

## Basic Survey (Radiation Dose Estimates) Reported on 7 February 2014

### 1. Simplified questionnaire

From the end of November through mid-December in 2013, we sent simplified questionnaires to those eligible for Thyroid Ultrasound Examination (around 250,000 excluding residents of nationally designated zones) who had not yet responded to the original questionnaire.

In addition, surveys were distributed at municipal offices and by mail on request.

As of 31 December 2013, 28,455 have responded to the simplified questionnaire, which increased the response rates to 25.0%, 1.4% up from the previous one.

Target population		2,056,994	
Response	Original questionnaire	486,757	23.7%
	Simplified questionnaire*	28,455	1.4%
	Total	515,212	25.0%

\*Preliminary figures  
Fractions have been rounded.

### 2. Response Rates and Radiation Dose Estimates (Original and Simplified Questionnaires Combined)

#### 2.1 Response Rates of Residents

The overall effective response rate to the Basic Survey (radiation dose estimates), which targeted the entire population of Fukushima Prefecture, was 25.0% (515,212/2,056,994) as of 31 December 2013. Regional variations in the response rates were observed, with 44% in the Soso area. In Aizu and Minami-aizu, response rates went up from 13%-15% to 16-17%. (Table 2)

## 2.2 Radiation Dose Estimates

Recorded movements of respondents are converted to digital data, and effective external cumulative doses are calculated using the dose calculation system developed by the National Institute of Radiological Sciences. Doses have been estimated for 470,234 of 515,212 respondents (91.3%) as of 31 December 2013, and the results have been returned to 460,733 respondents. (Table 2)

Area(preceding and full-scale surveys)	Target population a	Response b	Response rates c=b/a	Completed dose estimation d	Proportion e=d/b	Returned results f	Proportion g=f/b
Kempoku	505,539	140,982	27.9%	130,852	92.8%	129,663	92.0%
Kenchu	560,116	124,893	22.3%	113,506	90.9%	111,752	89.5%
Kennan	152,776	30,011	19.6%	26,077	86.9%	25,725	85.7%
Aizu	267,696	46,470	17.4%	38,045	81.9%	37,592	80.9%
Minami-aizu	30,831	5,146	16.7%	3,825	74.3%	3,788	73.6%
Soso	196,205	87,761	44.7%	84,327	96.1%	81,161	92.5%
Iwaki	343,831	79,949	23.3%	73,602	92.1%	71,052	88.9%
Total	2,056,994	515,212	25.0%	470,234	91.3%	460,733	89.4%

Including Yamakiya of Kawamata, Namie and Iitate.

## 2.3 Response Rates (Visitors)

The survey questionnaire was distributed upon request to non-residents who were visiting or staying in Fukushima Prefecture at the time of the accident. Of 2,073 responses, doses have been estimated for 1,859 respondents (89.7%), and the results shall be returned accordingly. (Table 3)

Number of request a	Response b	Response rates c=b/a	Completed dose estimation d	Proportion e=d/b	Returned results f	Proportion g=f/b
3,804	2,073	54.5%	1,859	89.7%	1,782	86.0%

### 3. Results of Radiation Dose Estimates

Radiation doses for a total of 470,234 residents have been estimated to date. The results for 460,408 respondents (excluding radiation workers) suggested that the doses for more than 90% of the respondents were <2 mSv in Kempoku and Kenchu areas. The doses for approximately 91% of the respondents in Kennan area and more than 99% of those in Aizu and Minami-aizu were <1 mSv. Doses for about 78% of respondents in the Soso area and more than 99% of respondents in Iwaki were also <1 mSv. (Table 4)

Effective Dose (mSv)	Total	Excluding radiation workers				By region (excluding radiation workers)													
						Kempoku *		Kenchu		Kennan		Aizu		Minami-aizu		Soso **		Iwaki	
<1	311,567	305,286	66.3%	94.9%	40,908	31.6%	66,257	59.0%	23,376	90.6%	37,403	99.4%	3,768	99.4%	61,995	78.0%	71,579	99.2%	
1-2	134,002	131,606	28.6%	99.8%	75,564	58.5%	39,548	35.2%	2,410	9.3%	223	0.6%	23	0.6%	13,260	16.7%	578	0.8%	
2-3	20,795	20,403	4.4%		4.7%	12,265	9.5%	6,135	5.5%	12	0.0%	8	0.0%	0	0.0%	1,963	2.5%	20	0.0%
3-4	1,541	1,457	0.3%	0.2%	443	0.3%	296	0.3%	0	0.0%	1	0.0%	0	0.0%	714	0.9%	3	0.0%	
4-5	622	578	0.1%		0.2%	44	0.0%	6	0.0%	0	0.0%	0	0.0%	0	0.0%	526	0.7%	2	0.0%
5-6	496	437	0.1%	0.1%	25	0.0%	2	0.0%	0	0.0%	0	0.0%	0	0.0%	409	0.5%	1	0.0%	
6-7	297	258	0.1%		0.1%	8	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	250	0.3%	0	0.0%
7-8	166	128	0.0%	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	127	0.2%	0	0.0%	
8-9	124	82	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	82	0.1%	0	0.0%
9-10	78	46	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	46	0.1%	0	0.0%	
10-11	78	45	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	45	0.1%	0	0.0%
11-12	54	32	0.0%	0.0%	1	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	31	0.0%	0	0.0%	
12-13	40	14	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14	0.0%	0	0.0%
13-14	35	13	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	13	0.0%	0	0.0%	
14-15	32	11	0.0%		0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	11	0.0%	0	0.0%
15≤	307	12	0.0%	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	12	0.0%	0	0.0%	
Total	470,234	460,408	100.0%	100.0%	100.0%	129,259	100%	112,244	100%	25,798	100%	37,635	100%	3,791	100%	79,498	100%	72,183	100%
Max	66mSv	25mSv	/	/	/	11mSv	/	5.9mSv	/	2.6mSv	/	3.6mSv	/	1.6mSv	/	25mSv	/	5.9mSv	/
Mean value	0.8mSv	0.8mSv	/	/	/	1.2mSv	/	0.9mSv	/	0.5mSv	/	0.2mSv	/	0.1mSv	/	0.7mSv	/	0.3mSv	/

\* Including Yamakiya of Kawamata.  
\*\* Including Namie and Iitate.  
Percentages have been rounded and may not total to 100%.

### 4. 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 ≤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.