

Report on Life and Health of Parents and Children after the Fukushima Nuclear Power Plant Accident

Thank you for your cooperation in conducting the “Survey on Life and Health of Parents and Children after the Fukushima Nuclear Power Plant Accident in 2014,” following the 1st (2013) survey. We were able to collect important data. We will send you the report of the results. This report summarizes major points of the survey results, aiming to inform you about overall life and health tendencies of parents and children. “Fukushima Child Health Project” is a cohort study designed to indicate measures required for recovering stable life as soon as possible, by continuing to regularly assess the life and health conditions of children and parents in Fukushima. Thank you for your attention.

July 1st, 2014

“Survey on Life and Health of Parents and Children after the Fukushima Nuclear Power Plant Accident in 2014”

- Survey methods
 - Investigation period: Questionnaires were sent on January 20th 2014, and returned between January 24th to June 26th
 - Survey method: Mail survey
 - Participants: Among four-year-old children born in the fiscal year 2008 (from April 2nd 2008 to April 1st 2009) and their parents living in nine cities, towns, and villages in Nakadori region (Fukushima City, Koori Town, Kunimi Town, Date City, Koriyama City, Nihonmatsu City, Otama Village, Motomiya City, and Miharu Town), those that participated in the survey conducted in 2013 (N=2,627)
 - Response results: The number of responses were 1,595 (response rate of 60.7%)
- Notes on data
 1. Questionnaires are still being sent back by the participants. We hope to return the results to you as soon as possible. Therefore, questionnaires that were returned by May 12th (N=1,584) were analyzed on this occasion.
 2. Values in the graphs generally indicate the percentage of all responses (N=1,584). The data are rounded off to the first decimal place. Moreover, very small values are not indicated in graphs. Therefore, the total is not always 100%.
 3. Please inform us in advance if you cite any data from this survey.

Contact information

Management office of Fukushima Child Health Project
Department of Preventive Medicine and Public Health, Faculty of Medicine, Fukuoka University
7-45-1, Nanakuma, Jonan-ku Fukuoka-shi, 814-0180, Japan
Tel: +81-92-801-1011 (ext. 3305)
E-mail: fkkp@fukuoka-u.ac.jp
PIC: Kayo Ushijima

1. Responses to the survey

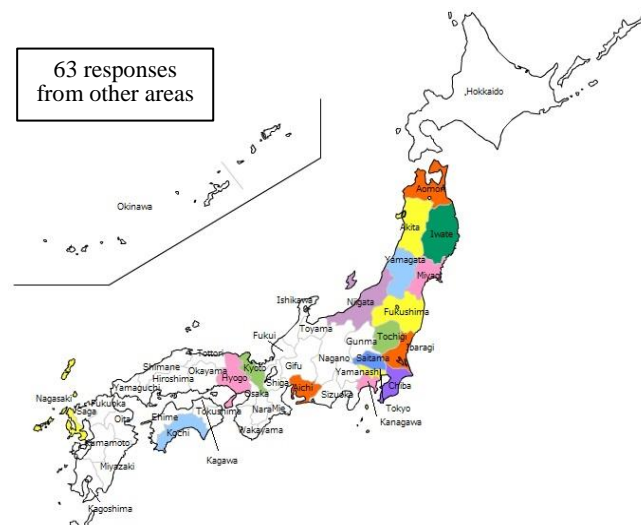
1.1 Over 60% of the 1st survey respondents participated in the 2nd survey

We sent a questionnaire of this survey to all respondents of our 1st survey conducted in 2013. They were 4-year-old children born in the fiscal year 2008 (from April 2nd 2008 to April 1st 2009) and their parents living in the following nine cities, towns, and villages in the Nakadori region: Fukushima City, Koori Town, Kunimi Town, Date City, Koriyama City, Nihonmatsu City, Otama Village, Motomiya City, and Miharu Town. In this 2nd survey, we received about 60% responses from respondents of the first survey.

Table 1. Responses based on districts

Area	The 1 st Survey (2013)			The 2 nd Survey (2014)		
	Participants	Responses	Response rate (%)	Participants	Responses	Response rate (%)
Fukushima City	2137	883	41.3	883	519	58.8
Koori Town	70	34	48.6	34	22	64.7
Kunimi Town	63	27	42.9	27	13	48.1
Date City	404	175	43.3	175	116	66.3
Koriyama City	2644	1076	40.7	1076	621	57.7
Nihonmatsu City	397	175	44.1	175	109	62.3
Otama Village	81	44	54.3	44	26	59.1
Motomiya City	290	125	43.1	125	80	64.0
Miharu Town	105	34	32.4	34	15	44.1
Others *		54		54	63	
Total	6191	2627	42.4	2627	1584	60.3

* “Others” refer to those who were registered in the basic resident register of the 9 areas above from October to December 2012 and who moved to other areas than these 9 areas at the time of the survey. The figure below indicates residential areas other than participants’ districts of the 2nd survey.



2. Life of Children

2.1 Of children, 30% play outside for “1 hour or more”

Since just after the accident to six months after the accident, 62.8% of children “did not play outside at all.” However, this rate significantly decreased to 11.4% after 2 years and subsequently to 2.2% after 3 years. This indicates that the length of time that children play outside has increased (Fig. 1). According to the finding on children in City A of the Tohoku Region conducted by Etsuko Watanabe et al. (“Associations of Family and Neighborhood Environments with Outside Playing Time and Screen Time on Weekdays of Preschool Children in Japan,” *Research in Exercise Epidemiology* 2012), 4-year-old children who played outside for “1 hour or more” accounted for 75.4%. In our study, 30% of children play outside for “1 hour or more.” Accordingly, we can say that the length of time that children play outside remains relatively shorter compared to children in other regions.

Fig. 2 shows the length of time that children play outside and watch TV and so on. The most number of children or 40.9% of children watch TV, videos, and DVDs for “2 hours or less.” The above study by Etsuko Watanabe et al. reported that 55.6% of 4-year-old children watched TV and so on for “2 hours or more.” In our study, the rate was 40%. Despite that there are concerns about children in Fukushima playing less outside and watching more TV, such a trend was not observed in this study.

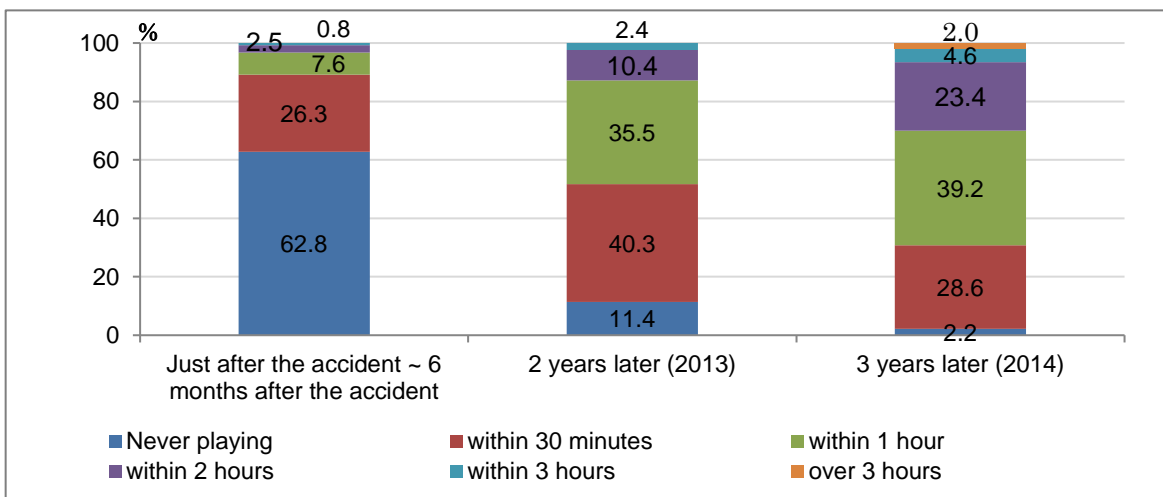


Figure. 1 Changes in time playing outside

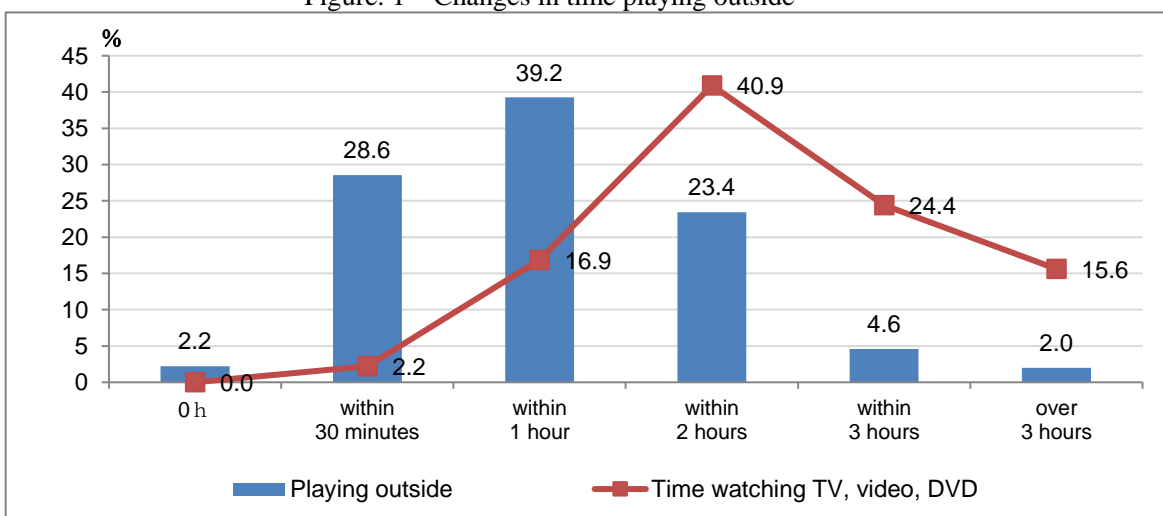


Figure. 2 Time playing outside and Watching TV etc.

2.2 Changes in parent-child communication

Fig. 3 shows the changes in parent-child communication. The rates of parents who eat meals, play, and sing songs with their children as well as read to their children three times a week to almost every day have decreased compared to a year ago. On the other hand, there seems to be an increasing trend for the frequency of meeting with friends or relatives with children of a similar age and the frequency of going to the park with their children. This result suggests that the style of parent-child communication have changed in accordance with the developmental stages of children.

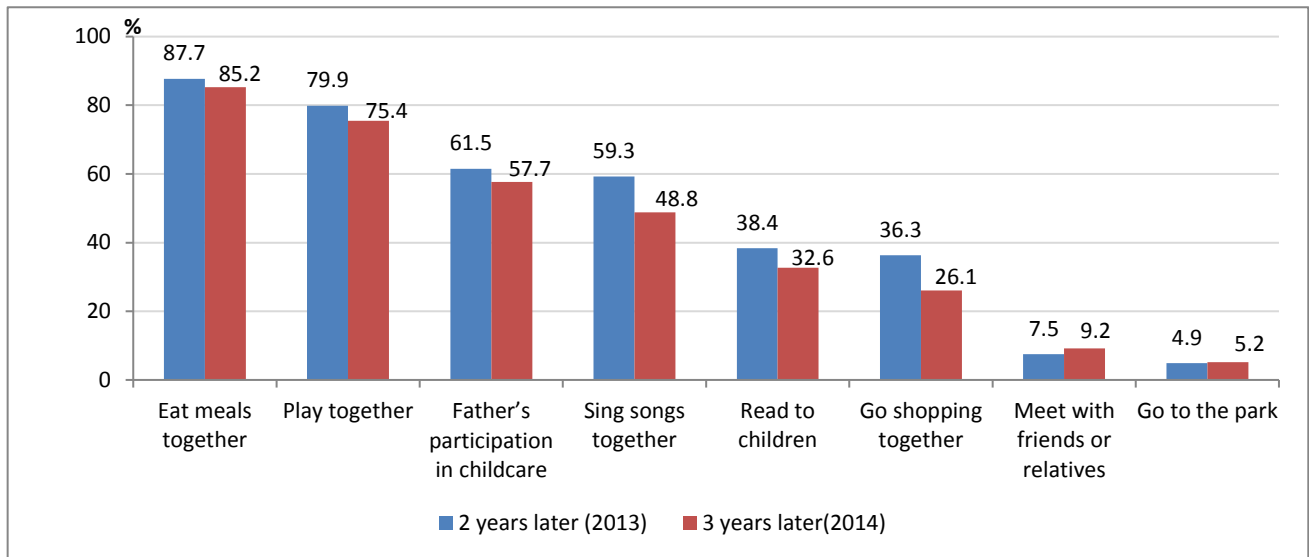


Figure. 3 Changes in parent-child communication (Rates of 3 times a week – almost every day)

3. Children's development and health

3.1 A need for support is high in all areas among children

In order to comprehensively assess children's adaptation and mental health, this survey used the Japanese version of the Strengths and Difficulties Questionnaire (SDQ), which is a widely used questionnaire across the world. The Japanese version of the SDQ consists of the following five areas: "emotional symptoms," "conduct problems," "hyperactivity / inattention," "peer relationship problems," and "prosocial behavior." "Emotional symptoms" include depression, anxiety, and other emotional disorders. "Conduct problems" include oppositional defiant behaviors and anti-social behaviors. "Hyperactivity / inattention" includes a lack of attention and concentration. "Peer relationship problems" include isolation and rejection from peers. "Prosocial behavior" includes cooperative characteristics and sympathetic characteristics. The lower score of "prosocial behavior" and the higher score of other four areas mean that there is a higher need for support.

Fig. 4 shows the assessment results of the 1st survey (2013) and the 2nd survey (2014) using the Japanese version of the SDQ. The need for support has decreased in all areas among both boys and girls. However, compared to the survey results by Wataru Noda et al. conducted in another prefecture ("Re-examination of the Japanese Version of the Strengths and Difficulties Questionnaire, Parent Ratings Form: Generating cut-off score and normative data for each grade and sex using the entire cohort data in one suburban city in Japan," *Clinical Psychiatry*, 2012), children in this study have a higher need for support in almost all areas.

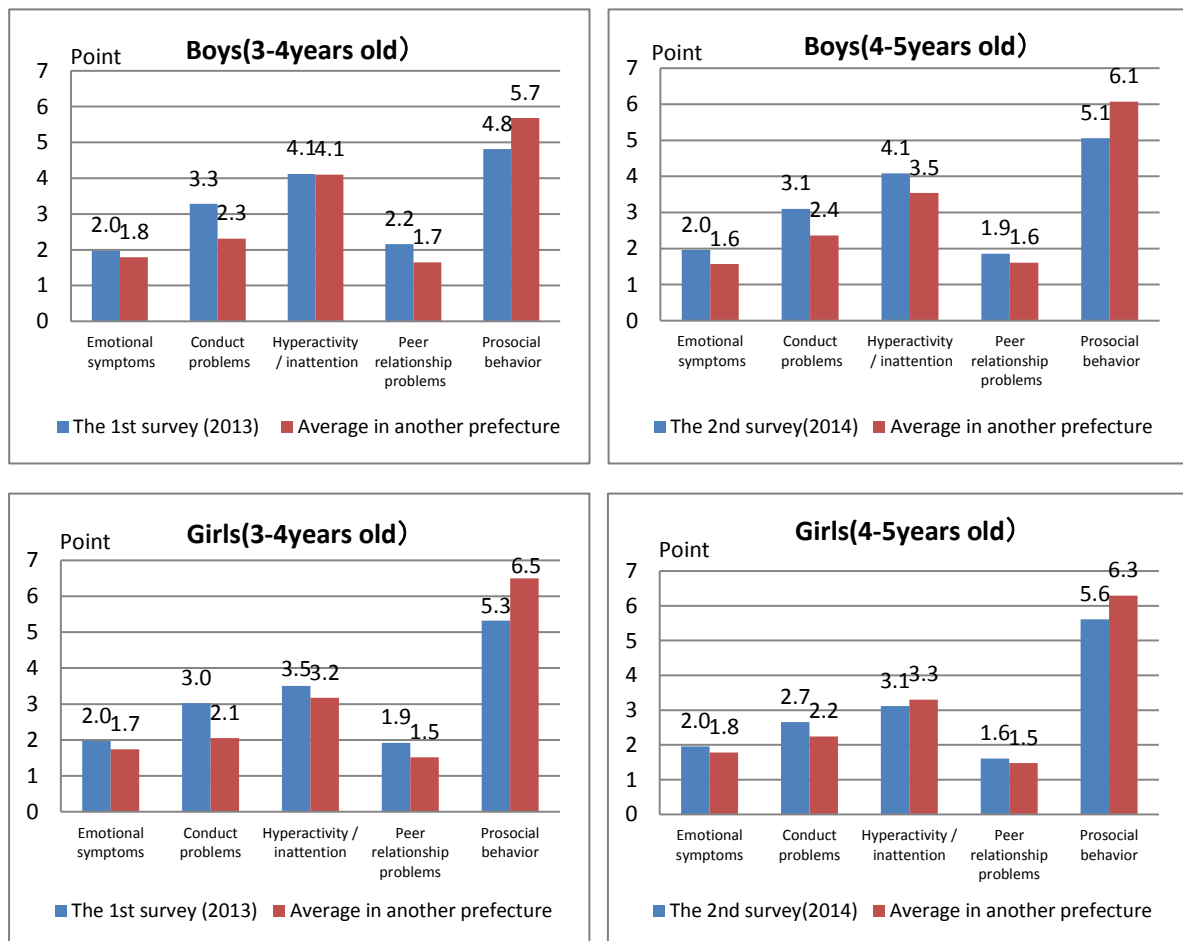


Figure. 4 Children's adaptation and mental health

3.2 Children’s health conditions are mostly positive

The combined rate of respondents who indicated “good” and “rather good” was 94.8% in the 1st survey and 95.2% in the 2nd survey. This shows that children’s health conditions are mostly positive.

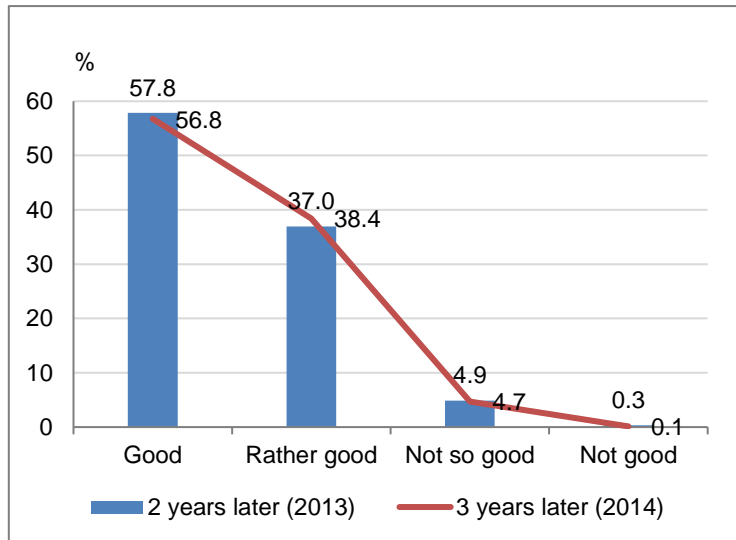


Figure. 5 Children’s health conditions

3.3 “Skin itch,” “cough,” and “cold” remain as the three leading symptoms as last year

With regard to the “children’s physical symptoms in the past six month,” three prevalent symptoms were observed in the 2nd surveys as the 1st survey. They were “skin itch,” “cough,” and “cold,” and more than 50% of respondents indicated children “often” or “sometimes” have these symptoms. While the rates of respondents who indicated “cough” and “cold” decreased from last year, the rates of those who indicated the following increased from last year: “sore throat,” “stomachache,” “get tired easily,” “nosebleed,” and “headache.”

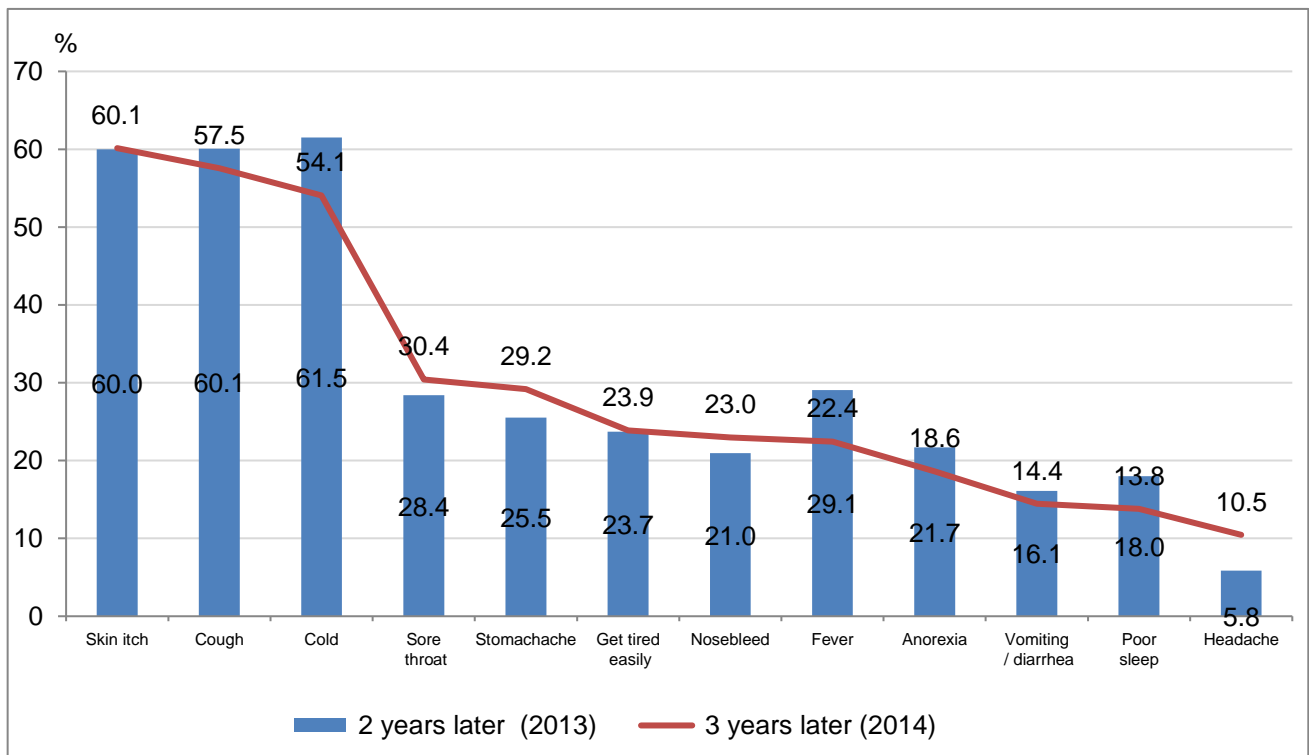


Figure. 6 Children’s physical symptoms

4. Mother's mental and physical health

4.1 Health conditions of mothers are generally positive

With regard to the “health conditions of mothers in the past 6 months,” the combined rate of respondents who indicated “good” and “rather good” was 77.5% in the 1st survey and 78.7% in the 2nd survey. This shows that health conditions of mothers are mostly positive. However, about 20% of respondents indicated “not so good” or “not good” in both the 1st and 2nd surveys.

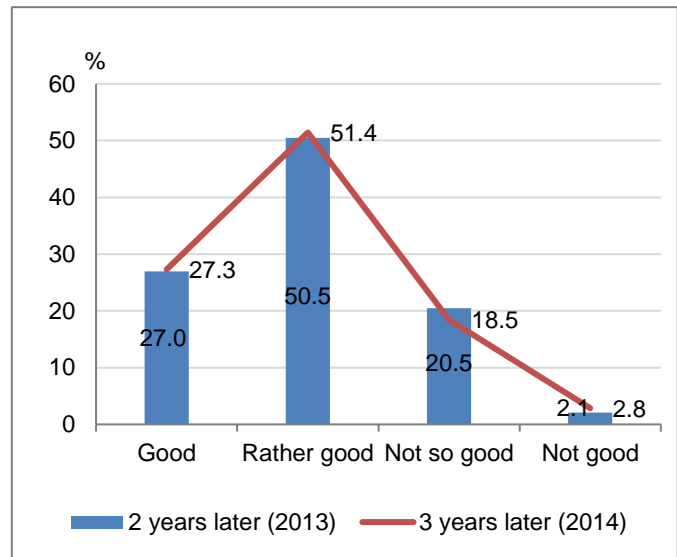


Figure. 7 Health condition of mothers

4.2 The rates of most symptoms decreased from last year

Fig. 8 shows the “changes in subjective symptoms in the past 6 months” among mothers. Respondents who indicated that they “often” or “sometimes” suffer from “stiff shoulder,” “lower back pain,” and “headache” account for more than 60% in both the 1st survey (2013) and 2nd survey (2014). The rates of all items decreased from last year except “sore throat” and “skin itch.”

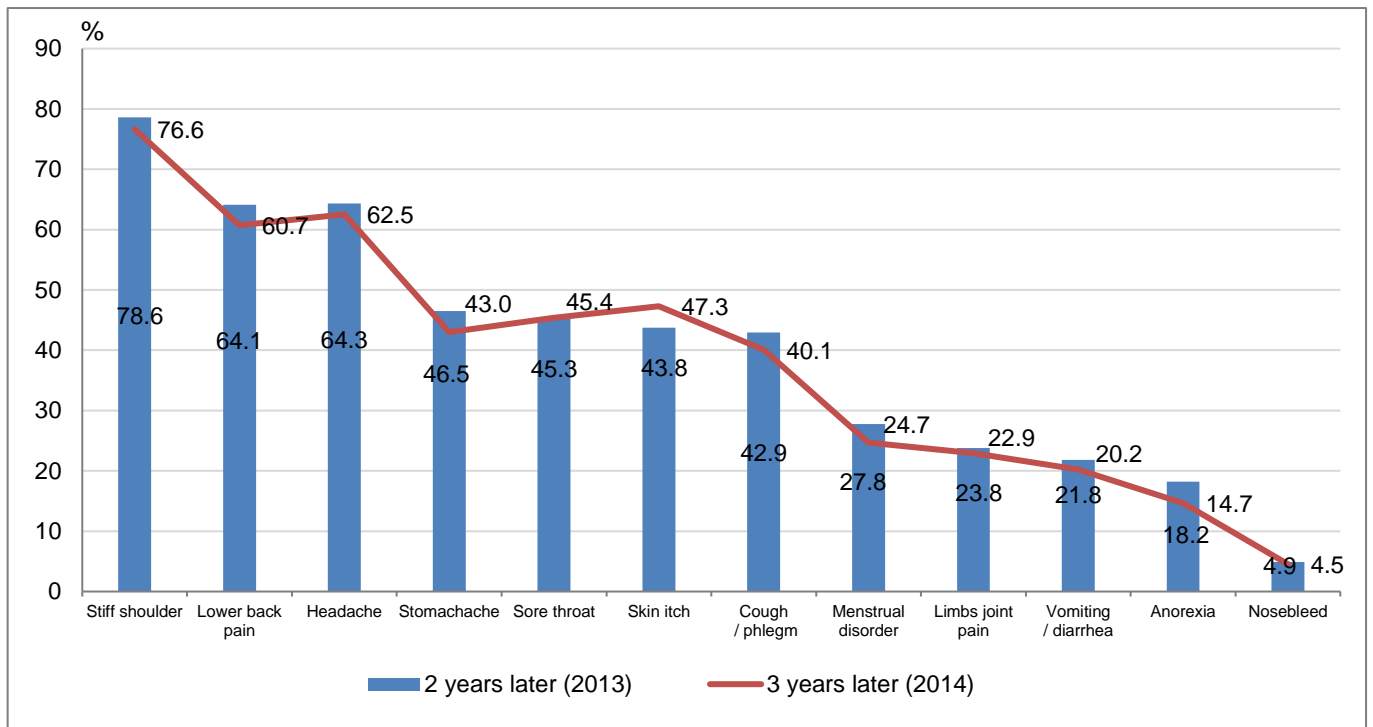


Figure. 8 Subjective symptoms of mothers

4.3 Type of stress changed

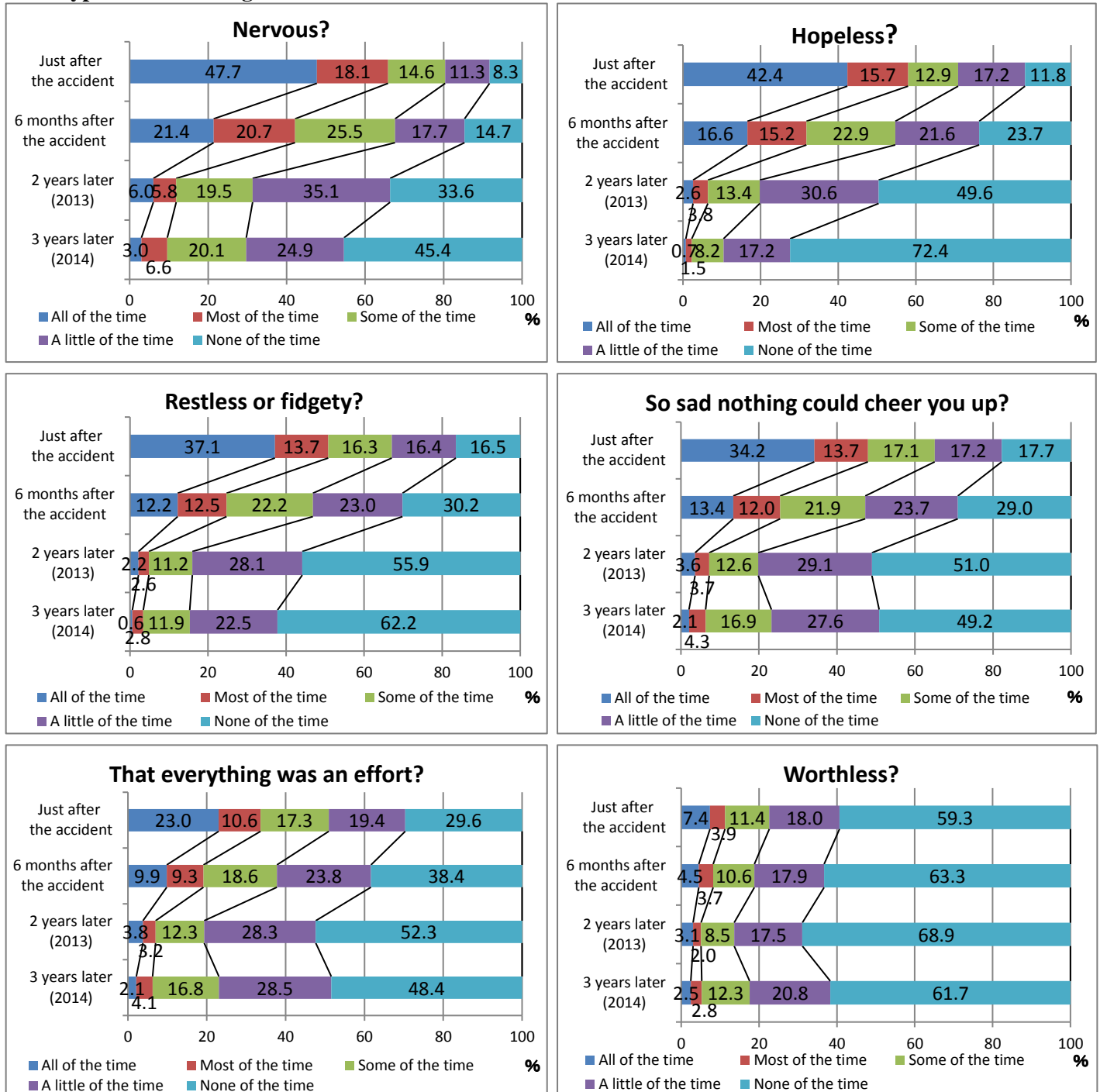


Figure. 9 Changes in mental health condition of mothers

Fig. 9 shows how “mental health” of mothers has changed. We used the 6 question items (K6), which have been widely used to indicate severity of mental health problems including psychological stress. The question asks, “During the past one month, about how often have you had this feeling?” As a result, the rate of response “all of the time” gradually decreased over time in all items. The rates of responses “most of the time” and “some of the time” also decreased in all items since just after the accident to two years later. However, these rates increased three years later in all items except “I have felt hopeless.” Now that three years have passed since the nuclear power plant accident, the way respondents feel stress may have changed: today, they experience occasional stress that is suddenly provoked rather than feeling stress “all of the time”.

5. Life following Fukushima nuclear accident

5.1 Changes in lifestyle following the nuclear power plant accident have three trends

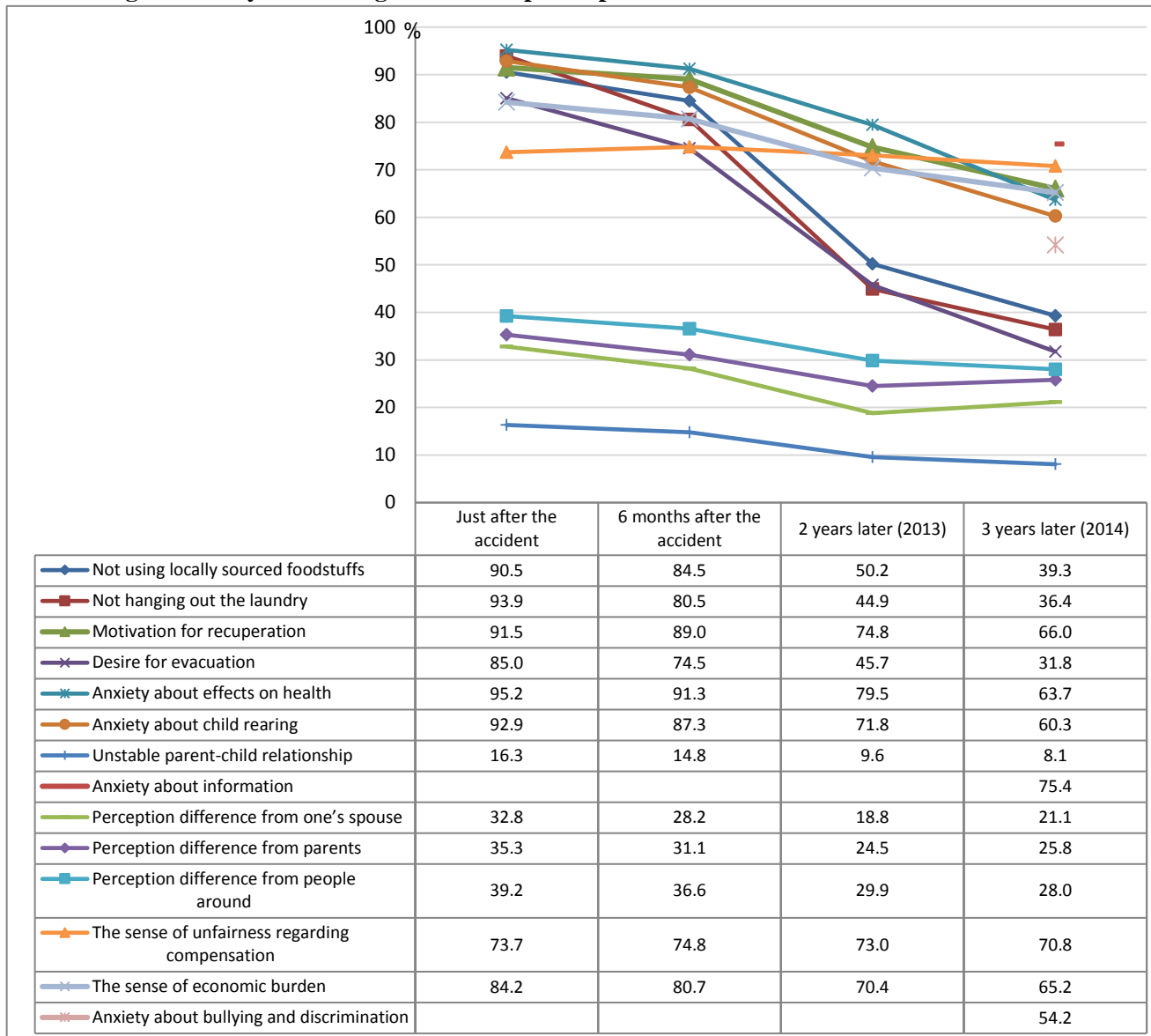


Figure. 10 Lifestyle changes after the accident (the total percentage of “true” and “rather true”)

With regard to lifestyle changes following the nuclear power plant accident, three trends were observed in the 2nd survey as the 1st survey. First, the rates remain high for the following items: sense of unfairness regarding compensation, sense of economic burden, motivation for recuperation, anxiety about effects on health, and anxiety about child rearing. Second, the rates rapidly decreased for the following items: do not use locally sourced foodstuffs, do not hang out the laundry, and desire for evacuation. Third, the rates remain low and unchanged for the following items: perception difference from my spouse, parents, and people around me or people in the community over responses to radioactivity. Over response to radioactivity, respondents felt a perception difference the most from people around them or people in the community, followed by their parents and their spouse. Changes in lifestyles following the nuclear power plant accident, particularly those that persist with high rates, may cause unstable mental status. Respondents “do not know which information about radioactivity is correct” and information anxiety is currently the highest among respondents.

5.2 The frequency of recuperation is on a decreasing trend

The combined rate of respondents who “often” and “sometimes” went on recuperation was 87.5% since just after the accident to six months after the accident. This rate decreased to 74.9% two years later and 66.0% three years later. However, in the free descriptions of the questionnaire, there were many opinions requesting for increased recuperation opportunities and pointing out the lack of recuperation information.

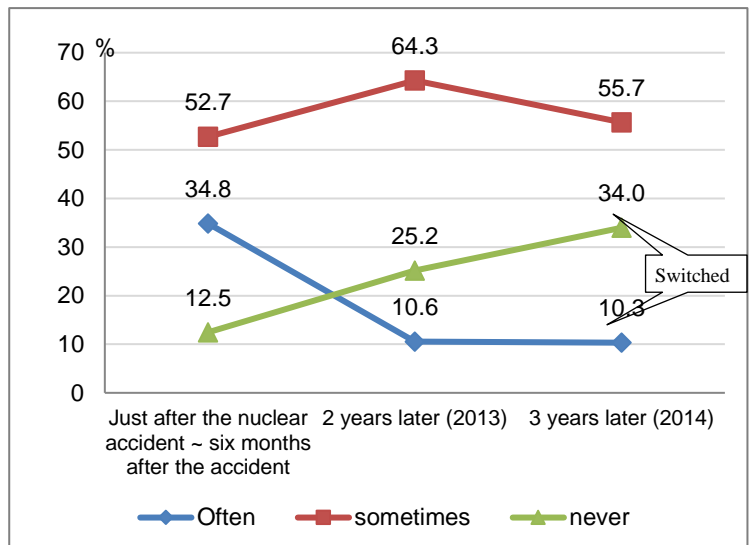


Figure11: Frequency of recuperation activities

5.3 The source of reference information about radioactivity is TV

In the 1st survey, many respondents indicated that they refer to the Internet and word-of-mouth as sources of information about radioactivity. However, the rates decreased in the 2nd survey. Instead, the leading sources of reference information were as follows: TV (74.7%); public institutions including municipal office, health center, and medical institutions (56.3%); and newspapers (53.8%).

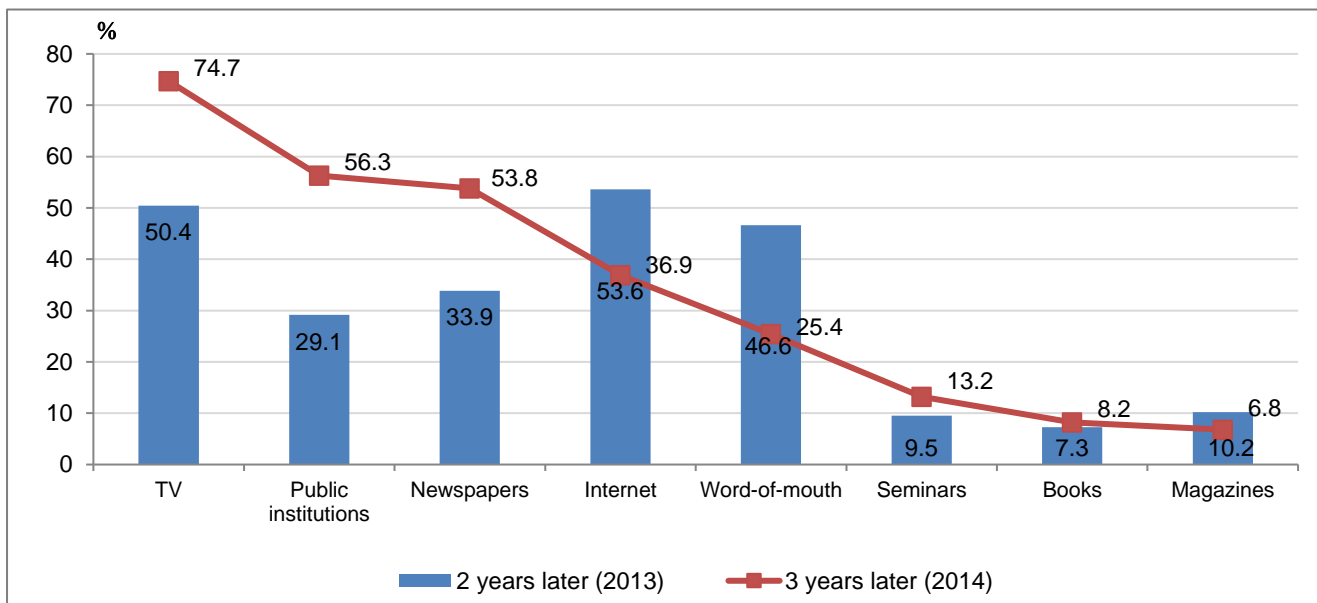


Figure12: Changes in the source of reference information about radioactivity, evacuation and recuperation

5.4 Severity of radioactive contamination in the region

Fig. 13 shows the changes in the severity of radioactive contamination in the areas of respondents' residence. In the 1st survey, "rather serious" accounted for 50.3% followed by "serious" with 27.7%. In the 2nd survey, "rather serious" slightly decreased to 47.1% and "serious" decreased significantly to 12.9%. On the other hand, "not so serious" was 20.3% in the previous survey but increased significantly to 34.9% in the present survey.

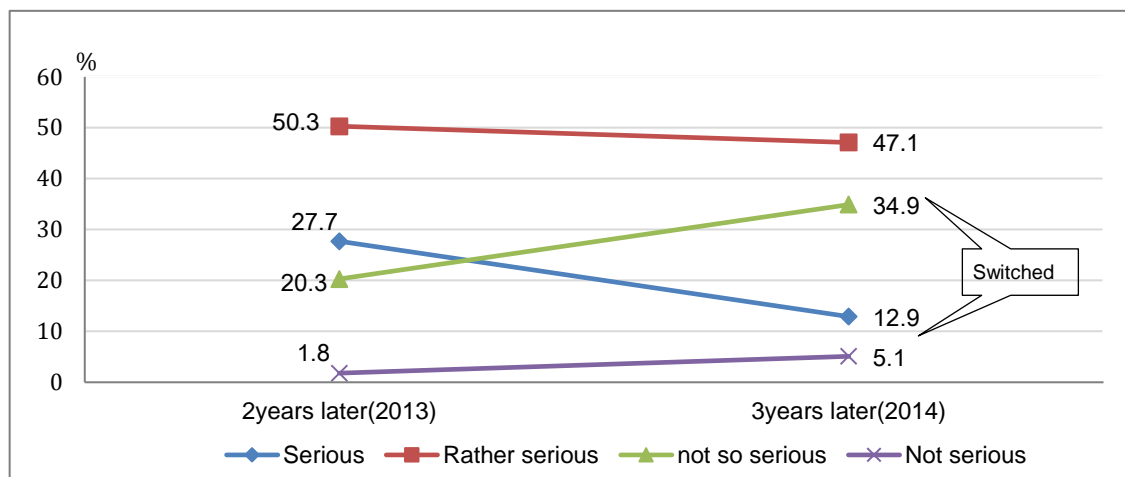


Figure 13 Perceptions about severity of radioactive contamination

6. Community Attachment

6.1 The degree of community attachment is on a recovery trend

Fig. 14 shows the changes in the degree of community attachment. All three items had a higher rate before the accident: “I like this area” (90.8%), “I feel this is my hometown” (82.6%), and “I am proud of living here” (70.1%). However, at the time point of two years later, all rates decreased. In particular, “I am proud of living here” significantly decreased to 48.8%. Now that three years have passed following the accident, all rates increased. This shows that people have slowly recovering attachment and affection for their community.

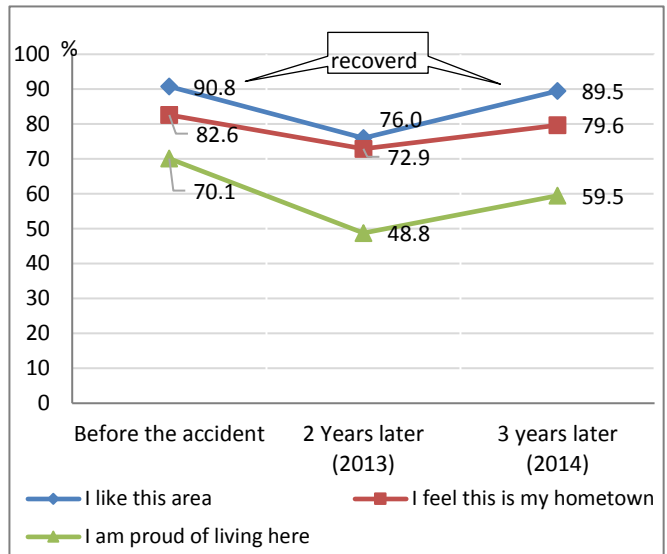


Figure. 14 Local conditions and attachment to local communities

6.2 There is an increased intention to keep living

We asked respondents whether or not they want to keep living in the current area. In the previous survey, 23.2% indicated that they “want to move if possible” and 4.2% indicated that they “want to move immediately.” In the present survey, the rates decreased to 14.6% and 1.9% respectively. The results indicated that the both rates of those who “want to keep living forever” and who “want to keep living for the present” have increased.

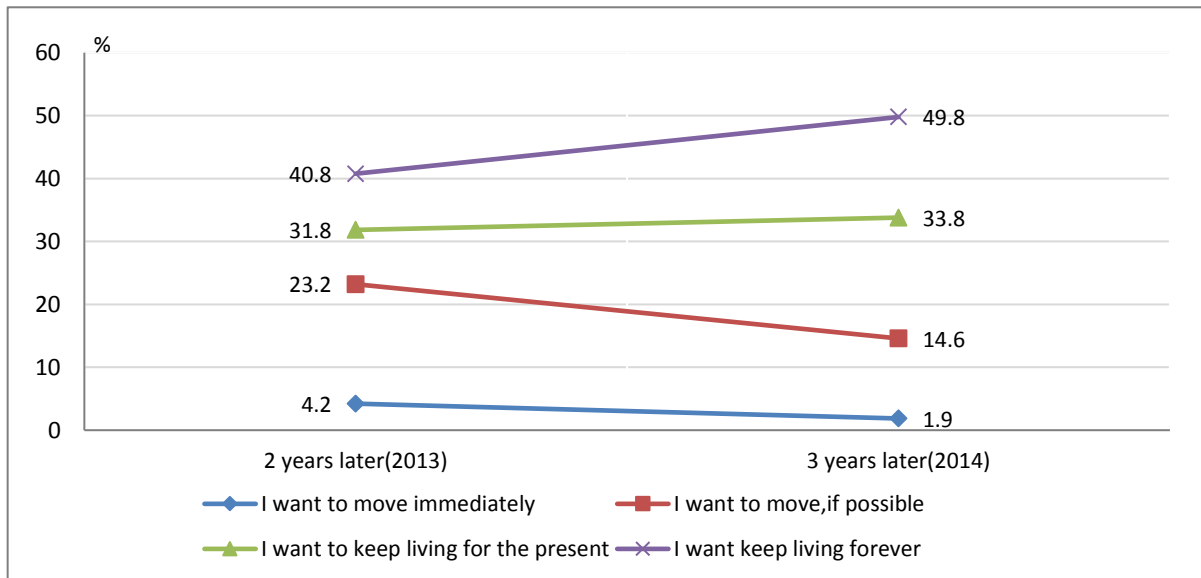


Figure: 15 Intention to continue living in the area

7. Support

7.1 A major source of support is “spouse”

Fig. 16 shows the relationship of supporters to respondents. The highest rate is “spouse” (87.5%) followed by “own parents” (76.9%) and “parents-in-law” (42.0%). This shows that mothers of young children count on their spouse and own parents for support.

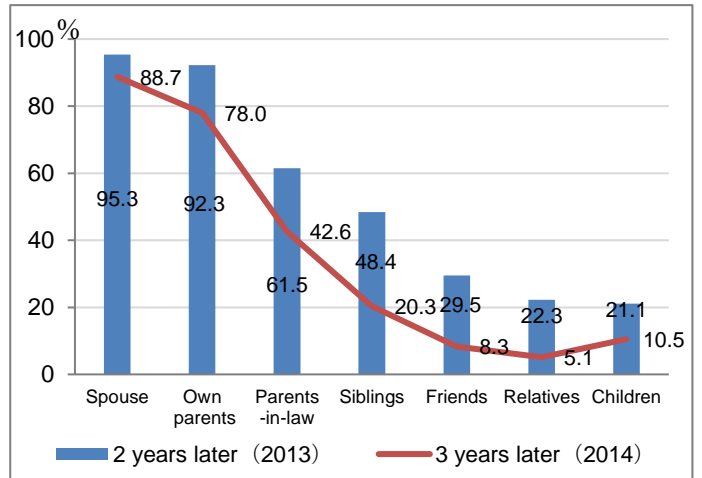


Figure.16 Someone that helps respondents

7.2 Spouses provide support in various situations

Fig. 17 shows the relationship of supporters to respondents and from whom respondents can expect support. Spouse and own parents have higher rates across all types of support. Accordingly, respondents can expect support from their spouse and own parents in various situations

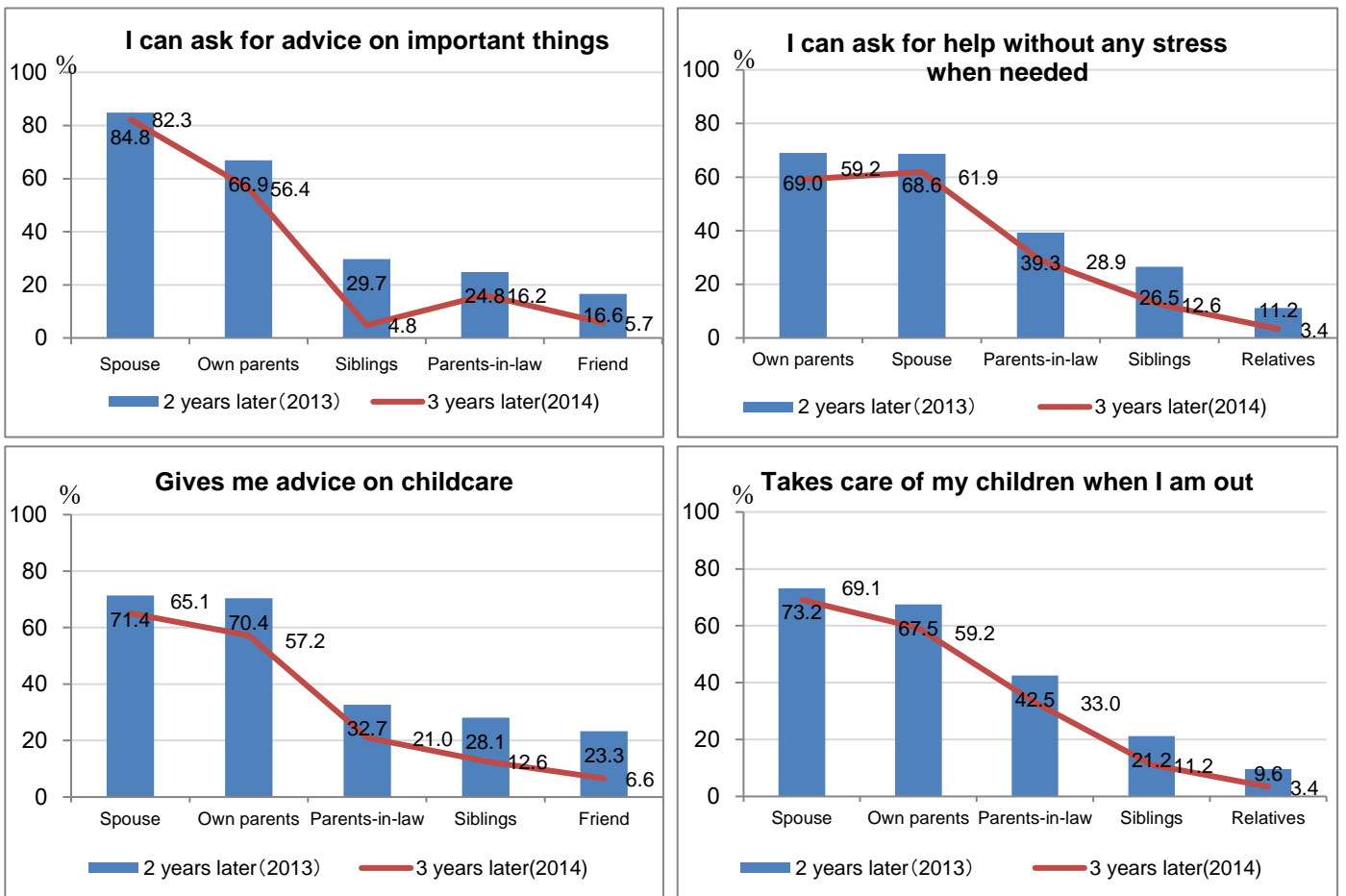


Figure. 17 Contents of Support

8. Free descriptions of a questionnaire

8.1 Free responses

	The 1st survey (2013)	The 2nd survey (2014)
Contents	Total no. of responses 1201	Total no. of responses 707
Anxiety / worry	681 (56.7%)	272 (38.5%)
Children's play (playground)	255 (21.2%)	130 (18.4%)
Evacuation / recuperation	245 (20.4%)	81 (11.5%)
Decontamination (radioactivity / radiation)	241 (20.1%)	188 (26.6%)
Financial burden	212 (17.7%)	38 (5.4%)
Security (compensation / security / warranty / Indemnity)	191 (15.9%)	112 (15.8%)
Others	626 (52.1%)	202 (28.6%)

We received many opinions in the free response section of the survey. About 45% of respondents stated their opinions in both the 1st and 2nd surveys and the most number of opinions were on “anxiety / worry.” In the second survey, the rates of opinions on “decontamination” increased. Note that the number of responses include duplicate responses.

8.2 Contents of free answers (Top 5)

The 1st survey (2013)		The 2nd survey (2014)	
Anxiety / worry	681		272
Anxiety about future (marriage, prejudice, health)	247	Anxiety for future (marriage, prejudice, health)	188
Anxiety about radioactivity (radiation)	103	Vague anxiety	53
Effects of not playing outside	54	Anxiety about food	21
Vague anxiety	51	Anxiety about mental aspects	15
Anxiety about staying in Fukushima	50	Anxiety about playing outside after decontamination	14
Children's play	255		130
Want more indoor playgrounds	81	Want more indoor playgrounds	29
Restricting my children from playing outside	74	Want to let my children play outside	29
Seeking improvement on the environment so that children can play outside	30	Seeking improvement on indoor playgrounds designed for elementary school children or older	13
Problems with indoor playgrounds (catching disease, parking)	22	Let my children play outside	12
Want to let my children play outside	10	Restricting my children from playing outside	9

The 1st survey (2013)		The 2nd survey (2014)	
Evacuation / recreation	245		81
Unable to evacuate against my wish	126	Want more recreation opportunities	16

Hoping for continued recuperation (Mother and child) on evacuation	42	Want to know the information about recuperation	9
Evacuated but returned	37	Unable to evacuate against my wish	9
Unable to go on recuperation against my wish	12	Unable to go on recuperation against my wish	7
Conflicts over evacuation	5	Conflicts over evacuation	7
Decontamination (radioactivity / radiation)	241		188
Please decontaminate	132	Sense of unfairness with regard to decontamination	70
Sense of unfairness with regard to decontamination	32	Dissatisfaction and distrust for decontamination procedures and after treatment	37
Radiation should be fully considered	13	Perceptual gaps with people around me over radiation issues	17
Do not understand whether or not the amount of radiation is normal	12	Able to have hope after decontamination	13
Unable to let my children play outside due to the high level of radiation	9	Want to know correct information	13
Sense of financial burden and its contents	212		38
Increased recuperation spending	62	Purchase of food grown in other prefectures	14
Purchase of food grown in other prefectures	43	Increased recreational spending	13
Purchase of water	38	Purchase of water	10
Spending one way or another	24	Increase in electric bills	3
Burden from evacuation	20	Increased burden from voluntary evacuation	3
Security (compensation / security / warranty / Indemnity)	191		112
Termination of compensation	52	Continued provision of compensation for children	25
Continued provision of compensation for children	27	Termination of compensation	22
Future health protection	20	Claims for residents of evacuation areas	20
Unfair demarcation for compensation	19	Unfair demarcation for compensation	15
Unfair demarcation for evacuation areas	14	Future health protection	10
Others	626		202
Distrust for information	112	Requests, encouragements, and complaints for the survey	60
Requests	106	Opposing the restart of nuclear power plants	14
Pros and Cons of the survey	76	Requests	11
Perceptual gaps	63	Reporting about the recent life	10
Believe in bright future	52	Anger and distrust toward the national government and TEPCO	10

We classified free descriptions and listed the top five opinions of the corresponding content. Many respondents wrote down their opinions including the following: anxiety about future (marriage, prejudice, health); want more indoor playgrounds and want to let my children play outside; want more recuperation opportunities; sense of unfairness with regard to decontamination and after treatment; continued provision of compensation for children; and requests for the survey.

9. Conclusions

The results of this analysis are summarized as follows:

- (1) The length of time that children play outside has gradually increased over time since the nuclear power plant accident. Yet, the rate of respondents who indicated “1 hr. or more” was about 30% while the study in another prefecture indicated 75.4%. In comparison, the time of playing outside is still shorter among children in Fukushima. With regard to parent-child communication, there was a shift in the style of communication from close communication at homes to more socially oriented communication.
- (2) With regard to adaptation and mental health of children, the need for support decreased compared to last year. However, compared to the results of the survey in another prefecture, the need for support is still higher. This suggests that providing support is needed in the adaptation and mental health aspects of children.
- (3) With regard to the overall health of children, over 90% of respondents indicated either “good” or “rather good.” The most prevalent symptom among children is “skin itch” as last year.
- (4) With regard to the overall health of mothers, over 70% of respondents indicated either “good” or “rather good.” While their subjective symptoms were the same with the common symptoms in Japan, “skin itch” ranked as one of the major symptoms among mothers as children.
- (5) With regard to mental status of mothers, they have slowly recovered serenity with the passing of time since the accident. However, the type of stress may have gradually changed from constant episodic stress that resulted immediately after the accident to chronic stress that is occasionally provoked.
- (6) With regard to life changes following the nuclear power plant accident, there are three trends as last year. The first is the changes that remain high with small changes. The second is the changes that rapidly decreased over time from immediately after the accident. The third is the changes that remain low and unchanged from immediately after the accident. Since changes in lifestyles can cause major stress, a support system is essential in order to assist people recover their normal lives before the accident.
- (7) The degree of community attachment is on an increasing trend compared to last year. People may have slowly felt at ease and recovered affection and attachment for their community with the passing of time and the progress of decontamination.
- (8) Mothers of young children count the most on “spouse (husband)” and “own parents.” This suggests that support from one’s spouse and own parents play a very important role in their mental wellbeing.

We have conducted more detailed analysis of this survey by aggregating the data by area. We will release the results online on the website of Fukushima Child Health Project and accordingly report the information to relevant cities, towns, and villages, as well as the prefecture. Our statistical surveys such as this one aim to grasp the situations faced by people in Fukushima. Along with those surveys, we have been conducting more detailed interview surveys. Through these initiatives, we aim to delve into the issues and challenges faced by people and by different areas in Fukushima.

We thank you for your continued support.

Fukushima Child Health Project
<http://mother-child.jpnowellness.com/>