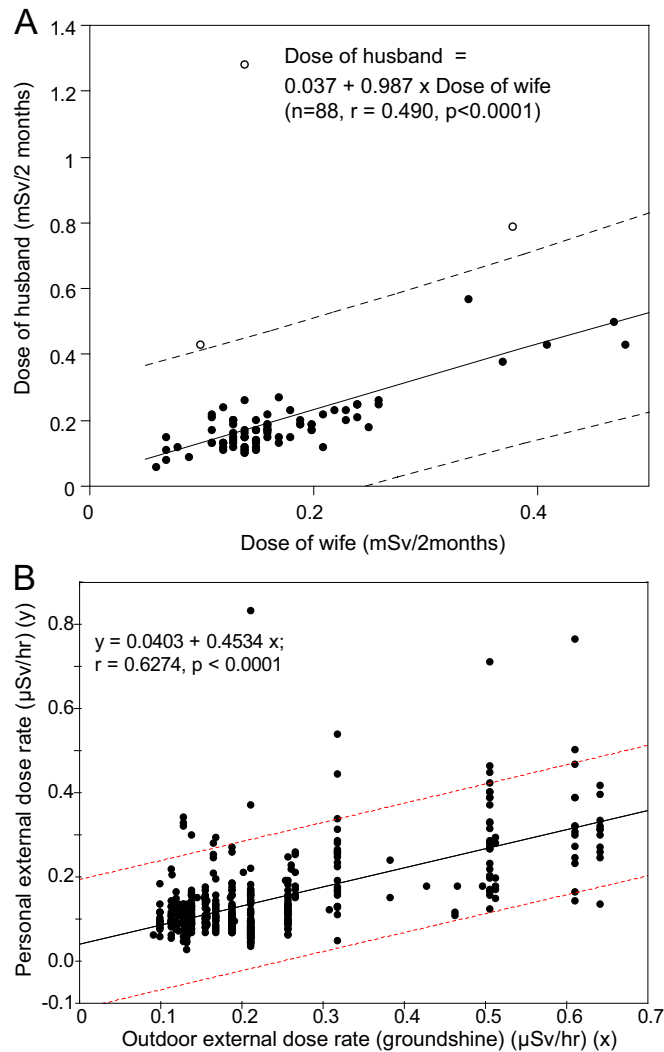


# Supporting Information

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**Fig. S1.** Plots of personal external radiation doses. (A) Correlation of personal external radiation doses between husband and wife in the village of Kawauchi. The linear regression line was fitted for external radiation doses between a husband and wife. Dotted lines indicate 95% upper and lower prediction intervals of the dose of the husband. (B) Correlation between personal external radiation doses and outdoor external dose rates around the residence of each participant. The linear regression line was fitted between personal external radiation doses and outdoor external dose rates. Dotted lines indicate 95% upper and lower prediction intervals of the personal external dose rate. Data of the outdoor external dose rate (December 1, 2012) are derived from the monitoring of environmental radioactivity by the Ministry of Education, Culture, Sports, Science, and Technology (<http://radioactivity.mext.go.jp/map/ja>).



**Table S1. Outdoor external dose rates in the Fukushima prefecture and estimated personal external dose rates for residents in various municipalities**

Region	Location	Population in 2013	Outdoor external dose rate, $\mu\text{Sv/h}^*$					Personal dose rate from groundshine, $\mu\text{Sv/h}$	
			$n^\dagger$	Mean	SD	Median	GM		GSD
Current study areas									
Sousou	Kawauchi	2,616	21	0.240	0.254	0.155	0.185	1.884	0.102 <sup>‡</sup>
Sousou	Tamano	—	5	0.553	0.135	0.610	0.539	1.294	0.31 <sup>‡</sup>
Sousou	Haramachi	—	16	0.264	0.119	0.233	0.241	1.553	0.182 <sup>‡</sup>
Evacuated areas									
Sousou	Iitate	5,943	21	1.873	0.937	1.618	1.679	1.609	
Sousou	Namie	18,897	38	4.229	4.896	2.909	1.995	4.265	
Sousou	Futaba	6,252	12	4.344	5.845	2.365	2.371	3.131	
Sousou	Okuma	10,949	14	10.505	9.224	5.976	7.535	2.311	
Sousou	Katsurao	1,468	11	0.979	1.264	0.674	0.671	2.208	
Sousou	Tomioka	14,459	16	3.002	1.669	2.662	2.597	1.761	
Sousou	Naraha	7,220	18	0.442	0.272	0.313	0.371	1.831	
Sousou	Kawauchi	334	3	0.637	0.547	0.512	0.469	2.762	
Sousou	Minamisoma	11,446	11	0.753	0.549	0.639	0.567	2.301	
Kenpoku	Kawamata	1,204	4	0.771	0.251	0.739	0.741	1.385	
Residential areas									
Kenpoku	Nihonmatsu	57,013	106	0.355	0.177	0.303	0.315	1.637	0.177 <sup>§</sup>
Kenpoku	Motomiya	30,721	45	0.273	0.085	0.265	0.262	1.329	0.160 <sup>§</sup>
Kenpoku	Kunimi	9,646	16	0.263	0.116	0.255	0.238	1.620	0.156 <sup>§</sup>
Kenpoku	Kawamata	14,621	31	0.279	0.144	0.226	0.250	1.579	0.143 <sup>§</sup>
Kenpoku	Fukushima	283,293	270	0.285	0.194	0.223	0.241	1.730	0.141 <sup>§</sup>
Kenpoku	Otama	8,433	17	0.262	0.138	0.223	0.229	1.721	0.141 <sup>§</sup>
Kenpoku	Date	62,905	92	0.259	0.133	0.213	0.231	1.602	0.137 <sup>§</sup>
Kenpoku	Koori	12,218	19	0.265	0.153	0.200	0.227	1.775	0.131 <sup>§</sup>
Kenchu	Koriyama	327,555	309	0.311	0.148	0.287	0.278	1.632	0.170 <sup>§</sup>
Kenchu	Miharu	17,500	35	0.233	0.096	0.215	0.215	1.483	0.138 <sup>§</sup>
Kenchu	Sukagawa	77,232	111	0.210	0.122	0.176	0.186	1.595	0.120 <sup>§</sup>
Kenchu	Ten-ai	5,957	16	0.190	0.123	0.176	0.156	1.923	0.120 <sup>§</sup>
Kenkan	Nishigo	19,809	31	0.271	0.123	0.246	0.246	1.578	0.152 <sup>§</sup>
Kenkan	Shirakawa	62,941	95	0.197	0.075	0.172	0.183	1.459	0.118 <sup>§</sup>
Kenkan	Tanakura	14,532	25	0.172	0.048	0.166	0.166	1.332	0.116 <sup>§</sup>
Sousou	Soma	35,727	61	0.208	0.070	0.209	0.195	1.444	0.135 <sup>§</sup>
Sousou	Hirono	5,024	28	0.180	0.041	0.181	0.175	1.253	0.122 <sup>§</sup>
Sousou	Minamisoma	64,261	73	0.223	0.139	0.174	0.195	1.636	0.119 <sup>§</sup>
Other municipalities in the Fukushima prefecture									
Kenpoku		478,850	596 <sup>¶</sup>	0.290	0.171	0.234	0.252	1.673	Less than 0.116 <sup>§</sup>
Kenchu		532,955	669	0.242	0.145	0.197	0.207	1.751	0.130 <sup>§</sup>
Kenkan		146,138	249	0.176	0.085	0.155	0.159	1.555	0.111 <sup>§</sup>
Aizu		253,780	339	0.113	0.036	0.107	0.108	1.356	0.089 <sup>§</sup>
Minamiaizu		28,373	62	0.065	0.017	0.064	0.063	1.301	0.069 <sup>§</sup>
Sousou		180,559	216 <sup>¶</sup>	0.222	0.137	0.190	0.197	1.586	0.126 <sup>§</sup>
Iwaki		328,243	428	0.136	0.051	0.127	0.129	1.366	0.098 <sup>§</sup>

GM, geometric mean; GSD, geometric SD.

\*Outdoor external dose rate monitoring data for December 1, 2012 (<http://radioactivity.mext.go.jp/map/ja>).

<sup>†</sup>Number of readings ( $n$ ) indicates the number of monitoring locations in each municipality on December 1, 2012.

<sup>‡</sup>Means of personal monitoring values (refer to Table 1).

<sup>§</sup>Estimated median. Using median values of the outdoor external dose rate data in each municipality, corresponding personal external dose rates were estimated using the equation given in Fig. S1B.

<sup>¶</sup>Evacuation areas are not included.

**Table S2. Demographic characteristics of study participants**

Population characteristics	Total	Area		
		Kawauchi village	Tamano area of Soma city	Haramachi area of Minamisoma city
The personal external dose survey				
<i>n</i> (no. of households)		666 (327); as of 04/01/12*	367 (151); as of 12/31/12	13,755 (4,692); as of 11/30/12 <sup>†</sup>
Respondent	483	388 (190)	65 (63)	30 (30)
Dropped	24	6	15	3
Participation rate, % <sup>‡</sup>		58	42	83
Sex, male:female	209:250	185:197	24:26	0:27
Age, y				
Means ± SD	62.4 ± 18.2	62.4 ± 19.3	63.7 ± 9.9	60.1 ± 9.0
Range	3–96	3–96	39–81	38–77
The food-duplicate survey				
<i>n</i>				
Respondent	131	82	19	30
Dropped	6	3	3	0
Participation rate, % <sup>‡</sup>		72	13	83
Sex, male:female	13:112	12:67	1:15	0:30
Age, y				
Mean ± SD	58.0 ± 11.1	56.7 ± 11.7	59.3 ± 11.2	60.7 ± 8.9
Range	26–92	26–92	34–77	38–78
Height, cm; mean ± SD	154.7 ± 7.4	155.8 ± 7.3	151.4 ± 7.6	153.6 ± 7.0
Weight, kg; mean ± SD	56.7 ± 9.1	57.5 ± 8.9	56.2 ± 7.4	54.8 ± 10.4
Occupation				
Farmer	15	10	3	2
Health care worker	9	7	0	2
Home maker	26	13	3	10
Office worker	44	34	4	6
Self-used worker	6	6	0	0
Retiree	25	9	6	10
Consumption of home-made vegetables	78	56	12	10

\*Most residents (2,793 people; 1,113 households) were evacuated in 2011.

<sup>†</sup>Population of areas corresponding to members of the local women's society.

<sup>‡</sup>Participation rate of invited candidates.

**Table S3. Composition of food-duplicate samples**

Food group	Daily consumption, g/d			National Health and Nutrition Survey, 2010*	
	Kawauchi	Tamano	Haramachi	Male	Female
	25th%, median, 75th%			GM (GSD), mode	
1. Rice	219, 303, 417	257, 310, 422	218, 294, 337	383 (1.12), 307	244 (1.12), 193
2. Other cereals	0, 36, 175	0, 57, 230	11, 90, 284	68 (1.51), 30	74 (1.39), 38
3. Potatoes, etc.	0, 20, 53	0, 5, 57	0, 8, 54	33 (1.64), 12	31 (1.59), 12
4. Beans	0, 34, 73	0, 36, 147	31, 105, 189	42 (1.60), 16	40 (1.57), 16
5. Nuts and seeds	0, 0, 0	0, 0, 0	0, 0, 0	0.5 (4.32), 0.02	0.9 (3.02), 0.1
6. Vegetables	209, 318, 435	265, 452, 595	157, 273, 429	251 (1.14), 192	252 (1.13), 197
7. Vegetable juice	0, 0, 0	0, 0, 0	0, 0, 0	—	—
8. Fruits	0, 40, 111	0, 44, 165	0, 56, 108	41 (1.75), 13	71 (1.49), 32
9. Fruit juice	0, 0, 0	0, 0, 0	0, 0, 0	—	—
10. Mushrooms	0, 0, 10	0, 0, 0	0, 0, 8	9.1 (1.94), 2.4	11 (1.83), 3.1
11. Seaweeds	0, 0, 6	0, 14, 40	0, 7, 26	6.7 (2.04), 1.6	4.7 (2.30), 0.9
12. Fish and shellfish	22, 48, 79	17, 34, 103	26, 59, 96	75(1.32), 43	58 (1.33), 33
13. Meats	13, 31, 73	12, 30, 49	0, 31, 74	74 (1.28), 45	52 (1.31), 30
14. Eggs	0, 35, 51	0, 41, 54	0, 35, 52	29 (1.34), 16	25 (1.36), 13
15. Milks	0, 65, 147	0, 85, 202	54, 103, 190	39 (1.82), 12	60 (1.62), 23
16. Confectioneries	0, 15, 51	0, 25, 66	0, 0, 41	9.4 (2.28), 1.8	16 (1.93), 4.4
17. Beverages	145, 371, 546	341, 555, 875	274, 545, 894	718 (1.21), 488	551 (1.21), 377
18. Liquids	243, 545, 1,026	731, 1,044, 1,729	465, 678, 1,171	383 (1.12), 307	244 (1.12), 193
		Mean ± SD			
Total	2,276 ± 631	3,270 ± 878	3,095 ± 1,318		
Water content, %	85.5 ± 3.6	88.3 ± 2.6	87.9 ± 3.3		
Dry weight	316.8 ± 8.8	375.2 ± 19.5	341.4 ± 14.3		

Liquids include tap water, well water, soup, seasonings, and oils.

\*Only mean and SD are available in the National Health and Nutrition Survey, 2010 (20). GM and GSD were calculated from the mean and SD under the assumption that data are distributed log-normally. The age group of 50–59 y was selected according to the average age of participants in this study (58.0 y).

**Table S4. Composition of food-duplicate samples of Fukushima origin**

Food group	Daily consumption of products of Fukushima origin, g/d		
	Kawauchi	Tamano	Haramachi
	Median, 75th%, maximum		
1. Rice	0, 199, 633	0, 121, 430	0, 153, 456
2. Other cereals	0, 0, 199	0, 32, 288	0, 0, 300
3. Potatoes, etc.	0, 30, 160	0, 36, 87	0, 1, 99
4. Beans	0, 0, 236	0, 20, 148	0, 52, 153
5. Nuts and seeds	0, 0, 0	0, 0, 2	0, 0, 0
6. Vegetables	183, 320, 641	381, 562, 756	125, 266, 695
7. Vegetable juice	0, 0, 0	0, 0, 0	0, 0, 0
8. Fruits	0, 10, 220	0, 88, 322	0, 12, 214
9. Fruit juice	0, 0, 210	0, 0, 0	0, 0, 0
10. Mushrooms	0, 0, 42	0, 0, 35	0, 0, 10
11. Seaweeds	0, 0, 3	0, 0, 4	0, 0, 0
12. Fish and shellfish	0, 0, 61	0, 0, 3	0, 0, 77
13. Meats	0, 0, 75	0, 0, 42	0, 0, 60
14. Eggs	0, 0, 82	0, 53, 131	0, 0, 54
15. Milks	0, 0, 384	0, 0, 74	0, 0, 251
16. Confectioneries	0, 0, 85	0, 0, 77	0, 0, 66
17. Beverages	0, 0, 484	0, 0, 693	0, 0, 882
18. Liquids	320, 758, 2,148	463, 1,101, 2,378	166, 525, 8,015

Liquids include tap water, well water, soup, seasonings, and oils.

Table S5. Particle size distribution and respiratory deposition estimate for radiocesium

Sampling site	Start–end sampling date and air volume (m <sup>3</sup> ) sampled	Fraction, μm	Dust amount, mg	Andersen low volume sampler		Respirable fraction, %
				Radioactivity, mBq/m <sup>3</sup>		
				<sup>134</sup> Cs	<sup>137</sup> Cs	
Kawauchi village 37°20'13" N 140°48'32" E	08/12/12–10/30/12 3,222 m <sup>3</sup>	<100	35.5	0.07	0.11	—
		<4.9	28.2	0.03	0.05	43
		<1.1	15.9	<0.03	<0.03	—
Tamano area of Soma city 37°46'8"N 140°43'1"E	09/02/12–10/01/12 1,179 m <sup>3</sup>	<100	20.5	0.13	0.14	—
		<4.9	16.9	0.08	0.07	55
		<1.1	11.7	<0.05	<0.07	—
Haramachi area of Minamisoma city 37°38'37" N 140°55'27" E	09/02/12–10/01/12 1,181 m <sup>3</sup>	<100	18.9	0.29	0.43	—
		<4.9	16.2	0.23	0.33	77
		<1.1	10.8	<0.04	<0.05	—

Table S6. Radiocesium in dust collected with high volume samplers

Sampling site	Start–end sampling date	Sampling term	High volume air sampler		Radioactivity in air, mBq/m <sup>3</sup>	Committed dose, $\mu$ Sv/y*	Cloudshine, pSv/h <sup>†</sup>	Outdoor external dose rate, $\mu$ Sv/h <sup>‡</sup>
			Air volume sampled, m <sup>3</sup>	Dust amount, mg				
Kawauchi village Community center 37°20'13" N 140°48'32" E	08/06/12–08/07/12	S	1,191	22	<sup>134</sup> Cs 0.14 <sup>137</sup> Cs 0.19	0.07 0.06	54.1	0.1
	08/07/12–08/08/12	S	977	10.2	0.1 0.14	0.05 0.04	39.0	—
	08/08/12–08/10/12	S	700	10.8	<0.11 0.2	0.06 0.05	32.9	—
	08/10/12–08/11/12	S	505	19	0.53 0.75	0.27 0.23	208	—
	08/11/12–08/12/12	S	413	18.4	<0.22 0.27	0.07 0.06	53.7	—
	08/12/12–09/07/12	L	3,859	44.3	0.05 0.07	0.02 0.02	19.5	—
Health service center 37°19'55" N 140°50'17" E	09/07/12–09/30/12	L	3,376	59.4	0.11 0.17	0.06 0.05	44.4	—
	08/06/12–08/06/12	S	80	4	<1.09 <1.29	<0.50	<202	0.16
	08/07/12–08/07/12	S	370	7	0.47 0.69	0.25 0.21	186	0.13
Junior high school 37°19'51" N 140°48'52" E	08/08/12–08/08/12	S	357	3.8	0.26 0.45	0.16 0.13	109	0.11
	08/10/12–08/10/12	S	354	16.6	<0.28 <0.34	<0.13	<52.2	0.15
Tamano area of Soma city 37°46'8" N 140°43'1" E	08/08/12–08/08/12	S	206	14.3	<0.38 0.72	0.21 0.18	116	0.66
	09/02/12–09/10/12	L	11,461	213.8	0.24 0.42	0.15 0.12	101	—
	09/10/12–09/18/12	L	11,473	219.3	0.28 0.47	0.16 0.14	117	—
	09/18/12–09/24/12	L	8,596	96.7	0.1 0.2	0.07 0.06	44.6	—
	09/24/12–10/01/12	L	10,083	107.3	0.14 0.22	0.08 0.07	56.9	—
	08/09/12–08/09/12	S	211	2.6	<0.47 0.71	0.22 0.19	127	0.26
Haramachi area of Minamisoma city 37°38'37" N 140°55'27" E	09/02/12–09/10/12	L	5,629	78.4	0.46 0.79	0.27 0.23	193	—
	09/10/12–09/18/12	L	5,783	90.3	0.43 0.63	0.23 0.19	170	—
	09/18/12–09/24/12	L	4,406	54.3	0.25 0.34	0.12 0.1	96.6	—
09/24/12–10/01/12	L	5,043	65.2	0.31 0.46	0.17 0.14	123	—	

\*Committed effective doses from inhalation of radiocesium were calculated using effective dose coefficients (0.020  $\mu$ Sv/Bq for <sup>137</sup>Cs and 0.039  $\mu$ Sv/Bq for <sup>134</sup>Cs in the case of adults and 0.041  $\mu$ Sv/Bq for <sup>134</sup>Cs and 0.070  $\mu$ Sv/Bq for <sup>137</sup>Cs in the case of children aged 3–7 y). It was assumed that radioactive cesium was in the respirable fraction and that a standard adult and child inhale 15.7 and 10.1 m<sup>3</sup> air, respectively. L, long-term sampling (over 1 wk); S, short-term sampling (within 24 h).

<sup>†</sup>Aged 3–7 y.

<sup>‡</sup>Cloudshine was calculated using the dose rate coefficient from a semiinfinite volume source in the air to obtain the effective doses in adult (0.26 nSv/(Bq/m<sup>3</sup>)/h for <sup>134</sup>Cs and 0.093 nSv/(Bq/m<sup>3</sup>)/h for <sup>137</sup>Cs).

<sup>§</sup>Dose rate as of December 1, 2012.

**Table S7. Detailed results of annual radiation doses estimated from 2012 using the Monte Carlo method**

Area and Period	50th	75th	90th	95th	99th	99.9th
Annual dose (mSv) at each percentile points, %*						
2012						
Kawauchi village	0.82	1.08	1.40	1.65	2.17	3.16
Including eight outliers <sup>†</sup>	0.80	1.26	1.97	2.57	4.18	6.50
Tamano area	2.33	3.07	3.92	4.53	5.92	7.82
Haramachi area	1.47	1.75	2.04	2.24	2.67	3.26
10 y after 2012						
Kawauchi village	0.29	0.38	0.49	0.58	0.76	1.11
Tamano area	0.83	1.08	1.38	1.59	2.06	2.70
Haramachi area	0.52	0.62	0.72	0.79	0.93	1.14
50 y after 2012						
Kawauchi village	0.11	0.14	0.18	0.22	0.28	0.41
Tamano area	0.31	0.40	0.51	0.59	0.77	1.01
Haramachi area	0.19	0.23	0.27	0.29	0.35	0.42

\*Total radiation doses were generated  $10^4$  times for each study area and their percentile values are shown. Variation in time of cesium in food and aerosols other than physical decay was not considered.

<sup>†</sup>Eight sets of outlying data of the personal external dose rate in the village of Kawauchi are included and fitted to a log-normal distribution.

**Table S8. External dose calculated by exact solution based on log-normal distribution**

Area and period	50th	75th	90th	95th	99th	99.9th
Annual dose (mSv) at each percentile points, %*						
Without long-term migration of radiocesium into the soil						
10 y after 2012						
Kawauchi village	0.29	0.38	0.48	0.56	0.74	1.11
Tamano area	0.82	1.06	1.35	1.55	2.02	2.72
Haramachi area	0.52	0.61	0.71	0.78	0.93	1.12
50 y after 2012						
Kawauchi village	0.11	0.14	0.18	0.21	0.27	0.42
Tamano area	0.30	0.40	0.50	0.58	0.75	1.01
Haramachi area	0.19	0.23	0.27	0.29	0.34	0.42
With long-term migration of radiocesium into the soil <sup>†</sup>						
10 y after 2012						
Kawauchi village	0.20	0.26	0.34	0.40	0.52	0.76
Tamano area	0.56	0.74	0.95	1.09	1.42	1.85
Haramachi area	0.36	0.42	0.49	0.54	0.64	0.77
50 y after 2012						
Kawauchi village	0.04	0.05	0.07	0.08	0.11	0.16
Tamano area	0.12	0.16	0.20	0.23	0.30	0.39
Haramachi area	0.07	0.09	0.10	0.11	0.13	0.16

\*Total radiation doses were generated  $10^4$  times for each study area and their percentile values are shown. Variation in time of cesium in food and aerosols other than physical decay was not considered.

<sup>†</sup>A reduction factor was considered in addition to the physical decay of radionuclides.



**Table S9. Annual effective dose in Japan from natural radiation and fallout from nuclear tests**

Form of exposure	Source	Effective dose, mSv/y
Natural exposure		
External		
	Cosmic ray	0.3* (0.23–0.32) <sup>†</sup>
	Terrestrial radiation	0.33* (0.12–0.52) <sup>‡</sup>
Internal		
Inhalation		
	Radon	0.37* (0.36–0.51) <sup>§</sup>
	Thoron	0.09*
	Smoking: <sup>210</sup> Pb and <sup>210</sup> Po	0.01*
	Other nuclides: U, etc.	0.006*
Ingestion		
	<sup>210</sup> Po	0.73* (0.15–0.81) <sup>¶</sup>
	<sup>210</sup> Pb	0.058* (0.03–0.16) <sup>  </sup>
	Tritium	0.0000082*
	<sup>14</sup> C	0.0025*
	<sup>40</sup> K	0.18*
	Total natural exposure	2.09* (1.38–2.21)**
	Variation in background exposure	0.85 (0.47–0.95) <sup>††</sup>
Artificial exposure		
Internal		
	<sup>90</sup> Sr	0.0017*
	<sup>137</sup> Cs	0.00078*
	<sup>239</sup> Pu and <sup>240</sup> Pu	0.00000097*
	Total artificial exposure	0.0025

\*Typical dose estimates in Japanese (24).

<sup>†</sup>Range (minimum–maximum) of means among 47 prefectures (25).

<sup>‡</sup>Range (minimum–maximum) of means among 47 prefectures (26).

<sup>§</sup>Range (minimum–maximum) of means among 9 regions in Japan (27, 28).

<sup>¶</sup>Range (minimum–maximum) of estimates among 7 major cities in Japan (29).

<sup>||</sup>Range (minimum–maximum) of estimates among 5 studies in Japan (30).

\*\*Variation in total dose of natural radiation was calculated by bootstrapping the dose from ingestion of <sup>210</sup>Po and <sup>210</sup>Pb and the dose of external exposure and radon inhalation in 47 prefectures (1,000 iterations). Other exposures were assumed to be constant across Japan. Mean of 5th and 95th percentile doses of the bootstrap dataset is presented.

<sup>††</sup>Median of the difference between 5th and 95th percentile doses of the bootstrap dataset is presented with a 95% CI.

**Table S10. Lifetime attributable risk of cancer incidence to an age of 89 y from 2012 in current study areas with a reduction factor for the long-term migration of radiocesium**

Age in 2012, y	Area	All solid cancers			Leukemia			Breast cancer	
		Lifetime exposure, mSv	LAR, %		Lifetime exposure, mSv	LAR, %		Lifetime exposure, mSv	LAR, %
			Male	Female		Male	Female		Female
1	Kawauchi	8.9	0.173	0.260	9.2	0.008	0.005	10.1	0.073
	Tamano	25.3	0.491	0.737	26.0	0.023	0.016	28.5	0.207
	Haramachi	15.2	0.295	0.442	15.6	0.014	0.009	17.2	0.125
	LBR		43.92	31.76		0.71	0.51		6.29
10	Kawauchi	8.8	0.138	0.204	9.0	0.006	0.004	10.1	0.049
	Tamano	25.0	0.389	0.578	25.6	0.016	0.010	28.5	0.138
	Haramachi	15.0	0.234	0.347	15.4	0.010	0.006	17.2	0.083
	LBR		43.96	31.76		0.67	0.48		6.28
20	Kawauchi	8.5	0.103	0.149	8.5	0.004	0.003	9.8	0.029
	Tamano	24.2	0.290	0.422	24.1	0.012	0.008	27.6	0.081
	Haramachi	14.5	0.174	0.254	14.5	0.007	0.005	16.6	0.049
	LBR		44.02	31.75		0.63	0.45		6.29

LAR, lifetime attributable risk; LBR, lifetime baseline risk.

Lifetime exposure doses were calculated using means for corresponding areas in 2012 with a physical decay of radiocesium and a reduction factor for the migration of radiocesium.

**Table S11. Attributable risk of cancer incidence for the 15 y from 2012 in current study areas**

Age in 2012, y	Area	All solid cancers			Leukemia			Breast cancer	
		15-y exposure, mSv	AR <sub>15y</sub> , %		15-y exposure, mSv	AR <sub>15y</sub> , %		15-y exposure, mSv	AR <sub>15y</sub> , %
			Male	Female		Male	Female		Female
1	Kawauchi	6.3	0.001	0.002	6.7	0.003	0.002	7.1	0.001
	Tamano	17.9	0.004	0.007	18.9	0.009	0.006	20.0	0.002
	Haramachi	10.8	0.002	0.004	11.4	0.005	0.004	12.0	0.001
	BR <sub>15</sub>		0.09	0.10		0.06	0.05		0.00
10	Kawauchi	6.3	0.002	0.003	6.5	0.001	0.001	7.2	0.001
	Tamano	17.8	0.004	0.008	18.5	0.004	0.003	20.3	0.003
	Haramachi	10.7	0.003	0.005	11.1	0.002	0.002	12.2	0.002
	BR <sub>15</sub>		0.16	0.20		0.06	0.04		0.01
20	Kawauchi	6.1	0.002	0.005	6.1	0.001	0.001	7.0	0.001
	Tamano	17.3	0.006	0.015	17.3	0.003	0.002	19.9	0.004
	Haramachi	10.4	0.004	0.009	10.4	0.002	0.001	12.0	0.002
	BR <sub>15</sub>		0.34	0.69		0.04	0.03		0.17

The 15-y exposure doses were calculated using means for corresponding areas in 2012 with only physical decay of radiocesium. AR<sub>15y</sub>, 15-y attributable risk; BR<sub>15y</sub>, 15-y baseline risk.