International Experts' Meeting on Severe Accident Management
in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant
March 19, 2014

Relief Activities Conducted by the Japanese Red Cross Society after the Fukushima Daiichi Nuclear Power Plant Accident and the Challenges for the Future

Japanese Red Cross Society

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The Japanese Red Cross Society (JRCS)

- The Japanese Red Cross Society (JRCS) is conducting its activities as an auxiliary role to the Japanese Government based on the Geneva Conventions and the resolutions adopted at the International Conference of the Red Cross.

- The JRCS operates 92 hospitals across Japan and contributes to providing medical needs to communities. The JRCS provides medical relief activities in disasters and organizes about 500 medical relief teams (about 5,000 team members).

- When a disaster occurs:
  - JRCS medical relief teams will be dispatched. The relief teams establish dERUs (domestic emergency response units) upon necessity.
  - JRCS relief teams provide medical care in the disaster-hit area and evacuation centers.
  - Psychological care will also be provided on a continuing basis.

Mt. Bandai (Erupted in 1888, Fukushima)

The monument of the disaster relief activities

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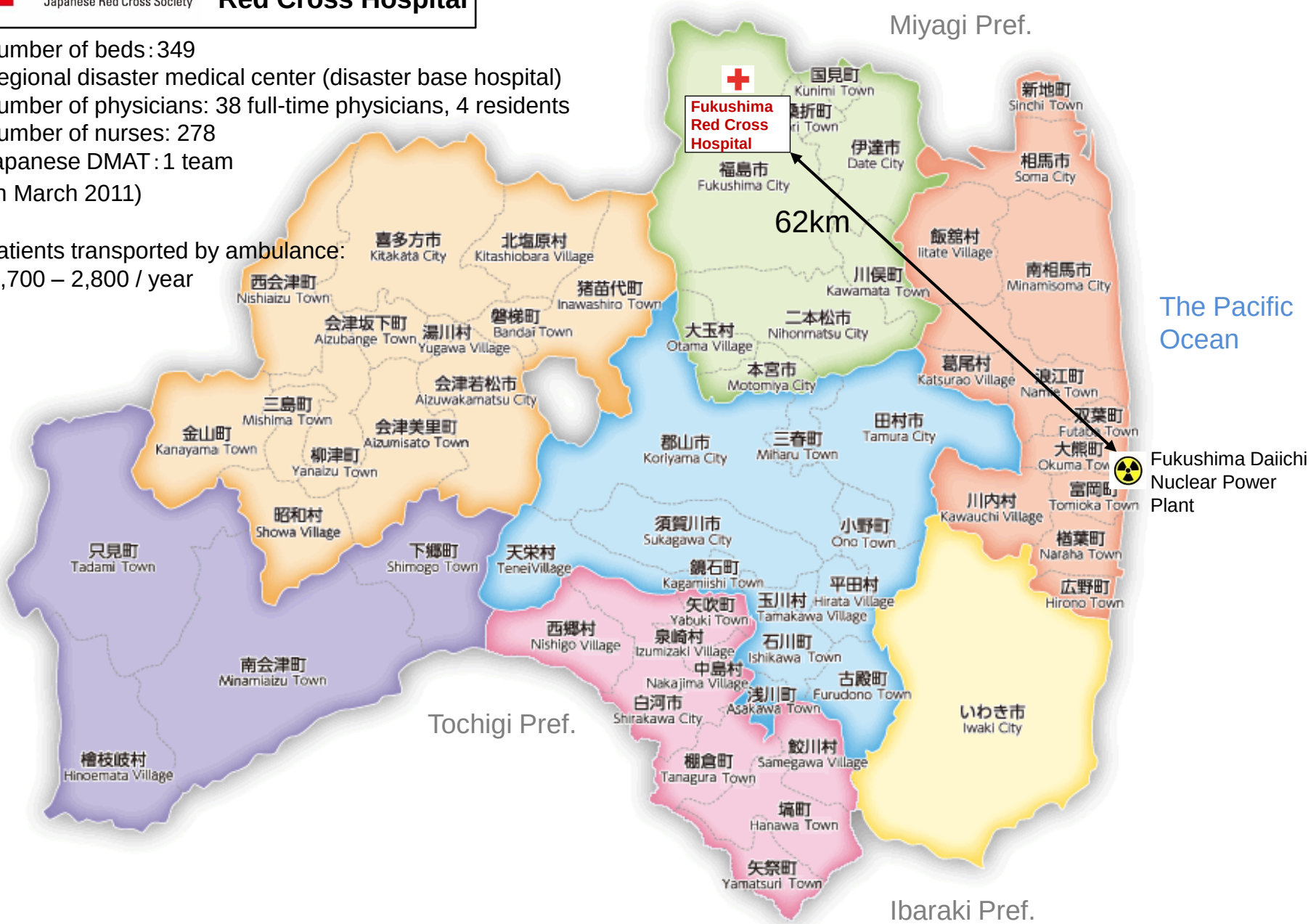
Fukushima Red Cross Hospital

Number of beds：349
Regional disaster medical center (disaster base hospital)
Number of physicians: 38 full-time physicians, 4 residents
Number of nurses: 278
Japanese DMAT：1 team
(In March 2011)

Patients transported by ambulance:
2,700 – 2,800 / year



At 14:46, March 11, 2011

Seismic Intensity: 6- (in the City of Fukushima)

First response at hospital: CSCA

(Command and Control, Safety, Communication, Assessment)

- Established disaster response headquarters
- Confirmed safety of inpatients, outpatients and hospital staff
- Checked damage to hospital buildings and confirmed the safety of the buildings
  - Minor damage to the walls (cracks) and the connecting corridors
  - No danger of building or ceiling collapsing
- Decided it was possible for hospital operations to continue
  - This decision was announced by the hospital public announcement system.
- Essential utilities : Water supply stopped, power failure → in-house power generation
  - X-ray and blood tests: Impossible
  - Boilers and sterilizer equipment were broken and thus impossible for surgical instruments to be sterilized
- Met twice a day to convey/share information - morning and evening
  - Participants: All physicians, chief nurses, administrative managers and managers of core function shared information about all hospital staff
- Accepted many patients with injuries and diseases: Established a triage area
  - Accepted 34 patients

- DMAT (Disaster Medical Assistance Team: 1 physician, 2 nurses, 2 clerks) was dispatched to Minamisoma City Hospital and they in turn transported two patients with serious respiratory insufficiency and multiple traumas to the Fukushima Medical University Hospital.
- .

JRCS Relief Teams in Fukushima
(Daytime, March 12)

12 JRCS relief teams (from the JRCS National Headquarters, Fukushima, Kanagawa, Niigata, Aichi (2), Shiga, Okayama, Hiroshima, Ehime, Kagawa and Kochi)

Relief activity locations: Shinchi, Soma, Tamura, Koriyama and Kawamata
132,000 evacuees at primary evacuation centers

★ : Relief Team

Fukushima Daiichi Nuclear Power Plant

Explosion at Unit 1

At 15:36, March 12

JRCS Relief Teams in Fukushima
(Evening, March 12)

7 JRCS relief teams (from Fukushima, Shiga, Okayama, Hiroshima, Ehime, Kagawa and Kochi)

Relief activity locations: Kawamata (Many evacuates from the restricted zone)

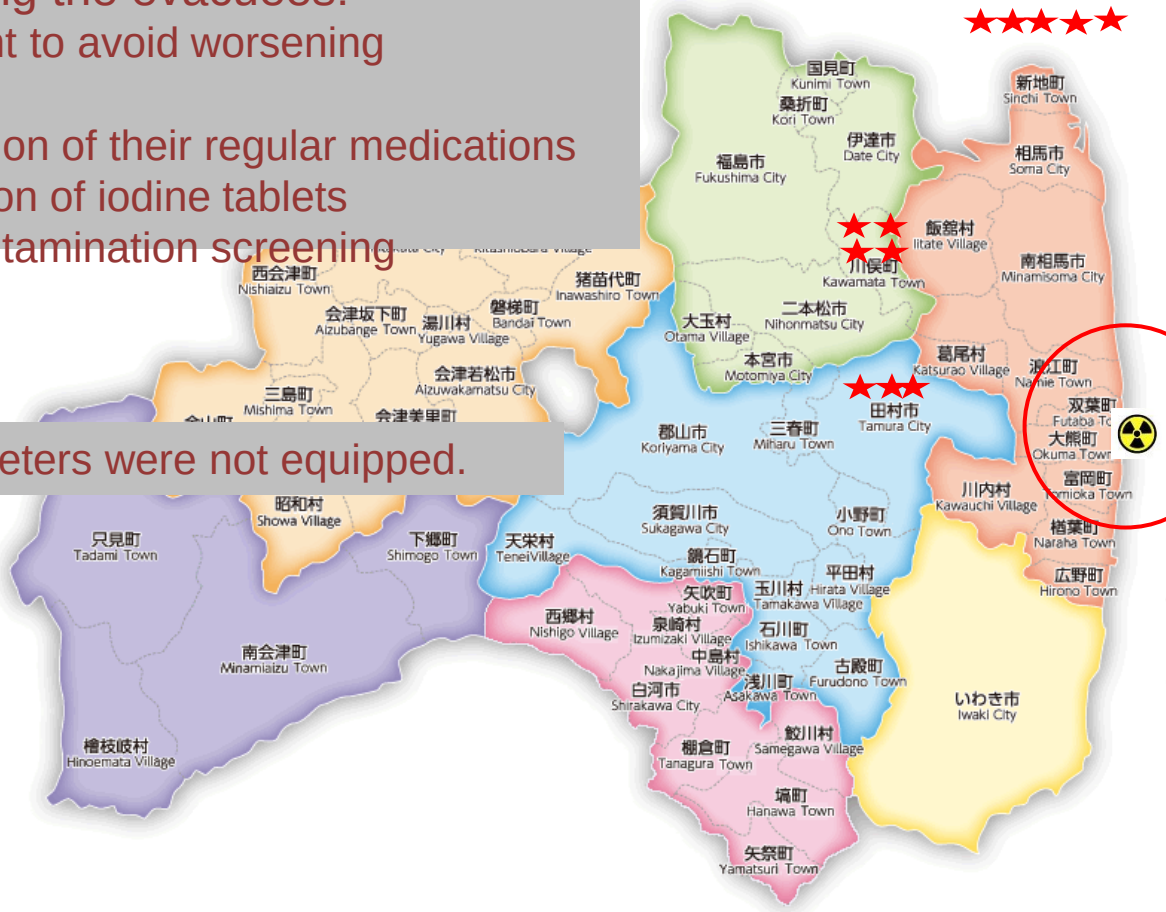
Needs among the evacuees:

- Treatment to avoid worsening hypertension
- Prescription of their regular medications
- Distribution of iodine tablets
- Body contamination screening

GM survey meters were not equipped.

Left for Shiroishi or Ishinomaki

★★★★★



★ : Relief Team

Fukushima Daiichi Nuclear Power Plant

Residents living within a 20km radius of the power plant -> Ordered to evacuate (at 18:25)

JRCS Relief Teams in Fukushima
(Evening, March 13)

7 JRCS relief teams (from Fukushima, Shiga, Okayama, Hiroshima, Ehime, Kagawa and Kochi)
Returned to the Fukushima Chapter office and a meeting was held.
Relief teams from other chapters:
“We cannot conduct relief activities in areas where safety cannot be guaranteed.”
“We will return to our hospitals for our relief team members’ safety.”

★ : Relief Team

Fukushima Daiichi Nuclear Power Plant

Residents living within a 20km radius of the power plant -> Ordered to evacuate

JRCS Relief Teams in Fukushima (March 14)

All the relief teams dispatched from other JRCS chapters left Fukushima and only Fukushima Red Cross Hospital remained to provide relief activities.

Relief teams left the evacuees behind: Appropriate?

★ : Relief Team

Fukushima Daiichi Nuclear Power Plant

Residents living within a 20km radius of the power plant -> Ordered to evacuate.

JRCS Relief Teams in Fukushima

	3/11	3/12	3/13	3/14	3/15	3/16	3/17	3/18	3/19	3/20	3/21
	DMAT →			Fukushima High School		Onahama Junior High 2					
Fukushima		Soma	Kawamata	Azuma Gym	Azuma Gym	Azuma Gym	Azuma Gym	Azuma Gym	Azuma Gym	Azuma Gym	Azuma Gym
National HQ		Shinchi	Left for Shiroishi and Ishinomaki								
Kanagawa		Shinchi			DMAT	Azuma Gym → Niigata					
Niigata		Shinchi									
Aichi 1		Shinchi									
Aichi 2		Shinchi									
Shiga		Soma/Kawamata		Left							
Okayama		Koriyama/ Kawamata									
Hiroshima		Kawamata									
Ehime		Tamura									
Kagawa		Tamura									
Kochi		Tamura									
Tokyo										Azuma Gym	
Yamanashi										Azuma Gym	

Response to the 2011 off the Pacific Coast of Tohoku Earthquake by the Japanese Red Cross Society (15)

March 19, 2011
(as of 12:00)
Disaster Management Division,
Disaster Management and
Social Welfare Department,
Japanese Red Cross Society
(Tel. 03-3437-7084)

Response to the 2011 off the Pacific Coast of Tohoku Earthquake by the Japanese Red Cross Society is as follows:
Please note that the descriptions and figures of the preliminary report will be updated.

1. JRCS relief teams dispatched as of 14:00, March 19, 2011

Dispatched location	Number of relief teams (including dERU, etc.)			
	Relief activities being conducted	Preparing for relief activities	Relief activities completed	Total Number of relief teams dispatched to date
Hokkaido	0	0	5	5
Iwate	13*1	11	30	54
Miyagi	27	21*2	61	109
Yamagata	0	0	1	1
Fukushima	1	4	15	20
Ibaraki	0	0	13	13
Tochigi	0	0	2	2
Chiba	0	0	2	2
Nagano	0	0	2	2
Total	41	36	131	208

*1: 1 air ambulance included.
*2: 4 trucks loaded with medications included.

Reasons for Limited Relief Activities in Fukushima

1. No code of conduct to respond to nuclear disasters
2. Lack of knowledge about radiation emergency medicine
3. Lack of equipment to measure radiation and protective gear

Air dose meter
Personal dosimeter
GM survey meter
} Not equipped

From March 26, 2011, personal dosimeter began to be distributed to JRCS relief teams

Safety guidance:
Air dose rate : Contact headquarters for direction at 20 μSv/h
Evacuate if it reaches 100 μSv/h
Personal dosimeter :
Evacuate if it reaches 1 mSv

Proposal from Fukushima Red Cross Hospital

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Fukushima Red Cross Hospital

- Education and training on “radiation emergency medicine” should be included in its disaster medicine training program so JRCS relief teams can understand the basics.

- If relief teams need to be sent to an area near a nuclear power plant after a disaster occurs:

  Correct information about released radioactive substances, etc. should be evaluated. At the same time, a system should be established in which relief team members can guarantee their personal safety by carrying an air dosimeter, personal digital dosimeter and GM survey meter to measure radiation levels.

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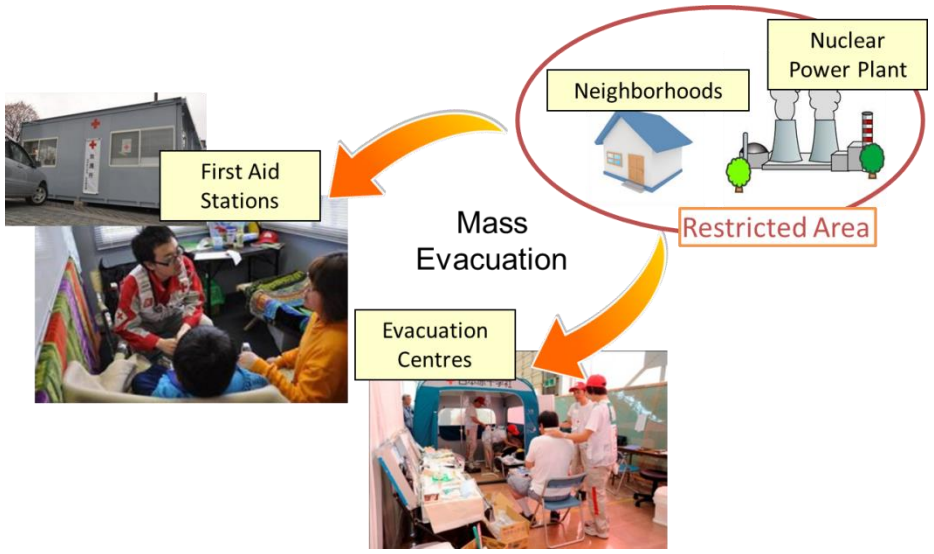
JRCS Safety Measures for Relief Activities under Nuclear Disaster

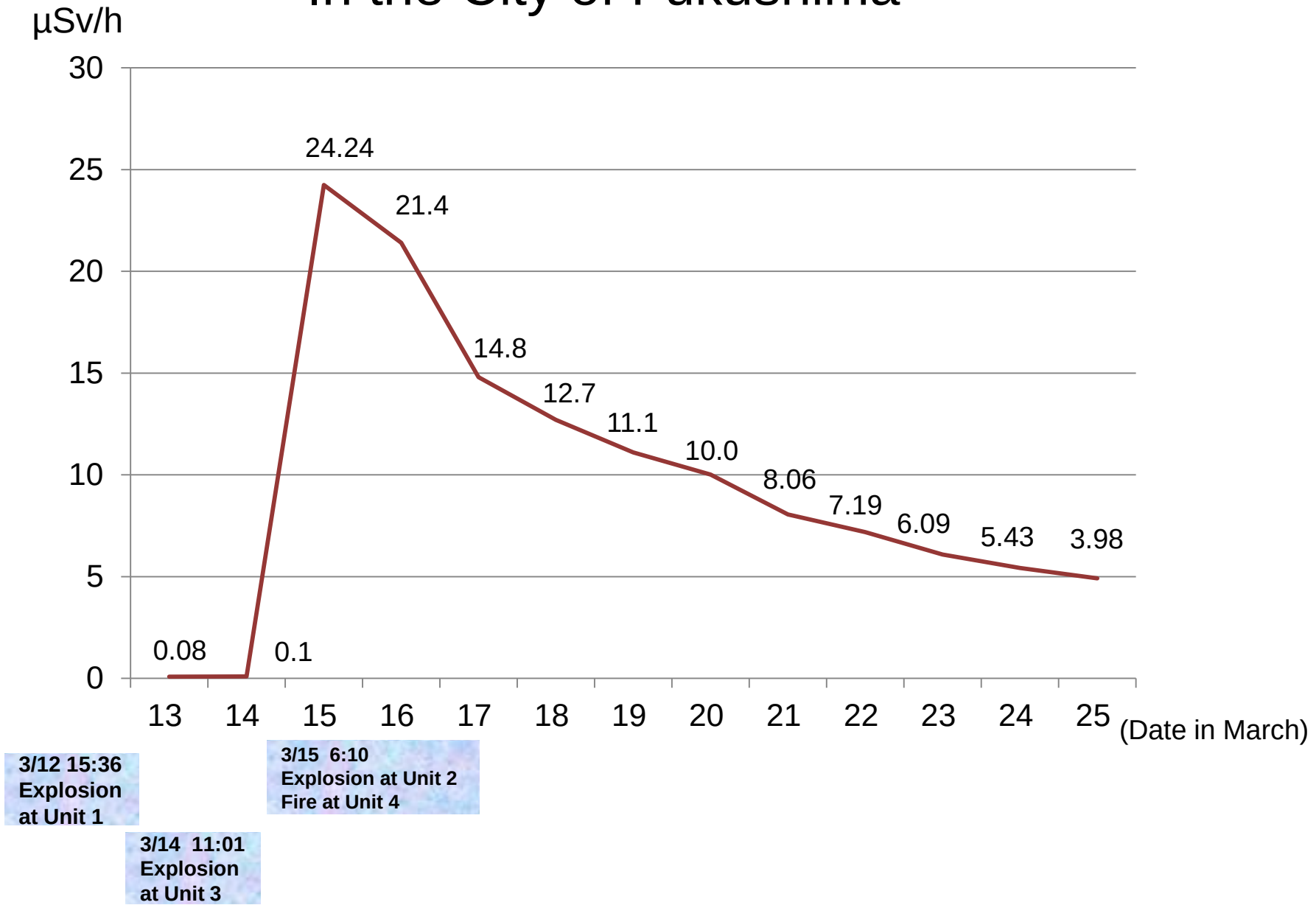
The JRCS established safety measures for its relief teams to conduct relief activities under nuclear disaster.

1. Criteria for cumulative exposure level: 1 mSv



2. Procurement of protective equipment
3. Training for radiation emergency medicine
4. Established “Guidelines for Relief Activities under Nuclear Disasters”

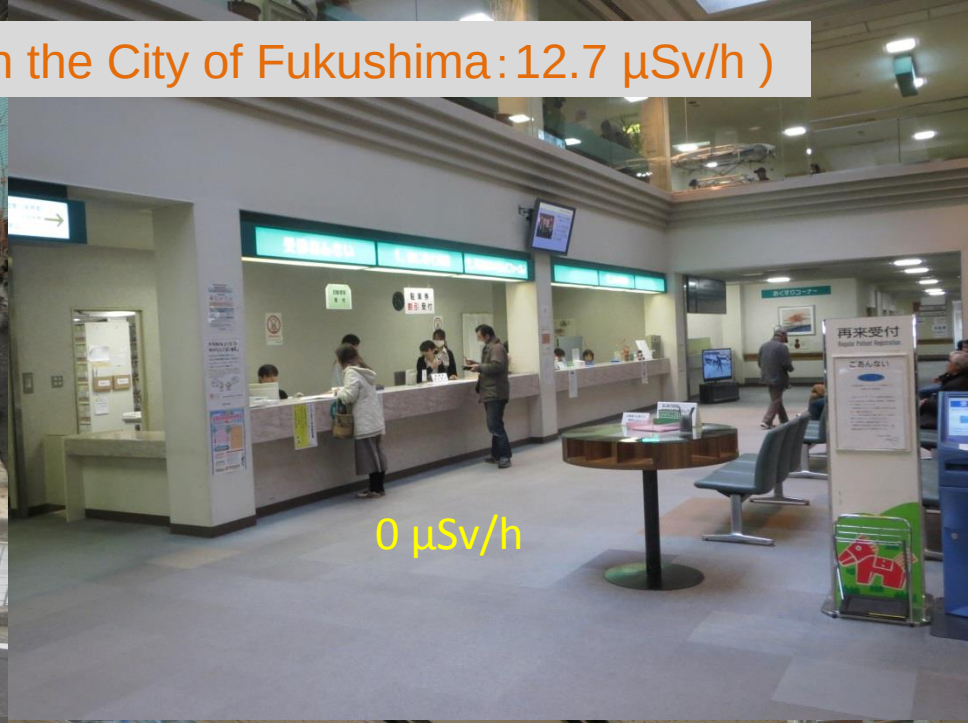
Air Dose Rate in March 2011
- In the City of Fukushima -



Responses at Fukushima Red Cross Hospital
(Instructing and Providing Information to Hospital Staff)

- In the case of air dose rate exceeding 100μSv/h:
  - Stay inside the hospital for at least 3 days and wait for dose to decline
- Ensure iodine tablets and food & drink to survive for 3 days
- Share safety information about effect from radiation
  - Acute exposure: No health effect if exposure dose is 100 mSv or below.
  - Measurement of environmental dose at each section of the hospital
- Our hospital accepted the temporary leave or evacuation by our staff who felt anxiety about radiation.

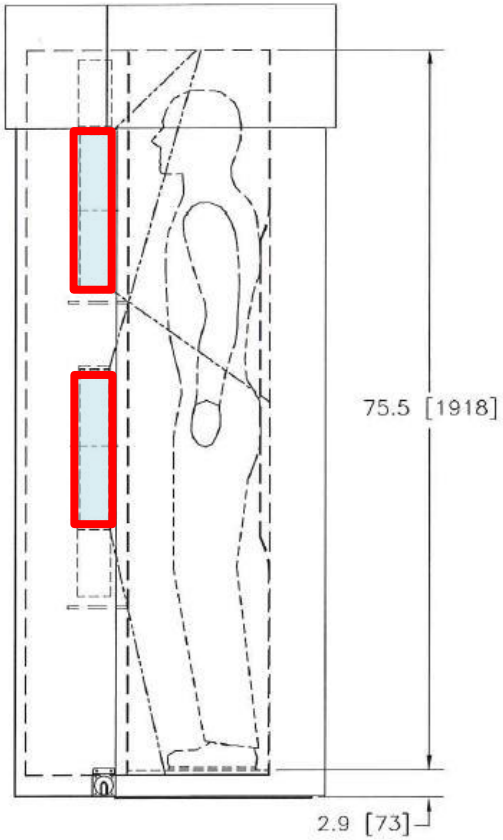
March 18, 2011 (Air dose rate in the City of Fukushima：12.7 μSv/h)



Screening for Internal Contamination Using Whole-body Counter (WBC)

FASTSCAN
manufactured by CANBERRA

Count time: 2 minutes



Two sodium iodide (NaI) detectors
(7.62cm × 12.7cm × 40.6cm)

Measurement Using WBC

- Detects gamma rays in the body
- Two possible nuclides currently detected in the body after the nuclear accident: Cs-134, Cs-137
- K-40 which exists in the natural environment is always detected

Lower limit of detection at Fukushima Red Cross Hospital

- Cs-134 ･･･180Bq
- Cs-137 ･･･200Bq
- Lower limit depends on environments (background), where WBC is installed
- Lower limit depends on WBCs

No. of WBC Screening and Measurement Result

April 2012 – January 2014

Age	No. of screened persons	Not detected	Detected	Detection rate
2～3	36	36	0	0.00%
4～6	1,651	1,650	1	0.06%
Elementary school students	345	345	0	0.00%
Junior high school students	89	88	1	1.12%
High school students	2,343	2,309	34	1.45%
39 years old ＞	4,183	4,159	25	0.60%
40 years old ≦	6,822	6,644	178	2.61%
Total:	15,469	15,231	239	1.55%

Committed Effective Dose of All Screened Persons : Less Than 1mSv

Committed effective dose:
Cumulative, lifelong dose after an intake of radioactive substances

- For adults: for 50 years
- For children: until becoming 70 years old

Dose limit for radiation workers: 50mSv per year
Dose limit for the public: 1mSv per year

- At our hospital, 15,469 persons were screened using WBC from April 9, 2012 to January 31, 2014. There were 239 persons whose values were above lower limit of detection and internal exposure was observed. The detection rate was 1.55%. The detection rate was especially low in children elementary school age or lower and in their parents aged 39 and under.

- The data suggests that parents with little children were well aware of internal exposure and paid close attention to the intake of food. On the other hand, some of the people aged 40 or over were not so conscious about internal exposure. They ate vegetables grown in their gardens without food testing. This resulted in a difference in the screening data.

- It is important to continue the screening using the whole-body counter and educate people on being more conscious about reducing of internal exposure.

Fukushima Red Cross Hospital's Challenges in the Future

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- Building a new hospital
  - People in the community can feel comfortable and trust when visiting the hospital and seeing a doctor
- Preventive medicine
  - Active involvement in check-ups
  - Continuation of internal exposure screening using WBC
  - Thyroid examination, which is part of health management program for Fukushima people by the Fukushima Prefectural Government
  - Open lectures for the community and health consultations
  - Implementation of "Psychological care" activities

Fukushima Red Cross Hospital's Challenges in the Future

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- Disaster medicine
  - Dissemination of information on nuclear disaster
  - Seminars/trainings about disaster medicine
  - Establish a radiation emergency medicine system
  - Primary radiation emergency hospital
  - Medical assistance team in nuclear disaster (NMAT)
  - Response to possible radiation exposure accidents in decommissioning and decontaminating at Fukushima Daiichi Nuclear Power Plant

Fukushima Red Cross Hospital's Challenges in the Future

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- Collaboration with Fukushima Medical University in disseminating information on disaster medical care to other countries
  - Co-hosting of international conferences and meetings in the City of Fukushima
  - Radiation disaster education: Dispatching of education teams abroad; trainings and mutual exchanges between Fukushima and other countries
  - Dissemination of information to other countries using the Red Cross network
  - Development of a network for radiation emergency medicine in collaboration with IAEA and WHO

- Building of infrastructure and database for disaster/emergency medical care information
  - Building of a robust information network for emergency medical care by connecting base hospitals in Fukushima
  - Establishing the most appropriate emergency medical care system by building emergency medical care database

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JRCS Nuclear Disaster Resource Center

The JRCS established the Japanese Red Cross Nuclear Disaster Resource Center in October 2013.

Main activities:

1. Develop and disseminate guidelines

2. Information gathering, compiling and sharing through its Digital Archives

   http://ndrc.jrc.or.jp

3. Inter-organization cooperation both inside and outside the JRCS

Mission Statement

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The mission statement of
the Japanese Red Cross Society:

“We mobilize people who desire to save those who are suffering, and protect the life, health and dignity of human beings in any circumstances.”