

# Basic Survey (Radiation Dose Estimates)

Reported on 20 February 2017

## 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% (566,043 of 2,055,305) as of 31 December 2016. Among the respondents, 72,615 answered through the simplified questionnaire. (See Table 1.)

Table 2 shows the response rates by age group.

		2,055,305	
Responses	Original questionnaire	493,428	24.0%
	Simplified questionnaire*	72,615	3.5%
	Total	566,043	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	46.5%	35.7%	18.1%	24.7%	22.4%	22.9%	27.9%	27.5%

## 1.2 Radiation Dose Estimates

Doses have been estimated for 551,874 of 566,043 respondents (97.5%) as of 31 December 2016, and results have been returned to 551,387 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	504,038	152,159	30.2%	149,233	98.1%	148,904	97.9%
Kenchu	557,218	136,235	24.4%	133,147	97.7%	133,087	97.7%
Kennan	152,228	35,131	23.1%	34,230	97.4%	34,222	97.4%
Aizu	267,202	57,790	21.6%	55,590	96.2%	55,577	96.2%
Minami-aizu	30,789	6,387	20.7%	6,078	95.2%	6,077	95.1%
Soso	195,591	90,058	46.0%	87,389	97.0%	87,322	97.0%
Iwaki	348,239	88,283	25.4%	86,207	97.6%	86,198	97.6%
Total	2,055,305	566,043	27.5%	551,874	97.5%	551,387	97.4%

Including areas covered by the initial survey of people in Yamakiya, Namie and Iitate.

\* Table 3 provides a more detailed view of the responses summarized in Table 1.

\* In case uncertainties in the action record of a questionnaire prevented a radiation dose estimate, further inquiry was made to facilitate an estimate. This supplemental effort has been proceeding as much as possible, but failure to make contact with residents has prevented around 13,500 dose estimates from being completed.

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
3,984	2,227	55.9%	2,014	90.4%	2,007	90.1%

\* 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 473,196 residents have been estimated to date. The results for 464,012 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)													
		Total	Total	%	%	Kempoku *		Kenchu		Kennan		Aizu		Minami-aizu		Soso **		Iwaki	
<1	294,229	288,511	62.2%	93.8%	24,931	20.0%	58,139	51.5%	25,954	88.3%	45,699	99.3%	4,947	99.3%	55,783	77.3%	73,058	99.1%	
1-2	149,242	146,899	31.7%	99.8%	83,750	67.0%	46,064	40.8%	3,421	11.6%	308	0.7%	36	0.7%	12,688	17.6%	632	0.9%	
2-3	26,009	25,636	5.5%		15,694	12.6%	8,182	7.3%	17	0.1%	25	0.1%	0	-	1,688	2.3%	30	0.0%	
3-4	1,575	1,495	0.3%	5.8%	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	0.0%	
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%		10	0.0%	1	0.0%	0	-	1	0.0%	0	-	218	0.3%	0	-	
7-8	155	116	0.0%	0.2%	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	-	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	36	12	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>473,196</b>	<b>464,012</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>124,919</b>	<b>100%</b>	<b>112,817</b>	<b>100%</b>	<b>29,392</b>	<b>100%</b>	<b>46,034</b>	<b>100%</b>	<b>4,983</b>	<b>100%</b>	<b>72,141</b>	<b>100%</b>	<b>73,726</b>	<b>100%</b>
<b>Max</b>	<b>66mSv</b>	<b>25mSv</b>				<b>11mSv</b>		<b>6.3mSv</b>		<b>2.6mSv</b>		<b>6.0mSv</b>		<b>1.9mSv</b>		<b>25mSv</b>		<b>5.9mSv</b>	
<b>Mean value</b>	<b>0.9mSv</b>	<b>0.8mSv</b>				<b>1.4mSv</b>		<b>1.0mSv</b>		<b>0.6mSv</b>		<b>0.2mSv</b>		<b>0.1mSv</b>		<b>0.8mSv</b>		<b>0.3mSv</b>	
<b>Median</b>	<b>0.6mSv</b>	<b>0.6mSv</b>				<b>1.4mSv</b>		<b>0.9mSv</b>		<b>0.5mSv</b>		<b>0.2mSv</b>		<b>0.1mSv</b>		<b>0.5mSv</b>		<b>0.3mSv</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.

#### Reference

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.

