#### Title

## The Fukushima Health Management Survey: estimation of external doses to residents in Fukushima Prefecture

Author names

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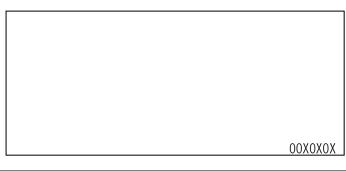
Effective	Number of r	esponder	nts (excluding	radiation	workers) by	areas
dose (mSv)	Minami-Soma	Iitate	Kawamata	Namie	Katsurao	Futaba
<1	18,647	196	613	5,855	493	2,644
1 - 2	6,046	323	2,634	1,972	158	463
2 - 3	493	360	174	354	24	72
3 - 4	95	338	52	64	4	18
4 - 5	35	357	17	37	0	6
5 - 6	3	321	5	17	1	4
6 - 7	6	184	3	15	0	3
7 - 8	4	84	0	12	0	6
8 - 9	1	57	0	9	0	2
9 - 10	0	29	0	5	0	1
10 - 11	0	21	0	10	0	0
11 - 12	1	17	1	8	0	2
12 - 13	0	8	0	5	0	0
13 - 14	0	4	0	4	0	0
14 - 15	0	3	0	3	0	0
> 15	0	3	0	6	0	1
Total	25,331	2,305	3,499	8,376	680	3,222

Table S1 Detailed distribution of estimated external doses for each of six municipalities shown in Fig. 4(b)

From the next page, a complete form of the questionnaire is shown as Sheet S1.

### The Fukushima Health Management Survey

# Basic Survey Medical Interview Sheet (Response Sheet)



This medical interview sheet is to ask you to record the time and whereabouts during the period from the March 11 earthquake until July 11 ("Record of Movements") in order to provide a basis for estimating levels of radiation exposure and to assist in future health control.

In particular, since there is no way to evaluate levels of external radiation exposure (other than by estimations based on your "Record of Movement"), we request that you enter your information as accurately as possible, while referring to resources such as the "Events Calendar" contained in the envelope.

The personal information contained in this medical interview sheet will be used for the purpose of health control in Fukushima Prefecture and information will also be provided to the municipality in which you live upon request. However this information will not be disclosed in any way that will identify an individual.

With the exceptions detailed below, this medical questionnaire must be completed only by the named respondent. However, in the case of minors, it should be filled out with a guardian's consent, and we ask that the guardian's name be written in the signature block provided for the guardian on the next page. For children under elementary school age, this form should be filled out by a guardian. Furthermore, for persons who are unable to complete the questionnaire by themselves (e.g., the elderly), it must be completed by a family member or a person living with the respondent.

After completing the questionnaire, please enclose it in the provided return envelope and return by post. It is acceptable to return multiple forms, such as those of family members, together in a single envelope.

Fukushima Prefecture

Fukushima Medical University

Please fill out the required information in the <u>underlined</u> spaces and select the applicable boxes with a tick ( $\checkmark$ ).

	Degnandant	
Today's Date:	Respondent:	
2011 MonthDay	$_1 \square$ Self $_2$	Proxy (Relationship)
Name (Family name, First Name):		Gender:
Katakana (if applicable):		$1 \square$ Male
Date of Birth : YearMonth_		
Guardian Signature Block (If the responde please provide the name and signature of t		onsenting to complete this survey,
(Guardian's printed name)	(Guardian's si	gnature)
Place of Birth (Nationality):		
Prefecture	Cit	y/Ward/County
		d/Town/Village
Registered address shown in the Alien Reg	gistration card as of M	arch 11, 2011:
₸		e as on the cover (go to the next question)
	<sub>2</sub> Same	e as place of birth (go to the next question)
Prefecture	City/Ward/Cour	ntyWard/Town/Village
Name of Building / Room Number:		
Current address:	$_1 \square$ Same	as place of birth (go to the next question)
₹−	$_2 \square$ Same	as place of birth (go to the next question)
	$_3 \square$ Same a	as on March 11 (go to the next question)
Prefecture	City/Ward/Cour	ntyWard/Town/Village
Name of Building / Room Number:		
Intended new address (Please fill this out if $\overline{\top}$ —	you know the address to	which you plan to move in the future)
	City/Word/Com	Word/Toyre/Villago
		ntyWard/Town/Village
Name of Building / Room Number:		
Intended date for moving: YearN	Month Date	
Contact Information		
*This is necessary in case we need to cont information.	act the respondent dire	ectly, such as to confirm incomplete
Phone Number: ()	Mobile Phone	Number: ()
Phone Number: () Are you currently living with others?		· · ·
$_1 \square$ I live alone $_2 \square$ I live	e with my family (inc	luding living only with spouse)
$_{3}\square$ I am living in a facility $_{4}\square$ Oth	ner (	)

1. Please mark the appropriate box with a tick ( $\checkmark$ ) with respect to the building type of your home

and the place of employment/education as of March 11.

In the space provided for place of employment/education, please provide details of the building type for other paces (apart from your home) where you spend a lot of time as part of your daily routine, such as for employment or schooling. Please provide details of the address up to the city and neighborhood (chōme) or village level, as appropriate.

For fields labeled "Other" please provide specific details regarding building construction. If you work outdoors, please select the "Other" box with a tick ( $\checkmark$ ).

Home	<ul> <li>1 Detached house (reinforced/steel-reinforced concrete construction)</li> <li>2 Detached house (other construction, e.g., wood, steel, light-gauge steel)</li> <li>3 Multiple dwelling/apartment (reinforced/steel-reinforced concrete construction)</li> <li>(floor of a floor building)</li> <li>4 Multiple dwelling/apartment (other construction, e.g., wood, steel, light-gauge steel)</li> <li>(floor of a floor building)</li> <li>5 Other () (floor of a floor building)</li> </ul>
	*For the purpose of this survey, please answer "concrete" for all buildings of the following
	construction types: reinforced concrete; steel; and concrete block.
	1       Place of Employment       2       School       3       Other ()         Address of place of employment or school (to the best of your knowledge)
	Prefecture City/Ward/County
Place of	Ward/Town/Village
employment/ education	1    Reinforced/steel-reinforced concrete construction (floor of a floor building)
	2□ Other construction (e.g., wood, steel, light-gauge steel) (floor of a floor building)
	$_{3}\square$ Outdoors (agriculture, etc.)
	If you have filled out details in this section, please use labels such as "Employment" and
	"Education" for the movement survey in the following Section 2.

2. We would like to know the locations and the relevant lengths of time with respect to places you visited in March this year. Please provide information about your movements between March 11 and March 25, following the example below.

#### Example

- Please use arrows to indicate durations of time. If you spent time away from your place of residence, please provide details of the place name up to the city and neighborhood (*chome*) or village, as appropriate.
- For schools, public institutions, etc. it is sufficient to provide the name of the facility only.
- Please provide information for each category: Indoors, Moving, and Outdoors. For time spent indoors, please indicate whether this was in a wood or concrete building by marking with "(W)" or "(C)", respectively.
- Please note that it is not necessary to state whether it was a wood or concrete building with respect to your home or place of work.
- Please indicate the time spent outdoors next to the arrow and provide details about the location in the right column.
- For time spent outside Fukushima Prefecture, please indicate the total time, including travel time or time spent outdoors, under the section marked "Whereabouts: Indoors".

	Wheneshoute				Place name / Facility					
	Whereabouts	0	3	6	9	12	15	18	21 24	
E	Indoors	-	1	-		•		4		<ol> <li>Home</li> <li>Your own field/garden</li> <li>Car</li> </ol>
Example	Moving				<b>∢</b> → 3					
e	Outdoors			•	⇔ 2(1 hour		<b>⑤</b> (2	2.5 hour	·s)	$\bigcirc$ -shi) (C) $\bigcirc$ -aza, $\bigcirc$ -machi, $\bigcirc$ -shi

#### **Actual movements**

	Whereabouts									im	е							Place / Facility
	whereabouts	0	 3	}		6	5	 9	 	12	_	15	 1	8		21	24	
March	Indoors				- - - - -													
11	Moving																	
(Fri)	Outdoors		     		     	       			 									
March	Indoors					       			 									
12	Moving				1													
(Sat)	Outdoors		     		     													
March	Indoors																	
13	Moving				     													
(Sun)	Outdoors				     				 									
March	Indoors		-		       	       												
14	Moving				- - - -													
(Mon)	Outdoors				     	1			 									
March	Indoors																	
15	Moving				     													
(Tue)	Outdoors		- - - - - - -												-			

#### Actual movements (continued)

	Whereabouts				-	 _	me		_				Place / Facility
<u> </u>		0		3	6	9	 2	1	5	18	21	24	
March	Indoors												
16	Moving												
(Wed)	Outdoors											1	
March	Indoors												
17	Moving												
(Thu)	Outdoors												
Manah	Indoors					T							
March 18	Moving				-								
(Fri)	Outdoors												
<u> </u>	Indoors					+				+			
March						+				+			
19 (Sat)	Moving					 _							
(5at)	Outdoors					_				_			
March	Indoors							-					
20	Moving												
(Sun)	Outdoors											-	
March	Indoors					Ť				T			
21	Moving												
	Outdoors												
	Indoors					+							
March	Moving					+							
22 (Tue)	Outdoors					+				+			
(100)						 +				+			
March	Indoors		     										
23	Moving												
(Wed)	Outdoors												
March	Indoors												
24	Moving												
(Thu)	Outdoors									Τ		-	
	Indoors												
March 25	Moving					+				+			
(Fri)	Outdoors					+				+			
()								:					

3. We would like to ask you about places you visited and places of regular outings for the period from March 26 to July 11, 2011. For example, if you commuted to work from Monday to Friday and you had different regular outings on Saturdays, please fill in the former as "Outing (1)" and the latter as "Outing (2)" etc.

Please fill in the address details up to the house/block number (*banchi*). If you are unsure of the address of a place which you visited while on an outing, it is acceptable to provide just the name of the facility. Also, for visits outside Fukushima Prefecture, it is acceptable to provide the address up to the name of the municipality.

Period	Places where you spent time
March 26	Area of residence
$\bigcup$	Prefecture City/Ward/Parish Ward/Town/Village         Time spent outside for shopping, doing chores, etc in the area surrounding your         place of residence:       [] hours per day
(month) (day)	Place of regular outing ① (place of employment or education):         Facility name:         Location:         Prefecture City/Ward/Parish Ward/Town/Village         Time spent indoors at the place for outing:         [] hours per day         Time spent outdoors at the place for outing:         [] hours per day         Please circle the relevant day(s):         Mon Tue Wed Thu Fri Sat Sun
	Place of regular outing ②: Facility name         Location:         Prefecture City/Ward/Parish Ward/Town/Village         Time spent indoors at place of outing:       [] hours per day         Time spent outdoors at place of outing:       [] hours per day         Please circle the relevant day(s):       Mon Tue Wed Thu Fri Sat Sun
(month) (day)	Area of residence         PrefectureCity/Ward/ParishWard/Town/Village         Time spent outside for shopping, doing chores, etc in the area surrounding your         place of residence:       [] hours per day
	Place of regular outing ① (place of employment or education): Facility name: Location:
(month) (day)	Prefecture City/Ward/Parish Ward/Town/Village Time spent indoors at the place for outing: [] hours per day Time spent outdoors at the place for outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun
	Place of regular outing ②: Facility name Location:
	Prefecture City/Ward/Parish Ward/Town/Village Time spent indoors at place of outing: [] hours per day Time spent outdoors at place of outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun

Period	Places where you spent time										
	Area of residence										
(month) (day)	PrefectureCity/Ward/ParishWard/Town/Village Time spent outside for shopping, doing chores, etc in the area surrounding your place of residence:] hours per day										
	Place of regular outing $①$ (place of employment or education):										
(month) (day)	Facility name: Location:										
	Prefecture City/Ward/Parish Ward/Town/Village Time spent indoors at the place for outing: [] hours per day Time spent outdoors at the place for outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun										
	Place of regular outing ②: Facility name Location:										
	Prefecture City/Ward/Parish Ward/Town/Village Time spent indoors at place of outing: [] hours per day Time spent outdoors at place of outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun										
	Area of residence										
(month) (day) $\int_{-\infty}^{\infty}$	Prefecture City/Ward/Parish Ward/Town/Village Time spent outside for shopping, doing chores, etc in the area surrounding your place of residence: [] hours per day										
	Place of regular outing $①$ (place of employment or education):										
(month) (day)	Facility name: Location:										
	PrefectureCity/Ward/ParishWard/Town/Village Time spent indoors at the place for outing: [] hours per day Time spent outdoors at the place for outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun Place of regular outing ②: Facility name										
	Location:										
	Prefecture City/Ward/Parish Ward/Town/Village Time spent indoors at place of outing: [] hours per day Time spent outdoors at place of outing: [] hours per day Please circle the relevant day(s): Mon Tue Wed Thu Fri Sat Sun										

\*Space for four (4) periods is provided; however, if this is insufficient, please submit with additional photocopies, etc., attached.

4. Please fill in the dates and activities for days on or after March 26 to July 11 which do not correspond to the answer in (3) above. For time spent outside Fukushima Prefecture, please include all travel time in the column of "indoors"

#### Example

- Please use arrows to indicate durations of time. If you spent time away from your place of residence, please provide details of the place name up to the city and neighborhood (*chome*) or village, as appropriate.
- For schools, public institutions, etc. it is sufficient to provide the name of the facility only.
- Please provide information for each category: Indoors, Moving, and Outdoors. For time spent indoors, please indicate whether this was in a wood or concrete building by marking with "(W)" or "(C)", respectively.
- Please note that it is not necessary to state whether it was a wood or concrete building with respect to your home or place of work.
- Please indicate the time spent outdoors next to the arrow and provide details about the location in the right column.
- For time spent outside Fukushima Prefecture, please indicate the total time, including travel time or time spent outdoors, under the section marked "Whereabouts: Indoors".

<u></u> P					,	Time								Place / Facility
	Whereabouts	0	3	6		9	12	1	5	18	2	21	24	-
	Indoors		0				-	4		•	- 4			<ol> <li>Home</li> <li>Your own field/garden</li> <li>Car</li> </ol>
May 1	Moving				•	3								<ul> <li>④ Evacuation centre</li> <li>(△ Jr High School,</li> </ul>
	Outdoors				↔ ②(1	hou	r)		<b>(</b> 2.	5 hou	rs)		-	OO -shi) (C) ⑤∆-aza, OO-machi, OO-shi
	Indoors	•	1		▶		-	3					1	①Home ②Car
May 5	Moving					2					2			300 Prefecture
	Outdoors													
May 8	Indoors													Almost the same as on May 1
May 15	Moving												-	
May 22	Outdoors													

#### Activities not corresponding to (3) above.

	Whereabouts				Place / Facility					
	whereabouts	0	3	6	9	12	15	18	21 2	4
	Indoors									
( )	Moving									
	Outdoors									
	Indoors									
( )	Moving									
	Outdoors									
	Indoors									
( )	Moving									
	Outdoors									]

	Indoors					
( )	Moving					
	Outdoors					
	Indoors					
( )	Moving					
	Outdoors					
	Indoors					
( )	Moving					
	Outdoors					
	Indoors					
( )	Moving					
	Outdoors					

\*Space for seven (7) days is provided; however, if this is insufficient, please submit with additional photocopies, etc., attached.

5. If you entered the restricted area, such as for temporary access to your home, etc, please enter the date and activities performed on that date.

	Wheneshoute					Time				Place / Facility
	Whereabouts	0	3	6	9	12	15	18	21 24	L
	Indoors		i   i							
( )	Moving									
	Outdoors									
	Indoors									
( )	Moving									
	Outdoors									
	Indoors									
( )	Moving									
	Outdoors									

6. From March 11 through to March 31, to what extent did you consume products such as crops produced in your own fields, orchards, home garden, etc, or milk from livestock that you raise? Please mark the appropriate box with a tick ( $\checkmark$ ) and provide details in the square brackets ([]) with respect to types of food eaten, whether it was from an open field or greenhouse, and how many times such foodstuffs were consumed.

Type of food	Classification				
Did you eat	1□Yes	If you answered "yes", fill in the following information:			
any home-grown	2□No	①Type [ ]:1□ Field 2□ Greenhouse 3□Unknown Approximately what quantity?			
fruit or vegetables?		Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ②Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ③Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ④Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ④Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ⑤Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ⑤Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ⑥Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []         ⑥Type []]: 1□ Field 2□ Greenhouse 3□Unknown         Approximately what quantity?         Serving size: Small: [] Medium: [] Large: [] or No. of pieces []			
		on plates of the following diameters, respectively: less than 10 cm (small), 10-20cm (medium) and over 20 cm (large))			
Did you drink milk from any livestock		Type of livestock: [ ] On the basis of a 200 mL cup, how many cups in total did you drink?			
you raise (cows, etc)?	<sup>2</sup> <sup>□</sup> No Go to the next question.				

7. For the period between March 11 and March 31, which of the following was the main source of drinking water that you used for everyday consumption?

Please mark the appropriate box with a tick ( $\checkmark$ ) and provide details in the square brackets ([])

$1\square$	Tap water	Consumed daily between: March [ ] and March [ ]
2□	Water from private waterworks or well	Consumed daily between: March [] and March []
3□	Mineral water	Consumed daily between: March [] and March []
4□	Other [	1

8. For the period between March 11 and March 31, did you take "stabilized iodine tablet"?

 $_{1}\square$  No  $_{2}\square$  Yes $\rightarrow$  Date taken [\_\_\_\_(Month) \_\_\_\_(Day)]  $_{3}\square$  I don't know.

9. For the period between March 11 and March 31, did you undergo screening for radioactive contamination?

 $_1\square$  No

 $_{2}\Box$  Yes  $\rightarrow$  (Month) (Day) Place at measurement taken [ ]

Were you decontaminated?	₁□ No	$_2\square$ Yes
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10. Are you currently or have you previously been a "radiation worker"?

 $_1\square$  No  $_2\square$  Yes

 $_{3}\Box$  I don't know  $\rightarrow$  Please describe the details of your occupation (\_\_\_\_\_)

This is the end of the survey. Please submit this form with the return envelope.