博士論文

Social Capital and Mental Health among Displaced Residents from Fukushima

（福島県避難者のソーシャルキャピタルとメンタルヘルス）

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Dedication

To my husband, Navid, for all his support and love.

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Acknowledgement

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Chapter 1

Research Background

I. Introduction

More than six years have passed since the 11 March 2011 Great East Japan Earthquake and the resulting tsunami and nuclear reactor meltdowns. The compound disaster claimed some 18,500 lives and destroyed thousands of homes and businesses along the coast of the Tohoku region causing more than $250 billion in losses (National Police Agency of Japan 2015; Cabinet office of the Government of Japan 2011).120,000 people remain displaced from their homes in Fukushima prefecture because of radioactive fallout from the Fukushima Dai-ichi nuclear plant; thousands of others remain in temporary shelters in non-irradiated areas awaiting permanent shelter (*Mainichi Shinbun* 8 March 2015). Evacuees from the disaster face various challenges such as uncertainty about their livelihoods and health, a loss of normalcy, and the evacuation of their homes and towns. Comparative epidemiological research has shown that disasters negatively affect the mental health of survivors (Deeg et al. 2005; Reininger et al. 2013).

Initial surveys of the evacuees from the 2011 Tohoku disaster observed a similar phenomenon of increased stress and higher levels of psychological distress (Yabe et al. 2014; Niwa 2014). Epidemiological surveys conducted in Fukushima illustrated the importance of mental health care among Fukushima residents (Yasumura et al. 2012). To cope with these problems and to improve the recovery policies, social capital is one of the key concepts. It is currently gaining great attention as a key notion for recovery and disaster preparedness in the disaster affected areas and its role to maintain health is also getting attention as we can see from literature claiming deeper reservoirs of social capital can improve disaster survival and

improve physical and mental health (Aida et al. 2013). One study of Miyagi prefecture showed that high level of social cohesion was associated with a lower risk of post traumatic disorder after the disaster (Hikichi et al.2016). The residents of Miyagi prefecture were mostly affected by tsunami but not the nuclear power plant meltdowns. We still lack a clear understanding of the role of social capital in maintaining mental health among the evacuees from Fukushima.

To bridge the gaps in the literature, we measure and analyze the levels of social capital and mental health of displaced residents from a town of Futaba in Fukushima Prefecture through multiple survey research. For analysis, first, we compare mental health status of Futaba residents with that of overall Japan and other disaster affected areas, and tracked the change of social capital before and after the disaster. Second, we analyze association between social capital and mental health. Third, using natural experimental situation provided by the disaster, we test a canonical version of the prospect theory for better understanding of social determinants of mental health status among Futaba residents.

We uncover four important findings. First, the average level of mental stress among displaced Futaba residents is unusually high compared with all Japanese citizens. Their psychological distress scores are high even compared to individuals living in areas of Tohoku affected by the earthquake and tsunami but not directly affected by the nuclear catastrophe. Second, social capital has substantially declined among Futaba residents after disaster and it would take time for recovery. Third, high levels of social capital captured by the number of neighbors from Futaba, participation in volunteer work and engagement in social events act as a shield against unusually poor mental health. Fourth, we find that house size change caused by the disaster and mental health status have loss aversion relationship.

This thesis makes several contributions to the literature and brings important policy implications. First, it is the first study to quantitatively investigate the nexus between mental

health and social capital among the displaced population from Fukushima and demonstrate a positive association with social ties. Furthermore, this is the first study that measured social capital before and after the disaster and that continuously measured change of social capital after the disaster among Fukushima residents. Next, we find that influence of a nuclear power plant accident on mental health is more serious than that of other natural disasters. The results bring important policy implications for disaster managers, vulnerable communities, and decision makers because we need different toolkits for improving mental health in a nuclear crisis. As social capital acts as a shield against psychological distress, we also suggest that decision makers implement evacuation plans which ensure – as much as possible – continuity among social networks through techniques such as keeping evacuees from the same original community together in temporary shelters. Disaster managers should support local community activities such as volunteer work opportunities and social activities. Moreover, we test the prospect theory using natural experimental situation and find that change of house size caused by the disaster and mental health have loss aversion relationship, which is new empirical evidence of the prospect theory. In addition, our results imply that there is a possibility of reference point movement in dimension of income change, which can provide important policy implication about compensation policy for disaster affected residents.

The rest of the thesis is organized as follows: Rest of chapter one covers literature review and explains our study purpose. Chapter 2 discusses the data collected exclusively for this study and overviews our method of analysis. Chapter 3 shows our first analysis on the impact of disaster on mental health and social capital among Futaba residents. Chapter 4 presents our main analysis result on association between social capital and mental health among Futaba residents. Chapter 5 presents another main body of analysis which is testing the prospect theory using our unique dataset. Finally, Chapter 6 concludes our findings.

II. Literature on Social Capital and Mental Health in Disaster Settings

In this section, we first review definition and measurement of social capital. Then, we review studies of social capital and mental health in disaster settings.

1. Social Capital

(1) Definition of Social Capital

First of all, what is social capital? Because of its broad dissemination among various disciplines such as sociology, political science, anthropology, and economics, there have been no single universal definition of social capital (Kawachi et al. 2013). To understand the concept, it is convenient to use two different perspectives used by Kawachi et al (2010) which are social cohesion and network view. They define social cohesion school of social capital is conceptualized as the resources available to members of social groups such as trust, norms, and exercise of sanctions. The important point is that social capital is recognized as a group property, not individuals who belongs to the group. Therefore, the uncooperative individual still can get benefit by social capital if other members in the group are cooperating each other. On the other hand, network view of social capital sees social capital as resources such as social support and information channels embedded within an individual's social network as Lin (1999) defines (Kawachi et al. 2010).

Another widely used important categorization of the notion of social capital would be the three categories of bonding, bridging, and linking social capital (Aldrich 2012). The view can be further categorization of network view of social capital. Aldrich's clear figure explaining three aspects of social capital is shown in Figure 1.1 borrowed from his book "Building resilience." Bonding social capital "refers to the links between like-minded people, or the reinforcement of homogeneity. It builds strong ties, but can also result in higher walls

excluding those who do not qualify (Baron et al. 2001). ” In other words, it can be defined as connection between individuals within a certain community. Bridging social capital is defined as connection between “members of the group or network to extralocal networks, crossing ethic, racial, and religious cleavages (Aldrich 2012).” It can be said that bridging social capital is horizontal connection between individuals in different communities. Finally, linking social capital would be defined as “norms of respect and networks of trusting relationships between people who are interacting across explicit, formal, or institutionalized power or authority gradients in society (Szreter and Woolcock 2004).”In other words, linking social capital is connection between communities and authorities.

Thinking about different categorization of social capital, it would be important to clarify who this capital belongs to. Inaba (2005) has defined three categories of social capital which are social capital as personal goods, social capital as public goods, and social capital as club goods. Social capital as personal goods can be explained as the network between people, social capital as public goods can be explained as general trust and norms in the society, and social capital as club goods can be explained as trust and norm within certain groups (Inaba 2011). In addition, social capital as club goods could also be explained as network between communities or network toward governmental authorities, which encompasses the categorization of social cohesion

Furthermore, there is another commonly used categorization of social capital which are, cognitive social capital and structural social capital. Structural social capital consists of what people do which could be objectively verified while cognitive social capital consists of what people feel and therefore it is subjective (Harpham 2010).

(2) Measurement of Social Capital

There are various proxies to measure social capital. Harpham (2010) selects following

6 aspects for measuring community level social capital in survey. First one is networks including connections to informal and formal groups such as question asking “In the last 12 months, have you been an active member of any of the following groups in *name of place*?” Second one is civic participation asking like “In the last (recall period), have you done something for your neighborhood as a whole?” Third one is perceived social support which Harpham (2010) mentions that it is helpful to separate into instrumental, emotional, and informational support. An example question is “in the last 12 months, have you received any help or support from any help or support from any of the following, this can be emotional help, economic help or assistance in helping you know or do things?” Fourth one is Trust. One of the commonly used way to measure trust is the question on trust in the General Social Survey often called “GSS TRUST”. The question is “Generally speaking, would you say that most people can be trusted or that you can’t be too careful in dealing with people?" The respondents choose answer from three choices which are “Most people can be trusted,” “Can’t be too careful,” and “Depends.” There are questions refer to familiar/personal trust as well such as SOCAT asking “do you think that in this community people generally trust one another matters of lending and borrowing?” Fifth aspect is reciprocity which is the willingness to help others with the expectation that the favor will be returned to themselves when necessary. For example, Harpham (2010) show that ASCAT question asking “In general, people around here are willing to help each other out.” He also mentions such question can be included asking “in the past six months, how often have you helped neighbors?” Sixth aspect is informal social control, which is community’s collective capacity of action which is often measured by likelihood of people in a community acting when something bad such as fighting or children drawing in not allowed places being done.

As measurements of individual level social capital, Gaag and Weber (2010) introduce three types of measurements which are name generator, position generator and resource

generator. Name generator asks a respondent to mention names of persons he/she knows and then asks information about all relationships with focal individual to assess types of resources. Position generator is a method focusing more on presence of social resources. Gaag and Weber (2010) explains that it typically asks about 10 to 30 different occupations if a respondent knows anyone having this occupation. Resource generator is a method using a checklist where access is checked against a list of useful and concrete social capital such as if one knows anyone who knows a lot about DIY, who has a professional occupation, and so on.

As Anderson et al. (2004) shows its effectiveness of measuring social capital using economic experiment, conducting economic experiments such as public goods game, trust game and dictator game is also another unique way of measuring social capital.

Various researches have made social capital index to measure multidimensional social capital as well. For example, Cabinet Office of Japan has made a Social Capital Index to compare social capital between prefectures in Japan. The proxies chosen by Cabinet Office are shown in Table 1.1.

2. Social Capital and Mental Health in Disaster Settings

(1) Literature

Disasters destroy physical and mental health of the population. Various research have reported mental health problems of the disaster affected people. The risk prevalence of Post-Traumatic Stress Disorder (PTSD) is reported to be higher after humanmade disasters than that of natural disasters (Neria et al., 2008). Bromet (2012) also reports that Chernobyl disaster affected residents show a two-fold increase in post-traumatic stress and other mood and anxiety disorders and poorer subjective ratings of health (Bromet 2012). Recent study report that high risk prevalence of PTSD among Fukushima evacuees (Tsujiuchi 2015). Disasters also destroy physical and social environment, which can affect population health in

long term. (Aida et al. 2013) It has been reported that forced reallocation following the destruction of a community can increase health problems (Uscher-Pines, 2009; Yzermans et al., 2005). To mitigate disasters' impact and also to facilitate recovery after disasters, social capital is getting attention as a key notion (Hawkins and Maurer 2010). Aldrich (2012) explores various disasters and explain the role of social capital for better resilience. Hikichi (2015) also reports that pre-disaster levels of connection between people lead cooperation between people after disaster and effective livelihood support for affected reside under the Great East Japan Earthquake. Moreover, social capital is said to have a potential to population health right after a disaster and also to reduce long term health impact caused by a disaster (Aida et al. 2013; Aida and Kondo 2014). In this section, we review literature on social capital and mental health in disaster settings.

Using Web of Science, we soughed literature examined association between social capital and mental health in disaster settings. This search was conducted in May 5, 2017. First we used the term "social capital" or "social cohesion" and refined search results with "disaster" and further refined search results with "mental health" and reached to 47 research abstracts. Among these 47 articles there are 19 empirical studies from 12 disasters. These 19 empirical studies are reviewed in following. Among these 19 empirical studies, all are published after 2010 and 9 are published in or after 2015, which shows that this field of study is in the beginning stage and getting increasing interest.

Human Rights Abuse in Nigeria (1995)

Beiser et al. (2010) conduct empirical study in 2002 examining association between social capital and mental health under long term human rights abuse in Niger Delta region of Nigeria whose apogee of the violence was in 1995. They conduct interview to a total of 100 residents both from a seriously affected village and a not affected village. Their interview

contains PTSD module from WHO Diagnostic Interview Schedule and social capital measurements, which include economic security, a sense of moral order, a sense of safety and perceived social support. This is a cross-sectional study and they use logistic regression for calculating association between social capital and prevalence of PTSD. They find that low level of social capital proxies except for economic security are predictors of PTSD.

Hurricane Katrina in the United States (2005)

Four studies examine association between social capital and mental health under the impact of Hurricane Katrina. First, Beaudoin (2011) use their original panel data set obtained from 500 African American Adults in New Orleans in May to Jun 2006 and in September 2006 after Hurricane Katrina. They examine association between social capital related measures and cigarette smoking and alcohol consumption after the disaster and also assess whether social capital related measures moderate the influence of PTSD to increase cigarette smoking and alcohol consumption. They made social capital related variables "neighborliness" and "provided social support" by conducting a factor analysis from following questions for each variable. Neighborliness is measured by following three questions. "After Hurricane Katrina, about how often have you borrowed from or lent things to your neighbors in New Orleans?", "After Hurricane Katrina, about how often have you and your neighbors in New Orleans helped one another with tasks, such as house repairs and house cleanup?" and "After Hurricane Katrina, about Probability how often have you worked on a community project in New Orleans?" Provided social support is measured by following three questions. "After Hurricane Katrina, about how often have you given advice to people in New Orleans who are not members of your immediate family?", "After Hurricane Katrina, about how often have you offered emotional support to people in New Orleans who are not members of your immediate family?" and "After Hurricane Katrina, about how often have

you tried to comfort people in New Orleans who are not members of your immediate family?" Respondents choose among range from 1 = never to 5 = very often. As a result, they find that neighborliness predicts increased alcohol consumption, high provided social capital predicts quitting cigarette or never initiating smoking behavior, and neighborliness moderate the association between PTSD and alcohol consumption among people with high PTSD.

Second, Weil et al. (2012) analyze over time impact of social embeddedness and trust on stress using original dataset obtained by three waves of interview survey conducted toward randomly selected age 18 and over residents in East Baton Rouge Parish, LA who had already lived in Baton Rouge before the Hurricane, i.e. no evacuees included. Interview was conducted between September 2005 and April 2007 with respondents of 1,349 for first round of survey, 1,008 for second round, and 603 for the third round. These data consist of repeated cross section data set to be analyzed. As to social capital measures, four scales are used for measuring social embeddedness: Associational Involvement, Civic Leadership, Faith-Based Engagement and Informal Socializing. Interpersonal Trust and Inter-Racial Trust are used for measuring trust. They employ various stress indicators such as depression, anger, fear of social disorders and evacuees, and feelings of aggravation about traffic congestion, crowding in neighborhoods, stores, and schools, telephone disruptions, and rudeness. All social capital indices and stress factors are created using a principle components factor analysis for further analysis. They find that right after the disaster, a person with high social capital experience higher stress, then eventually turns that a person with high social capital experiences less stress.

Third, Le (2013) analyze association between social capital and depression using data set from a population-based cross-sectional survey of adults who live in 23 southernmost counties of Mississippi (N = 708) both prior to and after the Hurricane Katrina. Interviews were conducted between February and July 2007. They employ questions asking of five-point

scale how much they agreed that people in their neighborhood after Hurricane Katrina (1) were close knit or unified, (2) were willing to help their neighbors, (3) generally got along with each other, (4) did not share the same values, and (5) could be trusted. The average point of 5 questions give a measure of individually perceived social cohesion. The individual social cohesion within each county are averaged to estimate county-level social cohesion. Also, social support is measured with seven-point scale to describe how often they received various informal supports from others during the 2-month period after Katrina. Each individual's points were summed to give a score. They find that joint exposure to displacement and low county-level social cohesion are associated with high risk of depression, while exposure to just one of the factors is associated with only small risk of depression.

Flood in Morpeth, England (2008)

Wind et al. (2011) analyze the association between social capital and mental health using their original data set obtained from 232 respondents from a small town of Morpeth in England hit by one of its worst flood since 1963 in September 2008. Symptoms of anxiety and depression are assessed by the Hopkins Symptom Checklist-25 and symptoms of PTSD are assessed by the PTSD Checklist Civilian Version. For social capital measure, they select the SA-SCAT which enable them to differentiate impact of cognitive and structural social capital. They find that cognitive social capital is positively associated with lower mental health problems, while structure social capital is associated with more anxiety. Furthermore, Wind and Komproe. (2012) did further study using same dataset examining association between posttraumatic distress and social capital measures. They find that high community social capital indirectly predicts less posttraumatic stress.

Flood in South Yorkshire and Worcestershire in England (2007)

Greene et al. (2015) test whether strong neighborhood social cohesion protects residents from the psychological harm caused by flooding using the survey data obtained from 2,238 individuals living in flood-affected areas in England (South Yorkshire and Worcestershire). The flood occurred in Jun and July of 2007 and the survey was conducted in September to October in 2007 in South Yorkshire and in January to February in 2008 in Worcestershire. Psychological distress was measured with the General Health Questionnaire (GHQ-12). Social cohesion was measured with the Neighborhood Cohesion Scale. (Buckner 1988; Robinson and Wilkinson 1995) They use Bayesian structural equation modeling to assess factors relating to the latent variables of resilience including social cohesion. They find that resilience and social cohesion are important predicts on undermining the risk of developing poor mental health.

War in Northern Sri Lanka (1983-2009)

Somasundaram and Sivayokan (2013) conducted qualitative study in post-war Northern Sri Lanka to understand common psychosocial problems faced by families and communities and the associated risk and protective factors. Case studies and clinical interviews are carried out by the principal author and by trained mental health workers. They point out that risk factors that impedes community rehabilitation and recovery included continuing military governance, depletion of social capital, particularly lack of trust.

Earthquake in Pisco, Peru (2007)

Flores et al. (2014) evaluate the association between Post-Traumatic Stress Disorder and both structural and cognitive social capital among adult survivors of the earthquake in Pisco, Peru in 2007. They used their original population-based cross-sectional data set

collected in five counties in Pisco, selecting 1012 adults through complex, multi-stage random sampling. They use Adapted Social Capital Assessment Tool (SASCAT) and the civilian PTSD checklist (PCL-C) for measurement of social capital and mental health. They find that cognitive social capital was found to be negatively associated with chronic PTSD but no significant association was found between structural social capital and chronic PTSD.

Indian Ocean Tsunami in India (2004)

Augustine (2014) examined relationship between posttraumatic growth and certain demographic, individual, family, and community (social capital) variables using original dataset obtained from 301 participants recruited from the tsunami-affected villages in the Karunagappally taluk (a group of several villages organized for revenue purposes) in Kerala, India two years after the disaster. For measuring social capital, he uses a six-item questionnaire (Krishna, 2002) that is especially developed for exploring informal networks that are common in rural India. It includes questions on membership in labor-sharing groups, how to deal with crop disease, how to deal with natural disasters, public spiritedness, solidarity, and willingness of owning land by themselves or collectively. As to measure posttraumatic growth, he employs Posttraumatic Growth Inventory (PTGI; Tedeschi and Calhoun 1995, 1996). As a result of analysis, on contrary to his expectation, he finds no evidence that social capital contributes to posttraumatic growth.

Hurricane Sandy in the United States (2012)

Lewe et al. (2015) examine the influence of both individual- and community-level factors on resilience after Hurricane Sandy using original data collected through telephone interviews conducted after 13 to 16 months of the disaster with a random sampling among adult residents in the disaster affected areas in New York City. Disaster-related posttraumatic

stress (PTS) was measured using the PTSD Checklist for DSM-5 (PCL-5) and depression was assessed using the nine-item Patient Health Questionnaire (PHQ-9). They use the percentage of participants living alone as a community level social capital proxy. They find that living in an area with high social capital (low percentage of living alone) significantly predicts higher PTS.

Typhoon Morakot in Taiwan (2009)

Chao (2016) examines whether community cohesion mediates or moderates the association between outdoor activities and depressive symptoms among the elderly displaced by Typhoon Morakot in Taiwan. He uses cross-sectional dataset including 292 adults aged 65 years or older who were relocated to permanent residence after Typhoon Morakot had damaged their homes in August 2009. Interviews were conducted from February 2013 to September 2013. Depressive symptoms were assessed using a 10-item shortened version of the Center for Epidemiologic Studies Depression Scale (CES-D) developed by Radloff (1977). Community cohesion was assessed using the Neighborhood Social Cohesion and Disorder Scale (Mendes de Leon et al., 2009). Questions includes the degree to which they felt, safe walking alone in the community after dark, people in this community are friendly, the community is kept very clean, people in this community are helpful, many people want to move into this community, they did not belong in this community, public facilities were usually damaged by community residents, and people in the area could not be trusted. They find that community cohesion both mediates and moderates the association between outdoor activities and depressive symptoms, showing that high community cohesion both associates with high participation of outdoor activities and low depressive symptoms and also showing that outdoor activities can have good impact for depressive symptoms only for those with high community cohesion.

Wenchuan earthquake in China (2008)

Cui and Sim (2017) explore elderly people's needs from psychosocial perspectives by qualitative in-depth interviews with 10 elderly persons from a community located in the epicenter of Wenchuan earthquake in 2008. The interviews were conducted in early 2014. They find that one of the major problems is disruption of previous social networks and argue necessity of empowering family and strengthening community cohesion as important initiatives.

The Deepwater Horizon Oil Spill in the United States (2010)

Gaston et al. (2016) assess the associations between depression level and oil spill exposure, socioeconomic risk factors, and social capital. They conducted interview survey in between 2012 to 2014 to 2,852 adult women living in coastal Louisiana parishes at the time of the Deepwater Horizon Oil Spill. CES-D is employed for measuring depression. As social capital proxies, questions measuring perceived social support, social cohesion, social control and neighborhood participation are included. They find that women with the worst mental health status have lower education and income, have a higher rate of unemployment, and have the least perceived social support, which is one of the social capital proxies.

Rung et al. (2017) use same dataset and examine that whether social capital and social support mediate the effects of exposure to the Deepwater Horizon oil spill on depression among women. They use CES-D as depression measure same as Gaston et al. (2016). They categorize social capital proxies to three types, structural social capital, cognitive social capital, and social supports. Structural social capital was measured with nine questions, participation in neighborhood or block organization meeting; business or civic group; nationality or ethnic pride group; local or state political organization; volunteered in a local organization; veteran's group; labor union; literary, art, study, book club, or discussion group;

fraternity, sorority, or alumni group. Cognitive social capital was measured with Sense of community scale (Chavis et al., 1987) and informal social control scale (Sampson et al., 1997). Social support measurement consists of 6 questions asking if you received social support, provided everyday favors, take care if sick, lend money for medical emergency, talk about relationship troubles, locate housing if had to move. They find that structural social capital was associated with increased levels of cognitive social capital, which were associated with higher levels of social support, which in turn were associated with lower levels of depression.

Great East Japan Earthquake (2011)

There are four studies examining social capital and mental health under the Great East Japan Earthquake. Takahashi et al. (2015) launched a health promoting program named Hamarassen Farm targeting residents in temporary housing in Rikuzentakata and evaluated the impact of this program in terms of physical and mental health promotion. Psychosocial well-being, the sense of purpose in life among new 21 participants in Hamarassen farms was measured before the beginning of farming in June and August 2012. The results show that this project have significant contribution to participants' mental health. They argue that this success would partly come from an increased social network and community social capital provided by the project.

Hikichi et al. (2016) examine if pre-disaster level of community social cohesion is associated with a lower risk of PTSD after the Great East Japan earthquake. They by chance have conducted pre-disaster level base line survey of elderly residents who lived in a city 80 kilometers west of the epicenter 7 months before the earthquake in August 2010 (n = 8,576). A follow-up survey was conducted about 2.5 years after the disaster. They use the Screening Questionnaire for Disaster-Related Mental Health (Fujii et al. 2008). Social cohesion was

assessed based on answers to questionnaire items about residents' perceptions of trust asking "Do you think that people living in your community can be trusted in general?", mutual help asking "Do you think people living in your community try to help others in most situations?" and community attachment asking "How attached are you to the community in which you live?" They find that community-level social cohesion before the disaster were significantly associated with lower risks of PTSD symptoms.

Yagi et al. (2016) examine the association between social capital and PTSD symptoms among children and their caregivers recruited from four nursery schools in coastal areas affected by the tsunami, as well as one in an unaffected inland area (N = 94) in Iwate prefecture. Symptoms of PTSD among children are assessed using a caregiver questionnaire, the Parent Report of the Child's Reaction to Stress (Fletcher 1996), from which they choose 28 items to reduce the burden on respondents. Caregiver's mental health is assessed for PTSD symptoms using the self-reported questionnaire, Impact of Event Scale–Revised (IES-R) (Weiss 1996), and depression is assessed using the K6 (Kessler 2002). Social capital is assessed through a questionnaire to caregivers asking their perception of cognitive social capital including social trust and mutual aid in place they live with their family after the disaster. Social trust was assessed by the question, ''do you think that people in your neighborhood trust each other?'' Mutual aid is assessed by the question, ''do you think that people in your neighborhood help each other?'' They find that children of caregivers who perceive high community social capital measured by trust and mutual aid show lower PTSD symptoms and caregiver's mental health mediated the association between social trust and child PTSD symptoms.

Finally, Tsuchiya et al. (2017) examine the association between social capital and psychological distress, considering the interaction of disaster-related house condition after the Great East Japan Earthquake. They use their original data from 3,793 adults living in

Shichigahama, Miyagi Prefecture which was obtained between October and December in 2012. Social capital is measured by generalized trust and psychological distress is measured by K6. They find that individuals with low social capital, large-scale house damage, and displacement were at greater risk of psychological distress.

(2) Further Study and Contribution of Our Study

The number of literature considering social capital and mental health under disaster setting is rapidly increasing but still have many remained problems to be explored. Literature review show that most of them find positive association between social capital and mental health, but not always. To understand the results with different inferences, it should be first noted that not only types of disasters and targets have very different characteristics in each study, but also the proxies of mental health and especially social capital are different in each study. They use different level of social capital; individual level or community level, and different timing of the measurement of social capital; pre-disaster level or after disaster level. Findings of Weil et al. (2012) show that a person with high social capital experiences higher stress right after the disaster, but a person with high social capital experiences less stress after a while directly explains that when the survey was conducted matters. To understand how these differences of the timing from the disaster affect to examine association between social capital and mental health under disaster settings, we need to pile up more empirical studies, and our study contributes as one of the research stocks.

Second, as other remained problems, we can see that there is no study focusing on change in social capital before and after the disaster and examine association of the change of social capital with change in mental health status. Since both mental health and social capital can be negatively affected by the disaster, not only preserved social capital before the disaster, but also how important it is to keep good social capital after the disaster should be

examined in further study which will give insights to the importance of social capital related activities or temporary housing allocation in accordance with pre-disaster living place. In our study, we measure social capital before and after the disaster, which enable us to conduct analysis at least change in social capital and mental health after the disaster, which is remained as our future study.

Third, we can see there is very few panel study in literature. One of the largest challenges in examining association between social capital and mental health is endogeneity. Panel data study can give us one of the solutions to reduce this endogenous bias. Furthermore, not only that there is very few panel study, almost no long-term study is found. Since our survey data has been conducted multiple times including both social capital and mental health measurement, analysis of long term change of those proxies and analysis of association between social capital and mental health using panel data setting will be possible and important future study to work on.

Fourth, not only to ease psychological distress with social capital but also to take advantage of the challenging experience and get better mental health status with social capital is an exciting idea of the healing though only examined by Augustine (2014). Augustine (2014) didn't find any positive association between social capital and posttraumatic growth. But this viewpoint of social capital's role is exciting. We can employ posttraumatic growth measure in our future survey and examine association between posttraumatic growth and social capital change in long term.

Fifth, the ways how a study connect social capital with mental health are different in each study. Our study throws a first insight to view structural social capital to be connected to mental health through cognitive social capital.

Finally, there is a lack of evidence in technological/humanmade disaster compared to natural disasters. Various recent studies in the Great East Japan Earthquake examine social

capital and mental health as reviewed, but none of the study includes residents of Fukushima, seriously affected by the nuclear power plant accident. The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (2012) approved that Fukushima nuclear accident was humanmade accident in the final report. It is definitely important to investigate social capital and mental health under this historically unique experience of the nuclear disaster.

In this study, we aim to contribute to improvement of Fukushima recovery policy and to contribute to literature by filling gaps and adding new insights using our unique data obtained from Fukushima evacuees.

III. Fukushima Nuclear Power Plant Accident and a Town of Futaba in Fukushima

1. Nuclear Power Plant Accident and Evacuation

At 2:46 pm on March 11th, 2011 the Great East Japan Earthquake occurred. Magnitude was 9.0, which is the largest earthquake recorded in Japan. Japan Meteorological Agency Seismic Intensity scaled 7 in Kurihara city of Miyagi prefecture and 6+ in 28 cities and towns in Miyagi, Fukushima, Ibaraki and Tochigi prefecture. 6- or weaker scale of the seismic intensity were observed nationwide from Hokkaido to Kyusyu (Japan Meteorological Agency 2012). The earthquake also brought tsunami and nuclear reactor accident. Maximum height of tsunami was 8.5m in Miyako, Iwate prefecture at 3:26pm on March 11th, 8.0m in Ofunato, Iwate prefecture at 3:18pm on March 11th, 9.3m in Soma, Fukushima prefecture at 3:51pm on March 11th, and 7.6m in Ishinomaki, Miyagi prefecture at 3:25pm on March 11th (Department of International Affairs of Japan Science and Technology Agency 2011). The number of people who died because of this disaster is 15,893, missing 2,556, and injured 6,152 as of December 9th, 2016 (National Police Agency of Japan 2016). From Fukushima

prefecture, 31,936 still live within and 39,218 live outside of Fukushima as evacuees as of May 2017. (Disaster Countermeasures Headquarter of Fukushima Prefecture 2017).

According to Fukushima Revitalization Station (2017), evacuation orders are announced in the following order by the government. On the day the earthquake occurred on 11 March 2011, at 20:50, government placed first evacuation order to those who live within 2 km radius from the Fukushima I Nuclear Power Plant (plant I). At 21:23 on the same day, government broaden the evacuation area to 3 km radius distance from the plant I and they also placed indoor standby order to residents within 10 km radius from the plant I. On March 12th, 5:44, government placed evacuation order to those live in 10km radius from the plant I. On the same day, at 7:45, government placed evacuation order to residents live within 3 km radius from Fukushima II Nuclear Power Plant (plant II), and placed indoor standby order to residents within 10 km radius from the plant II. At 17:39 on 12th, government placed evacuation order to residents within 10 km radius from the plant II and at 18:25, government placed evacuation order to residents within 20km from plant I. On March 15th 11am, government placed indoor standby order to those live within 20km to 30km radius from the plant I.

On April 22, 2011, government established three types of evacuation zones (Fukushima Revitalization Station 2017); they decide the area within 20 km radius from the plant I as hazard area where free entrance is prohibited and area outside of 20 km radius but high contamination of radiation suspected area on northwest side was decided as planned-evacuation area where residents need to evacuate within 1 month. Other than that, within 20 to 30 km radius from the plant I was decided as evacuation area in case of emergency. Figure 1.2 visualize the different types of evacuation areas. On June 16th, since many hotspots were found with high radiation level outside the evacuation areas, government decided those spots as special areas for evacuation recommendation. This evacuation recommendation was

removed by the end of 2014. Also on September 30th, government removed evacuation area in case of emergency.

In April 2012, government reconstructed categorization of evacuation areas under hazard zone and planned evacuation zone as seen in Figure 1.3 (as of April 2015). Government decided area which they are sure that annual radiation exposure level is less than 20millisieverts as zone in preparation for the lifting of the evacuation order. Areas with annual radiation exposure level of over 20millisieverts was decided to be restricted residence area. Entrance to those areas were permitted. However, areas whose annual radiation exposure level exceeds 50millisieverts is defined as difficult-to-return zone and entrance continued to be prohibited. After that, evacuation orders had been removed in various places, but not all as Figure 1.4 shows.

It should be noted that though there are many residents who evacuated following the evacuation order, there are substantial number of residents who evacuated voluntary as Hino (2015) mentions. Comparing to various compensations provided for those who evacuate from the areas under evacuation order, compensations they can receive is much smaller, housing support was almost the only public provided support (Hino 2015). One of the major issues affecting mental health of residents is gaps between compensations among disaster affected areas as Tsujiuchi (2015) reports. Studies focusing on the health status of those voluntary evacuated residents should be encouraged as well as forced evacuated residents.

Tokyo Electric Power Company (TEPCO) have provided various types of monetary compensations to affected residents. One of the largest compensation equally provided for all the residents in evacuated areas was compensation for moral harm. The basic idea of this compensation is providing 100,000 yen per month per person (lump-sum payment was possible) as they pay 6.5 million yen per person as a total by the end of 2017 June and they decided payment of additional 7 million yen per person for after 2017 July. TEPCO also

provides asset compensation covering full price of residents' asset in the town and provides income compensation for almost 3 years which cover full income they were earning before the disaster. Other than these, medical fee, new acquisition of house fee, housing fee, as such many things were covered by compensations for those who lived in the evacuation area. The detailed information of TEPCO's compensation policy is available in their home page (http://www.tepco.co.jp/fukushima_hq/compensation/guidance/index-j.html Accessed 8th May 2017).

2. A Town of Futaba, Fukushima

A Town of Futaba locates 2 km to 10km radius from the plant I and almost all the area belongs to difficult-to-return zone. Futaba consists of 6,128 residents and 2,305 households as of 2017.5.1 according to Futaba town office home page (http://www.town.fukushima-futaba.lg.jp/ Accessed 8th May 2017). Right after the disaster, Futaba town office has provided evacuation shelter in a Stadium in Saitama prefecture and *Kisai* high school about one month after the disaster. *Kisai* high school was closed in the end of 2013 after sending out the last resident to other residence (Author heard from Futaba office). Many residents have moved to apartments and temporary units or newly bought house from those shelters. As of 2017 May, some have already moved into public restoration housing but new entrance is still being processed. Since the case of Futaba is historically very unique in the world, this research would not only contribute to improve recovery policy of the region but also gives special insights for social capital and disaster studies.

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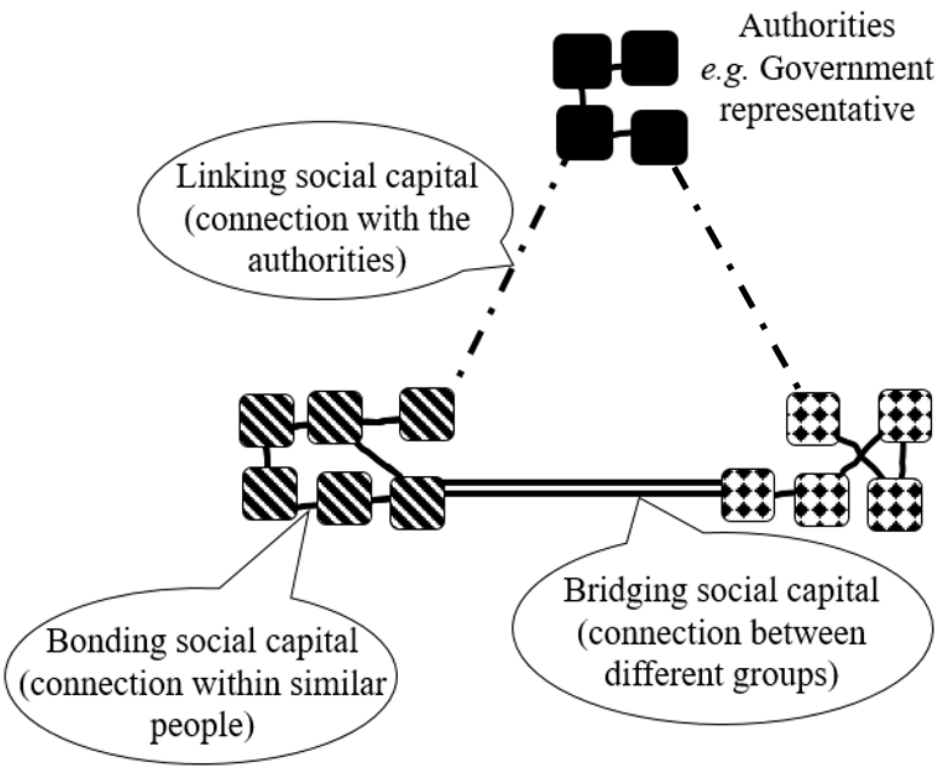

Figure 1.1 Bonding, Bridging, and Linking Social Capital

Notes) Adapted from Aldrich, D. P., 2012. Building Resilience. Chicago: The University of Chicago Press. p 34

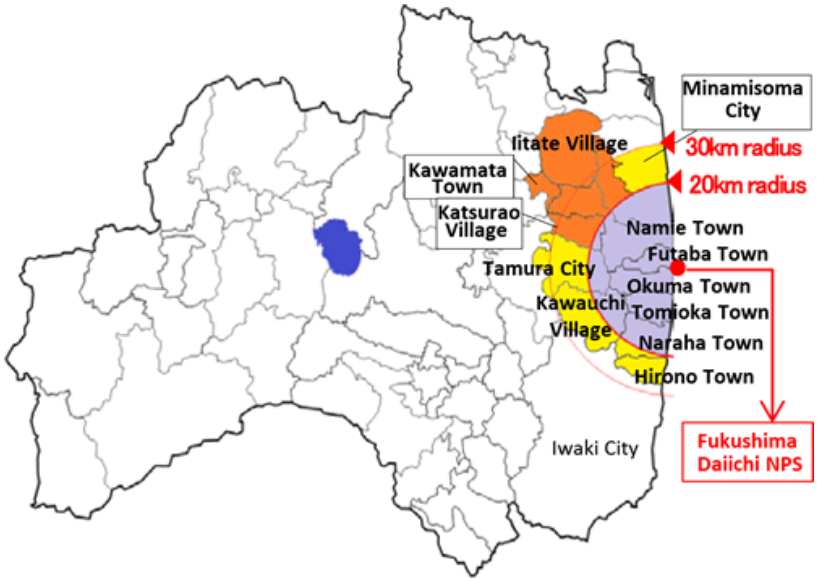

Figure 1.2 Evacuation Instruction as of April 22nd 2011

Source) Fukushima Revitalization Station, 2017. Transition of evacuation instruction zones. http://www.pref.fukushima.lg.jp/site/portal-english/en03-08.html. Accessed 8th May 2017.

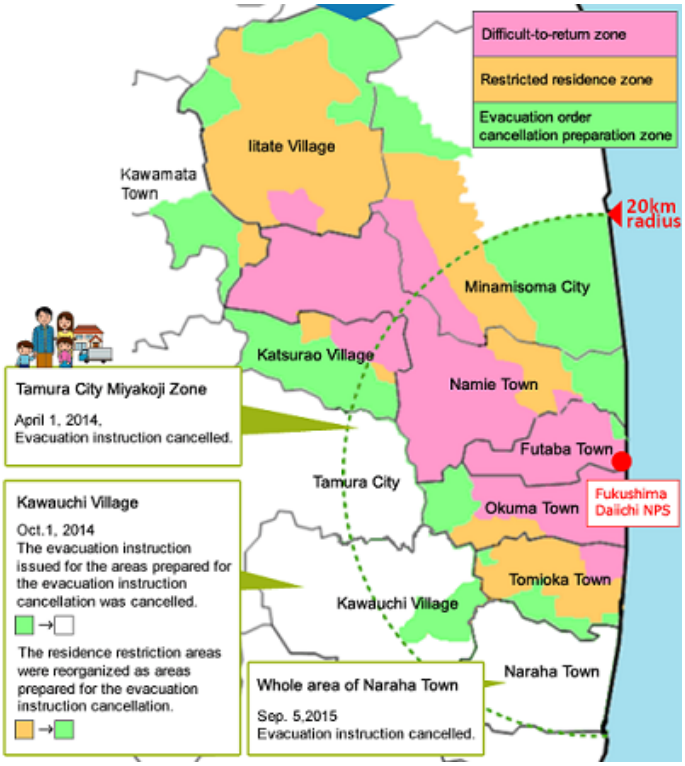

Figure 1.3 Evacuation Instruction as of April 22nd 2015

Source) Fukushima Revitalization Station, 2017. Transition of evacuation instruction zones. http://www.pref.fukushima.lg.jp/site/portal-english/en03-08.html. Accessed 8th May 2017.

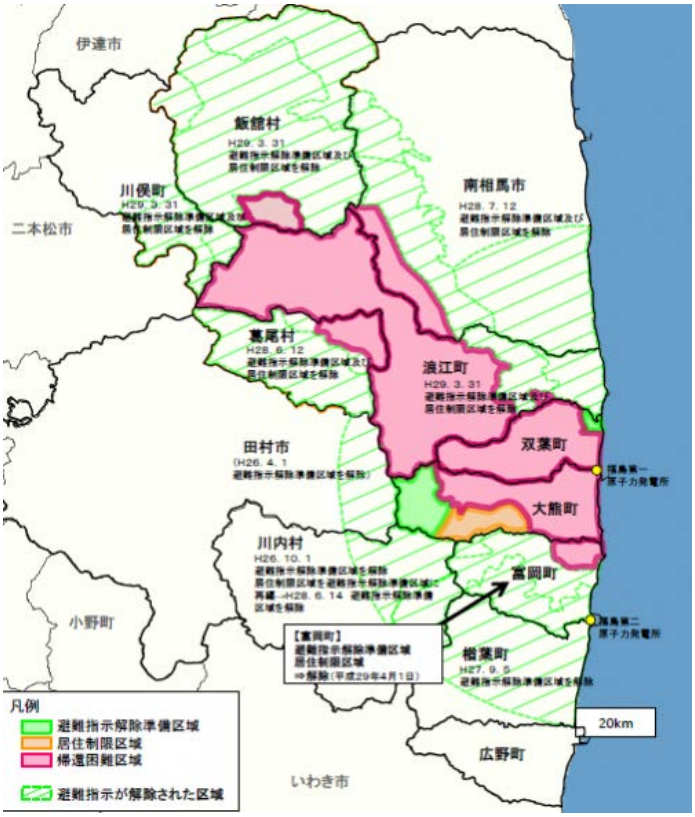

Figure 1.4 Evacuation Instruction as of April 1st 2017

Source) Fukushima Revitalization Station, 2017. Transition of evacuation instruction zones. http://www.pref.fukushima.lg.jp/site/portal-english/en03-08.html. Accessed 8th May 2017.

Table 1.1. 12 Social Capital Proxies Chosen by Cabinet Office, Japan (2003)

Composition	Sub-Index	Detail of Index
I. Network (Network index)	Network with neighbors	(i) Frequency of attending social associations with neighbors (ii) Number of neighbors who have social relationships
	Social network	(iii) Frequency of having social associations with friends (iv) Frequency of having social associations with relatives (v) Participation situation for sport or recreation activities
II. Trust (Trust index)	General trust	(vi) General trust to strangers
	Mutual trust and help	(vii) Trust to neighbors (viii) Trust to Friends (ix) Trust to relatives
III. Participation (Participation index)	Social participation	(x) Participation situation for regional activities (xi) Percentage of participants to volunteer works (xii) Contributuion amount to community chest per person

Chapter 2

Data

I. Data Collection Method

1. Questionnaire

Our original survey questionnaire has been distributed by mail to all the displaced residents from a town of Futaba, Fukushima. As explained in previous parts, Futaba has about 6,900 residents and has about 2,600 households before the disaster. With support of Futaba-town-office, we have distributed the survey to around 2,900 addresses which are recorded as addresses of household in addition to some non-household head people who requested to town office to send the town magazine. Ideally, the survey should have been distributed to all the residents of Futaba, but we have targeted the survey only to household heads because of practical issues. The number of households is about 2,600 and the number of distribution is 2,900, which means that the survey must have been distributed to almost all the household heads of Futaba residents.

The survey was conducted three times so far: July 2013, December 2014, and July 2016. For the first round of the survey, the questionnaire has been distributed with monthly Futaba-town newsletter to residents in July 2013 and we have got 585 answers, which leads response rate of about 20 percent. For the second-round survey conducted in December 2014, we posted directly to those who had written their names and address on the optional page of the questionnaire in the first-round survey, in addition to the distribution by Futaba town office with the Futaba-town newsletter. We have received 654 answers which leads about 22 percentage of response rate. For the third-round survey, following second-round survey, we posted directly to those who had written their names and address in previous surveys in

addition to the distribution by Futaba town office with the monthly Futaba-town newsletter. We have received 499 answers which leads about 17 percent response rate. Response rates presented here is calculated according to the distribution of survey which is 2,900. Since number of household in Futaba is about 2,600 when the disaster occurred and about 2,300 currently, when we consider the actual number of household, actual response rate is higher than what we report here.

The questionnaire includes general information such as age, sex, family composition before and after the disaster, living place before and after the disaster, income before and after the disaster, occupation before and after the disaster, and educational background. We include measurements for social capital before and after the disaster and the K6 questions which are shown in Table 2.1. Furthermore, we include evacuation process after the disaster, way of acquiring information during evacuation, questions asking whether to go back to their home town in the future or not, and how many times they have answered questionnaire survey after the disaster. In second-round survey, we added some questions about happiness, eating habit such as asking how many times to eat outside per week, and purchasing behavior such as how many cars they bought after the disaster. On the other hand, we omitted some of questions such as some social proxies and evacuation process because of space limitation in the second-round survey. In the third-round survey, we added questions asking about relationships with original residents in the place they evacuated. These questions were added following a meeting with Futaba town officers and Mayor of Futaba who told us that their current concern is the relationship between Futaba residents and original residents who live where Futaba residents evacuated to.

This research has been conducted under the confirmation of ethics committee of University of Tokyo confirmed on July 25th, 2013, as the project number 13-48.

2. Social Capital Proxies

For measuring social capital, 13 measures are chosen which are shown in Table 2.2 referring to the common understanding of social capital introduced by Inaba (2011) and the research by Cabinet office (2003), Japan in 2002 measuring social capital of Japanese.

As a social capital index, Japanese Cabinet Office has chosen 12 proxy variables of social capital categorized into three categories which are “Network”, “Trust”, and “Participation”. However, one of the most important aspects of social capital, “Trust”, is only measured by attitudinal measures in the index made by Cabinet Office. For example, in their measurement of trust using public goods experiment by Anderson, they tried to compare the results of experiments not only with attitudinal measures of trust such as GSS trust question, but also with some behavioral measures such as a question asking “Do you leave the door unlocked when you go out?” (Anderson et al. 2004) In the proxies we employ, those behavioral measures of trust are included for measuring social capital.

One of the major proxies which have been used world widely for measuring social capital is GSS “TRUST” measure. In our study, we include GSS “CANTRUST” measure instead of “TRUST” measure since Japanese version of GSS (JGSS) have only included “CANTRUST” question in their recent survey held in 2012. For comparability with average result of all Japanese, we have adopted GSS“CANTRUST” measure instead of GSS“TRUST” measure. The question of GSS “TRUST” measure and GSS “CANTRUST” measure differs only in the choices given for respondents. Both questions ask “Generally speaking, would you say most people can be trusted, or that you can’t be too careful in dealing with people?” For GSS “TRUST”, the answer choices are three; “Most people can be trusted”, “Can’t be too careful” and “Depends”. On the other hand, for GSS “CANTRUST”, the answer choices are four; “People can almost always be trusted”, “People can usually be trusted”, “You usually can’t be too careful in dealing with people”, “You almost always can’t

be too careful in dealing with people”

3. Mental Health Measure: K6

We have adopted K6 score as a mental health proxy. K6 is internationally used valid proxy for measuring mental health first introduced by Kessler (2002) as a screening scale of psychological distress for US National Health Interview Survey (Kessler, 2002). This proxy is also included in annual government health surveys in US and Canada and also in the WHO World Mental Health Surveys (Kessler, 2002). The K6 questions consist of the 6 questions shown in Table 2.1 from “a” to “f”. For each question, respondents need to choose one scale out of the 5 scales. Total score of the 6 questions is called the K6 score of the respondent, which means that people who have high score tend to have more possibility of having mental health problems.

In Japanese context, Furukawa et al (2008) developed Japanese version of K 6 and concluded that Japanese versions of K6 demonstrates screening performances almost equivalent to original English versions (Furukawa et al, 2008). Furthermore, Kawakami and Furukawa (2007) show three ways of categorizing K6 score which are, over 5, equivalent to have mental stress, over 10, equivalent to have mood disorder and anxiety disorder, and over 13, equivalent to have serious mental disorder.

II. Characteristics of Respondents

Respondents of our survey consists majority of males and the elderly. As Figure 2.1 shows, the percentage of male is about 80 percent in all of our surveys and it reflects the original sex distribution of house hold heads of Futaba who are target of our survey. Also, Figure 2.4 to 2.6 show the age distribution of respondents of our survey and it reflects

original distribution of house hold heads shown in Figure 2.3 though age distribution of the respondents obviously left skewed compared to entire population of Futaba residents shown in Figure 2.2.

Futaba residents cannot go back to their home town and they are currently evacuating to all over Japan (2017/4). Table 2.3 shows that how many Futaba residents live in which prefecture in 2013 August and in 2016 July and how many responses we obtain from each prefecture in each round of survey. The prefectures which have many Futaba residents are Fukushima, Ibaraki, Saitama, Chiba, Tokyo, Kanagawa, Niigata, Miyagi and Tochigi. Among these prefectures, residents in Fukushima, Ibaraki and Miyagi increased during 2013 to 2016 while it decreased in others.

The house types of respondents are heterogeneous and has been changing through time as well. As shown in Figure 2.7, most respondents lived in rented rooms in 2013. For those who rent rooms, *Kariage* policy was applied in many cases. *Kariage* policy is a support provided for displaced residents and residents can choose their apartment wherever in Japan and prefectural government pays for their rent. There are some rules for this system, such as the rent needs to be less than 60,000 yen for a family which consists of less than 5 people. In 2013, there were still some people who lived in *Kisai* high school. *Kisai* high school was an emergence shelter for Futaba residents and sent out the last Futaba resident to other place and closed as an evacuation shelter in December 2013. From 2013 to 2015, we can see that people who lived in rented rooms and temporary prehab shelters decreased and many residents had bought their own house outside the Futaba.

In addition, the income distribution in Figure 2.8 unsurprisingly shows that income has generally decreased because of the disaster among Futaba residents. What should be noted here is that income level is not recovering between 2013 and 2015 but it is slightly down warding. To make it clear, the plotted income in Figure 2.8 doesn’t include compensation

they receive from TEPCO. There are several possible reasons that their income do not recover. First, some of them might have lost jobs and they couldn't get any new jobs that provide similar income condition as before the disaster. Second, considering that there are many elderlies in our sample, some might have decided to retire because of this incidence. Further investigation and longer-term measurement is necessary in this aspect.

III. Overview of Methods for Analysis

We analyze our data set in three phases. First, we investigate the impact of the disaster on social capital and mental health by looking at K6 score and social capital proxies. We compare K6 score distribution of respondents with overall Japanese distribution and with distribution in other disaster affected areas. Also, we observe change of distribution of K6 from 2013 survey to 2016 survey. Furthermore, we investigate how social capital changed before and after the disaster and how it is recovering after the disaster. Second, we analyze association between social capital and mental health using an intervening variable model. Third, using our unique data set which provide natural experiment setting, we test the prospect theory assuming mental health status as utility and change of income, house size and health status as its determinants.

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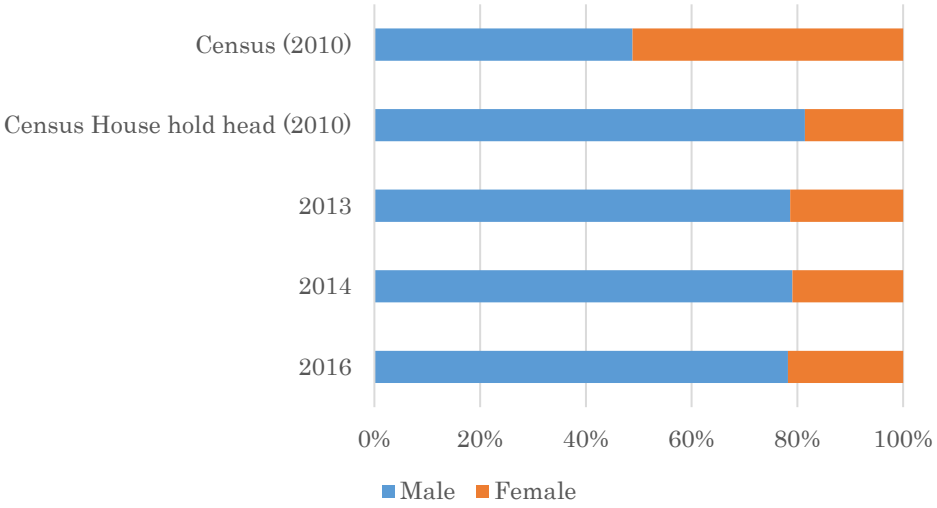

Figure 2.1 Sex Distribution of Respondents

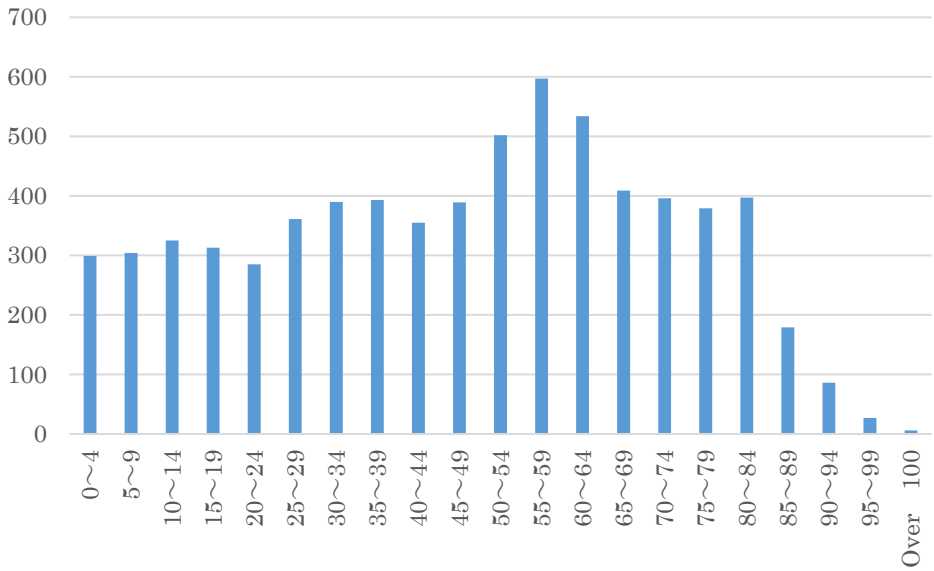

Figure 2.2 Age Distribution of Futaba Population (Census 2010)

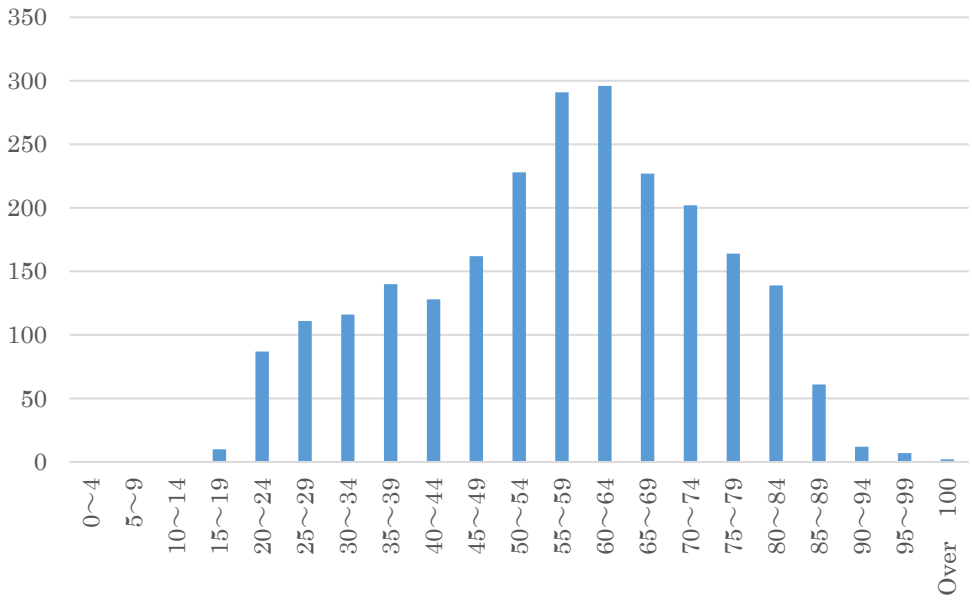

Figure 2.3 Age Distribution of Futaba Population of House Hold Heads (Census 2010)

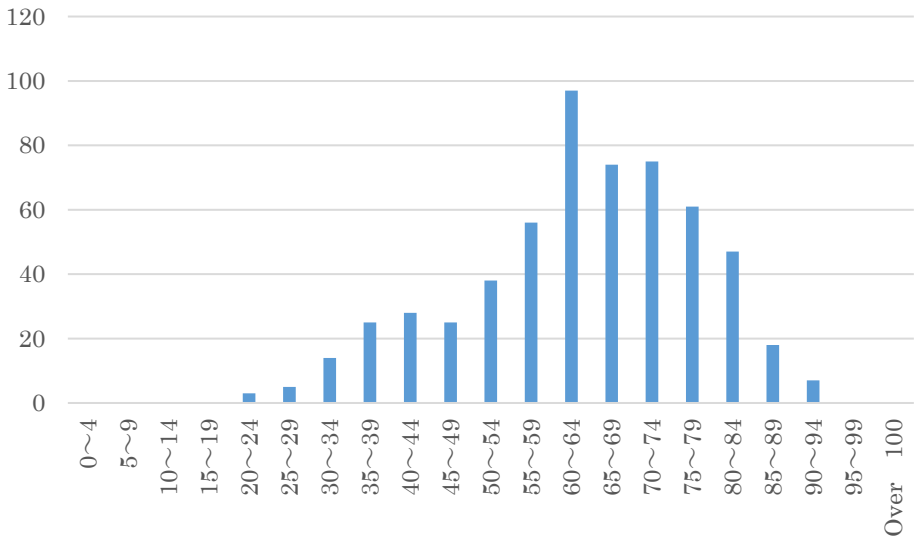

Figure 2.4 Age Distribution of Respondents (2013)

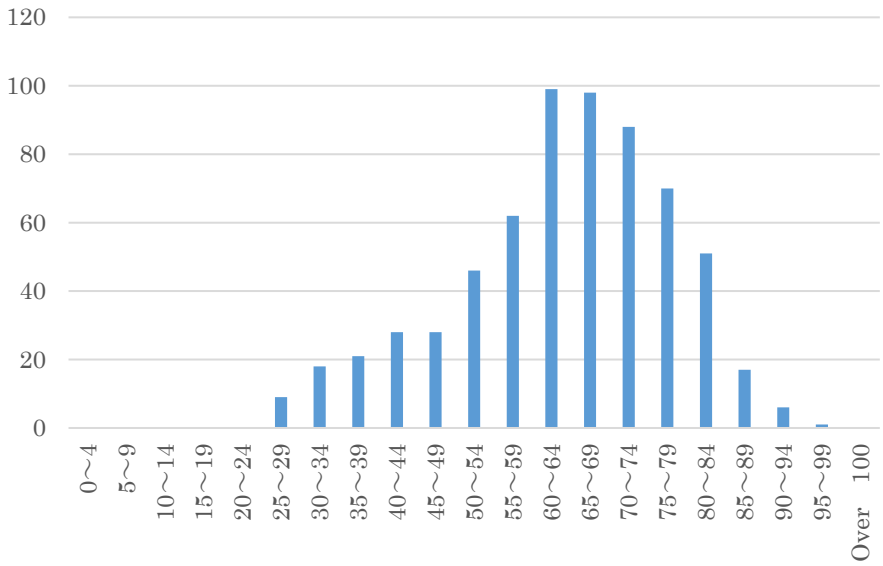

Figure 2.5 Age Distribution of Respondents (2014)

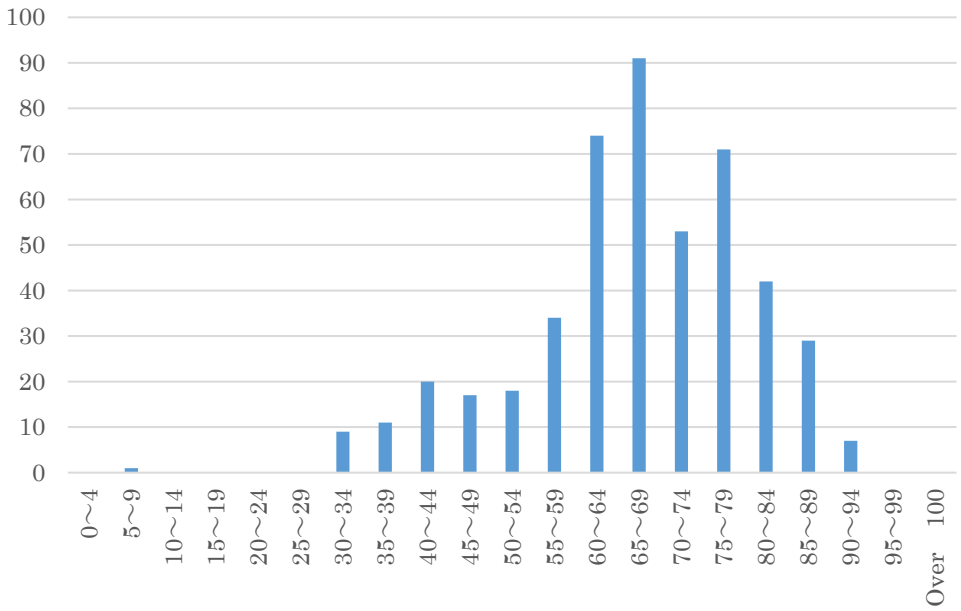

Figure 2.6 Age Distribution of Respondents (2016)

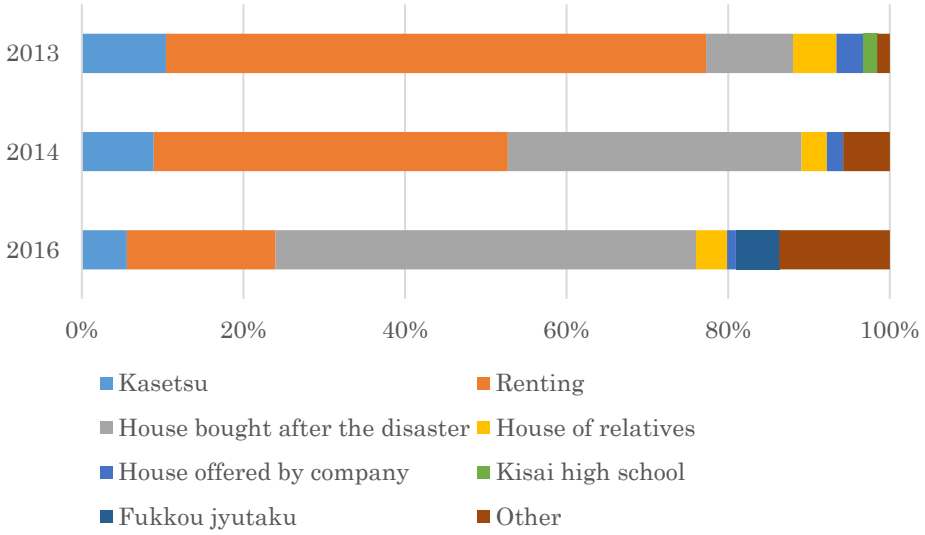

Figure 2.7 Housing Types among Respondents

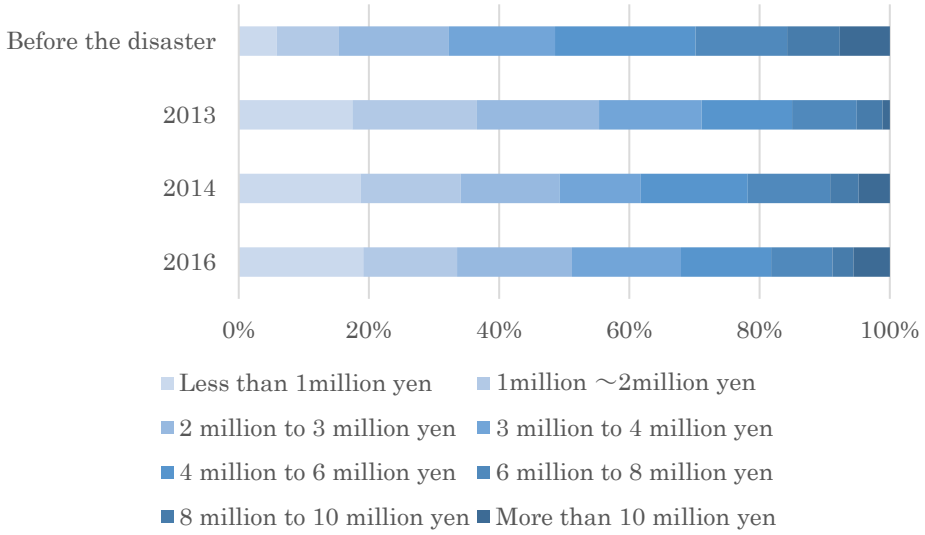

Figure 2.8 Income Distribution of Respondents

Table 2.1 K6 Questions

	During past 30 days how often did you feel….	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a.	… nervous?	4	3	2	1	0
b.	… hopeless?	4	3	2	1	0
c.	…restless or fidgety?	4	3	2	1	0
d.	…so depressed that nothing could cheer you up?	4	3	2	1	0
e.	…that everything was an effort?	4	3	2	1	0
f.	…worthless?	4	3	2	1	0

Table 2.2 Social Capital Proxies

Category	Label	Question	Answer
Network	(i) Talking time with family	Hours to talk with family per day	Numerical: hours/day
	(ii) Talking time with friends	Hours to talk with friends per day	Numerical: hours/day
	(iii) Number of people to exchange greetings	Number of persons to exchange greetings per day	Numerical: number of persons
	(iv) Number of friends	Number of friends who exchange information more than 3times a year	Numerical: number of friends
	(v) Help	Talking of neighborly ties, how often does household head give something to neighbors or help neighbors, or get something from neighbors or get help from neighbors ?	Category (Ordered) 4: So often 3: Moderately 2: Not so often 1: None
Trust	(vi) Trust	GSS "CANTRUST" Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?	Category (Ordered) 4: Most people can be trusted 3: People can be trusted more often than not 2: Can't be too careful more often than not 1: Can't be too careful
	(vii) Fair	Do you think most people try to be fair?	Category 1: Yes 2: No 3: Don't know
	(viii) Trustworthy	Do you think you are trustworthy?	Category 1: Yes 2: No 3: Don't know
	(ix) Help2	Neighbors will help me when I am in trouble	Category (Ordered) 5: Strongly agree 4: Agree 3: Can't tell 2: Don't agree 1: Don't agree at all
	(x) Door	Do you leave the door open when you go out?	Category 1: Yes 2: No 3: Don't know
	(xi) Borrow	Do you often borrow money or staffs to your friends?	Category 1: Yes 2: No 3: Don't know
Participation	(xii) Volunteer	Hours to participate in volunteer work per week	Numerical: hour/week
	(xiii) Recreation	Hours to join tea paty or other activities per week	Numerical: hour/week

Table 2.3 Evacuation Situation of Futaba Residents

	Num of residents (2013)	Num of residents (2016)	Num of response (2013)	Num of response (2014)	Num of response (2016)		Num of residents (2013)	Num of residents (2016)	Num of response (2013)	Num of response (2014)	Num of response (2016)
Hokkaido	13	15	2	2	3	Shiga	1	1	0	0	0
Aomori	21	16	2	1	1	Kyoto	12	10	0	1	1
Iwate	9	9	1	0	1	Osaka	4	5	1	1	1
Miyagi	178	250	12	16	17	Hyogo	3	2	1	0	0
Akita	15	11	2	3	2	Nara	5	-	0	1	0
Yamagata	50	32	3	3	1	Wakayama	-	-	-	-	-
Fukushima	3,823	4,071	321	381	283	Tottori	-	-	-	-	-
Ibaraki	404	463	44	50	37	Shimane	18	16	1	2	0
Tochigi	165	160	13	17	12	Okayama	3	3	0	0	0
Gunma	39	40	1	4	3	Hiroshima	3	4	1	2	1
Saitama	974	856	71	67	46	Yamaguchi	-	-	-	-	-
Chiba	191	171	28	27	19	Tokushima	1	-	0	0	0
Tokyo	371	335	29	17	18	Kagawa	-	-	-	-	-
Kanagawa	199	178	18	21	19	Ehime	5	5	1	0	0
Niigata	206	157	11	9	3	Kochi	-	-	-	-	-
Toyama	18	13	0	1	1	Fukuoka	10	9	1	3	1
Ishikawa	13	18	1	0	0	Saga	4	4	0	0	0
Fukui	8	5	0	0	0	Nagasaki	6	5	0	0	0
Yamanashi	12	14	3	0	1	Kumamoto	5	2	1	1	1
Nagano	7	15	0	0	0	Oita	7	6	1	1	1
Gifu	10	6	1	1	0	Miyazaki	-	-	-	-	-
Shizuoka	36	33	3	1	2	Kagoshima	16	14	1	1	1
Aichi	13	4	0	0	0	Okinawa	4	4	1	1	
Mie	-	-	-	-	-	Other/Unknown	16	4	9	18	23
						Total	6,898	6,966	585	653	499

Notes) Author survey and Futaba town home page information
http://www.town.fukushima-futaba.lg.jp/5257.htm Accessed 29th April 2017

Chapter 3

Impacts of the Nuclear Disaster on Mental Health and Social Capital

I. Unusually Low Mental Health among Futaba Residents

We begin by looking at psychological distress captured by K6 score. We compare the distribution of K6 scores among Futaba residents with that of across Japan, other disaster affected areas, and evacuees in other disaster affected areas, using age and gender distribution to validate the findings. The average level of psychological distress among Futaba residents is unusually high compared with that from across Japan as seen in Figure 3.1. The age and gender stratified comparison of K6 score shown in Table 3.1 also validates our finding. The Japanese data used for comparison is Comprehensive Survey of Living Conditions conducted by Japanese ministry of Health, Labour and Welfare in 2013 which we use because it is one of the most large-scaled, random surveys covering all the population of Japan at the similar timing of our survey.

Furthermore, the average level of psychological distress among Futaba residents is high even when compared with other disaster affected areas such as Wakabayashi district of Sendai, Ogatsu and Oshika districts of Ishinomaki, Yamada, Otsuchi and Rikuzentakata that were seriously damaged by the earthquake and tsunami (but not the nuclear plant meltdowns) as seen in Figure 3.2. The data of disaster affected areas comes from *Higashi Nihon Daishinsai hisaisya no kenkōjō taitō ni kansuru chōsa* [Exploration of health status of disaster affected residents by the Great East Japan earthquake] conducted in 2011 led by Hayashi et al. This data was chosen for comparison since it is one of the largest scaled survey data targeting residents in seriously damaged areas and the city, town or district level distribution of K6 score was available.

We recognize the limitation of the comparison shown in Figure 3.2 that our survey respondents consist of only evacuees while the supplemental data do not solely reflect evacuees' mental health. This is because the comparing data reflects the answers of those who did not need to evacuate though the areas were overall seriously damaged. Therefore, we conducted further comparison of K6 distribution of Futaba residents with mental health of only evacuees in another disaster affected area as shown in Figure 3.3. The data used for comparison here is from Ō*kyū kasetsu jūtaku (Prefab) Nyūkyosha kenkō chōsa* (Health survey of prefab temporary units' residents) conducted in Miyagi prefecture in 2013 by the prefectural government. We used this data as it reflects the status of those who live in temporary units in Miyagi, that is, the mental health status of disaster evacuees. Figure 3.3 shows that Futaba residents have high K6 scores even when compared with evacuees in other disaster affected areas. Gender and age stratified comparison of percentage of K6 score over 13 among evacuees is also available in Table 3.2, which shows that K6 score is especially high among Futaba elderlies (over 60s) compared to evacuees in other disaster affected areas.

In addition, considering the mental health status change among Futaba residents during 2013 to 2016, we cannot see prominent recovery as shown in Figure 3.1. Moreover, from Figure 3.2, we can see that the number of those who has better mental health with less than 9 points of K6 score has increased but those who have bad mental health with higher than 13 points of K6 score increased as well. Furthermore, as we can see from Figure 3.3, K6 score distribution among those who live in temporary prehab units are getting higher within 3 years.

Furthermore, to investigate K6 score distribution heterogeneity among Futaba residents, we compare the K6 score among Futaba farmers. As we can see from Table 3.3, people who engaged in farming before the disaster generally have higher K6 core compared to average distribution of Futaba residents. We also compare K6 score of farmers who could

continue to be farmers after the disaster and farmers who needed to quit after the disaster. From 2013 and 2014 data, average K6 score is higher for those who needed to quit farming while 2016 data shows almost no difference between them.

We also find subjective health measure show deterioration of health among residents as we can see in Figure 3.4. In same way as K6 score distribution, subjective health measurement does not show recovery during 3 years from 2013 to 2016.

II. Deterioration of Social Capital among Futaba Residents

From our survey, prominent decline of social capital among the Futaba residents has been observed. Most of the 13 social capital proxies measured in 2013 which asked retrospectively the status before the disaster and the status in 2013 show the decline of social capital among Futaba residents after the disaster as we can see from Figure 3.5 to Figure 3.17. First proxy, which is “Talking time with family”, shows the least change among the 13 proxies before and after the disaster as shown in Figure 3.5. However, all other proxies show decline of social capital after the disaster. Furthermore, many of the social capital proxies were continued to be included in survey conducted in 2014 and in 2016 to observe its recovery. Most of the proxies show no significant recovery after the disaster.

In addition, we can compare GSS Trust distribution with overall Japanese distribution using results from Japanese General Social Surveys 2010 and 2012 as we can see in figure 3.10. This shows overall GSS Trust measure declined between 2010 and 2012 in Japanese population. However, the decline is more severe among Futaba residents and it is even slowly getting worse during 2013 to 2016.

III. Discussion and Policy Implication

We see several takeaways from these results. First, the K6 scores of ex-Futaba residents indicate the high possibility of severe mental distress caused by the nuclear disaster; residents may be experiencing PTSD, anxiety, and depression because of direct and indirect costs. Causes of distress include evacuation, uncertainty about the future, and potential radiation impact on their health and livelihoods. There are a substantial number of residents who described their concerns about their future in open-ended sections of our survey. Also, many may feel betrayed by the government and the Tokyo Electric Power Company because of the collapse of the safety myth about nuclear power. As a result, decision makers and NGOs may need different toolkits for handling these kind of natural-technological (*natech*) disasters (Arata et al. 2000).

Furthermore, we find no significant improve of mental health among residents and the percentage of those who have better mental health has increased but those who have bad mental health also has increased. This shows the possibility that residents are getting separated to two categories: those getting better and those getting worse. Longer term observation would be important for further investigation of the cause of this separation and the reason behind to ease mental distress of those whose mental health status is getting worse.

Moreover, we find that those with high K6 score have increased among prehab temporary unit residents. There are two possible reasons behind this. First, considering that there are many residents who had left temporary prehab units during the 3 years, those with better mental health might have moved from temporary prehab units earlier and those with bad mental health had stayed. Second, the longer term stay of temporary prehab units might put serious stress on residents. Further investigation would be necessary for understanding

the cause, but in either cases we mention, mental health care targeting those who have stayed temporary prehab units for long time is necessary.

In addition, investigating change of social capital before and after the disaster, we confirm that disaster significantly damaged social capital among residents. And from most of the proxies measured continuously after the disaster, social capital is not recovered, which suggest it will take long term to recover their social capital.

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Tsuji, I., 2012. Kousei Roudou Kagaku Gijyutsu Kenkyuu-hi Hojyokin Buntan Kenkyuu Houkoku-syo: Miyagiken-chousa (厚生労働科学技術研究費補助金分担研究報告書：宮城県調査) [Health Labour Sciences Research Grant Project Report, Miyagi Prefecture Study] (in Japanese). Higashinihon-daishinsai Hisaisya no Kenkoujyoutai-tou ni kansuru Chousa Heisei 23 nendo Soukatsu Buntan Kenkyuu Houkoku-syo (東日本大震災被災者の健康状態等に関する調査平成２３年度総括分担研究報告書)[A study about the Health of the People Affected by the Great East Japan Disaster, Health Labour Sciences Research Grant Project Report of 2011], 209-219.

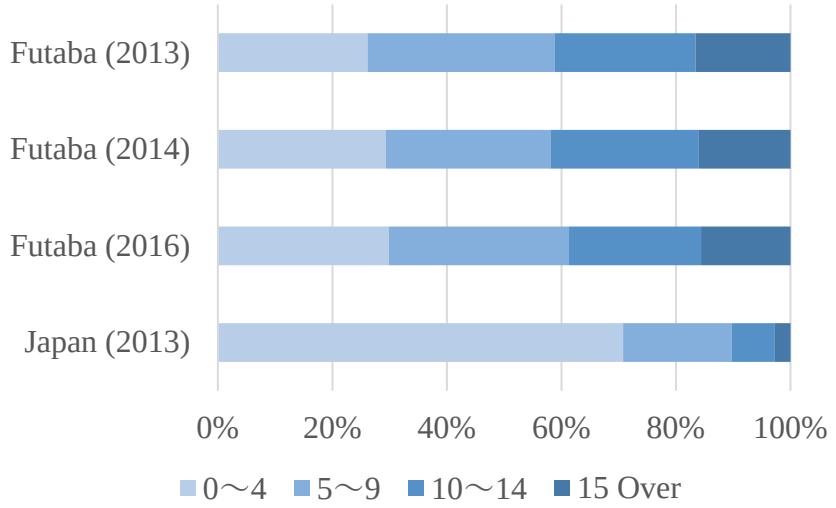

Figure 3.1 Comparison of K6 Score Distribution between Futaba and Japan

Source) Author surveys and Ministry of Health, Labour and Welfare (2013)

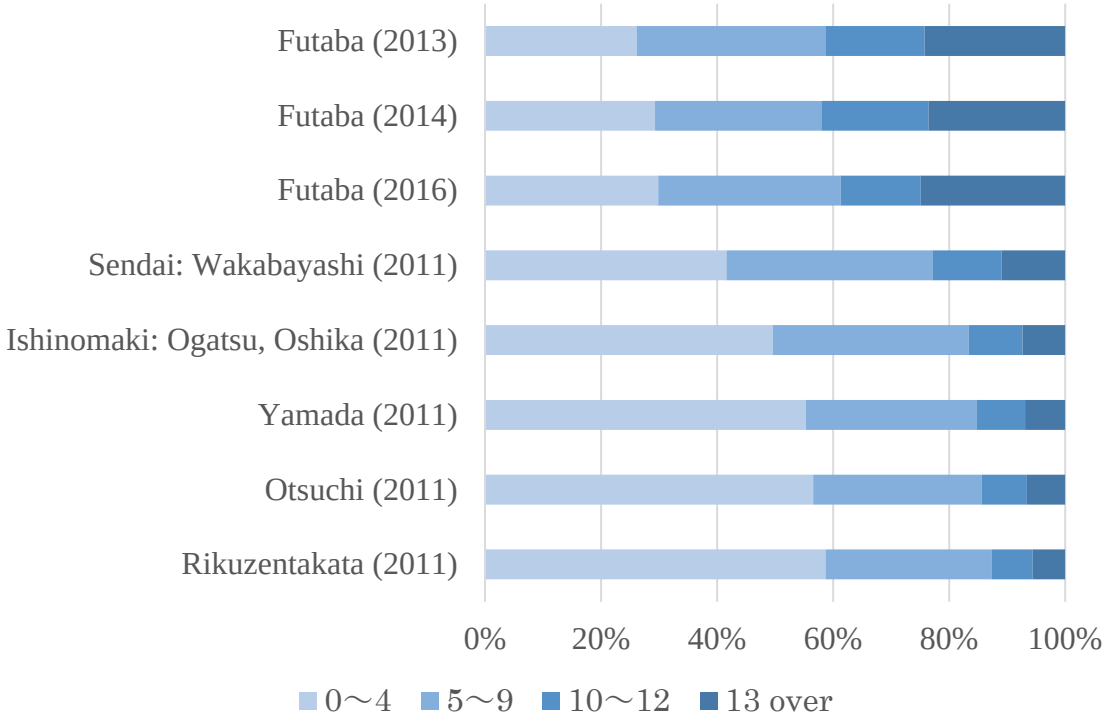

Figure 3.2 Comparison of K6 Score among Disaster Affected Areas

Source) Author surveys, Tsuji (2012), and Ogawa and Sakata (2012)

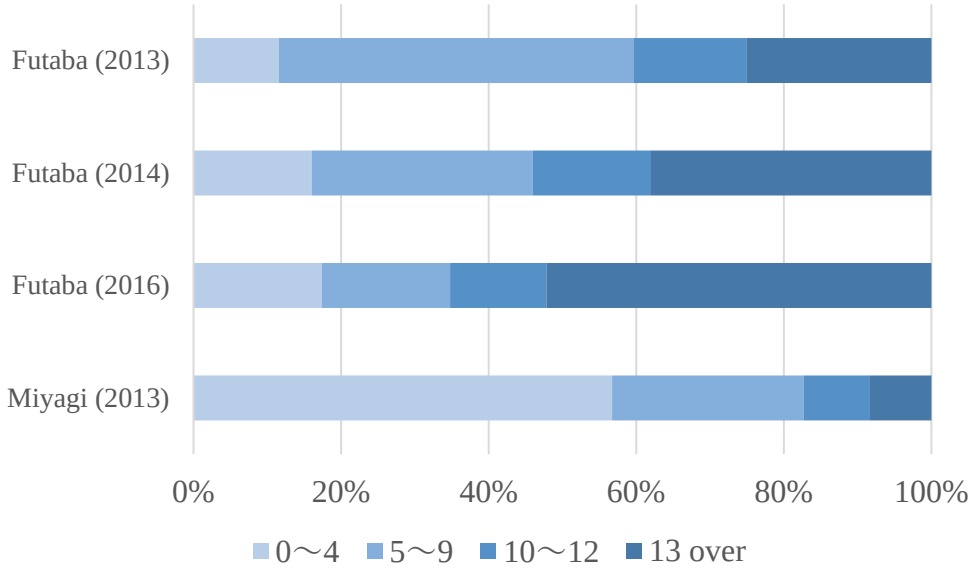

Figure 3.3 K6 Distribution of Those Who Live in Prehab Temporary Units

Source) Futaba data is from author surveys and Miyagi data is from Ō*kyū kasetsujūtaku (Prefab) Nyūkyosya kenkō chōsa* (Health survey of prefab temporary units' residents) in 2013 by Miyagi prefectural government.

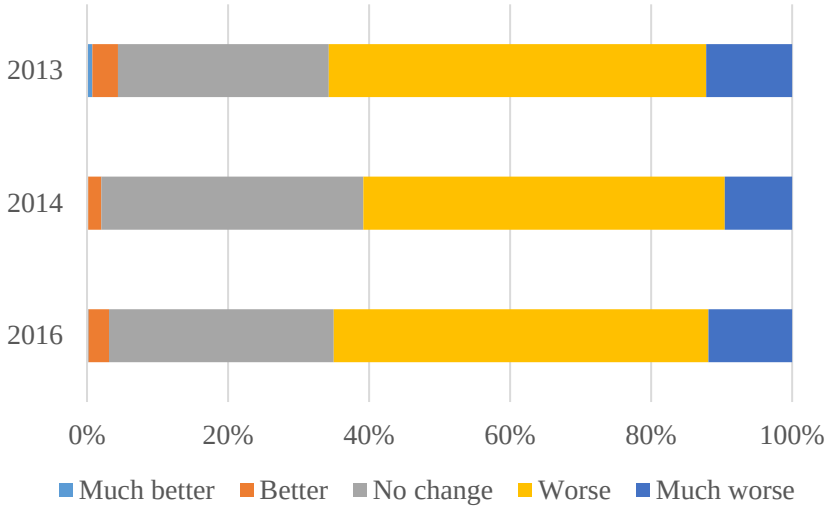

Figure 3.4 Subjective Health Status

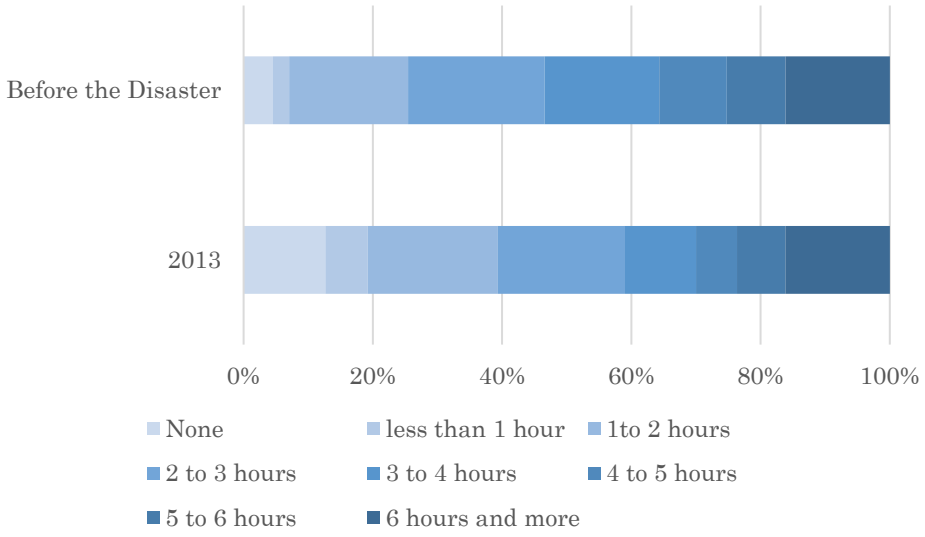

Figure 3.5 Change of Social Capital 1: Talking Time with Family

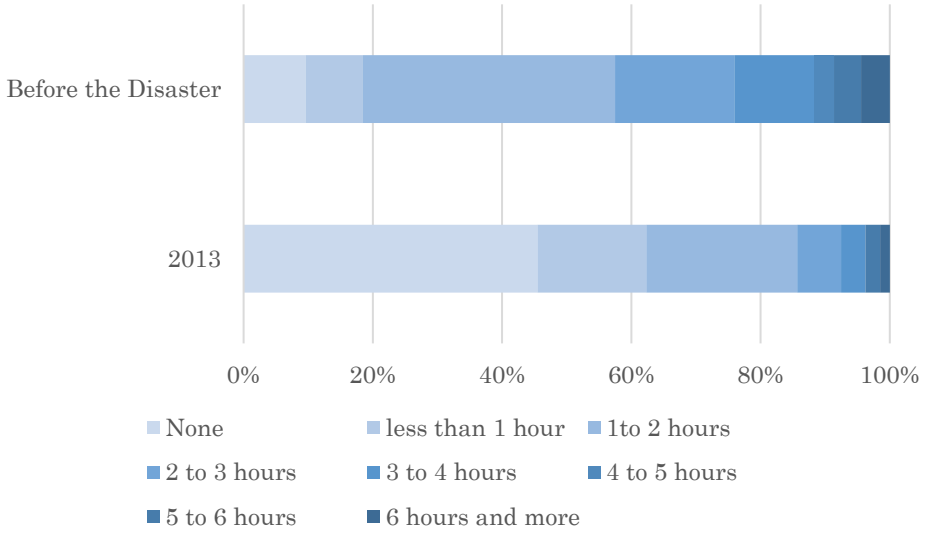

Figure 3.6 Change of Social Capital 2: Talking Time with Friends

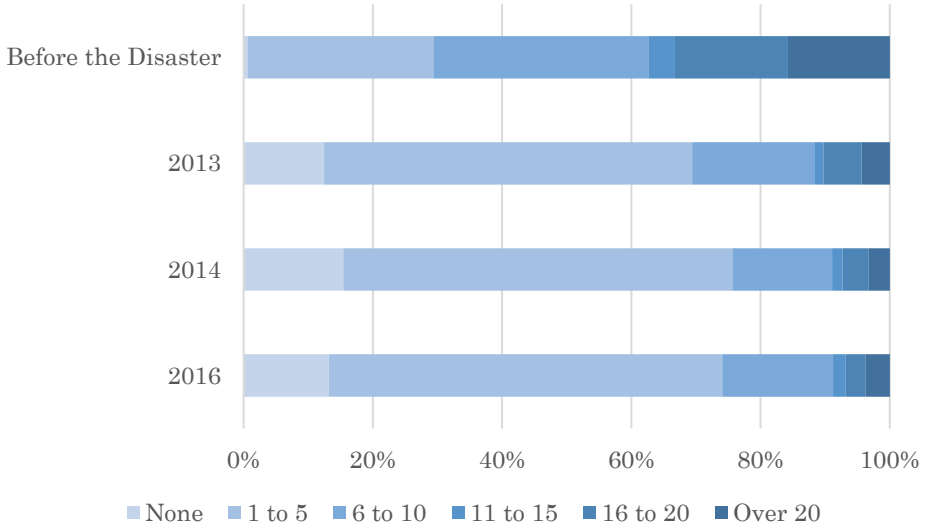

Figure 3.7 Change of Social Capital 3: Number of People Exchanging Greetings per Day

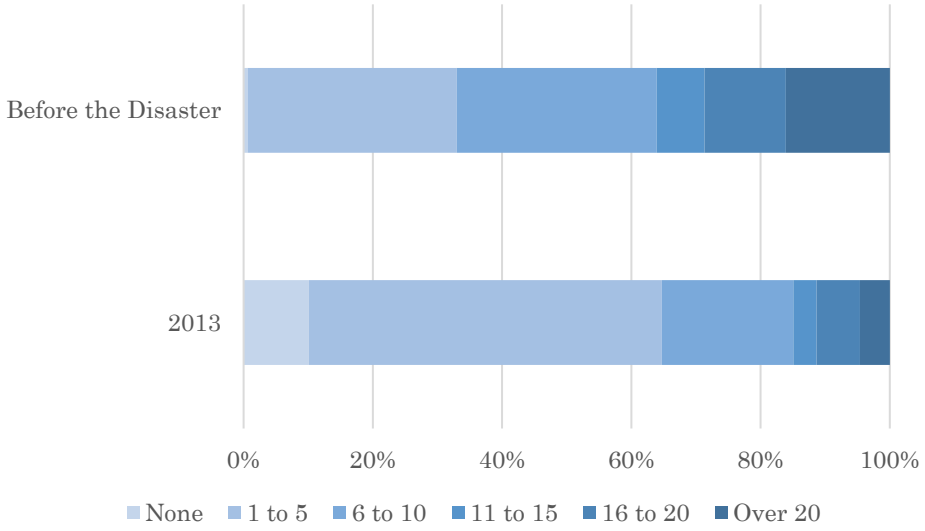

Figure 3.8 Change of Social Capital 4: Number of Friends from Futaba

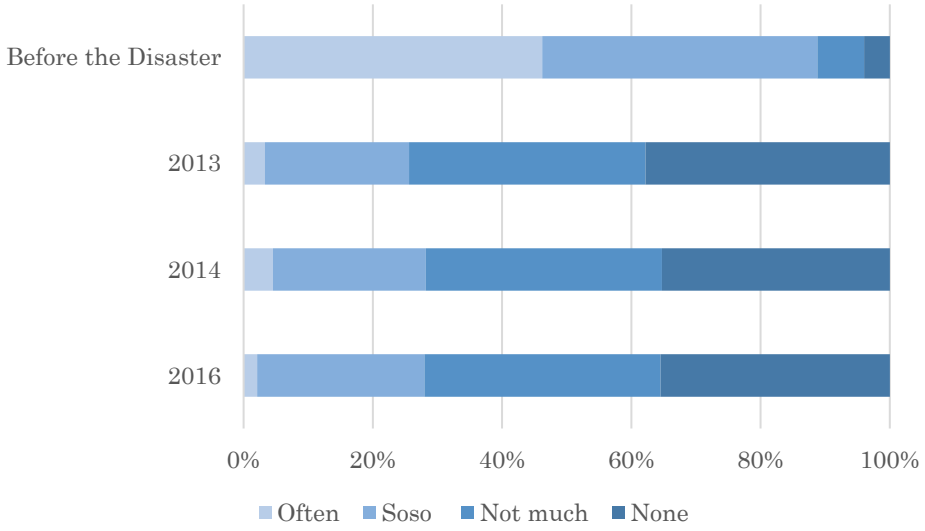

Figure 3.9 Change of Social Capital 5: Frequency of Mutual Help

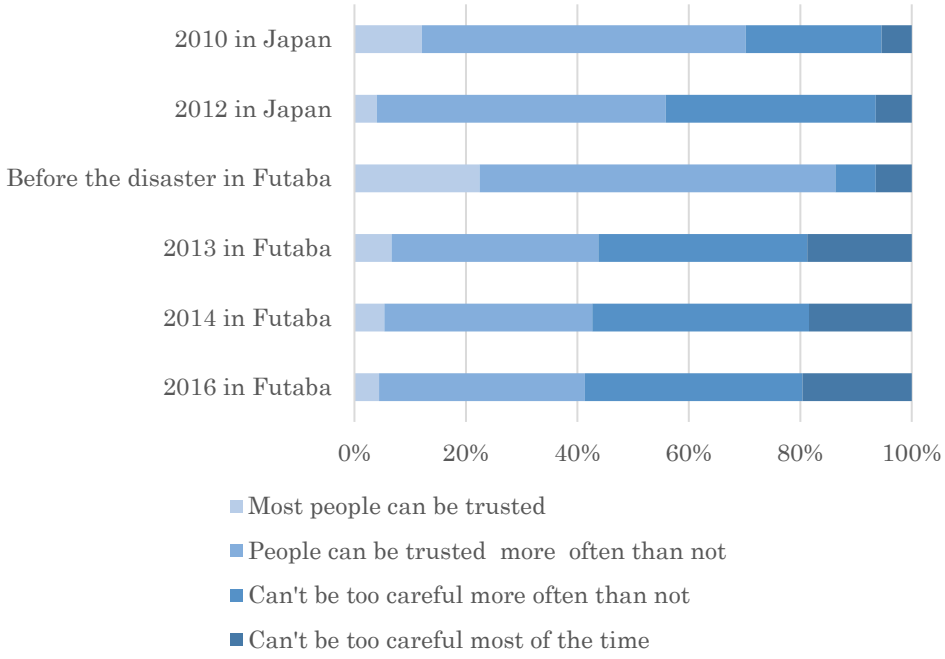

Figure 3.10 Change of Social Capital 6: GSS Trust

Source) Futaba data is from author surveys and Japan data is from The Japanese General Social Surveys 2010 and 2012.

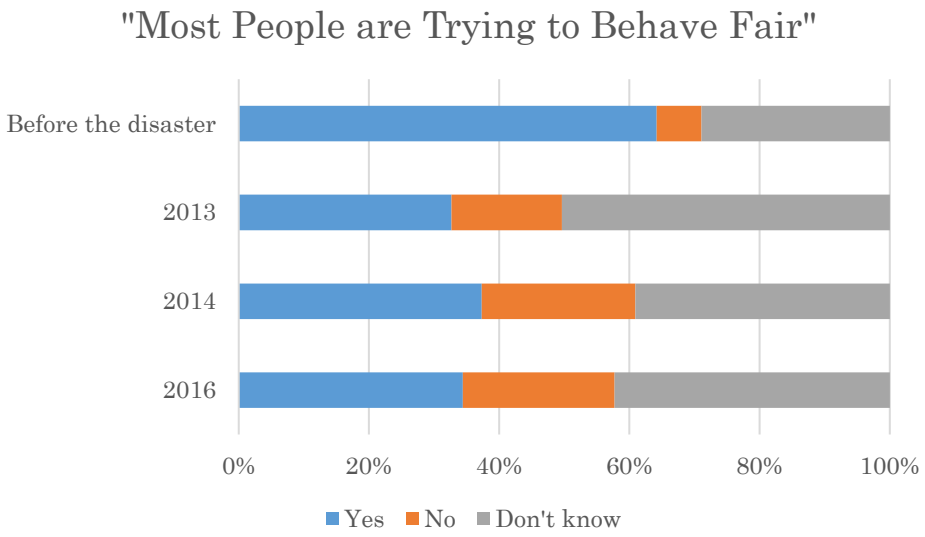

Figure 3.11 Change of Social Capital 7: Fair

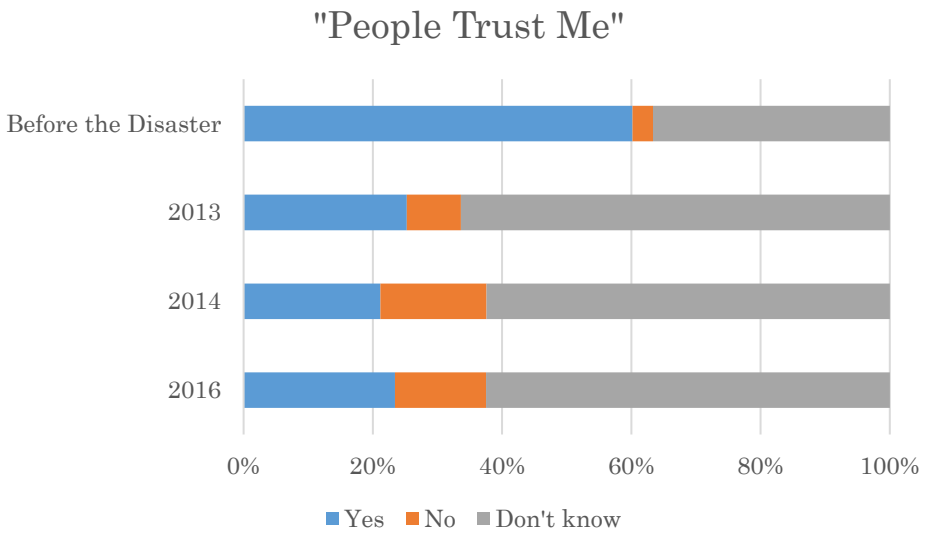

Figure 3.12 Change of Social Capital 8: Trustworthiness

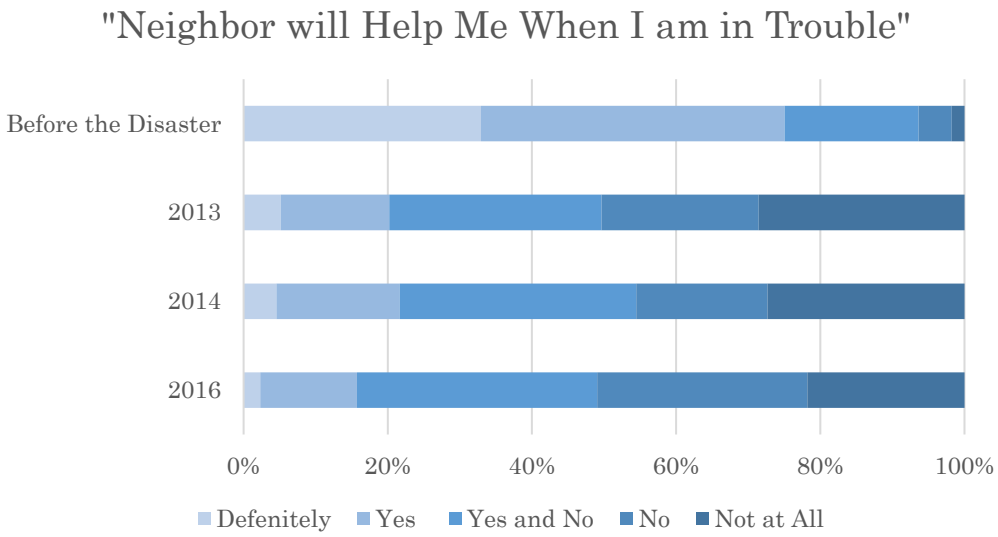

Figure 3.13 Change of Social Capital 9: Trust to Neighbors

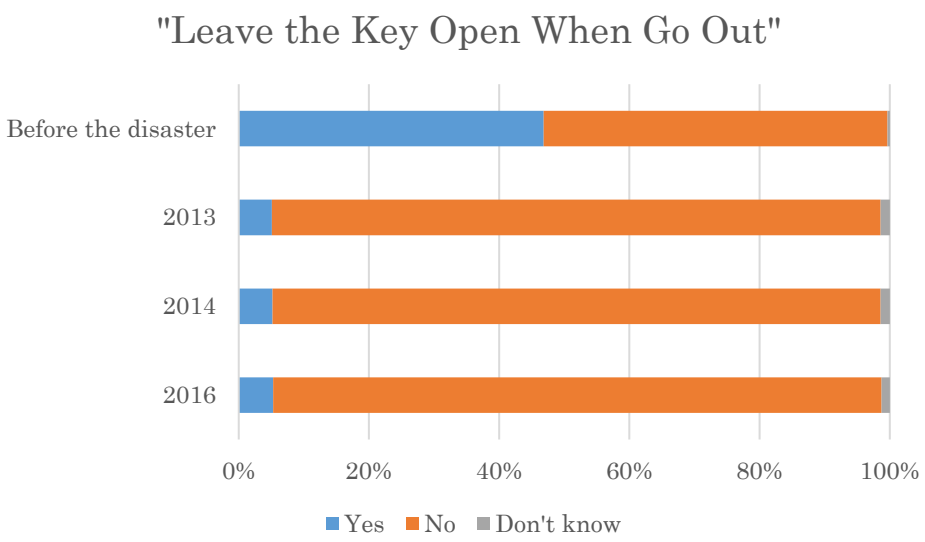

Figure 3.14 Change of Social Capital 10: Key

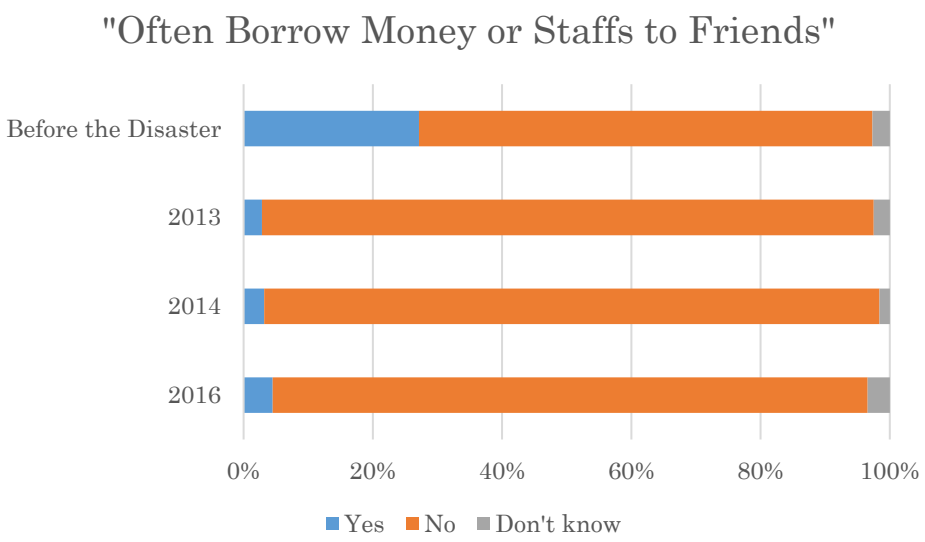

Figure 3.15 Change of Social Capital 11: Borrow

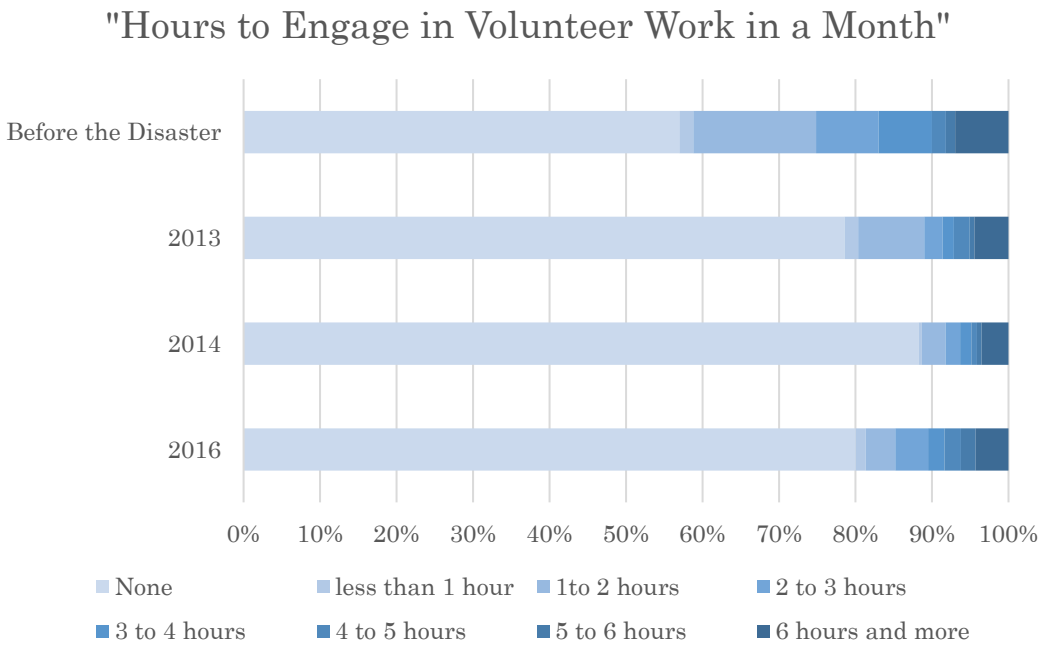

Figure 3.16 Change of Social Capital 12: Volunteer

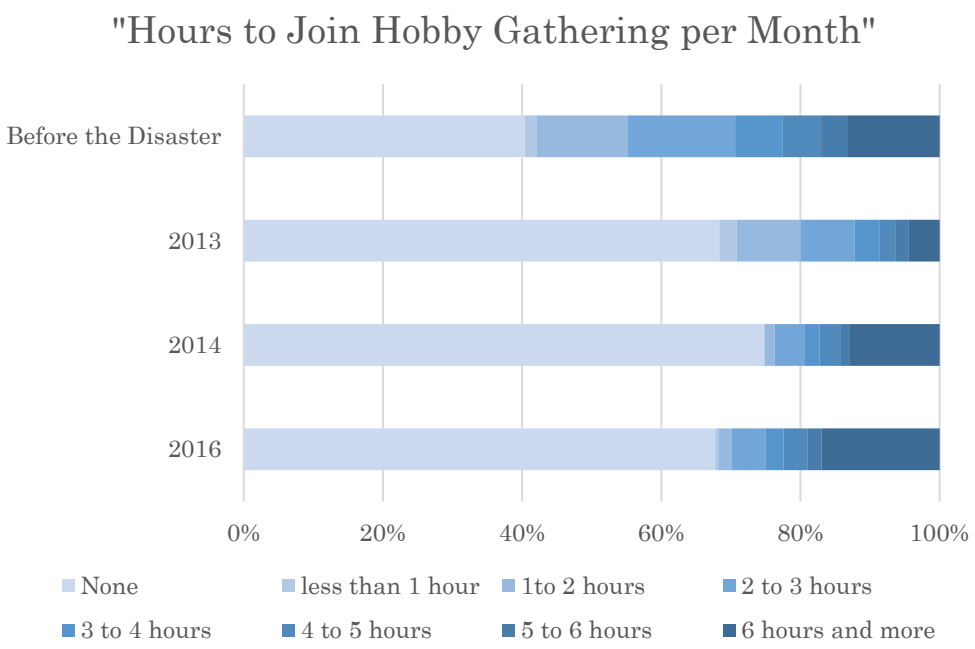

Figure 3.17 Change of Social Capital 13: Hobby

Table 3.1 Gender and Age Stratified Comparison of K6 Score between Futaba and Japan

		Male					Female				
Age	K6 score	0～4	5～9	10～14	15 over	unknown	0～4	5～9	10～14	15 over	unknown
Total	Japan	69.7	16.6	6.7	2.3	4.7	65	19.3	7.7	2.8	5.3
	Futaba	25.6	30.0	22.1	14.6	7.7	17.1	26.0	23.6	17.1	16.3
12-19	Japan	74.9	12.3	5.1	1.5	6.1	72	14.4	6.1	1.9	5.7
	Futaba	-	-	-	-	-	-	-	-	-	-
20-29	Japan	67.0	17.3	9.5	3.7	2.5	63.2	20.0	10.3	4.5	2.0
	Futaba	57.1	14.3	14.3	14.3	0	0	100.0	0	0	0
30-39	Japan	68.2	17.7	8.2	3.4	2.6	64.3	20.8	9.3	3.6	2.0
	Futaba	57.1	22.9	17.1	2.9	0	33.3	33.3	0	33.3	0
40-49	Japan	67.8	18.6	8.0	2.8	2.8	63.0	22.0	9.2	3.5	2.2
	Futaba	18.6	39.5	18.6	14.0	9.3	0	66.7	22.2	11.1	0
50-59	Japan	69.4	18.7	7.1	2.1	2.7	64.7	22.2	9.2	3.5	2.2
	Futaba	23.1	37.2	19.2	10.3	10.3	25.0	25.0	25.0	12.5	12.5
60-69	Japan	74.5	15.3	4.4	1.3	4.5	70.0	17.2	5.3	1.7	5.7
	Futaba	27.9	30.0	20.0	17.9	4.3	20.7	27.7	27.7	13.8	10.3
70-79	Japan	69.6	14.6	4.9	1.5	9.4	63.9	17.0	5.9	1.9	11.2
	Futaba	22.1	26.9	26.9	12.5	11.5	21.9	15.6	28.1	15.6	18.8
Over 80	Japan	61.4	16.9	6.2	2.3	13.3	56.9	18.8	8.5	3.0	12.8
	Futaba	7.0	25.6	30.2	25.6	11.6	7.1	17.9	17.9	25.0	32.1

Notes) Futaba data is from author surveys (2013) and Japan data is from Comprehensive Survey of Living Conditions by Ministry of Health, Labor and Welfare (2013).

Table 3.2 Gender and Age Stratified K6 Score Comparison among Evacuees in Disaster Affected Areas.

Age	Total	18 - 29	30 - 39	40 - 49	50 - 59	60 - 69	70 - 79	80 Over
Male (Percentage of Over 13)								
Futaba	23.2	14.3	5.7	18.6	15.4	24.3	21.2	37.2
Futaba (Prefab)	23.1	-	0.0	0.0	0.0	28.6	23.5	-
Miyagi (Prefab)	7.3	4.4	7.6	7.3	7.1	6.7	7.8	11.5
Futaba (Private)	25.9	0.0	5.0	31.8	14.6	25.8	21.7	46.7
Miyagi (Private)	5.6	4.4	5.0	6.1	5.2	5.6	6.1	10.4
Female (Percentage of Over 13)								
Futaba	29.1	0.0	33.3	11.1	18.8	31.0	25.0	25.0
Futaba (Prefab)	30.8	-	-	0.0	25.0	25.0	50.0	0.0
Miyagi (Prefab)	9.3	7.4	8.0	9.1	8.9	8.3	11.2	10.6
Futaba (Private)	33.9	0.0	40.0	0.0	12.5	40.0	26.3	44.4
Miyagi (Private)	7.8	5.6	6.8	8.9	7.0	7.9	7.4	13.5
Total (Percentage of Over 13)								
Futaba	24.2	12.5	9.8	17.0	16.0	25.2	22.1	31.9
Futaba (Prefab)	25.0	-	0.0	0.0	11.1	27.8	28.6	0.0
Miyagi (Prefab)	8.3	5.9	7.8	8.2	8.0	7.5	9.7	10.9
Futaba (Private)	27.2	0.0	12.0	25.9	14.3	28.2	22.8	45.0
Miyagi (Private)	6.8	5.0	6.0	7.6	6.2	6.8	6.9	12.5

Notes) Futaba data is from author survey (2013). Miyagi (prefab temporary units) is from Ō*kyū kasetsujūtaku (Prefab) Nyūkyosya kenkō chōsa* (Health survey of prefab temporary units' residents) in 2013 by Miyagi prefectural government. Miyagi (private housing used as temporary units) is from *Minkan chintai kariage jyutaku tou nyuukyosya kenkou chousa* (Health survey of residents in private housing used as temporary units) in 2013 by Miyagi prefectural government.

Table 3.3 K6 Distribution of Futaba Farmer

	Variable	Obs	Mean	S.E.	S.D.	95% Conf.	Interval
2013	Overall	524	8.66	0.26	6.01	8.14	9.17
	Farmer (pre-disaster)	49	11.39	0.78	5.45	9.82	12.95
	t-value of difference = -3.0633 (p-value = 0.0023)						
	Farmer quit	44	11.55	0.79	5.26	9.95	13.15
	Farmer continued	5	10	3.33	7.45	0.75	19.25
	t-value of difference = 0.5973 (p-value = 0.5532)						
2014	Overall	594	8.56	0.25	5.99	8.08	9.04
	Farmer (pre-disaster)	62	9.94	0.72	5.7	8.49	11.38
	t-value of difference = -3.0633 (p-value = 0.0023)						
	Farmer quit	55	10.33	0.78	5.78	8.76	11.89
	Farmer continued	7	6.86	1.55	4.1	3.07	10.65
	t-value of difference = -1.7283 (p-value = 0.0844)						
2016	Overall	442	8.38	0.3	6.28	7.8	8.97
	Farmer (pre-disaster)	21	10.67	1.3	5.97	7.95	13.38
	t-value of difference = -1.6326 (p-value = 0.1032)						
	Farmer quit	17	10.65	1.51	6.22	7.45	13.85
	Farmer continued	4	10.75	2.78	5.56	1.9	19.6
	t-value of difference = -0.0302 (p-value = 0.9762)						

Chapter 4

Association between Social Capital and Mental Health*

I. Method of Analysis

Now, we investigate the relationship between social capital and mental health among Futaba residents using a two-step empirical procedure. First, we conduct a factor analysis to derive a factor called “trust perception.” Second, we examine the indirect impact of social capital on mental health through the derived factor “trust perception”.

Table 4.1 presents questions we used as social capital variables for analysis. In addition to participation measures, such as participation in volunteer activities and tea parties, we ask about the number of Futaba neighbors after displacement to capture levels of social capital continuing from their pre-disaster community. We ask about the number of Futaba neighbors after displacement who knew each other before the disaster and the number of Futaba neighbor after displacement who they did not know each other before the disaster. Table 4.2 presents social capital related measures we use to derive the factor variable “trust perception.” To capture trust perception, we go beyond standard attitudinal measures of trust and social capital– such as those from the General Social Survey (GSS) – to include behavioral measures such as “Do you leave the door unlocked when you go out?” Descriptive statistics of all the variables used in our analysis are shown in Table 4.3.

To examine the indirect impact of social capital on mental health intervened by the derived factor “trust perception,” we test an intervening model as shown in Figure 4.1. Following Mackinnon et al. (2002) and Shrout and Bolger (2002), we use the following estimation models.

* Analysis and results in this chapter are reported in Iwasaki et al. (2017).

(1) $I = \beta_{I0} + \boldsymbol{S}\beta_{IS} + \varepsilon_I$

(2) $P = \beta_{P0} + \boldsymbol{S}\beta_{PS} + \alpha_{PI}I + \varepsilon_P$

where P represents K6 score. I represents the intervening variable "trust perception." $\boldsymbol{S}$ is a set of social capital proxies including the number of Futaba neighbors who they knew each other before the disaster, the number of Futaba residents who they did not know each other before the disaster, a dummy variable for those who participate in volunteer activities, and a dummy variable for those who participate in tea parties. We first test the significance of β_{IS} using the specification (1) and significance of α_{PI} using the specification (2). We also check the insignificance of β_{PS} using specification (2) to make sure that there is no direct impact of social capital on K6 score and then we test the significance of $\beta_{IS} \times \alpha_{PI}$ using Sobel (Sobel 1982), Aroian (Aroian 1944) and Goodman (Goodman 1960) tests. In addition, we estimate the reduced-form version of the model (2) to quantify determinants of mental health other than social capital proxies and use control variables to manage potential confounding factors.

As we have cross-sectional study with a response rate of about 20 percent, we recognize the potential for two biases in our estimation – sample selection bias arising from endogenous participation in our survey and endogeneity bias arising from endogenous social capital due to each evacuee's relocation choice. As to investigate the former, we employed 2010 census data to explore the determinants of survey participation. According to estimation results of our survey participation regression model based on the combined 2010 census data and our data, older residents, male residents, and residents of certain settlements were more likely to complete our questionnaire as shown in Table 4.4. To handle potential sample selection bias arising from endogenous survey participation, we combine our data with 2010

Census data for validation and adopted Heckman's correction method (Heckman 1979). As to the latter bias, we estimated the model with administrative unit fixed effects to eliminate endogeneity bias due to time-invariant unobserved heterogeneity across local government levels. Furthermore, we also note that the possibility of "common method bias" as limitation of our study since both explanatory variables and outcome variable are based on self-reported answers (Podsakoff et al. 2003).

II. Result

We find that levels of social capital as captured by post disaster number of neighbors from Futaba, participation in tea parties and engagement in volunteer work can improve mental health through a factor we deem a trust perception. We demonstrate this through a two-step empirical analysis. First, we derived the intervening variable trust perception by conducting a factor analysis of general trust, trust in neighbors, frequency of mutual help with neighbors, self-evaluation of trustworthiness, and evaluation of fairness of society. As the first factor with the largest eigenvalue highly correlates with these five variables as we can see in Table 4.5, we can call this factor "trust perception." Second, we used this factor in an intervening variable model as shown in Figure 4.1.

The estimated results of model (1) of β_{IS} and (2) of β_{PS} and α_{PI} of Figure 4.1 with Heckman correction are displayed in Table 4.6 which shows that the social capital variables significantly and positively correlate with the factor trust perception, thereby demonstrating the significance of β_{IS} in model (1). Also, the estimation results of model (2) show that trust perception is significantly negatively correlated with K6 scores (α_{PI}) while the four social capital proxies captured by estimated β_{PS} are largely insignificant, which is consistent with the intervening model. The Sobel, Aroian, and Goodman tests show the significance of $\beta_{IS} \times$

α_{PI} in Table 4.7 and validate our intervening variable model. Table 4.8 reports the estimated results of model (1) of β_{IS} and (2) of β_{PS} and α_{PI} of Figure 4.1 with Heckman correction and administrative unit fixed effects and Table 4.9 reports its joint significance test results which validate our findings. In addition, we should note that the inverse mills ratio of all the estimation results are insignificant which means that sample selection bias is not a serious obstacle. The first step estimation results of Table 4.6 and 4.8 are reported on Table 4.10.

In addition to social capital measures, the income of the residents is strongly associated with mental health. To quantify the overall effects of income on mental health, Figure 4.2 and Table 4.11 displays the estimation results of a reduced-form version of the model. The first step estimation results of Table 4.11 are reported on Table 4.12. Futaba residents have received various types of monetary compensation from TEPCO but these subsidies are not included in our analysis.

III. Discussion and Policy Implication

Our results show that social capital positively correlates with mental health through the intervening factor trust perception. This association between social capital and mental health intervened by a cognitive status we claim corresponds with a theory by Cohen et al (2000) where they claim social networks can improve mental health through positive affective states. Furthermore, local governments across Tohoku have created various policies and activities to maintain social networks among disaster affected residents in order to create better mental health. For example, in Saitama prefecture, to where many evacuated residents from Fukushima have moved, local communities provide various opportunities for disaster affected residents to gather and have tea parties through programs such as the *Saigai-Tsunagari Café* (post-disaster social connection café), *F-café-juju*, and the *Oshaberi-salon*

(NPO hands-on Saitama 2013). Also, there is an undergoing integrated program called Taketoyo project (Japan Gerontological Evaluation Study 2016) to strengthen social capital by providing salons for the elderly. Our study provides the first quantitative evidence of the potential efficacy of these social capital strengthening activities among Fukushima evacuees and encourages detailed evaluation of these activities as conducted in Taketoyo project.

Our results also show that disaster affected residents who participate in volunteer work improve their psychological well-being. From the anthropological perspective, some disaster affected residents face emotional debt because of the support they received. One scholar theorized that residents can restore their dignity by presenting "counter-gifts" to others (Uchio 2013). The *Ibasho-café*, a program set up in the tsunami affected city of Ofunato to provide a place for disaster affected residents to gather and allow elderly residents to take leadership roles, similarly builds on the role of engagement and civic participation (Kiyota et al. 2015). Our analysis suggests that volunteer work and bottom up social activities should be supported. Further, we show that having more neighbors from Futaba can eventually improve mental health. This result supports various policies by Japanese local governments which distribute temporary and permanent shelters according to residents' original neighborhoods (Aldrich and Meyer 2015). Our study provides empirical support for the effectiveness of these group-relocation activities (Aldrich 2012).

Finally, income and livelihood conditions serve as other influential variables on mental health. This is consistent with various empirical studies of mental health which argue for the importance of economic resources in maintaining mental health (Keleher and Armstrong 2006). This suggests the significance of public policies which provide jobs and income for evacuees and internally displaced people following disaster.

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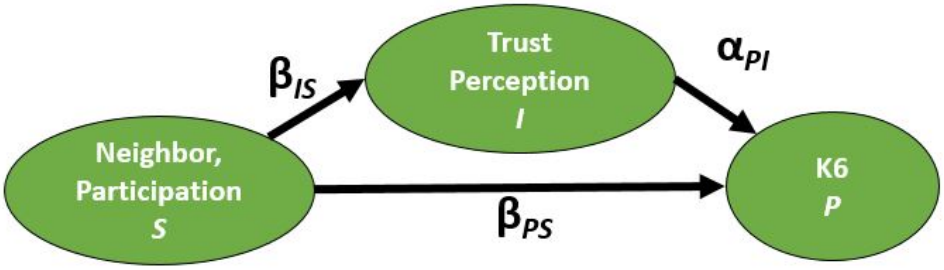

Figure 4.1 Intervening Model.

Source) Iwasaki et al. (2017)
Notes) S represents social capital variables, I is the intervening variable trust perception, and P indicates K6, the mental health proxy.

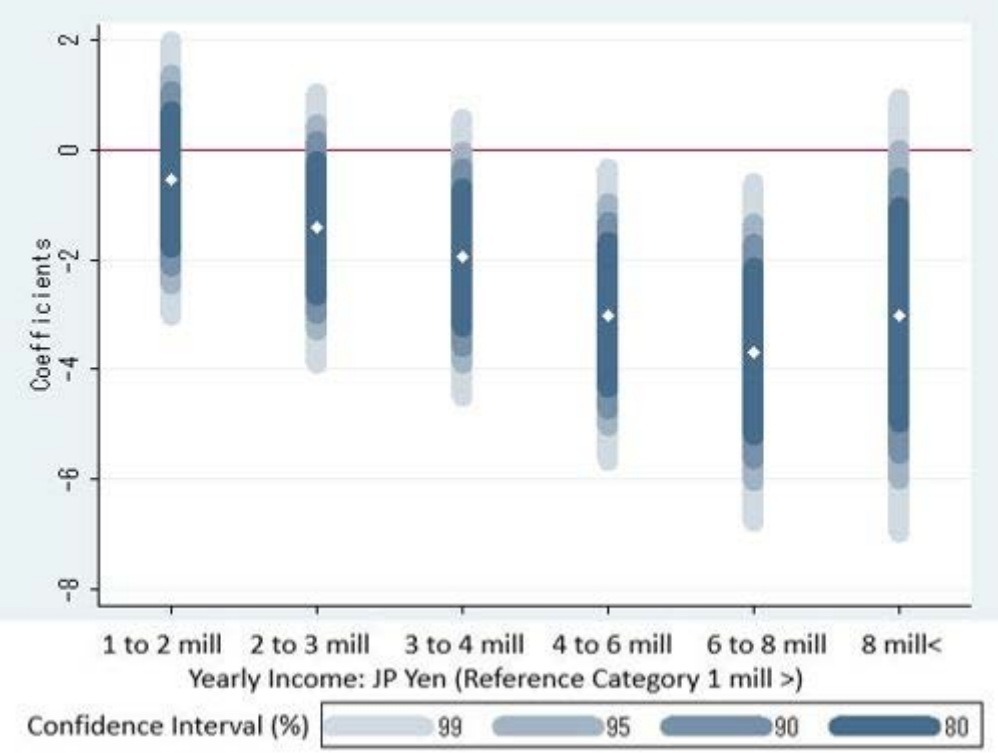

Figure 4.2 K6 Regression on Wealth

Source) Iwasaki et al. (2017)

Table 4.1 Social Capital Proxies for Analysis

Variable	Question in the Questionnaire	Answer
Number of Futaba unknown neighbors	Number of Futaba neighbors after displacement who did not know each other before the disaster	Category 1. Over 20 2. 10 to 19 3. 6 to 9 4. 3 to 5 5. 1 to 2 6. None (For analysis, interval regression is used for constructing continuous variable.)
Number of Futaba known neighbors	Number of Futaba neighbors after the disaster who knew each other before the disaster	
Participation in volunteer activities	# hours participating in volunteer work per week	Numerical: hour/week (For analysis, a dummy variable for 0 < is employed.)
Participation in tea party	# hours joining tea party or other activities per week	Numerical: hour/week (For analysis, a dummy variable for 0 < is employed.)

Source) Iwasaki et al. (2017)

Table 4.2. Social Capital Proxies for Deriving a Factor (Trust perception)

Variable	Question in the Questionnaire	Answer
General trust	Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?	Category (Ordered) 4: People can be trusted 3: People can be trusted more often than not 2: You cannot be too careful more often than not 1: You cannot be too careful
Mutual help	Talking of neighborly ties, how often does household head give something to neighbors or help neighbors, or get something from neighbors or get help from neighbors?	Category (Ordered) 4: So often 3: Moderately 2: Not so often 1: None
Fairness	Do you think most people try to be fair?	Category 1: Yes 2: No 3: Don't know
Self-trustworthiness	Do you think you are trustworthy?	Category 1: Yes 2: No 3: Don't know
Trust in neighbors	Neighbors will help me when I am in trouble	Category (Ordered) 5: Strongly agree 4: Agree 3: Can't tell 2: Don't agree 1: Don't agree at all
Leaves door open	Do you leave the door open when you go out?	Category 1: Yes 2: No 3: Don't know
Borrows from neighbors	Do you often lend or borrow money or things to or from your friends?	Category 1: Yes 2: No 3: Don't know

Source) Iwasaki et al. (2017)

Table 4.3 Descriptive Statistics

Variable	Obs	Mean	Std.Dev	Min	Max
Age (in years)	575	62.967	14.388	24	94
Gender dummies					
Male	585	0.774	0.418	0	1
Female	585	0.210	0.408	0	1
No answer	585	0.015	0.123	0	1
House type dummies					
Kasetsu (temporary prefab) units	585	0.103	0.304	0	1
Relative's house	585	0.053	0.224	0	1
Kariage (private housing used as temporary) units	585	0.603	0.490	0	1
House bought	585	0.106	0.308	0	1
Rental housing	585	0.055	0.228	0	1
Nursing home	585	0.015	0.123	0	1
Kisai high school	585	0.017	0.130	0	1
Employer's provision	585	0.032	0.177	0	1
No answer	585	0.016	0.123	0	1
Income dummies (in yen)					
Less than 1 million	585	0.159	0.366	0	1
1 million to 2 million	585	0.174	0.380	0	1
2 million to 3 million	585	0.171	0.377	0	1
3 million to 4 million	585	0.144	0.351	0	1
4 million to 6 million	585	0.126	0.333	0	1
6 million to 8 million	585	0.091	0.287	0	1
More than 8 million	585	0.046	0.210	0	1
No answer	585	0.089	0.285	0	1
Health condition dummies					
Much better	585	0.007	0.082	0	1
Better	585	0.032	0.177	0	1
No change	585	0.268	0.443	0	1
Worse	585	0.480	0.500	0	1
Much worse	585	0.109	0.312	0	1
No answer	585	0.103	0.304	0	1
K6 measure	524	8.656	6.014	0	24

Table 4.3 Descriptive Statistics (Continued)

Variable	Obs	Mean	Std.Dev	Min	Max
No. of Futaba unknown neighbor	583	3.702	6.043	0	22
No. of Futaba known neighbor	583	3.513	5.452	0	28
Tea party dummies					
0 hours / week	585	0.421	0.494	0	1
More than 0 hours /week	585	0.195	0.396	0	1
No answer	585	0.385	0.487	0	1
Volunteer dummies					
0 hours / week	585	0.451	0.498	0	1
More than 0 hours /week	585	0.123	0.329	0	1
No answer	585	0.426	0.495	0	1
General trust (after disaster)	571	2.317	0.852	1	4
Mutual help (after disaster)	574	1.911	0.853	1	4
Trust in neighbors (after disaster)	564	2.465	1.197	1	5
Leaves door open dummies					
Yes	585	0.050	0.217	0	1
No	585	0.909	0.287	0	1
Don't know	585	0.014	0.116	0	1
No answer	585	0.027	0.163	0	1
Borrows from neighbors dummies					
Yes	585	0.027	0.163	0	1
No	585	0.909	0.287	0	1
Don't know	585	0.024	0.153	0	1
No answer	585	0.039	0.195	0	1
People are fair dummies					
Yes	585	0.306	0.461	0	1
No	585	0.159	0.366	0	1
Don't know	585	0.472	0.500	0	1
No answer	585	0.063	0.244	0	1
Self-trustworthiness dummies					
Yes	585	0.243	0.429	0	1
No	585	0.080	0.272	0	1
Don't know	585	0.638	0.481	0	1
No answer	585	0.039	0.195	0	1

Source) Iwasaki et al. (2017)
Notes) *Kasetsu* housing refers to temporary shelters provided by government, while *kariage* housing refers to cash compensation for housing rentals. Income variables do not include any compensation. Health condition: We ask, "How is the household head’s health compared to his or her health before the disaster?"

Table 4.4 Estimation Result of Survey Participation Equation

Age category (20 ～29): reference category	
Age category (30 ～39)	0.0474***
	(0.00950)
Age category (40 ～49)	0.0664***
	(0.0106)
Age category (50 ～59)	0.0841***
	(0.00981)
Age category (60 ～69)	0.176***
	(0.0132)
Age category (70 ～79)	0.185***
	(0.0144)
Age category (80 ～)	0.125***
	(0.0129)
Age category (no answer)	0.321**
	(0.140)
Gender (male) : reference category	
Gender (female)	-0.132***
	(0.00800)
Gender (no answer)	0.587***
	(0.112)
Residential block in Futaba (1): reference category	
Residential block in Futaba (2)	-0.0223
	(0.0312)
Residential block in Futaba (3)	0.00961
	(0.0867)
Residential block in Futaba (4)	0.0600
	(0.0614)
Residential block in Futaba (5)	-0.0579
	(0.0401)
Residential block in Futaba (6)	-0.00617
	(0.0319)
Residential block in Futaba (7)	0.00222
	(0.0390)
Residential block in Futaba (8)	0.000312
	(0.0290)
Residential block in Futaba (9)	-0.0943**
	(0.0432)
Residential block in Futaba (10)	-0.0472
	(0.0360)

Table 4.4 Estimation Result of Survey Participation Equation (Continued)

Residential block in Futaba (11)	-0.0410
	(0.0373)
Residential block in Futaba (12)	-0.0115
	(0.0343)
Residential block in Futaba (13)	-0.0431
	(0.0356)
Residential block in Futaba (14)	-0.0122
	(0.0364)
Residential block in Futaba (15)	-0.0278
	(0.0428)
Residential block in Futaba (16)	-0.00513
	(0.0285)
Residential block in Futaba (17)	-0.0653*
	(0.0385)
Residential block in Futaba (18)	-0.0679*
	(0.0361)
Residential block in Futaba (19)	-0.00657
	(0.0453)
Residential block in Futaba (20)	-0.0325
	(0.0293)
Residential block in Futaba (21)	0.895***
	(0.0408)
Residential block in Futaba (no answer)	0.521***
	(0.183)
_cons	0.0815***
	(0.0276)
N	5691
adj. R-sq	0.103

Notes) Dependent variable is a dummy variable which take 1 when a person joined our survey. Robust standard error in parenthesis. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 4.5 Factor Loadings Result to Derive the Intervening Variable, “Trust perception”

Variable	Factor1 (Trust perception)	Uniqueness
General trust	0.3376	0.886
Mutual help	0.5957	0.6452
Trust in neighbors	0.6918	0.5214
Leaves door open (Yes)	#	0.9808
Borrows from neighbors (Yes)	#	0.9845
People are fair (Yes)	0.4562	0.7919
Self-trustworthiness (Yes)	0.5033	0.7467
KMO measure = 0.63		

Source) Iwasaki et al. (2017)
Notes) # shows that factor loadings are smaller than 0.3 in absolute value. We retained only the first factor because the eigenvalues associated with the remaining factors are smaller than 1 following Kaiser’s criterion (Kaiser 1960). KMO measure represents Kaiser–Meyer–Olkin measure of sampling adequacy (Kaiser 1974) which shows that the derived factor is meaningful at acceptable level.

Table 4.6 Regression Results of Heckman Selection Model (1) and (2)

	(1) Dependent variable: Trust perception			(2) Dependent variable: K6		
	(a)	(b)	(c)	(d)	(e)	(f)
Factor *I* (Trust perception)				-1.105***	-1.014***	-1.020***
				(0.338)	(0.326)	(0.333)
No. of Futaba unknown neighbor	0.0196***	0.0200***	0.0163**	0.108**	0.0725	0.0714
	(0.00655)	(0.00705)	(0.00667)	(0.0522)	(0.0538)	(0.0516)
No. of Futaba known neighbor	0.0214***	0.0233***	0.0272***	0.0291	0.0155	0.0282
	(0.00731)	(0.00754)	(0.00722)	(0.0582)	(0.0572)	(0.0559)
Volunteer participation dummy	0.260**	0.274**	0.218**	-0.488	-0.880	-1.405*
	(0.106)	(0.107)	(0.108)	(0.837)	(0.804)	(0.833)
Tea party participation dummy	0.263***	0.249***	0.402***	-0.546	-0.635	0.0337
	(0.0883)	(0.0897)	(0.0942)	(0.702)	(0.684)	(0.744)
Constant	-0.318**	-0.673*	-1.079**	9.585***	5.357*	4.332
	(0.138)	(0.401)	(0.438)	(1.115)	(2.871)	(3.230)
Inverse Mills ratio for the Heckman correction	0.0535	0.184	0.194	-0.802	-0.577	0.0406
	(0.0834)	(0.145)	(0.142)	(0.661)	(1.002)	(0.990)
Control Variables	No	Yes (Short set)	Yes (Long set)	No	Yes (Short set)	Yes (Long set)
N	5691	5684	5678	5671	5665	5660
Wald test statistics of a null hypothesis that all coefficients except the constant term are zero	71.36	108.68	206.60	16.52	107.84	170.67
p-value for the null hypothesis	0.0000	0.0000	0.0000	0.0055	0.0000	0.0000

Notes) Standard error in parenthesis. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Interval regression is used for constructing continuous variable for number of Futaba neighbors (known and unknown). These variables were originally structured as ordered categories. However, to better understand the estimation results, we constructed a continuous variable using interval regression. For the estimation, in addition to the category number of unknown and known Futaba neighbors, gender dummies, age, house type dummies, current prefecture dummies, and residential block in Futaba dummies were employed. After the estimation, the numbers were rounded. Furthermore, upper and lower bounds were adjusted according to the original categories. We also report a Wald test statistics of a null hypothesis that all coefficients in the regression model except the constant term are zero. Our results reject the null hypothesis strongly. Omitted control variables from (b) and (e) are house type, education, gender, income level and income level before the disaster dummies and age. In addition to those, on (c) and (f), general trust before the disaster, mutual help before the disaster, trust in neighbors before the disaster, leaves door open before the disaster, borrows from neighbors dummies before the disaster, people are fair dummies before the disaster, self-trustworthiness dummies before the disaster, volunteer participation dummies before the disaster and tea party participation dummies before the disaster are included

Table 4.7 Joint Significance of β_{IS} and α_{PI}

				Sobel test		Aroian test		Goodman test	
	β_{IS}	α_{PI}	$\beta_{IS}\,\alpha_{PI}$	score	p-value	score	p-value	score	p-value
No. of Futaba unknown neighbor									
Test of (a) and (d) of Table 4.6	0.0196***	-1.105***	-0.0217	-2.207	0.0273	-2.153	0.0313	-2.266	0.0235
Test of (b) and (e) of Table 4.6	0.0200***	-1.014***	-0.0203	-2.096	0.0361	-2.039	0.0414	-2.158	0.0309
Test of (c) and (f) of Table 4.6	0.0163**	-1.020***	-0.0166	-1.910	0.0561	-1.851	0.0642	-1.976	0.0482
No. of Futaba known neighbor									
Test of (a) and (d) of Table 4.6	0.0214***	-1.105***	-0.0236	-2.181	0.0292	-2.126	0.0335	-2.240	0.0251
Test of (b) and (e) of Table 4.6	0.0233***	-1.014***	-0.0236	-2.192	0.0284	-2.137	0.0326	-2.252	0.0244
Test of (c) and (f) of Table 4.6	0.0272***	-1.020***	-0.0277	-2.377	0.0175	-2.328	0.0199	-2.429	0.0152
Volunteer participation dummy									
Test of (a) and (d) of Table 4.6	0.260**	-1.105***	-0.2873	-1.962	0.0498	-1.906	0.0567	-2.024	0.0430
Test of (b) and (e) of Table 4.6	0.274**	-1.014***	-0.2778	-1.977	0.0480	-1.919	0.0550	-2.041	0.0413
Test of (c) and (f) of Table 4.6	0.218**	-1.020***	-0.2224	-1.685	0.0919	-1.626	0.1039	-1.752	0.0798
Tea party participation dummy									
Test of (a) and (d) of Table 4.6	0.263***	-1.105***	-0.2906	-2.202	0.0277	-2.148	0.0318	-2.260	0.0238
Test of (b) and (e) of Table 4.6	0.249***	-1.014***	-0.2515	-2.071	0.0384	-2.014	0.0440	-2.133	0.0329
Test of (c) and (f) of Table 4.6	0.402***	-1.020***	0.4100	-2.488	0.0128	-2.445	0.0145	-2.535	0.0113

Notes) * significant at 10% level, ** significant at 5% level, *** significant at 1% level."

Table 4.8 Regression Results of Heckman Selection Model (1) and (2) with Administrative Unit Fixed Effects

	[1] Dependent variable: Trust perception			[2] Dependent variable: K6		
	(a)	(b)	(c)	(d)	(e)	(f)
Factor *I* (Trust perception)				-0.903***	-0.799**	-0.830**
				(0.333)	(0.320)	(0.331)
No. of Futaba unknown neighbor	0.0203***	0.0186***	0.0152**	0.103**	0.0795	0.0727
	(0.00645)	(0.00692)	(0.00651)	(0.0508)	(0.0518)	(0.0501)
No. of Futaba known neighbor	0.0256***	0.0261***	0.0292***	0.0277	0.0193	0.0378
	(0.00718)	(0.00735)	(0.00701)	(0.0563)	(0.0550)	(0.0543)
Volunteer participation dummy	0.211**	0.237**	0.201*	-0.178	-0.730	-1.400*
	(0.104)	(0.105)	(0.107)	(0.812)	(0.776)	(0.813)
Tea party participation dummy	0.304***	0.284***	0.440***	-0.936	-0.748	-0.0395
	(0.0879)	(0.0893)	(0.0935)	(0.688)	(0.670)	(0.740)
Constant	-0.375**	-0.788*	-1.180**	10.16***	3.818	4.111
	(0.171)	(0.444)	(0.460)	(1.345)	(3.093)	(3.352)
Inverse Mills ratio for the Heckman correction	0.0164	0.191	0.210	-0.389	0.292	0.516
	(0.0847)	(0.152)	(0.144)	(0.653)	(1.006)	(0.973)
Control Variables	FE	FE + Short set	FE + Long set	FE	FE + Short set	FE + Long set
N	5691	5684	5678	5671	5665	5660
Wald test statistics of a null hypothesis that all coefficients except the constant term are zero	142.35	189.24	307.83	100.88	212.53	275.94
p-value for the null hypothesis	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000

Source) Iwasaki et al. (2017)

Notes) Standard error in parenthesis. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Interval regression is used for constructing continuous variable for number of Futaba neighbors (known and unknown). We also report a Wald test statistics of a null hypothesis that all coefficients in the regression model except the constant term are zero. Our results reject the null hypothesis strongly. Omitted control variables from all the columns are prefecture fixed effects (except for Fukushima prefecture) and city fixed effects in Fukushima prefecture. We adopted a Heckman correction model using observed characteristics in the 2010 Census such as sex and age categories of each respondent and non-respondent. In addition, omitted control variables on (b) and (e) are house type, education, gender, income level and income level before the disaster dummies and age. In addition to those, on (c) and (f), general trust before the disaster, mutual help before the disaster, trust in neighbors before the disaster, leaves door open before the disaster, borrows from neighbors dummies before the disaster, people are fair dummies before the disaster, self-trustworthiness dummies before the disaster, volunteer participation dummies before the disaster and tea party participation dummies before the disaster are included. Those coefficients are not reported in the Table but are available from the corresponding author upon request.

Table 4.9 Joint Significance Test for Regression Results of Heckman Selection Model with Administrative Unit Fixed Effects.

				Sobel test		Aroian test		Goodman test	
	β_{IS}	α_{PI}	$\beta_{IS}\,\alpha_{PI}$	score	p-value	score	p-value	score	p-value
No. of Futaba unknown neighbor									
Test of (a) and (d) of Table 4.8	0.0203***	-0.903***	-0.0183	-2.054	0.0399	-1.997	0.0458	-2.117	0.0343
Test of (b) and (e) of Table 4.8	0.0186***	-0.799**	-0.0149	-1.829	0.0673	-1.765	0.0776	-1.901	0.0573
Test of (c) and (f) of Table 4.8	0.0152**	-0.830**	-0.0126	-1.709	0.0875	-1.640	0.1009	-1.787	0.0740
No. of Futaba known neighbor									
Test of (a) and (d) of Table 4.8	0.0256***	-0.903***	-0.0231	-2.158	0.0309	-2.107	0.0352	-2.214	0.0268
Test of (b) and (e) of Table 4.8	0.0261***	-0.799**	-0.0209	-2.042	0.0411	-1.990	0.0466	-2.099	0.0358
Test of (c) and (f) of Table 4.8	0.0292***	-0.830**	-0.0242	-2.148	0.0317	-2.104	0.0354	-2.195	0.0281
Volunteer participation dummy									
Test of (a) and (d) of Table 4.8	0.211**	-0.903***	-0.1905	-1.624	0.1042	-1.558	0.1192	-1.700	0.0891
Test of (b) and (e) of Table 4.8	0.237**	-0.799**	-0.1894	-1.674	0.0941	-1.605	0.1085	-1.754	0.0795
Test of (c) and (f) of Table 4.8	0.201*	-0.830**	-0.1668	-1.503	0.1327	-1.432	0.1521	-1.586	0.1126
Tea party participation dummy									
Test of (a) and (d) of Table 4.8	0.304***	-0.903***	0.2745	-2.134	0.0328	-2.081	0.0375	-2.191	0.0284
Test of (b) and (e) of Table 4.8	0.284***	-0.799**	0.2565	-2.589	0.0096	-2.574	0.0100	-2.604	0.0092
Test of (c) and (f) of Table 4.8	0.440***	-0.830**	0.3652	-2.213	0.0269	-2.175	0.0296	-2.253	0.0243

Source) Iwasaki et al. (2017)

Notes) * significant at 10% level, ** significant at 5% level, *** significant at 1% level."

Table 4.10 First Step Estimation Results of Table 4.6 and 4.8

	(a)	(b)	(c)	(d)	(e)	(f)
Age dummies						
20 - 29	-	-	-	-	-	-
30 - 39	0.693***	0.687***	0.689***	0.693***	0.686***	0.687***
	(0.163)	(0.163)	(0.163)	(0.163)	(0.164)	(0.164)
40 - 49	0.865***	0.862***	0.864***	0.818***	0.819***	0.821***
	(0.161)	(0.161)	(0.161)	(0.162)	(0.162)	(0.162)
50 - 59	0.971***	0.971***	0.956***	0.921***	0.921***	0.905***
	(0.154)	(0.154)	(0.154)	(0.155)	(0.155)	(0.155)
60 - 69	1.437***	1.436***	1.439***	1.418***	1.418***	1.421***
	(0.152)	(0.152)	(0.152)	(0.152)	(0.152)	(0.152)
70 - 79	1.494***	1.499***	1.491***	1.435***	1.438***	1.433***
	(0.154)	(0.155)	(0.155)	(0.155)	(0.155)	(0.155)
Over 80	1.233***	1.235***	1.232***	1.128***	1.131***	1.127***
	(0.160)	(0.160)	(0.160)	(0.162)	(0.162)	(0.162)
No answer	1.670***	-13.15	-13.15	1.934***	-11.75	-11.75
	(0.373)	(.)	(.)	(0.378)	(.)	(.)
Sex dummies						
Male	-	-	-	-	-	-
Female	-0.893***	-0.902***	-0.907***	-0.897***	-0.905***	-0.912***
	(0.0556)	(0.0559)	(0.0564)	(0.0575)	(0.0578)	(0.0582)
No answer	0.999**	7.430	7.423	-0.493	0.297	0.296
	(0.480)	(3578.3)	(3593.6)	(0.586)	(0.712)	(0.712)
Futaba area dummies						
Ishikuma	-	-	-	-	-	-
Yamada	-0.238	-0.235	-0.259	-0.287	-0.262	-0.287
	(0.187)	(0.188)	(0.189)	(0.187)	(0.189)	(0.190)
Matsusako	-0.533	-0.525	-5.696	-5.767	-5.744	-5.752
	(0.597)	(0.598)	(.)	(.)	(.)	(.)
Mizusawa	0.103	0.113	0.110	0.0847	0.112	0.109
	(0.312)	(0.313)	(0.313)	(0.311)	(0.313)	(0.313)
Mesaku	-0.511	-0.502	-0.505	-0.693**	-0.667*	-0.671*
	(0.326)	(0.327)	(0.327)	(0.349)	(0.350)	(0.351)
Koriyama	-0.117	-0.112	-0.135	-0.220	-0.195	-0.221
	(0.187)	(0.189)	(0.190)	(0.188)	(0.191)	(0.192)
Kamihatori	-0.125	-0.115	-0.152	-0.176	-0.149	-0.189
	(0.236)	(0.237)	(0.240)	(0.238)	(0.240)	(0.243)
Niiyama	-0.0602	-0.0494	-0.0558	-0.123	-0.0933	-0.100
	(0.170)	(0.172)	(0.172)	(0.169)	(0.172)	(0.172)
Matsukura	-0.762*	-0.755*	-0.757*	-1.122**	-1.096**	-1.100**
	(0.404)	(0.405)	(0.405)	(0.495)	(0.496)	(0.496)
Terasawa	-0.465*	-0.456*	-0.458*	-0.649**	-0.623**	-0.626**
	(0.247)	(0.248)	(0.248)	(0.262)	(0.264)	(0.264)
Shibukawa	-0.384	-0.437	-0.438	-0.493*	-0.525*	-0.527*
	(0.271)	(0.280)	(0.280)	(0.279)	(0.289)	(0.290)
Konokusa	-0.135	-0.125	-0.127	-0.153	-0.126	-0.129
	(0.206)	(0.208)	(0.208)	(0.206)	(0.208)	(0.208)

Table 4.10 First Step Estimation Results of Table 4.6 and 4.8 (Continued)

Hosoya	-0.321	-0.333	-0.335	-0.367	-0.350	-0.353
	(0.242)	(0.245)	(0.245)	(0.243)	(0.245)	(0.245)
Shimohatori	-0.187	-0.177	-0.179	-0.264	-0.236	-0.239
	(0.229)	(0.230)	(0.230)	(0.231)	(0.233)	(0.233)
Nakada	-0.241	-0.232	-0.235	-0.258	-0.231	-0.234
	(0.276)	(0.277)	(0.277)	(0.275)	(0.277)	(0.277)
Nagatsuka	-0.111	-0.0979	-0.103	-0.179	-0.150	-0.155
	(0.168)	(0.170)	(0.170)	(0.167)	(0.170)	(0.170)
Morotake	-0.456	-0.521*	-0.523*	-0.540*	-0.524*	-0.526*
	(0.296)	(0.308)	(0.308)	(0.306)	(0.307)	(0.308)
Nakahama	-0.577**	-0.569**	-0.570**	-0.590**	-0.564**	-0.566**
	(0.285)	(0.286)	(0.286)	(0.284)	(0.286)	(0.286)
Nakano	-0.0952	-0.0852	-0.0876	-0.207	-0.180	-0.183
	(0.269)	(0.270)	(0.270)	(0.276)	(0.278)	(0.278)
Maeda	-0.305*	-0.315*	-0.317*	-0.360**	-0.345*	-0.347*
	(0.180)	(0.182)	(0.182)	(0.180)	(0.183)	(0.183)
Other	7.972	7.829	7.841	7.960	7.909	7.924
	(.)	(5184.7)	(5177.6)	(.)	(.)	(.)
No answer	0.0820	1.626**	1.623**	0.707	7.259	7.254
	(0.601)	(0.788)	(0.787)	(0.678)	(.)	(.)
_cons	-1.895***	-1.902***	-1.894***	-1.830***	-1.856***	-1.848***
	(0.213)	(0.214)	(0.214)	(0.212)	(0.214)	(0.214)
N	5691	5684	5678	5671	5665	5660

Table 4.11 K6 Regression on Income with Heckman Correction

	(1)	(2)	(3)	(4)
Income dummies (JPY)				
Less than 1 million				
[reference category]				
1 million to 2 million	-0.735	-0.531	-0.874	-0.722
	(0.958)	(0.970)	(0.944)	(0.955)
2 million to 3 million	-1.551	-1.423	-1.331	-1.307
	(0.955)	(0.959)	(0.930)	(0.927)
3 million to 4 million	-2.166**	-1.961**	-2.308**	-2.021**
	(0.972)	(0.981)	(0.948)	(0.951)
4 million to 6 million	-3.365***	-3.004***	-3.288***	-3.040***
	(1.030)	(1.039)	(1.025)	(1.026)
6 million to 8 million	-3.909***	-3.679***	-3.802***	-3.594***
	(1.191)	(1.196)	(1.165)	(1.164)
more than 8 million	-3.409**	-3.011**	-3.207**	-2.940**
	(1.504)	(1.533)	(1.505)	(1.499)
No answer	-0.611	-0.551	-0.0229	-0.204
	(1.455)	(1.457)	(1.417)	(1.415)
Constant	6.482**	5.357*	6.167*	4.332
	(2.804)	(2.871)	(3.197)	(3.230)
Inverse Mills Ratio	-0.672	-0.577	-0.236	0.0406
for Heckman Correction	(0.983)	(1.002)	(0.976)	(0.990)
Control variables	Short set	Shortset w/ Factor	Long set	Long set w/ factor
N	5684	5665	5668	5660
Wald test statistics of a null hypothesis that all coefficients except the constant term are zero	97.78	107.84	155.73	170.67
p-value for the null hypothesis	0.0000	0.0000	0.0000	0.0000

Notes) Standard errors in parentheses * p<0.10 ** p<0.05 *** p<0.01. Income dummies is self-reported yearly income per house hold. Control variables are number of unknown neighbors from Futaba, number of known neighbors from Futaba, participation in volunteer activities, participation in tea party, house type dummies, education dummies, age, gender, income before disaster dummies. In addition, on column (3) and (4), general trust before the disaster, mutual help before the disaster, trust in neighbors before the disaster, leaves door open dummies before disaster, borrows from neighbors dummies before disaster, people are fair dummies before disaster, self-trustworthiness dummies before disaster, participation in volunteer activities dummies before disaster and participation in tea party dummies before disaster are included. Furthermore, on column (2) and (4), the factor trust perception is included. Those coefficients are not reported in the Table but are available from the corresponding author upon request.

Table 4.12 First Step Estimation Results of Table 4.11

	(1)	(2)	(3)	(4)
Age dummies				
20 - 29	-	-	-	-
30 - 39	0.702***	0.686***	0.686***	0.687***
	(0.163)	(0.164)	(0.164)	(0.164)
40 - 49	0.830***	0.819***	0.831***	0.821***
	(0.162)	(0.162)	(0.162)	(0.162)
50 - 59	0.936***	0.921***	0.913***	0.905***
	(0.155)	(0.155)	(0.155)	(0.155)
60 - 69	1.444***	1.418***	1.434***	1.421***
	(0.152)	(0.152)	(0.152)	(0.152)
70 - 79	1.458***	1.438***	1.432***	1.433***
	(0.155)	(0.155)	(0.155)	(0.155)
Over 80	1.157***	1.131***	1.138***	1.127***
	(0.162)	(0.162)	(0.162)	(0.162)
No answer	-11.73	-11.75	-11.76	-11.75
	(.)	(.)	(.)	(.)
Sex dummies				
Male	-	-	-	-
Female	-0.899***	-0.905***	-0.909***	-0.912***
	(0.0569)	(0.0578)	(0.0578)	(0.0582)
No answer	0.280	0.297	0.284	0.296
	(0.713)	(0.712)	(0.713)	(0.712)
Futaba area dummies				
Ishikuma	-	-	-	-
Yamada	-0.230	-0.262	-0.271	-0.287
	(0.188)	(0.189)	(0.189)	(0.190)
Matsusako	-5.743	-5.744	-5.581	-5.752
	(.)	(.)	(.)	(.)
Mizusawa	0.111	0.112	0.109	0.109
	(0.313)	(0.313)	(0.313)	(0.313)
Mesaku	-0.669*	-0.667*	-0.671*	-0.671*
	(0.351)	(0.350)	(0.351)	(0.351)
Koriyama	-0.183	-0.195	-0.209	-0.221
	(0.191)	(0.191)	(0.191)	(0.192)
Kamihatori	-0.108	-0.149	-0.190	-0.189
	(0.236)	(0.240)	(0.243)	(0.243)
Niiyama	-0.0668	-0.0933	-0.0871	-0.100
	(0.172)	(0.172)	(0.172)	(0.172)
Matsukura	-1.097**	-1.096**	-1.099**	-1.100**
	(0.496)	(0.496)	(0.497)	(0.496)
Terasawa	-0.560**	-0.623**	-0.562**	-0.626**
	(0.257)	(0.264)	(0.257)	(0.264)
Shibukawa	-0.526*	-0.525*	-0.527*	-0.527*
	(0.289)	(0.289)	(0.289)	(0.290)
Konokusa	-0.127	-0.126	-0.129	-0.129
	(0.208)	(0.208)	(0.208)	(0.208)
Hosoya	-0.351	-0.350	-0.353	-0.353
	(0.245)	(0.245)	(0.245)	(0.245)

Table 4.12 First Step Estimation Results of Table 4.11 (Continued)

Shimohatori	-0.237	-0.236	-0.238	-0.239
	(0.233)	(0.233)	(0.233)	(0.233)
Nakada	-0.232	-0.231	-0.234	-0.234
	(0.277)	(0.277)	(0.277)	(0.277)
Nagatsuka	-0.131	-0.150	-0.152	-0.155
	(0.170)	(0.170)	(0.170)	(0.170)
Morotake	-0.526*	-0.524*	-0.526*	-0.526*
	(0.307)	(0.307)	(0.308)	(0.308)
Nakahama	-0.564**	-0.564**	-0.565**	-0.566**
	(0.286)	(0.286)	(0.286)	(0.286)
Nakano	-0.181	-0.180	-0.183	-0.183
	(0.278)	(0.278)	(0.278)	(0.278)
Maeda	-0.327*	-0.345*	-0.338*	-0.347*
	(0.182)	(0.183)	(0.183)	(0.183)
Other	7.868	7.909	7.879	7.924
	(.)	(.)	(.)	(.)
No answer	7.329	7.259	7.329	7.254
	(5191.8)	(.)	(5211.2)	(.)
_cons	-1.876***	-1.856***	-1.856***	-1.848***
	(0.214)	(0.214)	(0.214)	(0.214)
N	5684	5665	5668	5660

Chapter 5

Natural Experiment on Prospect Theory[†]

I. Theory and Empirical Studies on Prospect Theory

To understand better determinants of seriously deteriorated mental health among Futaba residents and to contribute to literature, we test prospect theory using our unique dataset. We use data set obtained by 2013 survey and 2014 survey in this analysis. While models of reference-dependent preferences and loss aversion have been tested in a variety of laboratory experiments, there is little real-world evidence that validates such models (Köbberling 2006; DellaVigna 2009). Exceptions are the celebrated studies by Camerer et al. (1997), Genesove and Mayor (2001), Mas (2006), Crawford and Meng (2011), and Barseghyan, et al. (2013). These papers examined the theory in a variety of contexts such as the housing market, finance, labor supply, insurance, and employment. The findings of these studies are largely consistent with prospect theory. The theory is also used for explaining the relationship between well-being and reference income (Vendrik and Woltjer 2007). However, still little real world studies confirm the theoretical implications of prospect theory. In existing studies, there are a number of remaining issues such as the identification of the reference point and causal relationship and validity and generalizability of the empirical results as a real experienced welfare consequence of reference dependence and loss aversion.

To bridge these gaps in the existing studies, we test the basic components of the canonical version of prospect theory by exploiting a natural experimental situation generated by the Fukushima Daiichi Nuclear Disaster. To carry out our study, we collected and employed data from the residents of a town of Futaba, who were unexpectedly displaced by

[†] A part of preliminary results presented in this chapter were published as Iwasaki et al. (2016)

the disaster in March 2011. Since Futaba is located within a 2 to 10 km radius from the Fukushima Daiichi nuclear power plant, the government placed an indefinite evacuation order on all of the town's residents after the incident. Accordingly, all of the Futaba residents were suddenly forced to move from their homes and many of the residents lost stable income sources although the Tokyo Electric Power Company (TEPCO) and the Japanese government have provided a variety of monetary and non-monetary compensations. Since the incident was unforeseen, the sudden evacuation provides us with a natural experiment in a sense of DiNardo (2008) in which individuals exogenously and unexpectedly lost their income sources and health for an indefinite period of time.

We believe that our study contributes to the literature because this natural experiment enables us to test reference dependence and loss aversion, the two basic components of the canonical version of the prospect theory introduced by Kahneman and Tversky (1979). First, reference dependence is the property that each individual's value function is defined over differences from a reference point instead of overall wealth. Second, loss aversion indicates that the value function has a kink at the reference point and is steeper for losses than it is for gains (DellaVigna, 2009). Pre-disaster levels are likely to be a salient reference point for the evacuees' utility function. Hence, we apply pre-disaster income level, health status and house size as reference points to test the theory. We can investigate the main characteristics of prospect theory by examining changes in psychosocial outcomes caused by the evacuation order.

II. Method of Analysis

1. Descriptive Statistics

Table 5.1 and Table 5.2 show descriptive statistics of the main variables used for this

analysis from 2013 survey and 2014 survey respectively. We asked for categorical household income levels in the 2013 survey; to estimate the continuous income level of each resident, we adopt a methodology of interval regression and assume that the minimum income level is zero. In 2014 survey, we asked for continuous household income. The main variable we used for analysis, which is “Income per person” indicates the household income divided by number of family member. Comparing the values before and after the disaster, the average income level per person clearly declined from 1.87 million to 1.73 million JPY according to 2013 dataset, and from 2.14 million to 1.62 million JPY according to 2014 dataset. “Change in income per person” indicates “income per person after the disaster – income per person before the disaster.” For analysis, to avoid extreme impact of outliers, we employ Hadi’s method (Hadi 1994) to remove outliers in 5 percent level from “change of income per person”. Health change represents the self-reported evaluation of how health status changed after the disaster. We can easily verify that the average score is negative, indicating that the majority of the evacuees’ states of health deteriorated after the disaster from both rounds of the survey. House size question is not included in 2013 survey and is only included in 2014 survey. “House size per person” represents house size divided by number of family member. “Change in house size per person” indicates “house size per person after the disaster - house size per person before the disaster.” In same way as “change in income per person”, we removed outliers using Hadi’s method in 5 percent level from “Change in house size per person” to avoid extreme impact of outliers.

As to the other respondent characteristics, we find that our survey primarily consists of males and the elderly. While the population of Futaba as a whole has a balanced male-female ratio according to the 2010 national census, the male proportion of our survey respondents is 79 percent for 2013 survey and 80 percent for 2014 survey. In addition, the age distribution of the respondents is skewed toward the left for both rounds of the survey. In

other words, our data has a small proportion of people under age 50 compared to the census data. One of the reasons behind this discrepancy is because our survey respondents are the heads of household and therefore are not representative of the entire population in Futaba.

As seen in a previous chapter, mental health status of Futaba residents is unusually low. Understanding the determinants of mental health would provide the disaster-affected residents with invaluable insights and allow them to ease their distress. To this aim, we adopt the prospect theory model introduced by Kahneman and Tversky (1979) and test the theory using the data from our original survey. Many of the Futaba residents lost their homes, jobs, stable income sources, and overall wellbeing by the sudden disaster and the subsequent evacuation. This creates a natural experiment in the sense of DiNardo (2008), in which people are exogenously and unexpectedly forced to give up their assets and stable income sources for an indefinite period of time. Using this scenario, we can adopt and test the prospect theory framework.

2. Reference Dependence and Loss Aversion

Here, we test the two basic components of the canonical version of prospect theory introduced by Kahneman and Tversky (1979), i.e., reference dependence and loss aversion. Reference dependence, the first component of prospect theory, is a situation in which each individual's value function is defined over differences from a reference point instead of overall wealth. Loss aversion indicates that the value function has a kink at the reference point and is steeper for losses than it is for gains. With respect to the reference point, individuals dislike losses more than they value like-sized gains. Reference dependence and loss aversion can be described by Figure 5.1.

3. Empirical Framework

In our setting, pre-disaster conditions are likely to be a salient reference point for the evacuees' utility function. We take pre-disaster income per person, health status and house size per person as reference points. The outliers are removed using Hadi's method in 5 percent level. To test the two major characteristics of prospect theory as illustrated in Figures 5.1, we adopted multi-dimensional reference dependent utility model introduced by Köszegi and Rabin (2006). In their model with an assumption of separability across dimensions, a person's overall utility level is given by outcome-based utility and gain-loss utility components: $V = \Sigma_k m_k(Y_k) + \Sigma_k \mu_k m_k(Y_k - r_k)$ where Y_k is a level of monetary or no-monetary resource, k, and r_k is its reference point. With parameter restrictions, this model can satisfy the properties of Kahneman and Tversky's value function: for example, a condition, $\mu_k \neq 0$, shows reference dependence. Another set of conditions, $\mu_k = 1$ if $Y_k - r_k \geq 0$ and $\mu_k > 1$ if $Y_k - r_k < 0$ represents loss aversion. These properties can be empirically investigated in the following model.

(1) $$V = \alpha + \Sigma_k \alpha_k(Y_k) + \Sigma_k \beta_k(Y_k - r_k) + \Sigma_k \gamma_k(Y_k - r_k) * 1[(Y_k - r_k) < 0] + X\gamma + u,$$

where V shows the utility level, Y_k is a measured level of k-th resource that includes income level, health condition and house size, r_k is a reference point of k-th dimension, 1[.] is an indicator function which takes one if the argument is true, X is a set of control variables, and u is an error term. Since the loss aversion property indicates that the value function would be steeper for negative values than for positive values, loss aversion is tested by a null hypothesis that H_0: $\gamma_k = 0$.

In our empirical analysis, we define the utility level as $V = 24 - K6$, where V takes a

value between zero and twenty-four. Note that *V* indicates a level of improved mental health condition. Since the *K*6 also takes a value between zero and twenty four, the outcome measure *V*, should capture each individual's outcome level of the value function. In order to capture *Y* and *r*, we employ income, health status, and house size after and before the disaster, respectively, considering that the pre-disaster level of *Y* is likely to be a salient reference point. A set of controls, *X*, includes age dummies, female dummy, dummies for those who lost their family members after disaster, education dummies, job before disaster dummies, and dummies for residential block in Futaba before the disaster.

In natural experiment settings, it is crucial to make sure that treatment is given randomly. In our study context, however, we recognize that those who gained (e.g., change in income) from the disaster could be very different from those who lost from the disaster. To control these possible heterogeneity, we include all the significant variables from the exogeneity test of income change per person, health status change, and house size change per person to control variables: we regress each of these variables on a set of observed characteristics and also compare sample statistics for loss group and gain group as you can see in Table 5.4 to Table 5.6. We also include fixed effects of prefecture and city in Fukushima of current dwelling in order to control for the influences of unobserved amenity.

III. Result

1. Preliminary Result

In order to check reference dependence and loss aversion directly, we first run the following linear regression models without control variables:

(2) $$V = \alpha^{+} + \beta_1{}^{+}(Y_k - r_k) + u^{+} \text{ if } (Y_k - r_k) \geq 0$$

(3) $$V = \alpha^{-} + \beta_1{}^{-}(Y_k - r_k) + u^{-} \text{ if } (Y_k - r_k) < 0$$

The estimation results are in Figures 5.2 to 5.9: Figure 5.2 for income per person (2013), Figure 5.3 for income per person after removing 5% outliers by the Hadi (1994) method (2013), Figure 5.4 for health status (2013), Figure 5.5 for income per person (2014), Figure 5.6 for income per person after removing 5% outliers by the Hadi (1994) method (2014), Figure 5.7 for health status (2014), Figure 5.8 for house size per person (2014), and Figure 5.9 for house size per person after removing 5% outliers by the Hadi (1994) method (2014). We set the pre-disaster level as the reference point so that a value on the horizontal axis shows deviation Y_k from the reference point. This analysis is preliminary, because, in principle, the other running variables omitted from each model can cause omitted variable biases, although omitting them is convenient for graphical presentation.

Figures 5.2, 5.3, 5.4, 5.7, 5.8 and 5.9 indicate that the value function is steeper for losses than for gains, which is consistent with expectation of reference dependence and loss aversion, although the slope on the positive side in Figure 5.7 is negative. To avoid extreme effects of outliers, we tried the Hadi method in Figure 5.3, 5.6 and 5.9. For health status, we couldn't remove outliers using Hadi's method because of too small sample in the gain side. In our main empirical analysis, we use variables after removing outliers for income per person and house size per person. In Figures 5.5 and 5.6, we find no evidence of loss aversion.

2. Empirical Result

Table 5.3 shows the estimation results of equation (1) with a set of control variables. For 2013 data analysis let Y_1 = income per person in 2013, r_1 = income per person before the disaster, Y_2 = health status in 2013, and r_2 = health status before the disaster. The house size change is unfortunately not available in 2013 data set. Furthermore, while $Y_2 - r_2$ is available, Y_2 is not included because of unavailability. For 2014 dataset analysis, following the model of 2013 dataset analysis, let Y_1 = income per person in 2014, r_1 = income per person before the

disaster, Y_2 = health status in 2014, and r_2 = health status before the disaster. Also, since house size information is available in 2014 data set, let Y_3 = house size per person in 2014, r_3 = house size per person before the disaster. In same way as 2013 data set analysis, while $Y_2 - r_2$ is available, Y_2 is not included because of unavailability.

Our target is to test the null hypothesis, H_0: $r_k = 0$, by checking the coefficients on the interaction terms between the change in each wealth variable, i.e.,$(Y_k - r_k)$ and the dummy variables for negative change in each wealth variable, i.e., $1[(Y_k - r_k) < 0]$. As for the income per person variable, the estimated coefficient of the cross-terms are positive and statistically significant for analysis using 2013 dataset, which shows that value function is steeper for losses than it is for gains while cross-terms are not statistically significant using 2014 dataset. The estimated coefficients of the cross-terms on the health status variable are positive and statistically significant consistently. Furthermore, the estimated coefficients of the cross-terms on the house size per person variable are positive and statistically significant, supporting the existence of reference dependence and loss aversion.

One caution should be warranted that the proportion of $Y_k - r_k$ being positive differs in each dimension.

2013 dataset: $P(Y_1 - r_1) = 0.38$, $P(Y_2 - r_2) = 0.04$

2014 data set: $P(Y_1 - r_1) = 0.24$, $P(Y_2 - r_2) = 0.02$, $P(Y_3 - r_3) = 0.54$

Given the disaster, positive changes in $Y_k - r_k$ are less likely, as the income change show (38% and 25% positive). However, house size per person increased (54%). The most problematic is health change with only 4% and 2% increase. Hence we should take estimates for health change with a grain of salt.

3. Further Analysis on Income Change

As to the regression results from change in income, the inconsistent result in income

change, that 2013 data shows loss aversion while 2014 data doesn't, might be caused by a revised reference point. The pre-disaster income was fully supported in 2013 by the government, no matter how much they earn after the disaster. On the other hand, when the second survey was conducted in 2014, the TEPCO's compensation policy for pre-disaster income level had changed, and TEPCO covered only the decreased amount of income considering the current income. Also, many of the residents had bought their houses outside of Futaba in 2014 while not many had bought one in 2013, which can change their expectation on recovery. Such policies and surrounding circumstances might have changed reference points among residents.

In our survey, the question asking whether the residents would go back to Futaba or not in future is included. We might be able to use this question to separate those with a revised reference point, because the reference point of those who answered that they would go back to Futaba (66 persons) may keep the pre-disaster level reference point whereas the reference point of others could have changed. The simple regression results of utility on income using 2014 data for only those who answered that they would go back is shown in Figure 5.10 (sample size 42 with no missings) which suggests loss aversion. Age distribution comparison in Table 5.7 shows that average age of those who answered that they would go back to Futaba in the future are higher than average age of respondents.

IV. Discussion and Policy Implication

The conventional expected utility theory explains how individuals facing uncertain outcomes make decisions. There are, however, many individual behaviors that cannot be understood from the viewpoint of the expected utility theory. For those, prospect theory provides alternative explanations. Does the prospect theory work? There are several studies

reporting positive laboratory experimental evidence, but no evidence based on real world data exists as far as we know. This analysis provides probably the first such evidence by testing the two main tenets of prospect theory: reference dependence and loss aversion.

Following the well-known Tsunami and Fukushima Nuclear Disaster in March 2011, we conducted surveys and this disaster provides a natural experiment setting where losses/gains were not self-selected. We took mental distress measured by K6 as the dependent variable and took 'negative K6' as value/utility to be explained by three important factors: income, health and house size. The pre-disaster level serves as a reference point and we measured changes in these three variables for losses/gains. Understandably, there were far more losses than gains, but except for health, the proportion of gains was not too small (20% or higher) to enable our data analysis. For house size per person, there were almost equal number of losses and gains.

Loss aversion combined with reference dependence implies a regression function with different slopes around the reference point, with the prospect theory predicting the steeper slope on the negative (i.e., loss) side than on the positive (i.e., gain) side. We adopt multi-dimensional reference dependent utility model introduced by Köszegi and Rabin (2006) for estimation. Our main empirical finding is that there is evidence for prospect theory in the 2014 data with house size. In the 2013 survey, house size variable is not available unfortunately, but we still found evidence for prospect theory with income. Though health status shows loss aversion tendency both in 2013 and 2014 data, we should note that there are very few people whose health status became better after the disaster.

Why then was there no evidence for prospect theory in the 2014 data with income though there is an evidence for 2013 data? We attribute this to a revised (i.e. lowered) reference point of income in 2014. If the reference point adjusted toward the lower level than the pre-disaster point due to the revised expectations, victims must be over-compensated for

their loss in order to recover their original utility level. This logic can be clearly understandable with visualization in Figure 5.11. We cannot test whether the reference point has changed or not in this study and empirical study on endogenous determination of reference point would be an interesting topic for future study.

Our findings have a couple of policy implications. First, a sufficient, apparently more than enough, compensation should be provided to those who suffered a loss so that they can recover their original utility level. Second, if the reference point is lowered after the disaster, then the subsequent compensation should be larger than their loss in order to recover their original utility level. Third, given the multi-dimensionality of loss aversion, carefully designed intervention programs including health care as well as individual/group counseling should target victims with disproportionately large losses.

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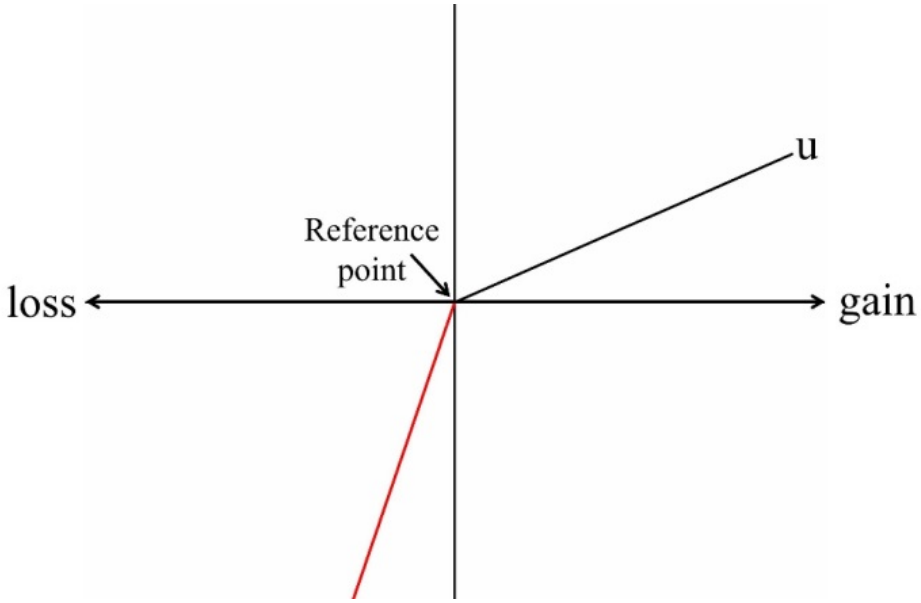

Figure 5.1 Reference Dependence and Loss Aversion

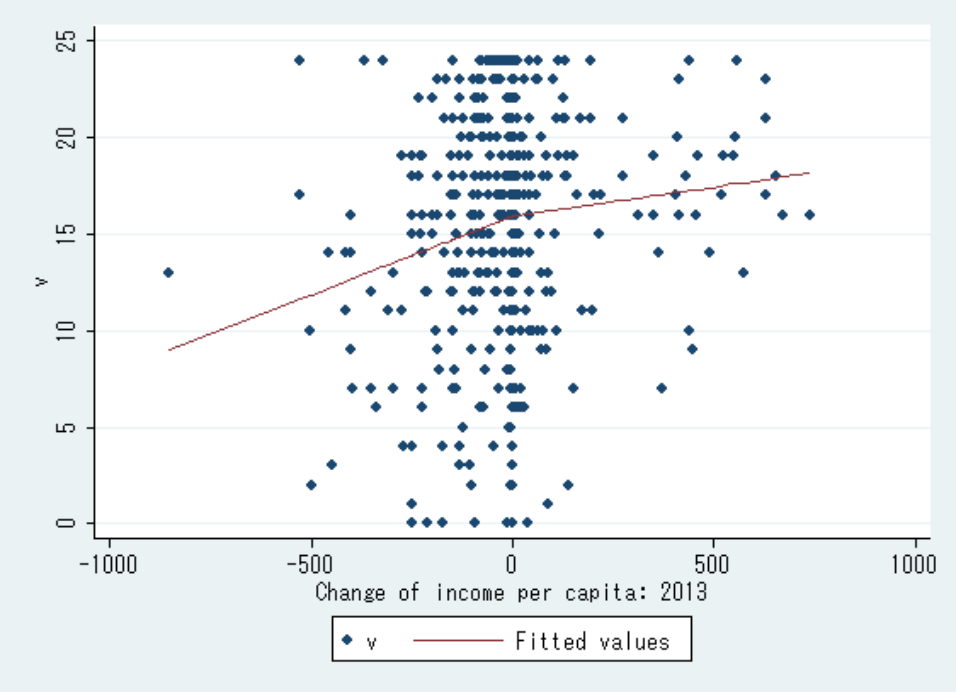

Figure 5.2 The Value Function over Change in Income per Person (2013)

Notes) The estimated parameter difference, i.e., β_{4+}- β_{4-} is -0.005 with standard error of 0.004.

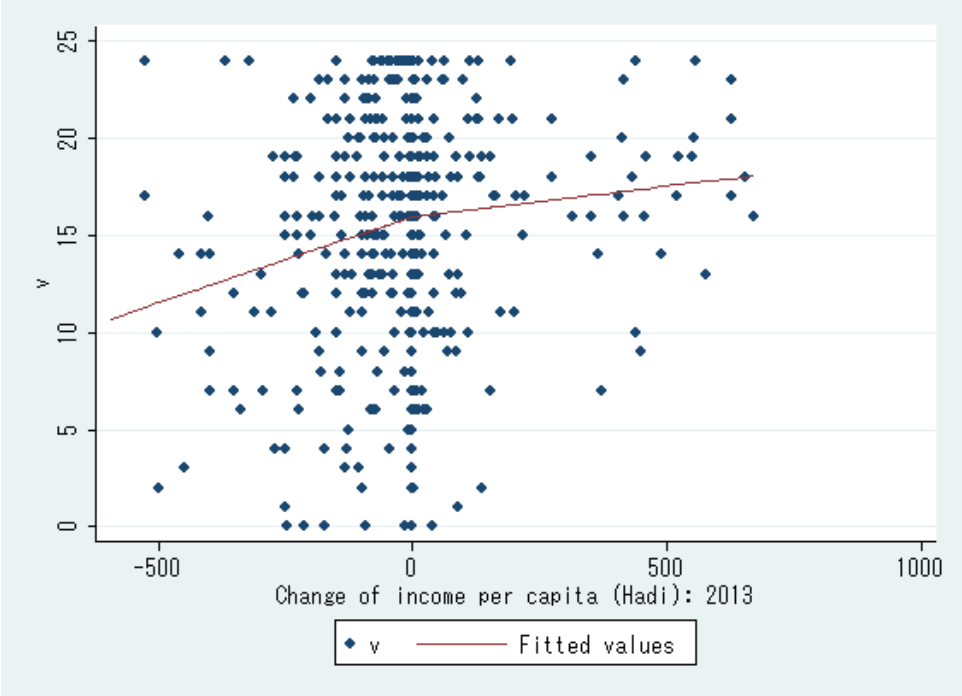

Figure 5.3 The Value Function over Change in Income per Person (2013):
5% of Outlier Removed by the Hadi Method

Notes) The estimated parameter difference, i.e., β_{4+}- β_{4-} is -0.015 with standard error of 0.006.

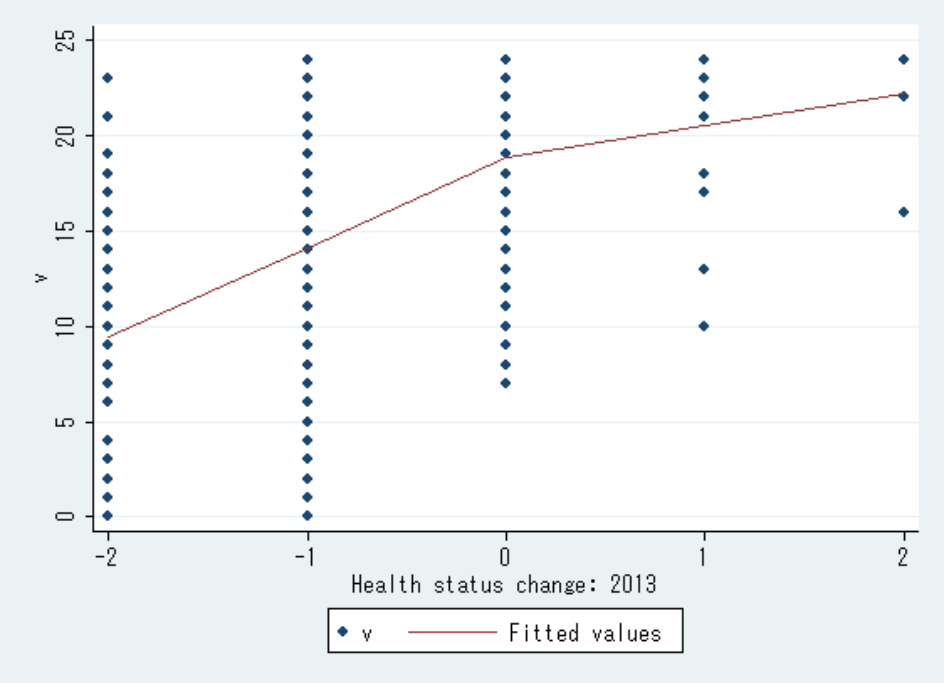

Figure 5.4 The Value Function over Change in Health Status (2013)

Notes) The estimated parameter difference, i.e., β_{4+}- β_{4-} is -7.676 with standard error of 1.321.

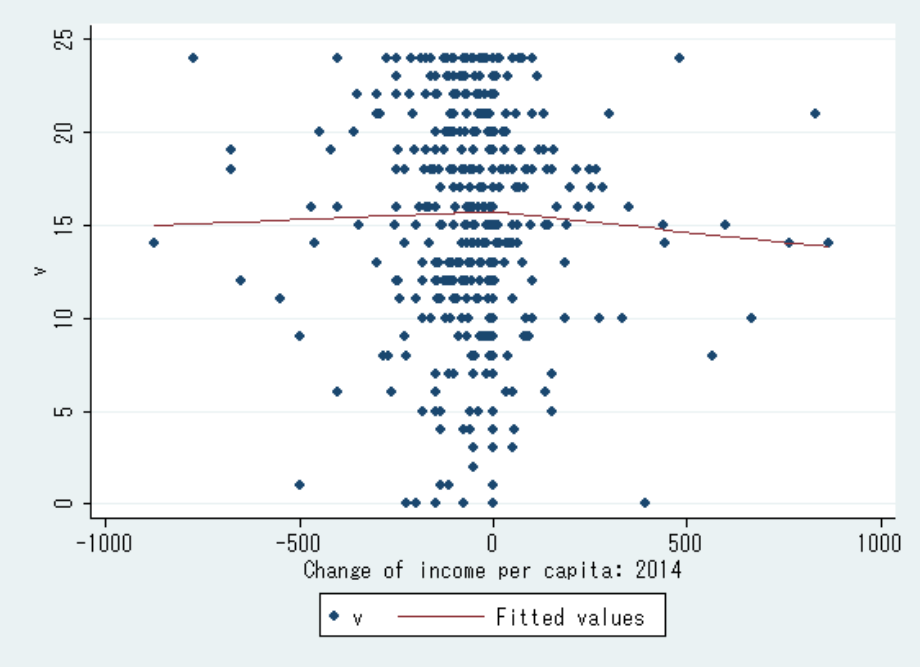

Figure 5.5 The Value Function over Change in Income per Person (2014)

Notes) The estimated parameter difference, i.e., β_{4+}- β_{4-} is -0.003 with standard error of 0.004.

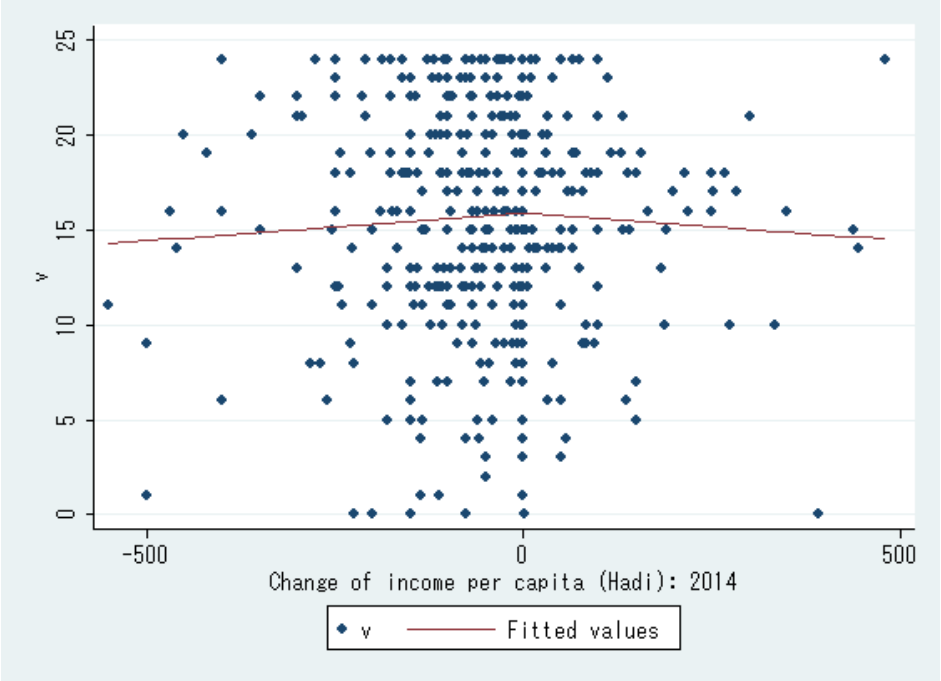

Figure 5.6 The Value Function over Change in Income per Person (2014): 5% of Outlier Removed by the Hadi Method

Notes) The estimated parameter difference, i.e., β_{4+}- β_{4-} is -0.006 with standard error of 0.006.

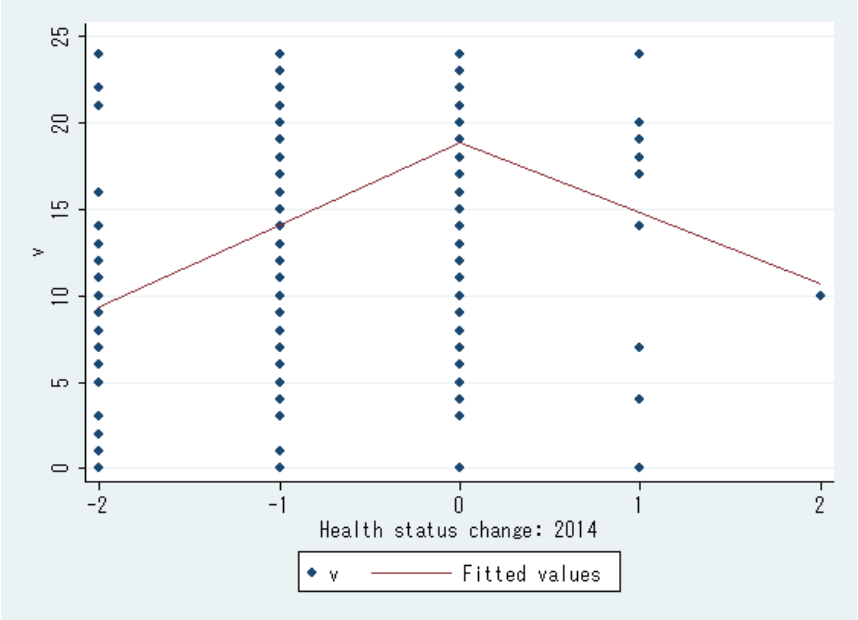

Figure 5.7 The Value Function over Change in Health Status (2014)

Notes) The estimated parameter difference, i.e., β_{2+}- β_{2-} is -8.789 with standard error of 1.485.

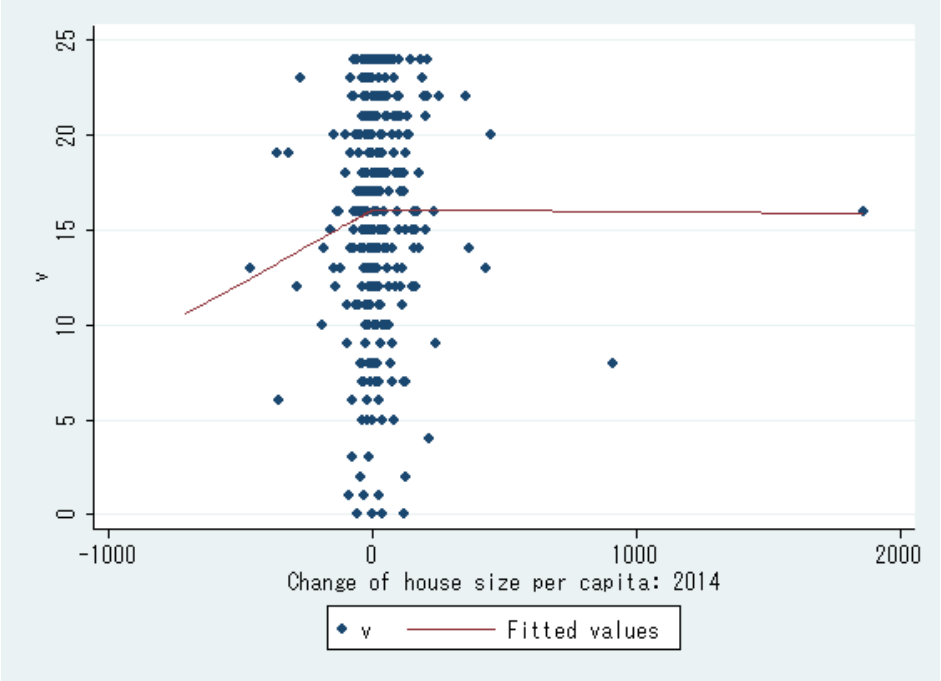

Figure 5.8 The Value Function over Change in House Size per Person (2014)

Notes) The estimated parameter difference, i.e., β_{3+}- β_{3-} is -0.008 with standard error of 0.007.

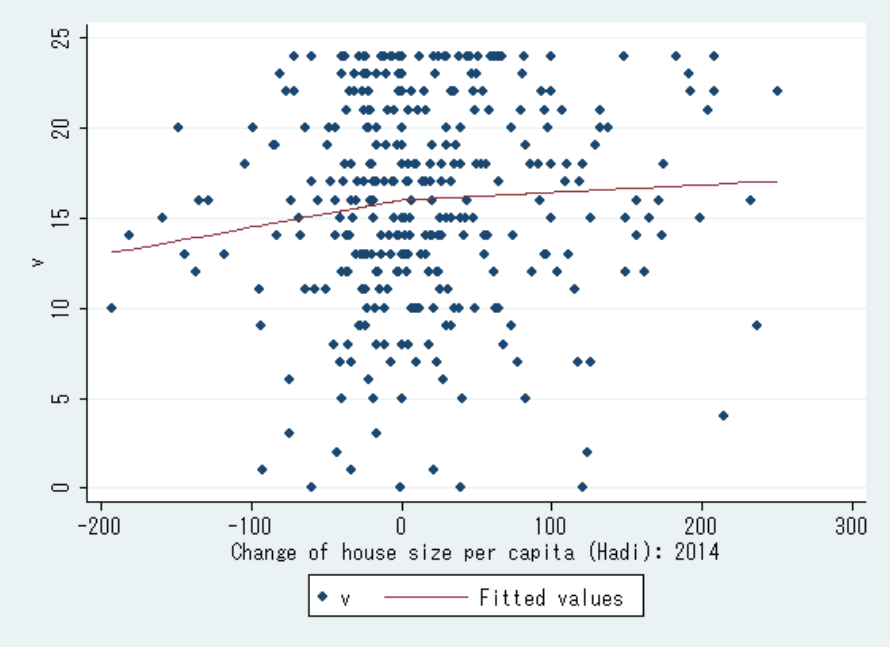

Figure 5.9 The Value Function over Change in House Size per Person (2014):
5% of Outlier Removed by the Hadi Method

Notes) The estimated parameter difference, i.e., β_{3+}- β_{3-} is -0.011 with standard error of 0.014.

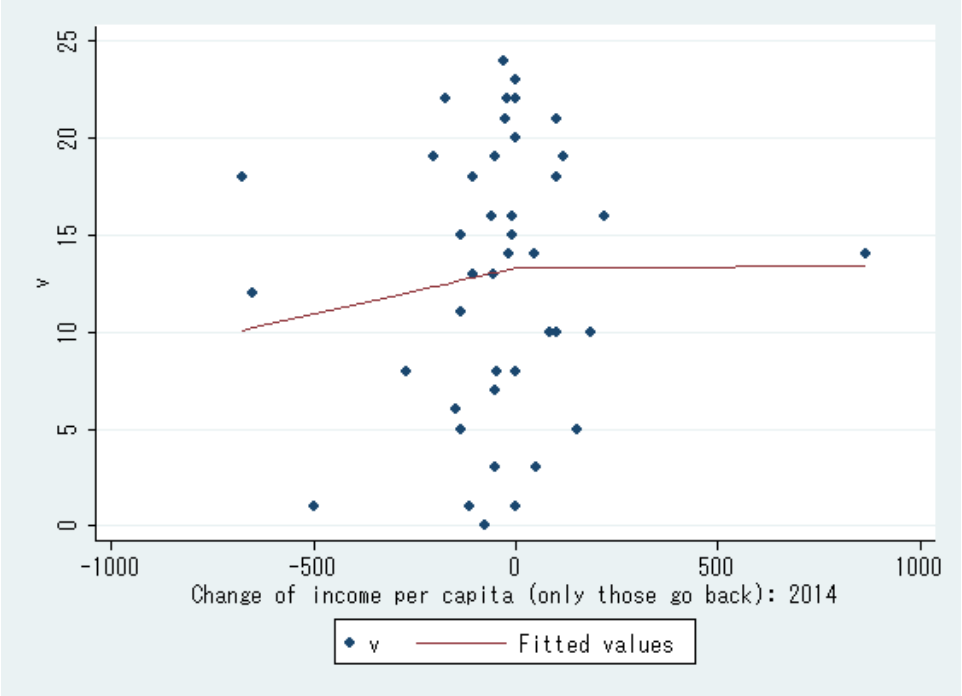

Figure 5.10 The Value Function over Change in Income per Person of Only Those Who Answered They Would Go Back to Futaba in the Future (2014)

Notes) The estimated parameter difference is -0.005 with standard error of 0.012.

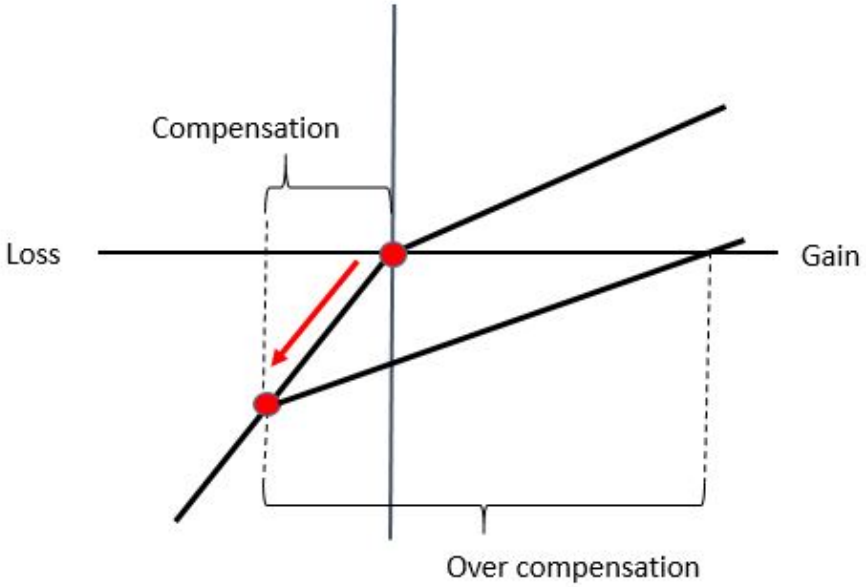

Figure 5.11 The Lowered Reference Point Case of Overcompensation Necessity

Table 5.1 Descriptive Statistics (2014)

Variable	Obs	Explanation	Mean	Std.Dev	Min	Max
K6	594	Kessler 6	8.56	5.99	0	24
Family size after disaster	643	Number of family members living together after disaster	2.66	1.53	1	12
Family size before disaster	625	Number of family members living together before disaster	3.40	1.75	0	10
Family size change	621	Family size after disaster – Family size before disaster	-0.75	1.71	-8	5
Health status change	638	-2 Much worse ～ 2 Much better	-0.68	0.68	-2	2
House size after disaster per person	403	Square meter: House size after disaster divided by family size after disaster	205.51	2245.97	4.13	45089
House size before disaster per person	523	Square meter: House size before disaster divided by family size before disaster	68.59	71.98	0	800
House size change	365	House size after disaster per person - House size before disaster per person	24.03	158.56	-709	1864.4
House size change (Hadi)	349	House size change per person, outlier removed using Hadi's method in 5 percentage level	17.32	70.39	-192	250.13
Income after disaster per person	477	10,000 yen: househod income after disaster divided by family size after disaster	162.48	175.62	0	1300
Income before disaster per person	465	10,000 yen: househod income before disaster divided by family size before disaster	213.52	152.30	0	1000
Income change per person	451	Income after disaster per person - Income before disaster per person	-45.69	179.87	-875	866.67
Age	641	Age when survey is distributed	63.39	14.01	26	96
Female dummy	654	Female=1	0.20	0.40	0	1
Dummies for loss of family						
1[No loss]	654	Did not lose any family member = 1	0.24	0.43	0	1
1[Yes]	654	Lost any family member =1	0.13	0.33	0	1
1[No answer]	654		0.62	0.49	0	1
Education dummies						
1[junior high school]	654		0.09	0.28	0	1
1[high school]	654		0.53	0.50	0	1
1[specialty school]	654		0.11	0.31	0	1
1[specialized vocational school]	654		0.01	0.08	0	1
1[community college]	654		0.03	0.18	0	1
1[university]	654		0.15	0.36	0	1
1[grad school]	654		0.01	0.10	0	1
1[other]	654		0.03	0.18	0	1
1[no answer]	654		0.04	0.20	0	1
Job before disaster dummies						
1[employee]	654		0.36	0.48	0	1
1[public employee]	654		0.08	0.27	0	1
1[doctor or lawyer]	654		0.00	0.06	0	1
1[agriculture]	654		0.11	0.31	0	1
1[fishing]	654		0.00	0.04	0	1

1[self-employed]	654	0.12	0.32	0	1
1[part time]	654	0.02	0.14	0	1
1[house work]	654	0.02	0.15	0	1
1[retired]	654	0.12	0.33	0	1
1[none]	654	0.07	0.26	0	1
1[other]	654	0.07	0.25	0	1
1[no answer]	654	0.02	0.14	0	1

Table 5.2 Descriptive Statistics (2013)

Variable	Obs	Explanation	Mean	Std.Dev	Min	Max
K6	524	Kessler 6	8.66	6.01	0	24
Family size after disaster	544	Number of family members living together after disaster	2.29	1.38	1	10
Family size before disaster	555	Number of family members living together before disaster	3.01	1.73	1	10
Family size change	535	Family size after disaster – Family size before disaster	-0.72	1.57	-7	9
Health status change	525	-2 Much worse ～2 Much better	-0.73	0.75	-2	2
Income after disaster per person	489	10,000 yen: household income after disaster estimated by intreg divided by family size after disaster	173.38	184.31	0	988.4
Income before disaster per person	501	10,000 yen: household income before disaster estimated by intreg divided by family size before disaster	186.92	142.12	0	1006
Income change per person	471	Income after disaster per person - Income before disaster per person	-16.87	186.53	-855	738.1
Age	575	Age when survey is distributed	62.97	14.39	24	94
Female dummy	585	Female=1	0.21	0.41	0	1
Dummies for loss of family						
1[No loss]	585	Did not lose any family member = 1	0.26	0.44	0	1
1[Yes]	585	Lost any family member =1	0.10	0.31	0	1
1[No answer]	585		0.64	0.48	0	1
Education dummies						
1[high school]	585		0.56	0.50	0	1
1[junior high school]	585		0.08	0.27	0	1
1[community college]	585		0.08	0.28	0	1
1[university]	585		0.12	0.33	0	1
1[other]	585		0.07	0.26	0	1
1[no answer]	585		0.08	0.27	0	1
Job before disaster dummies						
1[employee]	585		0.38	0.49	0	1
1[agriculture]	585		0.10	0.31	0	1
1[fishing]	585		0.00	0.04	0	1
1[self-employed]	585		0.10	0.30	0	1
1[doctor or lawyer]	585		0.01	0.07	0	1
1[house work]	585		0.02	0.14	0	1
1[student]	585		0.00	0.00	0	0
1[retired]	585		0.15	0.36	0	1
1[none]	585		0.03	0.17	0	1
1[part time]	585		0.03	0.18	0	1
1[other]	585		0.03	0.17	0	1
1[no answer]	585		0.14	0.35	0	1

Table 5.3 Tests of Reference Dependence and Loss Aversion

	2013				2014				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Income per person after disaster: Y	0.0038*		0.0022*	0.0021	0.0043			0.0009	0.0001
	(0.0019)		(0.0011)	(0.0022)	(0.0026)			(0.0051)	(0.0054)
Income change (Hadi) : Y - r	-0.0010		0.0013	0.00290	-0.0066			-0.0089	-0.0066
	(0.0021)		(0.0020)	(0.0030)	(0.0041)			(0.0084)	(0.0110)
1[Income change < 0]	0.892		1.351	1.433	-0.254			-0.710	-1.183
	(1.329)		(1.093)	(1.061)	(0.514)			(1.293)	(1.344)
Income change (Hadi) ×1[Income change < 0]	0.015***		0.009*	0.007*	0.0097			0.0119	0.0107
	(0.0044)		(0.0046)	(0.0042)	(0.0066)			(0.0092)	(0.0128)
Health status change: Y - r		1.78***	2.41***	2.30***		-4.555**		-4.87***	-5.20***
		(0.218)	(0.513)	(0.590)		(1.868)		(1.479)	(1.293)
1[Health status change < 0]		0.118	0.421	0.548		1.926		1.847	2.097
		(1.051)	(1.411)	(1.096)		(1.260)		(2.584)	(3.046)
Health status change ×1[Health status change < 0]		2.828***	1.975*	2.108**		10.30***		10.30***	10.63***
		(0.798)	(1.123)	(0.917)		(1.985)		(1.985)	(2.089)
House size per person after disaster: Y							0.0246*	0.0363*	0.0360
							(0.0126)	(0.0196)	(0.0253)
House size change (Hadi) : Y - r							-0.0252*	-0.0285	-0.0319
							(0.0143)	(0.0227)	(0.0272)
1[House size change < 0]							-0.100	-0.189	-0.128
							(1.466)	(1.331)	(1.548)
House size change (Hadi) × 1[House size change < 0]							0.045**	0.0384*	0.0406*
							(0.020)	(0.0202)	(0.0233)
_cons	15.55***	15.45***	13.97***	14.30***	20.89***	17.77***	16.65***	20.75***	24.05***
	(2.046)	(1.820)	(1.638)	(1.920)	(3.269)	(1.268)	(2.652)	(4.378)	(4.518)
N	432	477	406	406	411	578	329	264	264
adj. R-sq	0.121	0.299	0.286	0.306	0.000	0.227	0.050	0.247	0.259

Region in Futaba clustered standard error in parentheses * p<0.10 ** p<0.05 *** p<0.01

Controls: All columns include age dummies, female dummy, education dummies, job before disaster dummies, dummy for those who lost their family member after disaster, region in Futaba dummies, and prefecture dummies. These controls include all the significant variables in exogeneity tests (Table 5.4, Table 5.5 and Table 5.6). Column (4) and (9) also include dummies for each city in Fukushima prefecture.

Table 5.4 Exogeneity Test 1: Regression of Change Variables on Characteristics

	2013		2014		
	(1)	(2)	(3)	(4)	(5)
	Income change per person (Hadi)	Health status change	Income change per person (Hadi)	House size change per person (Hadi)	Health status change
Age	-0.0784	-0.00506*	0.571	0.0321	-0.0110***
	(0.733)	(0.00282)	(0.636)	(0.396)	(0.00253)
Female dummy	-8.672	-0.0180	22.04	-5.449	0.0148
	(22.19)	(0.0851)	(19.87)	(13.03)	(0.0748)
Education dummies					
Reference: High school					
1[junior high school]	-17.08	-0.0570	0.265	-7.836	-0.0775
	(33.35)	(0.129)	(26.07)	(16.49)	(0.0985)
1[specialty school]	-	-	-16.71	-3.944	-0.0903
			(23.53)	(14.63)	(0.0889)
1[specialized vocational school]	-	-	40.72	-52.15	0.360
			(98.57)	(51.30)	(0.337)
1[community college]	9.452	0.0822	25.68	-35.71*	0.250
	(30.67)	(0.124)	(40.00)	(20.77)	(0.153)
1[university]	28.03	-0.0324	3.723	-14.68	0.125
	(24.79)	(0.101)	(18.97)	(10.59)	(0.0828)
1[grad school]	-	-	-41.49	-42.49	0.172
			(70.59)	(33.15)	(0.279)
1[other]	43.33	-0.0852	17.35	-20.84	0.125
	(33.18)	(0.129)	(42.21)	(23.64)	(0.156)
1[no answer]	-26.77	-0.255*	192.5***	5.654	0.222
	(39.86)	(0.153)	(58.32)	(27.97)	(0.174)
Job before disaster dummies					
Reference: Employee					
1[public employee]	-	-	14.33	4.761	-0.0976
			(26.25)	(13.68)	(0.112)
1[agriculture]	65.28*	-0.295**	-16.28	-9.759	0.0384
	(33.38)	(0.125)	(25.16)	(14.72)	(0.103)
1[fishing]	161.8	-0.415	0	0	0.505
	(179.4)	(0.740)	(.)	(.)	(0.668)
1[self-employed]	-59.71*	-0.191	-52.98**	8.863	0.0305
	(31.46)	(0.119)	(25.22)	(14.16)	(0.0921)
1[doctor or lawyer]	2.243	-0.728*	204.2	0	0.00613
	(130.4)	(0.438)	(141.0)	(.)	(0.484)
1[house work]	-57.76	-0.159	-57.77	-15.57	0.0791
	(71.61)	(0.267)	(54.21)	(33.68)	(0.196)
1[retired]	20.98	-0.193*	16.48	-5.652	0.0247
	(29.63)	(0.116)	(24.00)	(14.23)	(0.101)
1[none]	38.11	-0.286	10.93	-21.97	0.167
	(52.41)	(0.204)	(32.10)	(18.55)	(0.124)
1[part time]	11.53	0.226	-2.476	25.30	0.0220
	(47.73)	(0.201)	(46.40)	(26.90)	(0.194)
1[other]	-89.63*	0.0521	-13.32	0.131	0.189
	(49.35)	(0.197)	(28.29)	(16.81)	(0.116)
1[no answer]	33.60	-0.0317	81.27	4.665	-0.0274
	(27.87)	(0.113)	(63.79)	(36.89)	(0.262)
_cons	-22.10	-0.291*	-87.89**	24.53	-0.0439
	(42.13)	(0.164)	(37.16)	(23.52)	(0.148)
N	469	518	438	347	630
adj. R-sq	0.009	0.040	0.031	-0.020	0.029

Standard errors in parentheses * p<0.10 ** p<0.05 *** p<0.01

Table 5.5 Exogeneity Test 2: T Test for Comparing Loss Group and Gain Group (2013)

	Income change per person (Hadi)							Health status change						
	Loss			Gain			Ttest	Loss			Gain			Ttest
Variable	Obs	Mean	Std.	Obs	Mean	Std.		Obs	Mean	Std.	Obs	Mean	Std.	
Age	267	59.98	14.53	202	64.62	13.41	***	339	64.94	13.59	179	58.27	15.45	***
Female dummy	267	0.16	0.37	202	0.25	0.44	**	345	0.23	0.42	180	0.16	0.37	**
Education dummies														
1[junior high school]	267	0.06	0.23	202	0.09	0.29		345	0.09	0.28	180	0.04	0.21	*
1[high school]	267	0.59	0.49	202	0.52	0.50		345	0.56	0.50	180	0.62	0.49	
1[community college]	267	0.10	0.31	202	0.07	0.26		345	0.07	0.25	180	0.11	0.31	
1[university]	267	0.13	0.34	202	0.16	0.37		345	0.12	0.33	180	0.14	0.35	
1[other]	267	0.06	0.24	202	0.08	0.28		345	0.08	0.27	180	0.07	0.25	
1[no answer]	267	0.05	0.22	202	0.06	0.24		345	0.08	0.27	180	0.03	0.16	**
Job before disaster dummies														
1[employee]	267	0.49	0.50	202	0.29	0.46	***	345	0.33	0.47	180	0.51	0.50	***
1[agriculture]	267	0.07	0.26	202	0.11	0.32		345	0.13	0.34	180	0.04	0.21	***
1[fishing]	267	0.00	0.00	202	0.00	0.07		345	0.00	0.05	180	0.00	0.00	
1[self-employed]	267	0.12	0.33	202	0.06	0.24	**	345	0.12	0.32	180	0.08	0.27	
1[doctor or lawyer]	267	0.00	0.06	202	0.00	0.07		345	0.01	0.09	180	0.00	0.00	
1[house work]	267	0.01	0.12	202	0.01	0.12		345	0.02	0.14	180	0.01	0.11	
1[retired]	267	0.12	0.33	202	0.19	0.39	**	345	0.16	0.37	180	0.13	0.33	
1[none]	267	0.01	0.09	202	0.06	0.24	***	345	0.04	0.19	180	0.02	0.13	
1[part time]	267	0.03	0.16	202	0.04	0.21		345	0.03	0.16	180	0.04	0.19	
1[other]	267	0.04	0.21	202	0.01	0.12	*	345	0.02	0.15	180	0.04	0.21	
1[no answer]	267	0.10	0.30	202	0.20	0.40	***	345	0.14	0.34	180	0.13	0.33	

* Pr(|T| > |t|) < 0.10 ** Pr(|T| > |t|) < 0.05 *** Pr(|T| > |t|) < 0.01

Table 5.6 Exogeneity Test 3: T Test for Comparing Loss group and Gain Group (2014)

	Income change per person (Hadi)							House size change per person (Hadi)							Health status change						
	Loss			Gain				Loss			Gain				Loss			Gain			
Variable	Obs	Mean	Std.	Obs	Mean	Std.dv	Ttest	Obs	Mean	Std.	Obs	Mean	Std.dv	Ttest	Obs	Mean	Std.	Obs	Mean	Std.dv	Ttest
Age	273	62.05	13.60	165	64.7	13.80	**	149	64.03	13.83	198	63.90	12.16		383	65.84	12.72	247	59.45	15.04	***
Female dummy	275	0.15	0.36	165	0.19	0.39		150	0.13	0.34	199	0.13	0.34		388	0.21	0.41	250	0.19	0.39	
Education dummies																					
1[junior high school]	275	0.08	0.27	165	0.07	0.26		150	0.05	0.23	199	0.07	0.26		388	0.11	0.31	250	0.06	0.23	**
1[high school]	275	0.58	0.49	165	0.50	0.50	*	150	0.45	0.50	199	0.57	0.50	**	388	0.54	0.50	250	0.52	0.50	
1[specialty school]	275	0.11	0.31	165	0.07	0.26		150	0.09	0.28	199	0.08	0.27		388	0.11	0.32	250	0.11	0.32	
1[specialized high school]	275	0.01	0.09	165	0.00	0.00		150	0.01	0.12	199	0.00	0.00		388	0.00	0.05	250	0.01	0.11	
1[community college]	275	0.03	0.16	165	0.04	0.19		150	0.06	0.24	199	0.02	0.14	*	388	0.03	0.16	250	0.05	0.21	
1[university]	275	0.17	0.38	165	0.24	0.43	*	150	0.25	0.44	199	0.21	0.41		388	0.14	0.35	250	0.18	0.39	
1[grad school]	275	0.01	0.10	165	0.01	0.08		150	0.02	0.14	199	0.01	0.10		388	0.01	0.07	250	0.02	0.13	
1[other]	275	0.02	0.15	165	0.04	0.19		150	0.05	0.21	199	0.02	0.14		388	0.03	0.18	250	0.03	0.18	
1[no answer]	275	0.00	0.00	165	0.04	0.01	***	150	0.02	0.01	199	0.02	0.01		388	0.03	0.01	250	0.02	0.01	
Job before disaster dummies																					
1[employee]	275	0.41	0.49	165	0.32	0.47	*	150	0.33	0.47	199	0.34	0.48		388	0.33	0.47	250	0.43	0.50	***
1[public employee]	275	0.09	0.28	165	0.10	0.30	*	150	0.13	0.34	199	0.12	0.33		388	0.08	0.27	250	0.08	0.27	
1[doctor or lawyer]	275	0.00	0.00	165	0.01	0.08		150	0.00	0.00	199	0.00	0.00		388	0.00	0.05	250	0.00	0.06	
1[agriculture]	275	0.12	0.32	165	0.09	0.29		150	0.11	0.31	199	0.12	0.32		388	0.12	0.33	250	0.08	0.28	
1[fishing]	275	0.00	0.00	165	0.00	0.00		150	0.00	0.00	199	0.00	0.00		388	0.00	0.00	250	0.00	0.06	
1[self-employed]	275	0.12	0.32	165	0.05	0.22	**	150	0.10	0.30	199	0.11	0.31		388	0.13	0.34	250	0.10	0.30	
1[part time]	275	0.03	0.17	165	0.01	0.11		150	0.03	0.16	199	0.02	0.14		388	0.02	0.15	250	0.02	0.13	
1[house work]	275	0.02	0.13	165	0.02	0.13		150	0.02	0.14	199	0.02	0.12		388	0.02	0.15	250	0.02	0.15	
1[retired]	275	0.12	0.32	165	0.19	0.40	**	150	0.16	0.37	199	0.12	0.33		388	0.14	0.35	250	0.10	0.30	
1[none]	275	0.04	0.20	165	0.10	0.30	***	150	0.08	0.27	199	0.06	0.23		388	0.07	0.26	250	0.07	0.26	
1[other]	275	0.05	0.23	165	0.09	0.29		150	0.04	0.20	199	0.09	0.29	*	388	0.06	0.24	250	0.08	0.27	
1[no answer]	275	0.01	0.01	165	0.02	0.01		150	0.00	0.00	199	0.00	0.00		388	0.01	0.01	250	0.01	0.01	

* Pr(|T| > |t|) < 0.10 ** Pr(|T| > |t|) < 0.05 *** Pr(|T| > |t|) < 0.01

Table 5.7 Age Distribution of Those Who Answered They Would Go Back to Futaba in the Future

	Obs	Mean	S.E.	S.D.	[95% Conf.	Interval]
Overall	641	63.3947	0.553388	14.01066	62.30802	64.48137
Those Who Answered They Would Go Back to Futaba in the Future	65	67.70769	1.592459	12.83881	64.52639	70.88899
t-value of difference =	-2.3823 (p-value = 0.0175)					

Chapter 6

Conclusion

I. Summary, Discussion and Future Study

In this study, we first examined the impact of the Great East Japan Earthquake and following nuclear power plant accident on mental health and social capital among evacuees from a town of Futaba in Fukushima. Second, we examined the role of social capital on maintaining mental health among Futaba residents. Third, we investigated other social determinants of mental health by testing the prospect theory using our unique dataset. The results give us multiple important policy implications and contributions to literature.

First, examining the impact of the Great East Japan Earthquake and following nuclear power plant accident on mental health and social capital, we find high risk of serious psychological distress among Futaba residents compared to Japanese population, residents in other disaster affected areas and evacuees in other disaster affected areas. Furthermore, we find no significant recovery of mental health among Futaba residents during three years from 2013 to 2016. Also, we see a possibility that the gap of mental health status between residents who could keep relatively good mental health status and residents whose mental health status got deteriorated after the disaster is getting larger during the three years from 2013 to 2016. In other words, mental health status of Futaba residents seems to experience bipolarization, which get even worse among people with poor mental health and better among people with good mental health. Moreover, we find that mental health status among residents living in prehab temporary units show increasing psychological stress during the three years from 2013 to 2016. Possible reasons behind this can be those with better mental health moved from temporary prehab units earlier while those with bad mental health stayed, or longer term stay

of temporary prehab units put high stress on residents. In addition, we confirm that disaster significantly damaged social capital among residents and it has not recovered by 2016.

Important policy implications can be derived from these findings. First, we need to develop and try different and intensive mental health care for victims of nuclear disaster. Moreover, mental health care should target those who have been staying in temporary prehab units for long time and whose mental health continue deteriorating after the disaster. Also, social capital facilitation is necessary because of its deterioration and slow recovery so far. For further study, long term track of change of social capital and mental health would be necessary to understand their long-term recovery process after disaster.

Second, we find positive association between structural social capital measured by number of known and unknown neighbors from Futaba in evacuated areas after the disaster, participation to volunteer work after the disaster and participation to hobby gathering after the disaster and mental health, intervened by cognitive social capital captured as trust perception. This result provides support for the effectiveness of group-relocation policy to temporary and permanent shelters (Aldrich 2012). As Lawther,P. M. (2014) claims, construction of the temporal or permanent shelters should be considered as social process, not only an engineering process. Our result also suggests that volunteer work and bottom up social activities should be supported. For future study, it would be important to evaluate each social capital enhancing project after disasters to provide more concrete suggestions for policy improvement to apply social capital for protection and enhancement of mental health status among disaster affected residents. Furthermore, field experiments can help to improve the quality of these social capital strengthening activities.

Third, we test the prospect theory by using our unique data set and find that there is an evidence of loss aversion examining relationship between change in house size and psychological distress of Futaba residents as a flip side of utility. This is a new empirical

evidence to support the prospect theory. Furthermore, we find that there is an evidence of loss aversion in relationship between income and psychological distress using 2013 data set but we find no evidence of loss aversion between income and psychological distress using 2014 data set. We think this attributes from revised reference point. However, we cannot test whether the reference point has revised or not in this study. Determination of reference point is one of the most important topics in the field of empirical study of the prospect theory and further investigation would be promising to provide important implication. Moreover, further investigation on reference point have possibility to give important implication on compensation policy after disasters. If residents' reference point had lowered, over compensation would be necessary to recover their original utility. Furthermore, this also supports importance of quick commitment of government or authorities on sufficient compensation before reference point of disaster affected residents falls.

Studies on social capital and health under disaster settings are getting more and more attention for its importance, but it is still a new field with many challenges that we can further work on. For example, as we discuss in literature review, there have been no study focusing on change in social capital before and after the disaster and examine association of the change in social capital with change in mental health status. In our study, we measure social capital before and after the disaster, which enable us to conduct analysis on association between change in social capital and mental health after the disaster. Also, there have been very few study using panel data set examining relationship between social capital and health for better understanding of their relationship including causality. We can construct panel data set from our multiple round survey and analyze data in future as well.

Furthermore, how to use the concept of social capital more practically in policy improvement under disaster is another important challenge of this field of study. To achieve effective support for disaster affected residents, field experiment would play an important

role to give concrete insights on how to apply the concept of social capital on maintaining good mental health status among disaster affected residents.

In addition, under long term evacuation period, challenges residents face change time by time. Providing insights to various challenges residents face in various timing after disasters would be important in future study. One of the most important issues Futaba residents currently face is to build new positive relationships with original residents in evacuated areas (Author interview from Futaba Mayor and free space writing in questionnaire). From third round of our survey, we include questions asking relationship with original residents. For example, we ask number of new friends from evacuated areas and if they have any experience being said bad things because of their evacuee status. By understanding successful/unsuccessful areas in building new relationship between Futaba residents and original residents, we can see what factors are important to build good relationship in the evacuated areas.

By untangling these challenges through continuous survey, field experiments and analysis, we wish to help improve community resilience under the risk of various disasters in future study.

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東日本大震災による被害・情報取得経路・復興に関する
アンケートのご協力のお願い

平成 25 年 7 月

突然のお便りで失礼いたします。

このたび、東京大学の研究プロジェクトとして、双葉町役場のご協力を得ながら、双葉町からの避難者の方全員を対象に「東日本大震災による被害・情報取得経路・復興に関するアンケート」を実施いたしております。

この調査では、震災によって双葉町の方のお仕事や日常生活がどれくらいダメージを受けたのか、震災の発生から 2 年 3 カ月以上経った今、生活を再建するために本当に役に立つ復興対策は何なのかを明らかにし、今後の復興政策に役立てていくことを目的にしています。調査結果は、皆様に報告させていただきますとともに、双葉町役場に報告致します。

お忙しいところ誠に恐縮ですが、世帯主の方もしくは世帯主の配偶者の方に、ご回答をお願い致します。もし、回答が難しい場合には、世帯主の方の立場から、ご家族の方、代理人の方等にご記入いただけますと幸甚です。最初のページから順番に各質問の質問文に沿って、あてはまる番号に○印をつけたり、ご意見を記入する形式でご回答ください。**アンケートは匿名ですので、個人名・世帯名をデータとして分析したり、公表したりすることは一切ございません。**また、個人情報の保護には万全を期しておりますので、決して皆様にご迷惑をおかけすることはありません。

ご回答いただきましたアンケートは **7 月末日までに**アンケート用紙の最後のページに添付させて頂きました返信用封筒に3つ折りにして封入の上、ご返信いただけますようお願い申し上げます。

本調査の趣旨をご理解いただき、なにとぞご協力くださいますようお願いいたします。

調査主体:　東京大学「災害からの生活基盤復興に関する国際比較」プロジェクト

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このアンケートでは、震災前に双葉町でお住まいになっていた「世帯」について、お答えください。

A. はじめにアンケートをご記入いただいている方についてお聞かせください。

A1. この調査票を記入していただいいているのはどなたですか。(番号の１つに○をお付けください)

1. 世帯主本人　2. 配偶者　3. 世帯主の代理人(ヘルパーの方など)
4. 世帯主の子ども　5. その他　(　　)

A2.東日本大震災による避難者の方々の調査協力の負担による調査疲れが問題になっています。
世帯全体で東日本大震災に関するアンケート調査に、**本アンケートを除いて**、これまで何回くらい回答したことがありますか。町や県による調査、大学その他による調査等**すべて含んだ数**をお知らせください。
(番号の１つに○をお付け下さい)

1. 15 回以上　2. 10～14 回　3. 6～9 回　4. 3～5 回　5. 1～2回　6. 0 回

B. 世帯主についてお聞かせください。

B1. 世帯主の基本的な情報についておしらせください。

a) 年齢 [　　] 歳　b) 性別 1. 男性　2. 女性　c) 現在のお住まい [　　] 県 [　　] 市

d) **現在の**お住まいの種類(番号の1つに○をお付けください)

1. 仮設住宅　2. 県営・市営住宅　3. 公務員宿舎　4. 借り上げ住宅
5. 社宅　6. 両親、息子娘の家　7. 兄弟姉妹の家　8. その他親戚の家
9. 震災前と異なる持ち家　10. その他(具体的に　　)

Sd1.現在のお住まいの近隣には、双葉町在住時には**知り合いでなかった**ものの、避難を通して**同じ双葉町民として知り合った方**はどれくらい住んでいらっしゃいますか。(番号の１つに○印をお付け下さい)

1. 20 世帯以上　2. 10～19 世帯　3. 6～9 世帯　4. 3～5 世帯　5. 1～2 世帯　6. いない

Sd2.現在のお住まいの近隣には、**双葉町在住時知り合いだった双葉町民の方**はどれくらい住んでいらっしゃいますか。(番号の１つに○印をお付け下さい)

1. 20 世帯以上　2. 10～19 世帯　3. 6～9 世帯　4. 3～5 世帯　5. 1～2 世帯　6. いない

e) 世帯主の**現在の**お仕事に一番近いものは。(番号の１つに○印をお付け下さい)

1. お勤め(会社員・公務員等)　2. 農業・林業従事　3. 水産業従事　4. 自営業(業種:　　)
5. 開業医、弁護士など自由業　6. 家事　7. 学生　8. 定年退職、引退
9. 無職:求職中　10. アルバイト　11. その他(具体的に:　　)

※世帯主の方が震災前の職場で勤務を継続・震災以前に退職済、現在求職活動中の方(震災後一時働いていたが現在は引退、求職中である場合も含む)は **g)**へお進み下さい。
震災がきっかけで世帯主の方が転職された方は **f)**へお進み下さい。

f) 世帯主の方は**震災後の**職場にはどのようにして就職されましたか。(○印は1つ)

1. ハローワークの紹介　2. 公務員試験等の就職試験　3. 町役場など公的機関の紹介
4. 家族・親戚の紹介　5. 友人の紹介　6. 同窓生の紹介
7. 就職 Web サイト等から　8. 自営業　9. その他(具体的に　　)

g)世帯主の**震災前の**お仕事に一番近いものは。(番号の１つに○印をお付け下さい)

1.お勤め(会社員・公務員等)　2.農業・林業従事　3.水産業従事　4.自営業(業種:　　)
5.開業医、弁護士など自由業　6.家事　7.学生　8.定年退職、引退
9.無職:求職中　10.アルバイト　11.その他(具体的に:　　)

h) 世帯主の方は**震災前の**職場にはどのようにして就職されましたか。(○印は1つ)

1.ハローワークの紹介　2.公務員試験等の就職試験　3.町役場など公的機関の紹介
4. 家族・親戚の紹介　5. 友人の紹介　6. 同窓生の紹介
7. 就職 Web サイト等から　8. 自営業　9. その他(具体的に　　)

i) 世帯主の最終学歴をお知らせください。(番号の１つに○印をお付け下さい)

1.高校　2.短大・高専　3.大学　4.その他(具体的に　　)

B2.世帯主の家族・親戚の構成をお教えください。(該当欄に**人数**を記入ください、0 は記入無で構いません)

	震災前(2011/2月末時点)				震災後(現在)			
	同居	別居			同居	別居		死別等
		(双葉町内)	(福島県内)	(福島県外)		(福島県内)	(福島県外)	
配偶者	人	人	人	人	人	人	人	人
父、義父	人	人	人	人	人	人	人	人
母、義母	人	人	人	人	人	人	人	人
兄弟姉妹	人	人	人	人	人	人	人	人
息子・娘	人	人	人	人	人	人	人	人
ペット	匹	匹	匹	匹	匹	匹	匹	匹

C.ご家族の方、ご近所付き合いなどについてお聞かせください。

C1.**震災前**、世帯主は、双葉町のどちらの**大字**にお住まいでしたか。(番号の１つに○印をお付け下さい)

1. 石熊　2. 山田　3. 松迫　4. 水沢　5. 目さく　6.郡山　7.上羽鳥
8. 新山　9. 松倉　10. 寺沢　11. 渋川　12. 鴻草　13.細谷　14.下羽鳥
15. 中田　16. 長塚　17. 両竹　18. 中浜　19.中野　20.前田　21.その他(　　)

C2.ご近所付き合いで、世帯主の家族がものをあげたり、手助けしたり、逆にものをもらったり、助けてもらったりという関係は**震災前**はどのくらいありましたか？また、**現在は**どのくらいありますか(○印は各1つ)

震災前:　1. かなりあった　2. ほどほどにあった　3. あまりなかった　4. なかった

現在:　1. かなりある　2. ほどほどにある　3. あまりない　4. ない

C3. そのうち、してもらったことはどのようなことですか？(○印はあてはまるすべての数字すべてに)

震災前:　1. 農作業の手伝い　2.漁業の手伝い　3.子どもの世話　4.おすそわけ　5.その他(　　)

現在:　1. 農作業の手伝い　2.漁業の手伝い　3.子どもの世話　4.おすそわけ　5.その他(　　)

C4.近所の人は私が困っていたら手助けしてくれる。(震災前と現在のお考え各１つに○をお付け下さい)

	よくあてはまる	あてはまる	どちらともいえない	あてはまらない	まったくあてはまらない
震災前のお考え	1	2	3	4	5
現在のお考え	1	2	3	4	5

C5. 震災前と震災後の生活について教えてください。（震災前と震災後の各１つを○で囲んでください）

	震災前			震災後		
	はい	いいえ	わからない	はい	いいえ	わからない
ドアを開けたまま外出することがよくある。	1	2	3	1	2	3
友人にお金やものを貸すことがよくある。	1	2	3	1	2	3
不在の双葉町自宅を含め空き巣被害にあったことがある。	1	2	3	1	2	3
その他犯罪の被害にあったことがある。	1	2	3	1	2	3
ほとんどの人は公平にしようとしていると思う。	1	2	3	1	2	3
自分は周りから信用されていると思う。	1	2	3	1	2	3

C6.一般的に、人は信用できると思いますか。それとも、人と付き合うときには、できるだけ用心したほうがよいと思いますか。（震災前のお考えと現在のお考え、各1つの数字に○をお付けください）

現在どうお考えか
お答え下さい。

1. ほとんどの場合、信用できる　2. たいていは、信用できる
3. たいていは、用心したほうがよい　4. ほとんどの場合、用心したほうがよい

震災前にどう考えて
いたかお答えくだい。

1. ほとんどの場合、信用できる　2. たいていは、信用できる
3. たいていは、用心したほうがよい　4. ほとんどの場合、用心したほうがよい

C7. ボランティア活動、クラブ活動、趣味の活動について各何時間くらいになるか教えてください。

	震災前	震災後
一週間のうち 平均的にボランティア活動を行う時間	時間／１週間	時間／１週間
一週間のうち お茶会などの趣味の会に参加する時間	時間／１週間	時間／１週間
一日に家族と話をする時間	時間／１日	時間／１日
一日に友人と話をする時間	時間／１日	時間／１日
一日に挨拶する人の平均的な人数	人／１日	人／１日
震災前からの友人の数 （年3回以上なんらかの形で連絡を取る人）	人	人
震災後避難地等でできた新しい友人の数 （年3回以上なんらかの形で連絡を取る人）		人

C8. 世帯主の健康状態について伺います。現在の健康状態は、震災前と比べるといかがですか。（○印は1つ）

1. 大変良くなっている　2. 良くなっている　3. 変わっていない　4. 悪くなっている　5. 大変悪くなっている

C9. **過去 30 日間に**世帯主はどれくらいの頻度で次のことがありましたか。
あてはまる数字１つに○をつけてください。

	全くない	少しだけ	ときどき	たいてい	いつも
神経過敏に感じましたか。	1	2	3	4	5
絶望的だと感じましたか。	1	2	3	4	5
そわそわ、落ち着かなく感じましたか。	1	2	3	4	5
気分が沈み込んで、何が起こっても気が晴れないように感じましたか。	1	2	3	4	5
何をするのも骨折りだと感じましたか。	1	2	3	4	5
自分は価値のない人間だと感じましたか。	1	2	3	4	5

D.東日本大震災後支援が必ずしも十分に被災された方に届かなかったり、タイミングがよくなかったということが問題になっています。皆様が受けた被害の程度やその後の支援実態についてお聞かせください。

D1.**震災前**のお住まいの所有形態はどちらにあたりますか。(数字の１つに○印をお付け下さい)

1. 持ち家・もしくは持ち家の親戚と同居　　2. その他賃貸、社宅等

SD1.震災前お住まいの宅地・建物・その他農地、貸地の広さを「平米」「坪」のいずれかでお答えください。

宅地	約		平方メートル	もしくは	約		坪
建物	約		平方メートル	もしくは	約		坪
農地、貸地等	約		平方メートル	もしくは	約		坪

SD2.震災前の主なお住まいのつくりはどちらにあたりますか(○印は1つ)

1.木造　2.鉄骨　3.鉄筋コンクリート　4.その他プレハブ住宅等

SD3 .主なお住まいの建築時期は　1.昭和　2.平成　3.明治　4.大正　　年頃

D2. 地震、津波等による双葉町のお住まいの被害状況を放射能汚染の被害を含まずに1つお選び下さい。

1.全壊　2.半壊　3.一部損壊　4.大きな被害無　5.その他(具体的に　　)

D3. 時間経過による双葉町のお住まいの被害状況についてお答えください(○印１つ)

1.掃除をすれば住める状況　2.リフォーム必須　3.建て替え必須

D4.**住宅の**賠償について支払いを受けたものに○印をしてください(○印はいくつでも構いません)

1.被災者生活再建支援金　2.地震・火災保険等　3.東京電力　4.その他(　　)

1から４の賠償の中で最も金額が大きかったのはどれですか？　(　　)番

D5.東京電力より精神的損害、避難費用、就労不能損害の支給を受けていますか。　1. はい　2. いいえ

D6.その他の被災で必要になったお金やモノを手に入れるための資金や物資の調達方法について、あてはまるものに○印をしてください。(○印はいくつでも構いません)

1.義援金　2.親戚からの援助　3.友人などからの私的な援助
4.金融機関からの融資　5.貯金の切り崩し　6.その他(　　)

1から６の中で最も大きかったのはどれですか。　(　　)番(物資の支援は金銭換算してください)

D7. **震災直後から現在に至るまでのお住まい**を教えてください。世帯主のそれぞれの時期の**主な**滞在場所と種類を A～C、1～12 の**各番号**に○印をお付けください。(○印は2つ以上でもかまいません)

	滞在場所			⇒	実際に住んでおられたところの種類													
	第一原発から20キロ圏内	20キロ圏外の福島県内	福島県外		震災時に住んでいた自宅	避難所・テント・車の中	ホテル・旅館等	両親・息子・娘宅	兄弟姉妹宅	その他親類宅	友人宅	仮設住宅	公営住宅	公務員宿舎	賃貸住宅	社宅	震災前と異なる持ち家	その他
3月11日－14日	A	B	C		1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生4日～1週間	A	B	C		1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生2週間～2ヵ月	A	B	C		1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生2～6ヵ月	A	B	C		1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生6ヶ月～2013/6月末	A	B	C		1	2	3	4	5	6	7	8	9	10	11	12	13	14

D8. 震災直後から現在に至るまで、どのような手段で主に情報を得ていらっしゃいましたか。
（あてはまる数字すべてに○印をしてください）

	実際に主に使っていた手段を○で囲んでください。													
	テレビ	ラジオ	インターネット	携帯電話・スマートホン	防災無線	双葉町での隣人・友人	同窓生	親戚	町	県	国	避難場所で出会った人	避難場所の県や市より	その他（　　）
3月11日－14日	1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生4日～1週間	1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生2週間～2ヵ月	1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生2～6ヵ月	1	2	3	4	5	6	7	8	9	10	11	12	13	14
発生6ヶ月～2013/6月末	1	2	3	4	5	6	7	8	9	10	11	12	13	14

D9. **震災前に世帯主と同居されていたご家族**の中で、震災から今日までの間に、**震災の影響で**ケガ、病気で入院をされたり、死亡された方がおられましたか。

死亡　　＿＿＿＿人　　災害弔慰金は支払われましたか。　1. はい　2. いいえ

病気・怪我による入院　　＿＿＿＿人　　賠償金は受け取りましたか。　1. はい　2. いいえ

D10. 東日本大震災による被災者の方々が、経済的に厳しい状況にあることが、マスコミなどでも取り上げられ、社会的な問題となっております。**震災前と現在の**年収についてあてはまる番号１つに○をしてください。

震災前の世帯主含めて**世帯全体の**年収（税引き前の金額、年金を含む）

1. 100 万円未満　2. 100 万円～200 万円未満　3. 200 万円～300 万円未満　4. 300 万円～400 万円未満
5. 400 万円～600 万円未満　6. 600 万円～800 万円未満　7. 800 万円～1000 万円未満　8. 1000 万円以上

現在の世帯主含めて**世帯全体の**年収（税引き前の金額、年金を含む、賠償・義援金等含まず）

1. 100 万円未満　2. 100 万円～200 万円未満　3. 200 万円～300 万円未満　4. 300 万円～400 万円未満
5. 400 万円～600 万円未満　6. 600 万円～800 万円未満　7. 800 万円～1000 万円未満　8. 1000 万円以上

D11. 世帯主は、将来町に戻るおつもりですか。　1. はい　2. まだ決められない　3. 戻らない

D12. 震災後の生活で困っていること、日ごろお気づきのこと、感じておられることなどご自由にお書き下さい。

■ **長時間にわたり、ご協力ありがとうございました。**
同封しました返信用封筒をお使いの上ご返送いただけますようお願いいたします。

［この用紙の回答は任意です］

―御礼とお願い―

このたびはアンケート調査にご協力頂き誠にありがとうございます。今後も皆様のお声を行政に届けていくためにも、原子力発電所の事故の影響の実態把握について継続的な調査が不可欠であります。つきましては、このような調査が将来行われる際、再度皆様のご協力を頂けることを願っております。**今後の調査にご協力頂ける場合には、この用紙に、住所と氏名、電話番号（任意）をご記入ください。ご記入頂かない場合は、このページは空欄でご返信ください。**

ふりがな　［　　］

氏名　　様

性別　　［1. 男性　　2. 女性　］

生年月日　［1. 明治　2. 大正　3. 昭和　4. 平成］＿＿＿年　＿＿＿月＿＿＿＿日

現在のご住所

〒　　－

双葉町でのご住所

〒　　－

ご連絡先電話番号（任意）　［　　－　　－　　］

個人情報の管理には万全を期しておりますので皆様個人にご迷惑をおかけすることはございません。本情報は研究・政策支援以外の目的で使用することはございません。また、アンケート用紙とは完全に分けて管理を致しますので、**世帯名・個人名が特定される形でデータが使われたり、公表されたりすることは一切ございません。**本紙をお送り頂き、継続して調査にご協力いただいた方には薄謝をお送り致します。

最後になりましたが、皆様の生活が一刻も早く安定と安心をとり戻されることを願っております。ご協力ありがとうございました。

東京大学「災害からの生活基盤復興に関する国際比較」プロジェクトメンバー一同

Appendix II. Survey Questionnaire 2013 (English Translation)

In this questionnaire, please answer about household which you belonged to in Futaba town

A. First of all, please tell us about yourself who is filling this form

A1. Who is filling this questionnaire? (Please circle one of the numbers)

1. Household head principal **2.** Spouse **3.** Agent for household head (helper etc)
4. Child of household head **5.** Other (　　)

A2. Survey fatigue among disaster affected people is noted as one of the problems.
How many times have you or your family answered survey questionnaire after the Great East Japan Earthquake **excluding this questionnaire survey?** Please include all surveys by town, prefecture, university and other institutes. (Please circle one of the numbers)

1. More than 15 times **2.** 10～14 times **3.** 6～9 times **4.** 3～5 times **5.** 1～2times **6.** None

B. Please answer about household head

B1. Basic information of house hold head

a) Age [　　] years old　b) sex **1.** male **2.** Female　Current place [　　] Prefecture [　　] city

d) Current living place (Please circle one of the numbers)

1. Kasetsu housing **2.** Municipal housing **3.** Civil servant housing **4.** Kariage housing
5. House offered by company **6.** Parents or children **7.** Brother or sister **8.** Other relatives
9. House bought after disaster **10.** Other(　　)

Sd1 How many neighbors from Futaba town who you **did not know** each other before the disaster do you have? (Please circle one of the numbers)

1. More than 20 **2.** 10～19 **3.** 6～9 **4.** 3～5 **5.** 1～2 **6.** None

Sd2. How many neighbors from Futaba town who you have known each other before the disaster do you have? (Please circle one of the numbers)

1. More than 20 **2.** 10～19 **3.** 6～9 **4.** 3～5 **5.** 1～2 **6.** None

e) **Current** job of the household head (Please circle one of the numbers)

1. Employee(Company, civil servant) **2.** Agriculture **3.** Fishery **4.** Self-employed(type:　　)
5. Medical doctor or lawyer **6.** Housework **7.** Student **8.** Age-limit retirement
9. Recruiting **10.** Part-time job **11.** Other (　　)

※If household head continued working in same company as of before the disaster now, please go to **g)**.
If household head changed job after the disaster, please go to **f)**.

f) How did the household head find a job after the disaster? (Please circle one of the numbers)

1. Public job-placement office **2.** Employment exam **3.** Introduced by town office
4. Introduced by relatives **5.** Introduced by friends **6.** Introduced by alumnus
7. Website **8.** Self-employed **9.** Other(　　)

g) Job of the household head **before the disaster** (Please choose one)

1. Employee (Company, civil servant)	2. Agriculture	3. Fishery	4. Self-employed (type:)
5. Medical doctor or lawyer	6. Housework	7. Student	8. Age-limit retirement
9. Recruiting	10. Part-time job	11. Other ( )	

h) How did the household head find a job before the disaster? (Please circle one of the numbers)

1. Public job-placement office	2. Employment exam	3. Introduced by town office
4. Introduced by relatives	5. Introduced by friends	6. Introduced by alumnus
7. Website	8. Self-employed	9. Other( )

i) Academic background of the household head. (Please circle one of the numbers)

1. High school 2. Junior college 3. University 4. Other ( )

B2. Family configuration of the household head (Please fill the number of family members in each cell)

	Before disaster (2011/2)				After disaster (now)			
	Living together	Living apart			Living together	Living apart		Bereaved
		Futaba	Fukushima	Other		Fukushima	Other	
Spouse								
Father								
Mother								
Sibling								
Child								
Pets								

C. Please tell us about your family and neighbors

C1. Which part of Futaba town did the household head live in Futaba? (Please circle one of the numbers)

1. Ishiguma	2. Yamada	3. Matsusaku	4. Mizusawa	5. Mesaku	6. Kooriyama	7. Kamihatori
8. Shinzan	9. Matsukura	10. Terasawa	11. Shibukawa	12. Konokusa	13. Hosoya	14. Shimohatori
15. Nakada	16. Nagatsuka	17. Morotake	18. Nakahama	19. Nakano	20. Maeda	21. Other( )

C2. Talking of neighborly ties, how often did household head give something to neighbors or help neighbors, or get something from neighbors or get help from neighbors before and after the disaster? (Please circle one of the numbers)

Before: 1. So often 2. Moderately 3. Not so much 4. None

After: 1. So often 2. Moderately 3. Not so much 4. None

C3. What did neighbors do for you? (Please circle all relevant numbers)

Before: 1. Help farming 2. Help fishery 3. Taking care of children 4. Giving a shore 5. Other( )

After: 1. Help farming 2. Help fishery 3. Taking care of children 4. Giving a shore 5. Other( )

C4. Neighbors will help me when I am in trouble (Circle each for before and after the disaster)

	Strongly agree	Agree	Yes and no	Don't agree	Don't agree at all
Before	1	2	3	4	5
After	1	2	3	4	5

C5. Please tell us about life before and after the disaster. (Circle each for before and after disaster)

	Before			After		
	Yes	No	DK	Yes	No	DK
Do you leave the door open when you go out?	1	2	3	1	2	3
Do you often borrow money or staffs to your friends?	1	2	3	1	2	3
Have you been a victim of sneak thief including your house in Futaba?	1	2	3	1	2	3
Have you been a victim of any other crime?	1	2	3	1	2	3
Do you think most people try to be fair?	1	2	3	1	2	3
Do you think you are trustworthy?	1	2	3	1	2	3

C6. Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? (Please circle each opinion before and after the disaster)

Now

1. Most people can be trusted 2. People can be trusted more often than not
3. Can't be too careful more often than not 4. Can't be too careful

Before the disaster

1. Most people can be trusted 2. People can be trusted more often than not
3. Can't be too careful more often than not 4. Can't be too careful

C7. How many hours do you spend for each activities?

	Before	After
Hours to participate in volunteer work per week	hour / week	hour / week
Hours to join tea party or other activities per week	hour / week	hour / week
Hours to talk with family per day	hour / day	hour / day
Hours to talk with friends per day	hour / day	hour / day
Number of persons to exchange greetings per day		
Number of friends who exchange information more than 3 times a year		
Number of new friends after disaster		

C8. How is the household head's health compared to his or her health before the disaster?

1. Much better 2. Better 3. No difference 4. Worse 5. Much worse

C9.

	During past 30 days how often did you feel….	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a.	… nervous?	4	3	2	1	0
b.	… hopeless?	4	3	2	1	0
c.	…restless or fidgety?	4	3	2	1	0
d.	…so depressed that nothing could cheer you up?	4	3	2	1	0
e.	…that everything was an effort?	4	3	2	1	0
f.	…worthless?	4	3	2	1	0

D. It has come to a question that necessary support has not reached to disaster affected people or timing of the support has not proper. Please let us know about degree of damage you have got and actual condition of the support you have got afterwards

D1. Ownership form of the house in Futaba town (Please circle one of the numbers)

1. Owned house or lived with family who owned house **2.** Other (Rental, or company provided house etc)

SD1. Size of house and land in Futaba town

Land About		M^2	or About		tsubo (1 tsubo≒3.3M^2)
House About		M^2	or About		tsubo
Agricultural land or lot for lent About		M^2	or About		tsubo

SD2. What was the house in Futaba town made of? (Please circle one of the numbers)

1. Wooden **2.** Iron frame **3.** reinforced concrete **4.** Other ( )

SD3 . When was the house built? **1.** Showa **2.** Heisei **3.** Meiji **4.** Taisho year

D2. Damage of house in Futaba town (Not including the damage by radiation)

1. Fully-destroyed **2.** Half-destroyed **3.** Partially-destroyed **4.** No particular damage **5.** Other ( )

D3. Damage of house in Futaba town caused by the passage of time

1. Need some cleaning **2.** Need renovation **3.** Need rebuilding

D4. Please circle what you got for house restitution (Please circle all relevant numbers)

1. Disaster victim relief financial support **2.** Earthquake or fire insurance **3.** TEPCO **4.** Other( )

Which was the biggest amount among 1 to 4? ( )

D5. Are you currently getting compensation for mental damage, evacuation costs, and inability of working?

1. Yes **2.** NO

D6. How do you fund money or staffs you need through evacuation other than the restitution? (Please circle all relevant numbers)

1. Public donation **2.** Support from relatives **3.** Support from friends
4. Loan from bank **5.** Saved money **6.** Other( )

Which was the biggest among 1 to 6?( ) (Include goods support by converted monetary scale)

D7. Circle the main place and house type you stayed in each evacuation period. Please circle both from A to C and 1 to 14. (Please circle all relevant numbers)

	Location (%)			Type of place (%)													
	Within 20 km from the reactor	Out of 20 km in Fukushima	Out of Fukushima	House in Futaba	Evacuation center car	Hotel	Parents, children's house	Brother or sister's house	Other relative's house	Friends' house	Kasetsu residence	Public housing	Government housing	Rented	House by company	House bought after disaster	Other
March 11th to 14th	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14
4 days to 10 days after disaster	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2 weeks to 2 months after disaster	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2 months to 6 months after disaster	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14
6 months after disaster to June 2013	A	B	C	1	2	3	4	5	6	7	8	9	10	11	12	13	14

D8. How have you got information since right after the disaster by now?
(Please circle all relevant numbers)

	Circle what you used to gather information (%)													
	TV	Radio	Internet	Cell phone Smart phone	Community wireless system	Friends or neighbors from Futaba town	Alumnus	Relatives	Town office	Prefectural office	Government	People met in evacuation center	Prefecture or city where evacuated	Other
March 11th to 14th	1	2	3	4	5	6	7	8	9	10	11	12	13	14
4 days to 10 days after disaster	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2 weeks to 2 months after disaster	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2 months to 6 months after disaster	1	2	3	4	5	6	7	8	9	10	11	12	13	14
6 months after disaster to June 2013	1	2	3	4	5	6	7	8	9	10	11	12	13	14

D9. Among family member you lived together before the disaster, are there anyone who passed away or injured after the disaster because of the impact of the disaster?

Death _____ Did you get special payment for death? **1.** Yes **2.** No

Hospitalized _____ Did you get compensation? **1.** Yes **2.** No

D10. It has come to an issue that disaster affected people have confront economic difficulties.
How much is the yearly household income before the disaster? (Before tax deduction, include pension)

1. Less than 1 million JPY **2.** 1 million ～ 2 million JPY **3.** 2 million ～ 3 million JPY **4.** 3 million ～ 4 million JPY
5. 4 million ～ 6 million JPY **6.** 6 million ～8 million JPY **7.** 8 million ～ 10 million JPY **8.** More than 10 million JPY

How much is the yearly household income after the disaster? (Before tax deduction, include pension, exclude compensation)

1. Less than 1 million JPY **2.** 1 million ～ 2 million JPY **3.** 2 million ～ 3 million JPY **4.** 3 million ～ 4 million JPY
5. 4 million ～ 6 million JPY **6.** 6 million ～8 million JPY **7.** 8 million ～ 10 million JPY **8.** More than 10 million JPY

D11. Is the household head planning to go back to Futaba town in the future? **1.** Yes **2.** Don't know yet **3.** No

D12. Please write freely what you have in your mind.

■ **Thank you very much for your cooperation**

Please send us back this questionnaire using the attached envelop

Appendix III. Summary Tables of 2013 survey

A1. Who is filling the questionnaire ?

	Frequency	Percent
Household head principal	400	68.38
Spouse	141	24.10
Agent for household head	2	0.34
Child of household head	25	4.27
Other	9	1.54
No answer	8	1.37
Total	585	100.00

A2. How many times have you or your family answered survey questionnaire after the Great East Japan Earthquake **excluding this questionnaire survey?**

	Frequency	Percent
More than 15 times	31	5.30
10 ~ 14 times	60	10.26
6 ~ 9 times	170	29.06
3 ~ 5 times	238	40.68
1 ~ 2 times	58	9.91
None	6	1.03
No answer	22	3.76
Total	585	100.00

B1.Please let us know about the household head's basic information

a) Age Average: 63 Max: 94 Min: 24

b) Sex Male: 77% Female: 21% No answer: 2%

c)Current living place

Please refer to table 7 in the context.

d) Kinds of current living place

	Frequency	Percent
Kasetsu housing	60	10.26
Prefectural and municipal housing	29	4.96
Civil servant housing	18	3.08
Kariage housing	294	50.26
House offered by company	17	2.91
House of parents or children	24	4.10
House of brothers or sisters	3	0.51
House of other relatives	4	0.68
House bought after the disaster	52	8.89
Other	77	13.16
No answer	7	1.20
Total	585	100.00

Sd1. How many neighbors from Futaba town do you have currently? (The neighbors only includes Futaba town residents who you did not know each other before the disaster)

	Frequency	Percent
More than 20 households	56	9.57
10 ~ 19 households	20	3.42
6 ~ 9 households	38	6.50
3 ~ 5 households	84	14.36
1 ~ 2 households	97	16.58
None	278	47.52
No answer	12	2.05
Total	585	100.00

Sd2. How many neighbors from Futaba town do you have currently? (The neighbors only includes Futaba town residents who you have known each other before the disaster)

	Frequency	Percent
More than 20 households	43	7.35
10 ~ 19 households	24	4.10
6 ~ 9 households	47	8.03
3 ~ 5 households	79	13.50
1 ~ 2 households	138	23.59
None	246	42.05
No answer	8	1.37
Total	585	100.00

e) **Current** job of the household head

	Frequency	Percent
Empluyee (Company・civil servant)	148	25.30
Agriculture・forestry	9	1.54
Fishery	1	0.17
Self-employed	23	3.93
Medical doctor or lowyer	1	0.17
Housework	14	2.39
Student	0	0.00
Age-limit retirement	181	30.94
Recruiting	125	21.37
Part-time job	15	2.56
Other	50	8.55
No answer	18	3.08
Total	585	100.00

f)How did the household head find a job after the disaster?

	Frequency	Percent
Public job-placement office	17	2.91
Employment exam	3	0.51
Introduced by town office	15	2.56
Introduced by relatives	4	0.68
Introduced by friends	10	1.71
Introduced by alumnus	1	0.17
Website	3	0.51
Self-employed	12	2.05
Other	32	5.47
Not applicable・No answer	488	83.41
Total	585	100.00

g)Job of the household head **before the disaster**

	Frequency	Percent
Empluyee (Company・civil servant)	220	37.61
Agriculture・forestry	58	9.91
Fishery	0	0.00
Self-employed	55	9.40
Medical doctor or lowyer	3	0.51
Housework	10	1.71
Student	0	0.00
Age-limit retirement	86	14.70
Recruiting	17	2.91
Part-time job	14	2.39
Other	39	6.67
No answer	83	14.19
Total	585	100.00

h) How did the household head find the job before the disaster?

	Frequency	Percent
Public job-placement office	35	5.98
Employment exam	70	11.97
Introduced by town office	13	2.22
Introduced by relatives	55	9.40
Introduced by friends	53	9.06
Introduced by alumnus	4	0.68
Website	11	1.88
Self-employed	71	12.14
Other	60	10.26
Not applicable・No answer	213	36.41
Total	585	100.00

i) Academic background of the household head

	Frequency	Percent
Junior high school	46	7.86
High school	329	56.24
Junior college	49	8.38
University	73	12.48
Other	43	7.35
No answer	45	7.69
Total	585	100.00

B2.Family configuration of the household head

Omitted

C1.Which part of Futaba town is the household head from?

	Frequency	Percent
Ishiguma	14	2.39
Yamada	42	7.18
Matsusaku	2	0.34
Mizusawa	7	1.20
Mesaku	4	0.68
Kooriyama	43	7.35
kamihatori	14	2.39
Shinzan	135	23.08
Matsukura	2	0.34
Terasawa	10	1.71
Shibukawa	7	1.20
Konokusa	22	3.76
Hosoya	10	1.71
Shimohatori	14	2.39
Nakada	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
Total	585	100.00

C2. Talking of neighborly ties, how often did household head give something to neighbors or help neighbors, or get something from neighbors or get help from neighbors before and after the disaster?

	Before disaster (%)	After disaster(%)
So ofter	45.81	3.25
Moderately	42.22	21.88
Not so much	7.18	35.90
None	3.93	37.09
No answer	0.85	1.88
Total	100.00	100.00

C3. What did neighbors do for you?

	Before disaster (%)	After disaster (%)
Helping farm work	20.51	0.51
Helping fishery	0.17	0.00
Taking care of children	11.79	2.05
Giving a shore	82.74	46.50
Other	11.28	13.50

C4. Neighbors will help me when I am in trouble

	Before disaster (%)	After disaster (%)
Strongly agree	31.79	4.96
Agree	40.68	14.53
Yes and no	17.95	28.38
Don't agree	4.44	21.03
Don't agree at all	1.71	27.52
No answer	3.42	3.59
Total	100.00	100.00

C5. Please choose the answer for each sentences from "Yes," " No, " and "Don' t know."

	Before the disaster (%)				After the disaster (%)			
	Yes	No	Don't know	No ans	Yes	No	Don't know	No ans
Do you leave the door open when you go out?	45.47	51.28	0.34	2.91	4.96	90.94	1.37	2.74
Do you often borrow money or staffs to your friends?	25.98	67.18	2.56	4.27	2.74	90.94	2.39	3.93
Have you been a victim of sneak thief including your house in Futaba?	12.31	77.44	6.15	4.1	12.65	67.35	14.19	5.81
Have you been a victim of any other crimes?	5.3	84.1	4.44	6.15	5.81	76.41	9.23	8.55
Do you think most people try to be fair?	60.68	6.5	27.35	5.47	30.6	15.9	47.18	6.32
Do you think you are trustworthy?	58.12	3.08	35.38	3.42	24.27	8.03	63.76	3.93

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

	Before the disaster (%)	After the disaster (%)
Most people can be trusted.	19.66	6.50
People can be trusted more often than not.	55.90	36.24
Can't be too careful more often than not.	16.07	36.58
Can't be too careful.	5.64	18.29
No answer	2.73	2.39
Total	100.00	100.00

C7. How many hours do you spend for each activities?

	Average before the disaster	Average after the disaster
Hours to participate in volunteer work per week	1.31 hours	0.87 hours
Hours to join tea paty or other activities per week	2.60 hours	1.03 hours
Hours to talk with family per day	3.57 hours	3.22 hours
Hours to talk with friends per day	1.87 hours	0.80 hours
Number of persons to exchange greetings per day	15.71	6.86
Number of friends who exchange information more than 3times a year	15.51	7.77
Number of new friends after the disaster	—	4.37

C8. How is the household head's health currently compared to his or her health before the disaster?

	Frequency	Percent
Much better	4	0.68
Better	19	3.25
No difference	157	26.84
Worce	281	48.03
Much worce	64	10.94
No answer	60	10.26
Total	585	100.00

C9. K6

	During past 30 days how often did you feel….	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a.	… nervous?	4	3	2	1	0
b.	… hopeless?	4	3	2	1	0
c.	…restless or fidgety?	4	3	2	1	0
d.	…so depressed that nothing could cheer you up?	4	3	2	1	0
e.	…that everything was an effort?	4	3	2	1	0
f.	…worthless?	4	3	2	1	0

Distribution of the total score

	Frequency	Percent
0～4	137	23.42
5～9	171	29.23
10～14	129	22.05
Over 15	87	14.87
No answer	61	10.43
Total	585	100.00

D1. Ownership form of the house in Futaba town

	Frequency	Percent
Owned house orlived together with family owned house	436	74.53
Other: Rental or company provided house etc	81	13.85
No answer	68	11.62
Total	585	100.00

SD1. Largeness of house and land in Futaba town

Results omitted

SD2. What was the house in Futaba town made of?

Results omitted

SD3 . When did was the house built?

Results omitted

D2. Damage situation of house in Futaba town(Not including the damage by radiation)

	Frequency	Percent
Fully-destroyed	28	4.79
Half-desroyed	57	9.74
Partially-destroyed	243	41.54
No particular damage	224	38.29
Other	17	2.91
No answer	16	2.74
Total	585	100.00

D3. Damage situation of house in Futaba town caused by the passage of time

	Frequency	Percent
Need some cleaning	142	24.27
Need renovation	197	33.68
Need Rebuilding	210	35.9
No answer	36	6.15
Total	585	100

D4. Please circle what you got for house restitution

	Distribution(%)
1. Disaster victim releaf financial support	7.01
2. Earthquake insurance, fire insurance	40.85
3. TEPCO	43.42
4. Other	9.4

Which was the biggest amount from 1 to 4?

	Frequency	Percent
1	7	1.20
2	116	19.83
3	184	31.45
4	6	1.03
No ans	272	0.85
Total	585	100.00

D5. Are you currently getting restitution for mental damage, evacuation costs, and inability of working?

	Frequency	Percent
Yes	497	84.96
No	67	11.45
No ans	21	3.59
Total	585	100.00

D6. How do you fund money or staffs you need through evacuation other than the restitution?

	Percentage of concerned (%)
1. Public donation	61.54
2. Support from relatives	26.31
3. Support from friends	11.62
4. Loan from bank	3.08
5. Saved money	75.56
6. Other	11.79

Which was the biggest among from a to 6?

	Frequency	Percent
1	84	14.70
2	25	4.27
3	6	1.03
4	6	1.03
5	223	38.12
6	43	7.35
No ans	198	33.84
Total	585	100.00

D7. Circle the main place and house type in each evacuation period. (Percentage of the respondents on the table)

	Location (%)			Type of place (%)													
	Within 20 km from the daiichi reactor	Out of 20 km but within Fukushima pref	Out of Fukushima pref	House in lived before the disaster	Evacuation center, tent, car	Hotel	Parents or children's house	Brother or sister's house	Other relative's house	Friends' house	Kasetsu residence	Public housing	Government housing	Rentedaccommodation	House offered by company	House bought after disaster	Other
March 11th to 14th	51	50	7	27	57	3	9	5	10	2	0.2	0.9	0.2	2	0.3	0.3	6
4 days to 10 days after disaster	9	54	86	1	40	5	12	10	15	4	0	0.2	0	2	0.3	0.2	5
2 weeks to 2 months after disaster	1	26	61	0.3	22	7	18	12	14	4	0.7	4	0.3	14	1	0.3	7
2 months to 6 months after disaster	0.9	32	50	0	14	8	10	4	4	0.9	3	10	0.5	29	2	0.5	7
6 months after disaster to June 2013	0.7	40	47	0.2	7	2	6	2	1	0.5	8	9	3	42	4	6	8

D8. How have you been gaining information since right after the disaster by now? (Percentage of the respondents on the table)

	Circle what you used to gather information (%)													
	TV	Radio	Internet	Cell phone, Smartphone	Community wireless system	Friends or neighbors from Futaba town	Alumnus	Relatives	Town office	Prefectural office	Government	People met in evacuation center	Prefecture or city where they evacuated	Other
March 11th to 14th	56	28	3	16	16	20	2	9	21	0.9	0.7	20	6	6
4 days to 10 days after disaster	64	19	5	16	2	15	2	12	18	2	1	15	9	6
2 weeks to 2 months after disaster	22	12	10	21	0.5	15	3	15	24	7	3	10	9	7
2 months to 6 months after disaster	69	11	15	20	0.2	15	3	12	34	11	6	8	11	8
6 months after disaster to June 2013	73	10	21	21	0.3	20	3	11	42	17	8	6	14	9

D9. Among the family member you would live together before the disaster, are there anyone who died or injured after the disaster **because of the impact of the disaster**?

Results omitted

D10. Including the income of the household head, how much is the yearly income of the household before and after the disaster?

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

D11. Is the household head planning to go back to Futaba town in the future?

	Frequency	Percent
Yes	56	9.59
Don't know yet	176	30.14
No	335	57.36
No answer	18	2.91
Total	585	100.00

D12. Please write freely what you have in your mind

We appreciate all the precious comments.

東日本大震災による被害・生活環境・復興に関する
アンケートのご協力のお願い

平成 26 年12月

突然のお便りで失礼いたします。

このたび、東京大学の研究プロジェクトとして、双葉町役場のご協力を頂き、双葉町からの避難者の方全員を対象に「東日本大震災による被害・生活環境・復興に関するアンケート」を実施いたしております。

私どもは昨年度も同様の調査を実施させて頂き、大変多くの方にご協力を頂きました。皆様のご協力に感謝致します。調査結果は町民の皆様に平成25年12月に郵送にてご報告させて頂いた他、双葉町役場の皆様にもご報告させて頂きました。調査結果は双葉町役場のウェブサイトからもご覧いただけます。(http://www.town.fukushima-futaba.lg.jp/4273.htm) また、学会等でも発表させて頂き、様々な面で役に立てて頂いていると伺っております。

今年度の調査は、震災の発生から 3 年半以上が経った今、生活を再建するために本当に必要なことは何なのか継続的な調査を通して分析し、今後の政策に役立てていくことを目的にしています。今回の調査結果も、町民の皆様に報告させていただきますとともに、双葉町役場に報告致します。

お忙しいところ誠に恐縮ですが、世帯主の方もしくは世帯主の配偶者の方に、ご回答をお願い致します。もし、回答が難しい場合には、世帯主の方の立場から、ご家族の方、代理人の方等にご記入いただけますと幸甚です。最初のページから順番に各質問の質問文に沿って、あてはまる番号に○印をつけたり、ご意見を記入する形式でご回答ください。**アンケートは匿名ですので、個人名・世帯名をデータとして分析したり、公表したりすることは一切ございません。**また、個人情報の保護には万全を期しておりますので、決して皆様にご迷惑をおかけすることはありません。

ご回答いただきましたアンケートは **12 月末日までに**アンケート用紙の最後のページに添付させて頂きました返信用封筒に3つ折りにして封入の上、ご返信いただけますようお願い申し上げます。

本調査の趣旨をご理解いただき、なにとぞご協力くださいますようお願いいたします。

調査主体:　東京大学「災害からの生活基盤復興に関する国際比較」プロジェクト

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はじめにアンケートをご記入いただいている方についてお聞かせください。

この調査票を記入していただいいているのはどなたですか。(番号の１つに○をお付けください)

1. 世帯主本人　2. 配偶者　3. その他　(　　)

1. 世帯主についてお聞かせください。

(1) 世帯主の基本的な情報についておしらせください。

ア) 年齢 [　　] 歳　　イ) 性別 1. 男性　2. 女性

ウ) 現在のお住まい [　　] 県 [　　] 市

(2) **現在の**お住まいの種類(番号の1つに○をお付けください)

1. 仮設住宅　2. アパート(賃貸)　3. マンション(賃貸)　4. 戸建(賃貸)　5. 公務員宿舎　6. 県営・市営住宅
7. 震災前と異なる持家(戸建):平成　　年　月 購入　8. 震災前と異なる持家(マンション):平成　　年　月 購入
9. 社宅　10. 親戚の家に在住(続柄:　　)　11. その他(具体的に:　　)

(3) お住まいの広さについて教えてください。

現在のお住まいの土地・住居面積の広さを「平米」「坪」のいずれかでお答えください。

(マンション・アパート等にお住まいの場合は、建物面積のみお答えください)

土地　約		平方メートル　もしくは	約		坪
建物面積　約		平方メートル　もしくは	約		坪

(4) 世帯主の**現在の**お仕事に一番近いものをお選びください。(番号の１つに○印をお付け下さい)

1. お勤め(会社員)　2. お勤め(公務員)　3. 開業医、弁護士等の自由業　4. 農業・林業　5. 水産業
6. 自営業(業種:　　)　7. アルバイト　8. 家事　9. 定年退職・引退
10. 無職: 休職中　11. その他(具体的に:　　)

(5) 世帯主の**震災前の**お仕事に一番近いものをお選びください。(番号の１つに○印をお付け下さい)

1. お勤め(会社員)　2. お勤め(公務員)　3. 開業医、弁護士等の自由業　4. 農業・林業　5. 水産業
6. 自営業(業種:　　)　7. アルバイト　8. 家事　9. 定年退職・引退
10. 無職: 休職中　11. その他(具体的に:　　)

(6) 世帯主の最終学歴をお知らせください。(番号の１つに○印をお付け下さい)

1. 高校　2. 専門学校　3. 短期大学　4. 大学　5. その他(具体的に　　)

(7) 震災前後の世帯主の家族・親戚の構成をお教えください。

現在　①現在の世帯主の同居家族の人数は何名ですか？ [　　] 名(本人含む、一人暮らしの場合は1)

②世帯主から見た現在の**同居**家族**すべてに**○をつけてください。またカッコ内に人数もご記載ください

1. 配偶者　2. 父　3. 義父　4. 母　5. 義母　6. 息子(　　人)　7. 娘(　　人)
8. 孫(　　人)　9. その他の同居家族: 具体的に＿＿＿＿＿＿(　　人)

震災前　① 震災前の同居家族の人数は何名ですか？ [　　] 名　(本人含む、一人暮らしの場合は1)

②現在の世帯主からみた**同居**家族**すべてに**○をつけてください。カッコ内に人数もご記載ください

1. 配偶者　2. 父　3. 義父　4. 母　5. 義母　6. 息子(　　人)　7. 娘(　　人)
8. 孫(　　人)　9. その他の同居家族: 具体的に＿＿＿＿＿＿(　　人)

・ 震災前の同居ご家族のうち震災後亡くなられたご家族　(　　人)

(8)　世帯主の健康状態について伺います。現在の健康状態は、震災前と比べるといかがですか。(○印は１つ)

1. 大変良くなっている　2. 良くなっている　3. 変わっていない　4. 悪くなっている　5. 大変悪くなっている

(9) 震災前と比較すると体重の変化はありましたか。(○印は１つ)

1. 増加した　2. やや増加した　3. 変わらない　4. やや 減少した 5. 減少した

(10) 現在、あなた(世帯主)はどの程度幸せですか。「とても幸せ」を 10 点、「とても不幸」を0点とすると、何点くらいになると思いますか。いずれかの数字を1つだけ○で囲んでください。

とても不幸　　とても幸せ

0点　1　2　3　4　5　6　7　8　9　10点

(11)　過去 30 日間に世帯主はどれくらいの頻度で次のことがありましたか。(あてはまる数字１つに○)

	全くない	少しだけ	ときどき	たいてい	いつも
神経過敏に感じましたか。	1	2	3	4	5
絶望的だと感じましたか。	1	2	3	4	5
そわそわ、落ち着かなく感じましたか。	1	2	3	4	5
気分が沈み込んで、何が起こっても気が晴れないように感じましたか。	1	2	3	4	5
何をするのも骨折りだと感じましたか。	1	2	3	4	5
自分は価値のない人間だと感じましたか。	1	2	3	4	5

(12) 被災者の方々の避難生活のための環境の変化に伴い、自宅での料理が困難となり、外食の増加のための健康被害が懸念されています。

震災前の双葉町における生活では、1週間の内で何回ほど外食されていましたか。

ア) 0 回　イ) 1 回　ウ) 2 回　エ) 3 回　オ) 4 回　カ) それ以上 :約　　回)

現在は１週間の内で何回ほど外食されていますか。

ア) 0 回　イ) 1 回　ウ) 2 回　エ) 3 回　オ) 4 回　カ) それ以上 :約　　回)

(13) 健康問題に関係して、避難民の方々の交通の不便による活動の制限が懸念されております。

ア) 震災後、新しい車はご購入になりましたか。　1. はい　2. いいえ

イ) ご購入された方へ質問です。

① 同居家族全体で、震災後、車を何台ご購入になりましたか　　台

② いつごろご購入になりましたか。(【】内はどちらかに○をお付けください)

1台目　【中古・新車】平成＿＿＿年＿＿月頃（1台以上ご購入された場合のみご記入ください）

2台目　【中古・新車】平成　　年＿＿月頃（2台以上ご購入された場合のみご記入ください）

3台目　【中古・新車】平成　　年＿＿月頃（3台以上ご購入された場合のみご記入ください）

2 .ご近所付き合いなどについてお聞かせください。

(1) 震災前、世帯主は、双葉町のどちらの大字にお住まいでしたか。(番号の１つに○印をお付け下さい)

1. 石熊　2. 山田　3. 松迫　4. 水沢　5. 目さく　6. 郡山　7. 上羽鳥
8. 新山　9. 松倉　10. 寺沢　11. 渋川　12. 鴻草　13. 細谷　14. 下羽鳥
15. 中田　16. 長塚　17. 両竹　18. 中浜　19. 中野　20. 前田　21. その他(　　)

(2) 現在のお住まいの近隣には、双葉町在住時には知り合いでなかったものの、避難を通して同じ双葉町民として知り合った方はどれくらい住んでいらっしゃいますか。(番号の1つに○印をお付け下さい。

1. 20世帯以上　2. 10～19世帯　3. 6～9世帯　4. 3～5世帯　5. 1～2世帯　6. いない

(3) 現在のお住まいの近隣には、双葉町在住時知り合いだった双葉町民の方はどれくらい住んでいらっしゃいますか。(番号の1つに○印をお付け下さい)

1. 20世帯以上　2. 10～19世帯　3. 6～9世帯　4. 3～5世帯　5. 1～2世帯　6. いない

(4) ご近所付き合いで、世帯主の家族がものをあげたり、手助けしたり、逆にものをもらったり、助けてもらったりという関係は震災前はどのくらいありましたか？また、現在はどのくらいありますか(○印は各1つ)

震災前:　1. かなりあった　2. ほどほどにあった　3. あまりなかった　4. なかった

現在:　1. かなりある　2. ほどほどにある　3. あまりない　4. ない

(5) 近所の人は私が困っていたら手助けしてくれる。(震災前と現在のお考え各1つに○をお付け下さい)

	よくあてはまる	あてはまる	どちらともいえない	あてはまらない	まったくあてはまらない
震災前のお考え	1	2	3	4	5
現在のお考え	1	2	3	4	5

(6) 震災前と震災後の生活について教えてください。(震災前と震災後の各1つを○で囲んでください)

	震災前			現在		
	はい	いいえ	わからない	はい	いいえ	わからない
ドアの鍵を開けたまま外出することがよくある。	1	2	3	1	2	3
友人にお金やものを貸すことがよくある。	1	2	3	1	2	3
ほとんどの人は公平にしようとしていると思う。	1	2	3	1	2	3
自分はまわりから信用されていると思う。	1	2	3	1	2	3

(7)現在参加しているボランティア活動や趣味の活動などについて教えてください。(○印は一つ)

ア)　ボランティア活動に参加することがある。　1. はい　2. いいえ　：はいの方は月　　時間程度

イ)　趣味の活動に参加することがある。　1. はい　2. いいえ　：はいの方は月　　時間程度

ウ)　同居家族以外で一日に挨拶する人の平均的な人数　　人

(8) 一般的に、人は信用できると思いますか。それとも、人と付き合うときには、できるだけ用心したほうがよいと思いますか。(震災前のお考えと現在のお考え、各1つの数字に○をお付けください)

現在どうお考えかお答え下さい。

1. ほとんどの場合、信用できる　2. たいていは、信用できる
3. たいていは、用心したほうがよい　4. ほとんどの場合、用心したほうがよい

震災前にどう考えていたかお答えください。

1. ほとんどの場合、信用できる　2. たいていは、信用できる
3. たいていは、用心したほうがよい　4. ほとんどの場合、用心したほうがよい

3. 皆様のうけた被害と支援実態についてお聞かせください。

(1) 震災前のお住まいの所有形態はどちらにあたりますか。(数字の１つに○印をお付け下さい)

1. 持家(戸建)　2. 持家(マンション)　3. 戸建(賃貸)　4. マンション(賃貸)　5. アパート(賃貸)
6. 公営住宅　7. 社宅　8. 親戚の家に在住（続柄:　　）9. その他(具体的に:　　)

(2) 震災前のお住まいの土地・建物面積の広さを「平米」「坪」のいずれかでお答えください。
(マンション・アパート等にお住まいの場合は、建物面積のみお答えください)

土地	約		平方メートル	もしくは	約		坪
建物面積	約		平方メートル	もしくは	約		坪

(3) 地震、津波等による双葉町のお住まいの被害状況を放射能汚染の被害を含まずに1つお選び下さい。

1. 全壊　2. 半壊　3. 一部損壊　4. 大きな被害無　5. その他(具体的に　　)

(4) 住宅、土地、家財の賠償について、その評価額が十分でないのではないかということが、社会的な問題となっております。受け取られた賠償額をお教えください。

また、賠償金額はそれぞれ十分納得のいく金額であったかどうか　【　】内にそれぞれ○をつけてください。

住宅　約　　万円　土地　約　　万円　家財　約　　万円

【十分 ・ 不十分 ・ どちらともいえない】【十分 ・ 不十分 ・ どちらともいえない】【十分 ・ 不十分・ どちらともいえない】

(5) 東日本大震災による被災者の方々が、経済的に厳しい状況にあることが、マスコミなどでも取り上げられ、社会的な問題となっております。震災前と現在の年収についてご記入ください。

震災前の世帯主含めて世帯全体の年収(税引き前金額、年金を含む)　約　　万円

現在の世帯主含めて世帯全体の年収(税引き前金額、年金を含む、賠償金等含まない)　約　　万円

(6)　世帯主は、将来町に戻るおつもりですか。　1. はい　2. まだ決められない　3. 戻らない

(7)　町に戻るおつもりの方はそれまでの間、戻らないつもりの方、もしくはまだ決められない方はこれから先長期的に生活する場所を既に決めていらっしゃいますか。　1. きめている　2. まだきめていない（わからない）

(8) 震災後の生活で困っていること、日ごろお気づきのこと、感じておられることなどご自由にお書き下さい。

■ 長時間にわたり、ご協力ありがとうございました。
同封しました返信用封筒をお使いの上ご返送いただけますようお願いいたします。

［この用紙の回答は任意です］

―御礼とお願い―

このたびはアンケート調査にご協力頂き誠にありがとうございます。今後も皆様のお声を行政に届けていくためにも、原子力発電所の事故の影響の実態把握について継続的な調査が不可欠であります。つきましては、このような調査が将来行われる際、再度皆様のご協力を頂けることを願っております。**今後の調査にご協力頂ける場合には、この用紙に、住所と氏名、電話番号（任意）をご記入ください。ご記入頂かない場合は、このページは空欄でご返信ください。**

ふりがな　［　　］

氏名　　様

性別　　［1. 男性　　2. 女性　］

生年月日　［1. 明治　2. 大正　3. 昭和　4. 平成］＿＿＿年　＿＿＿月＿＿＿＿日

現在のご住所

〒　　－

双葉町でのご住所

〒　　－

ご連絡先電話番号（任意）　［　　－　　－　　］

個人情報の管理には万全を期しておりますので皆様個人にご迷惑をおかけすることはございません。本情報は研究・政策支援以外の目的で使用することはございません。また、アンケート用紙とは完全に分けて管理を致しますので、**世帯名・個人名が特定される形でデータが使われたり、公表されたりすることは一切ございません。**本紙をお送り頂き、継続して調査にご協力いただいた方には薄謝をお送り致します。

最後になりましたが、皆様の生活が一刻も早く安定と安心をとり戻されることを願っております。ご協力ありがとうございました。

東京大学「災害からの生活基盤復興に関する国際比較」プロジェクトメンバー一同

Appendix V. Survey Questionnaire 2014 (English Translation)

In this questionnaire, please answer about household which you belonged to in Futaba town

1. Please answer about household head

(1) Basic information of house hold head

a) Age [ ] years old b) sex [1. male 2. Female] Current place [ ] Prefecture [ ] city

(2) Current living place (Please circle one of the numbers)

1. Kasetsu housing	2. Municipal housing	3. Civil servant housing	4. Kariage housing
5. House offered by company	6. Parents or children	7. Brother or sister	8. Other relatives
9. House bought after disaster	10. Other ( )		

(3) Size of land and house

Land About [ ] M^2 or About [ ] tsubo (1 tsubo≒3.3M2)

House/Room About [ ] M^2 or About [ ] tsubo

(4) **Current** job of the household head (Please circle one of the numbers)

1. Employee (Company, civil servant)	2. Agriculture	3. Fishery	4. Self-employed (type:)
5. Medical doctor or lawyer	6. Housework	7. Student	8. Age-limit retirement
9. Recruiting	10. Part-time job	11. Other ( )	

(5) Job of the household head **before the disaster** (Please circle one of the numbers)

1. Employee (Company, civil servant)	2. Agriculture	3. Fishery	4. Self-employed (type:)
5. Medical doctor or lawyer	6. Housework	7. Student	8. Age-limit retirement
9. Recruiting	10. Part-time job	11. Other ( )	

(6) Academic background of the household head (Please circle one of the numbers)

1. High school 2. Specialty school 3. Community college 4. University 5. Other ( )

(7) Family member

Now Number of family member living together now (Including household head)
Please Circle all the member living together and fill the parenthesis with numbers.

1. Spouse 2. father 3. mother 4. son( ) 5. daughter( )
6. grandchild( ) 7. Other _____( )

Before the Disaster

Number of family member living together now (Including household head)
Please Circle all the member living together and fill the parenthesis with numbers.

1. Spouse 2. father 3. mother 4. son( ) 5. daughter( )
6. grandchild( ) 7. Other _____( )

Number of family member who passed away after the disaster ( )

(8) How is the household head's health status compared to his or her health before the disaster?

1. Much Better **2.** Better **3.** No difference **4.** Worse **5.**Much worse

(9) Has your weight changed compared to the weight before the disaster?

1. Increased 2. Slightly increased 3. No change 4. Slightly decreased 5. Decreased

(10) How happy are you (house hold head)? Please locate your subjective evaluation of happiness between "Happiest" 10 and "Unhappiest" 0.

Unhappiest Happiest

0 1 2 3 4 5 6 7 8 9 10

(11)

	During past 30 days how often did you feel….	All of the time	Most of the time	Some of the time	A little of the time	None of the time
a.	… nervous?	4	3	2	1	0
b.	… hopeless?	4	3	2	1	0
c.	…restless or fidgety?	4	3	2	1	0
d.	…so depressed that nothing could cheer you up?	4	3	2	1	0
e.	…that everything was an effort?	4	3	2	1	0
f.	…worthless?	4	3	2	1	0

(12) There is growing concerns on health status of disaster affected residents caused by increasing frequency of eating out in result of environmental change making it difficult to cook at home.

How often did you eat out in a week **before the disaster**?

a) 0 b) 1 c)2 d) 3 e) 4 f) Over 5

How often do you eat out in a week **now**?

a) 0 b) 1 c)2 d) 3 e) 4 f) Over 5

(13) There is a growing concern on inconvenience in transportation among disaster affected residents.

a) Have you bought new car after the disaster? 1) Yes 2)No

b) If you have bought a car, ① How many cars did you buy? _____

② When did you buy?

1st car [new・ second hand] Year_____ Month_____

2nd car [new・ second hand] Year_____ Month_____

3rd car [new・ second hand] Year_____ Month_____

2 Please tell us about your neighbors

(1) Which part of Futaba town did the household head live in Futaba?(Please circle one of the numbers)

1.Ishiguma **2.**Yamada **3.**Matsusaku **4.**Mizusawa **5.**Mesaku **6.**Kooriyama **7.** Kamihatori
8.Shinzan **9.**Matsukura **10.**Terasawa **11.**Shibukawa **12.**Konokusa **13.**Hosoya **14.**Shimohatori
15. Nakada **16.**Nagatsuka **17.**Morotake **18.**Nakahama **19.** Nakano **20.** Maeda **21.**Other( )

(2) How many neighbors from Futaba town who you **did not know** each other before the disaster do you have? (Please circle one of the numbers)

1. More than 20 **2.** 10～19 **3.** 6～9 **4.** 3～5 **5.** 1～2 **6.** None

(3) How many neighbors from Futaba town who you have known each other before the disaster do you have? (Please circle one of the numbers)

1. More than 20 **2.** 10～19 **3.** 6～9 **4.** 3～5 **5.** 1～2 **6.** None

(4) Talking of neighborly ties, how often did household head give something to neighbors or help neighbors, get something from neighbors or get help from neighbors before and after the disaster?

Before: **1.** So often **2.** Moderately **3.** Not so much **4.** None

After: **1.** So often **2.** Moderately **3.** Not so much **4.** None

(5) Neighbors will help me when I am in trouble (Circle each for before and after the disaster)

	Strongly agree	Agree	Yes and no	Don't agree	Don't agree at all
Before	1	2	3	4	5
After	1	2	3	4	5

(6) Please tell us about life before and after the disaster. (Circle each for before and after disaster)

	Before			After		
	Yes	No	DK	Yes	No	DK
Do you leave the door unlocked when you go out?	1	2	3	1	2	3
Do you often borrow money or staffs to your friends?	1	2	3	1	2	3
Do you think most people try to be fair?	1	2	3	1	2	3
Do you think you are trustworthy?	1	2	3	1	2	3

(7) Please let us know about volunteer activities and hobby gatherings you attend.

a) Do you participate in any volunteer activities? 1. Yes 2. No :If yes, about _____ hours/month

b) Do you attend any hobby gatherings? 1. Yes 2. No :If yes, about _____ hours/month

c) How many people do you exchange greetings per day? 1. None 2. 1～2 3. 3～4 4. Over 5

(8) Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? (Please circle each opinion before and after the disaster)

Now

1. Most people can be trusted **2.** People can be trusted more often than not
3. Can't be too careful more often than not **4.** Can't be too careful

Before the disaster

1. Most people can be trusted **2.** People can be trusted more often than not
3. Can't be too careful more often than not **4.** Can't be too careful

3. Please let us know about degree of damage you have got and actual condition of the support you have got afterwards

(1) Living place before the disaster

1. House (own) **2.** Mansion (Own) **3.** House (rent) **4.** Mansion (rent) **5.** Apartment (rent)
6. Public housing **7.** Company's provision **8.** Relative's (Relation:) **9.** Other ( )

(2) Size of land and house (If you did not own house, please answer the house or room size)

Land	About		M^2	or About		tsubo (1 tsubo≒3.3M^2)
House/Room	About		M^2	or About		tsubo

(3) Damage of house in Futaba town (Not including the damage by radiation)

1.Fully-destroyed **2.**Half-destroyed **3.**Partially-destroyed **4.**No particular damage **5.**Other ( )

(4) It has come to a discussion that assets in Futaba including house, land, and house hold belongings are undervalued to calculate compensation. Please let us know the amount of compensation you received. (If you have not received yet, please write the expected amount) Also please choose whether it was sufficient amount for you or not by circling one of the choices in 【 】.

House _____JPY Land_____ JPY House belongings _____ JPY

【sufficient・not sufficient・Don't know】【sufficient・not sufficient・Don't know】【sufficient・not sufficient・Don't know】

(5) It has been reported in various news that disaster affected residents face serious economic problems. Please write your household income before and after the disaster.

House hold income **before the disaster** (before tax deduction, pension included) About _____JPY

Current House hold income (before tax deduction, pension included, compensation not included) About ____JPY

(6) Is the household head planning to go back to Futaba town in the future? **1.** Yes **2.** Don't know yet **3.** No

(7) Have you decided where to stay for time being? **1.** Yes **2.** No

(8) Please write freely what you have in your mind.

■ **Thank you very much for your cooperation**

Please send us back this questionnaire using the attached envelop

この調査票を記入していただいいているのはどなたですか。

	頻度	割合
世帯主本人	448	68.50
配偶者	111	16.97
その他	27	4.13
無回答	68	10.40
合計	654	100.00

1. 世帯主についてお聞かせください。

(1)世帯主の基本的な情報についてお聞かせください。

ア）年齢 平均: 63 歳　最年長: 96 歳 最年少: 26 歳

イ）男性: 77.4% 女性: 20.5% 無回答: 2.1%

ウ)現在のお住まい

全国各地からご回答いただきました。ありがとうございます。

集計結果は省略させて頂きます。

(2)**現在の**お住まいの種類

	頻度	割合
仮設住宅	57	8.72
アパート(賃貸)	141	21.56
マンション(賃貸)	36	5.50
戸建(賃貸)	65	9.94
公務員宿舎	13	1.99
県民・市営住宅	26	3.98
震災前と異なる持家(戸建)	211	32.26
震災前と異なる持家(マンション)	22	3.36
社宅	13	1.99
親戚の家に在住	20	3.06
その他	37	5.66
無回答	13	1.99
合計	654	100.00

(3) お住まいの広さについて教えてください

現在のお住まいの土地・住居面積の広さをお答えください。

土地面積:

	頻度	割合
0～100 平米	54	8.26
100～200 平米	59	9.02
200～300 平米	82	12.54
300 平米～	127	19.42
無回答	332	50.76
合計	654	100.00

住宅面積:

	頻度	割合
0～40 平米	51	7.80
40～80 平米	77	11.77
80～120 平米	41	6.27
120 平米～	236	36.09
無回答	249	38.07
合計	654	100.00

(4) 世帯主の現在のお仕事に一番近いものをお選びください。

	頻度	割合
お勤め(会社員)	129	19.72
お勤め(公務員)	29	4.43
開業医、弁護士等の自由業	2	0.31
農業・林業	7	1.07
自営業	30	4.59
アルバイト	17	2.60
家事	22	3.36
定年退職・引退	156	23.85
無職・休職中	220	33.64
その他	29	4.43
無回答	13	1.99
合計	654	100.00

(5) 世帯主の震災前のお仕事に一番近いものをお選びください。

	頻度	割合
お勤め(会社員)	237	36.24
お勤め(公務員)	51	7.80
開業医、弁護士等の自由業	2	0.31
農業・林業	69	10.55
水産業	1	0.15
自営業	78	11.93
アルバイト	13	1.99
家事	15	2.29
定年退職・引退	81	12.39
無職・休職中	49	7.49
その他	44	6.73
無回答	14	2.14
合計	654	100.00

(6)世帯主の最終学歴をお知らせください。

	頻度	割合
中学	56	8.56
高校	344	52.60
専門学校	72	11.01
短期大学	22	3.36
大学	101	15.44
大学院	6	0.92
その他	4	0.61
無回答	27	4.13
合計	654	100.00

(7) 震災前後の世帯主の家族・親戚の構成をお教えください。

世帯主の同居家族の人数は何名ですか？

	現在(%)	震災前(%)
1名	20.95	11.47
2名	34.40	22.48
3名	21.41	22.48
4名	11.31	15.29
5名	4.13	10.55
6名	3.36	8.10
7名以上	2.75	5.20
無回答	1.68	4.43
合計	100.00	100.00

(8)　世帯主の健康状態について伺います。現在の健康状態は、震災前と比べるといかがですか。

	頻度	割合
大変良くなっている	1	0.15
良くなっている	12	1.83
変わっていない	237	36.24
悪くなっている	327	50.00
大変悪くなっている	61	9.33
無回答	16	2.45
合計	654	100.00

(9)　震災前と比較すると体重の変化はありましたか。

	頻度	割合
増加した	83	12.69
やや増加した	151	23.09
変わらない	173	26.45
やや減少した	155	23.70
減少した	79	12.08
無回答	13	1.99
合計	654	100.00

(10) 現在、あなた(世帯主)はどの程度幸せですか。「とても幸せ」を10 点、「とても不幸」を0点とすると、何点くらいになると思いますか。

		頻度	割合
とても不幸	0	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
とても幸せ	10	12	1.83
無回答		21	3.21
合計		654	100.00

(11)　過去 30 日間に世帯主はどれくらいの頻度で次のことがありましたか。(K6)

点数基準	全くない	少しだけ	ときどき	たいてい	いつも
神経過敏に感じましたか。	0	1	2	3	4
絶望的だと感じましたか。	0	1	2	3	4
そわそわ、落ち着かなく感じましたか。	0	1	2	3	4
気分が沈み込んで、何が起こっても気が晴れないように感じましたか。	0	1	2	3	4
何をするのも骨折りだと感じましたか。	0	1	2	3	4
自分は価値のない人間だと感じましたか。	0	1	2	3	4

合計点数分布:

	頻度	割合
0～4 点	174	26.61
5～8 点	122	18.65
9～12 点	158	24.16
13～16 点	79	12.08
17 点以上	61	9.33
無回答	60	9.17
合計	654	100.00

(12) 被災者の方々の避難生活のための環境の変化に伴い、自宅での料理が困難となり、外食の増加のための健康被害が懸念されています。現在は1週間の内で何回ほど外食されていますか。震災前は、何回ほど外食されていましたか。

	現在(%)	震災前(%)
0 回	34.25	58.72
1 回	30.28	29.97
2 回	15.44	6.73
3 回	8.56	1.53
4 回	4.13	0.92
5 回以上	3.67	0.61
無回答	3.67	1.53
合計	100.00	100.00

(13)　健康問題に関係して、交通の不便による活動の制限が懸念されております。

ア)震災後、新しい車はご購入になりましたか。

	頻度	割合
はい	391	59.79
いいえ	242	37.00
無回答	21	3.21
合計	654	100.00

イ)ご購入された方へ質問です。同居家族全体で、震災後、車を何台ご購入になりましたか。

	頻度	割合
1 台	222	58.89
2 台	112	29.71
3 台	29	7.69
4 台	11	2.92
5 台	3	0.80
合計	377	100.00

2 .ご近所付き合いなどについてお聞かせください。

(1) 震災前、世帯主は、双葉町のどちらの大字にお住まいでしたか。

	頻度	割合
石熊	10	1.54
山田	48	7.34
松迫	2	0.31
水永	6	0.92
目さく	7	1.07
郡山	47	7.19
上羽鳥	10	1.53
新山	144	22.02
松倉	7	1.07
寺沢	10	1.53
渋川	9	1.38
鴻草	21	3.21
細谷	16	2.45
下羽鳥	13	1.99
中田	5	0.76
長塚	188	28.75
両竹	10	1.53
中浜	7	1.07
中野	12	1.83
前田	69	10.55
その他	5	0.76
無回答	8	1.22
合計	654	100.00

(2) 現在のお住まいの近隣には、双葉町在住時には**知り合いでなかった**ものの、避難を通して**同じ双葉町民として知り合った方**はどれくらい住んでいらっしゃいますか。

	頻度	割合
20 世帯以上	41	6.27
10～19 世帯	25	3.82
6～9 世帯	32	4.89
3～5 世帯	71	10.86
1～2 世帯	136	20.80
いない	334	51.07
無回答	15	2.29
合計	654	100.00

(3) 現在のお住まいの近隣には、**双葉町在住時知り合いだった双葉町民の方**はどれくらい住んでいらっしゃいますか。

	頻度	割合
20 世帯以上	13	1.99
10～19 世帯	27	4.13
6～9 世帯	46	7.03
3～5 世帯	78	11.93
1～2 世帯	150	22.94
いない	324	49.54
無回答	16	2.45
合計	654	100.00

(4) ご近所付き合いで、世帯主の家族がものをあげたり、手助けしたり、逆にものをもらったり、助けてもらったりという関係は**震災前**はどのくらいありましたか？また、**現在は**どのくらいありますか。

	現在(%)	震災前(%)
かなりあった	4.43	40.98
ほどほどにあった	23.09	43.43
あまりなかった	35.63	8.41
なかった	34.40	5.35
無回答	2.45	1.83
合計	100.00	100.00

(5) 近所の人は私が困っていたら手助けしてくれる。

	現在(%)	震災前(%)
よくあてはまる	4.43	33.18
あてはまる	16.67	38.53
どちらともいえない	31.96	19.42
あてはまらない	17.74	3.98
まったくあてはまらない	26.61	2.91
無回答	2.60	1.99
合計	100.00	100.00

(6) 震災前と震災後の生活について教えてください。

ドアの鍵を開けたまま外出することがよくある。

	現在(%)	震災前(%)
はい	5.05	51.99
いいえ	90.83	45.57
わからない	1.38	0.61
無回答	2.75	1.83
合計	100.00	100.00

友人にお金やものを貸すことがよくある。

	現在(%)	震災前(%)
はい	3.06	26.76
いいえ	91.74	68.20
わからない	1.53	2.14
無回答	3.67	2.91
合計	100.00	100.00

ほとんどの人は公平にしようとしていると思う。

	現在(%)	震災前(%)
はい	35.78	65.14
いいえ	22.63	8.26
わからない	37.46	23.55
無回答	4.13	3.06
合計	100.00	100.00

自分はまわりから信用されていると思う。

	現在(%)	震災前(%)
はい	20.49	55.50
いいえ	15.90	5.81
わからない	60.40	36.09
無回答	3.21	2.60
合計	100.00	100.00

(7)現在参加しているボランティア活動や趣味の活動などについて教えてください。

ア) ボランティア活動に参加することがある。

	頻度	割合
はい	86	13.15
いいえ	554	84.71
無回答	14	2.14
合計	654	100.00

イ) 趣味の活動に参加することがある。

	頻度	割合
はい	169	25.84
いいえ	463	70.80
無回答	22	3.36
合計	654	100.00

ウ) 同居家族以外で一日に挨拶する人の平均的な人数

	頻度	割合
0 名	95	14.53
1～3 名	260	39.76
4～6 名	123	18.81
7～9 名	8	1.22
10～19 名	85	13.00
20～29 名	26	3.98
30 名以上	19	2.91
無回答	38	5.81
合計	100.00	100.00

(8) 一般的に、人は信用できると思いますか。それとも、人と付き合うときには、できるだけ用心したほうがよいと思いますか。

	現在(%)	震災前(%)
ほとんどの場合、信用できる	5.20	20.95
たいていは、信用できる	36.24	55.20
たいていは、用心したほうがよい	37.77	16.21
ほとんどの場合、用心したほうがよい	17.89	5.35
無回答	2.91	2.29
合計	100.00	100.00

3. 皆様のうけた被害と支援実態についてお聞かせください。

(1) 震災前のお住まいの所有形態はどちらにあたりますか。

	頻度	割合
持家(戸建)	525	80.28
持家(マンション)	1	0.15
戸建(賃貸)	22	3.36
マンション(賃貸)	3	0.46
アパート(賃貸)	17	2.60
公営住宅	34	5.20
社宅	18	2.75
親戚の家に在住	13	1.99
その他	10	1.53
無回答	11	1.68
合計	654	100.00

(2) 震災前のお住まいの土地・住居面積の広さをお答えください。

土地面積:

	頻度	割合
0～100 平米	13	1.99
100～300 平米	78	11.93
300～500 平米	170	25.99
500～1000 平米	151	23.09
1000 平米～	88	13.46
無回答	154	23.55
合計	654	100.00

住宅面積:

	頻度	割合
0～40 平米	20	3.06
40～80 平米	37	5.66
80～120 平米	63	9.63
120 平米～	421	64.37
無回答	113	17.28
合計	654	100.00

(3) 地震、津波等による双葉町のお住まいの被害状況を放射能汚染の被害を含まずに1つお選び下さい。

	頻度	割合
全壊	34	5.20
半壊	79	12.08
一部損壊	247	37.77
大きな被害無	243	37.16
その他	15	2.29
無回答	36	5.50
合計	654	100.00

(4) 住宅、土地、家財の賠償について、その評価額が十分でないのではないかということが、社会的な問題となっております。受け取られた賠償額をお教えください。

集計結果は省略させて頂きます。

(5) 東日本大震災による被災者の方々が、経済的に厳しい状況にあることが、マスコミなどでも取り上げられ、社会的な問題となっております。震災前と現在の年収についてご記入ください。

集計結果は省略させて頂きます。

(6) 世帯主は、将来町に戻るおつもりですか。

	頻度	割合
はい	66	10.09
まだ決められない	184	28.13
戻らない	387	59.17
無回答	17	2.60
合計	654	100.00

(7) 町に戻るおつもりの方はそれまでの間、戻らないつもりの方、もしくはまだ決められない方はこれから先長期的に生活する場所を既に決めていらっしゃいますか。

	頻度	割合
はい	257	39.30
まだきめていない(わからない)	225	34.40
無回答	172	26.30
合計	654	100.00

(8) 震災後の生活で困っていること、日ごろお気づきのこと、感じておられることなどご自由にお書き下さい。

たくさんの大変貴重なご意見を頂きました。

ありがとうございました。

以上

東日本大震災による被害・生活環境・復興に関する
アンケートのご協力のお願い

平成 28 年 7 月

突然のお便りで失礼いたします。

このたび、東京大学の研究プロジェクトとして、双葉町役場のご協力を頂き、双葉町からの避難者の方全員を対象に「東日本大震災による被害・生活環境・復興に関するアンケート」を実施いたしております。

私どもは平成 25 年と 26 年にも同様の調査を実施させて頂き、大変多くの方にご協力を頂きました。皆様のご協力に感謝致します。調査結果は町民の皆様に郵送にてご報告させて頂いた他、双葉町役場の皆様にもご報告させて頂きました。調査結果は双葉町役場のウェブサイトからもご覧いただけます。(http://www.town.fukushima-futaba.lg.jp/4273.htm)また、学会等でも発表させて頂き、様々な面で役に立てて頂いていると伺っております。

今年度の調査は、震災の発生から 5 年以上が経った今、生活を再建するために本当に必要なことは何なのか継続調査を通して分析し、今後の政策に役立てていくことを目的にしています。今回の調査結果も、町民の皆様に報告させていただきますとともに、双葉町役場に報告致します。

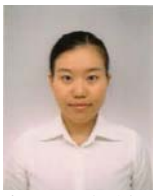
お忙しいところ誠に恐縮ですが、世帯主の方もしくは世帯主の配偶者の方に、ご回答をお願い致します。回答が難しい場合には、世帯主の方の立場から、ご家族の方、代理人の方等にご記入いただけますと幸甚です。最初のページから順番に各質問の質問文に沿って、あてはまる番号に○印をつけたり、ご意見を記入する形式でご回答ください。**アンケートは匿名ですので、個人名・世帯名をデータとして分析したり、公表したりすることは一切ございません。**また、個人情報の保護には万全を期しておりますので、決して皆様にご迷惑をおかけすることはありません。

ご回答いただきましたアンケートは**7月末日までに**アンケート用紙の最後のページに添付させて頂きました返信用封筒に3つ折りにして封入の上、ご返信いただけますようお願い申し上げます。

本調査の趣旨をご理解いただき、なにとぞご協力くださいますようお願いいたします。

調査主体:　東京大学「災害からの生活基盤復興に関する国際比較」プロジェクト

研究代表者:
東京大学経済学研究科教授
澤田康幸



東京大学大学院博士課程
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東京大学のロゴ入りボールペンを同封させて頂きました。どうぞお納めください。

はじめにアンケートをご記入いただいている方についてお聞かせください。

この調査票を記入していただいいているのはどなたですか。(番号の１つに○をお付けください)

1.世帯主本人　2.配偶者　3. その他　(　　)

1.世帯主についてお聞かせください。

(1)世帯主の基本的な情報についておしらせください。

ア) 年齢 [　　] 歳　イ) 性別 1. 男性　2. 女性　ウ) 現在のお住まい [　　] 都道府県 [　　] 市町 [　　] 地区

(2) 現在のお住まいの種類(番号の1つに○をお付けください)

1. 仮設住宅　2. みなし仮設住宅　3. 復興公営住宅　4. 自費による賃貸　5. 震災前と異なる持家
6. 親戚の家（続柄:　　）7. 社宅　8. その他　(　　)

(3)　現在のお住まいの広さについて教えてください。

現在のお住まいの土地・住居面積の広さを「平米」「坪」のいずれかでお答えください。

(マンション・アパート等にお住まいの場合は、建物面積のみお答えください)

土地　約 [　　] 平方メートル　もしくは　約 [　　] 坪

住居面積　約 [　　] 平方メートル　もしくは　約 [　　] 坪

(4) 震災前のお住まいの種類(番号の1つに○をお付けください)

1.持家(戸建)　2.持家(マンション)　3.戸建(賃貸)　4.マンション(賃貸)　5. アパート(賃貸)
6. 公営住宅　7. 社宅　8. 親戚の家に在住（続柄:　　）9. その他(　　)

(5) 震災前のお住まいの土地・住居面積の広さを「平米」「坪」のいずれかでお答えください。

(マンション・アパート等にお住まいの場合は、建物面積のみお答えください)

土地　約 [　　] 平方メートル　もしくは　約 [　　] 坪

住居面積　約 [　　] 平方メートル　もしくは　約 [　　] 坪

(6) 地震、津波等による双葉町のお住まいの被害状況を放射能汚染の被害を含まずに1つお選び下さい。

1.全壊　2.半壊　3.一部損壊　4.大きな被害無　5.その他(　　)

(7) 世帯主の最終学歴をお知らせください。(番号の１つに○印をお付け下さい)

1. 高校　2. 専門学校　3. 短期大学　4. 大学　5. その他（　　）

(8) 震災前後の世帯主の家族・親戚の構成をお教えください。

	現在	震災前
同居人数（一人暮らしの場合は1 ）	(　　) 名	(　　)名
18 歳未満の同居家族はいますか？	1.はい　2.いいえ → はいの場合は人数:(　　)名	1.はい　2.いいえ → はいの場合は人数:(　　)名
世帯主から見た同居家族すべてに○をつけてください。	1. 配偶者　2. 父　3. 義父 4. 母　5. 義母　6. 息子(　　人) 7. 娘(　　人)　8. 孫(　　人) 9. 娘婿　10. 息子の嫁 11. その他の同居家族(　　人)	1. 配偶者　2. 父　3. 義父 4. 母　5. 義母　6. 息子(　　人) 7. 娘(　　人)　8. 孫(　　人) 9. 娘婿　10. 息子の嫁 11. その他の同居家族(　　人)
ペットはいますか？	はい　いいえ	はい　いいえ
震災前の同居ご家族のうち震災後亡くなられたご家族はいますか？	1.はい　2.いいえ → はいの方　人数(　　)人、続柄(　　) 震災関連死の方はいますか？　(　はい　いいえ　)	

(9)　世帯主の健康状態について伺います。現在の健康状態は、震災前と比べるといかがですか。(○印は1つ)

1. 大変良くなっている　2. 良くなっている　3. 変わっていない　4. 悪くなっている　5. 大変悪くなっている

(10) 震災前と比較すると体重の変化はありましたか。(○印は1つ)

1. 増加した　2. やや増加した　3. 変わらない　4. やや減少した　5. 減少した

(11) 被災者の方々の避難生活のための環境の変化に伴い、自宅での料理が困難となり、健康被害が懸念されています。震災前と現在の外食の頻度を教えてください。

震災前:　1週間に　　回程度　　**現在:**　1週間に　　回程度

(12) 健康問題に関係して、被災者の方々の交通の不便による活動の制限が懸念されております。

① 震災前と現在の同居家族全体で保有する車の数を教えてください。保有していない場合は「0」とご記入下さい。

震災前:　　台　　**現在:**　　台

② **震災後**、新しい車はご購入になりましたか。　1.はい　2.いいえ

はいとお答えの方に伺います。何台ご購入されましたか？　　台

(13)　**過去30日間に**世帯主はどれくらいの頻度で次のことがありましたか。(あてはまる数字各1つに○)

	全くない	少しだけ	ときどき	たいてい	いつも
神経過敏に感じましたか。	1	2	3	4	5
絶望的に感じましたか。	1	2	3	4	5
そわそわ、落ち着かなく感じましたか。	1	2	3	4	5
気分が沈み込んで、何が起こっても気が晴れないように感じましたか。	1	2	3	4	5
何をするのも骨折りだと感じましたか。	1	2	3	4	5
自分は価値のない人間だと感じましたか。	1	2	3	4	5

(14) あなた(世帯主)は、中学生の時、夏休みに出された宿題をいつごろやることが多かったですか。当てはまるものを1つ選び、番号に○をつけてください。

1. 夏休みが始まると最初のころにやった　2. どちらかというと最初のころにやった
3. 毎日ほぼ均等にやった　4. どちらかというと終わりのころにやった
5. 夏休みの終わり頃にやった

(15) (近年、「幸福度」の研究が進んでおり、そうした既存研究に従って定型のご質問をさせていただきます。ただし、回答は任意です。)現在、あなた(世帯主)はどの程度幸せですか。「とても幸せ」を　10　点、「とても不幸」を0点とすると、何点くらいになると思いますか。いずれかの数字を1つだけ○で囲んでください。

とても不幸　　とても幸せ

0点　1　2　3　4　5　6　7　8　9　10点

2 .ご近所付き合いなどについてお聞かせください。

(1) **震災前**、世帯主は、双葉町のどちらの**大字**にお住まいでしたか。

(2)　ご近所付き合いで、世帯主の家族がものをあげたり、手助けしたり、逆にものをもらったり、助けてもらったりという関係は**震災前は**どのくらいありましたか？また、**現在は**どのくらいありますか(○印は各1つ)

震災前:　1. かなりあった　2. ほどほどにあった　3. あまりなかった　4. なかった

現在:　1. かなりある　2. ほどほどにある　3. あまりない　4. ない

(3) 近所の人は私が困っていたら手助けしてくれる。(震災前と現在のお考え各1つに○をお付け下さい)

	よくあてはまる	あてはまる	どちらともいえない	あてはまらない	まったくあてはまらない
震災前のお考え	1	2	3	4	5
現在のお考え	1	2	3	4	5

(4) 震災前と震災後の生活について教えてください。(震災前と震災後の各１つを○で囲んでください)

	震災前			現在		
	はい	いいえ	わからない	はい	いいえ	わからない
ドアの鍵を開けたまま外出することがよくある。	1	2	3	1	2	3
友人にお金やものを貸すことがよくある。	1	2	3	1	2	3
ほとんどの人は公平にしようとしていると思う。	1	2	3	1	2	3
自分はまわりから信用されていると思う。	1	2	3	1	2	3

(5) 現在参加しているボランティア活動や趣味の活動などについて教えてください。(○印は一つ)

① ボランティア活動に参加することがある。 1.はい 2.いいえ : はいの方は月 [ ] 時間程度

② 趣味の活動に参加することがある。 1.はい 2.いいえ : はいの方は月 [ ] 時間程度

③ 同居家族以外で一日に挨拶する人の平均的な人数 [ ] 人

(6) 一般的に、人は信用できると思いますか。それとも、人と付き合うときには、できるだけ用心したほうがよいと思いますか。(震災前のお考えと現在のお考え、各1つの数字に○をお付けください)

現在どうお考えかお答え下さい
1. ほとんどの場合、信用できる 2. たいていは、信用できる
3. たいていは、用心したほうがよい 4. ほとんどの場合、用心したほうがよい

震災前どう考えていたかお答え下さい
1. ほとんどの場合、信用できる 2. たいていは、信用できる
3. たいていは、用心したほうがよい 4. ほとんどの場合、用心したほうがよい

(7) 自分のまわりの人は信用できる。
現在 1. 強くそう思う 2.そう思う 3.そう思わない 4. 全くそう思わない
震災前 1. 強くそう思う 2.そう思う 3.そう思わない 4. 全くそう思わない

(8) 政府は信用できる。
現在 1. 強くそう思う 2.そう思う 3.そう思わない 4. 全くそう思わない
震災前 1. 強くそう思う 2.そう思う 3.そう思わない 4. 全くそう思わない

(9) 現在の避難先の住民と交流する機会がありますか？ 1. はい 2.いいえ 3.わからない

(10) 現在の避難先の住民に双葉町民であるということを隠した方が良いと感じたことはありますか？ 1. はい 2.いいえ 3.わからない

(11) 現在避難先の近隣住民の方はあなたが双葉町民であることを知っていますか？ 1. はい 2.いいえ 3.わからない

(12) 現在の避難されている場所でゴミ出しについて気が引ける思いをされたことはありますか？ 1. はい 2.いいえ 3.わからない

(13) 現在の避難先の地区の住民に双葉町民であるために悪口を言われたり、いたずらをされたりしたことはありますか？ 1. はい 2.いいえ 3.わからない

(14) 現在の避難先で近隣に震災前からの知人は住んでいますか？ 1. はい 2.いいえ 3.わからない
「はい」を選択された方に伺います: 何人いますか？ [ ] 人 うち双葉町民 [ ] 人

(15) 現在の避難先で新しくできた双葉町民の友人はいますか？ 1. はい 2. いいえ 3.わからない
「はい」を選択された方に伺います: 何人いますか？ [ ] 人

(16) 現在の避難先で新しくできた双葉町以外の地区から避難してきた友人はいますか？
1. はい 2. いいえ 3.わからない 「はい」を選択された方: 何人いますか？ [ ] 人

(17) 現在の避難先で新しくできた避難先住民の友人はいますか？ 1. はい 2. いいえ 3.わからない
「はい」を選択された方に伺います: 何人いますか？ [ ] 人

(18) ① 年賀状についてお聞きします。今年(2016年)の元旦、あなた(世帯主)が送った年賀状はおおよそ何枚でしたか。喪中で送らなかった場合には2.に○をつけてください

1.おおよそ(　　)枚　　2.喪中なので送らなかった(0枚)

② 今年(2016 年)元旦の年賀状を送った方にお聞きします。最も早い年賀状は、いつ頃送りましたか。

(　　)年(　　)月(　　)日　ごろ

3.震災前から5年以上が経ちました。これまでの生活を振り返ってお答えください。

(1) 世帯主は、将来町に戻るおつもりですか。　1. はい　2. まだ決められない　3. 戻らない(戻れない)

(2) 町に戻るおつもりの方はそれまでの間、戻らないつもりの方、もしくはまだ決められない方はこれから先長期的に生活する場所を既に決めていらっしゃいますか。　1.きめている　2.まだきめていない(わからない)

(3) 震災直後から現在までの転居の経緯を教えてください。
住居の種類には、【車中、避難所、ホテル、仮設住宅、借上住宅、親戚宅、持家、復興住宅】等をご記入ください。
また、車中泊などの場合は住居の広さは、ご記入いただかなくて構いません。わかる範囲でご記入ください。

期間	住居の種類	広さ(㎡)	同居人数	都道府県	市町村	地区
2011年3月11日 ～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　年　月　日						
年　月　日～　現在						

(4) 震災後の合計転居回数　　回

(5) 職の変化についてうかがいます。

①世帯主は現在お仕事をされていますか？　1.はい　2.いいえ

「はい」を選択された方に伺います。現在のご職業を教えてください。

「いいえ」を選択された方に伺います。以下のどちらにあたりますか？

1.退職済(年金受給)　2.失業中　3.その他(　　)

② 震災前後で職業に変化はありましたか？　1.はい　2.いいえ

「はい」を選択された方に伺います。震災前後の職業の変化について教えてください。

無職の期間がある場合は「無職」とご記入ください。定年退職された場合は「退職」とご記入ください。

期間	職業
震災前	
2011年3月11日～　年　月　日	
年　月　日～　年　月　日	
年　月　日～　年　月　日	
年　月　日～　年　月　日	
年　月　日～　現在	

(6) 健康状態の変化についてうかがいます。

① 世帯主の現在の健康状態はいかがですか。(ひとつに○をつけてください)

大変良い　良い　どちらとも言えない　悪い　大変悪い

② 震災前後の健康状態の変化について教えてください。それぞれひとつに○をつけてください。

震災前	大変良い　良い　どちらとも言えない　悪い　大変悪い
震災1か月後	大変良い　良い　どちらとも言えない　悪い　大変悪い
震災半年後	大変良い　良い　どちらとも言えない　悪い　大変悪い
震災1年後	大変良い　良い　どちらとも言えない　悪い　大変悪い
震災3年後	大変良い　良い　どちらとも言えない　悪い　大変悪い

(7) 収入の変化についてうかがいます。**(記入は任意です。数値として分析に用いられ、個人が特定される形で分析が行われることはございませんので安心してご記入頂けますと幸いです。)**

① 現在の世帯全体の税込年収を教えてください。(賠償は含みません、年金は含みます)　　万円

② 震災前後で世帯全体の税込年収(賠償含まない、年金含む)に変化はありましたか？　1.はい　2.いいえ

「**はい**」を選択された方に伺います。

震災前後の年収の変化について教えてください。(賠償は含みません、年金は含みます)

期間	年収(税込)
震災前	万円
2011年3月11日～　　年　　月　　日	万円
年　　月　　日 ～　　年　　月　　日	万円
年　　月　　日 ～　　年　　月　　日	万円
年　　月　　日 ～　　年　　月　　日	万円
年　　月　　日 ～　　現在	万円

4. 皆様のうけた支援実態についてお聞かせください。

賠償について、その評価額が十分でないのではないかということが、社会的な問題となっております。あてはまる数字に○をつけ、受取済の方は、受け取られた賠償金額をお教えください。また、賠償金額はそれぞれ十分納得のいく金額であったかどうかそれぞれ○をつけてください。**(回答は任意です。数値として分析に用いられ、個人が特定される形で分析が行われることはございませんので安心してご記入頂けますと幸いです。)**

「宅地・建物・借地権」の賠償 十分　不十分　わからない	1. 受取済　2. 申請中　3. 今後申請予定　4. 対象物無　5. その他(　　) → 受取額　　万円
「田畑」または「その他土地」 十分　不十分　わからない	1. 受取済　2. 申請中　3. 今後申請予定　4. 対象物無　5. その他(　　) → 受取額　　万円
「自動車」の賠償 十分　不十分　わからない	1. 受取済　2. 申請中　3. 今後申請予定　4. 対象物無　5. その他(　　) → 受取額　　万円
住宅獲得費用 十分　不十分　わからない	1. 受取済　2. 申請中　3. 今後申請予定　4. 対象物無　5. その他(　　) → 受取額　　万円
「就労不能損害」の賠償 十分　不十分　わからない	1. 受取済　2. 申請中　3. 今後申請予定　4. 対象就労無　5. その他(　　) → 2011年3月～2014年2月合計:　　万円 2014年3月～2015年2月合計:　　万円
「精神的賠償」 十分　不十分　わからない	1. すべて受取済　2. 一部受取済、残額申請予定　3. 全く受け取っていない 4. その他(　　)

5.復興公営住宅について教えてください。

(1) 復興公営住宅への入居について以下のどちらにあたりますか？

1.現在入居中　2.入居が決まっている　3.申込みし現在結果を待っている。　4.これから申し込む予定
5.入居しておらず、今後も申し込みをする予定もない　6. その他（　　）

(2) これまで復興公営住宅の抽選で外れたことはありますか？ 1. はい　2. いいえ

「はい」を選択された方に伺います: **抽選で外れた**団地について教えてください。

団地名　：　　団地

住戸形態　：1.平屋戸建て　2. 2階建て戸建て　3. 集合住宅（ペット不可）　4. 集合住宅（ペット可）

住宅の種類: 1. 一般住宅　2. 優先住宅

間取り　：1. 1LDK　2. 2LDK　3. 3LDK

入居予定だった世帯人数：　　人

申込み方法: 1. グループ申し込み　2. 個人申し込み

グループ申し込みをした場合、自分たちを含めて、何組で申し込みましたか？　　組

グループ申し込みをした場合どなたと申し込みましたか？（あてはまるものすべてに○）

1. 親戚　2. 震災前からの友人　3. 震災後にできた友人　4. その他（　　）

(3) 復興公営住宅に**入居している、入居が決定している、現在申込み結果を待っている、もしくは今後申込む予定の方**にお伺いいたします。入居している、入居が決定している、現在申込み結果を待っている、もしくは申込み予定の団地について教えてください。

団地名　：　　団地

住戸形態　：1.平屋戸建て　2. 2階建て戸建て　3. 集合住宅（ペット不可）　4. 集合住宅（ペット可）

住宅の種類: 1. 一般住宅　2. 優先住宅

間取り　：1. 1LDK　2. 2LDK　3. 3LDK

入居予定だった世帯人数：　　人

申込み方法: 1. グループ申し込み　2. 個人申し込み

グループ申し込みをした場合、自分たちを含めて、何組で申し込みましたか？　　組

グループ申し込みをした場合どなたと申し込みましたか？（あてはまるものすべてに○）

1. 親戚　2. 震災前からの友人　3. 震災後にできた友人　4. その他（　　）

(4) **復興公営住宅に申し込む予定がない方**に伺います。申込みしない理由を教えてください。

1. 新居を購入済　2. その他　（　　）

6. 現在の生活で困っていること、日ごろお気づきのこと、感じておられることなどご自由にお書き下さい。

■ **長時間にわたり、ご協力ありがとうございました。**

同封しました返信用封筒をお使いの上ご返送いただけますようお願いいたします。

［この用紙の回答は任意です］

―御礼とお願い―

　このたびはアンケート調査にご協力頂き誠にありがとうございます。今後も皆様のお声を行政に届けていくためにも、原子力発電所の事故の影響の実態把握について継続的な調査が不可欠であります。つきましては、このような調査が将来行われる際、再度皆様のご協力を頂けることを願っております。**今後の調査にご協力頂ける場合には、この用紙に、住所と氏名、電話番号（任意）をご記入ください。ご記入頂かない場合は、このページは空欄でご返信ください。**

ふりがな　［　　］

氏名　　様

性別　　［1.男性　　2.女性　］

生年月日　［1.明治　2.大正　3.昭和　4.平成］＿＿＿年　＿＿＿月＿＿＿＿日

現在のご住所

〒　　－

双葉町でのご住所

〒　　－

ご連絡先電話番号（任意）　［　　－　　－　　］

　個人情報の管理には万全を期しておりますので皆様個人にご迷惑をおかけすることはございません。本情報は研究・政策支援以外の目的で使用することはございません。また、**世帯名・個人名が特定される形でデータが使われたり、公表されたりすることは一切ございません。**本紙をお送り頂き、継続して調査にご協力いただいた方には薄謝をお送り致します。

　最後になりましたが、皆様の生活が一刻も早く安定と安心をとり戻されることを願っております。ご協力ありがとうございました。

東京大学「災害からの生活基盤復興に関する国際比較」プロジェクトメンバー一同

この調査票を記入していただいいているのはどなたですか。

回答	頻度	割合
世帯主本人	357	71.54
配偶者	77	15.97
その他	15	3.01
無回答	50	10.02
合計	499	100.00

1. 世帯主についてお聞かせください。

(1)世帯主の基本的な情報についてお聞かせください。
ア）年齢 平均: 67 歳　最年長: 93 歳 最年少: 6 歳
イ）男性: 75.6% 女性: 21.0% 無回答: 3.4%
ウ)現在のお住まい
全国各地からご回答いただきました。ありがとうございます。
集計結果は省略させて頂きます。

(2)**現在の**お住まいの種類

	頻度	割合
仮設住宅	26	5.21
みなし仮設住宅	51	10.22
復興公営住宅	25	5.01
自費による賃貸	39	7.82
震災前と異なる持家	245	49.10
親戚の家	18	3.61
社宅	5	1.00
その他	65	13.03
無回答	25	5.01
合計	499	100.00

(3) **現在の**お住まいの広さにをお教えください

土地面積:

	頻度	割合
0～100 平米	24	4.81
100～200 平米	55	11.02
200～300 平米	61	12.22
300 平米～	142	28.46
無回答	217	43.49
合計	499	100.00

住宅面積:

	頻度	割合
0～40 平米	42	8.42
40～80 平米	74	14.83
80～120 平米	88	17.64
120 平米～	164	32.87
無回答	131	26.25
合計	499	100.00

(4) **震災前の**お住まいの種類

	頻度	割合
持家(戸建)	393	78.76
持家(マンション)	3	0.60
戸建(賃貸)	10	2.00
マンション(賃貸)	0	0.00
アパート(賃貸)	14	2.81
公営住宅	19	3.81
社宅	16	3.21
親戚の家に在住	3	0.60
その他	8	1.60
無回答	33	6.61
合計	499	100.00

(3) **震災前の**お住まいの土地・住居面積の広さをお教えください。

土地面積:

	頻度	割合
0～100 平米	9	1.80
100～200 平米	22	4.41
200～300 平米	34	6.81
300 平米～	308	61.72
無回答	126	25.25
合計	499	100.00

住宅面積:

	頻度	割合
0～40 平米	13	2.61
40～80 平米	26	5.21
80～120 平米	30	6.01
120 平米～	332	66.53
無回答	98	19.64
合計	499	100.00

(6) 地震、津波等による双葉町のお住まいの被害状況を放射能汚染の被害を含まずに1つお選び下さい。

	頻度	割合
全壊	35	7.01
半壊	81	16.23
一部損壊	189	37.88
大きな被害無	153	30.66
その他	15	3.01
無回答	26	5.21
合計	499	100.00

(7) 世帯主の最終学歴をお知らせください。

	頻度	割合
高校	233	46.69
専門学校	61	12.22
短期大学	16	3.21
大学	79	15.83
その他	77	15.43
無回答	33	6.61
合計	499	100.00

(8) 震災前後の世帯主の家族・親戚の構成をお教えください。
同居人数平均　現在: 平均2.6名　震災前: 平均 3.3 名

18 歳未満の同居家族の有無

	現在		震災前	
	頻度	割合	頻度	割合
有	96	19.24	134	26.85
無	339	67.94	276	82.16
無回答	64	12.83	89	17.84
合計	499	100.00	499	10.00

ペットはいますか？

	現在		震災前	
	頻度	割合	頻度	割合
有	114	22.85	170	34.07
無	341	68.34	233	46.69
無回答	44	8.82	96	19.24
合計	499	100.00	499	10.00

震災前の同居ご家族のうち震災後亡くなられたご家族はいますか？

	頻度	割合
有	111	22.24
無	330	66.13
無回答	58	11.62
合計	499	100.00

(9)　世帯主の健康状態について伺います。現在の健康状態は、震災前と比べるといかがですか。

	頻度	割合
大変良くなっている	1	0.20
良くなっている	14	2.81
変わっていない	153	30.66
悪くなっている	255	51.10
大変悪くなっている	57	11.42
無回答	19	3.81
合計	499	100.00

(10) 震災前と比較すると体重の変化はありましたか。

	頻度	割合
増加した	61	12.22
やや増加した	117	23.45
変わっていない	124	24.85
やや減少した	107	21.44
減少した	73	14.63
無回答	17	3.41
合計	499	100.00

(11) 被災者の方々の避難生活のための環境の変化に伴い、自宅での料理が困難となり、健康被害が懸念されています。震災前と現在の外食の頻度を教えてください。

震災前:　平均 0.7 回/週　現在:平均　1.3 回/週

(12) 健康問題に関係して、被災者の方々の交通の不便による活動の制限が懸念されております。

① 震災前と現在の同居家族全体で保有する車の数を教えてください。

震災前平均:　2.2台　現在平均:　1.7台

② 震災後、新しい車はご購入になりましたか。

	頻度	割合
はい	321	64.33
いいえ	143	28.66
無回答	35	7.01
合計	499	100.00

(13) 過去 30 日間に世帯主はどれくらいの頻度で次のことがありましたか。

点数基準	全くない	少しだけ	ときどき	たいてい	いつも
神経過敏に感じましたか。	0	1	2	3	4
絶望的だと感じましたか。	0	1	2	3	4
そわそわ、落ち着かなく感じましたか。	0	1	2	3	4
気分が沈み込んで、何が起こっても気が晴れないように感じましたか。	0	1	2	3	4
何をするのも骨折りだと感じましたか。	0	1	2	3	4
自分は価値のない人間だと感じましたか。	0	1	2	3	4

合計点数(K6)分布:

	頻度	割合
0〜4 点	132	26.45
5〜8 点	116	23.25
9〜12 点	84	16.83
13〜16 点	60	12.02
17 点以上	50	10.02
無回答	57	11.42
合計	499	100.00

(14) あなた(世帯主)は、中学生の時、夏休みに出された宿題をいつごろやることが多かったですか。

	頻度	割合
夏休みが始まると最初のころにやった	58	11.62
どちらかというと最初のころにやった	107	21.44
毎日ほぼ均等にやった	60	12.02
どちらかというと終わりのころにやった	160	32.06
夏休みの終わり頃にやった	64	12.83
無回答	50	10.02
合計	499	100.00

(15) (近年、「幸福度」の研究が進んでおり、そうした既存研究に従って定型のご質問をさせていただきます。ただし、回答は任意です。)現在、あなた(世帯主)はどの程度幸せですか。「とても幸せ」を 10 点、「とても不幸」を0点とすると、何点くらいになると思いますか。

	頻度	割合
0 (とても不幸)	22	4.41
1	19	3.81
2	23	4.61
3	66	13.23
4	45	9.02
5	130	26.05
6	34	6.81
7	50	10.02
8	42	8.42
9	8	1.60
10(とても幸せ)	14	2.81
無回答	46	9.22
合計	499	100.00

2 .ご近所付き合いなどについてお聞かせください。

(1) 震災前、世帯主は、双葉町のどちらの大字にお住まいでしたか。

	頻度	割合		頻度	割合
石熊	3	0.60	鴻草	17	3.41
山田	33	6.61	細谷	14	2.81
松迫	0	0.00	下羽鳥	8	1.60
水永	4	0.80	中田	5	1.00
目さく	4	0.80	長塚	136	27.25
郡山	32	6.41	両竹	4	0.80
上羽鳥	4	0.80	中浜	8	1.60
新山	110	22.04	中野	8	1.60
松倉	4	0.80	前田	53	10.62
寺沢	10	2.00	その他	5	1.00
渋川	4	0.80	無回答	33	6.61
			合計	499	100.00

(2) ご近所付き合いで、世帯主の家族がものをあげたり、手助けしたり、逆にものをもらったり、助けてもらったりという関係は震災前はどのくらいありましたか？また、現在はどのくらいありますか。

	現在		震災前	
	頻度	割合	頻度	割合
かなりあった	10	2.00	220	44.09
ほどほどにあった	124	24.85	214	42.89
あまりなかった	175	35.07	33	6.61
なかった	170	34.07	15	3.01
無回答	20	3.01	17	3.41
合計	499	100.00	499	10.00

(3) 近所の人は私が困っていたら手助けしてくれる。

	現在		震災前	
	頻度	割合	頻度	割合
よくあてはまる	11	2.20	150	30.06
あてはまる	64	12.83	212	42.48
どちらともいえない	159	31.86	90	18.04
あてはまらない	139	27.86	12	2.40
まったくあてはまらない	104	20.84	14	2.81
無回答	22	4.41	21	4.21
合計	499	100.00	499	10.00

（4）震災前と震災後の生活について教えてください。

ドアの鍵を開けたまま外出することがよくある。

	現在		震災前	
	頻度	割合	頻度	割合
はい	25	5.01	257	51.50
いいえ	441	88.38	223	44.69
わからない	6	1.20	1	0.20
無回答	27	5.41	18	3.61
合計	499	100.00	499	10.00

友人にお金やものを貸すことがよくある。

	現在		震災前	
	頻度	割合	頻度	割合
はい	21	4.21	163	32.67
いいえ	431	86.37	296	59.32
わからない	16	3.21	14	2.81
無回答	31	6.21	26	5.21
合計	499	100.00	499	10.00

ほとんどの人は公平にしようとしていると思う。

	現在		震災前	
	頻度	割合	頻度	割合
はい	158	31.66	300	60.12
いいえ	107	21.44	53	10.62
わからない	196	39.28	114	22.85
無回答	38	7.62	32	6.41
合計	499	100.00	499	10.00

自分はまわりから信用されていると思う。

	現在		震災前	
	頻度	割合	頻度	割合
はい	108	21.64	286	57.31
いいえ	65	13.03	28	5.61
わからない	291	58.32	156	31.26
無回答	35	7.01	29	5.81
合計	499	100.00	499	10.00

（5） 現在参加しているボランティア活動や趣味の活動などについて教えてください。

① ボランティア活動に参加することがある。

	頻度	割合
はい	105	21.04
いいえ	375	75.15
無回答	19	3.81
合計	499	100.00

② 趣味の活動に参加することがある。

	頻度	割合
はい	163	32.67
いいえ	312	62.53
無回答	24	4.81
合計	499	100.00

③ 同居家族以外で一日に挨拶する人の平均的な人数

	頻度	割合
0 人	60	12.02
1〜3 人	144	28.86
3〜6 人	143	28.66
6〜10 人	24	4.81
10 人以上	84	16.83
無回答	44	8.82
合計	499	100.00

（6） 一般的に、人は信用できると思いますか。それとも、人と付き合うときには、できるだけ用心したほうがよいと思いますか。

	現在		震災前	
	頻度	割合	頻度	割合
ほとんどの場合、信用できる	21	4.21	110	22.04
たいていは、信用できる	175	35.07	268	53.71
たいていは、用心したほうがよい	190	38.08	81	16.23
ほとんどの場合、用心したほうがよい	93	18.64	19	3.81
無回答	20	4.01	21	4.21
合計	499	100.00	499	100.00

（7）自分のまわりの人は信用できる

	現在		震災前	
	頻度	割合	頻度	割合
強くそう思う	15	3.01	76	15.23
そう思う	248	49.70	318	63.73
そう思わない	166	33.27	58	11.62
まったくそう思わない	40	8.02	11	2.20
無回答	30	6.01	36	7.21
合計	499	100.00	499	100.00

（8）政府は信用できる

	現在		震災前	
	頻度	割合	頻度	割合
強くそう思う	5	1.00	10	2.00
そう思う	81	16.23	164	32.87
そう思わない	233	46.69	218	43.69
まったくそう思わない	149	29.86	70	14.03
無回答	31	6.21	37	7.41
合計	499	100.00	499	100.00

（9）現在の避難先の住民と交流する機会がありますか？

	頻度	割合
はい	236	47.29
いいえ	220	44.09
わからない	27	5.41
無回答	16	3.21
合計	499	100.00

（10） 現在の避難先の住民に双葉町民であるということを隠した方が良いと感じたことはありますか？

	頻度	割合
はい	240	48.10
いいえ	193	38.68
わからない	46	9.22
無回答	20	4.01
合計	499	100.00

（11） 現在避難先の近隣住民の方はあなたが双葉町民であることを知っていますか?

	頻度	割合
はい	295	59.12
いいえ	79	15.83
わからない	115	23.05
無回答	10	2.00
合計	499	100.00

（12） 現在の避難されている場所でゴミ出しについて気が引ける思いをあされたことはありますか？

	頻度	割合
はい	92	18.44
いいえ	369	73.95
わからない	27	5.41
無回答	11	2.20
合計	499	100.00

(13) 現在の避難先の地区の住民に双葉町民であるために悪口を言われたり、いたずらをされたりしたことがありますか？

	頻度	割合
はい	61	12.22
いいえ	359	71.94
わからない	65	13.03
無回答	14	2.81
合計	499	100.00

(14) 現在の避難先で近隣に震災前からの知人は住んでいますか？

	頻度	割合
はい	207	41.48
いいえ	243	48.70
わからない	37	7.41
無回答	12	2.40
合計	499	100.00

(15) 現在の避難先で新しくできた双葉町民の友人はいますか?

	頻度	割合
はい	194	38.88
いいえ	265	53.11
わからない	24	4.81
無回答	16	3.21
合計	499	100.00

(16)現在の避難先で新しくできた双葉町以外の地区から避難してきた友人はいますか？

	頻度	割合
はい	173	34.67
いいえ	208	41.68
わからない	103	20.64
無回答	15	3.01
合計	499	100.00

(17) 現在の避難先で新しくできた避難先住民の友人はいますか？

	頻度	割合
はい	203	40.68
いいえ	220	44.09
わからない	61	12.22
無回答	15	3.01
合計	499	100.00

(18)年賀状についてお聞きします。

① 今年(2016年)の元旦、あなた(世帯主)が送った年賀状はおおよそ何枚でしたか。

	頻度	割合
0 枚	126	25.25
1～9 枚	42	8.42
10～49 枚	173	34.67
50～99 枚	68	13.63
100 枚以上	36	7.21
無回答	54	10.82
合計	499	100.00

② 今年(2016 年)元旦の年賀状を送った方にお聞きします。最も早い年賀状は、いつ頃送りましたか。

集計結果は省略させて頂きます。

3.震災前から5年以上が経ちました。これまでの生活を振り返ってお答えください。

(1) 世帯主は、将来町に戻るおつもりですか。

	頻度	割合
はい	47	9.42
まだ決められない	85	17.03
戻らない(戻れない)	351	70.34
無回答	16	3.21
合計	499	100.00

(2) 町に戻るおつもりの方はそれまでの間、戻らないつもりの方、もしくはまだ決められない方はこれから先長期的に生活する場所を既に決めていらっしゃいますか。

	頻度	割合
決めている	249	49.90
まだ決めていない(わからない)	117	23.45
無回答	133	26.65
合計	499	100.00

(3) 震災直後から現在までの転居の経緯を教えてください。

集計結果は省略させて頂きます。

(4) 震災後の合計転居回数

	頻度	割合
3 回以内	76	15.23
4～6 回	268	53.71
7～9 回	98	19.64
10 回以上	11	2.20
無回答	46	9.22
合計	499	100.00

(5) 職の変化についてうかがいます。

① 世帯主は現在お仕事をされていますか。

	頻度	割合
はい	135	27.05
いいえ	335	67.13
無回答	29	5.81
合計	499	100.00

② 震災前後で職業に変化はありましたか。

	頻度	割合
はい	179	35.87
いいえ	214	52.89
無回答	106	21.24
合計	499	100.00

(6)健康状態の変化についてうかがいます。

① 世帯主の現在の健康状態はいかがですか。

	頻度	割合
大変良い	6	1.20
良い	88	17.64
どちらともいえない	161	32.26
悪い	124	24.85
大変悪い	33	6.61
無回答	87	17.43
合計	499	100.00

② 震災前後の健康状態の変化について教えてください。

震災前

	頻度	割合
大変良い	60	12.02
良い	299	59.92
どちらともいえない	90	18.04
悪い	21	4.21
大変悪い	1	0.20
無回答	28	5.61
合計	499	100.00

震災１か月後

	頻度	割合
大変良い	7	1.40
良い	101	20.24
どちらともいえない	176	35.27
悪い	146	29.26
大変悪い	37	7.41
無回答	32	6.41
合計	499	100.00

震災半年後

	頻度	割合
大変良い	6	1.20
良い	83	16.63
どちらともいえない	177	35.47
悪い	152	30.46
大変悪い	46	9.22
無回答	35	7.01
合計	499	100.00

震災１年後

	頻度	割合
大変良い	5	1.00
良い	74	14.83
どちらともいえない	165	33.07
悪い	179	35.87
大変悪い	40	8.02
無回答	36	7.21
合計	499	100.00

震災３年後

	頻度	割合
大変良い	6	1.20
良い	79	15.83
どちらともいえない	149	29.86
悪い	178	35.67
大変悪い	58	11.62
無回答	29	5.81
合計	499	100.00

（7）収入の変化についていかがいます。

集計結果は省略させて頂きます。

4.皆様のうけた支援実態についてお聞かせください。

「宅地･建物･借地権」の賠償

	頻度	割合
十分	29	5.81
不十分	144	28.86
わからない	114	22.85
無回答	212	42.48
合計	499	100.00

「田畑」または「その他の土地」の賠償

	頻度	割合
十分	10	2.00
不十分	118	23.65
わからない	82	16.43
無回答	289	57.92
合計	499	100.00

「自動車」の賠償

	頻度	割合
十分	22	4.41
不十分	61	12.22
わからない	95	19.04
無回答	321	64.33
合計	499	100.00

住宅獲得費用

	頻度	割合
十分	20	4.01
不十分	108	21.64
わからない	98	19.64
無回答	273	54.71
合計	499	100.00

「就労不能損害」の賠償

	頻度	割合
十分	20	4.01
不十分	87	17.43
わからない	89	17.84
無回答	303	60.72
合計	499	100.00

「精神的賠償」

	頻度	割合
十分	27	5.41
不十分	207	41.48
わからない	78	15.63
無回答	187	37.47
合計	499	100.00

5. 復興公営住宅について教えてください

(1)復興公営住宅への入居について以下のどちらにあたりますか？

	頻度	割合
現在入居中	24	4.81
入居が決まっている	8	1.60
申し込みし、現在結果を待っている	13	2.61
これから申し込む予定	13	2.61
入居しておらず、今後申し込む予定もない	270	54.11
その他	39	7.82
無回答	132	26.45
合計	499	100.00

（2）これまで復興公営住宅の抽選で外れたことはありますか？

	頻度	割合
はい	22	4.41
いいえ	176	35.27
無回答	301	60.32
合計	499	100.00

(3) 復興公営住宅に入居している、入居が決定している、現在申し込み結果を待っている、もしくは今後申し込む予定の方にお伺いします。入居している、入居が決定している、現在申し込みを待っている、もしくは申し込み予定の団地について教えてください。

集計結果は省略させて頂きます。

(4) 復興公営住宅に申し込む予定がない方に伺います。申し込みしない理由を教えてください。

	頻度	割合
新居を購入済		
その他		
無回答		
合計	499	100.00

6. 現在の生活で困っていること、日ごろお気づきのこと、感じておられることなどご自由にお書きください。

たくさんの大変貴重なご意見を頂きました。

ありがとうございました。

以上