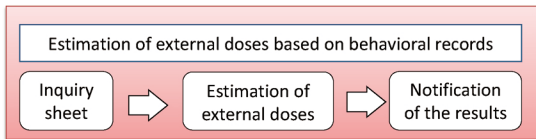


## A survey to obtain data that is to serve as the basis for monitoring and protecting residents' health

In order to estimate external doses, individuals were asked to keep and submit a record of their behavior.

Based on collected behavioral records for the four months from March 11 to July 11, 2011, each individual's external dose was estimated using the External Dose Estimation System developed by the National Institute of Radiological Sciences.

[Survey scheme]



Estimated results and the period for estimation are reported to participating individuals to let them know their own external doses, and at the same time, the obtained data are utilized in the Detailed Surveys and individuals' health management to be continued for the long term.

## [Period for estimation]

Behavior during the four months from March 11 to July 11, 2011

## [Coverage]

Approx. 2.06 million people

- Residents of the prefecture:

People with residence registration in the prefecture from March 11 to July 1, 2011

- People residing outside the prefecture:

- (1) People who were registered as residents in other prefectures but were residing in the prefecture from March 11 to July 1, 2011
- (2) People residing outside the prefecture who commuted to work or school in the prefecture from March 11 to July 1, 2011
- (3) People residing outside the prefecture who temporarily stayed in the prefecture from Mar. 11 to Mar. 25, 2011

(For people residing outside the prefecture, inquiry sheets were sent upon their request.)

# Basic Survey: Inquiry Sheets

There are two types of inquiry sheets: a detailed version and a simplified version.

## ● Detailed version (conventional version)

年月日	滞在場所	時 刻												地名・施設名
		0	3	6	9	12	15	18	21	24				
3/11 (金)	屋内	①												① 自宅 ② 車 ③ 会社
	移動	②												
3/12 (土)	屋内	④												④ 車中(○) ⑤ 中学校 ⑥ 知人宅(△) ⑦ 町字△
	移動	⑤												
3/13 (日)	屋内	⑧												⑧ 避難所(○) ⑨ 中学校(△)
	移動	⑨												
3/14 (月)	屋内	⑩												⑩ 避難宿泊所(▽) ⑪ 町▽温泉▽▽
	移動	⑪												
3/15 (火)	屋内	⑫												⑫ 電車 ⑬ 知人宅(○) ⑭ 市○○(△)
	移動	⑬												

All respondents were asked to record the activities they conducted on an hourly basis for the period from March 11 to March 25, but the simplified inquiry sheet allows some respondents to summarize their behavior and only enter basic behavioral patterns for a certain period of time.

In November 2013, a simplified inquiry sheet was introduced.

## ● Simplified version

期 間	滞 在 地 等
平成23年 3月11日	①この期間の居住地は、2ページで記載した住所と同じですか？ □同じ (□表紙の住所 □3月11日の住民票住所 □現住所) □異なる (下記□記入ください。)
___月___日	②居住地の途々でのこの期間、平均的にみると屋外にいる時間は、 1日あたりどのくらいでしたか？ □1時間 □2時間 □3時間 □4時間以上 [___]時間
行動パターン 大きく変わった は、その日の を記入し、変 らなかった人 は7月11日と記入 してください。)	③定期的な外出先 (勤務先や学校など) はありましたか？ □いいえ (次の欄にお読みください) □はい (3ページと同じであれば、外出先と住所の記入は不要) 外出先施設名: _____ 新道 市区 区町 市 郡 部 村
	④の外出先での滞在時間は、1日あたりどのくらいでしたか？ 屋内 [___] 時間 屋外 [___] 時間 外出する曜日とは？ (○で選択) : 月・火・水・木・金・土・日 その他にも、よく外出する先がありましたか？ □いいえ (次の欄にお読みください) □はい 外出先施設名: _____ 新道 市区 区町 市 郡 部 村
	④の外出先での滞在時間は、1日あたりどのくらいでしたか？ 屋内 [___] 時間 屋外 [___] 時間 外出する曜日とは？ (○で選択) : 月・火・水・木・金・土・日

## [Requirements for using the simplified inquiry sheet]

People who have experienced none or only one significant behavioral pattern change (such as a change of residence, school or workplace due to evacuation or moving) in the four months following the earthquake

## Examples

1 A person who was residing in Fukushima City at the time of the earthquake, evacuated to Kanagawa on March 15 and continued staying in Kanagawa until July 11

Moved once

**Simplified  
version**

2 A person who was residing in Fukushima City at the time of the earthquake, evacuated to Aizuwakamatsu on March 18 but returned to Fukushima City on June 10

Moved twice

**Detailed  
version**

# Basic Survey: Analysis Methods

## (Behavioral Pattern Survey and Dose Rate Map)

### Behavioral pattern survey

Examine behavioral patterns based on inquiry sheets of the Fukushima Health Management Survey

#### Survey period

Four months from March 11 to July 11, 2011

#### Surveyed items

- Stays (places, hours and building structures)
- Moves (places and hours)

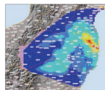
区 分 月 日	滞在 場所	時 刻							地名・施設名		
		0	3	6	9	12	15	18		21	24
記	屋内	①			④			④			①自宅 ②自宅の知 ③車内 ④避難所
入	移動	③									
例	屋外	②(80分)			⑤(120分)					(○)市××中学校(☉) ●○○市××町字△△	

Calculation of cumulative effective doses

Evaluate effective doses based on behavioral patterns and dose rate maps

### Dose rate maps

Prepare maps showing average daily effective dose rates based on data of SPEEDI and the Ministry of Education, Culture, Sports, Science and Technology (MEXT)



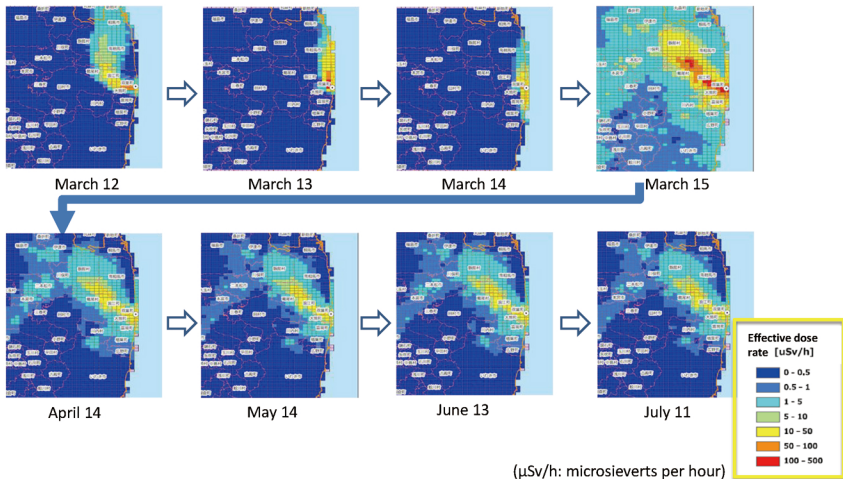
- March 12 to 14 Evaluation results by SPEEDI (effective dose rates)
- From March 15 onward Monitoring data released by MEXT (at that time) (ambient dose equivalent rates)

Convert ambient dose equivalent rates to effective dose rates by multiplying by 0.6

- Divide into 2 km × 2 km grids
  - Interpolate discrete data using software to create a map
- \* Values of natural radiation are not included.

# Basic Survey: Analysis Methods

## (Time-Series Dose Rate Maps)



# Basic Survey: Obtained Responses and Their Representativeness

The response rate was 27.7% for the entire Fukushima Prefecture. However, as a result of the examination on the representativeness, the dose distribution based on the responses obtained so far in the seven districts in the prefecture was found to be unbiased and to properly represent that of respective districts.

Table 1

## Responses to the Basic Survey

As of March 31, 2021

Coverage		2,055,237	
Number of responses	Detailed version	493,890	24.0%
	Simplified version	74,953	3.6%
	Total	568,843	27.7%

\* Response rates are rounded off for each category.

Table 2

## Response rate by age group

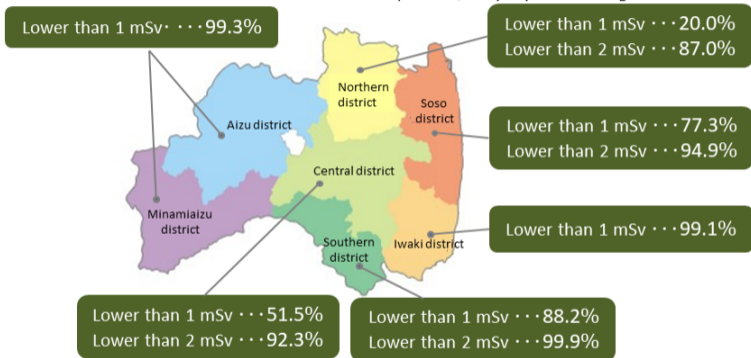
As of March. 31, 2021

Age group	0~9	10~19	20~29	30~39	40~49	50~59	60~	Total
Response rate	46.6%	36.3%	18.2%	24.8%	22.5%	23.0%	27.9%	27.7%

\* Rates (%) are rounded off.

## Results of estimated external effective doses by district

(for 466,639 people excluding radiation workers)



## Evaluation of estimated effective doses

Past epidemiological studies have not confirmed clear health effects of radiation below 100 mSv. Therefore, the estimated external effective doses, though covering only four months, can be evaluated as values that are unlikely to show any health effects caused by radiation.