

# Basic Survey (Radiation Dose Estimates)

Reported on 6 June 2016

## 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 27.5% (565,380 of 2,055,341) as of 31 March 2016. Among the respondents, 72,135 answered through the simplified questionnaire. (See Table 1.)

Table 2 shows the response rates by age group.

In addition to giving instructions at thyroid ultrasound examination venues for filling out the survey form, providing them at venues for check-ups and health exams organized by municipalities, starting in FY 2015, helped increase the number of responses by 8,463 compared to the end of FY 2014.

Survey population		2,055,341	
Responses	Original questionnaire	493,245	24.0%
	Simplified questionnaire*	72,135	3.5%
	Total	565,380	27.5%

\*Preliminary figures  
Fractions have been rounded.

Age group (years)	0-9	10-19	20-29	30-39	40-49	50-59	60-	Total
Response rate	46.4%	35.6%	18.0%	24.6%	22.3%	22.9%	27.9%	27.5%

\* Tables 3 and 4 show the results of the original and simplified questionnaires combined.

## 1.2 Radiation Dose Estimates

Doses have been estimated for 549,986 of 565,380 respondents (97.3%) as of 31 March 2016, and results have been returned to 547,268 respondents. (See Table 3.)

Area	Survey population a	Responses b	Response rate c=b/a	Completed dose estimates d	Proportion e=d/b	Returned results f	Proportion g=f/b
Kempoku	504,042	151,786	30.1%	148,815	98.0%	148,196	97.6%
Kenchu	557,243	136,159	24.4%	132,756	97.5%	132,302	97.2%
Kennan	152,226	35,030	23.0%	34,133	97.4%	33,690	96.2%
Aizu	267,203	57,764	21.6%	54,971	95.2%	54,298	94.0%
Minami-aizu	30,789	6,386	20.7%	6,049	94.7%	5,959	93.3%
Soso	195,604	89,999	46.0%	87,300	97.0%	87,178	96.9%
Iwaki	348,234	88,256	25.3%	85,962	97.4%	85,645	97.0%
Total	2,055,341	565,380	27.5%	549,986	97.3%	547,268	96.8%

Including areas covered by the initial survey of 29,044 people in Yamakiya, 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 4.)

Number of requests a	Responses b	Response rate c=b/a	Completed dose estimates d	Proportion e=d/b	Returned results f	Proportion g=f/b
3,971	2,217	55.8%	1,989	89.7%	1,957	88.3%

\* Table 3, 4, and Appendix 1 include the data in the estimation period less than four months.

## 2. Results of Radiation Dose Estimates

Table 5 shows a breakdown of completed dose estimates (from Table 3), excluding cases of data covering less than four months.

Radiation doses for a total of 471,337 residents have been estimated to date. The results for 462,186 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.

Effective Dose (mSv)	Total	Excluding radiation workers				By area (excluding radiation workers)												
		Kempoku *	Kenchu	Kennan	Aizu	Minami-aizu	Soso **	Iwaki										
<1	292,918	287,225	62.1%	93.8%	24,874	20.0%	57,925	51.5%	25,859	88.3%	45,111	99.3%	4,922	99.3%	55,718	77.3%	72,816	99.1%
1-2	148,794	146,458	31.7%	99.8%	83,470	67.0%	45,930	40.9%	3,420	11.7%	302	0.7%	34	0.7%	12,670	17.6%	632	0.9%
2-3	25,910	25,537	5.5%		5.8%	15,630	12.6%	8,148	7.2%	17	0.1%	25	0.1%	0	-	1,687	2.3%	30
3-4	1,575	1,495	0.3%	0.2%	472	0.4%	423	0.4%	0	-	1	0.0%	0	-	595	0.8%	4	0.0%
4-5	551	505	0.1%		0.2%	40	0.0%	5	0.0%	0	-	0	-	0	-	459	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	0.0%		0.1%	10	0.0%	1	0.0%	0	-	1	0.0%	0	-	218	0.3%	0
7-8	155	116	0.0%	0.0%	1	0.0%	0	-	0	-	0	-	0	-	115	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	0.0%	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	35	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	315	15	0.0%	0.0%	0	-	0	-	0	-	0	-	0	-	15	0.0%	0	-
<b>Total</b>	<b>471,337</b>	<b>462,186</b>	<b>100.0%</b>	<b>100.0%</b>	<b>124,518</b>	<b>100%</b>	<b>112,435</b>	<b>100%</b>	<b>29,296</b>	<b>100%</b>	<b>45,440</b>	<b>100%</b>	<b>4,956</b>	<b>100%</b>	<b>72,057</b>	<b>100%</b>	<b>73,484</b>	<b>100%</b>
<b>Max</b>	<b>66 mSv</b>	<b>25 mSv</b>			<b>11 mSv</b>		<b>6.3 mSv</b>		<b>2.6 mSv</b>		<b>6.0 mSv</b>		<b>1.9 mSv</b>		<b>25 mSv</b>		<b>5.9 mSv</b>	
<b>Mean value</b>	<b>0.9 mSv</b>	<b>0.8 mSv</b>			<b>1.4 mSv</b>		<b>1.0 mSv</b>		<b>0.6 mSv</b>		<b>0.2 mSv</b>		<b>0.1 mSv</b>		<b>0.8 mSv</b>		<b>0.3 mSv</b>	
<b>Median</b>	<b>0.6 mSv</b>	<b>0.6 mSv</b>			<b>1.4 mSv</b>		<b>0.9 mSv</b>		<b>0.5 mSv</b>		<b>0.2 mSv</b>		<b>0.1 mSv</b>		<b>0.5 mSv</b>		<b>0.3 mSv</b>	

\* Including Yamakiya. 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.

