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✉ kenkani@fmu.ac.jp Tel: 024-581-5454(平日9～17時)

2023 Fukushima Medical University International Symposium on the Fukushima Health Management Survey

Secretariat of International Symposium

Office of Public Communications and International Cooperation, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University

✉ kenkani@fmu.ac.jp, TEL: +81-24-581-5454 (Weekday, 9a.m. - 5 p.m. JST)



Center for Integrated  
Disaster Information Research

# **Reputational damage and distribution damage in radiation disasters after the accident at TEPCO's Fukushima Daiichi Nuclear Power Station**

**Sekiya Naoya**

Associate Professor, The Center for Integrated Disaster Information Research,  
Interfaculty Initiative Information Study, the University of Tokyo.

Senior Researcher, Research Division of the Great East Japan Earthquake and Nuclear Disaster  
Memorial Museum.

## Committee

- **Policy and Technical Investigation Advisor, Investigation Committee on the Accident at the Fukushima Nuclear Power Stations, Cabinet Secretariat.**
- **Chairman, Damage Investigation Committee on damage compensation of the accident at the Fukushima Nuclear Power Plant Accidents in the Nuclear Damage Compensation Dispute Resolution Center, Ministry of Education, Culture, Sports, Science and Technology**
- **Chairman, Investigation Committee on Evacuation Procedures at Nuclear Disaster, Niigata prefecture**
- **Project Advisor for Risk Communication, Integrated Program for Next Generation Volcano Research and human Resource Development, the Ministry of Education, Culture, Sports, Science and Technology.**
- **Member, The Subcommittee on Handling of ALPS Treated Water, Agency for Natural Resources and Energy, METI**
- **Member, “Expert Committee on International Education and Research Institute in the Fukushima Hamadori Region (Fukushima Institute for Research, Education and Innovation) ”, Reconstruction Agency**



## Emergency Exposure Situations

Wide-area evacuation after the accident

Urgent protective action immediately after nuclear disaster

ex. SPEEDI, Screening, iodine tablet ingestion, personal decontamination

## Existing exposure situation (Long-term exposure)

Internal exposure ; Bad reputation, Food safety management

External exposure ; Decontamination and restricted area setting

ALPS Treated Water

IDP : Internally Displaced Person

Longtime Refugee ; Area Sustainability and Revitalization, Bad Reputation

## Disclosure

Issue of nuclear reactor core meltdown and public information disclosure

Issue of communication with foreigner and foreign countries (50 miles)

20mSv/y(3.8 $\mu$ Sv)、1mSv /y (2.3 $\mu$ Sv)

# 01

## Fukushima Now

# 2011.4





# 2017



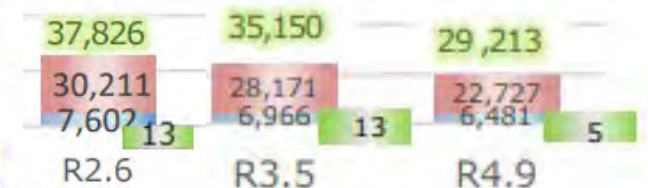
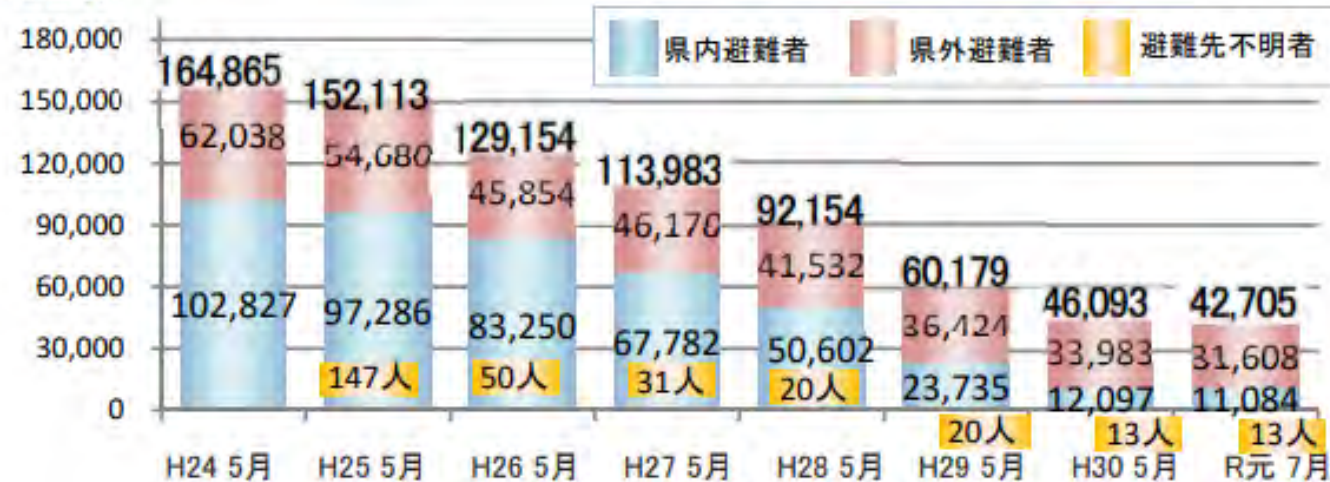
# Transition of Evacuees

1,784,936 people live in Fukushima

**IDPs** 29,213 evacuee in Japan(Fukushima accident)

## ◆避難者の推移

(単位:人)





## (1) Decontamination

Decontamination of prefectural land has been completed in all areas except for the Difficult-to-return Zone. Atmospheric radiation levels in the Prefecture have significantly dropped, and are the same as other major cities throughout the world.

### ○ Municipality led decontamination Completed in Mar. 2018

Area the national government conducts decontamination (Blue)

Area each municipality conducts decontamination (Orange, Green)



(Flow of decontamination: Diagram)

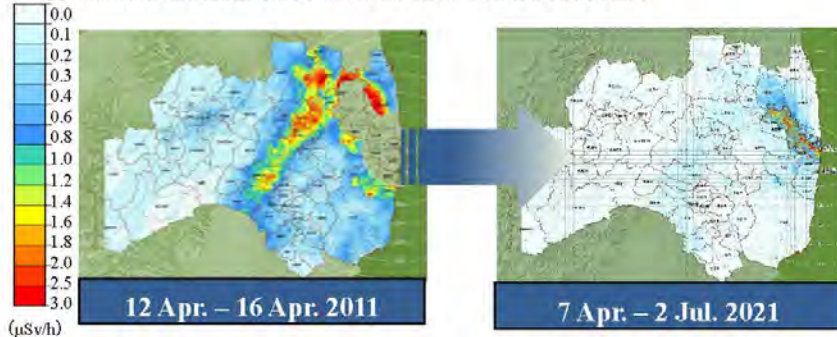


(Accumulation of transportation volume into the interim storage facility and future perspective)



Removed soil and waste are stored in the Interim Storage Facility for a certain period. The final disposal is required by law to be completed outside of the Prefecture within 30 years since the commencement of the Interim Storage Facility (By Mar. 2045).

### ○ Air radiation dose in Fukushima Prefecture



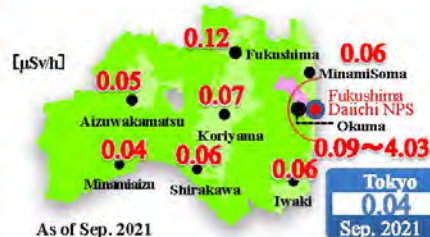
### Bases for comprehensive efforts towards environmental recovery and creation



Environmental monitoring, research information release, education, training, exchanges

### Environmental monitoring around the NPS

Fukushima Prefectural Centre for Environmental Creation Main Facilities (Miharu Town)



### ○ Challenges and Responses

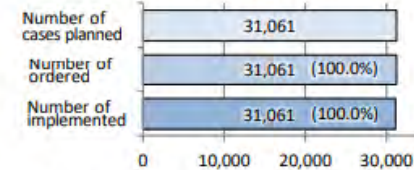
- Restoration of the land used for Temporary Storage Sites and returning back the land
- Safe maintenance and operation of the Interim Storage Facility as well as safe and secure transportation of contaminated soil
- Final disposal of contaminated soil outside of Fukushima Prefecture
- Decontamination and demolition of houses in the Difficult-to-return Zone (except for Special Zones for Reconstruction and Revitalization)

### Decontamination of farmland



#### Situation of decontamination in farmland (Including rice field, farm, orchard and grazing ground)

Excluding \*the areas the national government conducts decontamination (See page .6) (As of 2018.3.31)



### Monitoring of Fukushima's agricultural, forestry and fishery products

Fukushima's primary products undergo monitoring inspection before being shipped. Any product that is found to exceed the safety standard is banned from being shipped based on the product type and produced area. Products being distributed are confirmed to be safe.


#### ◆ Test results on all rice in all rice bags

(2019.8.26-2020.3.31)

Product	Total No. of samples	No. of samples exceeding safety standard limits	Proportion of samples exceeding safety standard limits
Brown rice Year 2019 production	Approx. 9.41 million	0	0.00%

Test results are released to the public.

<https://fukumegu.org/ok/contents/>




#### ◆ Inspection results

(2019.4.1-2019.10.31)

Classification	Total No. of samples	No. of samples exceeding standard limits	Proportion of samples exceeding standard limits
Vegetables & Fruits	2,180	0	0.00%
Livestock products	4,102	0	0.00%
Cultivated edible plants & mushrooms	1,161	0	0.00%
Marine fishery products	5,439	0	0.00%
Fresh water farmed fish	66	0	0.00%
Wild edible plants & mushrooms	781	0	0.00%
Fresh water fishery products	1,129	4	0.35%

Inspection: Fukushima prefecture is carrying out these inspections based on national guidelines.

\*Voluntary inspections by the fisheries cooperative association screened out a sample exceeding the standard limits (100Bq/kg)

Reference Safety standard limits for radioactive cesium ( Unit: Bq/kg)		
Category	Japan	EU
General foods	100	1,250
Milk	50	1,000
Infant foods	50	400
Drinking water	10	1,000

Data: Consumer Affairs Agency (Govt. of Japan)

# 02

## Reputational Damage



Almost agricultural products are no more than **the reference value** (100bq/kg) and so their intake has not been restricted.

\*1 Except for mushrooms, edible wild plants, wild animals, boars, etc.

\*2 Excluding food in old restricted area

\*3 Ume, Yuzu, chestnut, cucumber in some areas

[online] <https://www.mhlw.go.jp/file/01-Kinkyujouhou-11135000-Shokuhinanzenu-Kanshianzenka/0000186805.pdf>

Agricultural produce from Fukushima showed a reading of no more than **the reference value** (100bq/kg). Further, most of the readings were below **the detection limits of the measuring instruments** that were used (25bq/kg, 20bq/kg and 12bq/kg).



# Test results on all rice in all rice bag

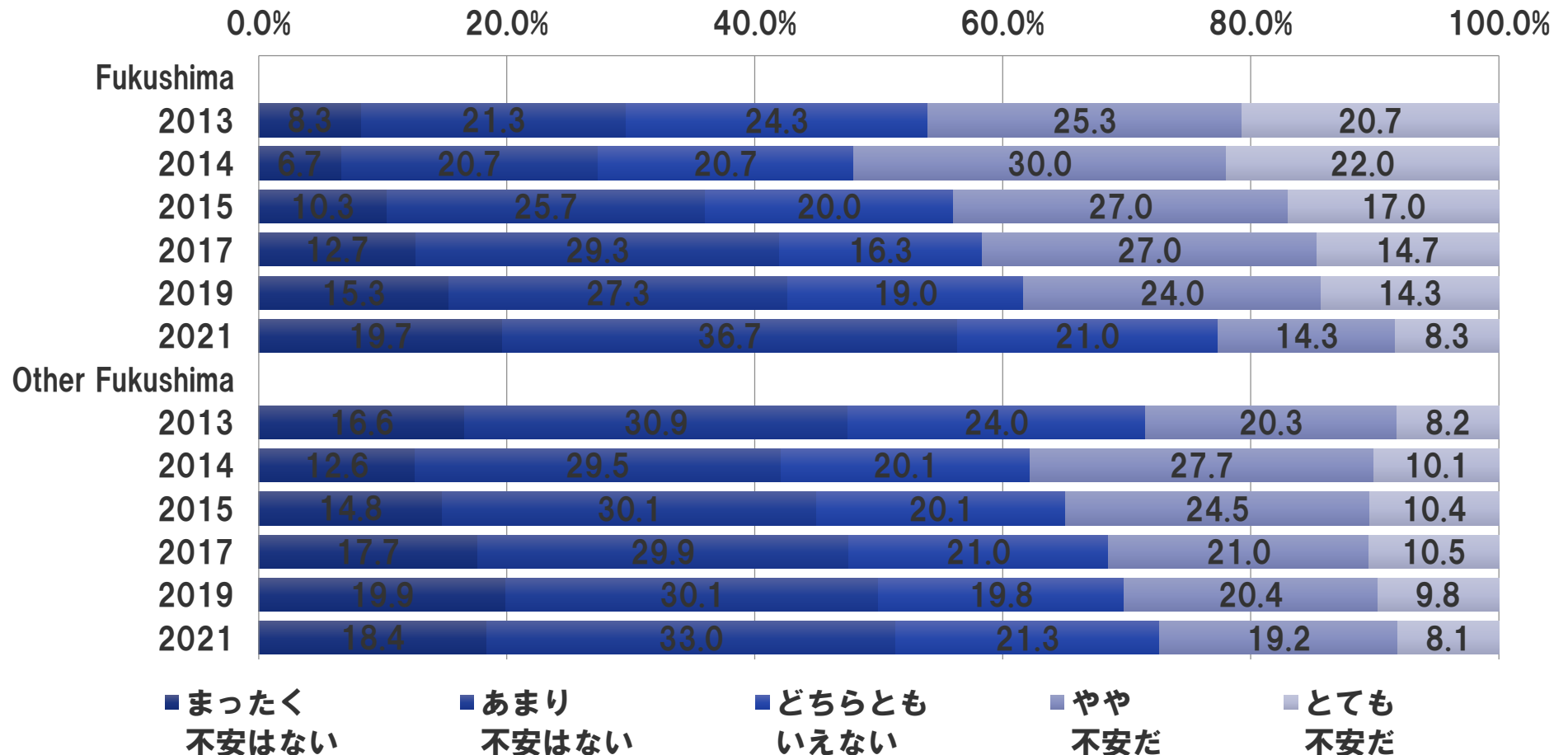
## Test results on all rice in all rice bag

	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019
<b>Less than 25 (Bq/kg)</b>	10,323,674 (99.78%)	10,999,220 (99.93%)	11,013,714 (99.98%)	10,454,908 (99.99%)	10,172,756 (99.999%)	9,976,268 (99.999%)	9,250,695 (99.999%)	9,491,780 (99.999%)
<b>25~50 (Bq/kg)</b>	20,357 (0.2%)	6,484 (0.06%)	1,910 (0.02%)	643 (0.006%)	417 (0.002%)	32 (0.0003%)	23 (0.0002%)	42 (0.0004%)
<b>51~75 (Bq/kg)</b>	1,678 (0.016%)	493 (0.0045%)	12 (0.0001%)	17 (0.0001%)	5 (0.0001%)	0	0	0
<b>76~100 (Bq/kg)</b>	389 (0.0038%)	323 (0.003%)	2 (0.00002%)	1 (0.00001%)	0	0	0	1 (0.00001%)
<b>More than 100 (Bq/kg)</b>	<b>71</b> (0.0007%)	<b>28</b> (0.0003%)	<b>2</b> (0.00002%)	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>Sum up</b>	10,346,169 (100%)	11,006,550 (100%)	10,014,640 (100%)	10,455,569 (100%)	10,173,178 (100%)	9,976,300 (100%)	9,248,306 (100%)	9,476,950 (100%)

[online] <https://fukumegu.org/ok/kome/> 2020年8月20日

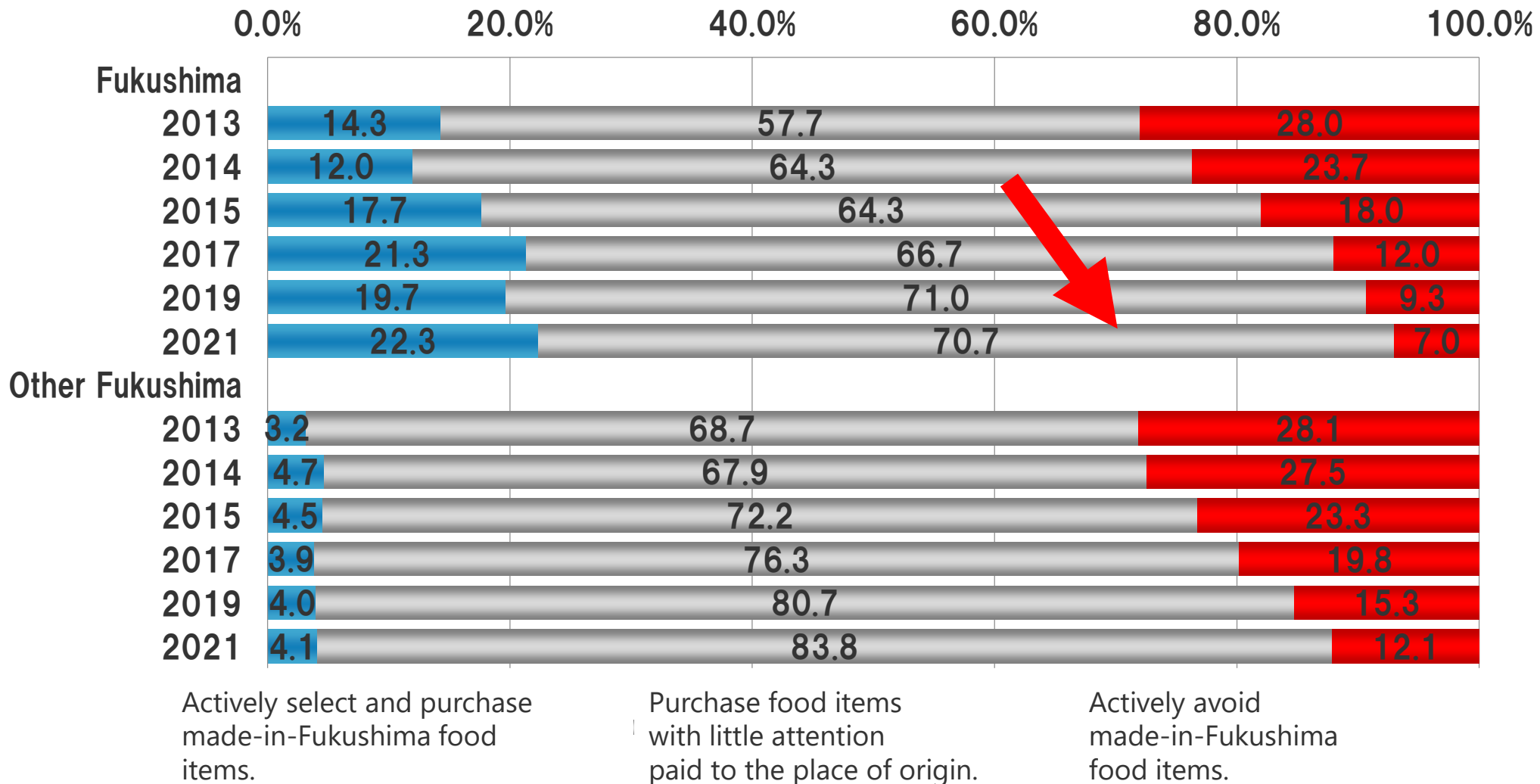
# Anxiety of Health

Are you anxious about the influence of radioactive substances on your own health now?



Not anxious at all / Minimally anxious / Neither / Somewhat anxious / Very anxious

# Material awareness: Reluctance to purchase 'made-in-Fukushima' food items



※ 2013 Sekiya/ Norinchukin Survey (All prefectures, N = 14091)

※ 2014 Sekiya Survey of Science and Research expenses (Tohoku + Tokyo, Osaka, and Nagoya, N = 1779)

※ 2015 Transdisciplinary Research Organization Survey (Tohoku + main cities, N = 3839)

※ 2017 Fukushima University Norinchukin survey (all prefectures, N = 9489)

# Meaning of monitoring inspection : Cause of eased anxiety

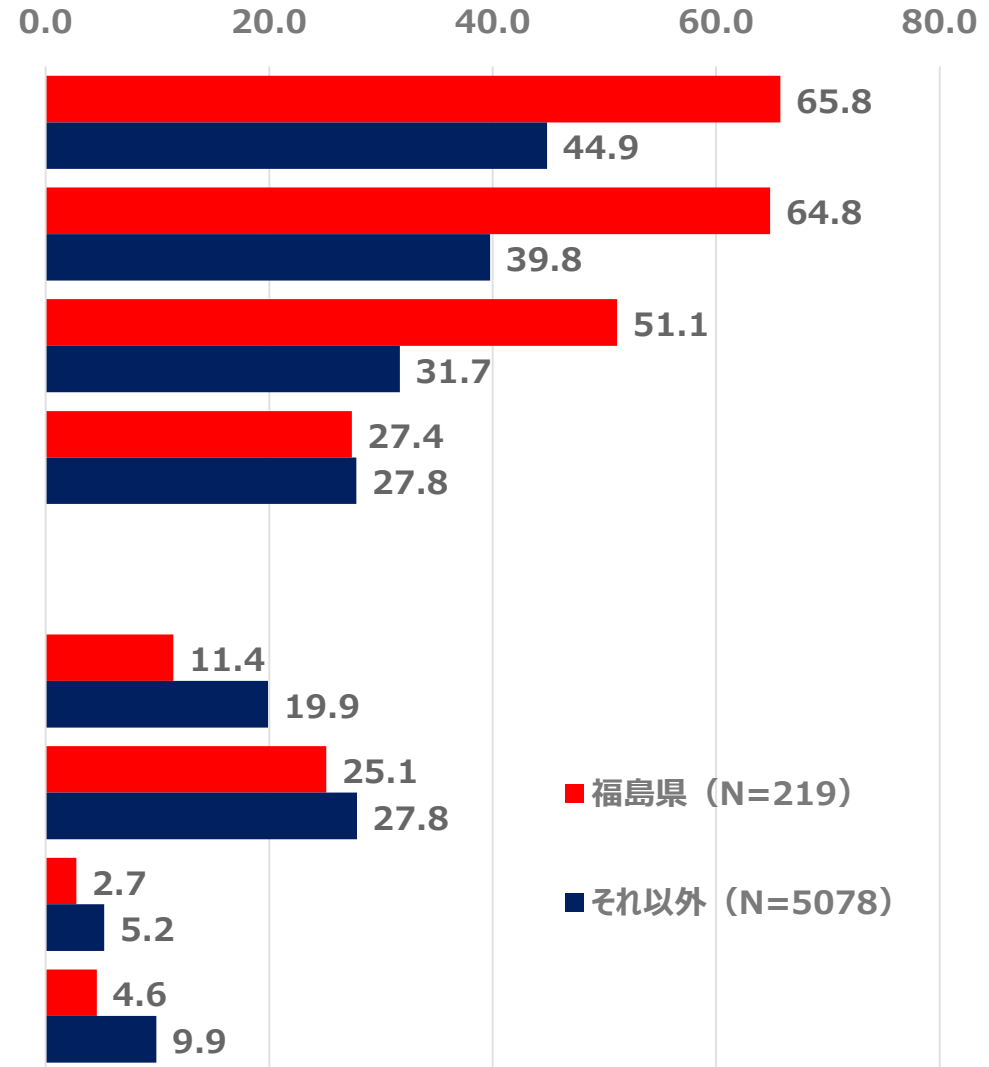
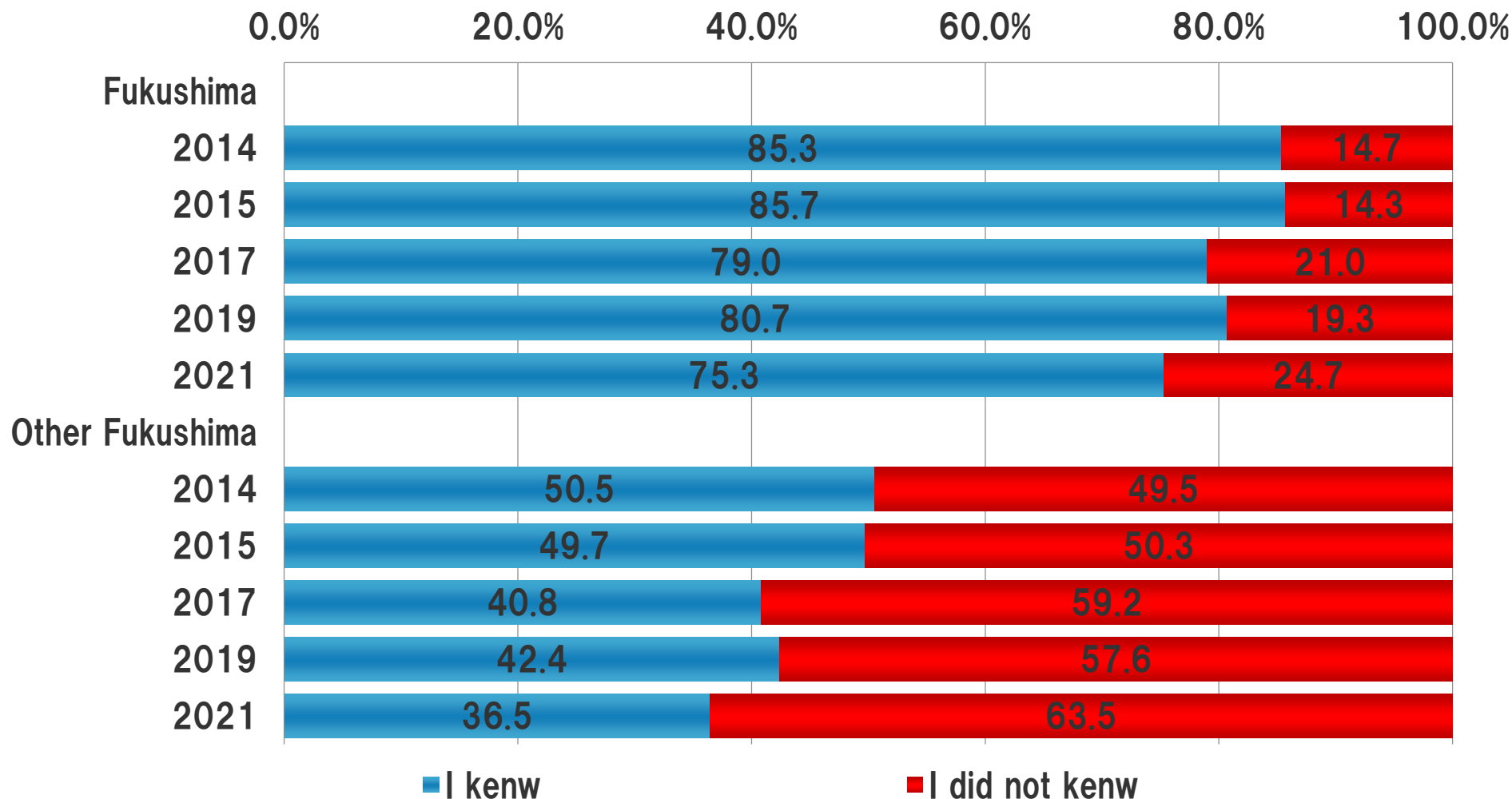


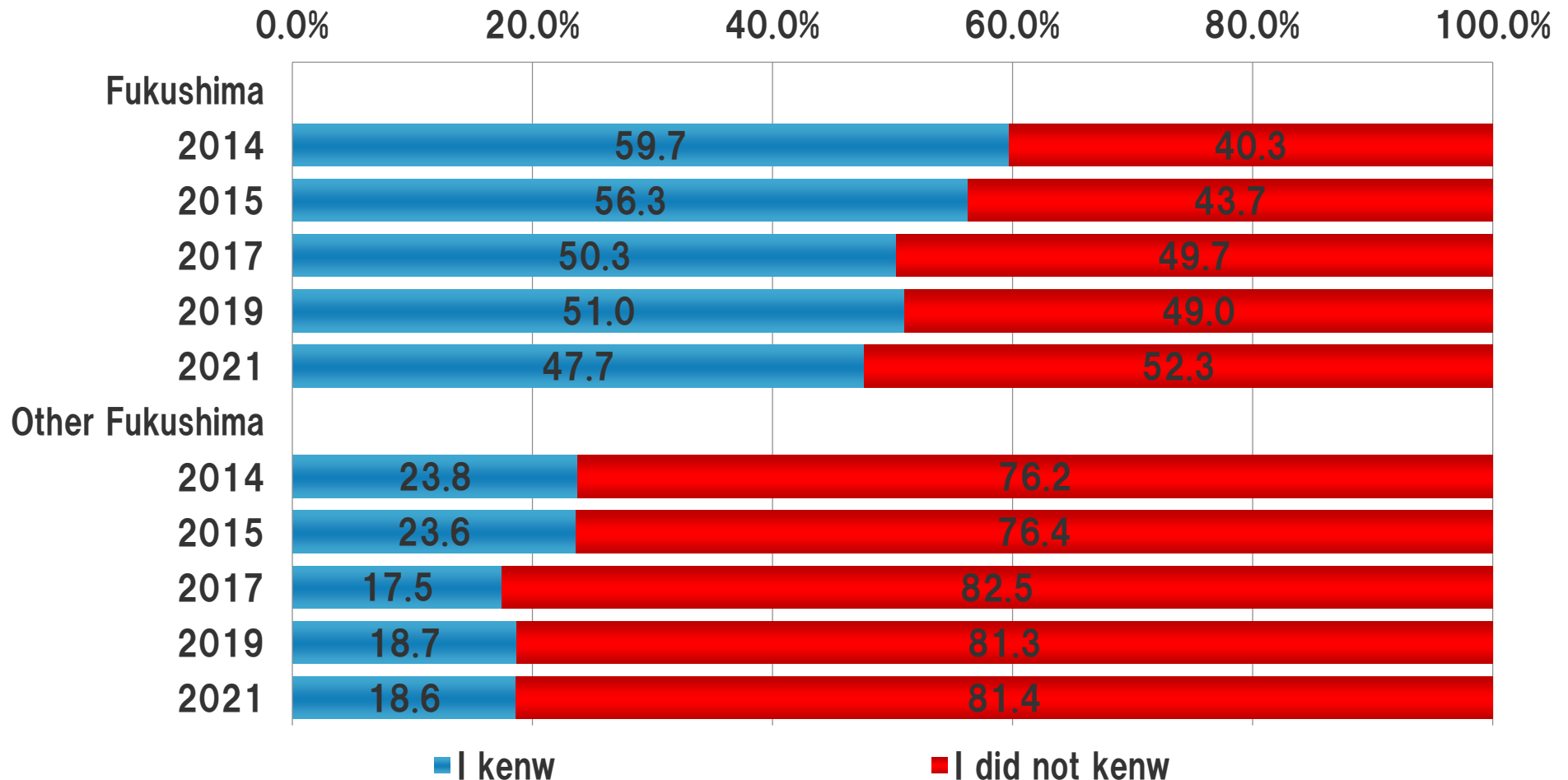
Figure : Reasons for lowered anxiety (2021)



## All bags of rice are inspected in Fukushima Prefecture



Even if the radioactive substance in food is inspected, it is almost below the detection limits of the measuring instruments



# 03

## International Comparison



# The Problem of import regulation

- South Korea has prohibited imports of all fish from the 8 prefectures around Fukushima.
- China has prohibited imports of all food from the 10 prefectures around Fukushima.



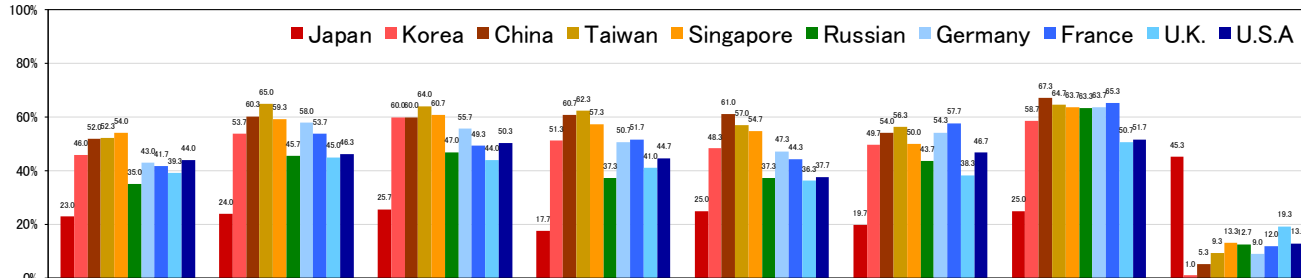
- Survey area :
  - Tokyo:Japan,
  - Seoul : Korea, Beijing and Shanghai: China, Taipei and Takao : Taiwan, Singapore
  - Moscow : Russian, Berlin : Germany, Paris : France, New York : U.K. , London : U.S.
- Survey Subcontractor : Survey Research Center Co., Ltd.
- Survey Target : Male and female residents in their 20s-60s
- Survey Method : Web-based
- Valid response : 3,000 samples, 300 samples in each of country, (equal allotment of each of the gender and age groups (from 20s through 60s))
- Survey period : February, 2017 March, 2022
- Survey organizer : Naoya Sekiya (The University of Tokyo)

# Image of nuclear accident immediately after accident

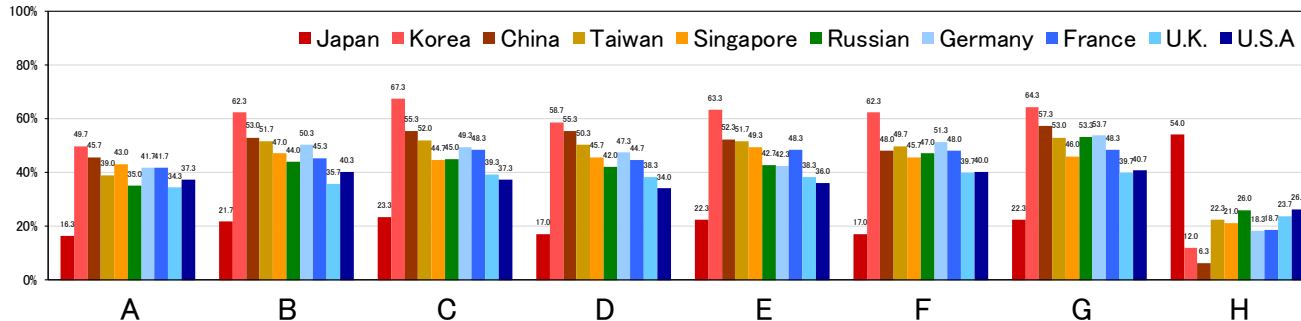
- A. 1. **People can no longer live there** because of radioactive contamination.
2. **Agricultural products can no longer be eaten** because of radioactive contamination.
3. **Seafood can no longer be eaten** because of radioactive contamination.
4. **Water can no longer be consumed** because of radioactive contamination.
5. **It is no longer possible to swim in the ocean** because of radioactive contamination.
6. **There has been an increase in patients with thyroid cancer** because of radioactive contamination.
7. **People's health has been damaged** because of radioactive contamination.

## Within Fukushima prefecture

< 2017年 >



< 2022年 >

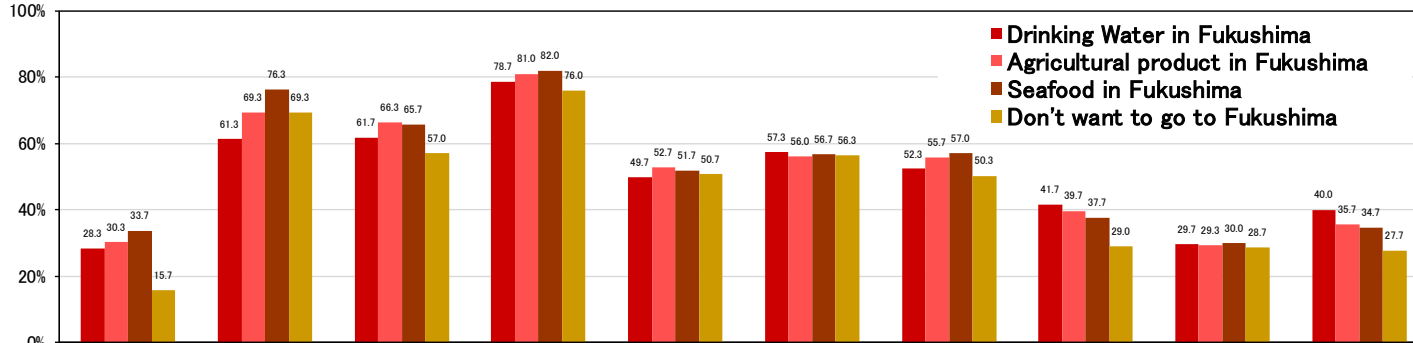


Q : The Great East Japan Earthquake occurred in Japan in March 2011. After the earthquake, many areas became contaminated with radioactive substances due to the accident of Fukushima Daiichi Nuclear Power Plant at the Tokyo Electric Power company . Please answer the following questions based on your own feelings regarding the above. What is your understanding regarding the items below? (Select all that apply for each item)<sub>20</sub>

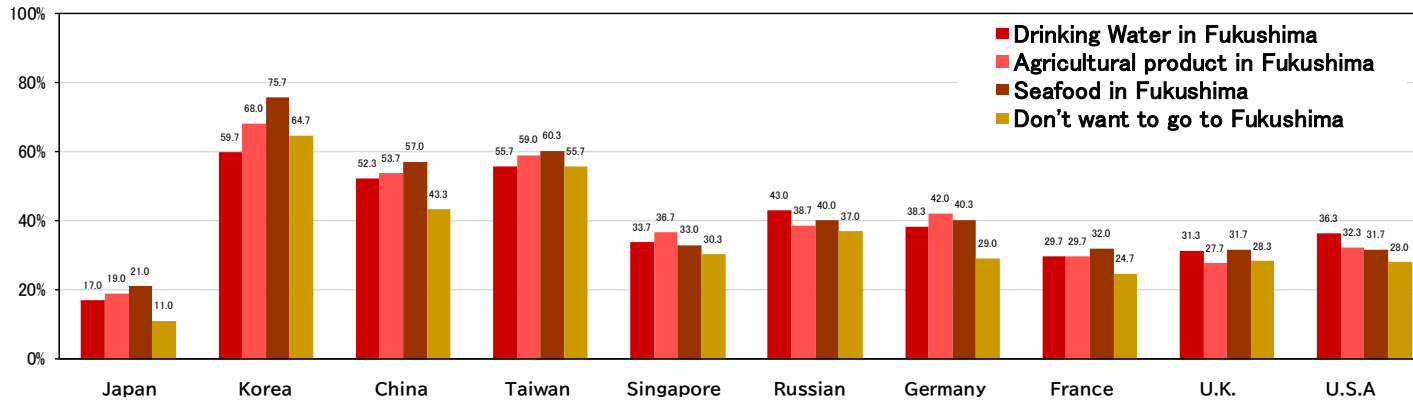
## Countries other than Japan are very nervous

1. I am nervous about drinking water in Fukushima prefecture when I think about the nuclear accident.
2. I am nervous about agricultural products in Fukushima prefecture when I think about the nuclear accident.
3. I am nervous about seafood in Fukushima prefecture when I think about the nuclear accident.
4. I don't want to go to Fukushima prefecture when I think about the nuclear accident.

< 2017年 >



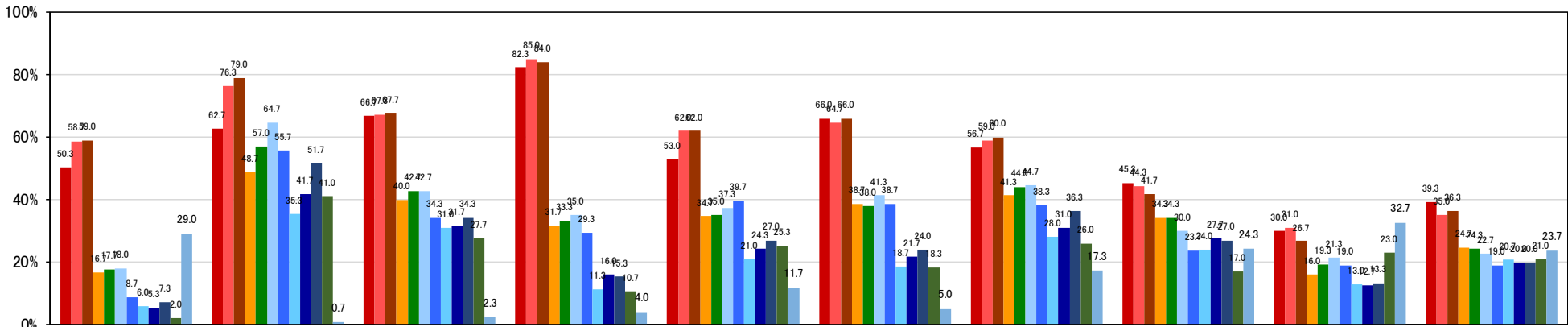
< 2022年 >



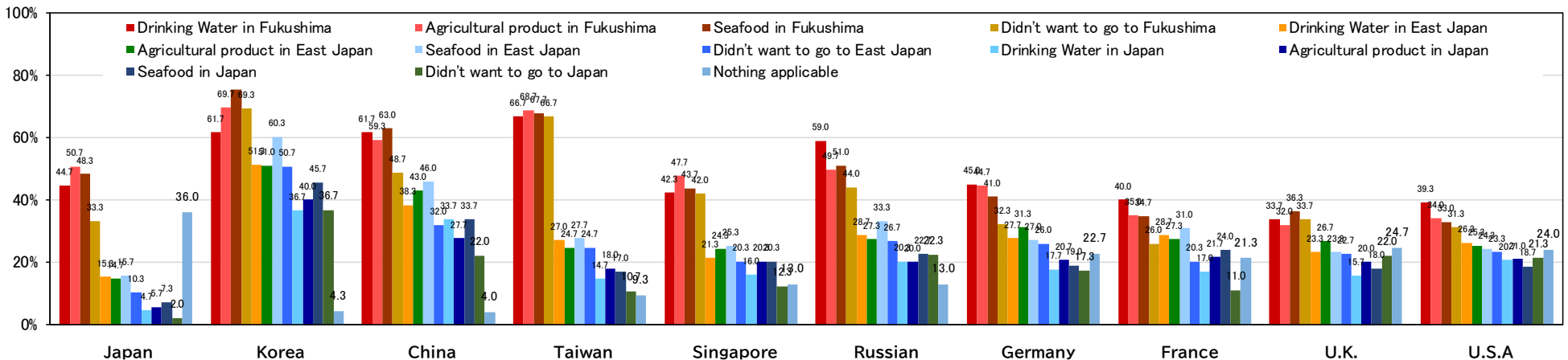
Now / Fukushima

# From the accident to the present, the drinking water, agricultural products, marine products, and destinations in Fukushima Prefecture have been a source of nervousness for foreigners.

< 2017年 >



< 2022年 >

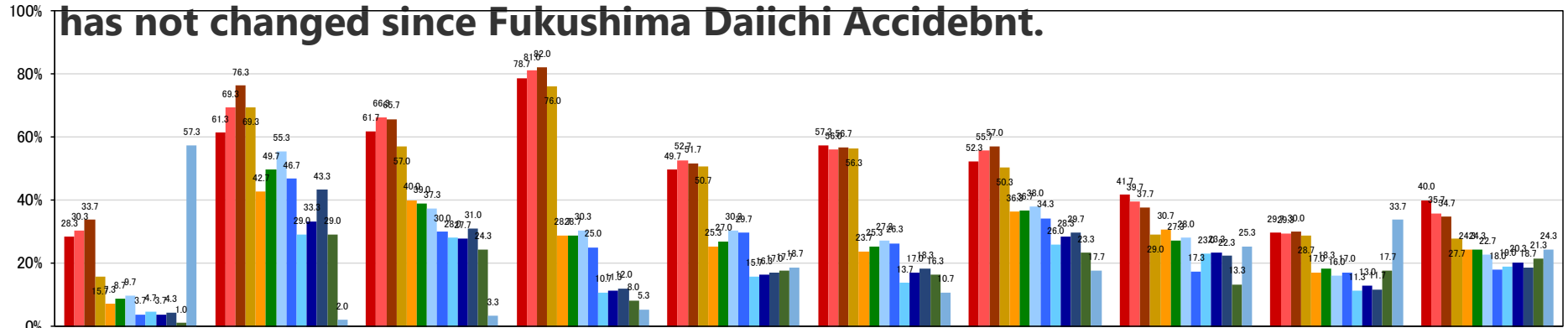


Nervous about ... **Past** / Fukushima, East Japan, Japan

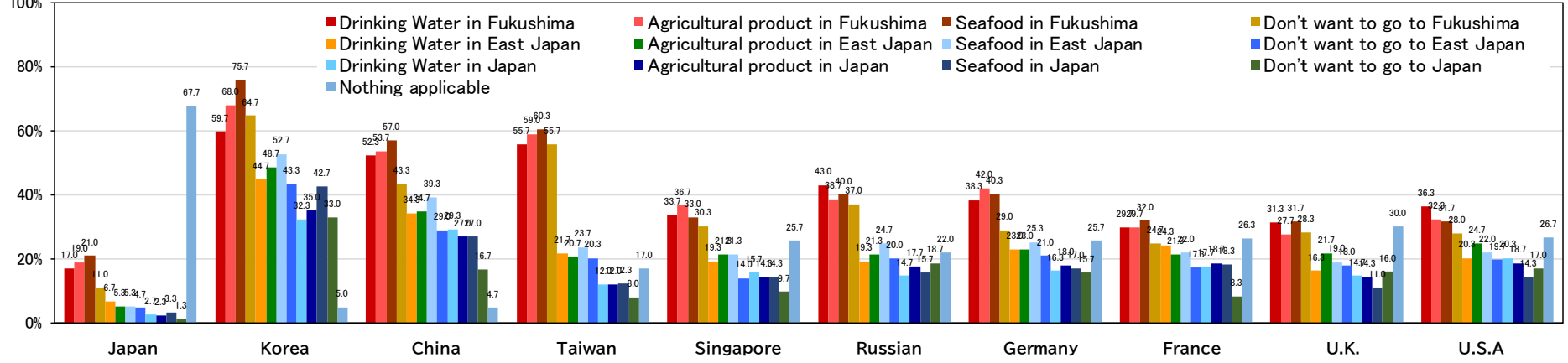


40% Korean and Chinese don't purchase food from East Japan  
30% Korean and Chinese don't purchase food for Japan  
as a whole. Korea and China are more nervous.

The image of East Japan and Japan as a whole by people overseas  
has not changed since Fukushima Daiichi Accident.



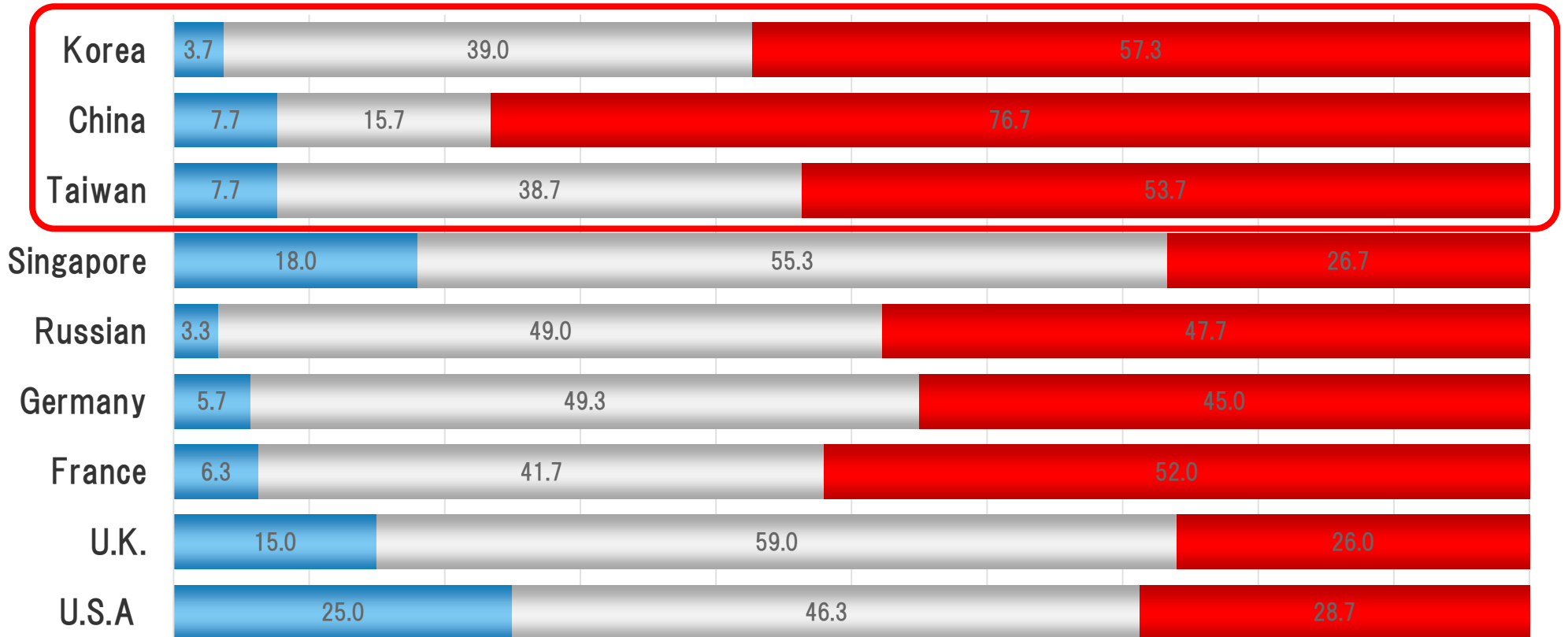
< 2022年 >



Nervous about .... **Now** / Fukushima , East Japan, Japan

### Neighboring countries are nervous about All food in All Japan

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%



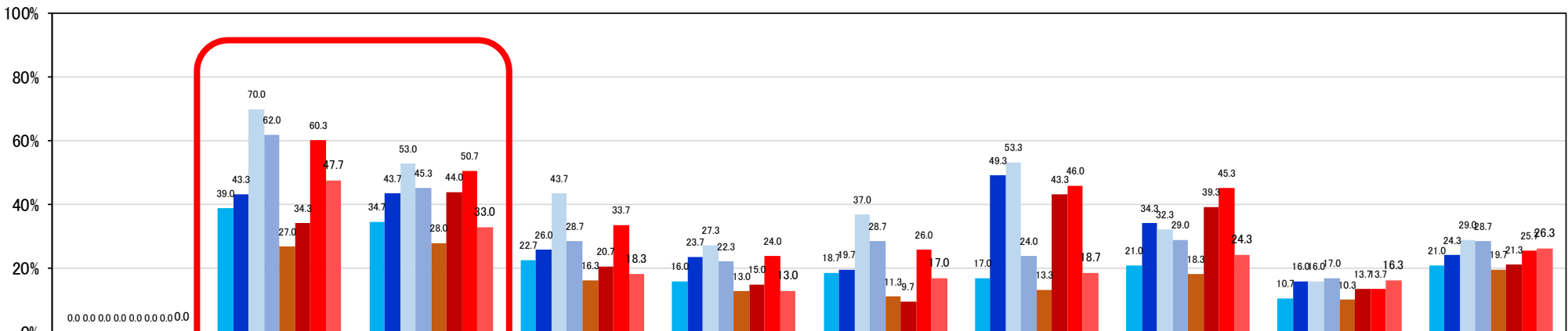
■ 1. I actively seek out and purchase foods produced in Japan.

■ 2. I don't think about where foods are produced when I purchase them.

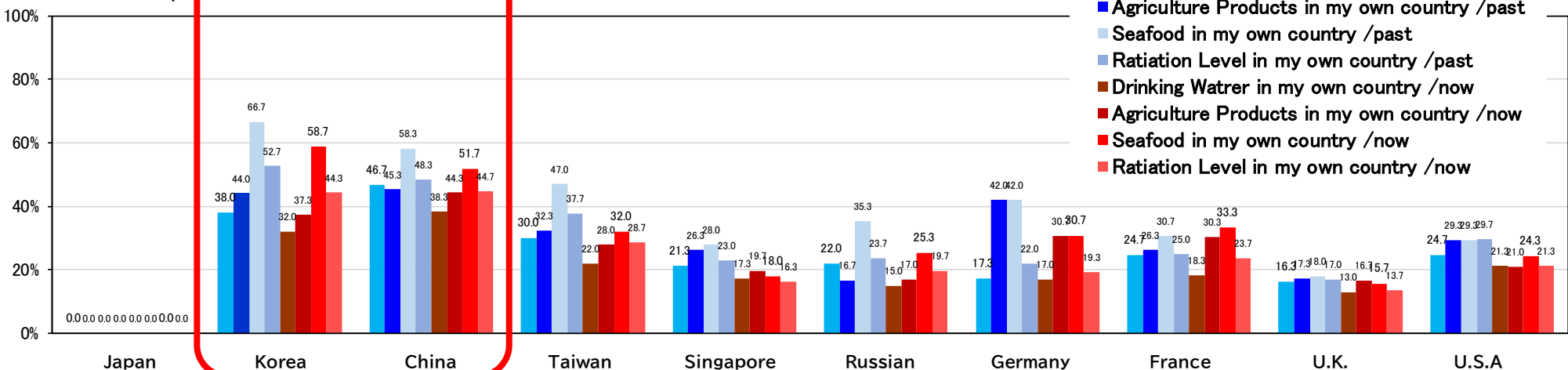
■ 3. I actively avoid foods produced in Japan.

## Countries other than Japan are very nervous water and Food in their country

< 2017年 >



< 2022年 >



- Drinking Water in my own country /past
- Agriculture Products in my own country /past
- Seafood in my own country /past
- Radiation Level in my own country /past
- Drinking Water in my own country /now
- Agriculture Products in my own country /now
- Seafood in my own country /now
- Radiation Level in my own country /now

## Contaminated Water / Treated Water by ALPS/ Tritium Water



**Although it can be diluted to below the reference value, it is now a matter to decide how to dispose, e.g., whether to release to the sea or not.**

# Recognition on Fukushima nuclear power plant accident

【2017】Prejudice against Fukushima nuclear power plant accident or Fukushima prefecture is not improved either.

I believe the **abortion** rate in Fukushima prefecture is rising.

I believe the **suicide** rate in Fukushima prefecture is rising.

I believe the **divorce** rate in Fukushima prefecture is rising.

I believe the **unemployment** rate in Fukushima prefecture is rising.

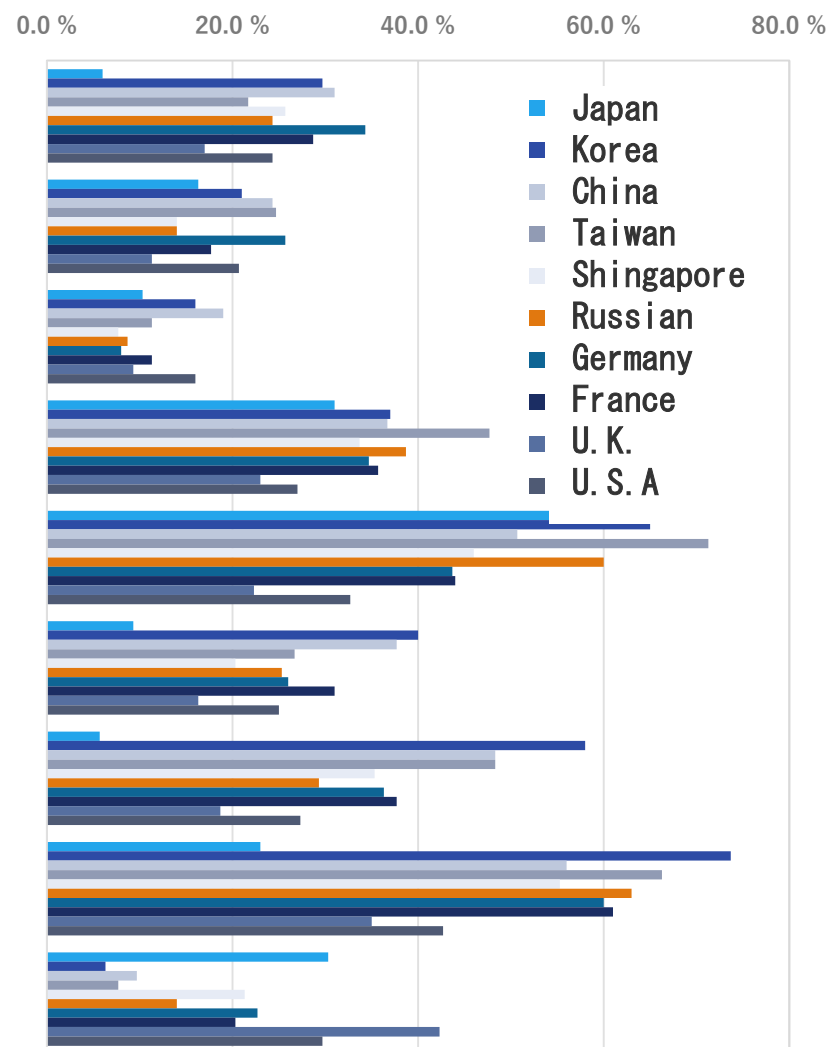
I believe Fukushima continues to experience an increase in **population outflow**

I believe that **nose bleeds** are increasing among the children in Fukushima prefecture.

I believe that there is an increase in **Down's syndrome** and other birth defects in Fukushima prefecture.

I believe that the **incidence of cancer** is rising in Fukushima prefecture.

Nothing applicable



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【2022】Prejudice against Fukushima nuclear power plant accident or Fukushima prefecture is not improved either.

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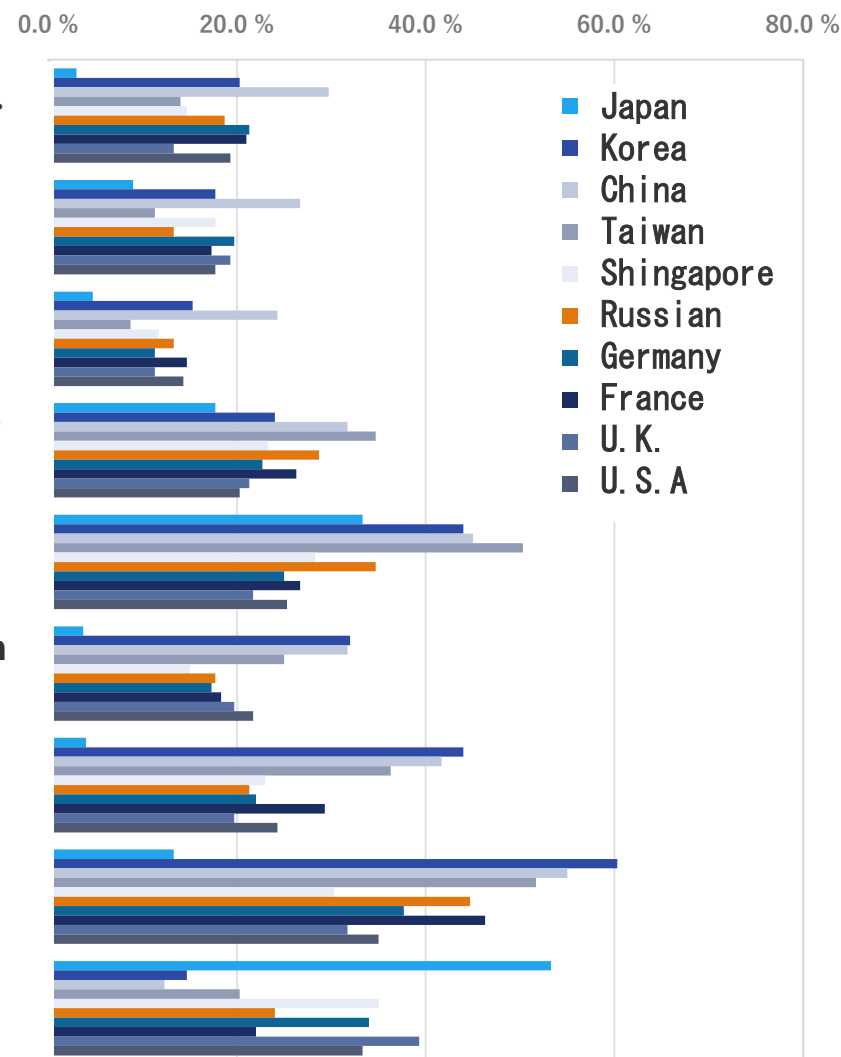
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I believe that the **incidence of cancer** is rising in Fukushima prefecture.

Nothing applicable



- 1) Anxiety about water in Fukushima prefecture, fishery products and agricultural products from Fukushima prefecture, and visits to Fukushima Prefecture remains high in 9 countries other than Japan, especially in Asian countries now.
- 2) Anxiety about water in East Japan as well as Fukushima prefecture, agricultural products and fishery products from East Japan as well as Fukushima prefecture, and visits to East Japan as well as Fukushima Prefecture remains high in 9 countries other than Japan, especially in Asian countries even now, too.
- 3) The reason for this is that the anxiety about the radioactive substance was high because the radioactive material may be spread in each country immediately after the accident especially in Asia.

# 04

## Conclusion





# Separate strategies for the Fukushima and non-Fukushima consumers

## Consumers residing in Fukushima

### Obtainment of radiation-related knowledge

= Concerns based on the knowledge

### Understanding of the regional and geographical names of Tohoku

= Understanding of the dose distribution

= Concerns based on the knowledge of the geographical features of the regions in question

## Consumers residing outside Fukushima

### Lack of radiation-related knowledge

= Concerns and non-acceptance based on the perceived imagery

### Lack of knowledge pertaining to the regional and geographical names of Tohoku

= Lack of understanding of the dose distribution

= Concerns based on the lack of relevant geographical knowledge

Science

Social

→ Transmission of information containing uniform messages and assuming the same level of knowledge among all recipients is difficult.

→ Different strategies will be required.

- Radioactive Disasters vary in aspect depending on the nuclide and its quantity. Disaster is Unique (Long Term Effect, People's anxiety in consumption behavior, Stigma and “Price Cuts” in the distribution stage
- Although several years have passed since the accident and the situation of Fukushima Prefecture has changed, information concerning them has not been provided, so people remains nervous in Asia.
- Therefore, it became clear that it is important to transmit information without misunderstanding, regarding the current situation in Fukushima Prefecture, and Fukushima Daiichi Nuclear Power Plant Accident.

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✉ kenkani@fmu.ac.jp Tel: 024-581-5454(平日9～17時)

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✉ kenkani@fmu.ac.jp, TEL: +81-24-581-5454 (Weekday, 9a.m. - 5 p.m. JST)