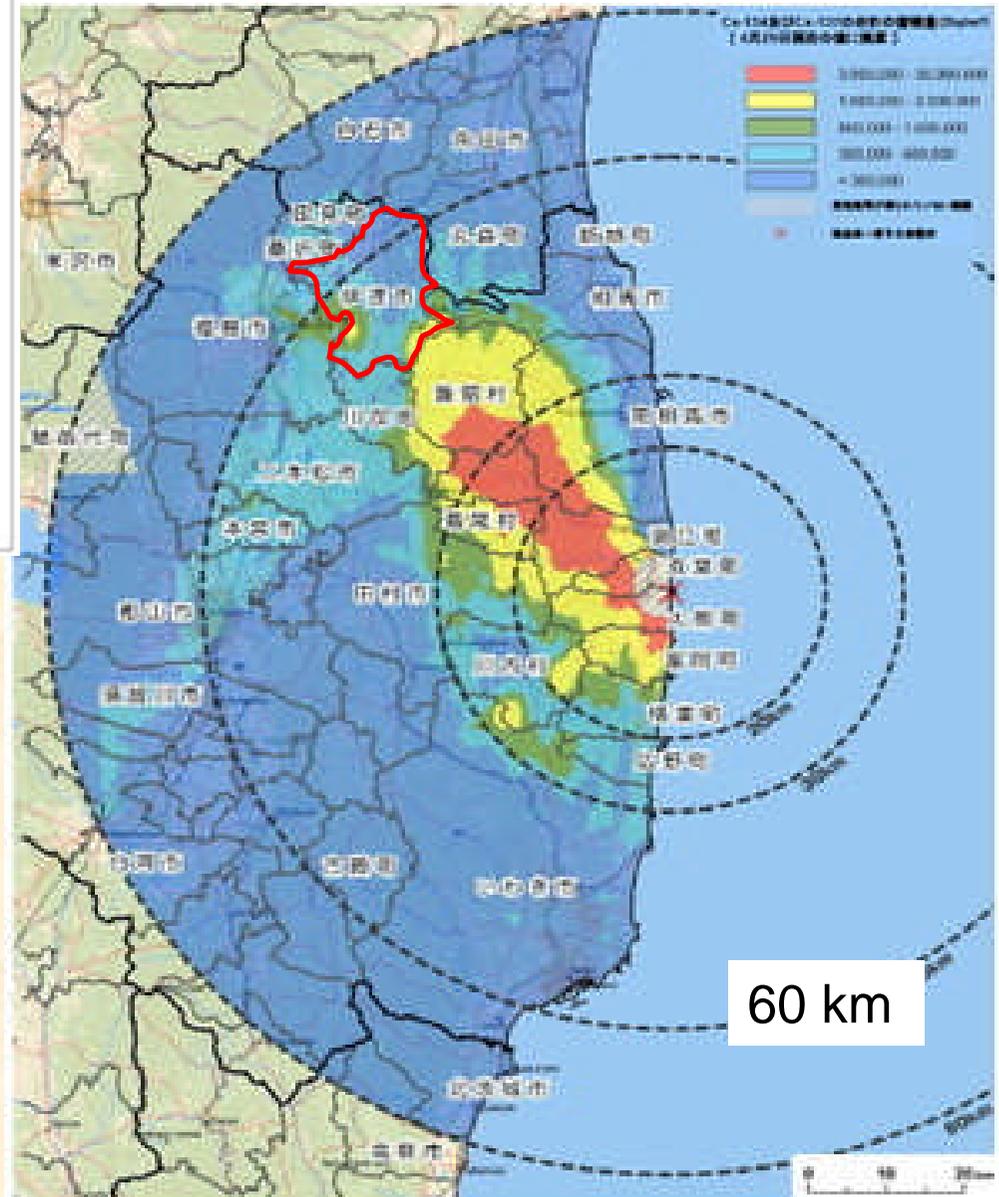
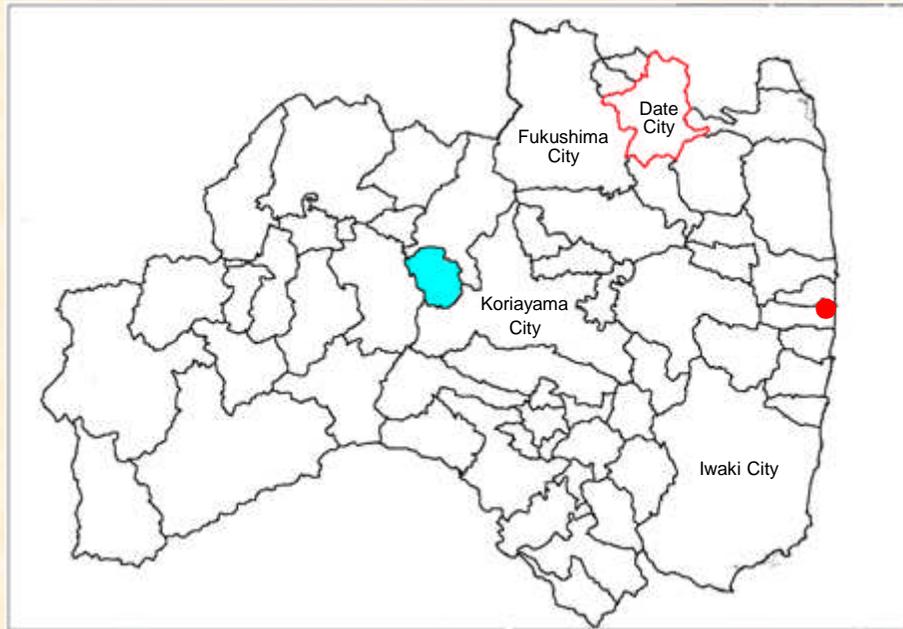


I R S N Seminar
**Course of the radiation disaster in Date City,
and issues concerning achieving peace of mind**
October 15 to 17, 2014



**Shoji Nishida, Mayor of Date City,
Fukushima Prefecture**

Results of airplane monitoring by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and U.S. DOE:
(Total ground surface accumulation of cesium 134 & 137 within an 80 km radius of the Fukushima Daiichi Nuclear Reactor)



Radiation released into the environment from the Fukushima Daiichi Nuclear Reactor accident.

1. Initial recognition and course of the radiation disaster

(1) Major disaster and abnormal situation at the nuclear reactor

March 11

14:46 Occurrence of the Great East Japan Earthquake

19:03 Declaration of an emergency situation at the nuclear reactor

⇒ Deemed as having no impact on Date City, as it is located more than 60 km away

21:23 Evacuation order issued for a 3 km radius

March 12

5:44 Evacuation order expanded to a 10 km radius

18:25 Evacuation order expanded to a 20 km radius

March 21

Issue of the City Disaster Measures Newsletter (Volume 1)

⇒ Includes statement: No need for concern, as Date City is located more than 30 km away

(2) Radiation hits Date City

March 23 Disclosure of SPEEDI data
⇒ Is there an awareness that Date City may also be contaminated?

March 30 First measurement of radiation levels

April 7 Acknowledgement of high radiation dose in school playgrounds → Need for measures for children

(3) Start of radiation measures

April 22 Setting of “Planned evacuation areas (Mandatory evacuation order) in Iitate Village, etc.

April 27 Chief Cabinet Secretary declares “Similar to Iitate Village, Date City also has contaminated areas” ⇒ Recognition of the need for evacuation as a city

June 4 Date City implements its own measures (support for voluntary evacuation) for 44 households

June 30 The government designates 4 areas and 113 households in Date City as “Special areas recommended for evacuation”

2. Measures for children

(1) (Parents) Concerns over radiation exposure at school

⇔ Is the health impact from radiation greater in children than in adults?

- Around April Wearing long sleeves, hat and mask when going to school; keeping the windows closed; not being allowed to play outside

- May 26 A decision of sole authority made by the Mayor for funding of 1 billion yen

⇒ Installing air conditioners

Wearing glass badge dosimeters

Decontaminating school playgrounds

- Measure for preventing radiation exposure while walking to school
→ Operating school buses

(2) Measures for internal radiation exposure

- Testing school lunches for radiation (*Kagezen* (Duplicated) method)
- Tests using a whole body counter (WBC)

(3) Concerns over obesity and stress

- Running a summer school

Held in remote areas where there are no concerns about radiation; aim is for the children to feel refreshed

- Setting up indoor play areas

Reaffirming the importance of exercise during childhood and the need for sand boxes for playing

3. Course of decontamination

(1) Decision to carry out decontamination and verification tests

- Evacuation

“So, what time can we return to our homes?”

⇔ When radiation has disappeared ⇔ Need for decontamination

- Prompt measures for radiation exposure

Cannot wait for guidance from the government

⇔ Date City implements its own initiatives

- End of April Removing topsoil from playgrounds of 2 elementary schools with high radiation dose ⇒ Proven effect of lowering radiation dose

- From June onwards

Date City independently removes topsoil from the playgrounds of all elementary schools and kindergartens in the city → The removed topsoil is buried underneath the school play grounds (temporary storage place)

- July Verification tests for decontamination of pools
→ Children went swimming

- July Verification tests for decontamination of private houses with high radiation dose
30 tons/house of radioactive substances
⇒ Need for temporary storage places

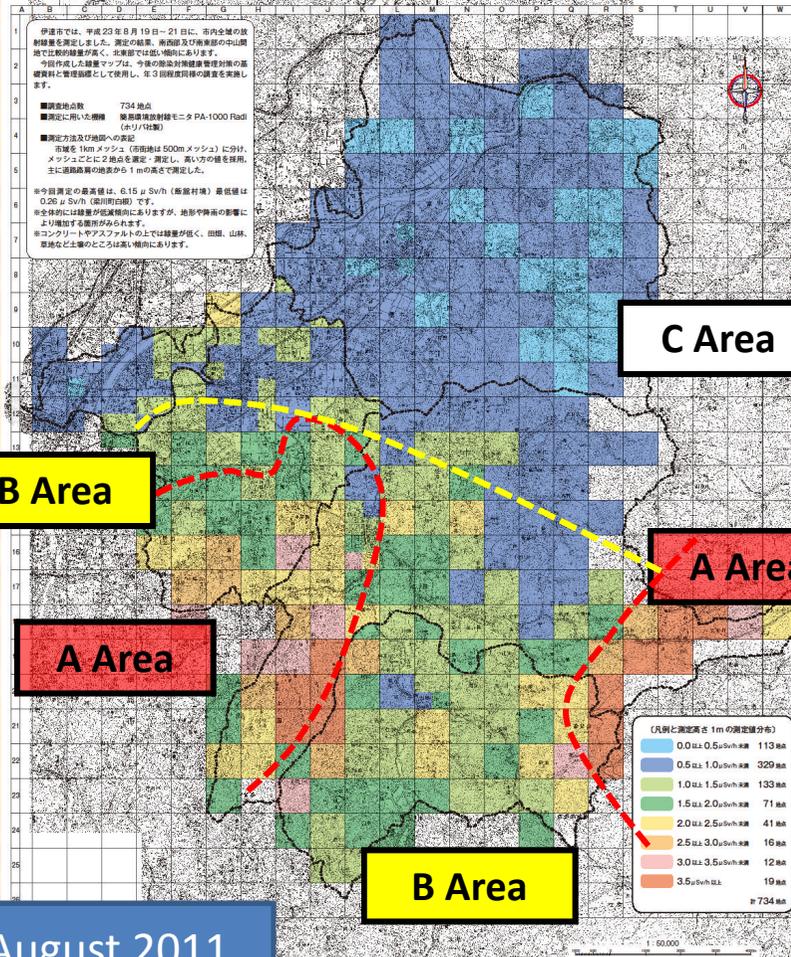
- October First time setting up temporary storage places
 - ← Tough reality of the difficulty in obtaining the understanding of residents

(2) Decontamination of living areas

In order to promptly carry out decontamination, it is done in accordance with decontamination levels based on the radiation dose

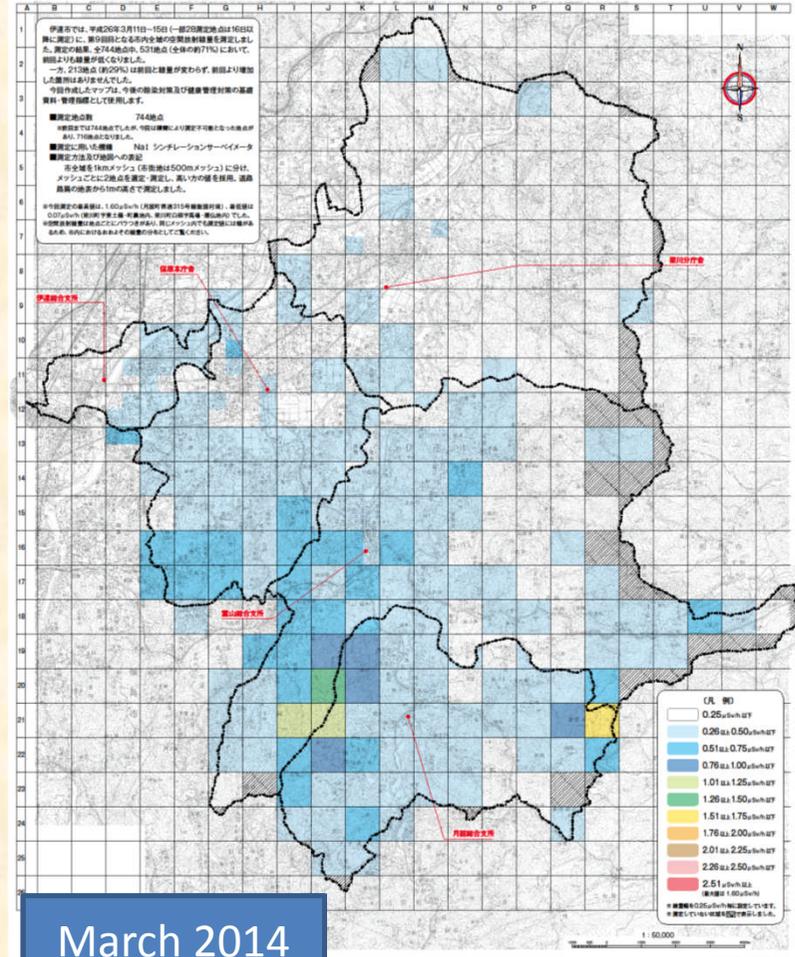
- Regular monitoring of all areas within Date City
 - (1 km mesh, every four months (from August 2011))
 - ⇒ To ascertain the dispersion of radiation dose
 - ⇒ To check the gradual decrease of air radiation dose from decontamination and its half-life period
 - ⇒ Divided into A,B,C areas according to radiation dose
- Decontamination target for the present time set at an annual exposure of 5 msv

Date City Complete Radiation Dose Measurement Map First time (August 19-21, 2011)



問い合わせ先：伊達市災害対策本部 環境防災課 (024-575-1003)

Date City Complete Radiation Dose Measurement Map Ninth time (March 11-15, 2014)



問い合わせ先：伊達市環境防災課 (024-575-1228)

- A Area (20 msv/y and above): 2,555 households
 - Construction costs 14.9 billion yen (6.5 million yen/1 household)
 - Construction starts May 2012 and is completed by August 2013
 - ⇒ Removed from “Special areas recommended for evacuation” in December 2013
- B Area (20 to 5 msv/y): 3,700 households
 - Construction costs 9 billion yen (2.5 million yen/1household)
 - Construction starts October 2012 and is completed by March 2014
- C Area (5 msv/y and under): 16,000 households
 - Construction costs 1 billion yen (60,000 yen/1 household)
 - Decontamination of hot spots (3 μ sv/h at 1 cm above ground)
 - Construction starts April 2013 and is completed by March 2014

Removal of topsoil from school and kindergarten playgrounds



Tominari Kindergarten

3.96 $\mu\text{Sv/h}$



**0.91 $\mu\text{Sv/h}$
(50 cm)**



Oguni Elementary School

5.35 $\mu\text{Sv/h}$



**0.88 $\mu\text{Sv/h}$
(50 cm)**





Temporary storage places for radioactive waste

(Over 90 places secured in Date City)



4. Management of radiation exposure

(1) External exposure ⇒ Wearing glass badge dosimeters

- Started in July 2011 A area and pregnant women, children:

Total 15,000 people

- July 2012-June 2013
people) Worn by all residents (approx. 65,000

⇔ For peace of mind

- July 2013-June 2014 Initial targets + B area (8,000 people)

+ Monitors in C area (2,000 people)

+ Willing participants (1,000 people)

Total 26,000 people

- From July 2014

Initial targets + Monitors in B & C areas

(2,000 people) + willing participants (1,000 people)

Total 18,000 people

(2) Internal exposure ⇒ WBC (All residents tested during FY2012,
third round of tests currently underway)

Food tests (16 testing areas set up in Date

City)

5. Analysis results of glass badge data

(1) Measured over one year from July 2012-June 2013. Results taken from continuous analysis throughout the year of data from 52,783 people

- Annual exposure of less than 1 msv: 66%, less than 2 msv: 94%

- Measures for children were successful

⇒ No child aged 15 years or under with an annual exposure of over 5 msv.

- 76 people with an annual exposure of over 5 msv

- Shift from a macro-type management of radiation dose of all residents to an individual-based management of radiation exposure

⇒ Move towards management of daily activities using the D shuttle radiation monitoring service

- An annual exposure of 1 msv is the government-stipulated air radiation dose

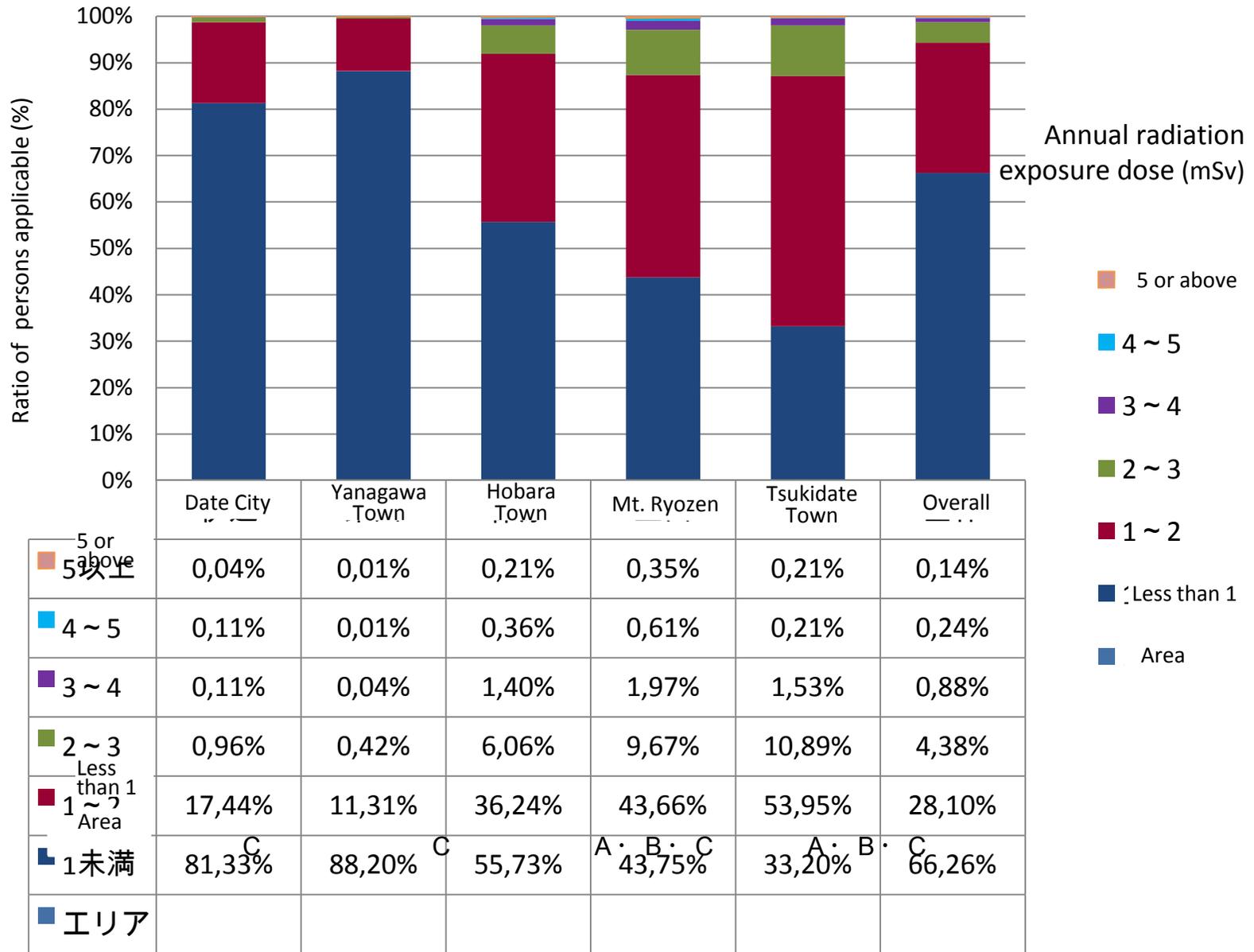
Exposure dose can reach up to double of 0.23 μ sv/h



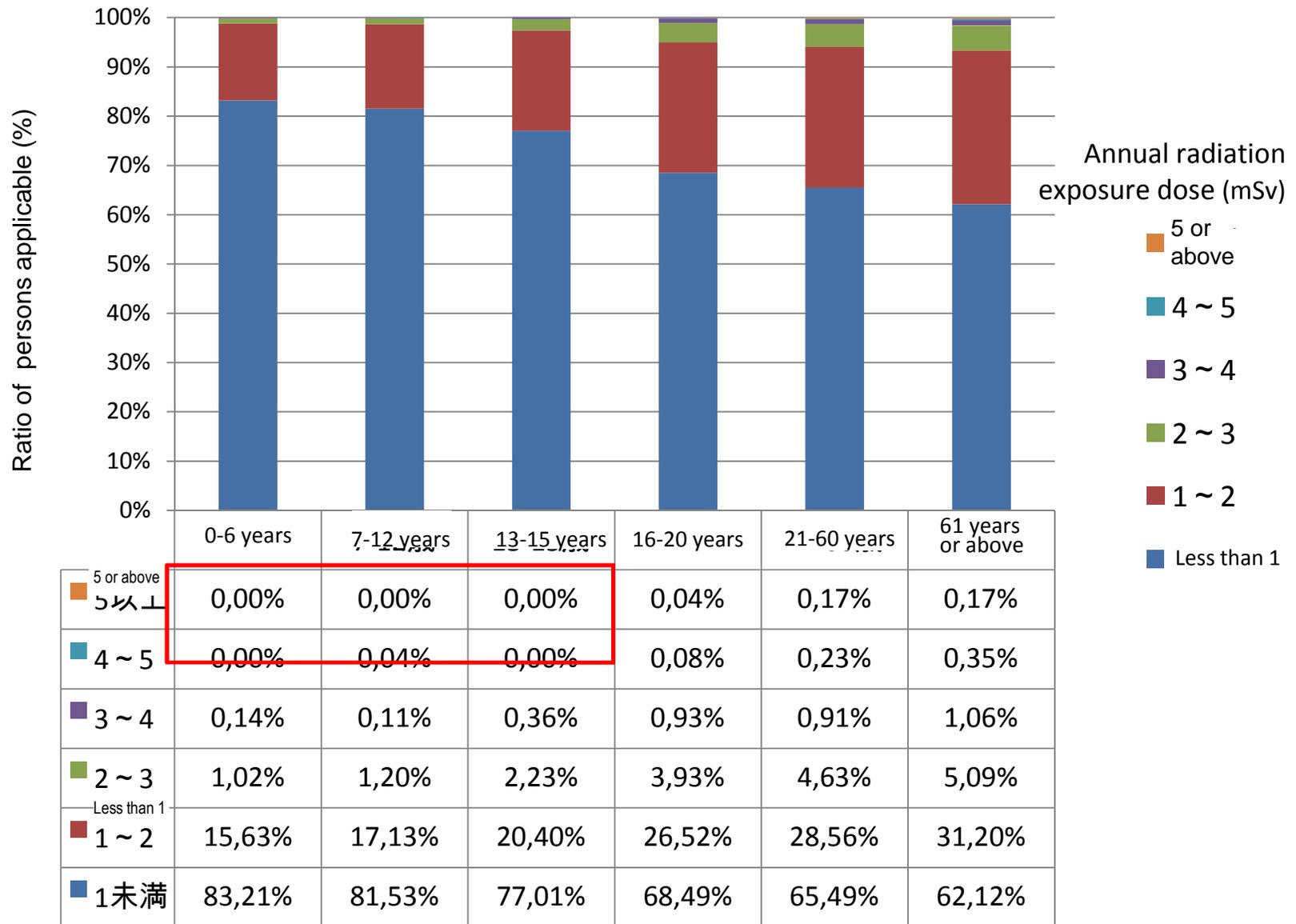
(2) Analysis results of data from 18,674 people, taken from July 2013-June 2014.

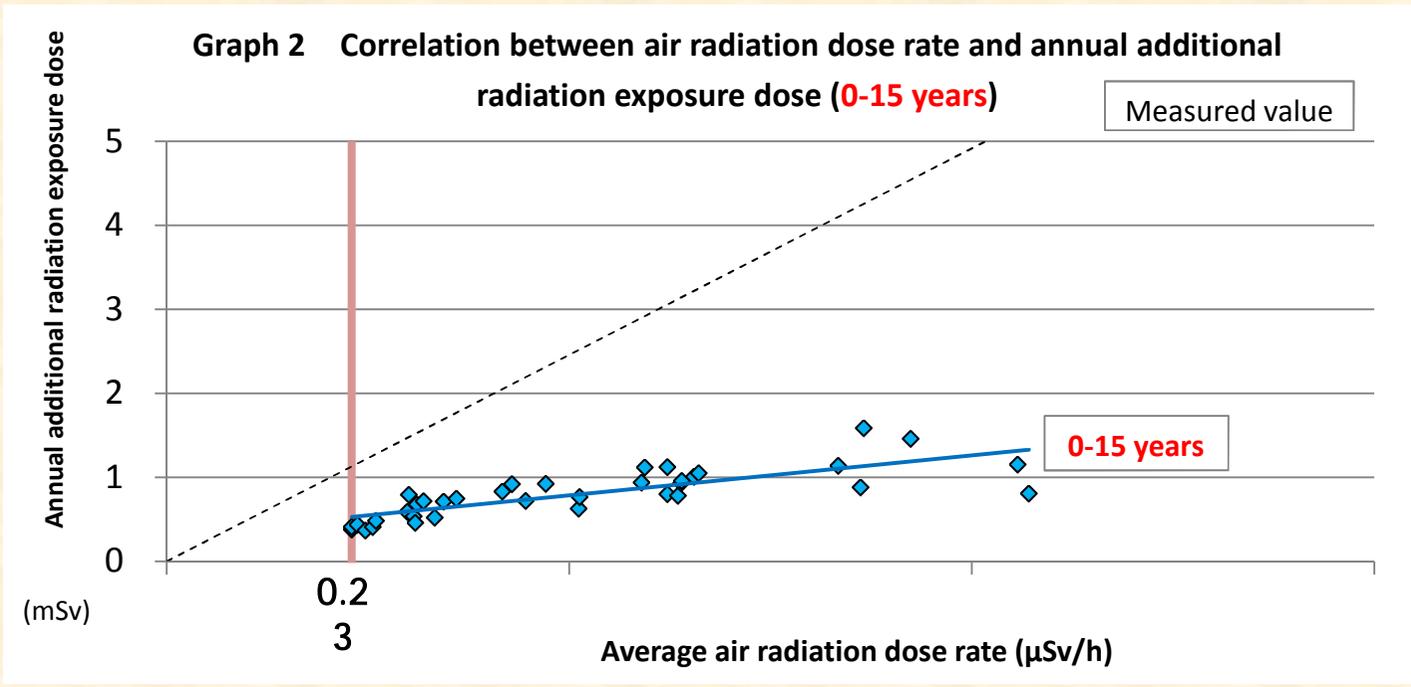
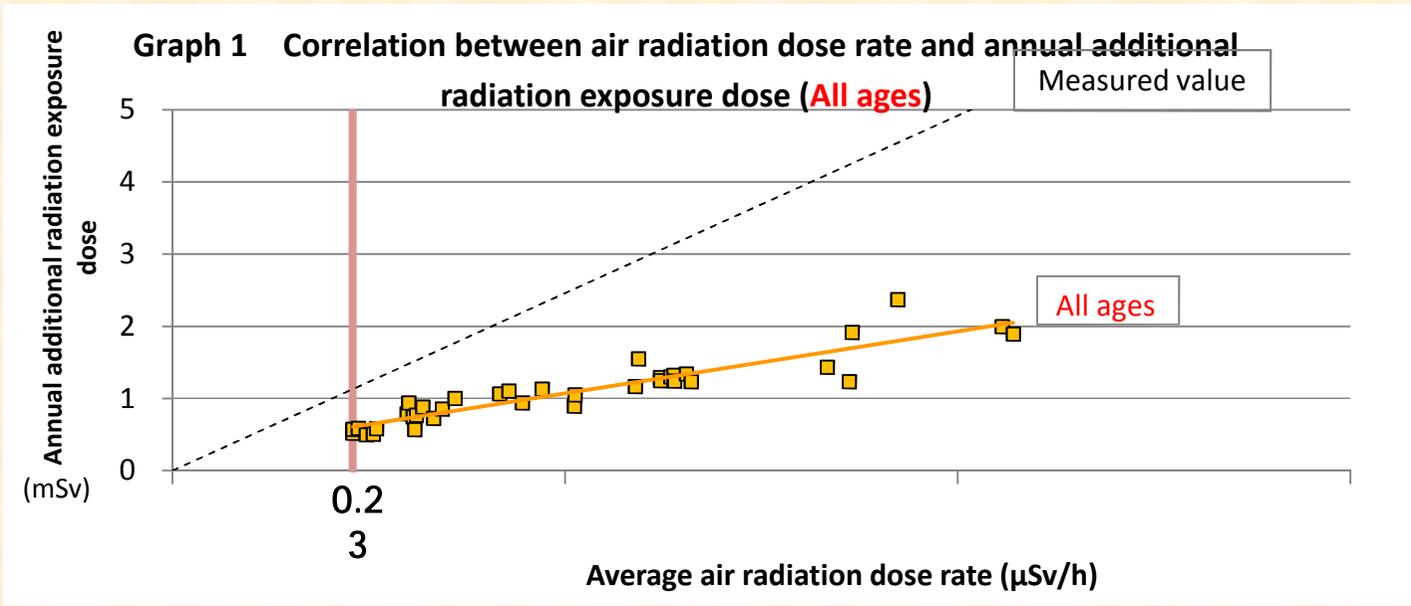
- Overall exposure dose for Date City is 0.75 msv, which is a 0.14 msv fall from the previous analysis results of 0.89 msv.
- Annual exposure of less than 1 msv: 75%, less than 2 msv: 97%, less than 3 msv: 99.4%
- People with a annual exposure of 5 msv or above: 11, 4-5msv: 12. These were abnormal values, and those people were handled individually.

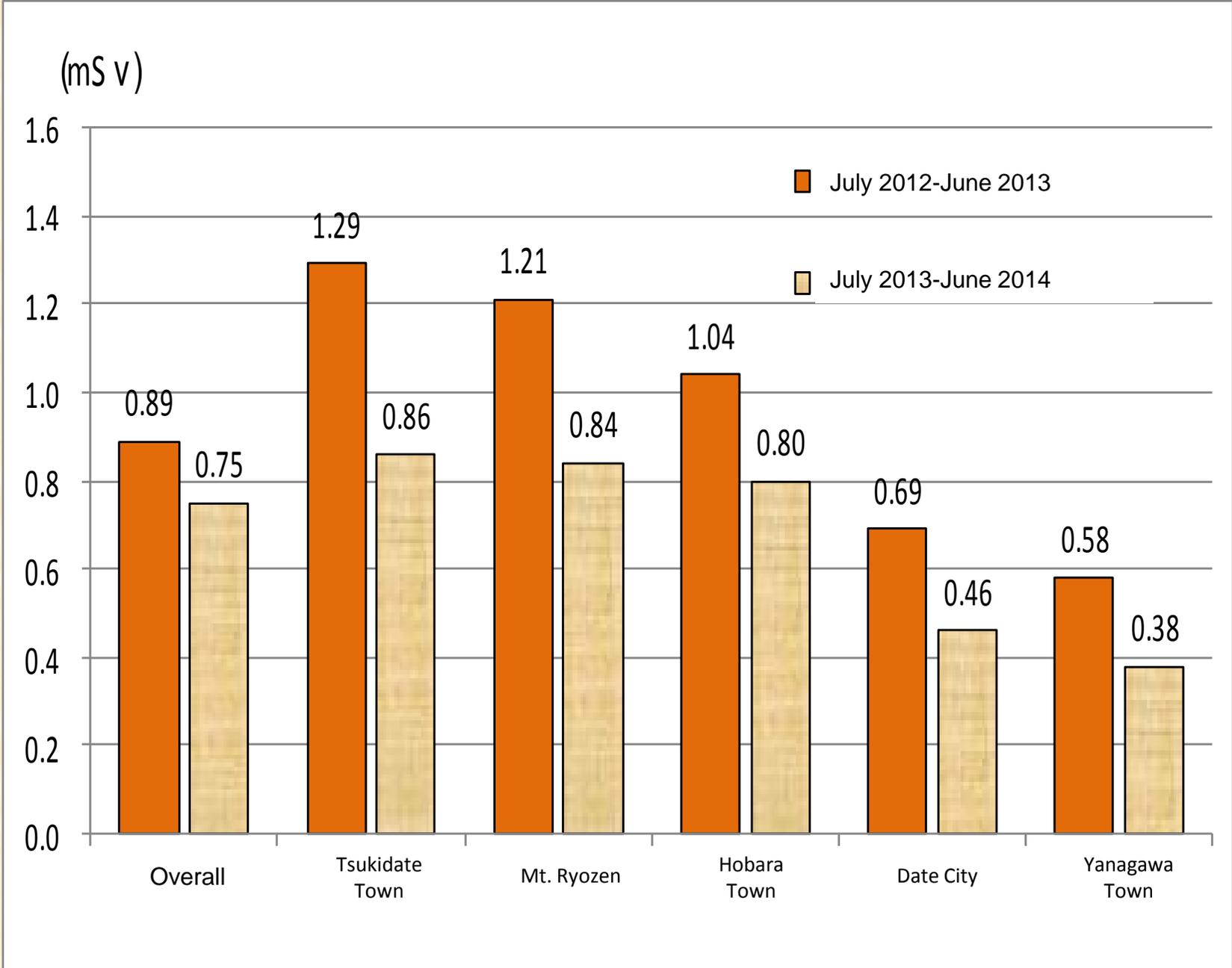
Annual radiation exposure dose by region



Annual radiation exposure dose by age







6. Concerns of residents living under a low radiation dose, and working towards building up resilience

(1) No strategy in setting the standard values for annual radiation exposure dose

- ICRP recommendation “In an emergency situation, the standard value should be set at 100 msv/y to 20 msv/y”
- The government decided on the ICRP lowest recommended value of 20 msv/y (air radiation dose of 3.2 μ sv/h) as the standard for an evacuation situation
- No reduction range proposed in response to queries about whether it is okay to use the same values for both adults and children; regarded as not possible to do.
- In December 2011, the government set the future target for the annual radiation exposure dose at 1 msv/y.
- The residents of Date City took this 1 msv/y to be a value that should be reached immediately.
- Based on the current state of decontamination, Date City set the value at 5 msv/y for the present time \Rightarrow This was reached in July 2014, and the current target is now 1 msv/y.

(2) Confusion over the government announcing the value of

1 msv/y as equivalent to an air radiation dose of 0.23 μ sv/h

- Request for all regions to carry out decontamination until the future target of 0.23 μ sv/h is reached.
 - Targets are set for decontamination.
 - If there is no decontamination of the area, then my grandchildren won't return home (even though the radiation dose is extremely low).
 - I cannot feel reassured with only decontamination of hot spots. There should be complete decontamination of the area, like in other municipalities.
- Measure 1: Carrying out follow-up decontamination
(From January 2014)
- ⇒ A questionnaire was distributed to all households, and based on the responses, individualized measures are being carried out to resolve concerns.

- Measure 2: Review 1 msv/y=0.23 μsv/h, based on actual measured values

Request made to government in June 2014, and response received in August 2014.

⇒ The government announced that 1 msv/y=0.23 μsv/h to 0.6 μsv/h

However, the target values for decontamination are decided by each municipality.

⇒ Statement made that 0.23 μsv/h is not recognized by the government as a standard value for decontamination

Although, in reality it is the basis for calculating the decontamination budget.

(3) The setting of excessively stringent standard values for food is fuelling concerns.

- Standards became strict when there was still a state of confusion (January 2012)

(Unit: Becquerel/kg)

		General food	Water
Japan	During the disaster	500	100
	January 2012	100	10
America		1200	1200
EU		1250	1000

(4) Some of the excessive reactions to radiation

- Is it okay to use the same standard values for both children and adults?
- Voluntary evacuation to outside the prefecture
 - (Date City, initially approx. 1000 people \Rightarrow Currently approx. 500 people, All prefectures approx. 25,000 people)
- Don't use Fukushima prefecture produce in school lunches
 - \rightarrow Carrying out tests using *Kagezen* (duplicated) method
- I won't eat the vegetables grown by my grandparents, but food bought at the supermarket is OK \Rightarrow Two separate dinner tables in the same household
- There should be no radiation
 - \Rightarrow Radiation has always existed in the natural world, and it's also necessary for use in medicine
- Joining anti-nuclear power protests

(5) Damage from harmful rumors

- Refusal to deliver even daily necessities, such as gasoline and food.

⇒ Issue now resolved

- Refusal to purchase agricultural produce such as rice, vegetables and fruit, or a drop in the price of these products.

⇒ Stepping up of radiation tests

- Also refusal to accept industrial products (PCs, etc.), request for certificate of safety.

⇒ Issue now resolved

- Outflow of contaminated water from Fukushima Daiichi Nuclear Reactor.

Impacts not only the fishing industry, but also agricultural produce

⇒ Seeking an early resolution of the issue

(6) Accepting the reality of living with radiation

- Coming up with innovative ways to live safely and with peace of mind while there is radiation around.
- Initiatives to grow safe crops and agricultural produce (e.g. measures for absorbing and controlling cesium).
- No distinction between good and bad radiation.
- There are limits to the effects of decontamination. The air radiation dose cannot be immediately lowered to zero.
- Decontamination requires a substantial amount of labor and money, and doesn't produce any benefits. → Use the money for other measures...
- There's no harm in occasionally eating seasonal mountain vegetables that are over standard levels.
- Correct knowledge of radiation \Leftrightarrow Reassurance=Safety+Trust
- Improving education on radiation

Compiling supplementary materials

⇒ For education from children to adults: Only 2 hours/year in Japan, compared to 72 hours/year in Belarus.



“Supplementary reader on radiation
Know the proper facts about radiation”
(Date City Education Committee)