Mental Health and Lifestyle Survey and Support for the Last 8 Years

The earthquake that occurred on March 11, 2011 caused Fukushima Prefecture to suffer tremendous damage not only due to the earthquake and subsequent tsunami but also due to the accident at the Fukushima Daiichi NPS. A number of people have been forced to take refuge for a prolonged period. They have faced hardships, such as breakup of communities, reputation damage, and discrimination, and have been exposed to psychosocial stress that is not normally caused by a natural disaster. Against such a background, commissioned by Fukushima Prefecture, a Mental Health and Lifestyle Survey has been conducted as part of the Fukushima Health Management Survey, targeting approximately 210,000 people from 13 disaster-afflicted municipalities, every year since 2012, and support has been offered using telephones, etc. based on the survey results. The major purpose is to support disaster victims, specifically, to detect those with health risks through screening based on the effective mental health indicators and provide them with appropriate care, or in other words, to take a high-risk approach. When deciding details of the support and items for the survey, the emphasis was placed on collaboration with targeted municipalities and their needs.

The health indicators used mainly focused on mental problems relating to stress caused by prolonged refuge life, but questions also widely covered other diverse items in consideration of the uniqueness of the Great East Japan Earthquake (fitness habits, sleeping habits, drinking habits, recognition of radiation risks, etc.). This survey is characterized by its method of continuously conducting questionnaires by post for as many as approximately 210,000 disaster victims and by the offering of support by phone, etc. to those with high risks identified through those questionnaires.

As a result, despite the problem of insufficient response rates, support by phone has been offered to over 3,000 people every year, and a newly established registered medical practitioner system and other relevant organizations have been introduced, as needed. The details of these support measures are reported to the Prefectural Oversight Committee every year. According to the results of a follow-up interview survey, which was conducted later, satisfaction levels of people who received support by phone were relatively high and it can be judged that a certain result was achieved. In particular, this disaster created a large number of long-term evacuees who are taking refuge far from Fukushima, which has hindered the provision of direct support such as visit support. In light of such circumstances, support by phone is considered to have been effective.

On the other hand, questionnaires sent to survey targets every year include many items not directly relating to support and too many questions contained therein are pointed out as one of the causes of low response rates. As explained later, these questions were effective for enabling deeper interpretation of survey results and reflection thereof in actual policies, but it may be necessary to carefully consider whether such detailed questions are necessary to be asked every year.

These detailed survey items have revealed people's mental and physical conditions in detail and correlations of factors causing mental and physical problems. For example, it became clear that a deep depression is closely related to worries over radiation risks and that conditions of refuge life strongly affect mental and physical health in various manners. These results are reported to the Prefectural Oversight Committee or in academic papers, etc. as needed. The outlines are as follows. (The following are only results reported to the Prefectural Oversight Committee. Others are separately compiled into a list of academic papers.)

1. Regarding general mental health levels of adults (aged 16 or over), the percentage of those with high risks was very high in the first-year survey but significant improvements were observed in the first three years. However, thereafter, the percentage has remained almost unchanged and has been higher than the national level, which serves as the standard. In particular, it is characteristic that the percentage of those with high risks was considerably high among evacuees outside Fukushima.
2. The percentage of children with high risks based on the indicators for developmental/emotional problematic behavior also showed significant improvements compared with the first year, but the percentage has remained at high levels among elementary and junior high school students. This survey also revealed notably high percentages among elementary and junior high school students who have taken refuge outside Fukushima.
3. People's lifestyle habits, such as fitness habits, and smoking or drinking habits, have been gradually improving compared to the year in which the survey was conducted for the first time. In particular, fitness habits and smoking habits have become almost the same or even better compared with the statistical data covering the whole country.
4. Recognition of radiation risks improved to some extent in the first three years and has been almost unchanged thereafter, which means that people still have considerably strong anxiety over the health effects of radiation exposure. Additionally, it is confirmed every year that worries over the effects of radiation exposure on the next generation are constantly higher than worries over late-onset effects.
5. Strong correlation has constantly been observed between general mental health levels and recognition of radiation risks.

Outlines of papers

1 Support by phone targeting children aged 15 or younger, which was provided from 2011 to 2016, was reviewed retrospectively. As a result, it was confirmed that support by phone is effective to a certain extent at the time of a large-scale disaster.

Support by phone offered to guardians of children aged 15 or younger in the "Mental Health and Lifestyle Survey" as part of the Fukushima Health Management Survey
OIKAWA Yuichi, et al., Journal of Health Psychology Research. 2020; 32: 151-158.

2 The accident at Fukushima Daiichi NPS caused various psychological problems, characteristically triggering social reaction such as discrimination and stigmas. Such social reaction is considered to have damaged the resilience of disaster victims and communities.

The psychosocial consequences of Fukushima disaster: What are we suffering from?
Maeda M, et al. Nuclear Emergencies. 2019 August 21; 63-67.

3 According to the results of the first-year survey, nearly 20% of disaster victims suffered sleep disorders, and factors such as refuge life in temporary houses or leased houses, loss of jobs, and decreases in income have affected their sleep disorders.

The association between self-reported sleep dissatisfaction after the Great East Japan Earthquake and a deteriorated socioeconomic status in the evacuation area: The Fukushima Health Management Survey
Zhang W, et al. Sleep Medicine. 2019 Sept. 6; 68: 63-70.

4 It was suggested that the emotional distress of adolescents may be associated with their worries over the health effects of radiation after the accident and their reaction to bereavement.

Changes in the mental health status of adolescents following the Fukushima Daiichi Nuclear Accident and related factors: Fukushima Health Management Survey
Hayashi F, et al. J Affect Disord. 2019 Sep 10; 260: 432-439.

5 In the recovery phase after the earthquake, risk factors triggering problem drinking differ by gender. It was found that financial problems are closely related in the case of men, and previous histories in the case of women.

Risk Factors of problem drinking in the chronic phase among evacuees in Fukushima following the Great East Japan Earthquake based on a two-year cohort study: The Fukushima Health Management Survey
Ueda Y, et al. Tohoku J Exp Med. 2019; 248(4): 239-252.

6 Nearly 20% of guardians worried about bullying and teasing toward their elementary school children at the time of the Fukushima Daiichi NPS accident, and those worries were found to have been especially strong for boys.

Parental recognition of bullying and associated factors among children after the Fukushima Nuclear Disaster: A 3-year follow-up study from the Fukushima Health Management Survey
Oe M, et al. Front Psychiatry. 2019; 10: 283.

7 This paper compiles psychosocial problems after the Fukushima Daiichi NPS accident and measures therefor, and overviews long-term psychosocial influence mainly based on the results of the Fukushima Health Management Survey.

Fukushima Nuclear Disaster: Multidimensional psychosocial issues and challenges to overcome them
Maeda M, et al. Encyclopedia of Environmental Health, 2nd Edition. 2019; 121-131.

8 It was suggested that there is the possibility that lowering people's recognition of radiation risks may have increased the frequency of laughing through mitigation of psychological sufferings.

Reduction of radiation-related anxiety promoted wellbeing after the 2011 disaster: "Fukushima Health Management Survey"
Murakami M, et al. Journal of Radiological Protection. 2018 Dec; 38(4): 1428-1440.

9 Based on the data of the first-year Fukushima Health Management Survey, psychometric properties of the simplified Japanese version of the Athens Insomnia Scale were examined and it was confirmed to be useful for evaluating local residents' insomnia.

Psychometric evaluation of the simplified Japanese version of the Athens Insomnia Scale: The Fukushima Health Management Survey
Iwasa H, et al. Journal of Sleep Research. 2018 Oct 12; e12771.

10 As a result of examining changes in recognition of radiation risks for the three years after the commencement to the survey, it was found that experience of strong traumas is associated with high levels of risk recognition and that examinees' mental conditions at the initial stage affected their subsequent risk recognition.

Changes in risk perception of the health effects of radiation and mental health status: The Fukushima Health Management Survey
Suzuki Y, et al. International Journal of Environmental Research and Public Health. 2018 Jun 10; 15(6): 1219.

11 The group of people who started smoking after the earthquake accounts for 1.4%, while 11.1% stopped smoking. People who newly started smoking are mainly observed among men and young people, often involving experience of traumas, etc. In contrast, notable factors for the group of people who stopped smoking are being female and having stable income.

Associations of disaster-related and psychosocial factors with changes in smoking status after a disaster: A cross-sectional survey after the Great East Japan Earthquake
Nakano H, et al. BMJ Open. 2018 Jun 30; 8(6): e018943.

12 Among children aged between 4 and 6, short sleeping hours are found to be associated with high mental health risks. In contrast, among school children, excessive sleep is associated with high mental health risks.

The relationship between sleep time and mental health problems according to the Strengths and Difficulties Questionnaire in children after an earthquake disaster: The Fukushima Health Management Survey
Itagaki S, et al. International Journal of Environmental Research and Public Health. 2018 Mar 30; 15(4): 633.

13 As a result of the analysis of emotional symptoms and behavior in establishing a peer relationship of children affected by the disaster, it was suggested that exercise and gender affect their behavioral problems.

Trajectories of emotional symptoms and peer relationship problems in children after nuclear disaster: Evidence from the Fukushima Health Management Survey
Oe M, et al. International Journal of Environmental Research and Public Health. 2018 Jan 6; 15(1): 82.

14 Differences between psychological effects after the Fukushima Daiichi NPS accident and those after other natural disasters were compared and analyzed, and it was found that a nuclear accident characteristically exerts prolonged influence and causes stigmas or other social reaction.

Psychosocial effects of the Fukushima disaster and current tasks: Differences between natural and nuclear disasters
Maeda M, et al. Journal of the National Institute of Public Health. 2018; 67(1): 50-58.

15 An interview survey conducted with the targets of the Fukushima Health Management Survey suggested that the percentages of those employed, those socially isolated, and those showing strong psychological stress responses are higher among non-respondents than among respondents to the Fukushima Health Management Survey.

The characteristics of non-respondents and respondents of a mental health survey among evacuees in a disaster: The Fukushima Health Management Survey
Horikoshi N, et al. Fukushima Journal of Medical Science. 2017 Dec 19; 63(3): 152-159.

16 It was suggested that the frequency of laughter of disaster victims is associated with their gender, age, lifestyles, and health conditions, and that changes in lifestyles after the disaster may affect the frequency of laughter.

Lifestyle factors and social ties associated with the frequency of laughter after the Great East Japan Earthquake: Fukushima Health Management Survey
Hirosaki M, et al. Quality of Life Research. 2018 Mar; 27(3): 639-650.

17 After the earthquake, nearly 10% of the residents covered by the Fukushima Health Management Survey newly started drinking. Factors to trigger drinking were being male, loss of sleep, and psychological sufferings, etc., which suggests the possibility that problem drinking may be reduced by paying attention to these factors.

The relationship between starting to drink and psychological distress, sleep disturbance after the Great East Japan Earthquake and nuclear disaster: The Fukushima Health Management Survey
Orui M, et al. Int'l Journal of Environmental Research & Public Health. 2017 Oct 24; 14(10).

18 It was suggested that female evacuees who consider radiation effects to be sizable are likely to suffer poor mental

health over the medium term.

Perception of radiation risk as a predictor of mid-term mental health after a nuclear disaster: The Fukushima Health Management Survey
Miura I, et al. International Journal of Environmental Research and Public Health. 2017 Sep 15; 14(9).

19 From the concrete content of support by phone for disaster victims, it became clear that many of the mothers have anxiety and difficulties and this exerts psychological effects on their mutual relationships with children.

Support by phone to parents of young children affected by the Great East Japan Earthquake: Based on "Fukushima Health Management Survey"
Oikawa Yuichi, et al. Traumatic Stress. 2017; 15: 69-75.

20 The nuclear accident brought about socioeconomic damage to disaster victims and such damage affected their subjective recognition of health conditions. However, it was suggested that lifestyle-related factors may ease people's subjective recognition of poor health.

Lifestyle-related factors that explain disaster-induced changes in socioeconomic status and poor subjective health: A cross-sectional study from the Fukushima Health Management Survey
Nagai M, et al. BMC Public Research. 2017 Apr 20; 17(1): 340.

21 Evacuees who took refuge away from their own residence after the earthquake are generally more likely to suffer worsened cardiovascular symptoms, and it also became clear that loss of jobs serves as a risk factor to worsen evacuees' headaches and dizziness.

Effects of socioeconomic factors on cardiovascular related symptoms among residents in Fukushima after the Great East Japan Earthquake: A cross-sectional study in the Fukushima Health Management Survey
Zhang W, et al. BMJ Open. 2017 Jun 23; 7(6): e014077.

22 The Great East Japan Earthquake and the NPS accident exerted extremely multifactorial psychological effects on residents, causing depressive reaction and traumatic reaction, etc., over a prolonged period. Care for their sufferings caused by the breakup of human relationships is required.
This paper focuses on the influence of the NPS accident and overviews other papers concerning the accident's psychosocial influence on residents in Fukushima.

Mental health consequences and social issues after the Fukushima disaster
Maeda M, et al. Asia Pacific Journal of Public Health. 2017 Mar; 29(2_suppl): 36S-46S.

23 With regard to lifestyle-related problems, evacuees who once received support by phone showed a significantly higher response rate for questionnaires in the following fiscal year than those who have not received such support. Therefore, support by phone is considered to be effective for improving questionnaire response rates.

Effects of support by phone targeting evacuees with risks of lifestyle-related diseases after the Great East Japan Earthquake in terms of questionnaire response rates and people's visits to medical institutions: Fukushima Health Management Survey
Horikoshi Naoko, et al. Japan Public Health Journal, 2017; 64 (2): 70-77.

24 Regular fitness habits are found to be necessary for maintaining children's mental health after a disaster.

Exercise habits are important for the mental health of children in Fukushima after the Fukushima Daiichi Disaster: The Fukushima Health Management Survey
Itagaki S, et al. Asia Pacific Journal of Public Health. 2017 Mar; 29(2_suppl): 171S-181S.

25 It was revealed that elderly evacuees after the NPS accident who are less independent and have poor life skills are highly likely to be in poor mental health.

The relationship between functional independence and psychological distress in elderly adults following the Fukushima Daiichi Nuclear Power Plant accident: The Fukushima Health Management Survey
Harigane M, et al. Asia Pacific Journal of Public Health. 2017 Mar; 29(2_suppl): 120S-130S.

26 With regard to PTSD reaction after the Fukushima Daiichi NPS accident and factors related to psychological recovery, it became clear that elderly people and evacuees whose living environments are severer are highly likely to suffer worsened symptoms.

Changes of posttraumatic stress responses in evacuated residents and their related factors: A 3-year follow-up study from the Fukushima Health Management Survey
Oe M, et al. Asia Pacific Journal of Public Health. 2017 Mar; 29(2_suppl): 182S-192S.

27 Looking at the percentage of children showing SDQ points over 16, for whom medical intervention for mental health is considered to be required, the percentage among disaster victims was considerably higher than that for a comparative cohort in other part of Japan, but no correlation with radiation doses at respective areas was found.

Mental health status of children after the Great East Japan Earthquake and Fukushima Daiichi Nuclear Power Plant Accident
Mashiko H, et al. Asia Pacific Journal of Public Health. 2017 Mar; 29(2_suppl): 131S-138S.

28 A longitudinal analysis of data for the three years after the earthquake revealed association between the seriousness of psychological sufferings and sleep insufficiency, problem drinking, shortage of social support, and recognition of radiation risks three years after the accident.

Predictors of severe psychological distress trajectory after nuclear disaster: Evidence from the Fukushima Health Management Survey
Oe M, et al. BMJ open. 2016 Oct 19; 6(10): e013400.

29 It was suggested that residents of Kawauchi village who used to live in the evacuation areas until the earthquake experienced serious mental health-related problems, such as depression and PTSD, affected by the NPS accident.

Psychological distress of residents in Kawauchi village, Fukushima Prefecture after the accident at Fukushima Daiichi Nuclear Power Station: The Fukushima Health Management Survey
Yoshida K, et al. PeerJ. 2016; 4: e2353.

30 The Great East Japan Earthquake and subsequent NPS accident exerted serious effects on mental health conditions of residents of evacuation areas and their mental health conditions may have further worsened according to their respective recognition of radiation risks.

Severe psychological distress of evacuees in evacuation zone caused by the Fukushima Daiichi Nuclear Power Plant accident: The Fukushima Health Management Survey
Kunii Y, et al. PLOS ONE. 2016; 11(7): e0158821.

31 The diagnostic accuracy of the shortened Japanese version of the Posttraumatic Stress Disorder Checklist (PCL-S) was examined based on diagnoses of evacuees from the Fukushima Daiichi NPS accident and it was confirmed to be reliable and effective as a measurement method and its diagnostic accuracy was found to be appropriate.

Diagnostic accuracy of Japanese posttraumatic stress measures after a complex disaster: The Fukushima Health Management Survey
Suzuki Y, et al. Asia Pacific Psychiatry. 2017 Mar; 9(1).

32 Association was found between psychological sufferings of evacuees after the Great East Japan Earthquake and low frequency of intake of specific diet and such relevance was especially notable among women.

Association between psychological distress and dietary intake among evacuees after the Great East Japan Earthquake in a cross-sectional study: The Fukushima Health Management Survey
Uemura M, et al. BMJ open. 2016 Jul 5; 6(7): e011534.

33 The reliability and appropriateness of the Japanese version of PCL-S were verified using data from the first-year survey and it was found to be an effective means for evaluating PTSD symptoms of residents of areas where they had traumatic experience.

Psychometric evaluation of the Japanese version of the Posttraumatic Stress Disorder Checklist in community dwellers following the Fukushima Daiichi nuclear power plant incident: The Fukushima Health Management Survey
Iwasa H, et al. SAGE Open. 2016; 6(2).

34 Support by phone was provided to approximately 4,000 disaster victims in FY2011. Support by phone is free from time constraints and geographical constraints and functioned extremely effectively at the time of the disaster.

Support by phone targeting disaster victims in Fukushima Prefecture
Kashiwazaki Yuya, et al. Clinical Psychiatry. 2016; 58 (5): 433-442.

35 The percentage of people showing high levels of K6 remained higher among disaster victims than among the general population even three years after the earthquake. This suggests that long-term intervention is strongly

required for dealing with mental health problems of disaster victims.

Three-year trend survey of psychological distress post-traumatic stress and problem drinking among residents in the evacuation zone after the Fukushima Daiichi Nuclear Power Plant accident
Oe M, et al. Psychiatry and Clinical Neurosciences. 2016 Jun; 70(6): 245-252.

36 This paper presents the numbers of suicides, the suicide rates and the current status in Fukushima Prefecture after the earthquake, and makes recommendations regarding measures to prevent suicides.

Fukushima mental health and suicide
Maeda M, et al. Journal of Epidemiology and Community Health. 2016 Sep; 70(9): 843-844.

37 Association was observed between refuge lives away from own residence and poor intake of fruits and vegetables (excluding juice), meat, soy products and dairy products.

Evacuation after the Great East Japan Earthquake was associated with poor dietary intake: The Fukushima Health Management Survey
Zhang W, et al. Journal of Epidemiology. 2017 Jan; 27(1): 14-23.

38 It was suggested that evacuees whose drinking behavior changed after the earthquake generally have poor mental health. Intervention regarding evacuees' drinking problems needs to take into account changes in their drinking behavior after the disaster.

Drinking behavior and mental illness among evacuees in Fukushima following the Great East Japan Earthquake: The Fukushima Health Management Survey
Ueda Y, et al. Alcoholism-Clinical and Experimental Research. 2016 Mar; 40(3): 623-630.

39 The percentage of residents in evacuation areas who have fitness habits was almost the same among evacuees who took refuge within Fukushima and those outside Fukushima, but the percentage was low among people living in places other than shelters or temporary houses.

Status of evacuation and fitness habits of evacuees after the Great East Japan Earthquake: Fukushima Health Management Survey
Nagai Masato, et al. Japan Public Health Journal, 2016; 63(1): 3-10.

40 This paper explains the uniqueness of psychosocial influence of the NPS accident in Fukushima, makes comparisons with other natural disasters, and points out the significance of long-term care and support for supporters.

The Great East Japan Earthquake: Tsunami and nuclear disaster
Maeda M, et al. Traumatic Stress and Long-Term Recovery. 2015; 71-90.

41 People who anticipate high probability of health effects of radiation showed a high percentage in terms of poor mental health conditions, and it became clear that there is correlation between mental disorders and recognition of radiation risks.

Psychological distress and the perception of radiation risks: The Fukushima Health Management Survey
Suzuki Y, et al. Bulletin of the World Health Organization. 2015 Sep 1; 93(9): 598-605.

42 Compared with 2010, standardized suicide death rates in the three disaster-afflicted prefectures decreased for the first two years, but in 2014, the rates in Iwate and Miyagi Prefectures increased to the levels before the disaster and the rate in Fukushima Prefecture exceeded the level before the disaster.

Suicide rates in the aftermath of the 2011 earthquake in Japan
Ohto H, et al. Lancet. 2015 May 2; 385(9979): 1727.

43 The percentages of people with sleep disorders and those targeted for support by phone are higher among evacuees who took refuge outside Fukushima Prefecture than among evacuees still living in the prefecture. Accordingly, support by phone is considered to be one of the effective support methods in the case where people take refuge in wider areas.

Status of lifestyles and support by phone depending on places for evacuation after the Great East Japan Earthquake
Horikoshi Naoko, et al. Welfare Indices, 2015; 62 (3): 2-8.

44 As shown in the ascertained levels of adults' K6 and PCL and children's SDQ, the earthquake and tsunami and the subsequent NPS accident caused psychological sufferings to residents in Fukushima Prefecture.

Psychological distress after the Great East Japan Earthquake and Fukushima Daiichi Nuclear Power Plant accident: Results of a mental health and lifestyle survey through the Fukushima Health Management Survey in FY2011 and FY2012
Yabe H, et al. Fukushima Journal of Medical Science. 2014; 60(1): 57-67.

Report on the Third-Round Thyroid Survey
(Second Full-Scale Thyroid Survey)

1. Summary

1.1 Purpose

In order to monitor the long-term health of children, we are now engaged in the second Full-scale Thyroid Survey (the Third-Round Survey). The first round was Preliminary Baseline Survey for initial assessment of thyroid glands, and the second round was the First Full-Scale Thyroid Survey to assess any changes.

1.2 Survey Population

In addition to the participants of Preliminary Baseline Survey (Fukushima residents born between 2 April 1992 and 1 April 2011), the Full-Scale Thyroid Survey (from and after the Second-Round Survey) also includes those who were born between 2 April 2011 and 1 April 2012.

1.3 Implementation Period

The Second Full-Scale Survey started on 1 May 2016 and covered examinees up to age 20 on a municipality-by-municipality schedule to FY 2017. Thereafter, we revised the schedule of examinations so that examinees can take examinations every five years – at ages 25, 30, 35, etc. – to make it easier for examinees to remember when they are due for examination. However, the interval between the examination at age 25 and the previous one should not be greater than 5 years.

1.4 Responsible Organizations

Fukushima Prefecture commissioned Fukushima Medical University (FMU) to conduct the survey in cooperation with organizations inside and outside Fukushima for the convenience for examination participants (the number of contracts is as of 31 December 2019).

1.4-1 The primary examination

Inside Fukushima Prefecture	83 medical facilities
Outside Fukushima Prefecture	122 medical facilities

1.4-2 The confirmatory examination

Inside Fukushima Prefecture	5 medical facilities including FMU
Outside Fukushima Prefecture	37 medical facilities

1.5 Method

1.5-1 The primary examination

We use ultrasonography for examination of the thyroid gland.

Assessments are made by specialists on the basis of the following criteria:

-Diagnostic criteria (A)

Those with A1 or A2 test results are recommended for watchful waiting until they undergo the primary examination, starting from April 2018.

A1: No nodules / cysts

A2: Nodules ≤5.0 mm or cysts ≤20.0 mm

-Diagnostic criteria (B)

Those with B test results are advised to take the confirmatory examination.

B: Nodules ≥5.1 mm or cysts ≥20.1 mm

Some A2 test results may be re-classified as B results when clinically indicated.

-Diagnostic criteria (C)

Those with C test results are advised to take the confirmatory examination.

C: Immediate need for confirmatory examination, judging from the condition of the thyroid gland.

1.5-2 The confirmatory examination

We conduct ultrasonography, blood test, urine test, and fine needle aspiration cytology (FNAC) if needed for those with B or C test results. Priority is given to those in urgent clinical need.

We recommend medical follow-up for those requiring it due to confirmatory test results.

1.5-3 Flow chart

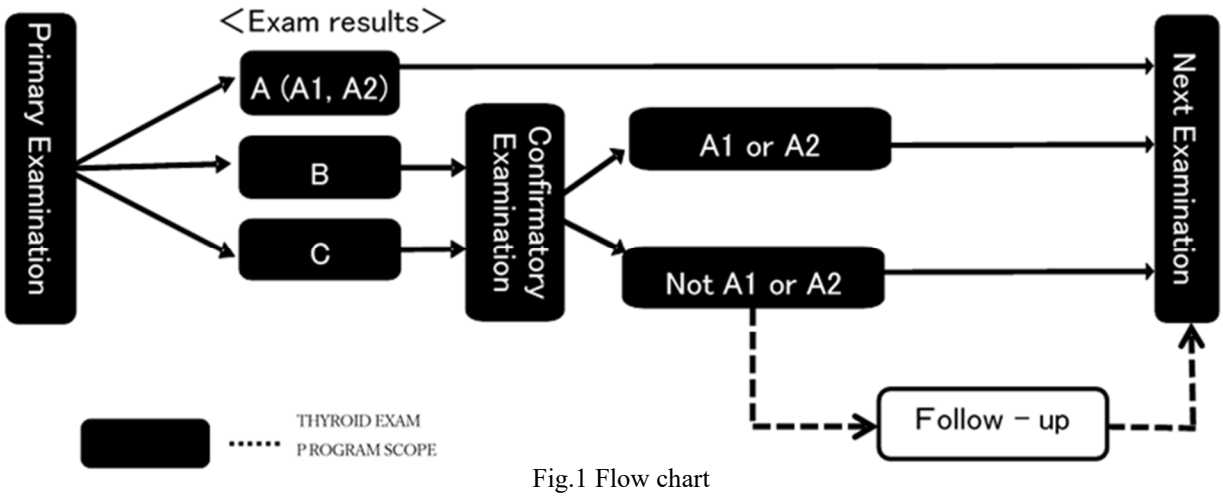


Fig.1 Flow chart

1.6 Municipalities Surveyed

The municipalities where examinations were carried out in FY 2016 and FY 2017 are as follows:

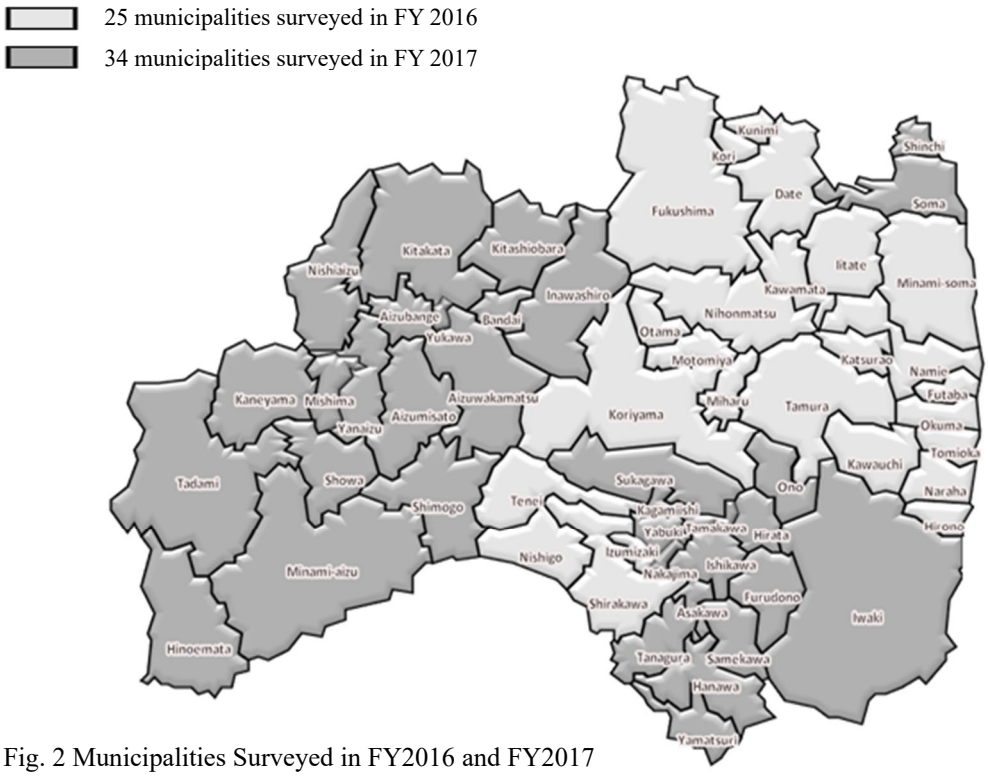


Fig. 2 Municipalities Surveyed in FY2016 and FY2017

2. Results as of 31 December 2019

2.1 Results of the Primary Examination

2.1-1 Progress report

The primary examination started on 1 May 2016 for at 336,669 people in 59 municipalities (25 municipalities in FY2016 and 34 municipalities in FY2017) and so far carried out for 217,916 people (64.7%). (Examination status for each municipality and that of prefectures other than Fukushima are as in Appendix 1 and Appendix 2)

Results have been confirmed for 217,908 participants (100.0%) and notifications have been sent accordingly. (The result for each municipality is as Appendix 3)

Thus far, 76,427 (35.1%) were classified as A1, 139,980 (64.2%) as A2, 1,501 (0.7%) as B, and none as C.

Table 1 Progress and results of the primary examination

	Survey population	Participants		Exam results							
		Proportion (%)	Outside Fukushima	Proportion (%)	Class (%)						
					A				Requiring confirmatory exam			
	a	b (b/a)		c (c/b)	A1 d	(d/c)	A2 e	(e/c)	B f	(f/c)	C g	(g/c)
FY 2016	191,876	126,391 (65.9)	8,909	126,386 (100.0)	44,040	(34.8)	81,541	(64.5)	805	(0.6)	0	(0.0)
FY 2017	144,793	91,525 (63.2)	3,598	91,522 (100.0)	32,387	(35.4)	58,439	(63.9)	696	(0.8)	0	(0.0)
Total	336,669	217,916 (64.7)	12,507	217,908 (100.0)	76,427	(35.1)	139,980	(64.2)	1,501	(0.7)	0	(0.0)

Table 2. Number and proportion of participatns with nodules/cysts

	Number of participants with confirmed results	Number and proportion of participants with nodules/cysts			
		Nodules		Cysts	
	a	≥5.1 mm b (b/a)	≤5.0 mm c (c/a)	≥20.1 mm d (d/a)	≤20.0 mm e (e/a)
FY 2016	126,386	805 (0.6)	430 (0.3)	0 (0.0)	81,926 (64.8)
FY 2017	91,522	693 (0.8)	399 (0.4)	3 (0.0)	58,740 (64.2)
Total	217,908	1,498 (0.7)	829 (0.4)	3 (0.0)	140,666 (64.6)

- Proportions are rounded to the 1st decimal place. This also applies to other tables.
- The participants in FY2016 and FY 2017 surveys are those received the Full-Scale Survey examination conducted on a municipality-by-municipality basis (until they are older than 20 years old), whereas those who receive the examination at 5-year intervals (those born in FY1992 and FY1993) are excluded.
- The results of those received examination at 5-year intervals will be shown separately. Examinations for those born in FY1992 (approx. 23,000) and FY1993 (approx. 22,000) took place in FY 2017 and FY2018, respectively.

2.1-2 Participation rates by age group

The participation rate of the age group of 18 or older (age as of 1 April 2016) in municipalities surveyed in FY 2016 was 17.2%.

The participation rate of the age group of 18 or older (age as of 1 April 2017) in municipalities surveyed in FY 2017 was 16.5%.

Table 3 Participation rates by age group

		Total	Age group (years)			
FY 2016	Age group (years)		4-7	8-12	13-17	18-23
	Survey population (a)	191,876	36,620	51,003	56,840	47,413
	Participants (b)	126,391	26,425	45,553	46,267	8,146
	Proportion (%) (b/a)	65.9	72.2	89.3	81.4	17.2
FY 2017	Age group (years)		5-7	8-12	13-17	18-24
	Survey population (a)	144,793	19,316	37,165	41,995	46,317
	Participants (b)	91,525	14,957	33,947	34,966	7,655
	Proportion (%) (b/a)	63.2	77.4	91.3	83.3	16.5
Total	Survey population (a)	336,669	55,936	88,168	98,835	93,730
	Participants (b)	217,916	41,382	79,500	81,233	15,801
	Proportion (%) (b/a)	64.7	74.0	90.2	82.2	16.9

・ Age groups are formed with the age as of 1 April of each fiscal year.

2.1-3 Comparison of Full-scale Thyroid Surveys

Comparison of Third- and Second-Round Survey results is as shown in Table 4.

Among 201,525 participants who were diagnosed as A1 or A2 in the Second-Round Survey, 200,829 (99.7%) had A1 or A2 results, and 696 (0.3%) were diagnosed as B in the Third-Round Survey.

Among 1,147 participants who were diagnosed as B in the Second-Round Survey, 442 (38.5%) had A1 or A2 results, and 705 (61.5%) were diagnosed as B in the Third-Round Survey.

Table 4 Comparison of Full-scale Thyroid Survey

			Results of the Second-round Survey*1 (%) a	Results of the Third-Round Survey *2			
				A		B	C
				A1 b b/a (%)	A2 c c/a (%)	d d/a (%)	e e/a (%)
Results of the Second-round Survey	A	A1	79,750 (100.0)	57,635 (72.3)	21,979 (27.6)	136 (0.2)	0 (0.0)
		A2	121,775 (100.0)	12,175 (10.0)	109,040 (89.5)	560 (0.5)	0 (0.0)
	B		1,147 (100.0)	62 (5.4)	380 (33.1)	705 (61.5)	0 (0.0)
	C		0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	No participation		15,236 (100.0)	6,555 (43.0)	8,581 (56.3)	100 (0.7)	0 (0.0)
Total			217,908 (100.0)	76,427 (35.1)	139,980 (64.2)	1,501 (0.7)	0 (0.0)

*1 Upper figures show a previous (Second Round) diagnosis for the participants in this (Third Round) survey whose results have been confirmed. They are not the breakdown of the total number of the previous-round participants (270,557)

*2 Upper figures show the breakdown of the Third-Round Survey participants who were diagnosed for each diagnostic class in the Second-Round Survey. Lower figures are their proportion (%).

2.2 Results of the Confirmatory Examination

2.2-1 Progress report

Confirmatory Examinations have been conducted since October 2016 and so far 1,101 (73.4%) of 1,501 people who were recommended for a confirmatory examination as a result of the primary examination have received the examination and 1,058 (96.1%) have completed the entire procedure of the examination (Implementation status of each municipality is shown in Appendix 5).

Of the foregoing 1,058 participants, 108 (A1: 9, A2: 99) (10.2%) were confirmed to meet A1 or A2 diagnostic criteria by the Primary Examination standards (including those with other thyroid conditions). Remaining 950 (89.8%) people were confirmed to be non-equivalent to A1 or A2.

Table 5 Progress and results of the confirmatory examination

	Number of those requiring confirmatory exam a	Participants Proportion (%) b (b/a)	Confirmatory exam coverage (%) c (c/b)	Confirmed exam results A1 d (d/c)	 A2 e (e/c)	Not A1 or A2 f (f/c)	 FNAC g (g/f)
FY 2016	805	612 (76.0)	584 (95.4)	5 (0.9)	58 (9.9)	521 (89.2)	39 (7.5)
FY 2017	696	489 (70.3)	474 (96.9)	4 (0.8)	41 (8.6)	429 (90.5)	38 (8.9)
Total	1,501	1,101 (73.4)	1,058 (96.1)	9 (0.9)	99 (9.4)	950 (89.8)	77 (8.1)

2.2-2 Results of fine needle aspiration cytology (FNAC)

Among those who underwent FNAC, 30 had nodules classified as malignant or suspicious for malignancy. 12 of them were male, and 18 were female. Participants' age at the time of the confirmatory examination ranged from 12 to 23 years (mean age: 16.4 ± 2.8 years). The minimum and maximum tumor diameters were 5.6 mm and 33.0 mm. Mean tumor diameter was 13.0 ± 6.5 mm.

Results of these 30 participants in the Full-Scale Survey (the Second-Round Survey) were: 20 were classified as A (A1: 6, A2: 14), 7 as B and 3did not participated in the survey.

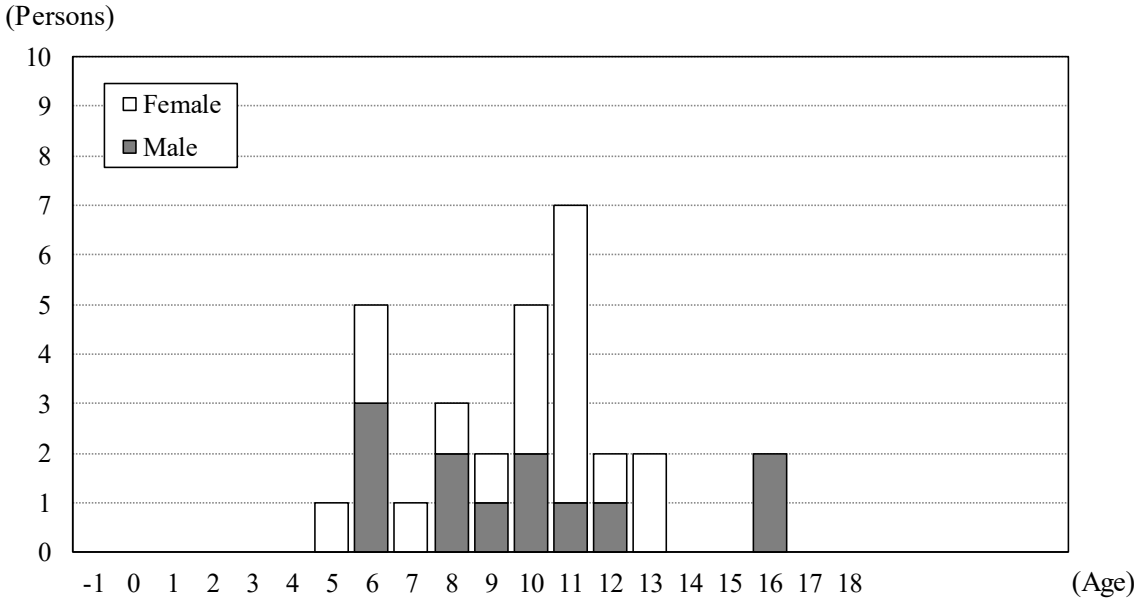
Table 6. Results of FNAC

A. Municipalities surveyed in FY 2016	
・Malignant or suspicious for malignancy：	12*)
・Male to female ratio：	6:6
・Mean age (SD, min-max):	16.3 (3.0, 12-23), 10.3 (2.8, 6-16) at the time of disaster
・Mean tumor size:	14.0 mm (6.0 mm, 8.7-30.4 mm)
B. Municipalities surveyed in FY 2017	
・Malignant or suspicious for malignancy：	18*)
・Male to female ratio：	6:12
・Mean age (SD, min-max):	16.5 (2.7, 12-22), 9.4 (2.9, 5-16) at the time of disaster
・Mean tumor size:	12.4 (6.9 mm, 5.6-33.0 mm)
C. Total	
・Malignant or suspicious for malignancy：	30*)
・Male to female ratio：	12:18
・Mean age (SD, min-max):	16.4 (2.8, 12-23), 9.8 (2.8, 5-16) at the time of disaster
・Mean tumor size:	13.0 mm (6.5 mm, 5.6-33.0 mm)

*) Surgical cases are as shown in Appendix 6.

2.2-3 Age distribution of malignant or suspicious-for-malignancy cases diagnosed by FNAC

Age distributions of 30 people having nodules classified as malignant or suspicious for malignancy by age as of 11 March 2011 is shown in Fig. 3, and by age as of the confirmatory examination in Fig. 4.



The horizontal axis begins at -1 to include residents of Fukushima Prefecture born between 2 April 2011 and 1 April 2012

Fig.3 Age as of 11 March 2011

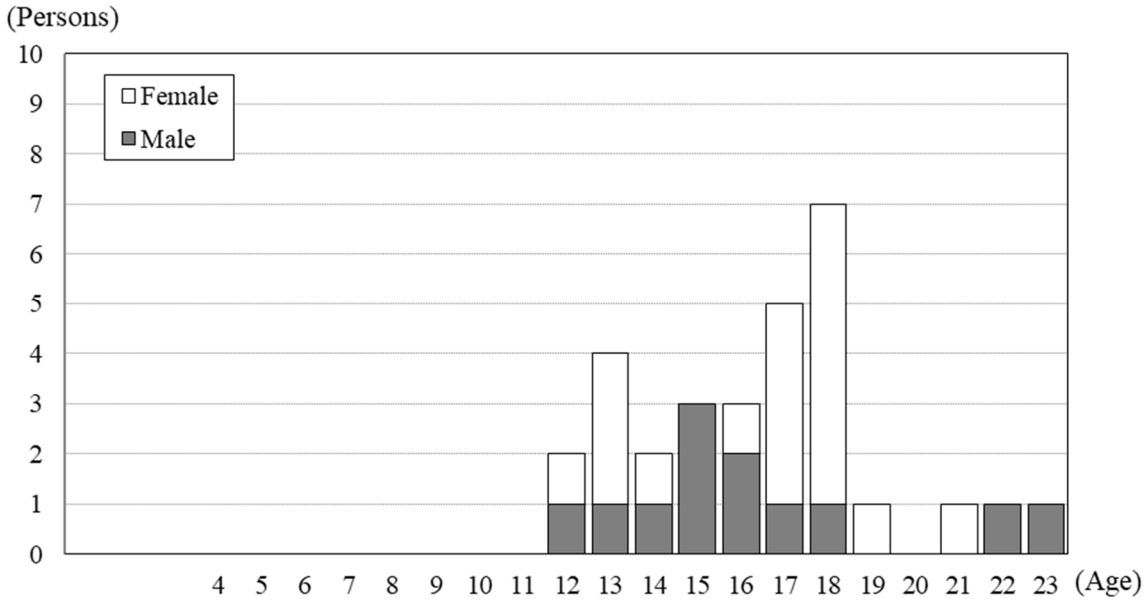


Fig. 4 Age as of the date of confirmatory examination

2.2-4 Basic Survey results of those with nodules diagnosed as malignant or suspicious for malignancy by FNAC

11 (36.7%) of the 30 people participated in the Basic Survey (for external radiation dose estimation), and 11 received the results. The highest effective dose documented was 1.5 mSv.

Table 7. A breakdown of dose estimates for participants of the Basic Survey

Effective dose (mSv)	Age at the time of the disaster									
	0-5		6-10		11-15		16-18		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<1	0	0	3	0	0	4	0	0	3	4
1-1.9	0	0	1	1	1	1	0	0	2	2
2-4.9	0	0	0	0	0	0	0	0	0	0
5-9.9	0	0	0	0	0	0	0	0	0	0
10-19.9	0	0	0	0	0	0	0	0	0	0
≥20	0	0	0	0	0	0	0	0	0	0
Total	0	0	4	1	1	5	0	0	5	6

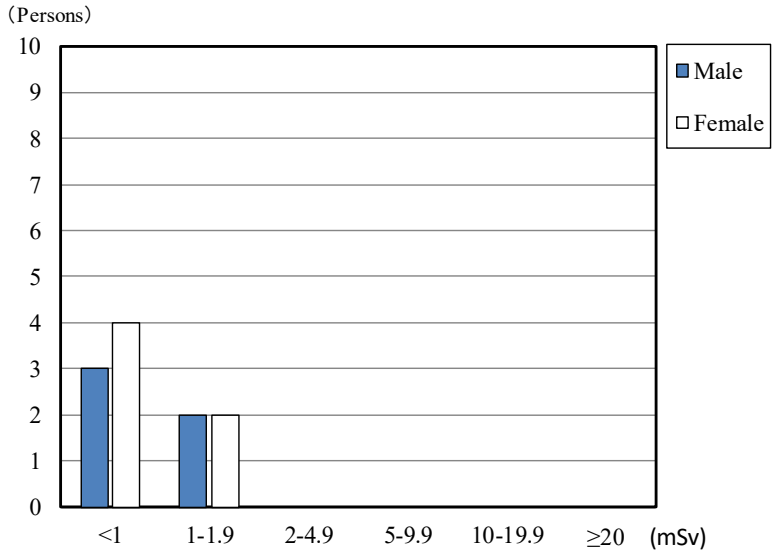


Fig. 5 Effective dose of the participants

2.2-5 Blood test and urinary iodine test results

Table 8. Blood test results

Mean±SD (Abnormal value)

	FT4 [1] (ng/dL)	FT3 [2] (pg/mL)	TSH [3] (μIU/mL)	Tg [4] (ng/mL)	TgAb [5] (IU/mL)	TPOAb [6] (IU/mL)
Reference Range	0.95-1.74 [7]	2.13-4.07 [7]	0.340-3.880 [7]	≤33.7	<28.0	<16.0
30 malignant or suspicious	1.2 ± 0.1 (3.3%)	3.6 ± 0.7 (16.7%)	1.8 ± 1.2 (16.7%)	29.8 ± 38.8 (26.7%)	20.0%	16.7%
Other 997	1.2 ± 0.2 (6.1%)	3.5 ± 0.5 (6.4%)	1.3 ± 4.4 (9.2%)	29.0 ± 97.9 (14.2%)	8.1%	12.6%

1) FT4: free thyroxine; thyroid hormone binding 4 iodines; higher among patients with thyrotoxicosis (such as Graves' disease) and lower with hypothyroidism (such as Hashimoto's thyroiditis).
2) FT3: free triiodothyronine; thyroid hormone binding 3 iodines; higher among patients with thyrotoxicosis (such as Graves' disease) and lower with hypothyroidism (such as Hashimoto's thyroiditis).
3) TSH: thyroid-stimulating hormone; higher among patients with Hashimoto's disease and lower with Graves' disease.
4) Tg: thyroglobulin; higher when thyroid tissue is destroyed or when neoplastic tissue produces thyroglobulin.
5) TgAb: anti-thyroglobulin antibody; higher among patients with Hashimoto's disease and Graves' disease.
6) TPOAb: anti-thyroid peroxidase antibody; higher among patients with Hashimoto's disease or Graves' disease.
7) Reference interval varies according to age.

Table 9 Urinary iodine test results (μg/day)

	Minimum	25th percentile	Median	75th percentile	Maximum
30 malignant or suspicious	69	144	229	397	3510
Other 999	26	109	176	323	8910

2.2-6 Confirmatory Examination results by area as of 31 December 2019

The proportions of participants with nodules diagnosed as malignant or suspicious for malignancy were 0.03% in Hamadori, 0.02% in 13 municipalities in the nationally-designated evacuation zones and Aizu, and 0.01% in Nakadori.

Table 10 Confirmatory examination results by area

Area	Number of Participants a	Participants who required confirmatory exam b	Proportion who required confirmatory exam (%) b/a	Number who underwent confirmatory exam	Malignant or Suspicious cases c	Proportion of malignant or suspicious cases (%) c/a
13 municipalities [1)]	27,085	212	0.8	161	5	0.02
Nakadori [2)]	121,923	761	0.6	566	8	0.01
Hamadori [3)]	41,296	323	0.8	231	12	0.03
Aizu [4)]	27,612	205	0.7	143	5	0.02
Total	217,916	1,501	0.7	1,101	30	0.01

1) Tamura, Minami-soma, Date, Kawamata, Hirono, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, Katsurao, Iitate
2) Fukushima, Koriyama, Shirakawa, Sukagawa, Nihonmatsu, Motomiya, Kori, Kunimi, Otama, Kagamiishi, Tenei, Nishigo, Izumizaki, Nakajima, Yabuki, Tanagura, Yamatsuri, Hanawa, Samegawa, Ishikawa, Tamakawa, Hirata, Asakawa, Furudono, Miharu, Ono
3) Iwaki, Soma, Shinchi
4) Aizuwakamatsu, Kitakata, Shimogo, Hinoemata, Tadami, Minami-aizu, Kitashiobara, Nishiaizu, Bandai, Inawashiro, Aizubange, Yugawa, Yanaizu, Mishima, Kaneyama, Showa, Aizumisato

2.3 Mental Health Care

2.3-1 Support for primary examination participants

Since July 2015, we offer person-to-person explanations to participants at public venues where primary examinations take place. After the examination, medical doctors explain the results showing the ultrasound image in private consultation booths set up at the venue. As of 31 December 2019, 27,853 (84.9%) of 32,806 participants visited the consultation booths. In case the booths cannot be set up at school, alternatives such as briefing sessions at schools and telephonic supports are offered.

※ The number of those who used the consultation booths includes participants receiving the Second-Round Survey.

2.3-2 Support for confirmatory examination participants

We have set up a support team for participants of the confirmatory examination within Fukushima Medical University to address their anxiety and concerns, as well as online support for Q&A and counseling.

Since the start of the Full-Scale Thyroid Survey, 1,175 participants (413 males and 762 females) have received support as of 31 December 2019. The number of supports provided was 2,433 in total. Of these, 1,347 (55.4%) received support at their first examination and 1,020 (41.9%) at subsequent examination (includes 139 (5.7%) at FNAC) – and 66 (2.7%) at informed consent.

For those who have proceeded to the health insurance medical care, we continue to provide support in cooperation with the teams of medical staff at hospitals.

※ The number of those who used the consultation booths at the confirmatory examination includes participants receiving the examination second time.

Appendix 1

Thyroid ultrasound examination (TUE) coverage by municipality — As of 31 December 2019

	Survey population	Participants		Proportion (%)	Number and proportion[*2] of participants by age group				Participants living outside Fukushima	Proportion (%)
	a	b	Outside Fukushima[*1]	b/a	4-9	10-14	15-19	≥20	c[*3]	c/b
Municipalities surveyed in FY 2016										
Kawamata	2,142	1,409	34	65.8	408	544	409	48	75	5.3
					29.0	38.6	29.0	3.4		
Namie	3,315	1,954	508	58.9	581	664	576	133	587	30.0
					29.7	34.0	29.5	6.8		
Iitate	987	604	23	61.2	174	261	151	18	42	7.0
					28.8	43.2	25.0	3.0		
Minami-soma	11,540	7,076	1,236	61.3	2,208	2,726	1,839	303	1,331	18.8
					31.2	38.5	26.0	4.3		
Date	10,210	7,086	243	69.4	2,028	2,674	2,095	289	268	3.8
					28.6	37.7	29.6	4.1		
Tamura	6,344	4,055	99	63.9	1,269	1,594	1,105	87	188	4.6
					31.3	39.3	27.3	2.1		
Hirono	975	546	66	56.0	163	185	154	44	59	10.8
					29.9	33.9	28.2	8.1		
Naraha	1,281	771	99	60.2	214	270	222	65	103	13.4
					27.8	35.0	28.8	8.4		
Tomioka	2,751	1,477	299	53.7	393	509	450	125	334	22.6
					26.6	34.5	30.5	8.5		
Kawauchi	297	171	15	57.6	47	72	49	3	16	9.4
					27.5	42.1	28.7	1.8		
Okuma	2,259	1,343	270	59.5	418	496	349	80	300	22.3
					31.1	36.9	26.0	6.0		
Futaba	1,133	464	117	41.0	139	184	117	24	126	27.2
					30.0	39.7	25.2	5.2		
Katsurao	211	129	4	61.1	36	50	32	11	10	7.8
					27.9	38.8	24.8	8.5		
Fukushima	49,340	34,105	2,098	69.1	10,281	12,202	10,176	1,446	2,440	7.2
					30.1	35.8	29.8	4.2		
Nihonmatsu	9,308	6,347	230	68.2	1,955	2,456	1,747	189	262	4.1
					30.8	38.7	27.5	3.0		
Motomiya	5,615	3,898	124	69.4	1,316	1,445	1,030	107	132	3.4
					33.8	37.1	26.4	2.7		
Otama	1,468	1,051	34	71.6	358	405	256	32	33	3.1
					34.1	38.5	24.4	3.0		
Koriyama	59,469	38,117	2,852	64.1	11,583	14,398	10,610	1,526	3,095	8.1
					30.4	37.8	27.8	4.0		
Kori	1,854	1,355	40	73.1	424	501	370	60	40	3.0
					31.3	37.0	27.3	4.4		
Kunimi	1,405	1,021	31	72.7	275	385	304	57	32	3.1
					26.9	37.7	29.8	5.6		
Tenei	966	634	24	65.6	191	258	164	21	23	3.6
					30.1	40.7	25.9	3.3		
Shirakawa	11,352	7,648	295	67.4	2,261	2,853	2,251	283	381	5.0
					29.6	37.3	29.4	3.7		
Nishigo	3,722	2,562	110	68.8	787	951	705	119	144	5.6
					30.7	37.1	27.5	4.6		
Izumizaki	1,163	800	12	68.8	239	310	222	29	19	2.4
					29.9	38.8	27.8	3.6		
Miharu	2,769	1,768	46	63.8	454	628	595	91	44	2.5
					25.7	35.5	33.7	5.1		
Subtotal	191,876	126,391	8,909	65.9	38,202	47,021	35,978	5,190	10,084	8.0
					30.2	37.2	28.5	4.1		

*1) The number of participants who received the examination at facilities outside Fukushima or by teams dispatched from FMU (as of 30 November 2019)

*2) The upper layer shows the number of participants, and the lower layer shows the proportion of participants from each municipality.

*3) The number of participants who have resident registration outside of Fukushima.

・ Age groups were formed based on the age at the Full-Scale Thyroid Survey (the Third-Round Survey). This applies to other tables hereafter.

	Survey population	Participants		Proportion (%)	Number and proportion[*2] of participants by age group				Participants living outside Fukushima	Proportion (%)
	a	b	Outside Fukushima*1	b/a	4-9	10-14	15-19	≥20	c[*3]	c/b
Municipalities surveyed in FY 2017										
Iwaki	56,810	36,625	2,007	64.5	8,793	13,724	11,600	2,508	2,097	5.7
					24.0	37.5	31.7	6.8		
Sukagawa	14,113	9,247	275	65.5	2,570	3,476	2,699	502	308	3.3
					27.8	37.6	29.2	5.4		
Soma	6,252	3,822	256	61.1	1,137	1,410	1,110	165	294	7.7
					29.7	36.9	29.0	4.3		
Kagamiishi	2,417	1,590	44	65.8	436	614	470	70	48	3.0
					27.4	38.6	29.6	4.4		
Shinchi	1,320	849	34	64.3	212	333	263	41	48	5.7
					25.0	39.2	31.0	4.8		
Nakajima	972	645	6	66.4	177	240	202	26	8	1.2
					27.4	37.2	31.3	4.0		
Yabuki	3,041	1,962	43	64.5	632	736	519	75	49	2.5
					32.2	37.5	26.5	3.8		
Ishikawa	2,530	1,609	36	63.6	485	591	470	63	51	3.2
					30.1	36.7	29.2	3.9		
Yamatsuri	930	578	16	62.2	187	219	148	24	12	2.1
					32.4	37.9	25.6	4.2		
Asakawa	1,210	820	27	67.8	214	316	251	39	37	4.5
					26.1	38.5	30.6	4.8		
Hirata	1,101	691	8	62.8	208	268	196	19	12	1.7
					30.1	38.8	28.4	2.7		
Tanagura	2,749	1,752	42	63.7	536	677	479	60	57	3.3
					30.6	38.6	27.3	3.4		
Hanawa	1,492	889	27	59.6	260	348	242	39	36	4.0
					29.2	39.1	27.2	4.4		
Samegawa	617	382	12	61.9	120	154	96	12	16	4.2
					31.4	40.3	25.1	3.1		
Ono	1,716	1,031	21	60.1	318	423	254	36	21	2.0
					30.8	41.0	24.6	3.5		
Tamakawa	1,210	798	10	66.0	222	333	220	23	12	1.5
					27.8	41.7	27.6	2.9		
Furudono	946	623	16	65.9	197	232	158	36	17	2.7
					31.6	37.2	25.4	5.8		
Hinoemata	94	47	5	50.0	14	13	17	3	4	8.5
					29.8	27.7	36.2	6.4		
Minami-aizu	2,512	1,472	25	58.6	437	559	428	48	30	2.0
					29.7	38.0	29.1	3.3		
Kaneyama	177	89	1	50.3	19	42	25	3	1	1.1
					21.3	47.2	28.1	3.4		
Showa	127	74	3	58.3	26	26	20	2	4	5.4
					35.1	35.1	27.0	2.7		
Mishima	174	107	1	61.5	24	44	37	2	1	0.9
					22.4	41.1	34.6	1.9		
Shimogo	873	528	9	60.5	160	200	148	20	8	1.5
					30.3	37.9	28.0	3.8		
Kitakata	8,079	4,925	101	61.0	1,336	1,903	1,518	168	121	2.5
					27.1	38.6	30.8	3.4		
Nishiaizu	885	476	9	53.8	135	175	145	21	16	3.4
					28.4	36.8	30.5	4.4		
Tadami	642	391	7	60.9	119	147	112	13	5	1.3
					30.4	37.6	28.6	3.3		
Inawashiro	2,383	1,504	40	63.1	456	560	420	68	50	3.3
					30.3	37.2	27.9	4.5		
Bandai	555	355	9	64.0	105	143	98	9	13	3.7
					29.6	40.3	27.6	2.5		
Kitashiobara	502	318	7	63.3	98	129	79	12	9	2.8
					30.8	40.6	24.8	3.8		
Aizumisato	3,311	2,065	43	62.4	568	832	563	102	49	2.4
					27.5	40.3	27.3	4.9		
Aizubange	2,790	1,737	48	62.3	489	679	490	79	39	2.2
					28.2	39.1	28.2	4.5		
Yanaizu	538	342	4	63.6	103	129	96	14	3	0.9
					30.1	37.7	28.1	4.1		
Aizuwakamatsu	21,119	12,768	401	60.5	3,585	4,811	3,915	457	480	3.8
					28.1	37.7	30.7	3.6		
Yugawa	606	414	5	68.3	121	159	115	19	8	1.9
					29.2	38.4	27.8	4.6		
Subtotal	144,793	91,525	3,598	63.2	24,499	34,645	27,603	4,778	3,964	4.3
					26.8	37.9	30.2	5.2		
Total	336,669	217,916	12,507	64.7	62,701	81,666	63,581	9,968	14,048	6.4
					28.8	37.5	29.2	4.6		

Appendix 2

Thyroid ultrasound examination (TUE) coverage outside Fukushima by prefecture As of 30 November 2019

Prefecture	Number of medeical facilities	Participants *
Hokkaido	7	**355**
Aomori	2	**143**
Iwate	3	**306**
Miyagi	2	**2,546**
Akita	1	**184**
Yamagata	3	**594**
Ibaraki	4	**770**
Tochigi	8	**752**
Gunma	2	**234**
Saitama	3	**589**
Chiba	5	**547**
Tokyo	17	**2,143**
Kanagawa	6	**1,034**
Niigata	2	**591**
Toyama	2	**23**
Ishikawa	1	**43**

Prefecture	Number of medeical facilities	Participants *
Fukui	1	**23**
Yamanashi	2	**105**
Nagano	3	**139**
Gifu	1	**43**
Shizuoka	2	**112**
Aichi	4	**223**
Mie	1	**25**
Shiga	1	**22**
Kyoto	3	**99**
Osaka	7	**232**
Hyogo	2	**138**
Nara	2	**30**
Wakayama	1	**6**
Tottori	1	**10**
Shimane	1	**15**
Okayama	3	**60**

Prefecture	Number of medeical facilities	Participants *
Hiroshima	2	**33**
Yamaguchi	1	**22**
Tokushima	1	**9**
Kagawa	1	**17**
Ehime	1	**12**
Kochi	1	**14**
Fukuoka	3	**85**
Saga	1	**5**
Nagasaki	3	**27**
Kumamoto	1	**31**
Oita	1	**14**
Miyazaki	1	**29**
Kagoshima	1	**19**
Okinawa	1	**54**

Total	122	**12,507**

- The number of participants includes those who received examination at facilities outside Fukushima or by teams dispatched by Fukushima Medical University.
- The number of dispatches of FMU teams for examinations outside Fukushima was 1, to Kanagawa.

Appendix 3

Results of primary examination by municipality

As of 31 December 2019

	Participants	Confirmed results b	Number by exam results				Nodules		Cysts	
			Proportion (%)							
		Proportion (%)	A		B	C	Proportion (%)		Proportion (%)	
	a	b/a (%)	A1	A2			≥5.1 mm	≤5.0 mm	≥20.1 mm	≤20.0 mm
Municipalities surveyed in FY 2016										
Kawamata	1,409	1,409	490	910	9	0	9	7	0	915
		100.0	34.8	64.6	0.6	0.0	0.6	0.5	0.0	64.9
Namie	1,954	1,954	652	1,286	16	0	16	9	0	1,289
		100.0	33.4	65.8	0.8	0.0	0.8	0.5	0.0	66.0
Iitate	604	604	203	397	4	0	4	2	0	397
		100.0	33.6	65.7	0.7	0.0	0.7	0.3	0.0	65.7
Minami-soma	7,076	7,076	2,568	4,455	53	0	53	32	0	4,477
		100.0	36.3	63.0	0.7	0.0	0.7	0.5	0.0	63.3
Date	7,086	7,086	2,461	4,575	50	0	50	23	0	4,599
		100.0	34.7	64.6	0.7	0.0	0.7	0.3	0.0	64.9
Tamura	4,055	4,055	1,490	2,519	46	0	46	22	0	2,544
		100.0	36.7	62.1	1.1	0.0	1.1	0.5	0.0	62.7
Hirono	546	546	195	347	4	0	4	3	0	346
		100.0	35.7	63.6	0.7	0.0	0.7	0.5	0.0	63.4
Naraha	771	771	293	475	3	0	3	2	0	476
		100.0	38.0	61.6	0.4	0.0	0.4	0.3	0.0	61.7
Tomioka	1,477	1,477	511	953	13	0	13	3	0	960
		100.0	34.6	64.5	0.9	0.0	0.9	0.2	0.0	65.0
Kawauchi	171	171	41	129	1	0	1	0	0	130
		100.0	24.0	75.4	0.6	0.0	0.6	0.0	0.0	76.0
Okuma	1,343	1,343	461	871	11	0	11	6	0	873
		100.0	34.3	64.9	0.8	0.0	0.8	0.4	0.0	65.0
Futaba	464	464	173	289	2	0	2	0	0	290
		100.0	37.3	62.3	0.4	0.0	0.4	0.0	0.0	62.5
Katsurao	129	129	50	79	0	0	0	1	0	79
		100.0	38.8	61.2	0.0	0.0	0.0	0.8	0.0	61.2
Fukushima	34,105	34,104	11,993	21,918	193	0	193	106	0	22,016
		100.0	35.2	64.3	0.6	0.0	0.6	0.3	0.0	64.6
Nihonmatsu	6,347	6,347	2,266	4,036	45	0	45	22	0	4,060
		100.0	35.7	63.6	0.7	0.0	0.7	0.3	0.0	64.0
Motomiya	3,898	3,898	1,357	2,524	17	0	17	8	0	2,535
		100.0	34.8	64.8	0.4	0.0	0.4	0.2	0.0	65.0
Otama	1,051	1,051	374	671	6	0	6	3	0	675
		100.0	35.6	63.8	0.6	0.0	0.6	0.3	0.0	64.2
Koriyama	38,117	38,116	13,085	24,792	239	0	239	130	0	24,902
		100.0	34.3	65.0	0.6	0.0	0.6	0.3	0.0	65.3
Kori	1,355	1,354	493	851	10	0	10	4	0	858
		99.9	36.4	62.9	0.7	0.0	0.7	0.3	0.0	63.4
Kunimi	1,021	1,021	340	673	8	0	8	2	0	678
		100.0	33.3	65.9	0.8	0.0	0.8	0.2	0.0	66.4
Tenei	634	634	213	414	7	0	7	1	0	419
		100.0	33.6	65.3	1.1	0.0	1.1	0.2	0.0	66.1
Shirakawa	7,648	7,648	2,666	4,941	41	0	41	23	0	4,965
		100.0	34.9	64.6	0.5	0.0	0.5	0.3	0.0	64.9
Nishigo	2,562	2,562	829	1,719	14	0	14	8	0	1,725
		100.0	32.4	67.1	0.5	0.0	0.5	0.3	0.0	67.3
Izumizaki	800	799	272	525	2	0	2	5	0	525
		99.9	34.0	65.7	0.3	0.0	0.3	0.6	0.0	65.7
Miharu	1,768	1,767	564	1,192	11	0	11	8	0	1,193
		99.9	31.9	67.5	0.6	0.0	0.6	0.5	0.0	67.5
Subtotal	126,391	126,386	44,040	81,541	805	0	805	430	0	81,926
		100.0	34.8	64.5	0.6	0.0	0.6	0.3	0.0	64.8

	Participants	Confirmed results	Number by exam results				Nodules		Cysts	
			Proportion (%)							
			A		B	C	Proportion (%)		Proportion (%)	
	a	Proportion b/a (%)	A1	A2			≥5.1 mm	≤5.0 mm	≥20.1 mm	≤20.0 mm
Municipalities surveyed in FY 2017										
Iwaki	36,625	36,624	12,659	23,682	283	0	281	145	2	23,799
		100.0	34.6	64.7	0.8	0.0	0.8	0.4	0.0	65.0
Sukagawa	9,247	9,247	3,236	5,928	83	0	83	46	0	5,969
		100.0	35.0	64.1	0.9	0.0	0.9	0.5	0.0	64.6
Soma	3,822	3,822	1,536	2,253	33	0	33	21	0	2,270
		100.0	40.2	58.9	0.9	0.0	0.9	0.5	0.0	59.4
Kagamiishi	1,590	1,590	528	1,050	12	0	12	7	0	1,056
		100.0	33.2	66.0	0.8	0.0	0.8	0.4	0.0	66.4
Shinchi	849	849	307	535	7	0	7	4	0	537
		100.0	36.2	63.0	0.8	0.0	0.8	0.5	0.0	63.3
Nakajima	645	645	226	416	3	0	3	4	0	415
		100.0	35.0	64.5	0.5	0.0	0.5	0.6	0.0	64.3
Yabuki	1,962	1,962	683	1,271	8	0	8	4	0	1,274
		100.0	34.8	64.8	0.4	0.0	0.4	0.2	0.0	64.9
Ishikawa	1,609	1,609	639	962	8	0	8	4	0	965
		100.0	39.7	59.8	0.5	0.0	0.5	0.2	0.0	60.0
Yamatsuri	578	578	196	379	3	0	3	1	0	381
		100.0	33.9	65.6	0.5	0.0	0.5	0.2	0.0	65.9
Asakawa	820	820	292	519	9	0	9	3	0	525
		100.0	35.6	63.3	1.1	0.0	1.1	0.4	0.0	64.0
Hirata	691	691	271	415	5	0	5	2	0	416
		100.0	39.2	60.1	0.7	0.0	0.7	0.3	0.0	60.2
Tanagura	1,752	1,752	635	1,107	10	0	10	8	0	1,114
		100.0	36.2	63.2	0.6	0.0	0.6	0.5	0.0	63.6
Hanawa	889	889	322	558	9	0	9	5	0	561
		100.0	36.2	62.8	1.0	0.0	1.0	0.6	0.0	63.1
Samegawa	382	382	139	239	4	0	4	3	0	241
		100.0	36.4	62.6	1.0	0.0	1.0	0.8	0.0	63.1
Ono	1,031	1,031	309	714	8	0	8	3	0	718
		100.0	30.0	69.3	0.8	0.0	0.8	0.3	0.0	69.6
Tamakawa	798	798	283	512	3	0	3	6	0	513
		100.0	35.5	64.2	0.4	0.0	0.4	0.8	0.0	64.3
Furudono	623	623	238	382	3	0	3	2	0	383
		100.0	38.2	61.3	0.5	0.0	0.5	0.3	0.0	61.5
Hinoemata	47	47	21	26	0	0	0	0	0	26
		100.0	44.7	55.3	0.0	0.0	0.0	0.0	0.0	55.3
Minami-aizu	1,472	1,472	552	909	11	0	11	3	0	913
		100.0	37.5	61.8	0.7	0.0	0.7	0.2	0.0	62.0
Kaneyama	89	89	31	57	1	0	1	1	0	57
		100.0	34.8	64.0	1.1	0.0	1.1	1.1	0.0	64.0
Showa	74	74	34	38	2	0	2	0	0	39
		100.0	45.9	51.4	2.7	0.0	2.7	0.0	0.0	52.7
Mishima	107	107	28	78	1	0	1	1	0	79
		100.0	26.2	72.9	0.9	0.0	0.9	0.9	0.0	73.8
Shimogo	528	528	220	303	5	0	5	1	0	307
		100.0	41.7	57.4	0.9	0.0	0.9	0.2	0.0	58.1
Kitakata	4,925	4,925	1,761	3,128	36	0	36	27	0	3,139
		100.0	35.8	63.5	0.7	0.0	0.7	0.5	0.0	63.7
Nishiaizu	476	476	178	294	4	0	4	2	0	293
		100.0	37.4	61.8	0.8	0.0	0.8	0.4	0.0	61.6
Tadami	391	391	144	245	2	0	2	1	0	247
		100.0	36.8	62.7	0.5	0.0	0.5	0.3	0.0	63.2
Inawashiro	1,504	1,504	526	963	15	0	15	7	0	974
		100.0	35.0	64.0	1.0	0.0	1.0	0.5	0.0	64.8
Bandai	355	355	131	222	2	0	2	2	0	223
		100.0	36.9	62.5	0.6	0.0	0.6	0.6	0.0	62.8
Kitashiobara	318	318	107	209	2	0	2	1	0	209
		100.0	33.6	65.7	0.6	0.0	0.6	0.3	0.0	65.7
Aizumisato	2,065	2,063	769	1,279	15	0	15	12	0	1,285
		99.9	37.3	62.0	0.7	0.0	0.7	0.6	0.0	62.3
Aizubange	1,737	1,737	586	1,137	14	0	14	17	0	1,140
		100.0	33.7	65.5	0.8	0.0	0.8	1.0	0.0	65.6
Yanaizu	342	342	123	219	0	0	0	0	0	219
		100.0	36.0	64.0	0.0	0.0	0.0	0.0	0.0	64.0
Aizuwakamatsu	12,768	12,768	4,526	8,150	92	0	91	54	1	8,191
		100.0	35.4	63.8	0.7	0.0	0.7	0.4	0.0	64.2
Yugawa	414	414	151	260	3	0	3	2	0	262
		100.0	36.5	62.8	0.7	0.0	0.7	0.5	0.0	63.3
Subtotal	91,525	91,522	32,387	58,439	696	0	693	399	3	58,740
		100.0	35.4	63.9	0.8	0.0	0.8	0.4	0.0	64.2
Total	217,916	217,908	76,427	139,980	1,501	0	1,498	829	3	140,666
		100.0	35.1	64.2	0.7	0.0	0.7	0.4	0.0	64.6

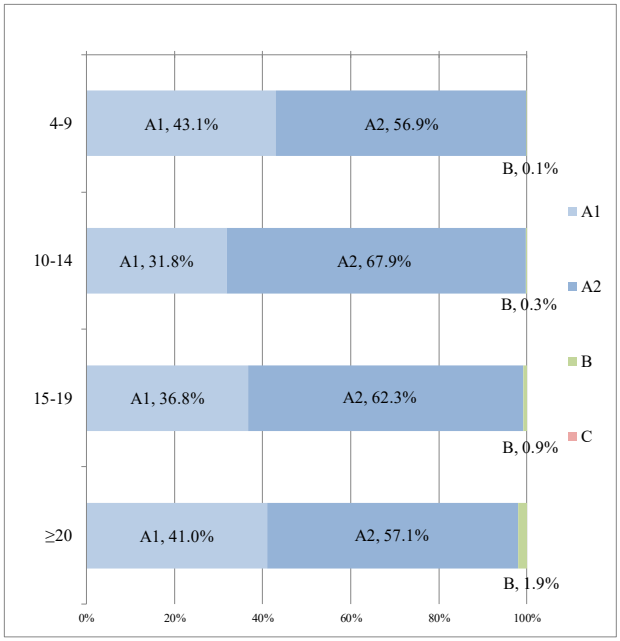
Appendix 4

1 Thyroid ultrasound examination results by age and sex

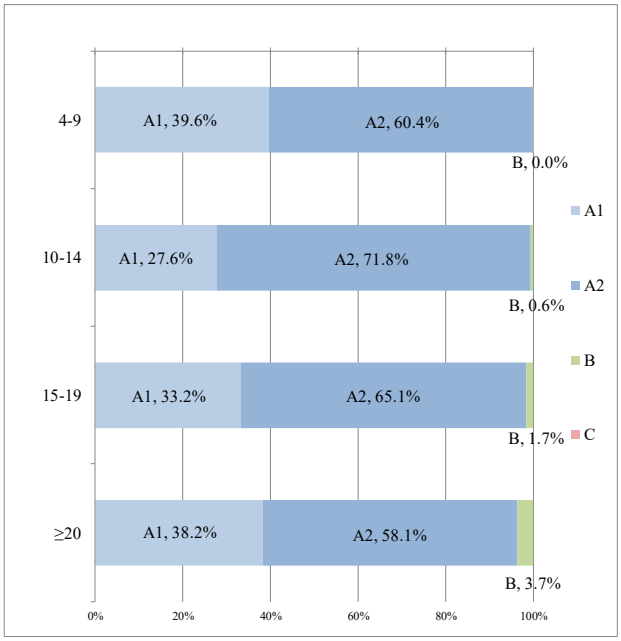
As of 31 December 2019

Class/ Sex / Age	A						B			C			Total		
	A1			A2											
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
4-9	13,887	12,064	25,951	18,338	18,383	36,721	17	12	29	0	0	0	32,242	30,459	62,701
10-14	13,268	11,055	24,323	28,284	28,707	56,991	110	242	352	0	0	0	41,662	40,004	81,666
15-19	11,697	10,532	22,229	19,838	20,687	40,525	286	541	827	0	0	0	31,821	31,760	63,581
≥20	1,774	2,150	3,924	2,470	3,273	5,743	83	210	293	0	0	0	4,327	5,633	9,960
Total	40,626	35,801	76,427	68,930	71,050	139,980	496	1,005	1,501	0	0	0	110,052	107,856	217,908

Results by age group (Male)



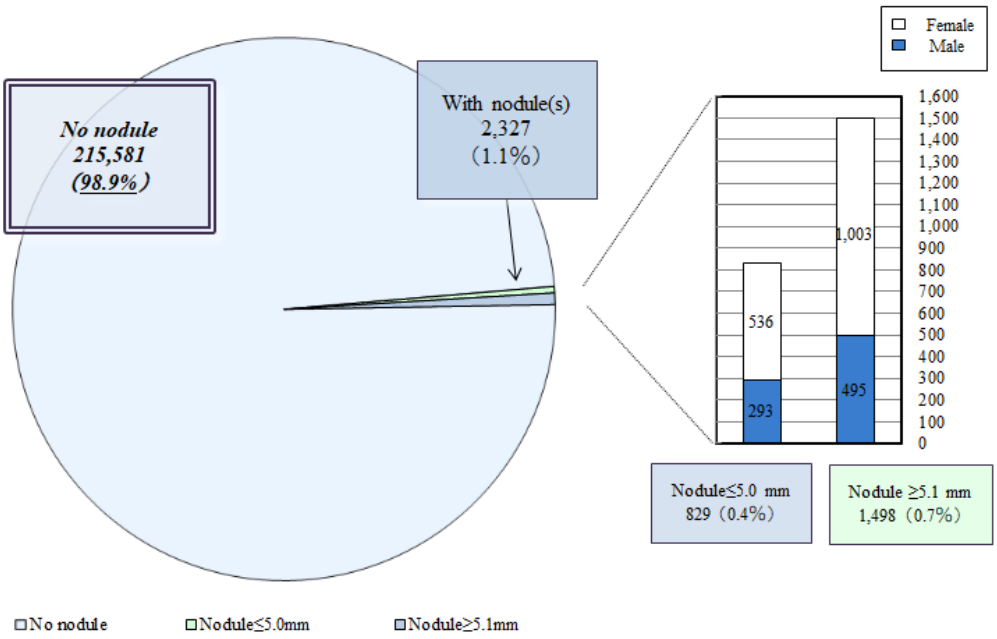
Results by age group (Female)

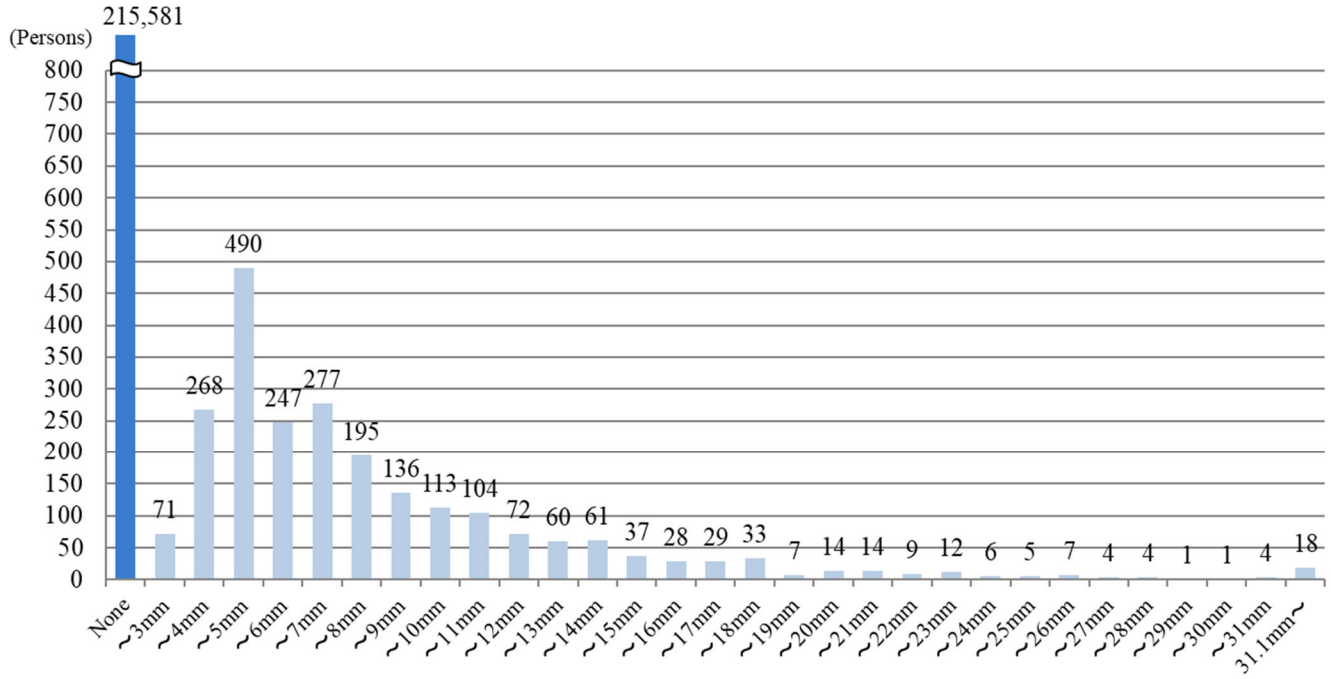


2 Nodule characteristics

As of 31 December 2019

Nodule size	Total	Male	Female	Class	Proportion
None	215,581	109,264	106,317	A1	98.9%
≤ 3.0 mm	71	34	37	A2	0.4%
3.1-5.0 mm	758	259	499		
5.1-10.0 mm	968	329	639	B	0.7%
10.1-15.0 mm	334	111	223		
15.1-20.0 mm	111	27	84		
20.1-25.0 mm	46	17	29		
≥ 25.1 mm	39	11	28		
Total	217,908	110,052	107,856		

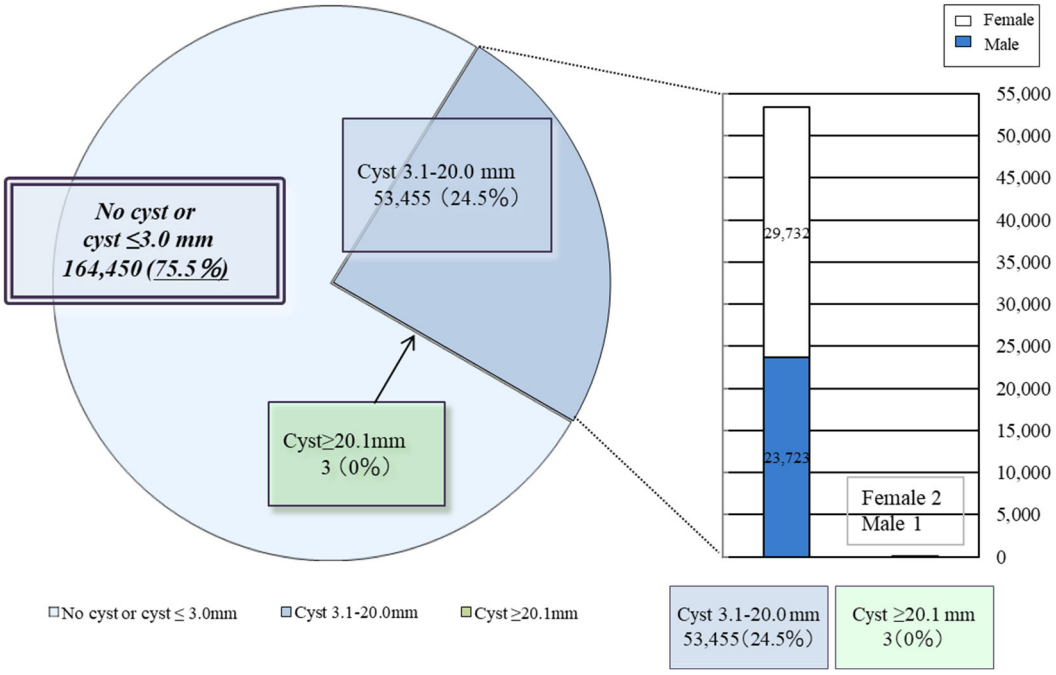


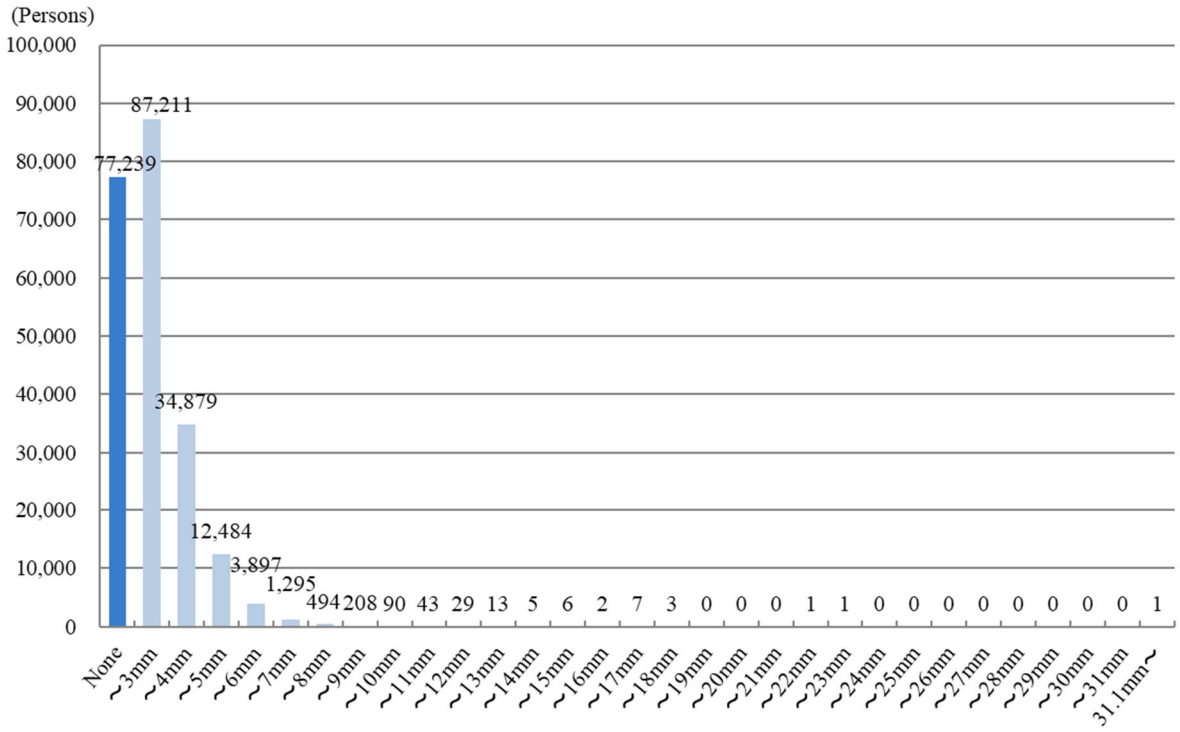


3 Cyst characteristics

As of 31 December 2019

Cyst size	Total	Male	Female	Class	Proportion
None	77,239	40,914	36,325	A1	75.5%
≤ 3.0 mm	87,211	45,414	41,797	A2	24.5%
3.1-5.0 mm	47,363	21,602	25,761		
5.1-10.0 mm	5,984	2,091	3,893		
10.1-15.0 mm	96	25	71		
15.1-20.0 mm	12	5	7		
20.1-25.0 mm	2	0	2	B	0.001%
≥ 25.1 mm	1	1	0		
Total	217,908	110,052	107,856		





Appendix 5

Results of confirmatory examination by area

As of 31 December 2019

Area	Participants	Participants who required confirmatory exam	Number of those who underwent confirmatory exam					Number of confirmed results				
			Total	Ages 4-9	Ages 10-14	Ages 15-19	≥ 20	Total	A1	A2	Not A1 or A2	
												FNAC
	a	b Proportion (%) b/a	c Proportion (%) c/b	d Proportion (%) d/c	e Proportion (%) e/c	f Proportion (%) f/c	g Proportion (%) g/c	h Proportion (%) h/c	i Proportion (%) i/h	j Proportion (%) j/h	k Proportion (%) k/h	l Proportion (%) l/k
13 municipalities [1]	27,085	212	161	1	36	95	29	154	0	19	135	14
		0.8	75.9	0.6	22.4	59.0	18.0	95.7	0.0	12.3	87.7	10.4
Nakadori [2]	121,923	761	566	14	111	317	124	543	5	45	493	33
		0.6	74.4	2.5	19.6	56.0	21.9	95.9	0.9	8.3	90.8	6.7
Hamadori [3]	41,296	323	231	2	53	115	61	224	2	23	199	21
		0.8	71.5	0.9	22.9	49.8	26.4	97.0	0.9	10.3	88.8	10.6
Aizu [4]	27,612	205	143	4	25	74	40	137	2	12	123	9
		0.7	69.8	2.8	17.5	51.7	28.0	95.8	1.5	8.8	89.8	7.3
Total	217,916	1,501	1,101	21	225	601	254	1,058	9	99	950	77
		0.7	73.4	1.9	20.4	54.6	23.1	96.1	0.9	9.4	89.8	8.1

1) Tamura, Minami-soma, Date, Kawamata, Hirono, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, Katsurao, Iitate
2) Fukushima, Koriyama, Shirakawa, Sukagawa, Nihonmatsu, Motomiya, Kori, Kunimi, Otama, Kagamiishi, Tenei, Nishigo, Izumizaki, Nakajima, Yabuki, Tanagura, Yamatsuri, Hanawa, Samegawa, Ishikawa, Tamakawa, Hirata, Asakawa, Furudono, Miharu, Ono
3) Iwaki, Soma, Shinchi
4) Aizuwakamatsu, Kitakata, Shimogo, Hinoemata, Tadami, Minami-aizu, Kitashiobara, Nishiaizu, Bandai, Inawashiro, Aizubange, Yugawa, Yanaizu, Mishima, Kaneyama, Showa, Aizumisato

Appendix 6

Surgical cases for malignancy or suspicion of malignancy

1. Municipalities surveyed in FY 2016	
・Malignant or suspicious for malignancy:	12 (11 surgical cases: 11 papillary thyroid carcinomas)
2. Municipalities surveyed in FY 2017	
・Malignant or suspicious for malignancy:	18 (15 surgical case: 15 papillary thyroid carcinomas)
3. Total	
・Malignant or suspicious for malignancy:	30 (26 surgical cases: 26 papillary thyroid carcinomas)

Report on the Fourth-Round Thyroid Survey
(Third Full-Scale Thyroid Survey)

1. Summary

1.1 Purpose

In order to monitor the long-term health of children, we are now engaged in the third Full-Scale Thyroid Survey (the Fourth-Round Survey), following the Preliminary Baseline Survey for background assessment of thyroid glands, and two Full-Scale Thyroid Surveys (the Second- and Third-Round Surveys) to continuously confirm the status of thyroid glands.

1.2 Survey Population

All the Fukushima residents approximately 18 years old or younger at the time of earthquake (born between 2 April 1992 and 1 April 2012).

1.3 Implementation Period

From April 2018 (schedule of FY 2018 and FY 2019):

1.3-1 For those 18 years old or younger

The examination will be carried out for each municipality in FY 2018 and FY 2019.

1.3-2 19 years old or older

The examination will be carried out for each age (school grade).
FY 2018: those who were born in FY 1996 and FY 1998
FY 2019: those who were born in FY 1997 and FY 1999

1.3-3 For those 25 years old

For those who are older than 20, examination will be carried out with 5-year interval.
FY 2018: those who were born in FY 1993
FY 2019: those who were born in FY 1994
The results of these examinations will be reported separately.

1.4 Responsible Organizations

Fukushima Prefecture commissioned Fukushima Medical University (FMU) to conduct the survey in cooperation with organizations inside and outside Fukushima for the convenience for examination participants (the number of contracts is as of 31 December 2019).

1.4-1 The primary examination

Inside Fukushima Prefecture	83 medical facilities
Outside Fukushima Prefecture	122 medical facilities

1.4-2 The confirmatory examination

Inside Fukushima Prefecture	5 medical facilities including FMU
Outside Fukushima Prefecture	37 medical facilities

1.5 Method

1.5-1 The primary examination

We use ultrasonography for examination of the thyroid gland.

Assessments are made by specialists on the basis of the following criteria:

-Diagnostic Criteria (A)

A1: No nodules / cysts

A2: Nodules ≤5.0 mm or cysts ≤20.0 mm

-Diagnostic Criteria (B)

B: Nodules ≥5.1 mm or cysts ≥20.1 mm

Some A2 test results may be re-classified as B results when clinically indicated.

-Diagnostic Criteria (C)

C: Immediate need for confirmatory examination, judging from the condition of the thyroid gland.

1.5-2 The confirmatory examination

We conduct ultrasonography, blood test, urine test, and fine needle aspiration cytology (FNAC) if needed for those with B or C test results. Priority is given to those in urgent clinical need.

We recommend medical follow-up for those requiring it due to confirmatory exam results.

1.5-3 Flow chart

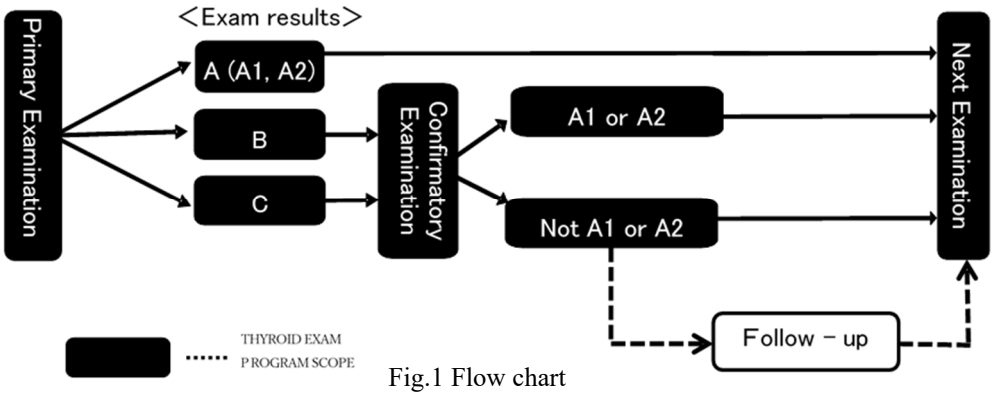


Fig.1 Flow chart

1.6 Municipalities Surveyed

The municipalities where examinations (for those 18 years old or younger) were carried out in FY 2018 and FY 2019 are as follows:

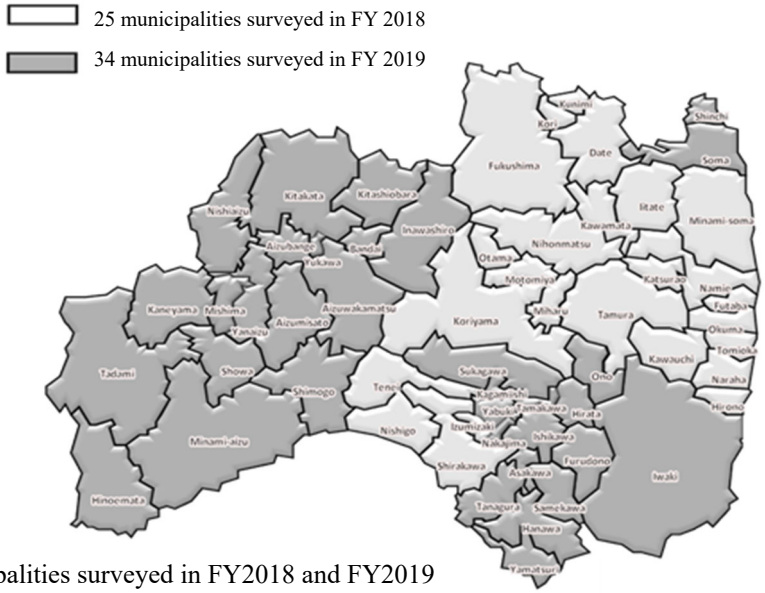


Fig.2 Municipalities surveyed in FY2018 and FY2019

2. Results as of 31 December 2019

2.1 Results of the Primary Examination

2.1-1 Progress report

The examination was carried out for 163,453 (55.6%) participants by 31 December 2019 (Implementation status for each municipality and prefectures other than Fukushima are shown in Appendix 1 and Appendix 2). Results of 148,993 participants (91.2%) have been confirmed and notifications were sent to them accordingly. (The result for each municipality is shown in Appendix 3).

Of these, 50,764 were classified as A1 (34.1%), 97,145 as A2 (65.2%), 1,084 (0.7%) as B, and none as C.

Table 1 Progress and results of the primary examination

	Survey population	Participants			Exam results					
		Proportion (%)		Outside Fukushima	Proportion (%)	Class (%)				
						A			Requiring confirmatory exam	
	a	b	(b/a)		c (c/b)	A1 d (d/c)		A2 e (e/c)	B f (f/c)	C g (g/c)
FY 2018	168,029	105,484	(62.8)	6,731	104,214 (98.8)	35,617	(34.2)	67,951 (65.2)	646 (0.6)	0 (0.0)
FY 2019	126,184	57,969	(45.9)	2,519	44,779 (77.2)	15,147	(33.8)	29,194 (65.2)	438 (1.0)	0 (0.0)
Total	294,213	163,453	(55.6)	9,250	148,993 (91.2)	50,764	(34.1)	97,145 (65.2)	1,084 (0.7)	0 (0.0)

Table 2. Number and proportion of participants with nodules/cysts

	Number of participants with confirmed results	Number and proportion of participants with nodules/cysts			
		Nodules		Cysts	
	a	≥5.1 mm b (b/a)	≤5.0 mm c (c/a)	≥20.1 mm d (d/a)	≤20.0 mm e (e/a)
FY 2018	104,214	643 (0.6)	345 (0.3)	3 (0.0)	68,278 (65.5)
FY 2019	44,779	438 (1.0)	191 (0.4)	0 (0.0)	29,425 (65.7)
Total	148,993	1,081 (0.7)	536 (0.4)	3 (0.0)	97,703 (65.6)

- Proportions are rounded at a lower decimal place. This applies to other tables as well.
- Those who receive the examination at 5-year intervals (those born between FY1992 and FY1995) are excluded. The results of examinations with 5-year intervals will be shown separately.
- The examination for those born in FY 1992 (approx. 23,000) and FY 1993 (approx. 22,000) took place in FY 2017 and FY 2018, respectively. Those born in FY 1994 (approx. 22,000) and FY 1995 (approx. 21,000) will be covered in FY 2019 and FY 2020 surveys, respectively.

2.1-2 Participation rates by age group

The participation rate for each age group as of 1 April of each year is shown in Table 3.

Table 3 Participation rates by age group

		Total	Age group (years)		
FY 2018	Age group (years)		6-11	12-17	18-24
	Survey population (a)	168,029	56,935	64,829	46,265
	Participants (b)	105,484	48,400	52,076	5,008
	Proportion (%) (b/a)	62.8	85.0	80.3	10.8
FY 2019	Age group (years)		7-11	12-17	18-24
	Survey population (a)	126,184	34,181	47,276	44,727
	Participants (b)	57,969	20,700	31,980	5,289
	Proportion (%) (b/a)	45.9	60.6	67.6	11.8
Total	Survey population (a)	294,213	91,116	112,105	90,992
	Participants (b)	163,453	69,100	84,056	10,297
	Proportion (%) (b/a)	55.6	75.8	75.0	11.3

・ Age groups are formed with the age as of 1 April of each fiscal year.

2.1-3 Comparison of Full-scale Thyroid Surveys

Comparison of Fourth- and Third-Round Survey results is shown in Table 4. Among 132,979 participants who were diagnosed as A1 or A2 in the Third-Round Survey, 132,457 (99.6%) had A1 or A2 results, and 522 (0.4%) were diagnosed as B in the Fourth-Round Survey. Among 582 participants who were diagnosed as B in the Third-Round Survey, 108 (18.6%) had A1 or A2 results, and 474 (81.4%) were diagnosed as B in the Fourth-Round Survey.

Table 4 Comparison of Full-scale Thyroid Survey

			Results of the Third-round Survey*1 (%) a	Results of the Fourth-Round Survey *2			
				A		B	C
				A1 b b/a (%)	A2 c c/a (%)	d d/a (%)	e e/a (%)
Results of the Third-round Survey	A	A1	45,941 (100.0)	35,000 (76.2)	10,869 (23.7)	72 (0.2)	0 (0.0)
		A2	87,038 (100.0)	9,380 (10.8)	77,208 (88.7)	450 (0.5)	0 (0.0)
	B		582 (100.0)	7 (1.2)	101 (17.4)	474 (81.4)	0 (0.0)
	C		0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
	No participation		15,432 (100.0)	6,377 (41.3)	8,967 (58.1)	88 (0.6)	0 (0.0)
Total			148,993 (100.0)	50,764 (34.1)	97,145 (65.2)	1,084 (0.7)	0 (0.0)

*1 Upper figures show a previous (Third-Round) diagnosis for the participants in this (Fourth-Round) survey whose results have been confirmed. They are not the breakdown of the total number of the previous-round participants (217,908).

*2 Upper figures show the breakdown of the Fourth-Round Survey participants who were diagnosed for each diagnostic class in the Third-Round Survey. Lower figures are their proportion (%).

2.2 Results of the Confirmatory Examination

2.2-1 Progress Report

By 31 December 2019, 604 of 1,084 people (55.7%) have received the examination. Of those, 503 (83.3%)

have completed.

Of the foregoing 503 participants, 43 (A1: 2, A2: 36) (8.5%) was confirmed to meet A1 or A2 diagnostic criteria by the Primary Examination standards (including those with other thyroid conditions). Remaining 460 (91.5%) people were confirmed to be outside of A1/A2 criteria.

Table 5 Progress and results of the confirmatory examination

	Number of those requiring confirmatory exam	Participants	Confirmatory exam coverage (%)	Confirmed exam results			
		Proportion (%)		A1	A2	Not A1 or A2	
							FNAC
	a	b (b/a)	c (c/b)	d (d/c)	e (e/c)	f (f/c)	g (g/f)
FY 2018	646	428 (66.3)	394 (92.1)	2 (0.5)	34 (8.6)	358 (90.9)	30 (8.4)
FY 2019	438	176 (40.2)	109 (61.9)	0 (0.0)	7 (6.4)	102 (93.6)	4 (3.9)
Total	1,084	604 (55.7)	503 (83.3)	2 (0.4)	41 (8.2)	460 (91.5)	34 (7.4)

2.2-2 Results of fine needle aspiration cytology (FNAC)

Among those who underwent FNAC, 16 had nodules classified as malignant or suspicious for malignancy. 8 of them were male, and 8 were female. Participants' age at the time of the confirmatory examination ranged from 11 to 20 years (mean age: 16.1 ± 2.6 years). The minimum and maximum tumor diameters were 6.1 mm and 29.4 mm. Mean tumor diameter was 11.5 ± 5.7 mm.

13 of these 16 participants had A (A1: 3, A2: 10) and 3 had B in the Full-Scale Examination (Third-Round Examination).

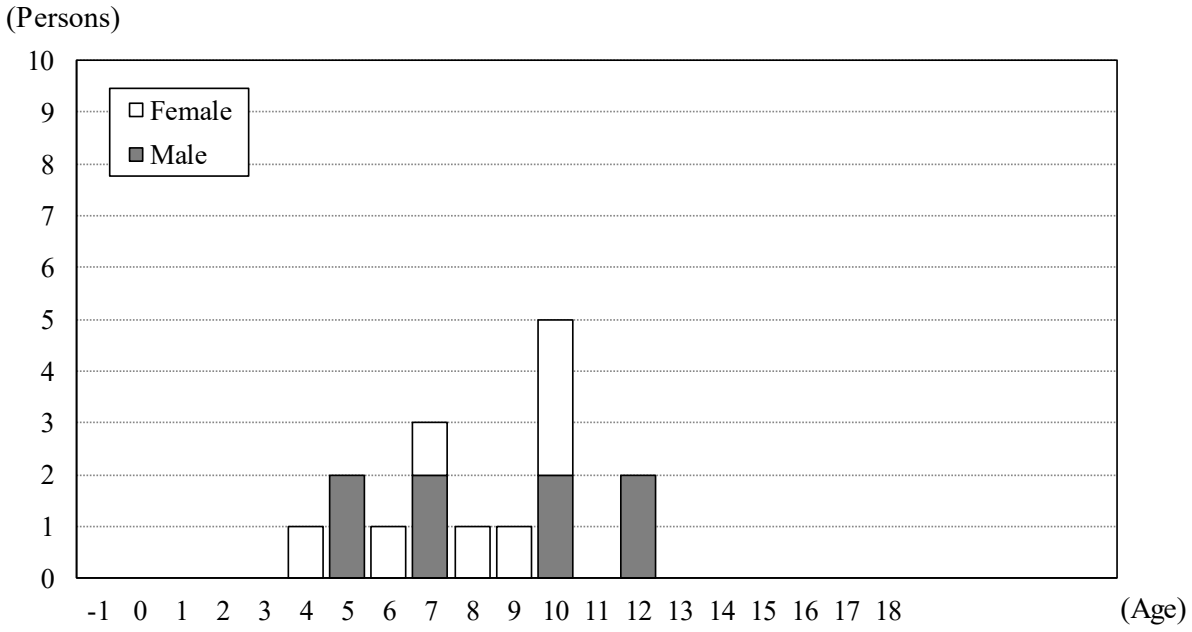
Table 6. Results of FNAC

A. Municipalities surveyed in FY 2018	
・Malignant or suspicious for malignancy：	15*)
・Male to female ratio：	7:8
B. Municipalities surveyed in FY 2019	
・Malignant or suspicious for malignancy：	1*)
・Male to female ratio：	1:0
C. Total	
・Malignant or suspicious for malignancy：	16*)
・Male to female ratio：	8:8
・Mean age (SD, min-max):	16.1 (2.6, 11-20), 8.3 (2.5, 4-12) at the time of disaster
・Mean tumor size:	11.5 mm (5.7 mm, 6.1-29.4 mm)

*) Surgical cases are as shown in Appendix 6.

2.2-3 Age distribution of malignant or suspicious-for-malignancy cases diagnosed by FNAC

Age distributions of 16 people with nodules classified as malignant or suspicious with their age as of 11 March 2011 is as Fig. 3, with their age as of confirmatory examination is as Fig. 4.



Note: Those who were 15 and 18 at the time of the disaster were not included in the Fourth-Round Survey participants.

The horizontal axis begins at -1 to include residents of Fukushima Prefecture born between 2 April 2011 and 1 April 2012

Fig.3 Age as of 11 March 2011

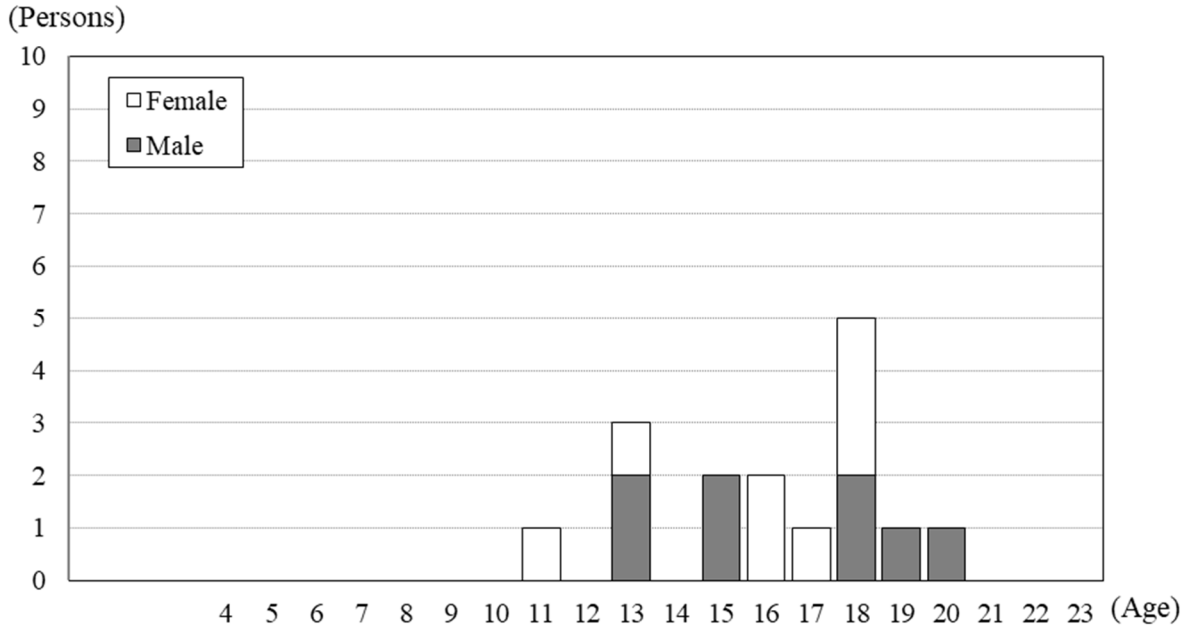


Fig. 4 Age as of the date of confirmatory examination

2.2-4 Basic Survey results of those with nodules diagnosed as malignant or suspicious for malignancy by FNAC

11 (68.8%) of the 16 people who were diagnosed as malignant or suspicious cases by FNAC had participated in the Basic Survey (for external radiation dose estimation), and 11 received the results. The highest effective dose documented was 2.4 mSv.

Table 7. A breakdown of dose estimates for participants of the Basic Survey

Effective dose (mSv)	Age at the time of the disaster									
	0-5		6-10		11-15		16-18		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<1	0	0	1	1	0	0	0	0	1	1
1-1.9	0	0	2	1	1	0	0	0	3	1
2-4.9	2	0	0	2	1	0	0	0	3	2
5-9.9	0	0	0	0	0	0	0	0	0	0
10-19.9	0	0	0	0	0	0	0	0	0	0
≥20	0	0	0	0	0	0	0	0	0	0
Total	2	0	3	4	2	0	0	0	7	4

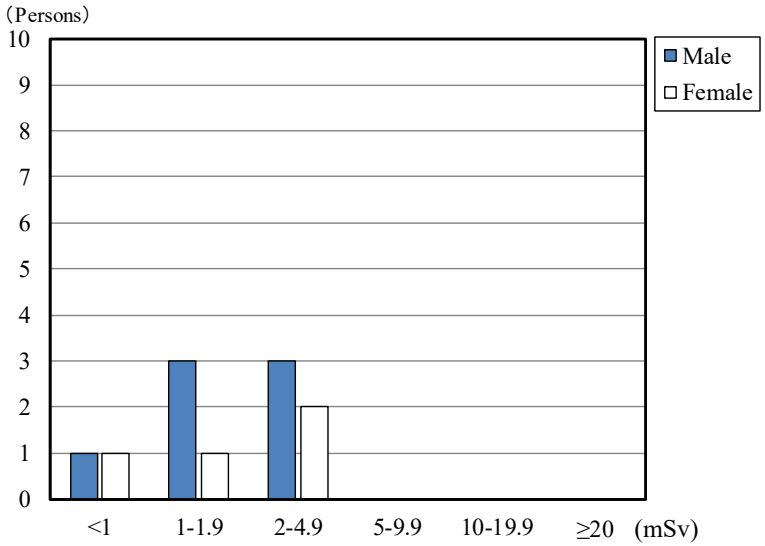


Fig. 5 Effective dose of the participants

2.2-5 Blood and urinary iodine test results

Table 8. Blood test results Mean±SD (Abnormal value)

	FT4 [1] (ng/dL)	FT3 [2] (pg/mL)	TSH [3] (μIU/mL)	Tg [4] (ng/mL)	TgAb [5] (IU/mL)	TPOAb [6] (IU/mL)
Reference Range	0.95～1.74 [7]	2.13～4.07 [7]	0.340～3.880 [7]	≤33.7	<28.0	<16.0
16 malignant or suspicious	1.3 ± 0.1 (0.0%)	3.5 ± 0.5 (0.0%)	1.3 ± 0.5 (0.0%)	29.6± 67.6 (12.5%)	43.8%	37.5%
Other 461	1.2 ± 0.3 (5.0%)	3.6 ± 0.9 (7.4%)	1.2 ± 0.9 (8.2%)	23.7± 57.4 (13.7%)	5.0%	6.3%

1) FT4: free thyroxine; thyroid hormone binding 4 iodines; higher among patients with thyrotoxicosis (such as Graves' disease) and lower with hypothyroidism (such as Hashimoto's thyroiditis).
2) FT3: free triiodothyronine; thyroid hormone binding 3 iodines; higher among patients with thyrotoxicosis (such as Graves' disease) and lower with hypothyroidism (such as Hashimoto's thyroiditis).
3) TSH: thyroid-stimulating hormone; higher among patients with Hashimoto's disease and lower with Graves' disease.
4) Tg: thyroglobulin; higher when thyroid tissue is destroyed or when neoplastic tissue produces thyroglobulin.
5) TgAb: anti-thyroglobulin antibody; higher among patients with Hashimoto's disease and Graves' disease.
6) TPOAb: anti-thyroid peroxidase antibody; higher among patients with Hashimoto's disease or Graves' disease.
7) Reference interval varies according to age.

Table 9 Urinary iodine test results (μg/day)

	Minimum	25th percentile	Median	75th percentile	Maximum
16 malignant or suspicious	54	132	211	487	1780
Other 455	32	122	204	335	17200

2.2-6 Confirmatory Examination results by area

The proportions of participants with nodules diagnosed as malignant or suspicious for malignancy were 0.01% in 13 municipalities in the nationally-designated evacuation zones and Nakadori, and 0.00% in Hamadori and Aizu.

Table 10 Confirmatory examination results by area

Area	Number of Participants a	Participants who required confirmatory exam b	Proportion who required confirmatory exam (%) b/a	Number who underwent confirmatory exam	Malignant or uspicious cases c	Proportion of malignant or suspicious cases (%) c/a
13 municipalities [1]	21,051	130	0.6	94	2	0.01
Nakadori [2]	102,825	658	0.6	408	14	0.01
Hamadori [3]	17,021	151	0.9	55	0	0.00
Aizu [4]	22,556	145	0.6	47	0	0.00
Total	163,453	1,084	0.7	604	16	0.01

1) Tamura, Minami-soma, Date, Kawamata, Hirono, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, Katsurao, Iitate
2) Fukushima, Koriyama, Shirakawa, Sukagawa, Nihonmatsu, Motomiya, Kori, Kunimi, Otama, Kagamiishi, Tenei, Nishigo, Izumizaki, Nakajima, Yabuki, Tanagura, Yamatsuri, Hanawa, Samegawa, Ishikawa, Tamakawa, Hirata, Asakawa, Furudono, Miharu, Ono
3) Iwaki, Soma, Shinchi
4) Aizuwakamatsu, Kitakata, Shimogo, Hinoemata, Tadami, Minami-aizu, Kitashiobara, Nishiaizu, Bandai, Inawashiro, Aizubange, Yugawa, Yanaizu, Mishima, Kaneyama, Showa, Aizumisato

3. Mental Health Care

We provide the following support.

3.1 Support for the Primary Examination Participants

After the examination, medical doctors explain the results showing the ultrasound image in private consultation booths at the venue. As of 31 December 2019, 2,556 (100%) of 2,557 participants visited the consultation booths.

3.2 Briefing Sessions

To help participants or their parents improve their understanding of the thyroid examination, briefing sessions were carried out. Since April 2018, 941 people in 30 venues participated in the briefing sessions as of 31 December 2019. The cumulative total of participants is 14,964.

3.3 Support for the Confirmatory Examination Participants

We have set up a support team for participants of the confirmatory examination within Fukushima Medical University to address their anxiety and concerns, as well as online support for Q&A and counseling.

Since the start of Fourth-Round Survey, 371 participants (123 males and 248 females) have received support as of 31 December 2019. The number of supports provided was 714 in total. Of these, 371 (52.0%) received support at their first examination and 343 (48.0%) at subsequent examination.

For those who proceeded to regular insured medical care, we continue to provide support in cooperation with teams of medical staff at hospitals.

Appendix 1

Thyroid ultrasound examination (TUE) coverage by municipality — As of 31 December 2019

	Survey population	Participants		Proportion (%)	Number and proportion[*2] of participants by age group			Participants living outside Fukushima	Proportion (%)
	a	b	Outside Fukushima[*1]	b/a	6-11	12-17	18-24	c[*3]	c/b
Municipalities surveyed in FY 2018									
Kawamata	1,832	1,131	25	61.7	472 41.7	576 50.9	83 7.3	39	3.4
Namie	2,858	1,323	294	46.3	500 37.8	631 47.7	192 14.5	345	26.1
Iitate	852	537	18	63.0	219 40.8	278 51.8	40 7.4	25	4.7
Minami-soma	10,202	5,846	805	57.3	2,440 41.7	2,918 49.9	488 8.3	867	14.8
Date	8,781	5,877	174	66.9	2,330 39.6	3,037 51.7	510 8.7	176	3.0
Tamura	5,435	3,395	65	62.5	1,506 44.4	1,634 48.1	255 7.5	77	2.3
Hirono	801	361	32	45.1	141 39.1	174 48.2	46 12.7	26	7.2
Naraha	1,094	372	47	34.0	116 31.2	181 48.7	75 20.2	53	14.2
Tomioka	2,340	864	183	36.9	281 32.5	422 48.8	161 18.6	200	23.1
Kawauchi	267	138	9	51.7	47 34.1	82 59.4	9 6.5	10	7.2
Okuma	2,020	833	200	41.2	301 36.1	399 47.9	133 16.0	207	24.8
Futaba	978	271	58	27.7	104 38.4	134 49.4	33 12.2	59	21.8
Katsurao	174	103	3	59.2	36 35.0	55 53.4	12 11.7	3	2.9
Fukushima	43,240	28,701	1,718	66.4	11,717 40.8	14,303 49.8	2,681 9.3	1,722	6.0
Nihonmatsu	8,104	5,431	190	67.0	2,271 41.8	2,769 51.0	391 7.2	179	3.3
Motomiya	4,910	3,181	92	64.8	1,398 43.9	1,561 49.1	222 7.0	90	2.8
Otama	1,287	914	24	71.0	416 45.5	440 48.1	58 6.3	17	1.9
Koriyama	52,559	32,966	2,367	62.7	13,395 40.6	16,602 50.4	2,969 9.0	2,343	7.1
Kori	1,609	1,125	30	69.9	465 41.3	545 48.4	115 10.2	26	2.3
Kunimi	1,204	802	17	66.6	294 36.7	430 53.6	78 9.7	18	2.2
Tenei	839	523	7	62.3	224 42.8	262 50.1	37 7.1	8	1.5
Shirakawa	9,972	6,438	245	64.6	2,606 40.5	3,273 50.8	559 8.7	248	3.9
Nishigo	3,263	2,189	91	67.1	915 41.8	1,075 49.1	199 9.1	96	4.4
Izumizaki	1,025	662	4	64.6	275 41.5	335 50.6	52 7.9	4	0.6
Miharu	2,383	1,501	33	63.0	561 37.4	775 51.6	165 11.0	27	1.8
Subtotal	168,029	105,484	6,731	62.8	43,030 40.8	52,891 50.1	9,563 9.1	6,865	6.5

*1) The number of participants who received the examination at facilities outside Fukushima (as of 30 November 2019)
*2) The upper layer shows number of participants, and the lower layer shows the proportion of participants from each municipality.
*3) The number of participants who have resident registration outside of Fukushima.
・ Age groups were formed based on the age at the Full-Scale Survey (the Fourth-Round Survey). This applies to other tables hereafter.

	Survey population	Participants		Proportion (%)	Number and proportion[*2] of participants by age group			Participants living outside Fukushima	Proportion (%)
			Outside Fukushima[*1]		6-11	12-17	18-24		
	a	b		b/a				c[*3]	c/b
Municipalities surveyed in FY 2019									
Iwaki	49,618	13,232	1,413	26.7	1,783 13.5	7,519 56.8	3,930 29.7	1,323	10.0
Sukagawa	12,378	7,428	197	60.0	2,746 37.0	3,873 52.1	809 10.9	179	2.4
Soma	5,507	3,133	194	56.9	1,253 40.0	1,619 51.7	261 8.3	215	6.9
Kagamiishi	2,133	1,303	29	61.1	489 37.5	692 53.1	122 9.4	28	2.1
Shinchi	1,162	656	31	56.5	230 35.1	364 55.5	62 9.5	27	4.1
Nakajima	849	498	7	58.7	191 38.4	261 52.4	46 9.2	4	0.8
Yabuki	2,672	1,675	26	62.7	726 43.3	832 49.7	117 7.0	27	1.6
Ishikawa	2,182	1,333	22	61.1	537 40.3	675 50.6	121 9.1	21	1.6
Yamatsuri	816	463	9	56.7	212 45.8	230 49.7	21 4.5	8	1.7
Asakawa	1,064	641	14	60.2	237 37.0	351 54.8	53 8.3	16	2.5
Hirata	969	597	7	61.6	244 40.9	302 50.6	51 8.5	6	1.0
Tanagura	2,399	1,444	27	60.2	586 40.6	772 53.5	86 6.0	26	1.8
Hanawa	1,299	696	12	53.6	288 41.4	367 52.7	41 5.9	17	2.4
Samegawa	519	299	3	57.6	136 45.5	153 51.2	10 3.3	3	1.0
Ono	1,488	855	9	57.5	349 40.8	435 50.9	71 8.3	11	1.3
Tamakawa	1,052	654	4	62.2	253 38.7	354 54.1	47 7.2	3	0.5
Furudono	817	506	17	61.9	205 40.5	245 48.4	56 11.1	12	2.4
Hinoemata	87	36	1	41.4	16 44.4	16 44.4	4 11.1	0	0.0
Minami-aizu	2,128	1,147	14	53.9	477 41.6	599 52.2	71 6.2	11	1.0
Kaneyama	147	71	0	48.3	21 29.6	41 57.7	9 12.7	0	0.0
Showa	115	68	3	59.1	31 45.6	33 48.5	4 5.9	3	4.4
Mishima	148	84	0	56.8	29 34.5	50 59.5	5 6.0	1	1.2
Shimogo	747	426	4	57.0	179 42.0	222 52.1	25 5.9	4	0.9
Kitakata	6,948	4,017	50	57.8	1,476 36.7	2,210 55.0	331 8.2	49	1.2
Nishiaizu	761	405	9	53.2	169 41.7	190 46.9	46 11.4	8	2.0
Tadami	555	334	5	60.2	138 41.3	170 50.9	26 7.8	1	0.3
Inawashiro	2,070	1,168	23	56.4	504 43.2	580 49.7	84 7.2	24	2.1
Bandai	477	286	7	60.0	109 38.1	157 54.9	20 7.0	5	1.7
Kitashiobara	445	272	2	61.1	115 42.3	145 53.3	12 4.4	2	0.7
Aizumisato	2,823	1,709	28	60.5	629 36.8	896 52.4	184 10.8	24	1.4
Aizubange	2,402	1,404	33	58.5	539 38.4	722 51.4	143 10.2	25	1.8
Yanaizu	464	284	2	61.2	115 40.5	143 50.4	26 9.2	2	0.7
Aizuwakamatsu	18,424	10,494	311	57.0	3,854 36.7	5,541 52.8	1,099 10.5	300	2.9
Yugawa	519	351	6	67.6	123 35.0	178 50.7	50 14.2	7	2.0
Subtotal	126,184	57,969	2,519	45.9	18,989 32.8	30,937 53.4	8,043 13.9	2,392	4.1
Total	294,213	163,453	9,250	55.6	62,019 37.9	83,828 51.3	17,606 10.8	9,257	5.7

Appendix 2

Thyroid ultrasound examination (TUE) coverage outside Fukushima by prefecture As of 30 November 2019

Prefecture	Number of medeical facilities	Participants *
Hokkaido	7	**256**
Aomori	2	**116**
Iwate	3	**235**
Miyagi	2	**2,063**
Akita	1	**147**
Yamagata	3	**448**
Ibaraki	4	**521**
Tochigi	8	**581**
Gunma	2	**152**
Saitama	3	**480**
Chiba	5	**405**
Tokyo	17	**1,442**
Kanagawa	6	**689**
Niigata	2	**410**
Toyama	2	**25**
Ishikawa	1	**35**

Prefecture	Number of medeical facilities	Participants *
Fukui	1	**15**
Yamanashi	2	**80**
Nagano	3	**116**
Gifu	1	**27**
Shizuoka	2	**81**
Aichi	4	**169**
Mie	1	**16**
Shiga	1	**10**
Kyoto	3	**73**
Osaka	7	**167**
Hyogo	2	**116**
Nara	2	**24**
Wakayama	1	**9**
Tottori	1	**7**
Shimane	1	**11**
Okayama	3	**45**

Prefecture	Number of medeical facilities	Participants *
Hiroshima	2	**21**
Yamaguchi	1	**20**
Tokushima	1	**5**
Kagawa	1	**23**
Ehime	1	**13**
Kochi	1	**10**
Fukuoka	3	**67**
Saga	1	**1**
Nagasaki	3	**24**
Kumamoto	1	**25**
Oita	1	**11**
Miyazaki	1	**20**
Kagoshima	1	**5**
Okinawa	1	**34**

Total	122	**9,250**

*The number of participants represents those who received examination at facilities outside Fukushima

Appendix 3

Results of primary examination by municipality — As of 31 December 2019

	Participants	Confirmed results b	Number by exam results				Nodules		Cysts	
			Proportion (%)				Proportion (%)		Proportion (%)	
		Proportion (%) b/a (%)	A		B	C	≥5.1 mm	≤5.0 mm	≥20.1 mm	≤20.0 mm
	a		A1	A2						
Municipalities surveyed in FY 2018										
Kawamata	1,131	1,127	408	715	4	0	4	3	0	719
		99.6	36.2	63.4	0.4	0.0	0.4	0.3	0.0	63.8
Namie	1,323	1,251	418	823	10	0	10	5	0	826
		94.6	33.4	65.8	0.8	0.0	0.8	0.4	0.0	66.0
Iitate	537	534	199	331	4	0	4	2	0	334
		99.4	37.3	62.0	0.7	0.0	0.7	0.4	0.0	62.5
Minami-soma	5,846	5,744	2,035	3,671	38	0	38	28	0	3,682
		98.3	35.4	63.9	0.7	0.0	0.7	0.5	0.0	64.1
Date	5,877	5,831	2,006	3,790	35	0	35	17	0	3,811
		99.2	34.4	65.0	0.6	0.0	0.6	0.3	0.0	65.4
Tamura	3,395	3,375	1,255	2,098	22	0	22	10	0	2,108
		99.4	37.2	62.2	0.7	0.0	0.7	0.3	0.0	62.5
Hirono	361	311	108	197	6	0	6	2	0	198
		86.1	34.7	63.3	1.9	0.0	1.9	0.6	0.0	63.7
Naraha	372	302	121	181	0	0	0	0	0	181
		81.2	40.1	59.9	0.0	0.0	0.0	0.0	0.0	59.9
Tomioka	864	741	271	466	4	0	4	0	0	468
		85.8	36.6	62.9	0.5	0.0	0.5	0.0	0.0	63.2
Kawauchi	138	134	40	92	2	0	2	0	0	94
		97.1	29.9	68.7	1.5	0.0	1.5	0.0	0.0	70.1
Okuma	833	705	239	463	3	0	3	4	0	466
		84.6	33.9	65.7	0.4	0.0	0.4	0.6	0.0	66.1
Futaba	271	247	77	169	1	0	1	0	0	170
		91.1	31.2	68.4	0.4	0.0	0.4	0.0	0.0	68.8
Katsurao	103	101	31	69	1	0	1	0	0	69
		98.1	30.7	68.3	1.0	0.0	1.0	0.0	0.0	68.3
Fukushima	28,701	28,476	9,815	18,505	156	0	155	90	1	18,582
		99.2	34.5	65.0	0.5	0.0	0.5	0.3	0.0	65.3
Nihonmatsu	5,431	5,404	1,889	3,464	51	0	50	20	1	3,492
		99.5	35.0	64.1	0.9	0.0	0.9	0.4	0.0	64.6
Motomiya	3,181	3,165	1,109	2,042	14	0	14	8	0	2,044
		99.5	35.0	64.5	0.4	0.0	0.4	0.3	0.0	64.6
Otama	914	910	302	602	6	0	6	2	0	605
		99.6	33.2	66.2	0.7	0.0	0.7	0.2	0.0	66.5
Koriyama	32,966	32,702	10,757	21,742	203	0	202	109	1	21,850
		99.2	32.9	66.5	0.6	0.0	0.6	0.3	0.0	66.8
Kori	1,125	1,116	395	714	7	0	7	2	0	717
		99.2	35.4	64.0	0.6	0.0	0.6	0.2	0.0	64.2
Kunimi	802	798	257	532	9	0	9	1	0	539
		99.5	32.2	66.7	1.1	0.0	1.1	0.1	0.0	67.5
Tenei	523	518	188	326	4	0	4	2	0	330
		99.0	36.3	62.9	0.8	0.0	0.8	0.4	0.0	63.7
Shirakawa	6,438	6,400	2,225	4,136	39	0	39	24	0	4,155
		99.4	34.8	64.6	0.6	0.0	0.6	0.4	0.0	64.9
Nishigo	2,189	2,175	731	1,431	13	0	13	9	0	1,437
		99.4	33.6	65.8	0.6	0.0	0.6	0.4	0.0	66.1
Izumizaki	662	660	241	417	2	0	2	2	0	419
		99.7	36.5	63.2	0.3	0.0	0.3	0.3	0.0	63.5
Miharu	1,501	1,487	500	975	12	0	12	5	0	982
		99.1	33.6	65.6	0.8	0.0	0.8	0.3	0.0	66.0
Subtotal	105,484	104,214	35,617	67,951	646	0	643	345	3	68,278
		98.8	34.2	65.2	0.6	0.0	0.6	0.3	0.0	65.5

	Participants	Confirmed results b	Number by exam results				Nodules		Cysts	
			Proportion (%)							
			A		B	C	Proportion (%)		Proportion (%)	
	a	Proportion b/a (%)	A1	A2			≥5.1 mm	≤5.0 mm	≥20.1 mm	≤20.0 mm
Municipalities surveyed in FY 2019										
Iwaki	13,232	7,259	2,415	4,736	108	0	108	43	0	4,785
		54.9	33.3	65.2	1.5	0.0	1.5	0.6	0.0	65.9
Sukagawa	7,428	7,347	2,316	4,967	64	0	64	40	0	4,998
		98.9	31.5	67.6	0.9	0.0	0.9	0.5	0.0	68.0
Soma	3,133	3,110	1,031	2,040	39	0	39	11	0	2,067
		99.3	33.2	65.6	1.3	0.0	1.3	0.4	0.0	66.5
Kagamiishi	1,303	1,291	400	880	11	0	11	5	0	885
		99.1	31.0	68.2	0.9	0.0	0.9	0.4	0.0	68.6
Shinchi	656	652	218	430	4	0	4	2	0	433
		99.4	33.4	66.0	0.6	0.0	0.6	0.3	0.0	66.4
Nakajima	498	495	171	321	3	0	3	0	0	324
		99.4	34.5	64.8	0.6	0.0	0.6	0.0	0.0	65.5
Yabuki	1,675	1,673	607	1,058	8	0	8	7	0	1,062
		99.9	36.3	63.2	0.5	0.0	0.5	0.4	0.0	63.5
Ishikawa	1,333	1,322	446	863	13	0	13	4	0	870
		99.2	33.7	65.3	1.0	0.0	1.0	0.3	0.0	65.8
Yamatsuri	463	461	145	316	0	0	0	2	0	316
		99.6	31.5	68.5	0.0	0.0	0.0	0.4	0.0	68.5
Asakawa	641	637	202	428	7	0	7	3	0	429
		99.4	31.7	67.2	1.1	0.0	1.1	0.5	0.0	67.3
Hirata	597	584	228	355	1	0	1	2	0	355
		97.8	39.0	60.8	0.2	0.0	0.2	0.3	0.0	60.8
Tanagura	1,444	1,439	529	900	10	0	10	7	0	908
		99.7	36.8	62.5	0.7	0.0	0.7	0.5	0.0	63.1
Hanawa	696	693	263	427	3	0	3	2	0	427
		99.6	38.0	61.6	0.4	0.0	0.4	0.3	0.0	61.6
Samegawa	299	297	126	168	3	0	3	0	0	169
		99.3	42.4	56.6	1.0	0.0	1.0	0.0	0.0	56.9
Ono	855	833	259	568	6	0	6	1	0	573
		97.4	31.1	68.2	0.7	0.0	0.7	0.1	0.0	68.8
Tamakawa	654	652	241	400	11	0	11	2	0	406
		99.7	37.0	61.3	1.7	0.0	1.7	0.3	0.0	62.3
Furudono	506	492	193	297	2	0	2	2	0	296
		97.2	39.2	60.4	0.4	0.0	0.4	0.4	0.0	60.2
Hinoemata	36	33	10	23	0	0	0	0	0	23
		91.7	30.3	69.7	0.0	0.0	0.0	0.0	0.0	69.7
Minami-aizu	1,147	1,114	408	695	11	0	11	3	0	701
		97.1	36.6	62.4	1.0	0.0	1.0	0.3	0.0	62.9
Kaneyama	71	66	19	47	0	0	0	0	0	47
		93.0	28.8	71.2	0.0	0.0	0.0	0.0	0.0	71.2
Showa	68	64	21	43	0	0	0	0	0	43
		94.1	32.8	67.2	0.0	0.0	0.0	0.0	0.0	67.2
Mishima	84	77	20	57	0	0	0	0	0	57
		91.7	26.0	74.0	0.0	0.0	0.0	0.0	0.0	74.0
Shimogo	426	408	155	249	4	0	4	0	0	251
		95.8	38.0	61.0	1.0	0.0	1.0	0.0	0.0	61.5
Kitakata	4,017	2,175	765	1,396	14	0	14	9	0	1,401
		54.1	35.2	64.2	0.6	0.0	0.6	0.4	0.0	64.4
Nishiaizu	405	340	129	209	2	0	2	1	0	210
		84.0	37.9	61.5	0.6	0.0	0.6	0.3	0.0	61.8
Tadami	334	331	116	214	1	0	1	0	0	215
		99.1	35.0	64.7	0.3	0.0	0.3	0.0	0.0	65.0
Inawashiro	1,168	1,121	401	704	16	0	16	4	0	717
		96.0	35.8	62.8	1.4	0.0	1.4	0.4	0.0	64.0
Bandai	286	258	72	183	3	0	3	1	0	185
		90.2	27.9	70.9	1.2	0.0	1.2	0.4	0.0	71.7
Kitashiobara	272	229	79	148	2	0	2	0	0	150
		84.2	34.5	64.6	0.9	0.0	0.9	0.0	0.0	65.5
Aizumisato	1,709	1,591	497	1,080	14	0	14	8	0	1,084
		93.1	31.2	67.9	0.9	0.0	0.9	0.5	0.0	68.1
Aizubange	1,404	1,239	387	842	10	0	10	5	0	849
		88.2	31.2	68.0	0.8	0.0	0.8	0.4	0.0	68.5
Yanaizu	284	264	93	171	0	0	0	0	0	171
		93.0	35.2	64.8	0.0	0.0	0.0	0.0	0.0	64.8
Aizuwakamatsu	10,494	5,910	2,051	3,794	65	0	65	24	0	3,830
		56.3	34.7	64.2	1.1	0.0	1.1	0.4	0.0	64.8
Yugawa	351	322	134	185	3	0	3	3	0	188
		91.7	41.6	57.5	0.9	0.0	0.9	0.9	0.0	58.4
Subtotal	57,969	44,779	15,147	29,194	438	0	438	191	0	29,425
		77.2	33.8	65.2	1.0	0.0	1.0	0.4	0.0	65.7
Total	163,453	148,993	50,764	97,145	1,084	0	1,081	536	3	97,703
		91.2	34.1	65.2	0.7	0.0	0.7	0.4	0.0	65.6

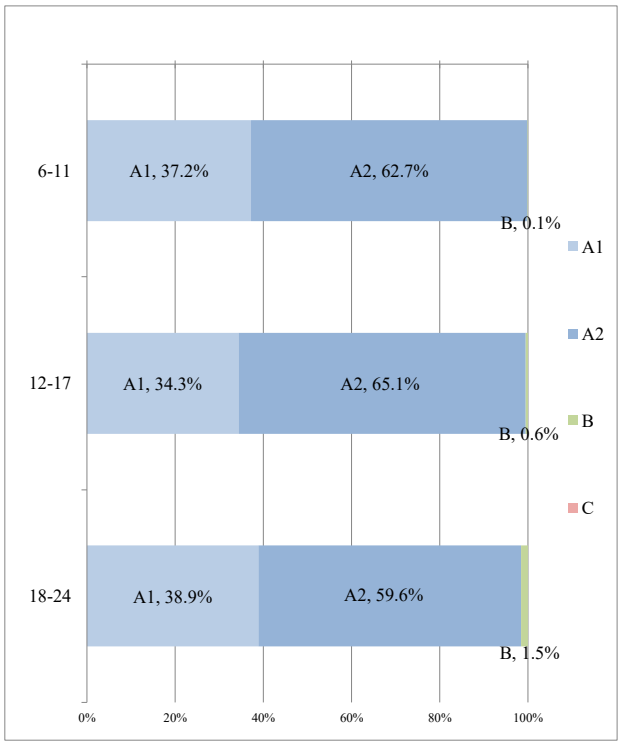
Appendix 4

1 Thyroid ultrasound examination results by age and sex

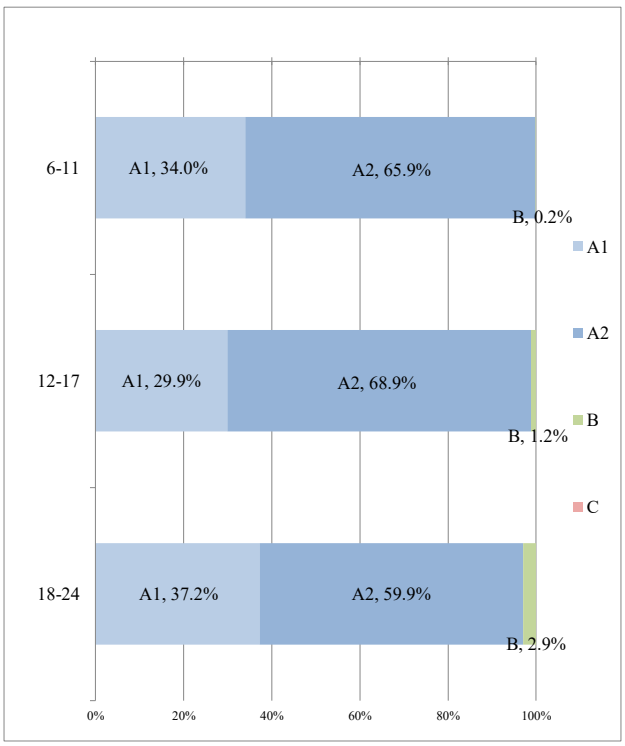
As of 31 December 2019

Class/Sex / Ages	A						B			C			Total		
	A1			A2											
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
6-11	11,019	9,620	20,639	18,591	18,640	37,231	36	45	81	0	0	0	29,646	28,305	57,951
12-17	13,122	11,280	24,402	24,884	26,019	50,903	213	444	657	0	0	0	38,219	37,743	75,962
18-24	2,676	3,047	5,723	4,105	4,906	9,011	106	240	346	0	0	0	6,887	8,193	15,080
Total	26,817	23,947	50,764	47,580	49,565	97,145	355	729	1,084	0	0	0	74,752	74,241	148,993

Results by age group (Male)



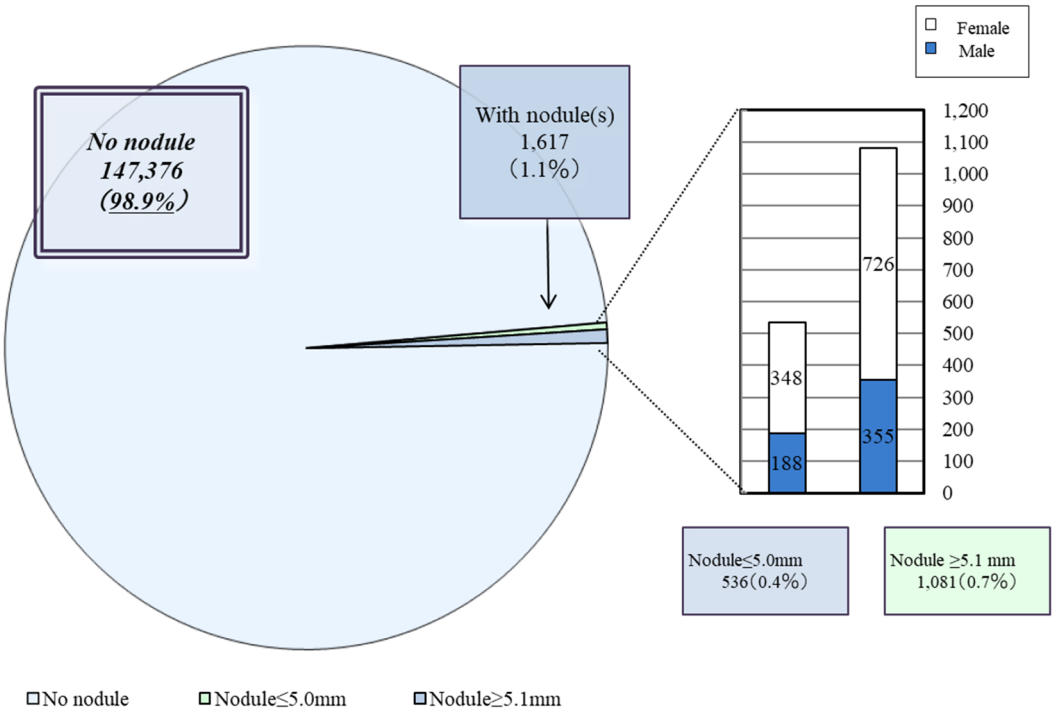
Results by age group (Female)

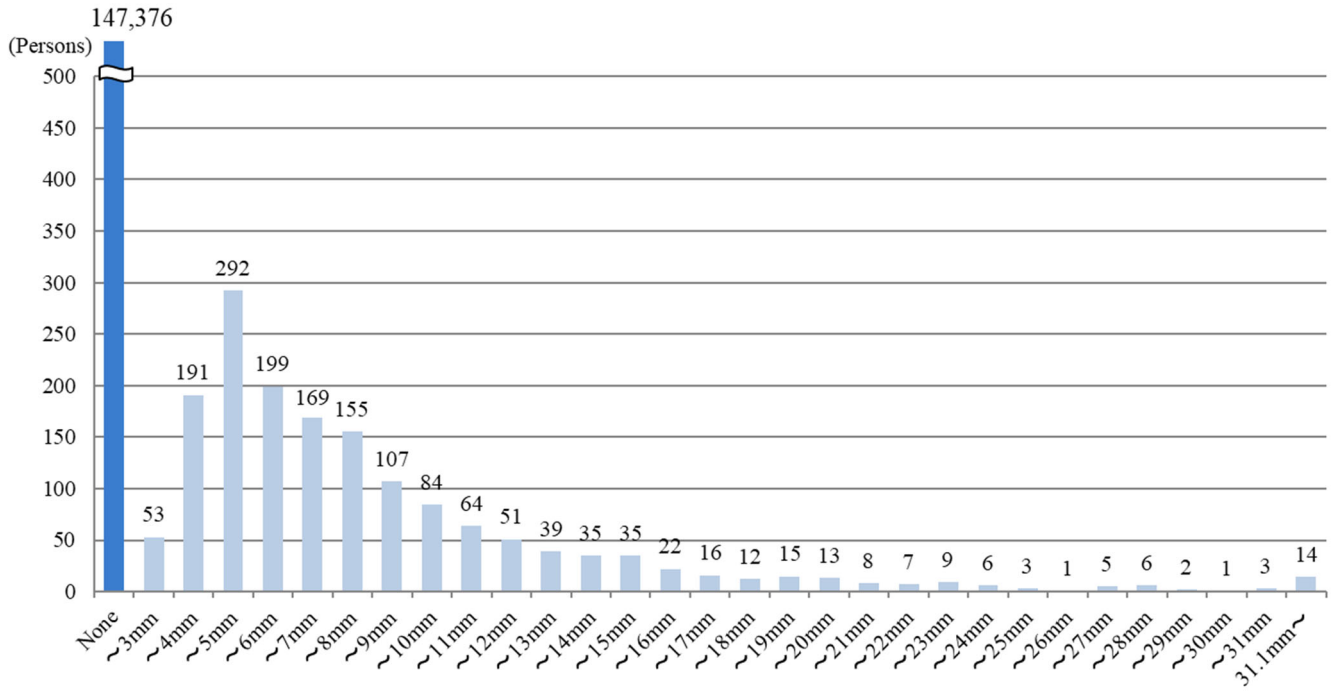


2 Nodule characteristics

As of 31 December 2019

Nodule size	Total	Male	Female	Class	Proportion
None	147,376	74,209	73,167	A1	98.9%
≤ 3.0 mm	53	23	30	A2	0.4%
3.1-5.0 mm	483	165	318		
5.1-10.0 mm	714	237	477	B	0.7%
10.1-15.0 mm	224	80	144		
15.1-20.0 mm	78	21	57		
20.1-25.0 mm	33	10	23		
≥ 25.1 mm	32	7	25		
Total	148,993	74,752	74,241		

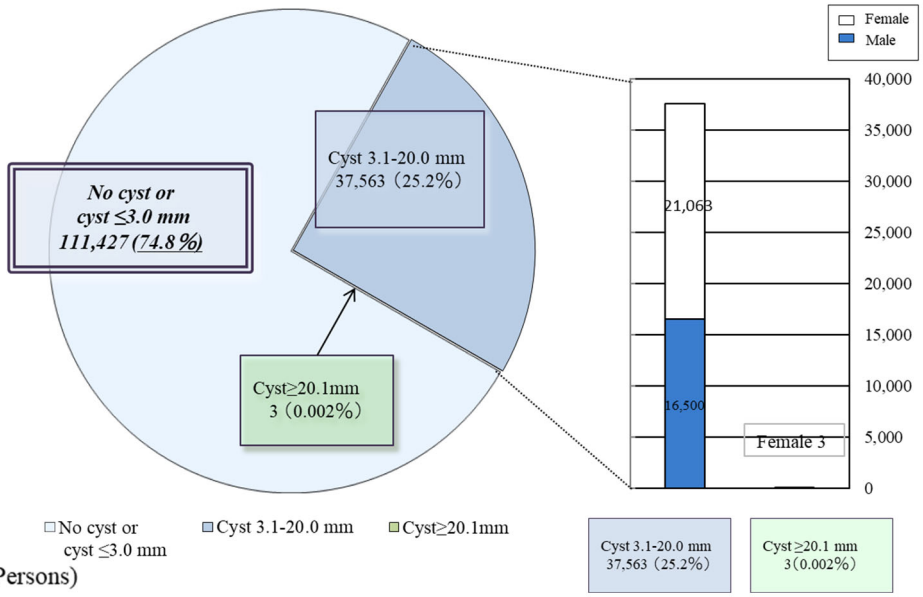


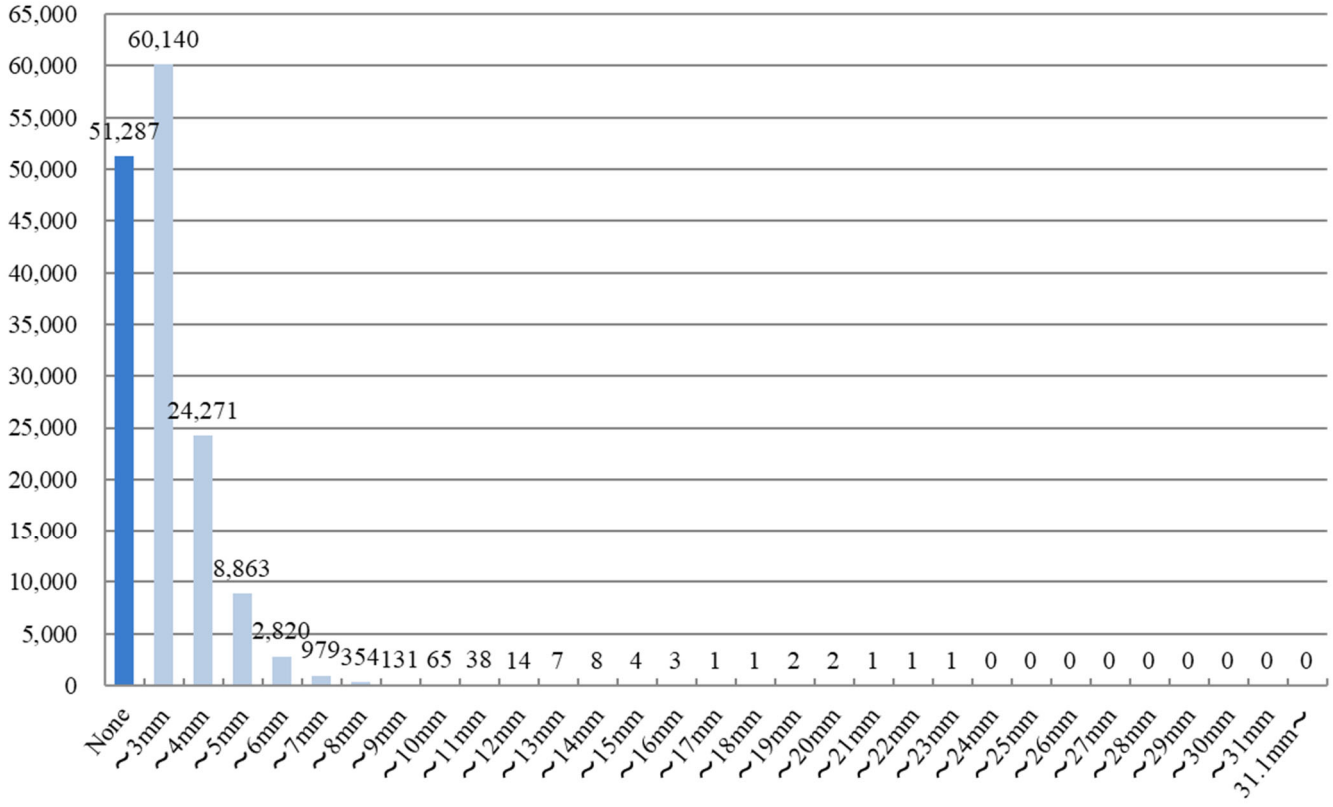


3 Cyst characteristics

As of 31 December 2019

Cyst size	Total	Male	Female	Class	Proportion
None	51,287	27,010	24,277	A1	74.8%
≤ 3.0 mm	60,140	31,242	28,898	A2	25.2%
3.1-5.0 mm	33,134	14,935	18,199		
5.1-10.0 mm	4,349	1,538	2,811		
10.1-15.0 mm	71	26	45		
15.1-20.0 mm	9	1	8		
20.1-25.0 mm	3	0	3	B	0.002%
≥ 25.1 mm	0	0	0		
Total	148,993	74,752	74,241		





Appendix 5

Results of confirmatory examination coverage by area — As of 31 December 2019

Area	Participants a	Participants who required confirmatory exam b	Proportion (%) b/a	Number of those who underwent confirmatory exam: Total c	Proportion (%) c/b	Ages 6-11 d	Proportion (%) d/c	Ages 12-17 e	Proportion (%) e/c	≥ 18 f	Proportion (%) f/c	Number of confirmed results: Total h	Proportion (%) h/c	A1 i	Proportion (%) i/h	A2 j	Proportion (%) j/h	Not A1 or A2 k	Proportion (%) k/h	FNAC l	Proportion (%) l/k
13 municipalities [1]	21,051	130		94		7		61		26		84		1		1		82		5	
		0.6		72.3		7.4		64.9		27.7		89.4		1.2		1.2		97.6		6.1	
Nakadori [2]	102,825	658		408		43		242		123		355		1		39		315		26	
		0.6		62.0		10.5		59.3		30.1		87.0		0.3		11.0		88.7		8.3	
Hamadori [3]	17,021	151		55		2		22		31		35		0		0		35		0	
		0.9		36.4		3.6		40.0		56.4		63.6		0.0		0.0		100.0		0.0	
Aizu [4]	22,556	145		47		5		24		18		29		0		1		28		3	
		0.6		32.4		10.6		51.1		38.3		61.7		0.0		3.4		96.6		10.7	
Total	163,453	1,084		604		57		349		198		503		2		41		460		34	
		0.7		55.7		9.4		57.8		32.8		83.3		0.4		8.2		91.5		7.4	

1) Tamura, Minami-soma, Date, Kawamata, Hirono, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, Katsurao, Iitate
2) Fukushima, Koriyama, Shirakawa, Sukagawa, Nihonmatsu, Motomiya, Kori, Kunimi, Otama, Kagamiishi, Tenei, Nishigo, Izumizaki, Nakajima, Yabuki, Tanagura, Yamatsuri, Hanawa, Samegawa, Ishikawa, Tamakawa, Hirata, Asakawa, Furudono, Miharu, Ono
3) Iwaki, Soma, Shinchi
4) Aizuwakamatsu, Kitakata, Shimogo, Hinoemata, Tadami, Minami-aizu, Kitashiobara, Nishiaizu, Bandai, Inawashiro, Aizubange, Yugawa, Yanaizu, Mishima, Kaneyama, Showa, Aizumisato

Appendix 6

Surgical cases for malignancy or suspicion of malignancy

1. Municipalities surveyed in FY 2018
   Malignant or suspicious for malignancy: 15 (11 surgical cases: 11 papillary thyroid carcinomas)
2. Municipalities surveyed in FY 2019
   Malignant or suspicious for malignancy: 1 (0 surgical case: 0 papillary thyroid carcinomas)
3. Total
   Malignant or suspicious for malignancy: 16 (11 surgical cases: 11 papillary thyroid carcinomas)