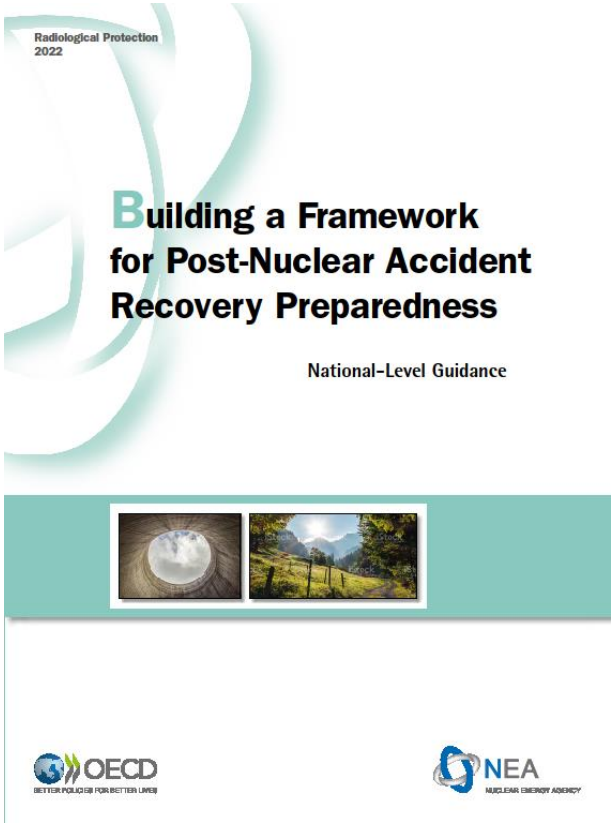


NEA Workshop on Preparedness for Post-Nuclear Accident Recovery

The importance of stakeholder involvement and successful communication for recover preparedness

Noboru TAKAMURA

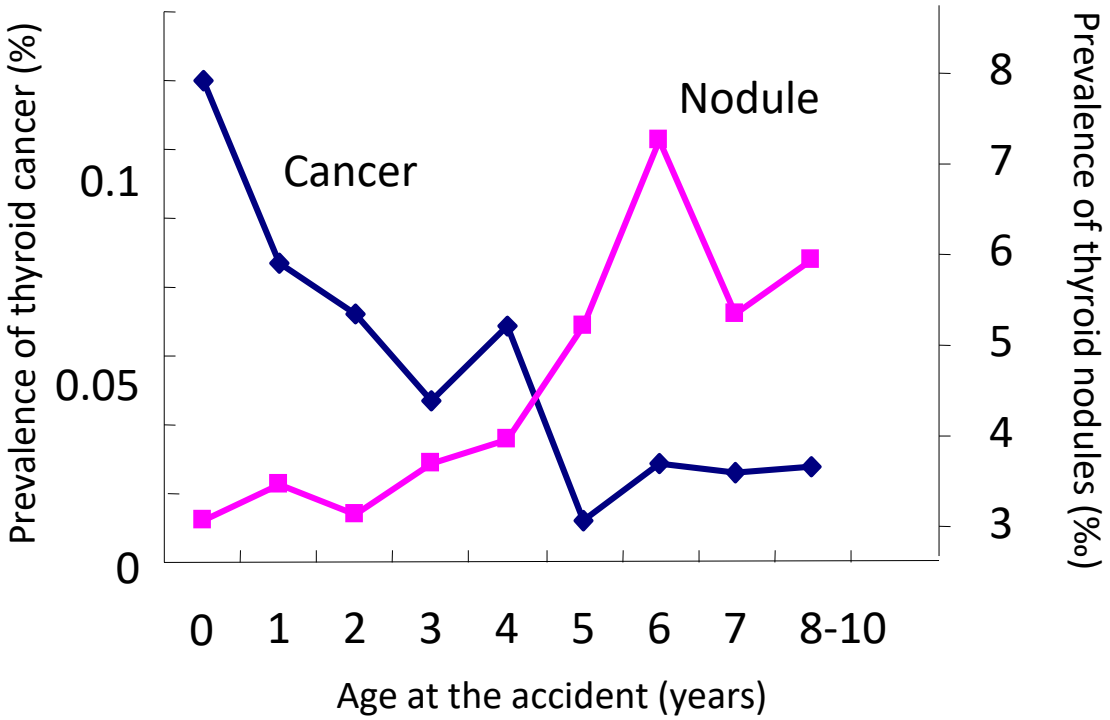
Professor

Atomic Bomb Disease Institute, Nagasaki University, Japan

27-28 October 2022, hosted by IRSN in Fontenay-aux-Roses, France

Chernobyl Sasakawa Health and Medical Cooperation Project (1990-2001)

Prevalence of thyroid cancer and nodules by age at the time of accident in children around Chernobyl

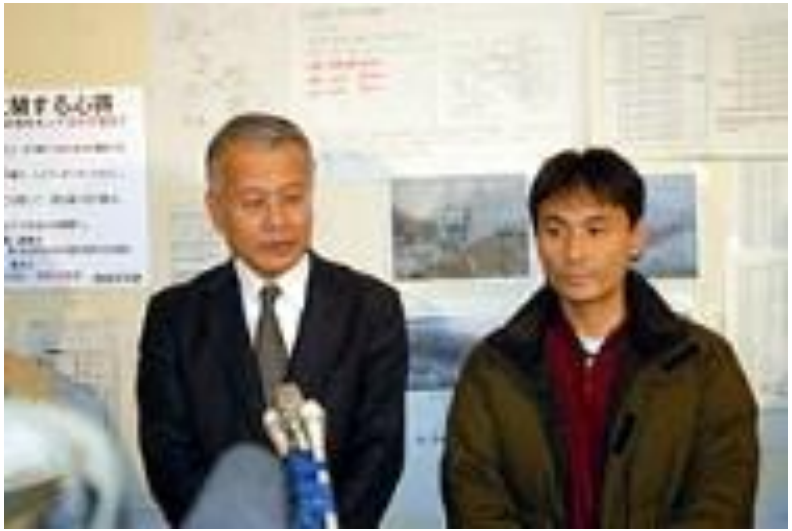


(Yamashita and Shibata 1997)

Lessons from Chernobyl

After Chernobyl accident, no municipalities which experienced evacuation returned to their hometown. This is due to the difficulties of re-establishment of the infrastructure, industries and community after the long term evacuation rather than radiological issues…

Advisor on Health Risk Control of Fukushima Prefecture (19 March 2011)



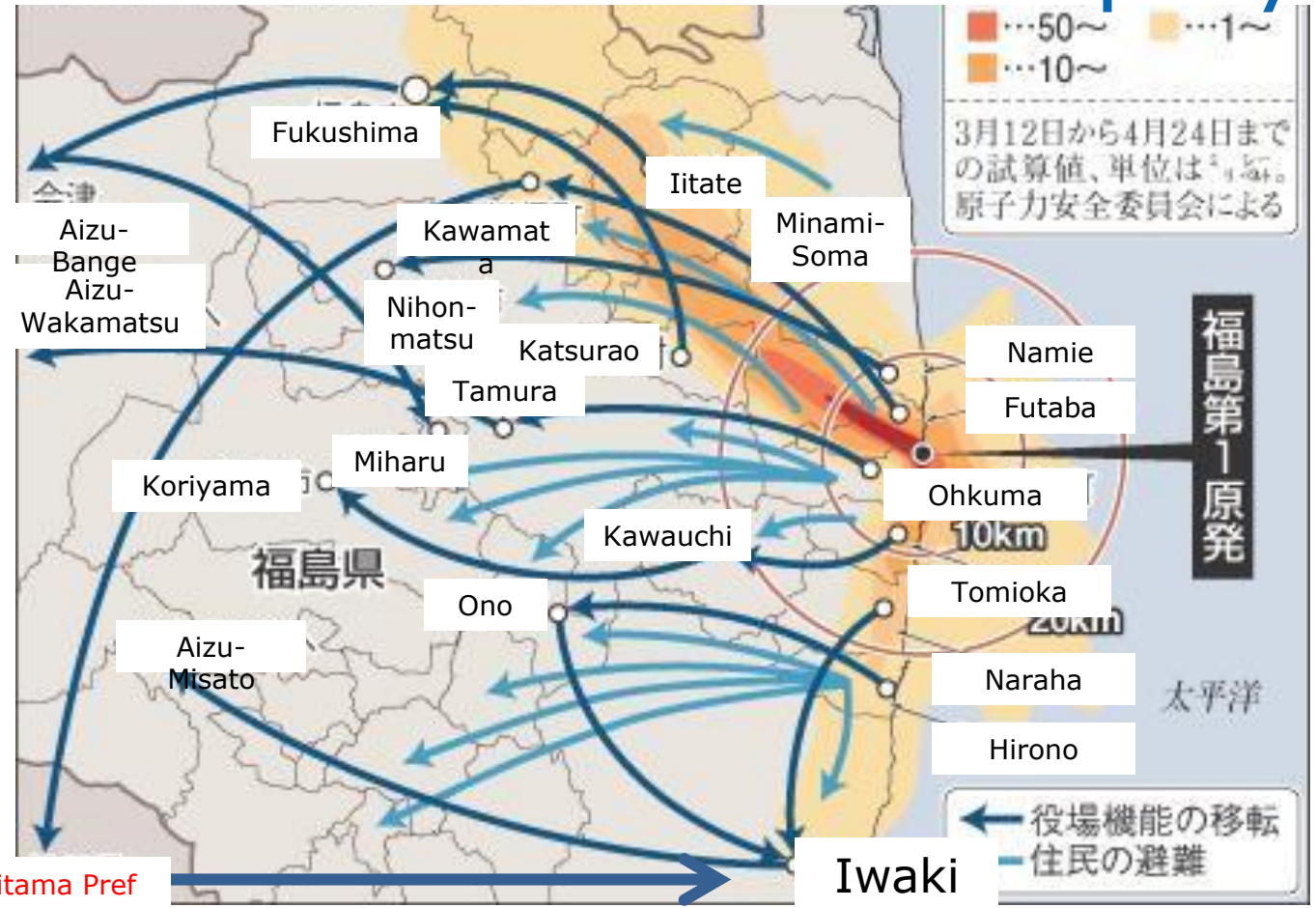
On 19 March 2011, Fukushima Prefecture Headquarter for Disaster Control entrusted two specialists with “Advisor on Radiation Health Risk Control”, to distribute the correct information on radiation exposure and health.

Crisis communication with general population in Fukushima city (21 March 2011)

FAQ in the initial phase

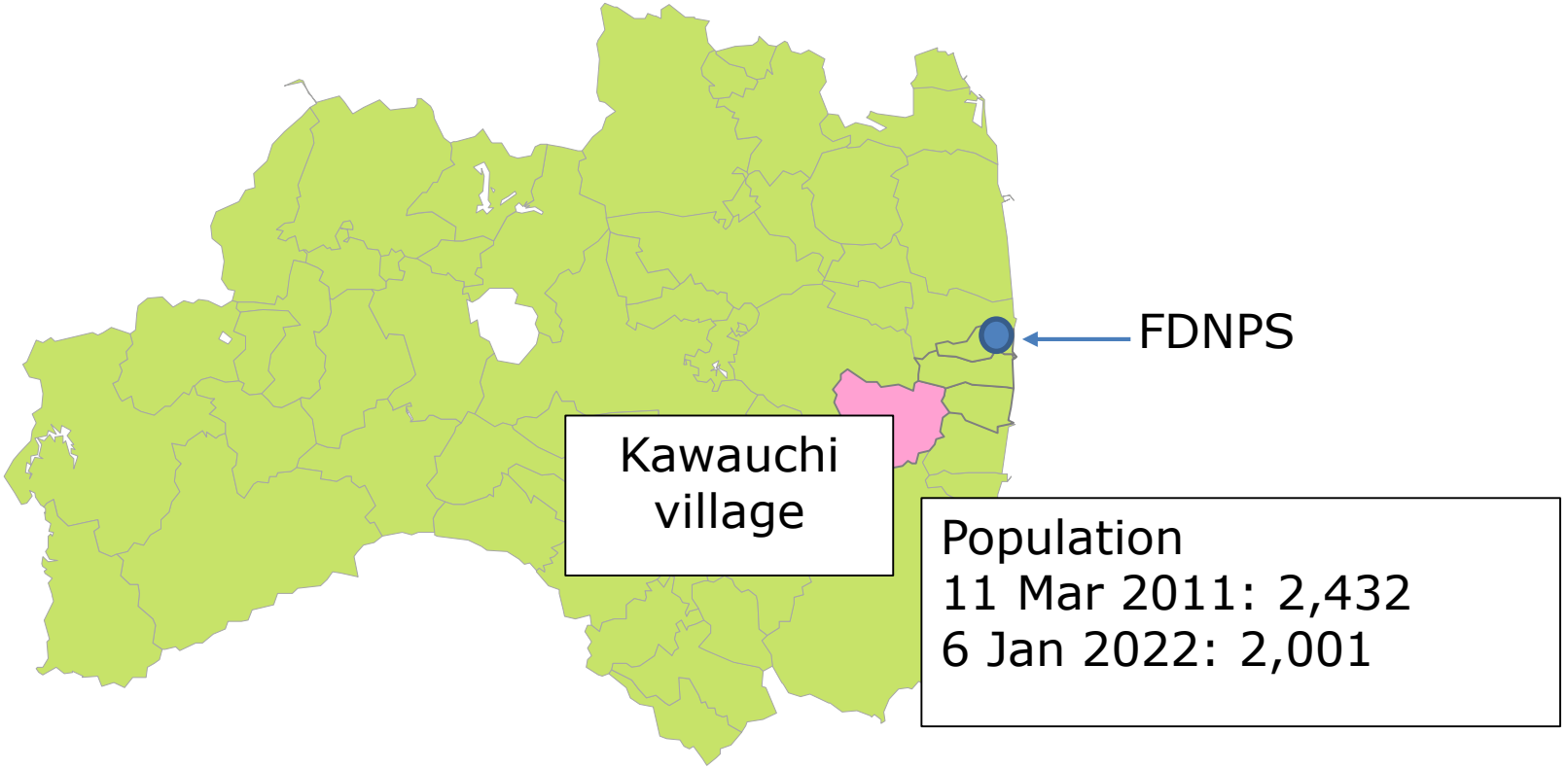
- ✓ Should we escape from Fukushima now?
- ✓ Can we go outside without mask?
- ✓ Can children play outside?
- ✓ Can my daughter have a baby in Fukushima?
- ✓ Radiation health effects is heritable?
- ✓ Can we drink tap water?
- ✓ How about the situation of the power plant now?

Evacuation root of each municipality



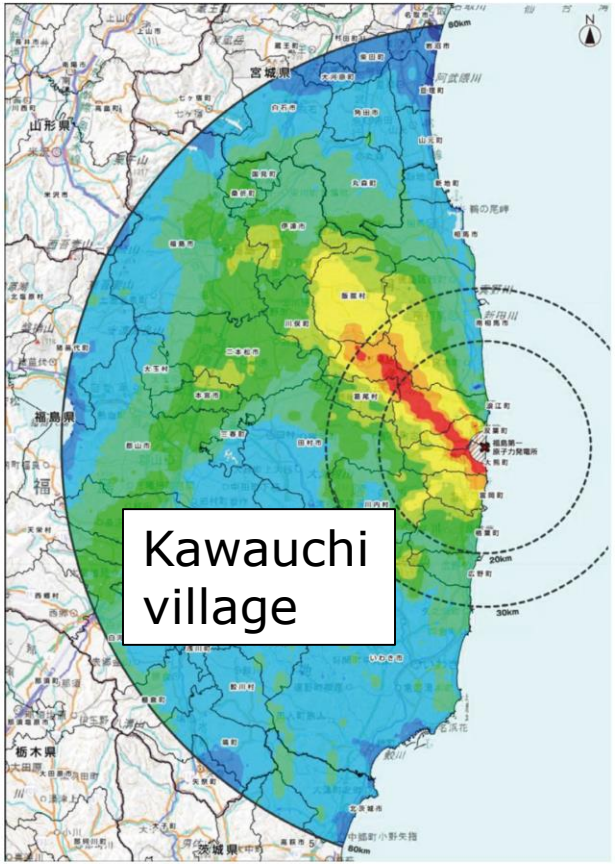
(Governmental Report 2012)

Kawauchi village, Fukushima Prefecture

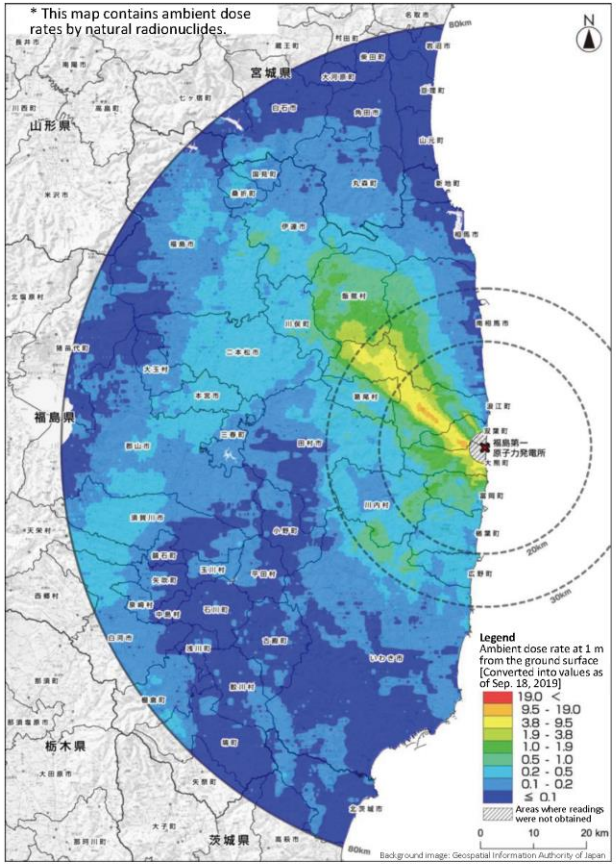


Spatiotemporal Distribution of Ambient Dose Rates

Distribution of Ambient Dose Rates within the 80-km Zone of TEPCO's Fukushima Daiichi NPS



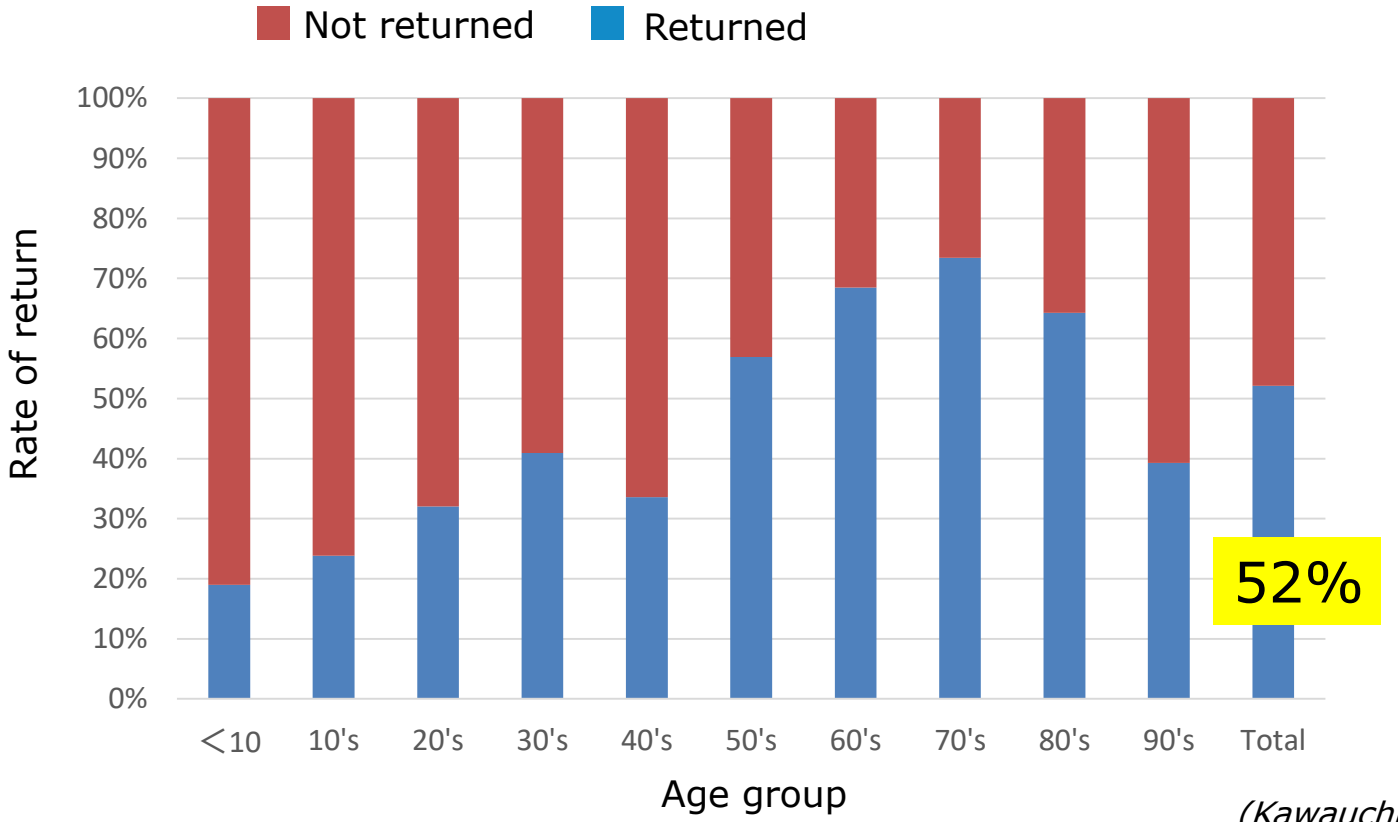
Released by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) on Dec. 16, 2011



Released by the Nuclear Regulation Authority on Feb. 13, 2020

Decontamination of schools and residential houses in Kawauchi village

Rate of residents returning to Kawauchi village (May, 2013)



(Kawauchi village office)

Establishment of Satellite Office in Kawauchi village (April 2013)

Opening ceremony of the satellite office in Kawauchi village

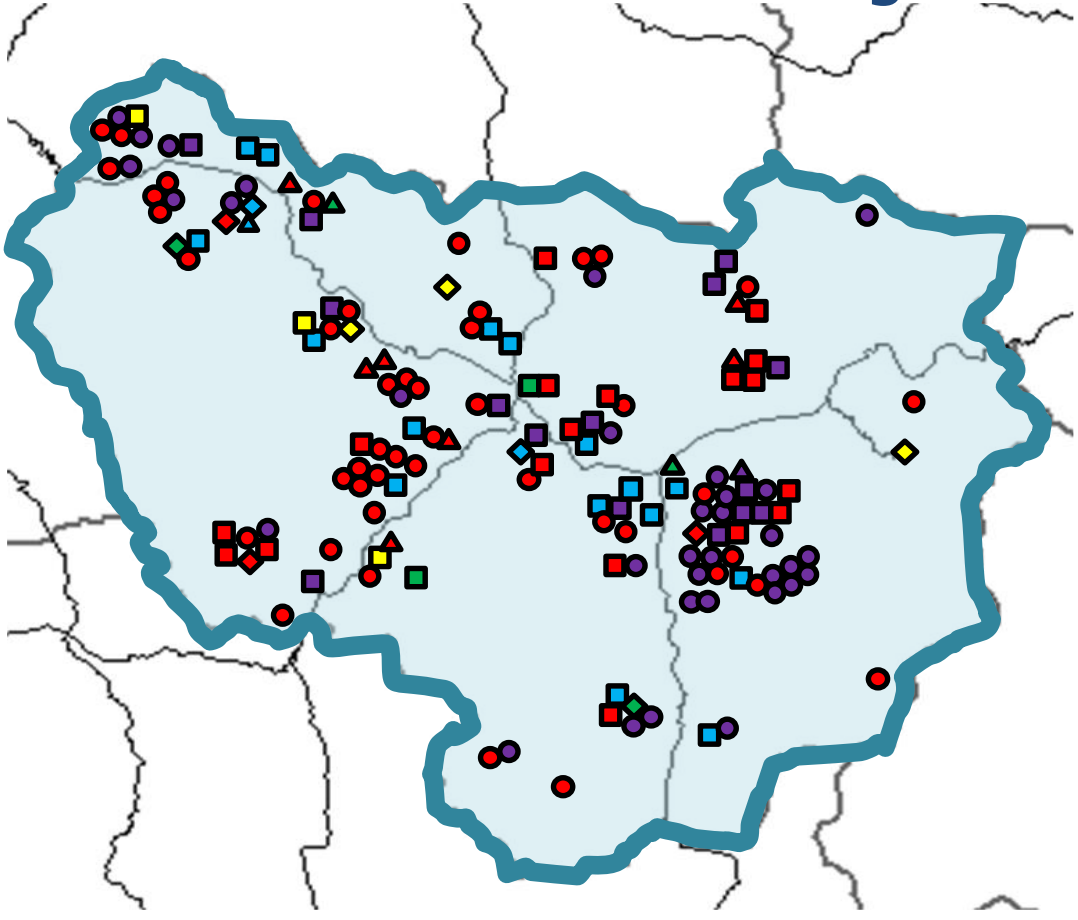
Briefing to the Prime Minister on the activities of satellite office

Mission of Satellite Office

1. Evaluation of effectiveness of decontamination through the measurement of radionuclides in soils.
2. Evaluation of risks of internal exposure through the measurement of foods and waters.
3. Health consultation with inhabitants including evacuees according to the results of above mentioned measurements.
4. Health promotion of inhabitants including evacuees.

Risk communication by a public health nurse of Nagasaki University in Kawauchi village

“Mushroom map” with radiocesium concentrations in Kawauchi village

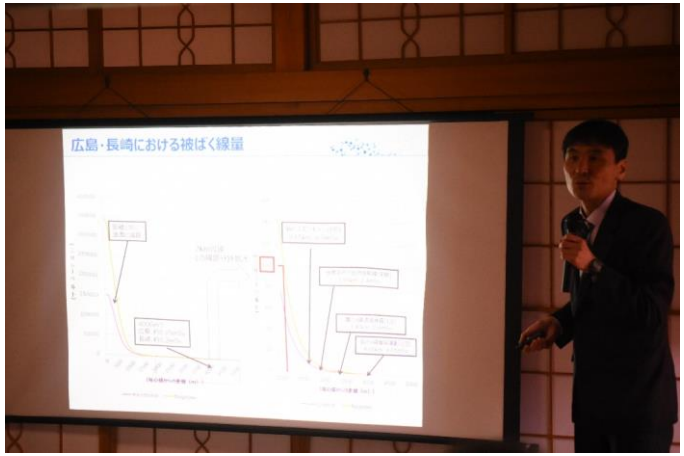


Hawk Wing
Honey Mushroom
Brick Cap
Others

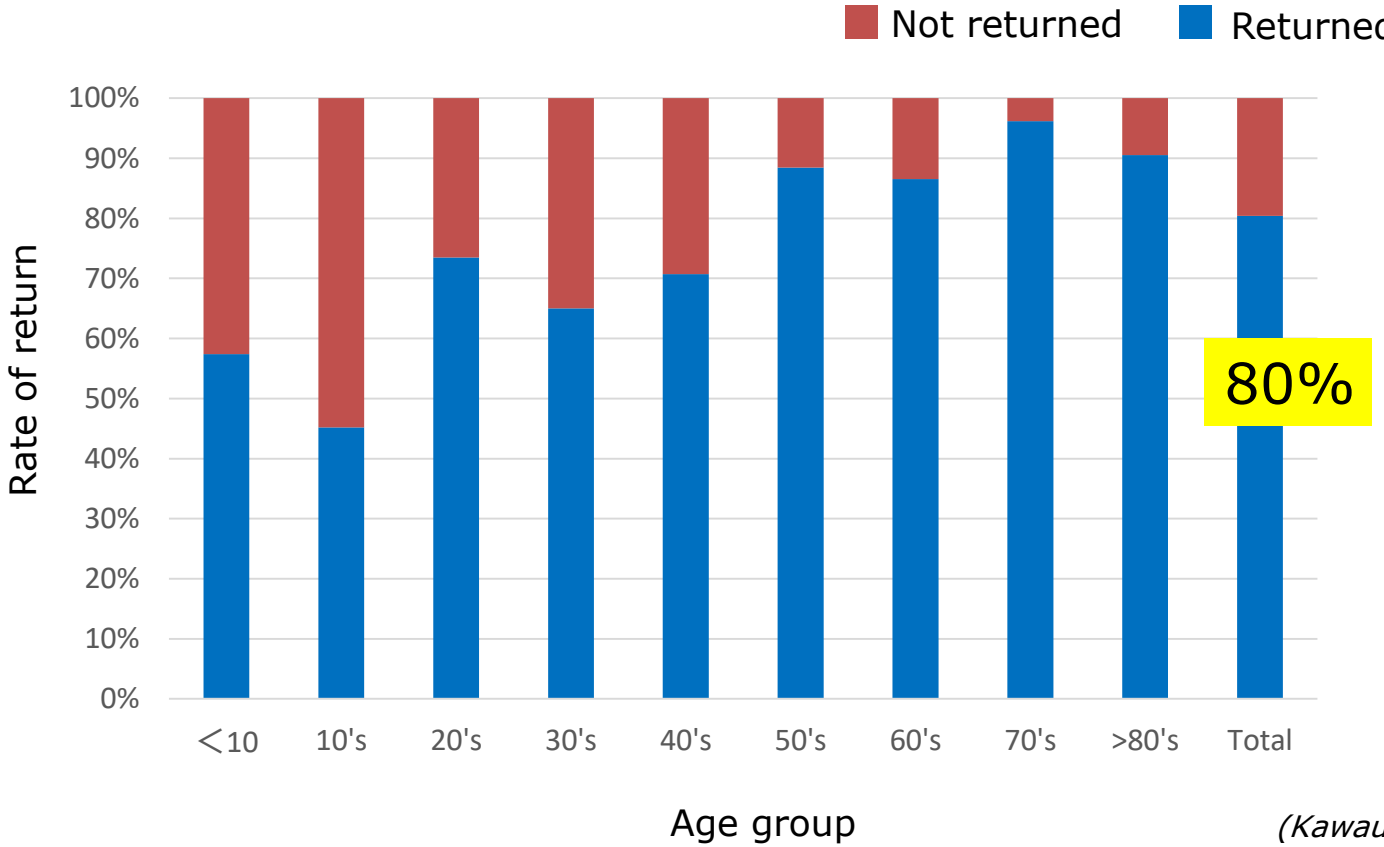
n.d.
10−49
50−99
100−999
>1,000(Bq/kg)

(Nakashima et al. Peer J. 2015)

Risk communication with residents about mushroom



Rate of residents returning to Kawauchi village (May, 2017)



(Kawauchi village office)

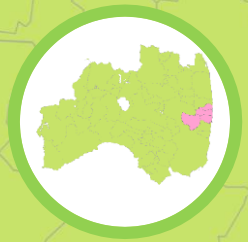
Satellite offices around FDNPS

Kawauchi
April 2013

Tomioka
October 2016

Ohkuma
July 2020

Futaba
December 2021



FDNPS

Risk communication about "mushroom map"

Risk communication in Kawauchi

Soil sampling

Explain to students about the measurement of radiocesium

Risk communication with mothers

Predicted number of residents of each municipality

	Katsurao	Namie	Futaba	Ohkuma	Tomioka	Kawauchi	Naraha	Hirono	Total
Population on March 2011	1,567	21,434	7,140	11,505	15,934	3,083	8,011	5,490	74,122
Population on January 2022	1,335	16,205	5,657	10,165	12,043	2,432	6,682	4,700	59,218 (-20%)
Returned	448	1,786	0	356	1,816	2,001	4,144	4,229	14,780 (25%)
Predicted Return (%)	46.1	16.7	10.8	12.5	15.1	80.9	54.3	83.3	29.4
Population in future	615	2,706	611	1,270	1,818	2,001	4,144	4,229	17,394

(Prepared by Mr Juichi Ide)

Factors associated with intention to return to Tomioka

	References	OR	95%CI
Sex	Male /Female(ref)	1.6**	1.2–2.0
Age	60=</60>(ref)	0.8	0.7-1.1
Living with children	Yes/No (ref)	0.7	0.5-1.0
Expectations with improving infrastructure of Tomioka	Yes/No (ref)	1.5**	1.3-1.7
Anxieties for drinking water in Tomioka	Yes/No (ref)	0.5**	0.4-0.7
Anxieties for genetic effects by living in Tomioka	Yes/No (ref)	0.6**	0.5-0.8
Wishes to consult with experts of radiation	Yes/No (ref)	2.7**	2.1-3.5

(Matsunaga et al. J Rad Res 2019)

Risk communication with young mother and pregnant women in Tomioka town

Radiation risk communication between residents, local authority and experts

Demographics of subjects, and perception of the effects of radiation exposure on heath

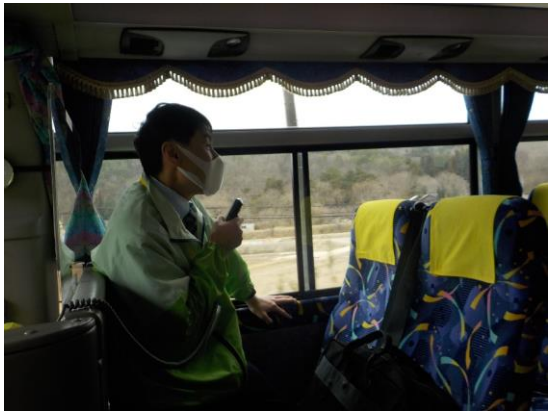
		Return (n=138)	Undecided (n=223)	Not to return (n=668)	p
Sex	Male/ Female	82/56 (59.4%)	122/101 (54.7%)	350/318 (52.4%)	0.308
Age	≥60/<60	105/33 (76.1%)	148/75 (66.4%)	460/208 (68.9%)	0.139
Living with children aged <18 years	Yes/No	9/129 (6.5%)	39/184 (17.5%)	147/521 (22.0%)	<0.001*
Concerns about consuming locally sourced food	Yes/No	42/96 (30.4%)	125/98 (56.1%)	393/275 (58.8%)	<0.001*
Belief that living in Tomioka will cause cancer	Yes/No	35/103 (25.4%)	103/120 (46.2%)	362/306 (54.2%)	<0.001*
Belief that genetic effects will appear in next generation	Yes/No	57/81 (41.3%)	143/80 (64.1%)	413/255 (61.8%)	<0.001*

(Orita et al., Int J Environ Res Public Health, 2020)

Risk communication with residents living outside Tomioka town

Providing information from Tomioka town office and risk communication between residents and experts about radiation exposure and health effects

Radiation risk communication with high school students in Fukushima



Training course of master course students in Tomioka and Ohkuma towns