Psychological Effects

Stress Factors for Affected People

- Future uncertainty
- Uncertainty about residence and workplace security
- Social prejudice
- Media influences
- Differences of climates and customs

Characteristics unique to radiation disasters

- Unable to predict disasters
- Difficult to determine the extent of damage
- Possible radiation effects that might arise in the future

Source: Prepared based on the "Mental Support at the Chernobyl Accident," Material 3-2 for the 3rd meeting of the Investigative Commission for Mental Care and Measures against Health Concern, Exposure Medicine Sectional Meeting, Nuclear Regulation Authority (former Nuclear Safety Commission)
http://warp.da.ndl.go.jp/info:ndljp/pid/8422832/www.nsr.go.jp/archive/nsc/senmon/shidai/kokoro/kokoro003/siryo2.htm (in Japanese)

Psychological Effects

Radiation Accidents and Health Concerns

Anxiety caused by radiation accidents

- Anxiety over health effects of radiation
- Anxiety over health effects on children now and in the future

Psychological effects from protracted anxiety

- Possibility that mental health may deteriorate
- Possibility that mothers' anxiety may affect the mental state and growth of children

Factors that increase anxiety

- Unable to acquire reliable information
- Confusion caused by scientifically inaccurate information
- Stigmas and stereotypes

Psychological Effects

Psychiatric Effects on Children

Possible psychological effects of radiation issues:

- Parents' anxiety over radiation proves that they are dedicated parents.
- Parents' excessive concern over radiation could affect children mentally and physically.

Regarding fetal exposure and neuropsychological disorders caused by the Chornobyl NPS Accident:

- The results of studies on the neuropsychological disorders of children who were fetuses at the time of the accident are not coherent.
- Although there is a report that exposure affected the IQ of the fetuses, no correlation has been found between thyroid exposure doses and children's IQs.

Source: Prepared based on the Kolominsky Y et al., J Child Psychol Psychiatry, 40 (2): 299-305, 1999

Psychological Effects

Response to the TEPCO's Fukushima Daiichi NPS Accident and Local Communities (1/2)

Conclusion from dialogue with the local residents 1

(View of the International Commission on Radiological Protection (ICRP))

- Participants recognized the importance of developing radiation protection culture to allow inhabitants to understand and evaluate the information on the consequences of the accident and to take informed actions for reducing radiological exposure.
- They recognized the need for a more detailed characterization of the radiological situation to allow people to know where, when and how they are exposed.
- They underlined their concern about the future demographic pattern due to an acceleration in the younger generations leaving the prefecture and abandoning farming activities.
- They discussed with great emotion the issue of discrimination of people in the affected areas, especially for those of pre-marital age to marry and have children.
- The preservation of the traditional and popular activity of gathering wild vegetables (sansai) was identified as culturally important in maintaining the cohesion of the Fukushima community.

Source: Prepared based on Lochard, J (2012), the material for the 27th symposium of the Nuclear Safety Research Association

Psychological Effects

Response to the TEPCO's Fukushima Daiichi NPS Accident and Local Communities (2/2)

Conclusion from dialogue with the local residents 2

(View of the International Commission on Radiological Protection (ICRP))

- Develop a mechanism to support projects proposed by local communities and residents to improve living conditions.
- Support community expectations that decisions on recovery actions reflect their priorities, be based on their knowledge of the local context, and support their current and future interests.
- Continue efforts to monitor individual internal and external exposures, and to provide information and tools in order to help people to make their own judgments.
- Create a forum for a permanent dialogue between all concerned parties (producers, distributers and consumers) on the issue of foodstuff.
- Promote the involvement of parents, grand-parents and teachers to develop radiation protection culture among children.
- Strengthen dialogue and cooperation with stakeholders elsewhere in Japan and abroad.

Source: Prepared based on Lochard, J (2012), the material for the 27th symposium of the Nuclear Safety Research Association

Psychological Effects

Overview of Health Effects - Chornobyl NPS Accident -

Summary of effects on mental health

World Health Organization (WHO) Report issued in 2006 upon the 20th anniversary of the Chornobyl NPS accident

- **Anxieties and medically unexplained physical symptoms including depression and Post Traumatic Stress Disorders (PTSD) are increasing as stress-related disorders among the group of disaster victims, compared to a control group.**
- **The effects of the Chornobyl NPS Accident on mental health have been the biggest health issue for the residents.**

Source: World Health Organization: Mental, psychological and central nervous system effects. Health effects of the UN Chernobyl accident and special health care programmes: report of the UN Chernobyl forum expert group "Health" (eds. Bennett B., et al), 93-97, WHO, Geneva 2006

Psychological Effects

Summary by WHO - Chornobyl NPS Accident -

Studies in the 2006 World Health Organization (WHO) Report

(i) Stress-related symptoms

(ii) Concern over effects on brains in development (fetal effects)

(iii) Effects on decontamination workers

- High suicide rate
- Some scholars point out concerns over functional brain disorders

Source: World Health Organization: Mental, psychological and central nervous system effects. Health effects of the UN Chernobyl accident and special health care programmes: report of the UN Chernobyl forum expert group "Health" (eds. Bennett B., et al), 93-97, WHO, Geneva 2006

Psychological Effects

Views of Expert Groups - Chornobyl NPS Accident -

Summary by Bromet et al. (2011)

(1) Among workers who participated in emergency work immediately after the accident and decontamination operations, a significant percentage is still suffering from depression and PTSD, even after the lapse of 20 years from the accident.

(2) Different studies show different results about psychiatric effects on children in the highly contaminated areas.

(3) Studies on general populations have found that the percentages of self-reported health problems, clinical or preclinical depression, anxiety and PTSD are high.

(4) Mothers remain in a psychiatric high-risk group as they have been concerned about family health at all times.

Source: Bromet EJ, JM Havenaar, LT Guey. A 25 year retrospective review of the psychological consequences of the Chernobyl accident, Clin Oncol 23, 297-305, 2011

Psychological Effects

View Different from the 2006 WHO Report
- Chornobyl NPS Accident -

2006 World Health Organization (WHO) Report：

Mental health such as anxiety is the biggest problem for regional healthcare.

Against this,

concerns have been raised over the decrease in international investigations since the 2006 WHO Report.

(i) It has been pointed out that the physical effects and damage from the Chornobyl NPS Accident might be greater than the estimate in the WHO Report, and that it would be necessary to continue international investigations.*1

(ii) There has been a criticism that the WHO's view would make people less wary of foods from the contaminated areas and could impede future investigations and research.*2

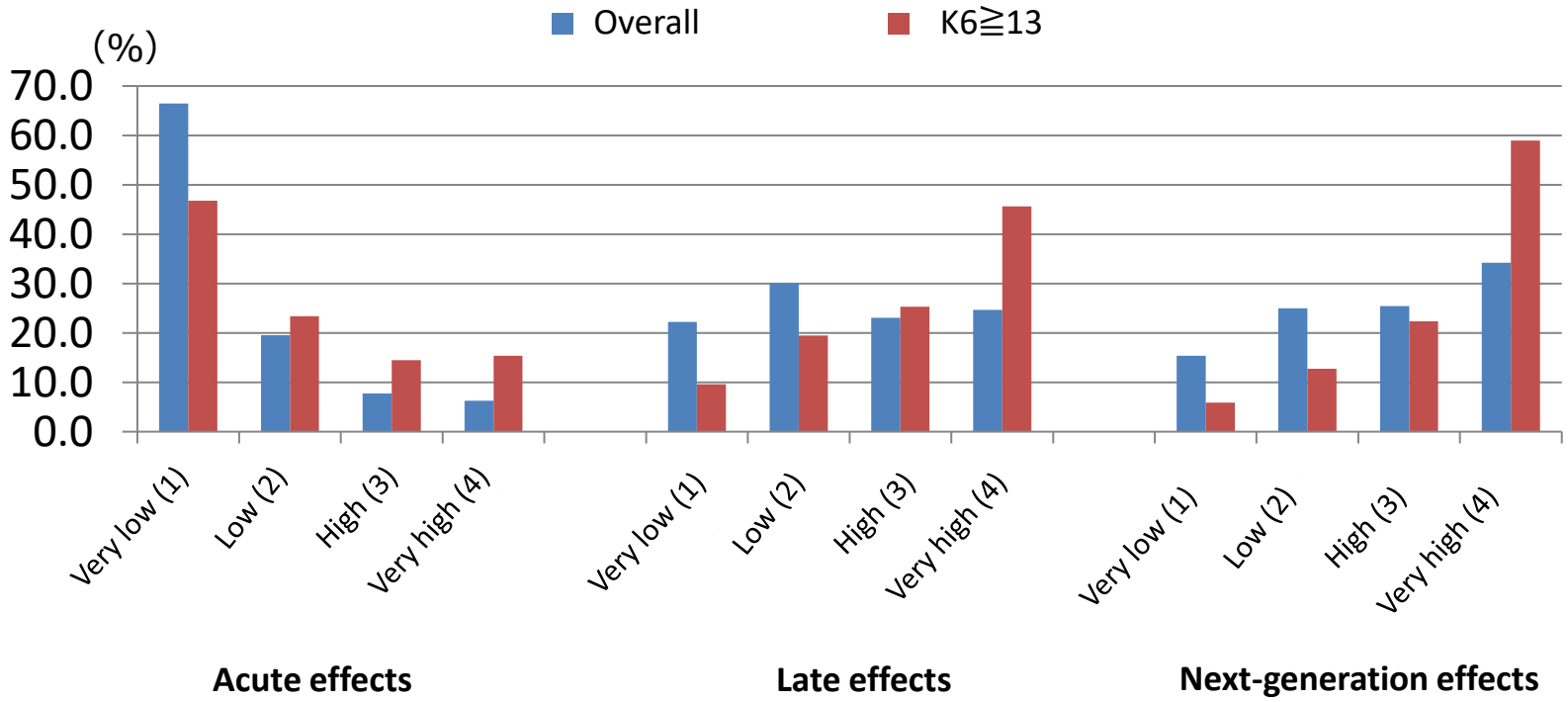
*1: This view is based on the fact that in Rivne in Ukraine, the incidence of neural tube defects is 22.2 per 10,000 people, the highest throughout Europe. (Wertelecki, Pediatrics, 125, e836, 2010)

However, it has not been clear what is causing this.

*2: Holt, Lancet, 375, 1424 - 1425, 2010

Psychological Effects — Relationship between Mental Health and Perception of Risks Concerning Health Effects of Radiation

Results of the Mental Health and Lifestyle Survey of the FY2011 Fukushima Health Management Survey



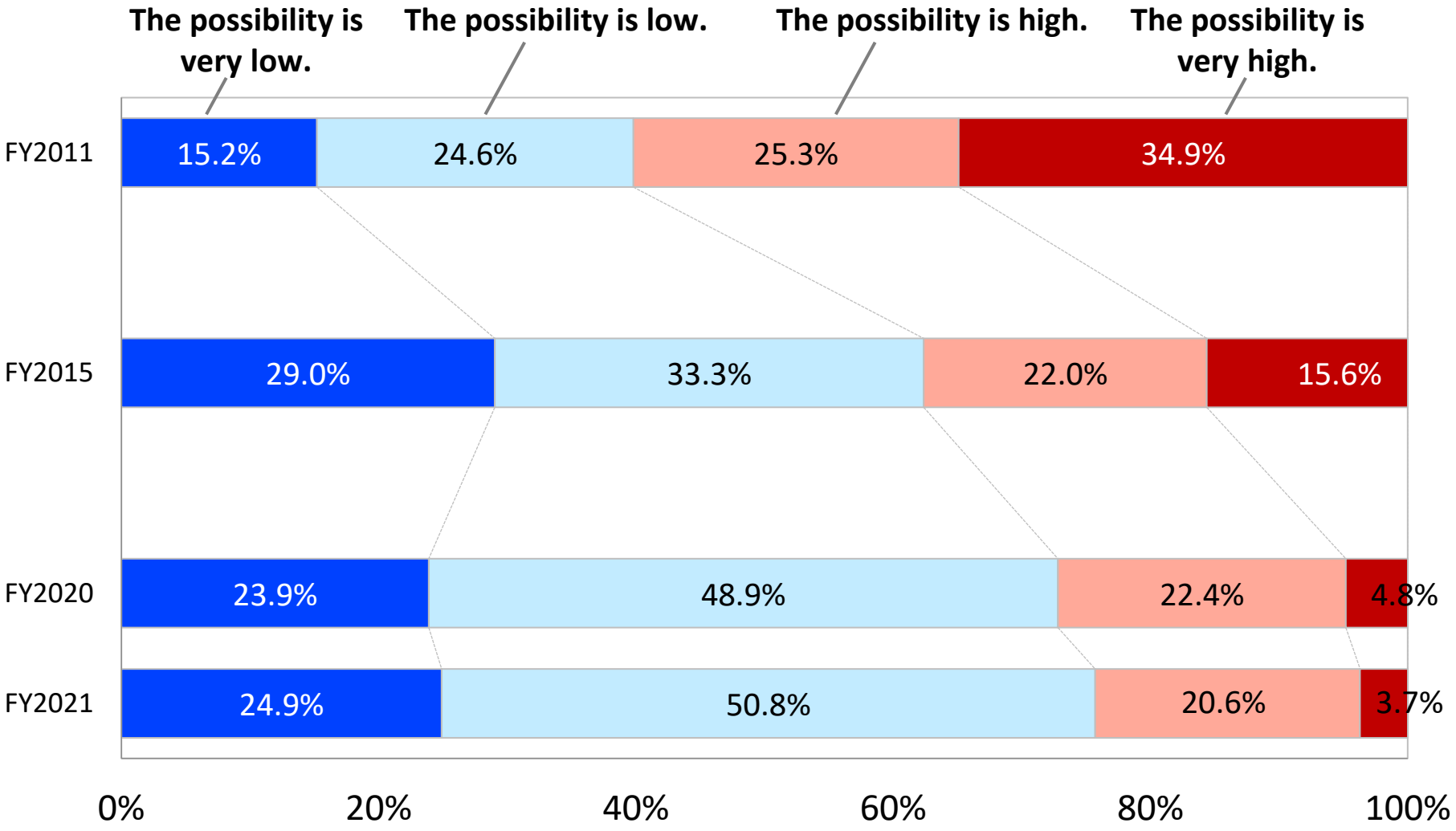
*K6 is a self-recording scale to measure general levels of mental health. Scores exceeding 13 show strong depression and anxiety symptoms.

- **Overall trend**
  The majority answered that the possibility of acute effects is very low. Opinions vary with regard to late effects. The largest number of respondents chose the option "very high" for next-generation effects.
- **Among people with mental disorders**
  The percentages of respondents who chose the option "very high" were large for all three types of effects.

Source: Prepared based on Suzuki Y, et. al., Bull World Health Organ, 2015 (http://dx.doi.org/10.2471/BLT.14.146498)

Psychological Effects

Changes in Perception of Radiation Risks (Next-generation Effects)



Source: Prepared based on the materials of the 45th and 48th Prefectural Oversight Committee Meeting for Fukushima Health Management Survey

Psychological Effects

Increase in Induced Abortions in Europe
- Chornobyl NPS Accident -

The Chornobyl NPS Accident occurred on April 26, 1986.

Increase in induced abortions in remote places

Greece: Sharp decline in birthrate in January 1987

⇒Induced abortions for 23% of fetuses in the early stage of fetation in May 1986 (estimation)

Italy: Approx. 28 to 52 unnecessary abortions per day for five months after the accident (estimation)

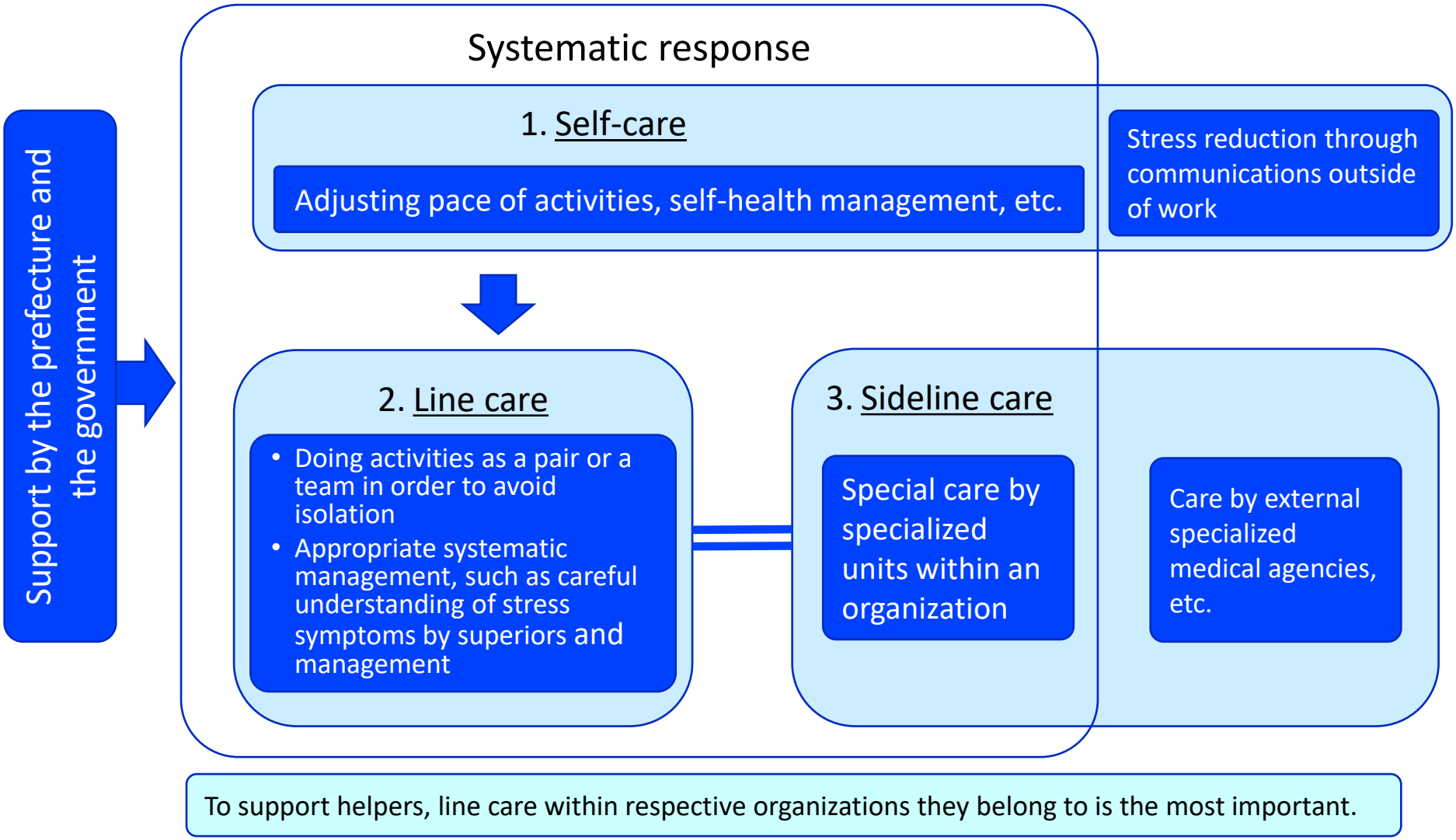
Denmark: Slight increase

Sweden, Norway, Hungary: None

Source: Prepared based on the Proceedings of the Symposium on the effects on pregnancy outcome in Europe following the Chernobyl accident. Biomedicine & Pharmacotherapy 45/No 6, 1991

Fukushima and Psychological Care

Support for Helpers: Three Stages of Care



To support helpers, line care within respective organizations they belong to is the most important.

Prepared based on "Psychological Care to Disaster Victims, Prefecture-Level Guidelines," Cabinet Office, March 2012; "Fukushima Psychological Care Manual," Fukushima Mental Health and Welfare Centre, 2012; "Manual on Post-Disaster Psychological Care at Workplaces," Japan Labor Health and Welfare Organization, June 2005; "Current Situations and Issues with the Mental Health of Disaster Victims in Fukushima," Masaharu Maeda, Firefighting Science and Information

Fukushima and Psychological Care

Stress Measures for Helpers

Support for helpers within respective organizations

1. **Set work goals**
   - Clarify the importance and goals of jobs
   - Keep daily reports, diary or a note of activities to organize thoughts
2. **Maintain the pace of life**
   - Get enough sleep, nutrition and water
3. **Take rest when possible**
4. **Figure out how to get refreshed**
   - Take a deep breath, close eyes, meditate, do stretches
   - Take a walk, do exercise, listen to music, have meals, take a bath, etc.
5. **Socialize as a way of relieving stress**
   - Contact family, friends, etc. when possible (preferably people unrelated to work)

Self-support of helpers

a. **Avoid overworking**
   - Know your limits and adjust the pace of activities

b. **Be aware of stress**
   - Manage your own health and detect stress symptoms at an early stage

c. **Try to relieve stress**
   - Relaxation, body care, refreshment
   - Communicate with people outside work (family, friends, etc.)

d. **Avoid isolation**
   - Work as a pair or a team

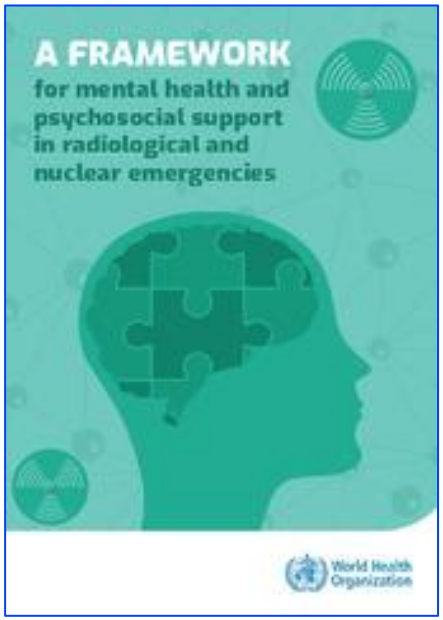
e. **See things differently**

Source: Prepared based on the "Fukushima Psychological Care Manual," Fukushima Mental Health and Welfare Centre, 2012

Psychological Care in Nuclear Emergencies

MHPSS in Radiological and Nuclear Emergencies

◆ In 2020, the World Health Organization (WHO) published "A Framework for Mental Health and Psychosocial Support in Radiological and Nuclear Emergencies," material compiling concrete recommendations concerning psychological care in all radiological and nuclear emergencies based on existing guidelines published by the WHO and the Inter-Agency Standing Committee (IASC).
◆ This publication aims to integrate and promote psychological care and radiation protection and provide guidance targeting officials and specialists involved in planning radiation protection and countermeasures and risk management as well as mental health and psychosocial support (MHPSS) experts working in health emergencies.



As a public health approach with an emphasis on MHPSS interventions, the following are essential for all phases of preparing for, responding to, and recovering from radiological and nuclear emergencies:

1. Cross-sector coordination between radiation protection and MHPSS actors
2. Community engagement
3. Risk communication
4. Application of core-ethics principles

Source: Prepared based on "A Framework for Mental Health and Psychosocial Support in Radiological and Nuclear Emergencies" (2020), WHO
[The Japanese version is posted on the website of the Department of Disaster Psychiatry, Fukushima Medical University (https://www.d-kokoro.com/).]

Psychological Care in Nuclear Emergencies

People Especially in Need of Psychological Support after Emergencies

- People **directly** affected
- **Parents** concerned about the long-term impact on their children's health and prospective parents
- **Children** from affected areas
- People **with underlying health concerns**, such as people suffering from diseases, elderly people, and people with disabilities
- People **with low literacy levels**
- **Responders*** working in stressful conditions
- People living in **facilities for the elderly or other residential facilities and institutions**
- **Evacuees** and members of **hosting communities**
- People with pre-existing mental health and **psychosocial concerns**
- **Workers of the nuclear facility** where the accident occurred and their families

* Respondents: Healthcare workers, clean-up workers at the accident site, reporters and other responders

Source: Prepared based on "A Framework for Mental Health and Psychosocial Support in Radiological and Nuclear Emergencies" (2020), WHO
[The Japanese version is posted on the website for lectures of the Department of Disaster Psychiatry, Fukushima Medical University (https://www.d-kokoro.com/).]

Psychological Care in Nuclear Emergencies

Key MHPSS Elements at Each Phase after Emergencies

Preparation and planning phase	1) A risk and vulnerability analysis and needs assessment
	2) Formulation of general mental health policy while involving diverse sectors and people
	3) Mapping of existing resources
	4) Mental health and psychosocial support (MHPSS) integration into general health care
	5) Monitoring and evaluation of MHPSS implementation
Emergency response phase	1) Understanding of psychological impacts due to emergency protective actions
	2) Explanation of proper methods of emergency protective actions and communication
	3) Decision-making concerning the implementation of protective measures
	4) Identification of people at risk, interventions and advocacy
	5) Re-establishment of normal cultural and religious events, resumption of schooling, and re-establishment of healthy events
Recovery phase	1) Engagement of related parties in diverse fields for the recovery of communities
	2) Development of support services within a long-term perspective
	3) Appropriate responses to stigma
	4) Community-based interventions
	5) Planning and implementation of care for groups at risk (children, people with disabilities, etc.)
	6) Efforts to deal with a lack of financial resources and human capacity

Source: Prepared based on "A Framework for Mental Health and Psychosocial Support in Radiological and Nuclear Emergencies" (2020), WHO
[The Japanese version is posted on the website for lectures of the Department of Disaster Psychiatry, Fukushima Medical University (https://www.d-kokoro.com/).]