

"Damage, Information Acquisition Route, and Reconstruction Under the Great East Japan Earthquake"

## The 1st Survey of Nuclear Disaster Evacuees from Futaba, Fukushima, Summary of Results 2013

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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 first survey conducted in July 2013.<sup>1</sup>

Table 1. Basic Information

Target	All household heads of Futaba, Fukushima
Number of questionnaires distributed	2,900
Distribution date of questionnaires	July 3, 2013
Collection period of questionnaires	July 3, 2014 – August 22, 2013
Number of responses	585
Response rate	About 20%

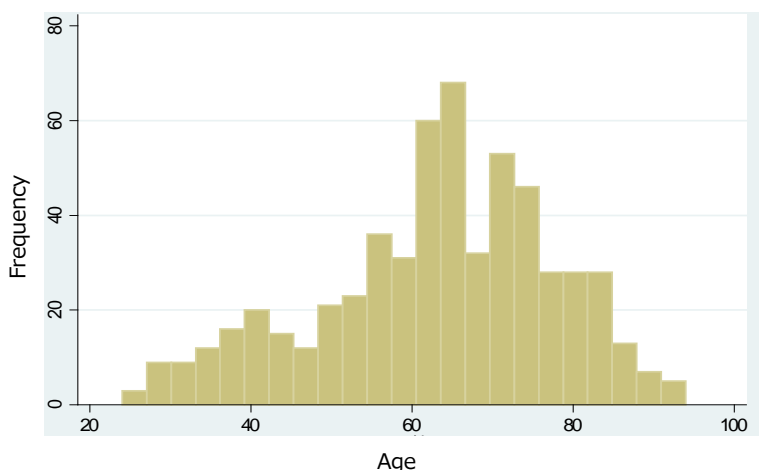
The survey includes questions about basic attributes such as age and gender, as well as questions related to connections with others (social capital) and health conditions (see the appendix at the end of this report for all the questions included in the survey). The questionnaires were distributed to all households of Futaba (about 2,900 households) that receive the regular town mail from Futaba. We received responses from 585 Futaba residents who had evacuated nationwide (the response rate was about 20%).

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

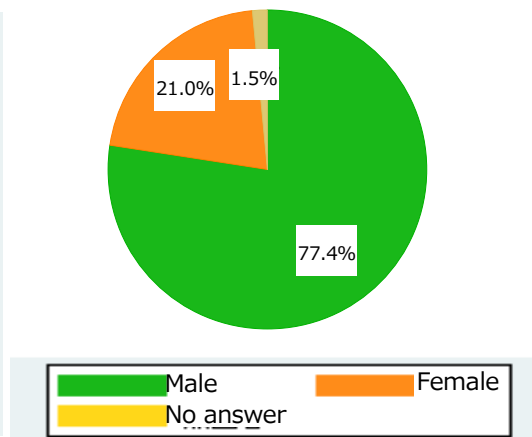
<sup>1</sup> This research was supported by the following research grants.  
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This study is approved by the Ethics Committee of the University of Tokyo (19 -73).

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**



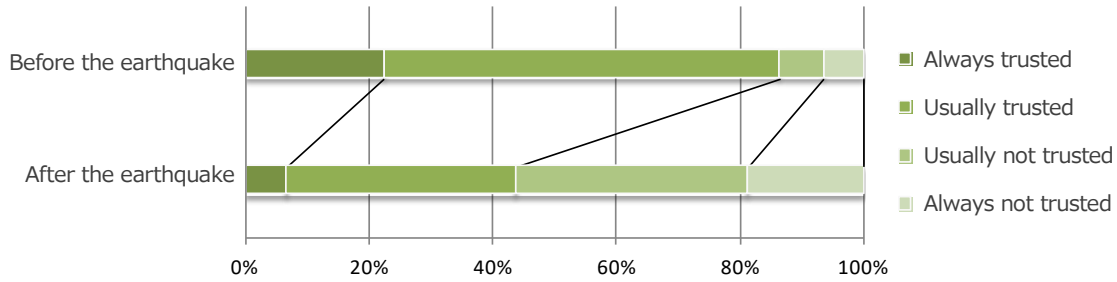
## 2—Change in Social Capital

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. The survey results show 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 "participation in hobby activities". As shown in Figure 3 to 5, all of these three indicators show that social capital has weakened because of the disaster. In addition, our further analysis show that the frequency of mutual help and participations in hobby activities decreased especially among those who do not have many neighbors from Futaba at the evacuation destinations.

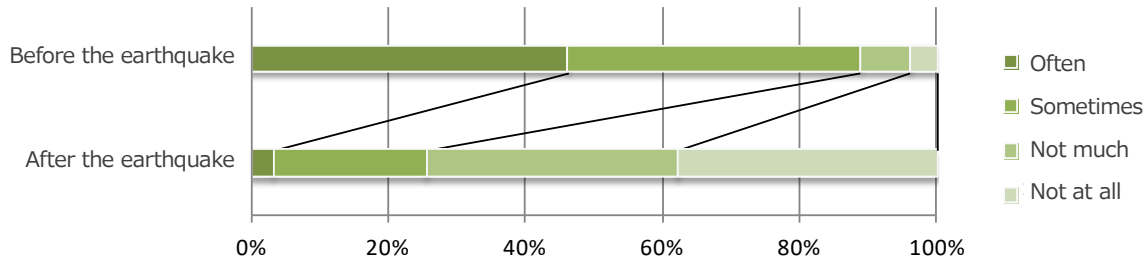
**Figure 3: Generalized Trust (GSS Trust)**

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



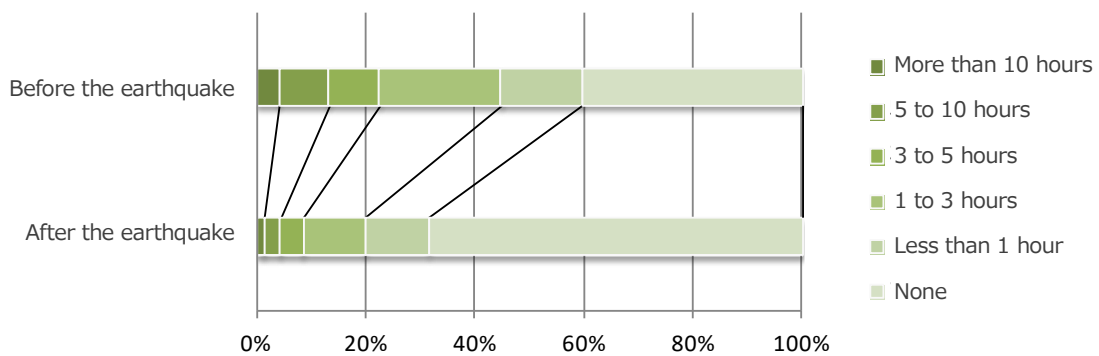
**Figure 4: Frequency of Mutual Assistance with Neighbors**

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



**Figure 5: Participation in Hobby Activities**

"How many hours per week do you spend time to participate in gatherings of hobby activities"

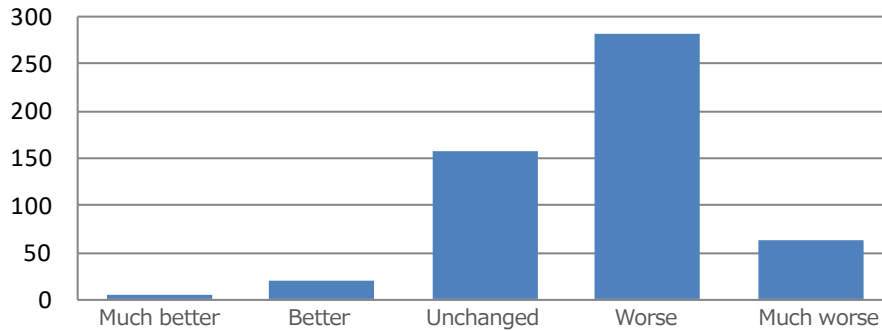


### 3—Health Condition

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.

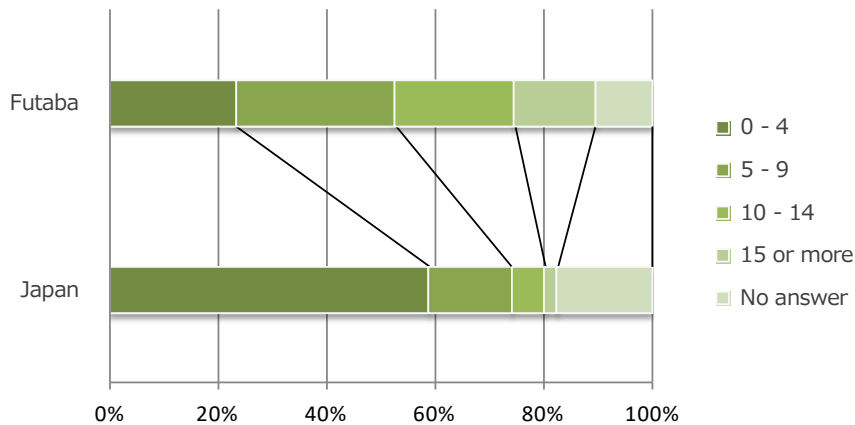
**Figure 6. Change in Subjective Health Status**

"How is your health status compared to the pre-disaster 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**

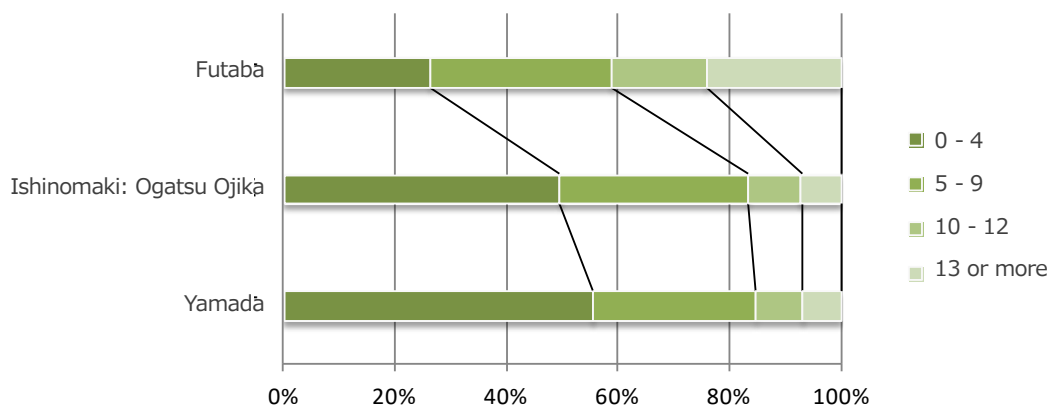


(Note) K6 score indicates the level of psychological distress, and the higher the value, the higher the level of stress.

(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)

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 Ogatsu and Ojika area of Ishinomaki and Yamada 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

**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

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, with further analysis, we 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 generalized trust tend to keep good mental health status after the disaster.

In addition, hearing from some Futaba residents about their psychological distress caused by the substantial deduction of their living space at evacuation destinations compared to homes they used to live in Futaba, we tested if the deduction of living space led psychological distress among Futaba residents using our dataset. As a result, even after controlling for age, gender and income level, we found that those who used to live in larger homes in Futaba tend to have higher K6 scores after the disaster. In other words, those who used to live in larger homes before the disaster tend to be under higher stress after the disaster. The result empirically supports the opinions of Futaba residents that the deduction of living space caused by the disaster led psychological distress among Futaba residents.

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 20% 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

### A1. Who is filling out this questionnaire?

	Freq	%
Head of household	400	68.38
Spouse of the head of household	141	24.10
Deputy of the head of household	2	0.34
Son/daughter of the head of household	25	4.27
Other	9	1.54
No answer	8	1.37
<b>Total</b>	<b>585</b>	<b>100.00</b>

### A2. How many times have you answered questionnaire surveys related to the Great East Japan Earthquake so far (not including this survey) ?

	Freq	%
15 or more	31	5.30
10 - 14	60	10.26
6 - 9	170	29.06
3 - 5	238	40.48
1 - 2	58	9.91
0	6	1.03
No answer	22	3.76
<b>Total</b>	<b>585</b>	<b>100.00</b>

### B1. Please tell us about the household head.

#### (1) Basic information of the household head

a) Average age: 63 yrs Oldest: 94 yrs Youngest: 24 yrs

b) Gender distribution, Male: 77% Female: 21%  
No response: 2%

#### c) Current prefecture

We received answers from all over Japan. Thank you.  
(The aggregate result is omitted.)

#### d) Current dwelling type

	Freq	%
Temporary shelter	60	10.26
Municipal housing	29	4.96
Governmental housing	18	3.08
Post-disaster public-funded rental accommodation	294	50.26
Company housing	17	2.91
House of parents / son / daughter	24	4.10
House of siblings	3	0.51
House of other relatives	4	0.68
Owned house, detached. (different from the one before the earthquake)	52	8.89
Other	77	13.16
No answer	7	1.20
<b>Total</b>	<b>585</b>	<b>100.00</b>

### Sd1. How many neighbors from Futaba whom you did not know before the disaster do you have?

	Freq	%
More than 20 families	56	9.57
10~19 families	20	3.42
6~9 families	38	6.50
3~5 families	84	14.36
1~2 families	97	16.58
None	278	47.52
No answer	12	2.05
<b>Total</b>	<b>585</b>	<b>100.00</b>

### Sd2. How many neighbors from Futaba whom you have known since the pre-disaster period do you have?

	Freq	%
More than 20 families	43	7.35
10~19 families	24	4.10
6~9 families	47	8.03
3~5 families	79	13.50
1~2 families	138	23.59
None	246	42.05
No answer	8	1.37
<b>Total</b>	<b>585</b>	<b>100.00</b>

### e) Current job of the household head

	Freq	%
Company employee / Civil servant	148	25.30
Agriculture and Forestry	9	1.54
Fishery	1	0.17
Self-employed business	23	3.93
Free practice of medical practitioners, attorneys, etc.	1	0.17
Housekeeper	14	2.39
Student	0	0.00
Retired	181	30.94
Unemployed or on leave of absence	125	21.37
Part-time job	15	2.56
Other	50	8.55
No answer	18	3.08
<b>Total</b>	<b>585</b>	<b>100.00</b>

### f) How did you get a new job after the disaster?

	Freq	%
Public employment security office	17	2.91
Exam (e.g. civil servant)	3	0.51
Introduction from public institutes	15	2.56
Introduction from relatives	4	0.68
Introduction from friends	10	1.71
Introduction from alumni	1	0.17
Website for job information	3	0.51
Self-employed	12	2.05
Other	32	5.47
No answer/Not applicable	488	83.41
<b>Total</b>	<b>585</b>	<b>100.00</b>

g) Job before the Great East Japan Earthquake.

	Freq	%
Company employee / Civil servant	220	37.61
Agriculture and Forestry	58	9.91
Fishery	0	0.00
Self-employed business	55	9.40
Free practice of medical practitioners, attorneys, etc.	3	0.51
Housekeeper	10	1.71
Student	0	0.00
Retired	86	14.70
Unemployed or on leave of absence	17	2.91
Part-time job	14	2.29
Other	39	6.67
No answer	83	14.19
<b>Total</b>	<b>585</b>	<b>100.00</b>

h) How did you get a job before the disaster?

	Freq	%
Public employment security office	35	5.98
Exam (e.g. civil servant)	70	11.97
Introduction from public institutes	13	2.22
Introduction from relatives	55	9.40
Introduction from friends	53	9.06
Introduction from alumni	4	0.68
Website for job information	11	1.88
Self-employed	71	12.14
Other	60	10.26
No answer/Not applicable	213	36.41
<b>Total</b>	<b>585</b>	<b>100.00</b>

i) Academic history of the household head

	Freq	%
Junior high school	46	7.86
High school	329	56.24
Junior college / technical college	49	8.38
University	73	12.48
Other	43	7.35
No answer	45	7.69
<b>Total</b>	<b>585</b>	<b>100.00</b>

B2. Family structure

(The aggregate result is omitted.)

C1. Which area of Futaba did the household head live before the disaster?

	Freq	%
Ishiguma	14	2.39
Yamada	42	7.18
Matsuzako	2	0.34
Mizusawa	7	1.20
Mesaku	4	0.68
Koriyama	43	7.35
Kamihatori	14	2.39
Niiyama	135	23.08
Matsukura	2	0.34
Terasawa	10	1.71
Shibukawa	7	1.20
Konokusa	22	3.76
Hosoya	10	1.71
Shimohadori	14	2.39
Nakata	7	1.20
Nagatsuka	173	29.57
Morotake	5	0.85
Nakahama	5	0.85
Nakano	8	1.37
Maeda	53	9.06
Other	3	0.51
No answer	5	0.85
<b>Total</b>	<b>585</b>	<b>100.00</b>

C2. How often do you help or receive help from your neighbors before and after the disaster?

	Before the disaster (%)	Recently (%)
Quite often	45.81	3.25
Moderately	42.22	21.88
Not much	7.18	35.90
None	3.93	37.09
No answer	0.85	1.88
<b>Total</b>	<b>100.00</b>	<b>100.00</b>

C3. What kinds of help did you received from neighbors?

	Before the disaster (%)	Recently (%)
Agricultural works	20.51	0.51
Fishery works	0.17	0.00
Taking care of kids	11.79	2.05
Sharing staffs	82.74	46.50
Other	11.28	13.50

C4. My neighbors help me when I'm in trouble.

	Before the disaster (%)	Recently (%)
Strongly agree	31.79	4.96
Agree	40.68	14.53
Can't say either	17.95	28.38
Don't agree	4.44	21.03
Not at all	1.71	27.52
No answer	3.42	3.59
<b>Total</b>	<b>100.00</b>	<b>100.00</b>



C5. Life style before and after the disaster

I often go out and leave the door unlocked.

	Before the disaster (%)	After the disaster (%)
Yes	45.47	4.96
No	51.28	90.94
Don't know	0.34	1.37
No answer	2.91	2.74
Total	100.00	100.00

I often lend money or goods to friends.

	Before the disaster (%)	After the disaster (%)
Yes	25.98	2.74
No	67.18	90.94
Don't know	2.56	2.39
No answer	4.27	3.93
Total	100.00	100.00

I have been a victim of burglary, including at my home in Futaba, when I was not home.

	Before the disaster (%)	After the disaster (%)
Yes	12.31	12.65
No	77.44	67.35
Don't know	6.15	14.19
No answer	4.1	5.81
Total	100.00	100.00

I have been a victim of other crimes

	Before the disaster (%)	After the disaster (%)
Yes	5.3	5.81
No	84.1	76.41
Don't know	4.44	9.23
No answer	6.15	8.55
Total	100.00	100.00

I think most people try to be fair.

	Before the disaster (%)	After the disaster (%)
Yes	60.68	30.6
No	6.5	15.9
Don't know	27.35	47.18
No answer	5.47	6.32
Total	100.00	100.00

I think that I am trusted by others.

	Before the disaster (%)	After the disaster (%)
Yes	58.12	24.27
No	3.08	8.03
Don't know	35.38	63.76
No answer	3.42	3.93
Total	100.00	100.00

C6. Generally speaking, would you say that most people can be trusted or you can't be too careful in dealing with people?

	Before the disaster (%)	After the disaster (%)
Always trusted	19.66	6.50
Usually trusted	55.90	36.24
Usually not trusted	16.07	36.58
Always not trusted	5.64	18.29
No answer	2.37	2.39
Total	100.00	100.00

C7. Average hours to engage in volunteer work, hobby gatherings and talikg with people

- a) Volunteer activities before the disaster: 1.31 hrs / week  
Volunteer activities after the disaster: 0.87 hrs / week
- b) Hobby gatherings before the disaster: 2.60 hrs / week  
Hobby gatherings after the disaster: 1.03 hrs / week
- c) Talking with family before the disaster : 3.57 hrs / day  
Talking with family after the disaster : 3.22 hrs / day
- d) Talking with friends before the disaster : 1.87 hrs / day  
Talking with friends after the disaster : 0.80 hrs / day
- e) Number of non-family members to exchange greetings:  
Before the disaster : 15.71 / day  
After the disaster : 6.86 / day
- f) Number of friends from the pre-disaster period:  
Before the disaster: 15.71  
After the disaster: 7.77
- g) Number of new friends who got to know after the disaster:  
4.37

C8. How is the current health of the household head compared to the condition before the disaster?

	Freq	%
Much better	4	0.68
Better	19	3.25
Remains unchanged	157	26.84
Worse	281	48.03
Much worse	64	10.94
No answer	60	10.26
Total	585	100.00

C9. 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	Some 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	137	23.42
5 ~ 9 points	171	29.23
10 ~ 14 points	129	22.05
15 points or more	87	14.87
No answer	61	10.43
Total	585	100.00

D1. Dwelling type before the Great East Japan Earthquake

	Freq	%
Owned house / Family member's owned house	436	74.53
Other	81	13.85
No answer	68	11.62
Total	585	100.00

SD1. Size of the land and living space of residence before the Great East Japan Earthquake

(The aggregate result is omitted.)

SD2. Material for the house in Futaba

(The aggregate result is omitted.)

SD3. Age of the house in Futaba

(The aggregate result is omitted.)

D2. Damage to home in Futaba (Not including the radiation effect)

	Freq	%
Completely destroyed	28	4.79
Partial collapse	57	9.74
Partial destruction	243	41.54
No major damage	224	38.29
Other	17	2.91
No answer	16	5.74
Total	585	100.00

D3. Current status of home in Futaba

	Freq	%
Able to live in it again with cleaning	142	24.27
Partial construction is mandatory to live in it again	197	33.68
Rebuilding is mandatory	210	35.9
No answer	36	6.15
Total	585	100.00

D4. Compensation for home received

	%
1. Public support (victim's life rebuilding support)	7.01
2. Earthquake insurance / fire insurance	40.85
3. TEPCO	43.42
4. Other	9.4

→ Which support was the largest ?

	Freq	%
1. Public support (victim's life rebuilding support)	7	1.20
2. Earthquake insurance / fire insurance	116	19.83
3. TEPCO	184	31.45
4. Other	6	1.03
No answer	272	46.50
Total	585	100.00

D5. Have you received compensations from TEPCO?

	Freq	%
Yes	497	84.96
No	67	11.45
No answer	21	3.59
Total	585	100.00

D6. How did you cover the expenditure caused by the disaster?

	%
1. Earthquake relief money	61.54
2. Support from relatives	26.31
3. Support from friends	11.62
4. Loan from bank	3.08
5. Saving	75.56
6. Other	11.79

→ Which was the largest ?

	Freq	%
1. Earthquake relief money	84	14.70
2. Support from relatives	25	4.27
3. Support from friends	6	1.03
4. Loan from bank	6	1.03
5. Saving	223	38.12
6. Other	43	7.35
No answer	198	33.84
Total	585	100.00

D7. The place the head of household stayed after the disaster

A) Location (%)					
	March 11 to 14, 2011	March 15 to 18, 2011	March 19 to May 11, 2011	May 12 to Sep 11, 2011	Sep 12, 2011 to June 30, 2013
Within 20 km radius from the Fukushima Daiichi Nuclear Powerplant	51	9	1	1	1
Fukushima (Not within 20km radius from the Fukushima Daiichi Nuclear Powerplant)	50	54	26	32	40
Outside of Fukushima	7	86	61	50	47
B) Dwelling type (%)					
	March 11 to 14, 2011	March 15 to 18, 2011	March 19 to May 11, 2011	May 12 to Sep 11, 2011	Sep 12, 2011 to June 30, 2013
Home in Futaba	27	1	0	0	0
Evacuation shelter/tent/car	57	40	22	14	7
Hotel	3	5	7	8	2
Home of parent/son/daughter	9	12	18	10	6
Home of siblings	5	10	12	4	2
Home of other relatives	10	15	14	4	1
Home of friends	2	4	4	1	1
Temporary shelter	0	0	1	3	8
Municipal housing	1	0	4	10	9
Governmental housing	0	0	0	1	3
Rented	2	2	14	29	42
Companys' housing for their employees	0	0	1	2	4
Owned house (Other than the one in Futaba)	0	0	0	1	6
Other	6	5	7	7	8

D8. The major route of information acquisition

	March 11 to 14, 2011	March 15 to 18, 2011	March 19 to May 11, 2011	May 12 to Sep 11, 2011	Sep 12, 2011 to June 30, 2013
TV	56	64	22	69	73
Radio	28	19	12	11	10
Internet	3	5	10	15	21
Cell phone/Smart phone	16	16	21	20	21
Community wireless system	16	2	1	0	0
Friends/neighbors from Futaba	20	15	15	15	20
Alumni	2	2	3	3	3
Relatives	9	12	15	12	11
Town office	21	18	24	34	42
Prefectural office	1	2	7	11	17
Government	1	1	3	6	8
People who met during the evacuation	1	1	3	6	8
Local governments of the evacuation destinations	6	9	9	11	14
Other	6	6	7	8	9

D9. Among the family members with whom you lived before the Great East Japan Earthquake, are there any family members who died after the earthquake?

(The aggregate result is omitted.)

D10. Household yearly income before and after the disaster

	Before the disaster (%)	After the disaster (%)
Less than 1 mill JPY	5.30	15.90
1 to 2 mill JPY	8.72	17.44
2 to 3 mill JPY	15.38	17.09
3 to 4 mill JPY	14.87	14.36
4 to 6 mill JPY	19.66	12.65
6 to 8 mill JPY	12.82	9.06
8 to 10 mill JPY	7.35	3.59
Over 10 mill JPY	7.01	1.03
No answer	8.89	8.89
Total	100.00	100.00

D11. Does the household head plan to return to Futaba in the future?

	Freq	%
Yes	56	9.59
Haven't decided	176	30.14
No/Cannot	335	57.36
No answer	18	2.91
Total	585	100.00

D12. 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.