

"Damage, Living Environment, and Reconstruction Under the Great East Japan Earthquake"

The 2nd Survey of Nuclear Disaster Evacuees from Futaba, Fukushima, Summary of Results 2014

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1—Basic Information

Surveys on the damage, living environment and reconstruction under the Great East Japan Earthquake have been conducted via a research project called the "International comparison of reconstruction of living infrastructure from disasters" (Yasuyuki Sawada, Professor, Graduate School of Economics, The University of Tokyo; Keiko Iwasaki, Researcher, NLI Research Institute) of the University of Tokyo since 2013. The surveys target all household heads of Futaba in Fukushima prefecture, where all residents were forced to evacuate due to the nuclear power plant accident caused by the Great East Japan Earthquake that occurred in 2011. Surveys were conducted in July 2013, December 2014, July 2016, December 2017 and July 2019. This paper reports the summary of results of the second survey conducted in December 2014.¹

Table 1. Basic Information

Target	All household heads of Futaba, Fukushima
Number of questionnaires distributed	2,900
Distribution date of questionnaires	December 1, 2014
Collection period of questionnaires	December 1, 2014 – December 31, 2014
Number of responses	654
Response rate	About 23%

The survey includes questions about basic attributes such as age and gender, as well as questions related to connections with others (social capital) and health conditions (see the appendix at the end of this report for all the questions included in the survey). The questionnaires were distributed to all households of Futaba (about 2,900 households) that receive the regular town mail from Futaba. We received responses from 654 Futaba residents who had evacuated nationwide (the response rate was about 23%).

The survey targeted heads of households and Figures 1 and 2 show the distribution of age and gender of the

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respondents. As we can see from these figures, compared to the age and gender distribution reported in the national census, the age distribution of the respondents is left-skewed, with the majority of respondents in their 60s. The gender distribution shows that the majority of respondents are male. In addition, since the survey was conducted after the tremendous disaster, it is possible that the distributions of the respondents' characteristics are significantly different from those of general questionnaire surveys. Therefore, it should be noted that the results of this survey do not necessarily indicate the general trend of Futaba residents.

Figure 1: Age Distribution of Respondents

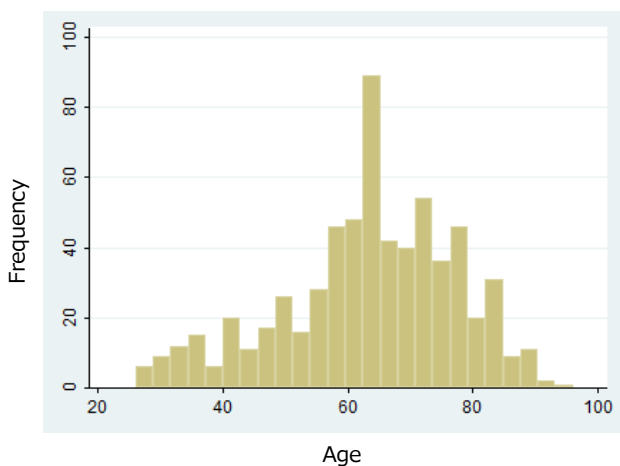
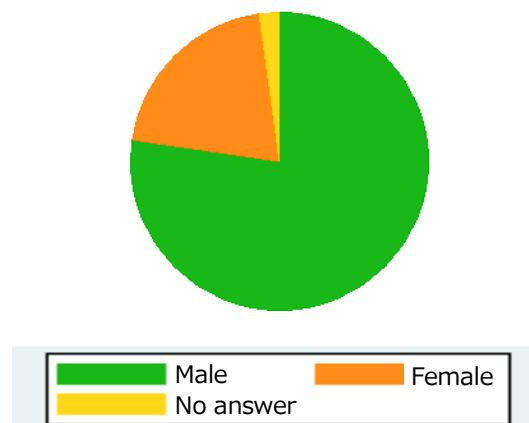


Figure 2: Gender distribution of Respondents



2—Change in Social Capital

Social capital refers to trusting relationships and networks, and is sometimes referred to as "kizuna" in Japanese. Social capital is getting attention as a key notion to achieve successful disaster recovery and has been one of the major focuses of our study. In previous studies, we found that social capital might have been weakened by the disaster among Futaba residents.

There are several indicators that are commonly used to measure social capital, but we focused on three items which are the level of "generalized trust", "frequency of mutual assistance with neighbors" and "trust in neighbors". As shown in Figure 3 to 5, all of these three indicators show that social capital has weakened because of the disaster and recovery trends cannot be observed so far. These indicate that it will take a very long time for social capital to recover, and we believe it is important to continue to monitor these changes over the long term.

Figure 3: Generalized Trust (GSS Trust)

"Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people"

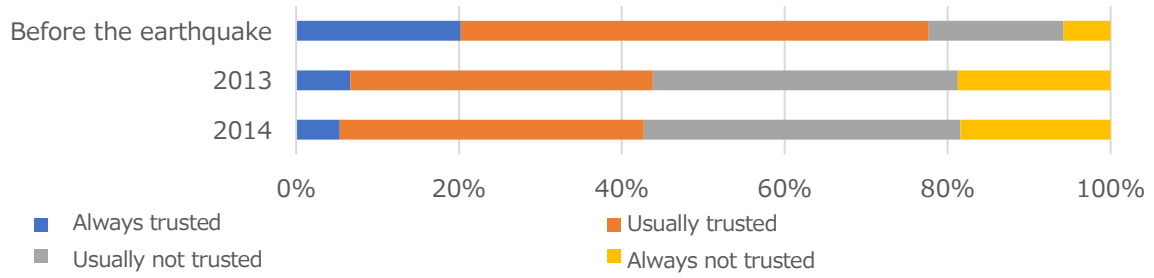


Figure 4: Frequency of Mutual Assistance with Neighbors

"How often do you help or receive help from your neighbors? "

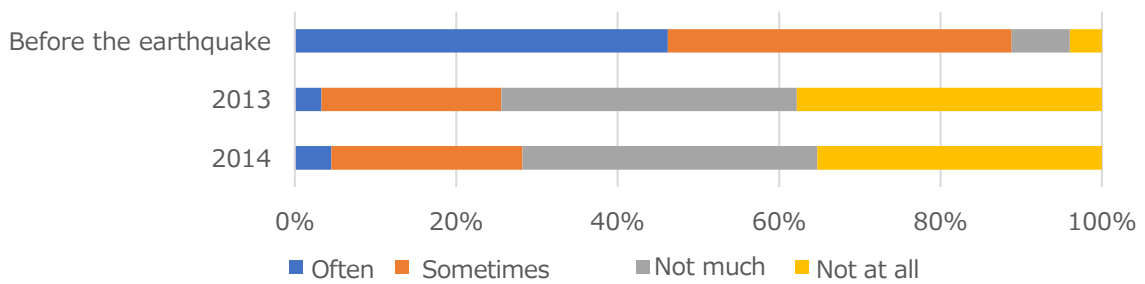
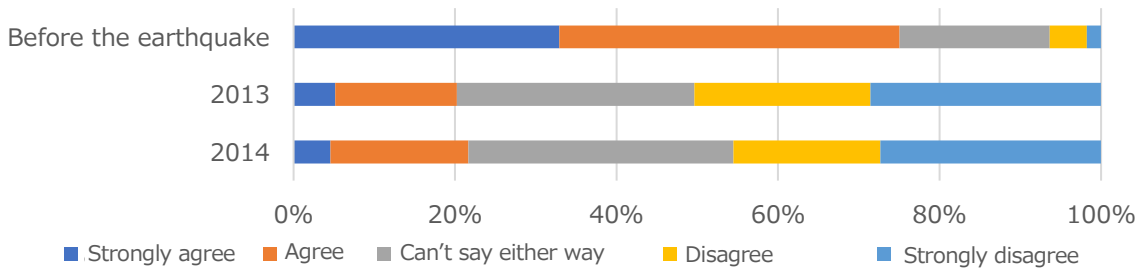


Figure 5: Trust in Neighbors

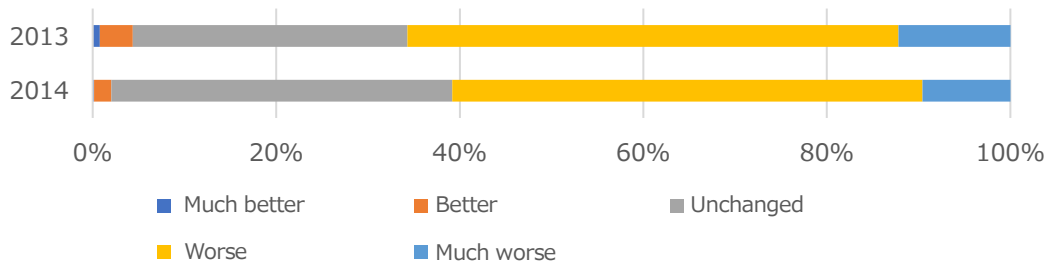
"My neighbors help me when I'm in trouble."



3—Health Condition

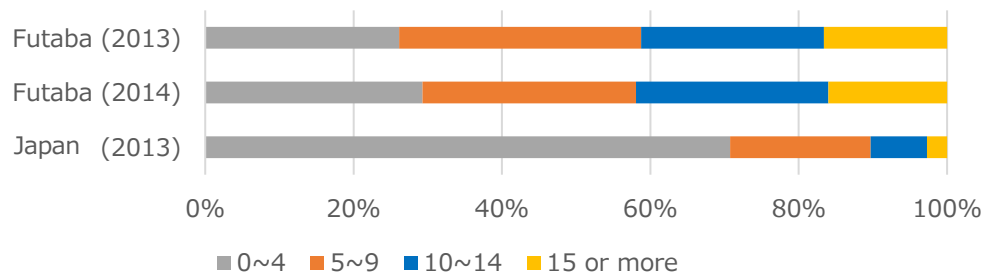
We included a question asking changes in health condition compared to pre-disaster status. As shown in Figure 6, many respondents rated their own health condition as worse than that of their pre-disaster status and the distribution has hardly changed since 2013.

Figure 6. Change in Subjective Health Status



As for mental health, the distribution of K6 score, a clinically validated index for diagnosing the overall stress state, shown in Figure 7 indicates that K6 scores of Futaba residents are much higher compared to those for Japan. (K6 is an internationally used measurement for general mental health status that consists of six questions. The higher the total score, the more likely the respondent is stressed.)

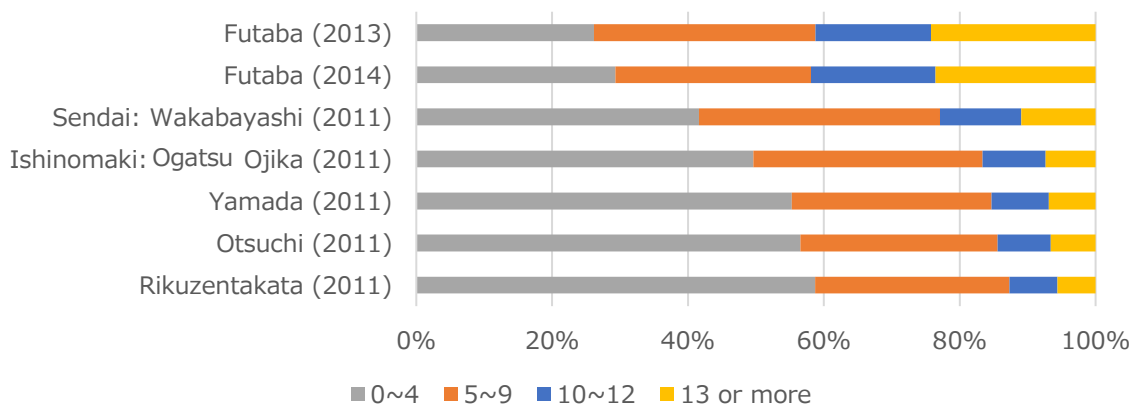
Figure 7: Distribution of K6 Score for Futaba and Japan



(Note) K6 score indicates the level of psychological distress, and the higher the value, the higher the level of stress.

(Source) Futaba: Past research by the University of Tokyo's "International comparison of reconstruction of living infrastructure from disasters" project. Japan: Comprehensive Survey of Living Conditions (2013)

Figure 8: Distribution of K6 Score for Futaba and Other Disaster Affected Areas



(Note) K6 score indicates the level of psychological distress, and the higher the value, the higher the level of stress.

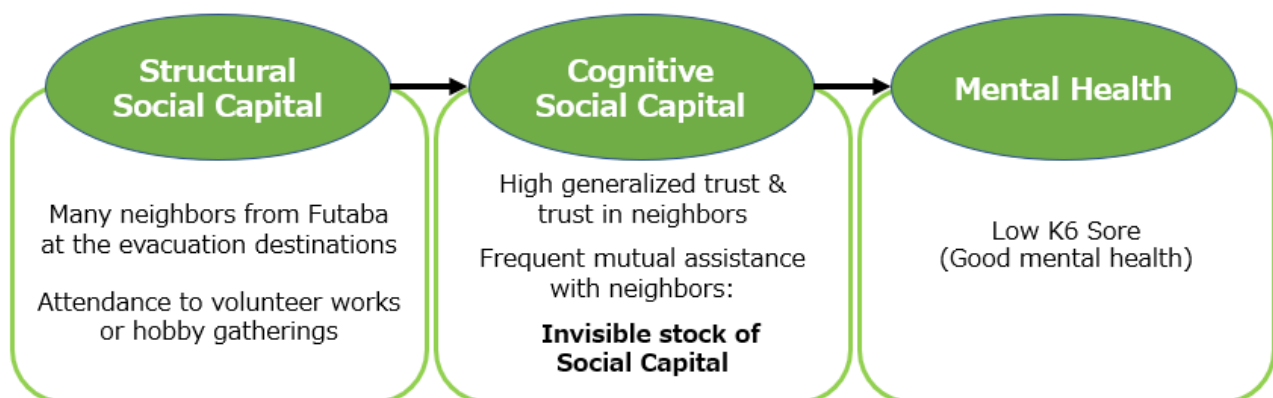
(Source) Futaba: Past research by the University of Tokyo's "International comparison of reconstruction of living infrastructure from disasters" project. Other regions: Survey on the Health of Great East Japan Earthquake Victims (Research Representative: Kenji Hayashi) 2012

K6 score distributions have been reported in disaster affected areas other than Futaba by the Government and local governments as well. As shown in Figure 8, K6 scores of Futaba residents tend to be higher than those of residents in other disaster affected areas, such as Wakabayashi area of Sendai and Ogatsu and Ojika area of Ishinomaki where the damages caused by the tsunami were tremendous. We believe that manmade disaster could have more serious and longterm impacts on victims' mental health status because of their unique characteristics including uncertainty of the future.

However, the results of this survey do not necessarily apply to all residents of Futaba, and a high K6 score does not necessarily mean that one has a mental disorder. Please note that the purpose of our survey is to provide policy implications to the Government or other administrative agencies.

Moreover, we analyzed characteristics of those who could keep good mental health under the tremendous disaster, and found that those who could keep good subjective health status after the disaster, those who have high income after the disaster and those who could keep high level of social capital tend to keep good mental health status after the disaster. As a mechanism connecting social capital and mental health, our study implied that high level of structural social capital helps people to have high level of cognitive social capital, which eventually helps people to keep good mental health (see Figure 9).

Figure 9: Social capital and mental health



As shown in Figure 9, those who have many neighbors from Futaba and those who attend hobby gatherings tend to have high level of cognitive social capital, and also tend to have good mental health status.

In addition, as to changes in income, health status, and living space caused by the disaster, we find that the greater the extent of decrease or deterioration is, the greater the degree of decline in individual well-being tends to be.

These results have been presented at international and domestic academic conferences. In addition, these results have been published in international academic journals. We intend to continue our analysis and contribute to the improvement of disaster preparation/rehabilitation policies.

Our survey results are based on aggregates and analyses of responses from approximately 23% of the households of Futaba and do not represent all Futaba residents. Since the survey was conducted after a major disaster, the characteristics of respondents may be very different from general surveys and there is a possibility of an overestimation in our results due to the deterioration of physical and mental health conditions. Therefore, special caution is required in interpreting the results, and any definitive judgments based solely on these findings should be avoided.

Appendix: Summary Tables

Who is filling out this questionnaire?

	Freq	%
Household head	448	68.50
Spouse	111	16.97
Other	27	4.13
No answer	68	10.40
Total	654	100.00

1. Please tell us about the household head.

(1) Basic information of the household head

A) Average age: 63 yrs Oldest: 96 yrs Youngest: 26 yrs

B) Gender distribution, Male: 77.4% Female: 20.5%

No response: 2.1%

C) Current prefecture

We received answers from all over Japan. Thank you.

(The aggregate result is omitted.)

(2) Current dwelling type

	Freq	%
Temporary shelter	57	8.72
Apartment (Rented)	141	21.56
Condominium (Rented)	36	5.50
Detached house	65	9.94
Governmental housing	13	1.99
Municipal housing	26	3.98
Owned house, detached. (different from the one before the earthquake)	211	32.26
Owned house, mansion. (different from the one before the earthquake)	22	3.36
Company housing	13	1.99
Relative's house	20	3.06
Other	37	5.66
No answer	13	1.99
Total	654	100.00

(3) Size of the land and living space of your current residence

Land size	Freq	%
0 ~ 100 square meters	54	8.26
100 ~ 200 square meters	59	9.02
200 ~ 300 square meters	82	12.54
300 square meters ~	127	19.42
No answer	332	50.76
Total	654	100.00

Living space size	Freq	%
0 ~ 40 square meters	51	7.80
40 ~ 80 square meters	77	11.77
80 ~ 120 square meters	41	6.27
120 square meters ~	236	36.09
No answer	249	38.07
Total	654	100.00

(4) Current job of the household head

	Freq	%
Company employee	129	19.72
Civil servant	29	4.43
Free practice of medical practitioners, attorneys, etc.	2	0.31
Agriculture and Forestry	7	1.07
Self-employed business	30	4.59
Part-time job	17	2.60
Housekeeper	22	3.36
Retired	156	23.85
Unemployed or on leave of absence	220	33.64
Other	29	4.43
No answer	13	1.99
Total	654	100.00

(5) Job before the Great East Japan Earthquake.

	Freq	%
Company employee	237	36.24
Civil servant	51	7.80
Free practice of medical practitioners, attorneys, etc.	2	0.31
Agriculture and Forestry	69	10.55
Fisheries	1	0.15
Self-employed business	78	11.93
Part-time job	13	1.99
Housekeeper	15	2.29
Retired	81	12.39
Unemployed or on leave of absence	49	7.49
Other	44	6.73
No answer	14	2.14
Total	654	100.00

(6) Academic history of the household head

	Freq	%
Junior high school	56	8.56
High school	344	52.60
Vocational school	72	11.01
Junior college	22	3.36
University	101	15.44
Graduate school	6	0.92
Other	4	0.61
No answer	27	4.13
Total	654	100.00

(7) Family and relatives of the household head before and after the disaster. Number of family members:

	Current (%)	Before the disaster (%)
1	20.95	11.47
2	34.40	22.48
3	21.41	22.48
4	11.31	15.29
5	4.13	10.55
6	3.36	8.10
7 or more	2.75	5.20
No answer	1.68	4.43
Total	100.00	100.00

(8) How is the current health of the household head compared to the condition before the disaster?

	Freq	%
Much better	1	0.15
Better	12	1.83
Remains unchanged	237	36.24
Worse	327	50.00
Much worse	61	9.33
No answer	16	2.45
Total	654	100.00

(9) Has your weight changed after the disaster?

	Freq	%
Increased	83	12.69
Slightly increased	151	23.09
Remains unchanged	173	26.45
Slightly decreased	155	23.70
Decreased	79	12.08
No answer	13	1.99
Total	654	100.00

(10) How happy are you (household head) now? If we set "Very happy" at 10 and "miserable" at 0, what do you think would be your score?

	Freq	%
0 (Miserable)	35	5.35
1	29	4.43
2	56	8.56
3	121	18.50
4	75	11.47
5	181	27.68
6	48	7.34
7	25	3.82
8	43	6.57
9	8	1.22
10 (Very happy)	12	1.83
No answer	21	3.21
Total	654	100.00

(11) The following questions ask about how you have been feeling during the past 30 days. For each question, please circle the number that best describes how often you had this feeling.

During the past 30 days, about how often did you feel ... (Point criteria)	None of the time	A little of the time	Som e of the time	Most of the time	All of the time
...nervous?	0	1	2	3	4
...hopeless?	0	1	2	3	4
...restless or fidgety?	0	1	2	3	4
...so depressed that nothing could cheer you up?	0	1	2	3	4
...that everything was an effort?	0	1	2	3	4
...worthless?	0	1	2	3	4

Total points (K6 score) distribution:

	Freq	%
0 ~ 4 points	174	26.61
5 ~ 8 points	122	18.65
9 ~ 12 points	158	24.16
13 ~ 16 points	79	12.08
17 points or more	61	9.33
No answer	60	9.17
Total	654	100.00

(12) Due to the environment change, it has become difficult to cook at home for many evacuees, and there are concerns about health hazards for them. Please tell us the frequency of eating out before and after the disaster.

	Currently (%)	Before the disaster (%)
None	34.25	58.72
Once a week	30.28	29.97
Twice a week	15.44	6.73
3 times a week	8.56	1.53
4 times a week	4.13	0.92
More than 5 times a week	3.67	0.61
No answer	3.67	1.53
Total	100.00	100.00

(13) Health concerns have been raised for the limitation of activities of disaster victims due to the inconvenience of transportation.

A) Did you buy a car after the disaster?

	Freq	%
Yes	391	59.79
No	242	37.00
No answer	21	3.21
Total	654	100.00

B) If Yes, how many cars did you buy as a total of your family?

	Freq	%
1	222	58.89
2	112	29.71
3	29	7.69
4	11	2.92
5	3	0.80
Total	377	100.00

2. Relationship with neighbors

(1) Which area of Futaba did the household head live before the disaster?

	Freq	%
Ishiguma	10	1.54
Yamada	48	7.34
Matsuzako	2	0.31
Mizusawa	6	0.92
Mesaku	7	1.07
Koriyama	47	7.19
Kamihatori	10	1.53
Niiyama	144	22.02
Matsukura	7	1.07
Terasawa	10	1.53
Shibukawa	9	1.38
Konokusa	21	3.21
Hosoya	16	2.45
Shimohadori	13	1.99
Nakata	5	0.76
Nagatsuka	188	28.75
Morotake	10	1.53
Nakahama	7	1.07
Nakano	12	1.83
Maeda	69	10.55
Other	5	0.76
No answer	8	1.22
Total	654	100.00

(2) How many neighbors from Futaba whom you did not know before the disaster do you have?

	Freq	%
More than 20 families	41	6.27
10~19 families	25	3.82
6~9 families	32	4.89
3~5 families	71	10.86
1~2 families	136	20.80
None	334	51.07
No answer	15	2.29
Total	654	100.00

(3) How many neighbors from Futaba whom you have known since the pre-disaster period do you have?

	Freq	%
More than 20 families	13	1.99
10~19 families	27	4.13
6~9 families	46	7.03
3~5 families	78	11.93
1~2 families	150	22.94
None	324	49.54
No answer	16	2.45
Total	654	100.00

(4) How often do you help or receive help from your neighbors before and after the disaster?

	Recently (%)	Before the disaster (%)
Quite often	4.43	40.98
Moderately	23.09	43.43
Not much	35.63	8.41
None	34.40	5.35
No answer	2.45	1.83
Total	100.00	100.00

(5) My neighbors help me when I'm in trouble.

	Recently (%)	Before the disaster (%)
Strongly agree	4.43	33.18
Agree	16.67	38.53
Can't say either	31.96	19.42
Don't agree	17.74	3.98
Not at all	26.61	2.91
No answer	2.60	1.99
Total	100.00	100.00

(6) Life style before and after the disaster

I often go out and leave the door unlocked.

	Recently (%)	Before the disaster (%)
Yes	5.05	51.99
No	90.83	45.57
Don't know	1.38	0.61
No answer	2.75	1.83
Total	100.00	100.00

I often lend money or goods to friends.

	Recently (%)	Before the disaster (%)
Yes	3.06	26.76
No	91.74	68.20
Don't know	1.53	2.14
No answer	3.67	2.91
Total	100.00	100.00

I think most people try to be fair.

	Recently (%)	Before the disaster (%)
Yes	35.78	65.14
No	22.63	8.26
Don't know	37.46	23.55
No answer	4.13	3.06
Total	100.00	100.00

I think that I am trusted by others.

	Recently (%)	Before the disaster (%)
Yes	20.49	55.50
No	15.90	5.81
Don't know	60.40	36.09
No answer	3.21	2.60
Total	100.00	100.00

(7) Participation in volunteer and hobby gatherings

A) I sometimes participate in volunteer activities.

	Freq	%
Yes	86	13.15
No	554	84.71
No answer	14	2.14
Total	654	100.00

B) I sometimes participate in hobby activities.

	Freq	%
Yes	169	25.84
No	463	70.80
No answer	22	3.36
Total	654	100.00

C) Average number of non-family members to exchange greetings in a day

	Freq	%
0	95	14.53
1~3	260	39.76
3~6	123	18.81
7~9	8	1.22
10~19	85	13.00
20~29	26	3.98
30 or more	19	2.91
No answer	38	5.81
Total	100.00	100.00

(8) Generally speaking, would you say that most people can be trusted or you can't be too careful in dealing with people?

	Recently (%)	Before the disaster (%)
Always trusted	5.20	20.95
Usually trusted	36.24	55.20
Usually not trusted	37.77	16.21
Always not trusted	17.89	5.35
No answer	2.91	2.29
Total	100.00	100.00

3. Disaster damage and supports

(1) Dwelling type before the Great East Japan Earthquake

	Freq	%
Owned house (detached house)	525	80.28
Owned house (condominium)	1	0.15
Rental (detached house)	22	3.36
Rental (condominium)	3	0.46
Rental (apartment)	17	2.60
Public housing	34	5.20
Company housing	18	2.75
Relatives' house	13	1.99
Other	10	1.53
No answer	11	1.68
Total	654	100.00

(2) Size of the land and living space of residence before the Great East Japan Earthquake

Land size	Freq	%
0 ~ 100 square meters	13	1.99
100 ~ 200 square meters	78	11.93
200 ~ 300 square meters	170	25.99
300 ~ 500 square meters	151	23.09
500 ~ 1000 square meters	88	13.46
Over 1000 square meters	154	23.55
No answer	654	100.00
Total	13	1.99

Living space size	Freq	%
0 ~ 40 square meters	20	3.06
40 ~ 80 square meters	37	5.66
80 ~ 120 square meters	63	9.63
120 square meters ~	421	64.37
No answer	113	17.28
Total	654	100.00

(3) Damage to home in Futaba (Not including the radiation effect)

	Freq	%
Completely destroyed	34	5.20
Partial collapse	79	12.08
Partial destruction	247	37.77
No major damage	243	37.16
Other	15	2.29
No answer	36	5.50
Total	654	100.00

(4) Compensations

(The aggregate result is omitted.)

(5) Income before and after the disaster

(The aggregate result is omitted.)

(6) Does the household head plan to return to Futaba in the future?

	Freq	%
Yes	66	10.09
Haven't decided	184	28.13
No/Cannot	387	59.17
No answer	17	2.60
Total	654	100.00

(7) Have you decided where you are going to live for the long term going forward?

	Freq	%
Decided	66	10.09
Haven't decided/ Don't know	184	28.13
No answer	387	59.17
Total	17	2.60

(8) Please feel free to write about any challenges you face, what you have noticed and what you feel.

We received many valuable opinions.
Thank you very much.