Measuring, discussing and living together

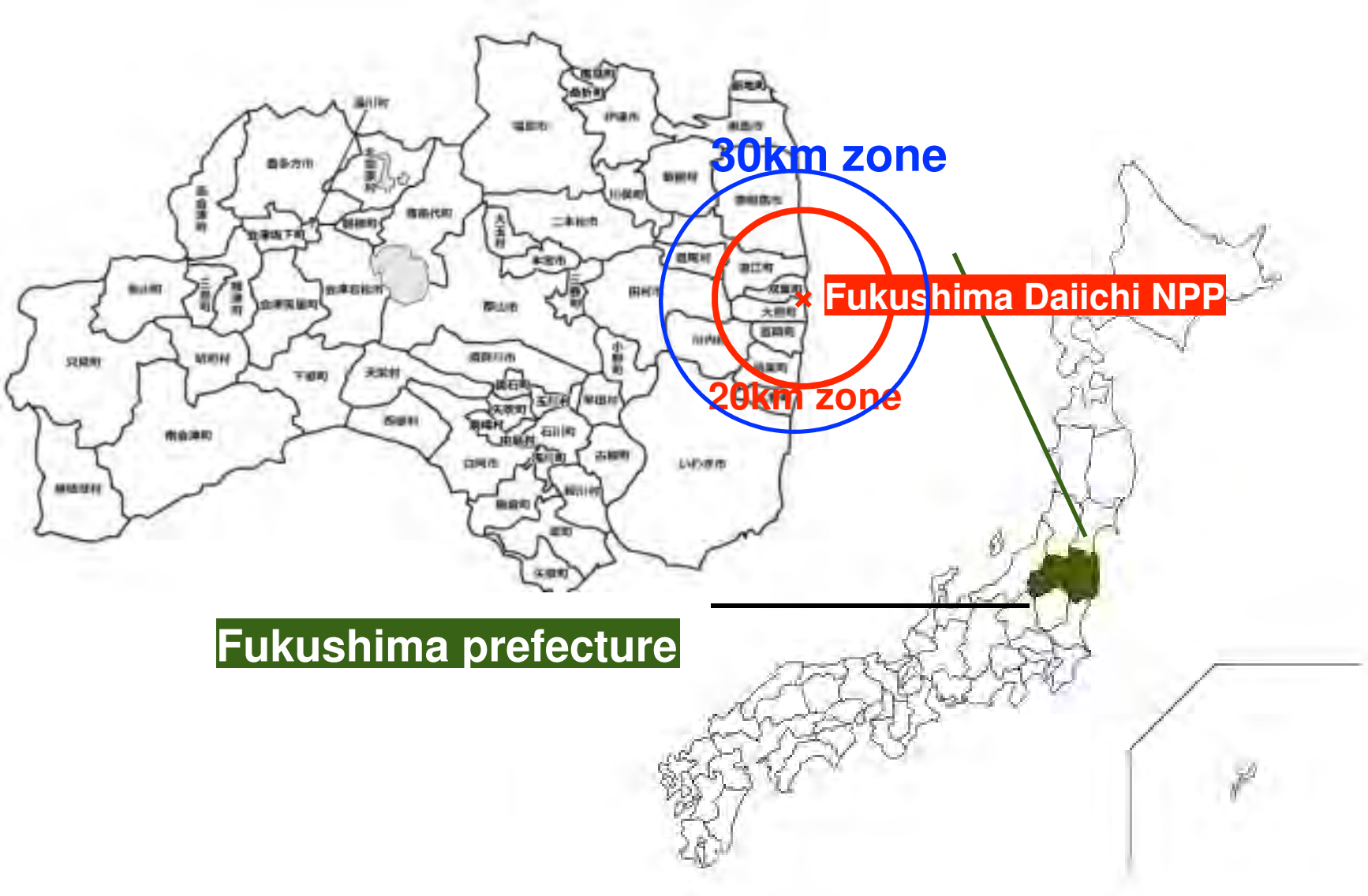
— What we learned from four years in Suetsugi

Ethos in Fukushima

Ryoko ANDO

20 th Oct. 2015

ICRP 2015


30km zone
Fukushima Daiichi NPP
20km zone
Fukushima prefecture

Three lines dividing people's lives after the disaster

1) Line by geographical distance:
the zone within **30 km** or the outer

2) Line by decontamination requirement:
Air dose rate **0.23 μSv/hour**
= annual dose 1 mSv/year

3) Line by food contamination:
Less than detection limit: **N.D.** or not

1)-A Line by distance: the zone within 30 km or the outer

- **11 Mar** 2011 14:46 The earthquake
- **12 Mar**: 20 km radius evacuation order by the Government
- **13 Mar**: Iwaki city northern area (within 20-30 km radius) voluntary evacuation request by Iwaki city mayor
- **15 Mar**: 20-30 km radius indoor sheltering order

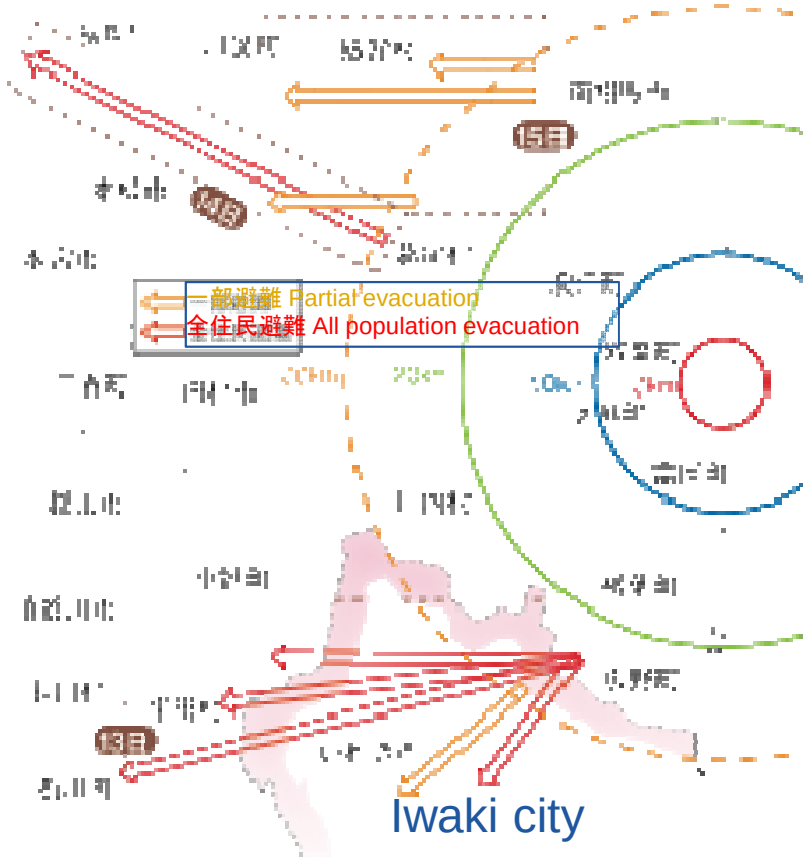


図3-4 いわき市の自主避難区域と30km圏内

Reference: http://www.city.iwaki.fukushima.jp/dbps_data/_material_/localhost/01_gyosei/0130/syogentokiroku/059_075.pdf

1)-B What the line by distance had brought?

- As once entry restricted, people had doubts about safety of the area **“Dangerous zone”**
- At the time of lifting restriction, people required a proof of **“Safety”**

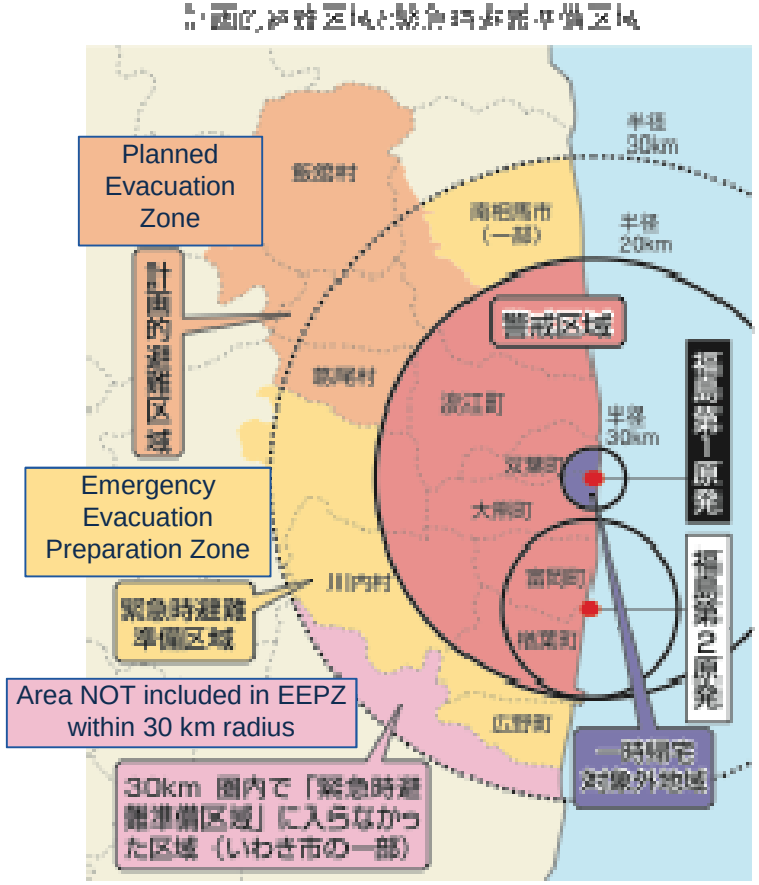


図3-1-4　計画的避難区域と緊急時避難準備区域の設定区域

2)-A Air dose rate and annual dose 0.23 μSv/h = 1 mSv/year

- August 2011: “The Act on Special Measures concerning the Handling of Radioactive Pollution” was enacted

Ministry of the Environment concept

As “long-term goal”, reduce “additional exposure dose” to “1 mSv/year”

To specify decontamination area, this value have been converted to air dose rate 0.23 μSv/h

2)-B MoE Criterion 0.23 μSv/h

1mSv/year =

$$[(0.19)\ \mu Sv/h \times \{(\underbrace{8}_{\text{hours}} \times \underbrace{1}_{\text{shielding}}) + (\underbrace{16}_{\text{hours}} \times \underbrace{0.4}_{\text{shielding}})\}] \times 365\ \text{days}$$

outdoors indoors

\+

0.04 Background radiation

|| μSv/h

0.23 Criterion to specify ICSA

μSv/h

ICSA: Intensive Contamination Survey Area

2)-C How people received this criterion?

- Places exceed 0.23 µSv/h are **DANGEROUS**:
  e.g. “I don’t return to my house until it gets lower than 0.23.” “Hills exceed 0.23, so I won’t enter.”

- If getting more than 1 mSv/year it affects to **FUTURE HEALTH**:
  e.g. “Even it is OK now, we will get cancer in future, won’t we?”

2)-D Our life space changed drastically

- Suddenly dangerous zones creep into daily life

- People started limiting their actions and lifestyles by themselves

- Strong mistrust and complaints to authorities which leave them idly

3) -A Line by N.D. – foodstuff limit value –

(1) **17 Mar 2011**: Tentative limit value (based on annual limit 5 mSv)

(2) **1 Apr 2012**: New limit value (based on annual limit 1 mSv)

○放射性セシウムの暫定規制値※1

Category	規制値
Drinking water	200
Milk and Dairy products	200
Vegetables	500
Grains	
Meat, Eggs, Fish, etc.	

※1 放射性ストロンチウムを含めて規制値を設定

○放射性セシウムの新基準値※2

Category	基準値
Drinking water	10
Milk	50
General foods	100
Infant foods	50

Unit: Bq/kg

（単位：ベクレル/kg）

※2 放射性ストロンチウム、プルトニウム等を含めて基準値を設定

3)-B Mistrust for standards itself

"The limit was tightened in such a short time. The first standard must have been wrong; they were labeling something dangerous as safe."

The mistrust originally existed was strengthened by this change

"Any standards set by the government cannot be trusted."

People tried to find safety in "N.D." whatever it meant

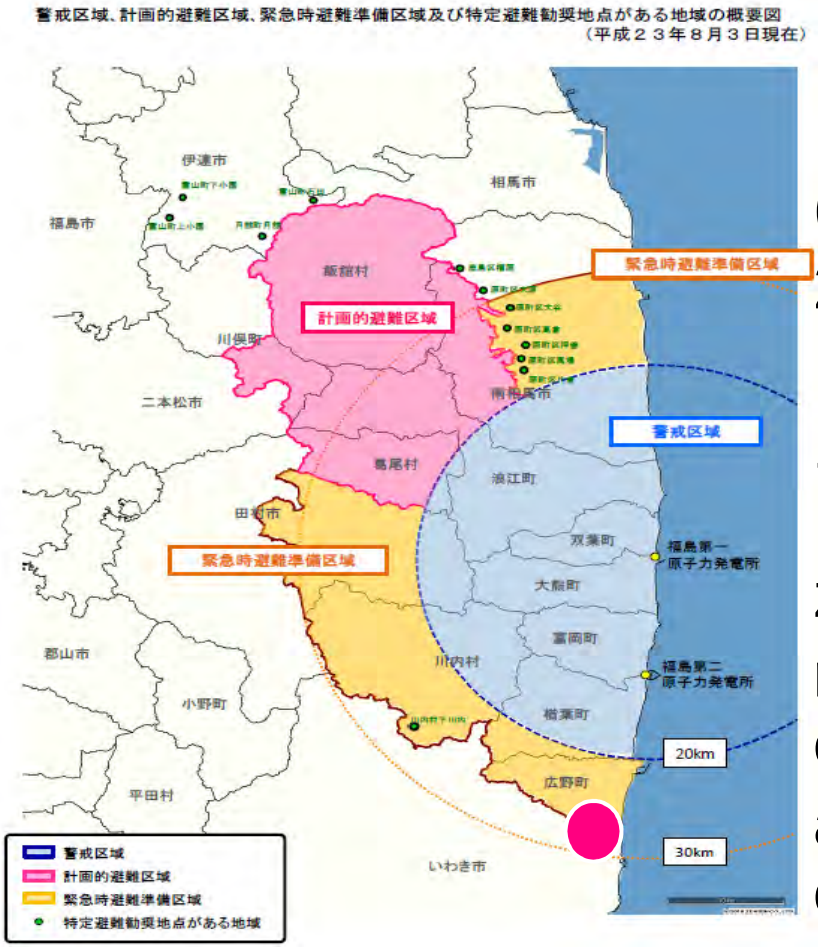
What the mistrust for standards had brought?

- Can't trust any standards: **"The lower, the safer"**

- In every action in daily life it is needed to make a decision: **"Dangerous or Safe"** Everywhere we had usually visited, everything we had usually eaten… **are they really safe?**

Practices in Suetsugi district

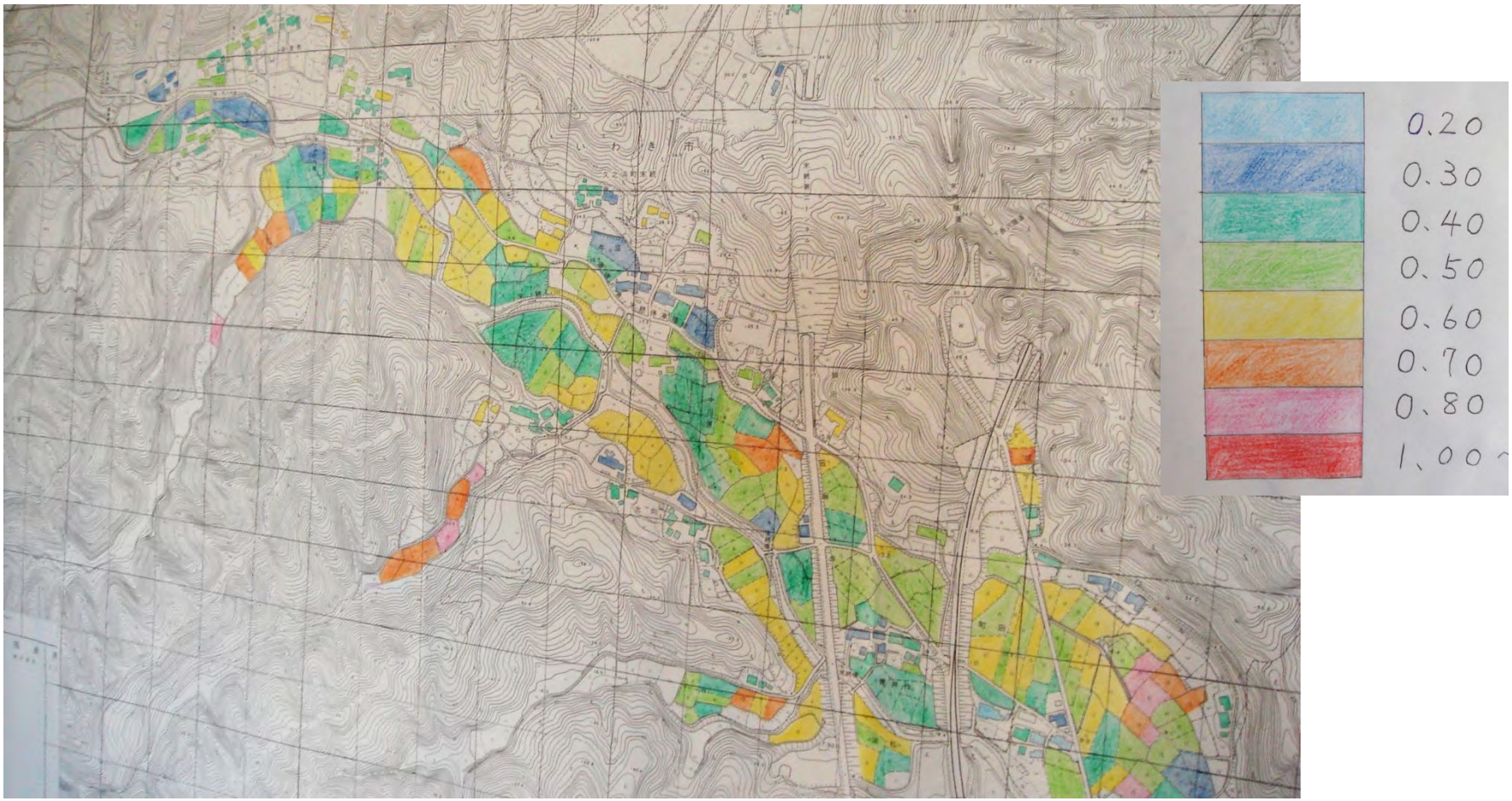
Where is Suetsugi district?
How many people are there?



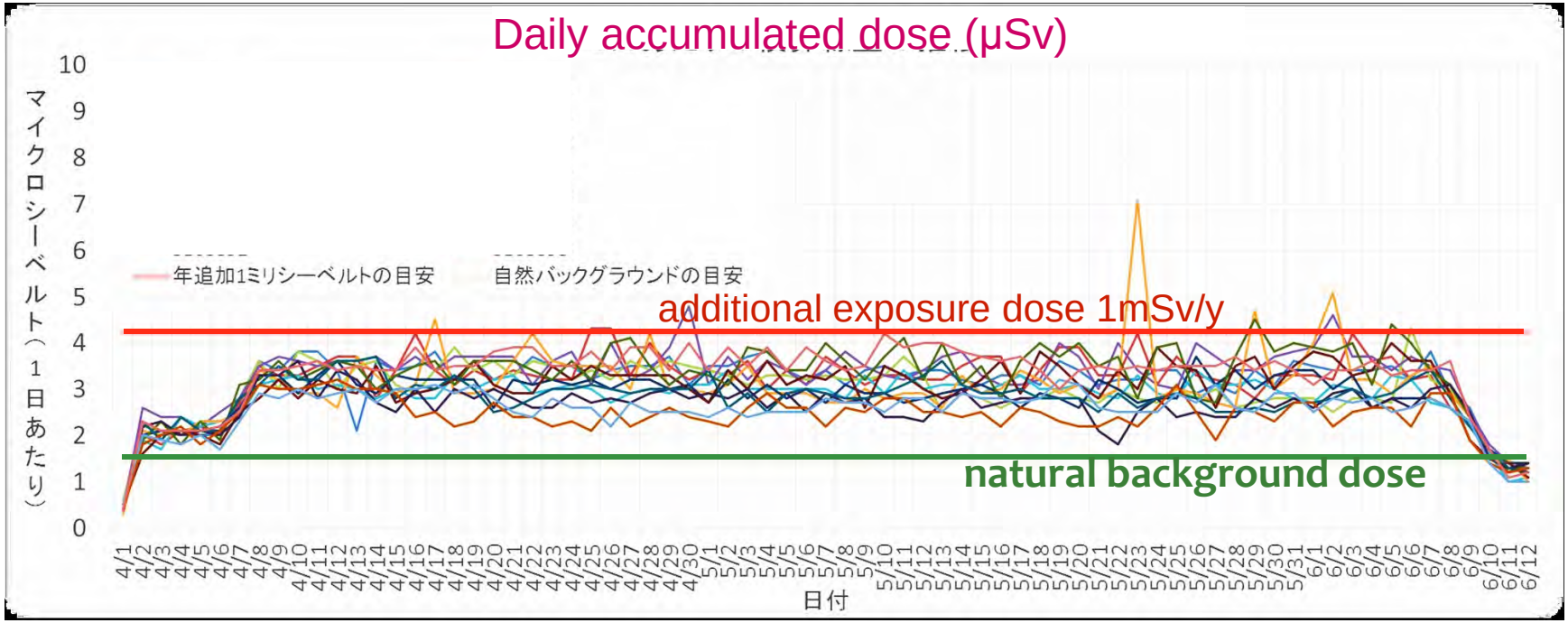
100 plus households,
about 400 people
(April 2014)
27-28 km away from the NPP

12 March – 22 April 2011
Designated as indoor sheltering zone;
residents were requested to evacuate,
almost all residents had been evacuated

Air dose rate / soil quality measured maps compiled by volunteers in Suetsugi district, Autumn 2011 – March 2012



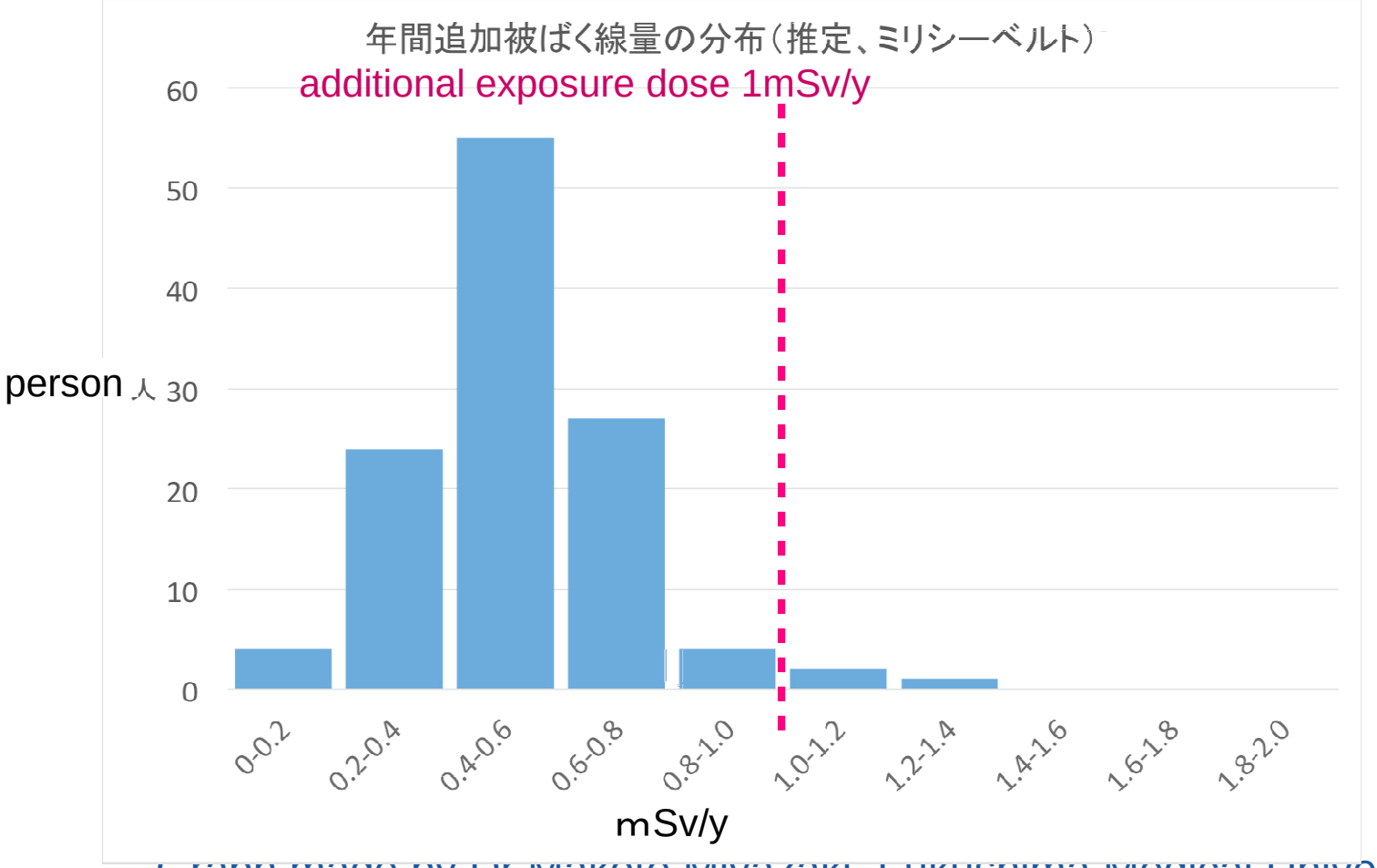
Grasping external exposure as whole district community



Graph made by Dr Makoto Miyazaki, Fukushima Medical University

Grasp exposure in each one's life space
and in community-level

Distribution of external exposure as district community



Graph made by Dr Makoto Miyazaki, Fukushima Medical University

Foodstuff measurement day at the community center

Measurement day on 3 March 2015

Confirm one's diet and foodstuff measurement

Community-wide whole body counter measurement

1st June 2013

124 person

2nd Oct 2013

34

3rd July 2014

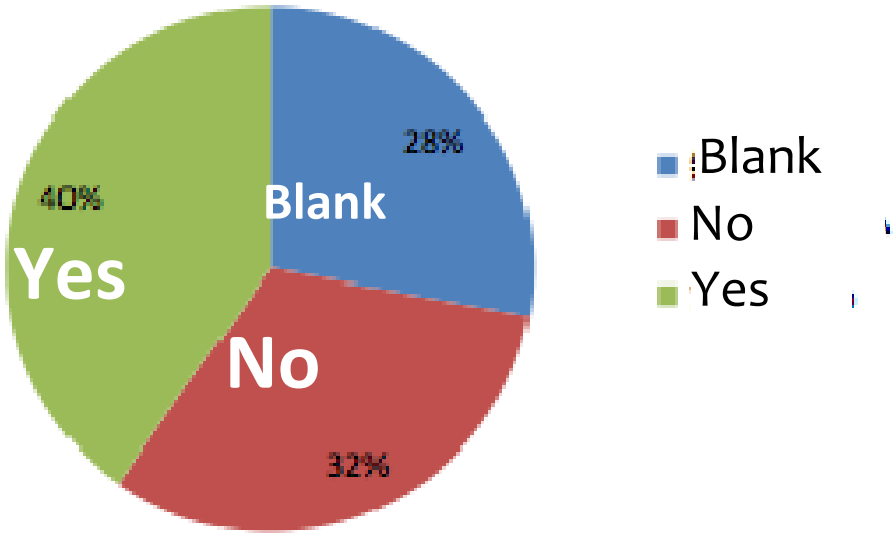
39

4th June 2015

41

Survey result at WBC measurement

Have you been eating local foodstuff since the accident?



Knowing diet and measurement result of the community strongly helped to understand one's own diet and measurement result

100
枚入
DAISO
Panasonic
MK-K48P

Summary of practices in Suetsugi (1)

1) Dose rate / soil quality actually measured map enabled to rethink the line “within 30 km radius = dangerous”
2) Individual external exposure measurement enabled to rethink the line “life cohabiting with any point exceeds 0.23 μSv/h is dangerous”
3) Internal exposure measurement and foodstuff monitoring enabled to rethink the line "anything not 'ND' is dangerous"

Summary of practices in Suetsugi (2)

- Measure one's own everyday things and discuss the results – "Measure and Discuss"
- This is the starting point to find a grip on the "lines" that have been imprinted onto our lives
- By contemplating the meaning of "lines", people can restore confidence in standards - trust for our society

Measurements redefine the meaning of lines

How much does this “line” or “standard” mean to my life?

Through data sharing – discussion

How much does it mean to our life, in other words, to our society?

Some “lines” can not be resolved by the “measure and discuss” approach

- When lines, as administrative boundary, are used to determine administrative action, such as compensation amount, voluntary measurement activities or the results do not have power to change the consequence of the administrative action or resulting disparity (if any)
- Labels that outsiders fixed are hard to change; Groundless prejudices such as "That is a 'high-risk' area, let's avoid anything to do with it” are hard to overcome, especially over time

Lessons learned (1)

- As every single “line” is drawn, it has huge impact on each person’s life
  A "line" has the power to tear apart someone’s life or the fabric of community
- However, the government believes that it is its mission to draw "lines”
  - Often the government does not consider the full extent of the social impact and the effect on individual lives

Lessons learned (2)

What is a line which is **“appropriate”** and **“necessary”** for society?

How to draw a line that will minimize people’s pain?

Conclusion

"Lines" have significant impact/consequences across the society, not limited to science/RP community, nor only during the emergency stage.

Any measures against future NP accidents/radiation emergency should fully consider said impact/consequences.

Lessons learned from Fukushima regarding the "lines" should be reflected in any thinking/planning of future responses.