ministry of Education, Culture, Sports, Science and Technology, and was launched in fiscal 2011.

This program will educate global leaders who have the judgment and capability to appropriately respond to radiation disasters, lead recovery with a clear principle and work internationally (Phoenix Leaders). To do this, we will assemble a cross-sectional expert academics and establish "radiation disaster recovery studies," and by educating "human resources who protect life from radiation disasters," "human resources who protect the environment from radioactivity," and "human resources who protect people and society from radioactivity," we will contribute to establishing a new social system of safety and security that will be a model for the 21st century.



3