

## Basic Survey (Radiation Dose Estimates)

Reported on 30 November 2015

### 1. Response Rates and Radiation Dose Estimates

#### 1.1 Response Rates of Residents

The overall effective response rate to the Basic Survey (radiation dose estimates), for the entire population of Fukushima Prefecture, was 27.3% (561,966 of 2,055,328) as of 30 September 2015. Response rate for the simplified questionnaire was 3.4% (69,100 of 2,055,328). (See Table 1.)

Thanks to instructions for filling out the survey form at thyroid ultrasound examination venues and venues for check-ups and health exams organized by municipalities, we continue to receive responses from participants.

Table 1 Response rates to the Basic Survey			
As of 30 September 2015			
Survey population		2,055,328	/
Responses	Original questionnaire	492,866	24.0%
	Simplified questionnaire*	69,100	3.4%
	Total	561,966	27.3%
*Preliminary figures Fractions have been rounded.			

\* Tables 2 and 3 show the results of the original and simplified questionnaires combined.

#### 1.2 Radiation Dose Estimates

Doses have been estimated for 544,714 of 561,966 respondents (96.9 %) as of 30 September 2015, and results have been returned to 542,463 respondents. (See Table 2.)

Table 2 Response rates to the Basic Survey							
As of 30 September 2015							
Area (preceding and full-scale surveys)	Survey population	Responses	Response rate	Completed dose estimates	Proportion	Returned results	Proportion
	a	b	c=b/a	d	e=d/b	f	g=f/b
Kempoku	504,042	151,182	30.0%	148,028	97.9%	147,645	97.7%
Kenchu	557,238	135,488	24.3%	131,494	97.1%	130,590	96.4%
Kennan	152,225	34,528	22.7%	33,177	96.1%	33,005	95.6%
Aizu	267,203	56,731	21.2%	54,066	95.3%	53,780	94.8%
Minami-aizu	30,789	6,321	20.5%	5,951	94.1%	5,893	93.2%
Soso	195,605	89,887	46.0%	86,768	96.5%	86,430	96.2%
Iwaki	348,226	87,829	25.2%	85,230	97.0%	85,120	96.9%
Total	2,055,328	561,966	27.3%	544,714	96.9%	542,463	96.5%
Including Yamakiya of Kawamata, Namie and Iitate.							

We have been estimating doses for non-residents who were visiting or staying in Fukushima Prefecture at the time of the accident. (See Table 3.)

Number of requests	Responses	Response rate	Completed dose estimates	Proportion	Returned results	Proportion
a	b	c=b/a	d	e=d/b	f	g=f/b
3,936	2,185	55.5%	1,941	88.8%	1,935	88.6%

\* Table 2, 3, and Appendix 1 include the data in the estimation period less than four months.

## 2. Results of Radiation Dose Estimates

Table 4 shows a breakdown of completed dose estimates (from Table 2), excluding cases of data covering less than four months<sup>1</sup>.

Radiation doses for a total of 466,102 residents have been estimated to date. The results for 457,031 respondents (excluding radiation workers) suggest that the doses for about 87% of the respondents in Kempoku area and about 92% in Kenchu area were <2 mSv. The doses for approximately 88% of the respondents in Kennan area and more than 99% of those in Aizu and Minami-aizu areas were <1 mSv. Doses for about 77 % of respondents in the Soso area and more than 99% of respondents in Iwaki were also <1 mSv.

1) There was a change in tallying procedures. Previously, when we returned the results to participants, estimated dose had been rounded (values less than 10 mSv were rounded to the nearest tenth, and radiation doses of 10 mSv or more were rounded to the nearest one) and then tallied. However, the values before rounding were used in some of the preceding surveys. This time, we standardized the method by using the values after rounding. There was no change in the results sent to the participants.

Effective Dose (mSv)	Total	Excluding radiation workers				By area (excluding radiation workers)												
		Kempoku *		Kenchu		Kennan		Aizu		Minami-aizu		Soso **		Iwaki				
<1	288,927	283,286	62.0%	93.8%	24,824	20.1%	56,998	51.3%	24,988	88.1%	44,231	99.3%	4,828	99.3%	55,312	77.3%	72,105	99.1%
1-2	147,773	145,455	31.8%	99.8%	82,919	67.0%	45,645	41.1%	3,346	11.8%	298	0.7%	34	0.7%	12,586	17.6%	627	0.9%
2-3	25,705	25,334	5.5%		5.9%	15,460	12.5%	8,116	7.3%	17	0.1%	25	0.1%	0	-	1,686	2.4%	30
3-4	1,571	1,491	0.3%	0.2%	468	0.4%	423	0.4%	0	-	1	0.0%	0	-	595	0.8%	4	0.0%
4-5	547	502	0.1%		0.2%	40	0.0%	5	0.0%	0	-	0	-	0	-	456	0.6%	1
5-6	441	389	0.1%	0.1%	19	0.0%	3	0.0%	0	-	0	-	0	-	366	0.5%	1	0.0%
6-7	268	230	0.1%		0.1%	10	0.0%	1	0.0%	0	-	1	0.0%	0	-	218	0.3%	0
7-8	152	114	0.0%	0.0%	1	0.0%	0	-	0	-	0	-	0	-	113	0.2%	0	-
8-9	118	78	0.0%		0.0%	1	0.0%	0	-	0	-	0	-	0	-	77	0.1%	0
9-10	72	41	0.0%	0.0%	0	-	0	-	0	-	0	-	0	-	41	0.1%	0	-
10-11	69	36	0.0%		0.0%	0	-	0	-	0	-	0	-	0	-	36	0.1%	0
11-12	52	30	0.0%	0.0%	1	0.0%	0	-	0	-	0	-	0	-	29	0.0%	0	-
12-13	37	13	0.0%		0.0%	0	-	0	-	0	-	0	-	0	-	13	0.0%	0
13-14	34	12	0.0%	0.0%	0	-	0	-	0	-	0	-	0	-	12	0.0%	0	-
14-15	27	6	0.0%		0.0%	0	-	0	-	0	-	0	-	0	-	6	0.0%	0
≥15	309	14	0.0%	0.0%	0	-	0	-	0	-	0	-	0	-	14	0.0%	0	-
Total	466,102	457,031	100.0%	100.0%	123,743	100%	111,191	100%	28,351	100%	44,556	100%	4,862	100%	71,560	100%	72,768	100%
Max	66 mSv	25 mSv			11 mSv		6.3 mSv		2.6 mSv		6.0 mSv		1.9 mSv		25 mSv		5.9 mSv	
Mean value	0.9 mSv	0.8 mSv			1.4 mSv		1.0 mSv		0.6 mSv		0.2 mSv		0.1 mSv		0.8 mSv		0.3 mSv	
Median	0.6 mSv	0.6 mSv			1.4 mSv		0.9 mSv		0.5 mSv		0.2 mSv		0.1 mSv		0.5 mSv		0.3 mSv	

\* Including Yamakiya of Kawamata.

Percentages have been rounded and may not total to 100%.

\*\* Including Namie and Iitate.

Excluding those with estimation period less than four months.

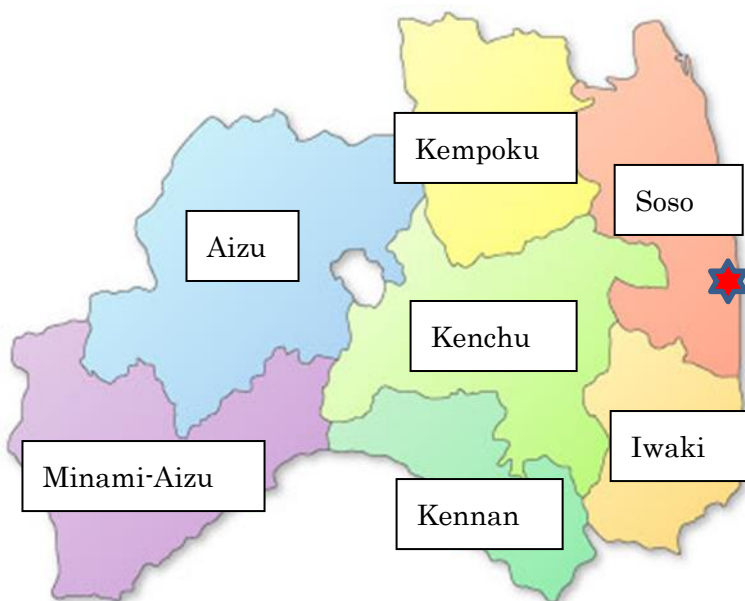
### 3. Evaluation of the results

The latest effective radiation dose estimates showed similar trends to those observed so far.

Since previous epidemiological studies<sup>1</sup> indicate no significant health effects at doses  $\leq 100$  mSv, we concluded that radiation doses estimated so far are unlikely to cause adverse effects on health, although this conclusion is based on external radiation doses estimated only for the first four months following the accident.

#### References

- 1) Sources and effects of ionizing radiation, United Nations Scientific Committee on the Effects of Atomic Radiation, UNSCEAR 2008 Report to the General Assembly, with scientific annexes.



## **4. Survey on the representativeness of dose distribution shown in the Basic Survey**

### **(Interim Report)**

In order to investigate whether people who have responded to the Basic Survey represent the whole population in regard to external dose estimates and dose distribution, we have been conducting a survey. This report presents progress and results gathered so far.

#### 4.1 Progress Report

Listed below are the projects that we have been working on. Some of them were completed as of 30 September 2015 (4.1-1 and 4.1-3).

##### 4.1-1

In order to find out if what has already been reported is an accurate and unbiased assessment of dose distribution for the whole population of Fukushima Prefecture, we visit randomly selected nonrespondents and encourage their cooperation.

##### 4.1-2

We compare by region the dose distribution of the respondents from the door-to-door survey and those who responded previously by mail. In the Soso area, where the residents experienced a wide range of exposure levels, more samples are selected.

##### 4.1-3

By visiting the nonrespondents, we ask them why they did not answer the questionnaire.

#### 4.2 Results

##### 4.2-1 Results of the door-to-door survey

There were 2,645 people to be interviewed in this survey, and 990 of them responded (four of them responded spontaneously). The number of respondents by region was: Kempoku (177), Kenchu (227), Kennan (71), Aizu (34), Minami-aizu (49), Soso (407) and Iwaki (25).

We found that the number of responses was enough to compare the dose distribution. We are estimating the doses for all respondents to make comparisons.

A more detailed breakdown of the response (e.g. responded, denied, or could not be visited) can be found in a chart shown on the next page.

##### 4.2-2 Reasons for not having answered the questionnaire

We used multiple choice questions and asked the participants why they did not answer the questionnaire previously.

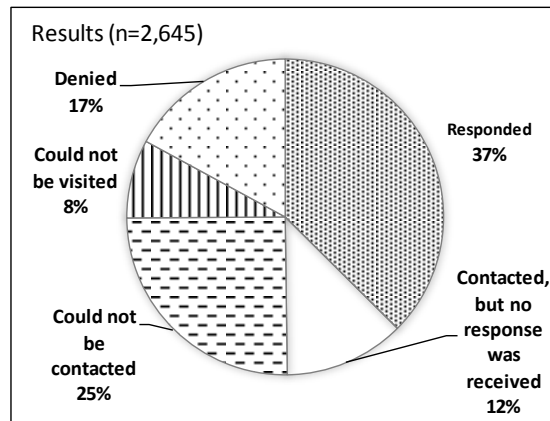
The most common reasons gathered were “I put off responding because it seemed time consuming,” followed by “I could not remember enough to fill out the questionnaire,” and then “I felt I needed someone to help filling out the survey form.”

#### 4.2-3 Details of the results

##### a. Results of the door-to-door survey

The table below describes the results of 2,645 participants.

Results	Number	(%)
Responded	990	37
Contacted, but no response was received	327	12
Could not be contacted	664	25
Could not be visited	212	8
Denied	452	17
Total	2,645	100



Description of the results

- Contacted, but no response was received:  
We handed out questionnaires and asked the participants or their family to cooperate, but did not get their responses.
- Could not be contacted:  
We visited the participants twice and left a notice but could not contact them.
- Could not be visited:  
We visited the participants to find out that they had moved to a different place.

##### b. Reasons for not answering the questionnaire

Respondents were allowed to select multiple answers from the list of choices below when asked why they did not answer the questionnaire previously.

A total of 1,094 responses were gathered and tallied.

Choice	Number
A. I could not remember enough to fill out the questionnaire.	393
B. I did not understand the purpose of the survey.	161
C. I did not want to remember the disaster.	77
D. I put off responding because it seemed time consuming.	594
E. I felt I needed someone to help filling out the survey form.	217
F. Judging by the previous results, it seemed unnecessary to know a radiation dose.	191
G. Other	104

