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Ten-year Pregnancy and Birth Survey Results and Four-year Post-disaster Follow-up Findings

ISHII Kayoko

Department of Midwifery and Maternal Nursing,
Fukushima Medical University School of Nursing

Office of Pregnancy and Birth Survey,
Radiation Medical Science Center for the Fukushima Health Management Survey

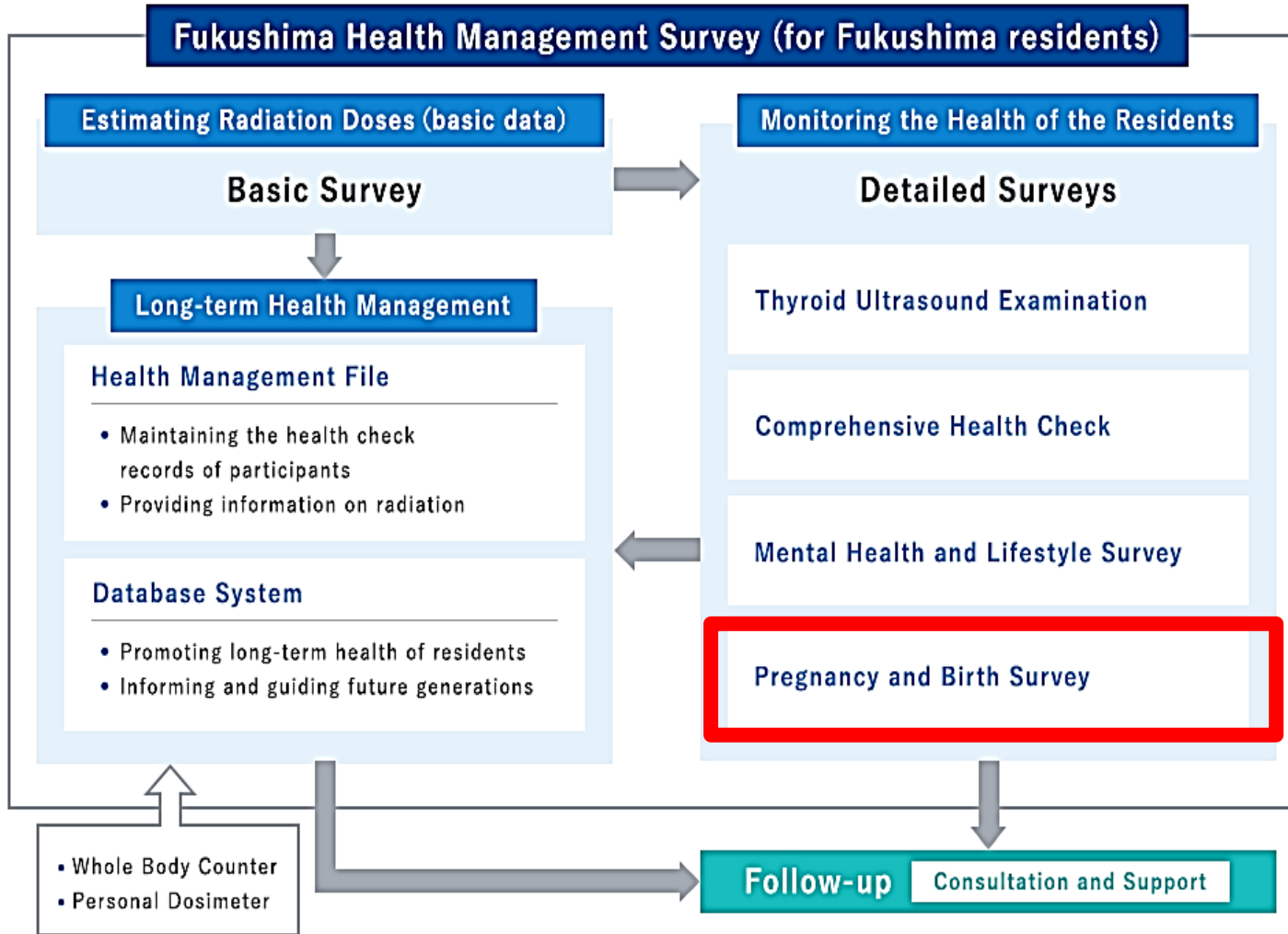


COI Disclosure

ISHII Kayoko

The presenter declares no conflicts of interest related to this presentation.

Overview of the Fukushima Health Management Survey



Personal attributes

- Age, Area
- Medical history, Pregnancy history

Perinatal period

- Perinatal care
- Diseases during pregnancy

Child health

- Gestational week, Birth weight
- Congenital disorders

Child rearing

- Depressive symptoms, Free written opinions
- Confidence in child rearing

Number of survey participants and response rate

The response rate of this survey has remained at about 50%.

Main survey

Fiscal year	Eligible persons	Responses from	
FY2011	16,001人	9,316人	(58.2%)
FY2012	14,516人	7,181人	(49.5%)
FY2013	15,218人	7,260人	(47.7%)
FY2014	15,125人	7,132人	(47.2%)
FY2015	14,572人	7,031人	(48.3%)
FY2016	14,154人	7,326人	(51.8%)
FY2017	13,552人	6,449人	(47.6%)
FY2018	12,838人	6,649人	(51.8%)
FY2019	11,909人	6,328人	(53.1%)
FY2020	11,382人	6,359人	(55.9%)
FY2021	(The main survey ended in FY2020.)		
FY2022			

Conducted the first follow-up survey in approx. 4 years after delivery

Eligible person:	Responses from	
7,252人	2,554人	(35.2%)
5,602人	2,021人	(36.1%)
5,734人	2,706人	(47.2%)
5,856人	2,719人	(46.4%)

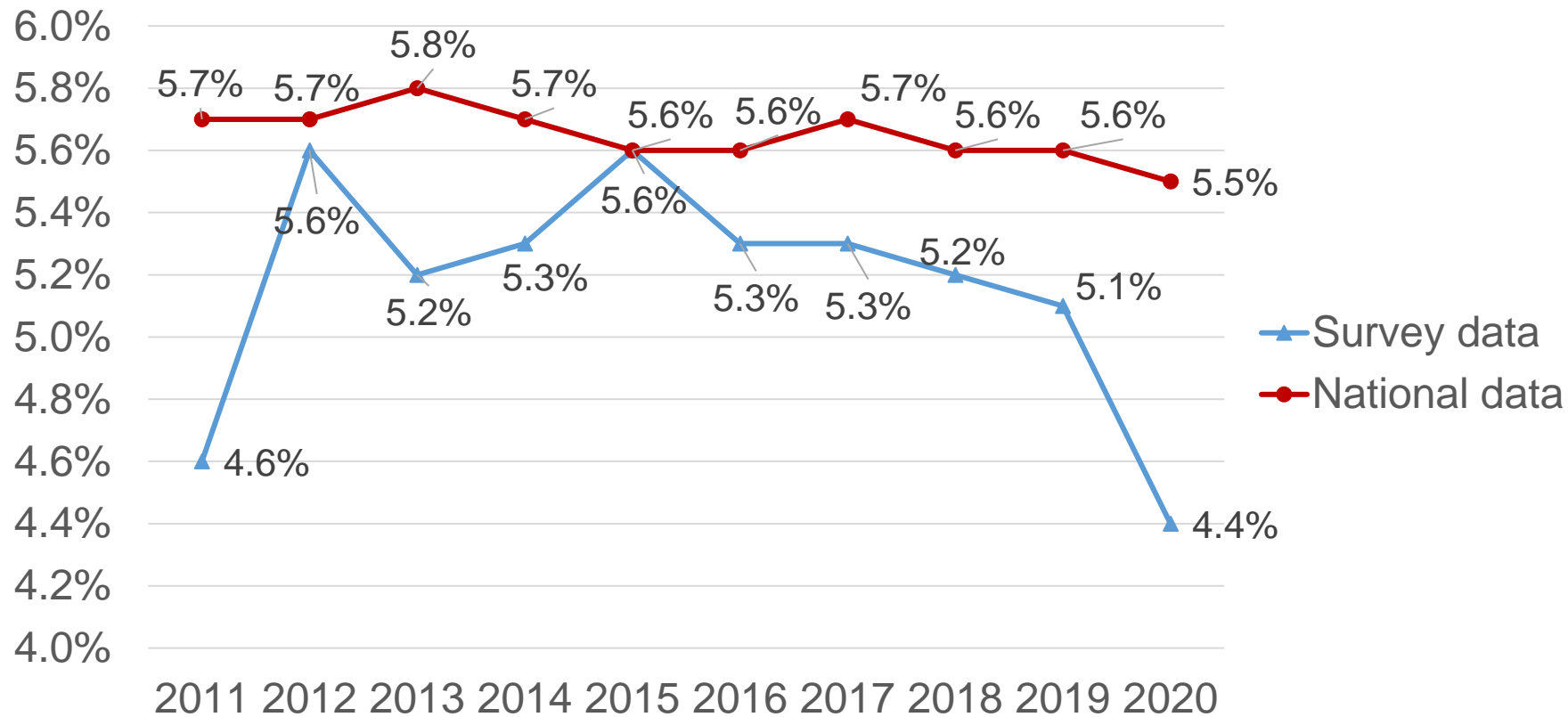
Conducted the second follow-up survey in approx. 8 years after delivery

Eligible person:	Responses from	
6,643人	2,354人	(35.4%)
5,152人	2,178人	(42.3%)
5,402人	2,492人	(46.1%)
5,248人	2,266人	(43.2%)

Proportion of preterm deliveries

(Childbirth occurring from 22 to less than 37 weeks of gestation)

Proportion of preterm deliveries is similar to national survey data.

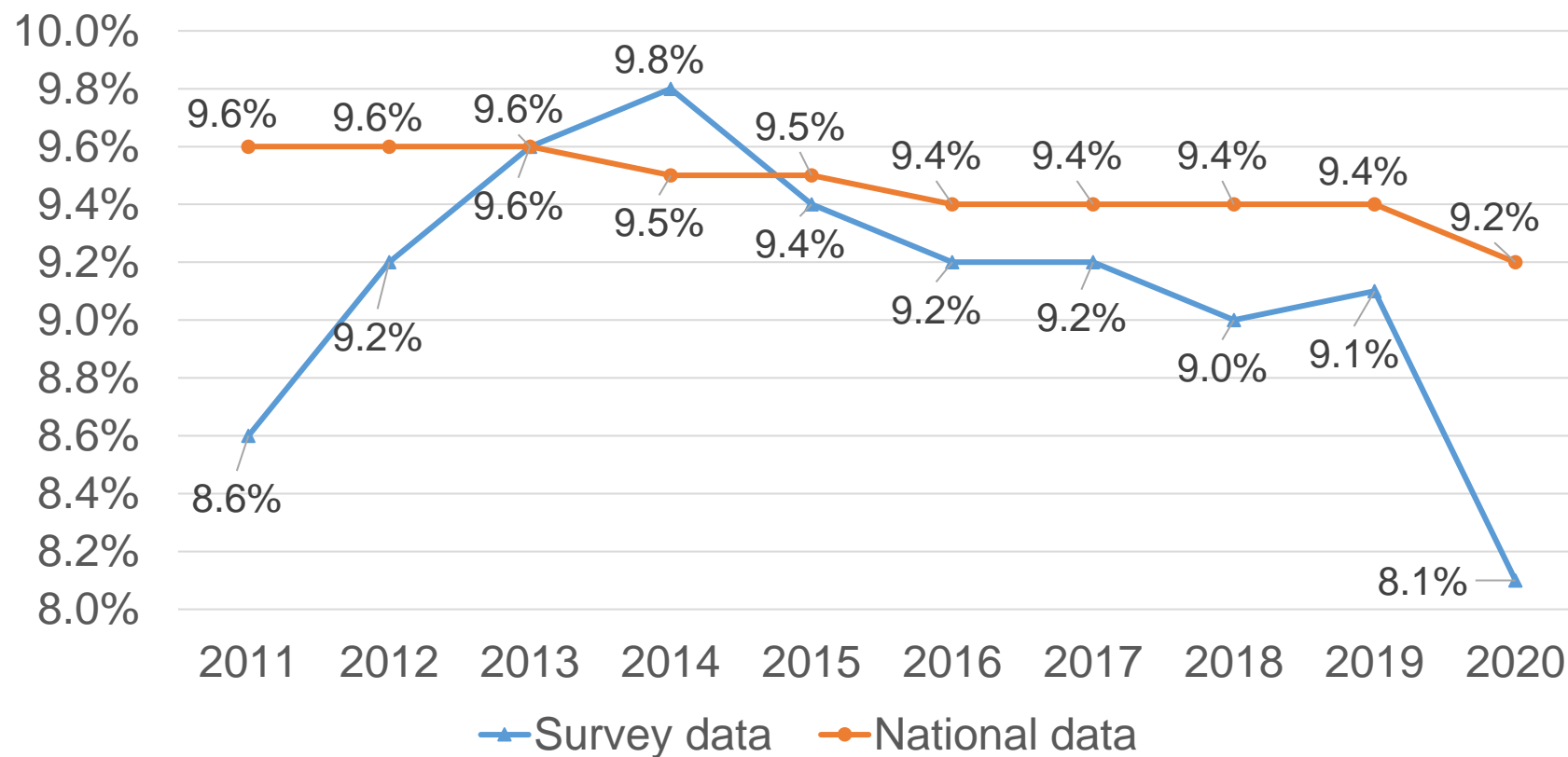


Vital Statistics of the Ministry of Health, Labor and Welfare

Proportion of low birth weight infants

(Low birth weight: less than 2,500 g)

Proportion of low birth weight infants is similar to national survey data.

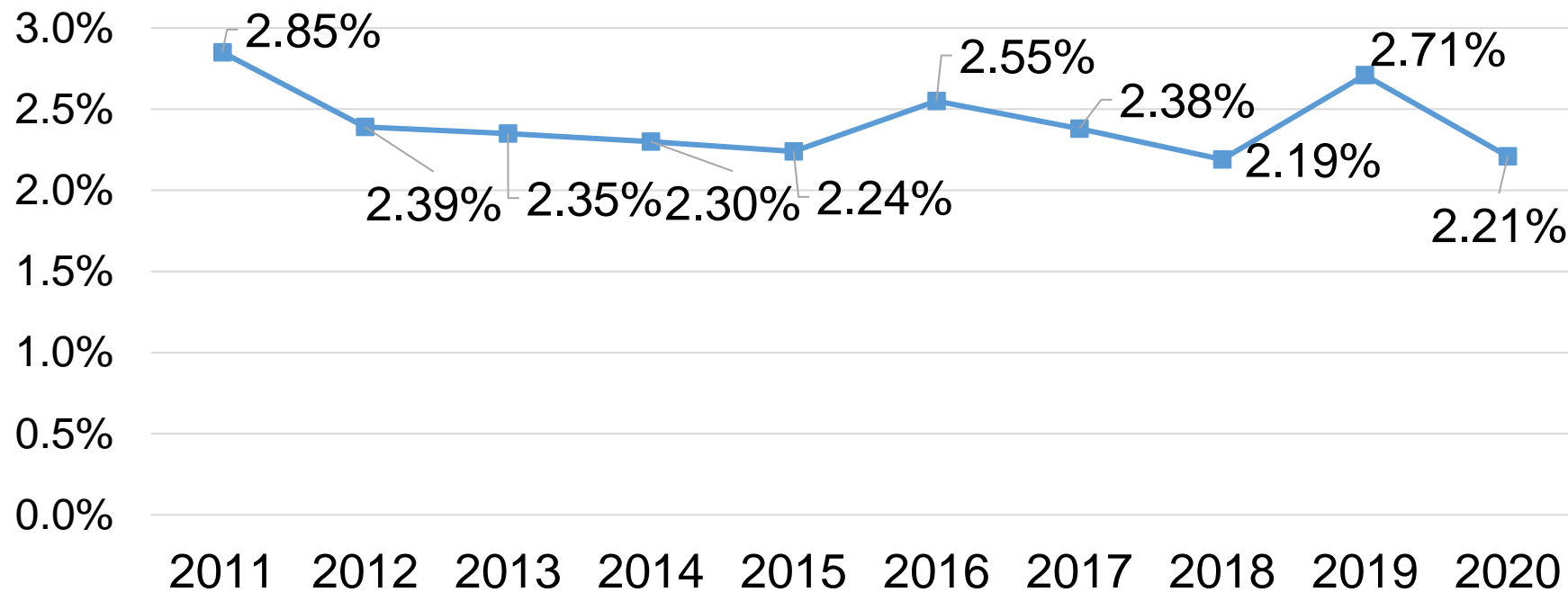


Vital Statistics of the Ministry of Health, Labor and Welfare

Incidence of congenital disorders in singletons

(Physical disorders in infants that occur during the prenatal period)

Incidence of congenital disorders in singletons is similar to national data for all births.

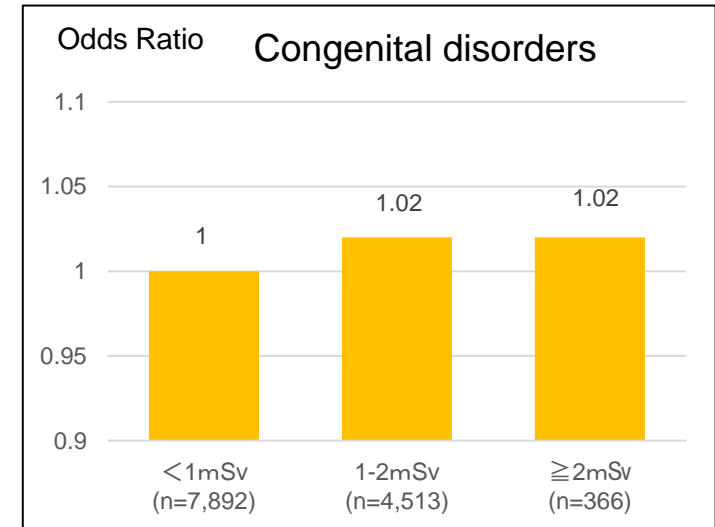
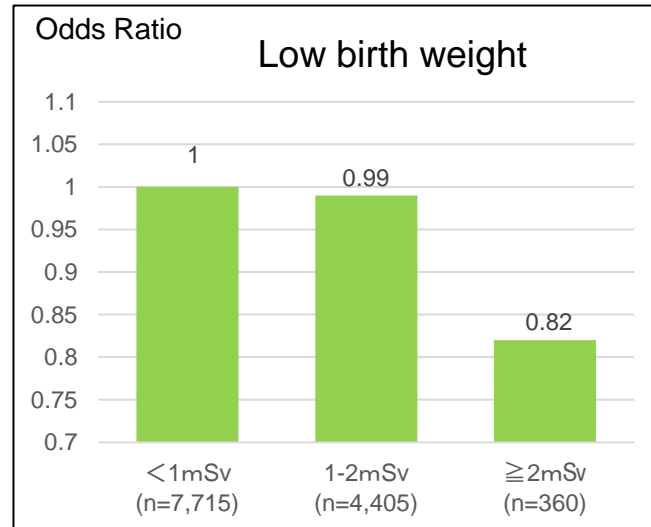
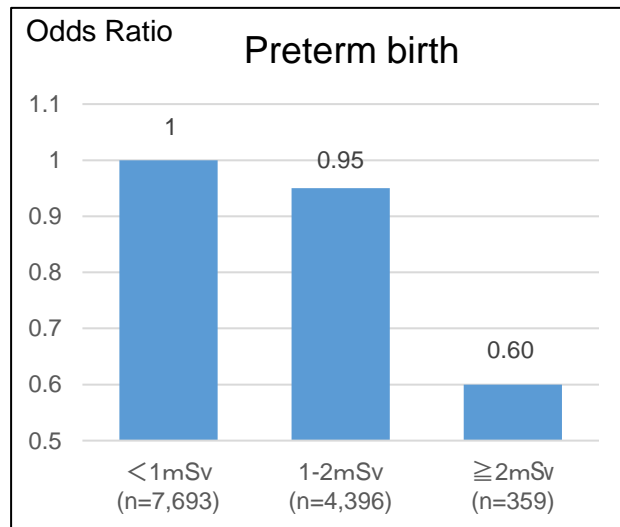


The frequency of morphologically identifiable congenital disorders at birth is estimated to be 2–3%.

Obstetrics Practice Guidelines in 2023

Effects of radiation exposure on preterm birth, low birth weight, and congenital disorders

No differences were observed even when external radiation doses during the first four months after the disaster were categorized into three groups (low, medium, and high).



Multivariable logistic regression analysis

Covariates: maternal age; infant sex; number of days since the disaster; primiparity; placenta previa; hypertensive disorders of pregnancy; use of infertility treatment; presence of mental health problems; residence in an evacuation area

Yasuda S, Okazaki K, Nakano H, et al.: J Epidemiol 2022; 32(Suppl 12): S104-S114.

Assessment of depressive symptoms

Two questions

◆ Have you often been feeling down or depressed over the past month?

Yes No

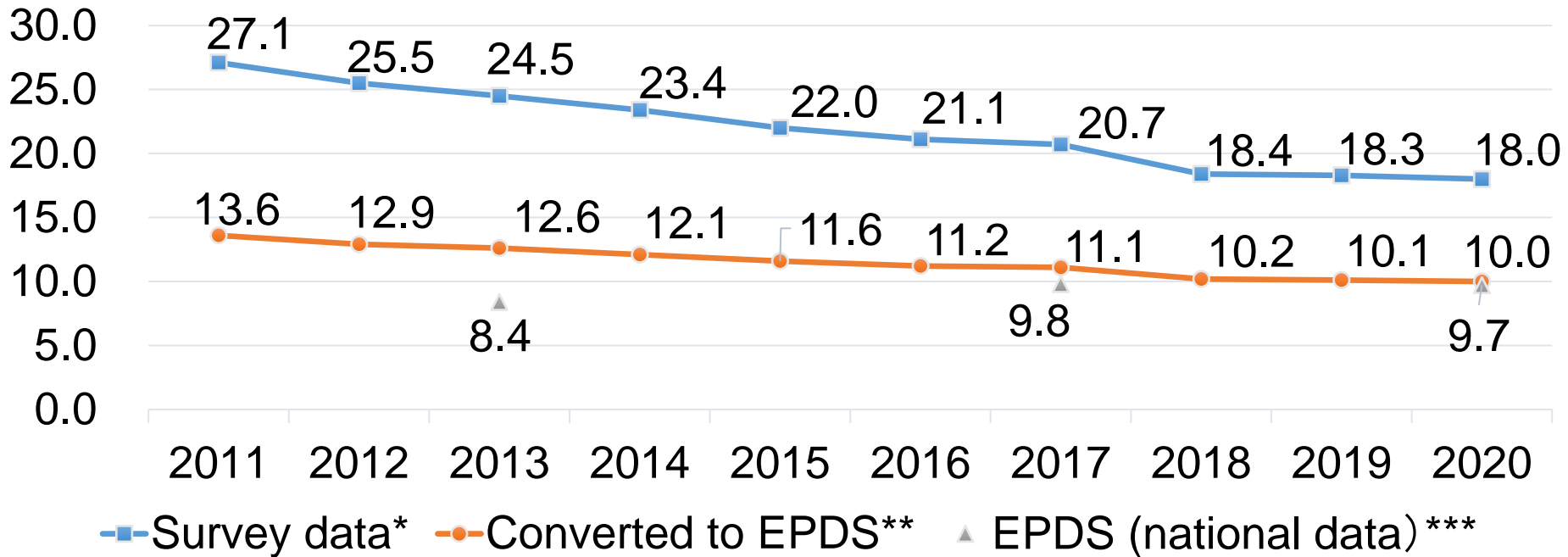
◆ Have you found little interest or pleasure in doing things over the past month?

Yes No

Depressive Symptoms:

YES to one or both of the two questions

Proportion of depressive symptoms



* Pregnancy and Birth Survey reports ** Mishina H, et al. *Pediatr Int.* 2009; 51: 48.

*** Healthy Parents and Children project in Japan: Edinburgh Postnatal Depression Scale (EPDS)

The proportion with depressive symptoms among mothers immediately after the disaster was higher than in national surveys, but it is gradually recovering to the national level.

Depressive symptoms and evacuation status (FY2012-2013)

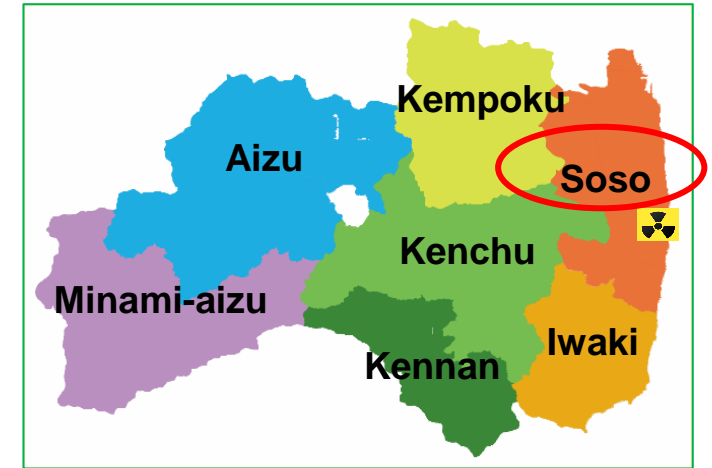
FY2012



FY2013



■ Depression ■ No Depression **p<.001, *p<.01

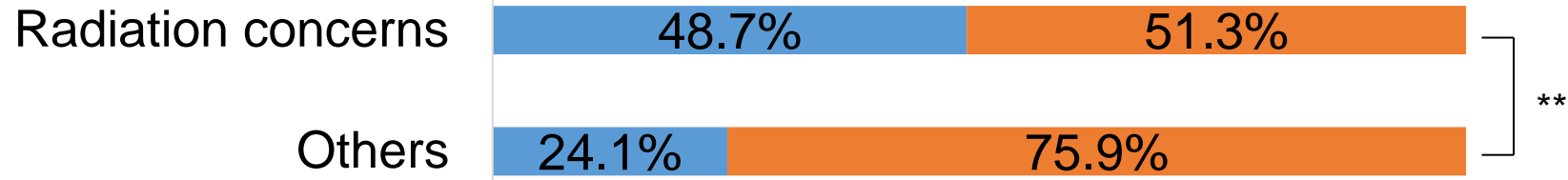


The proportion of mothers with depressive symptoms was higher among those who were evacuated than among those who were not.

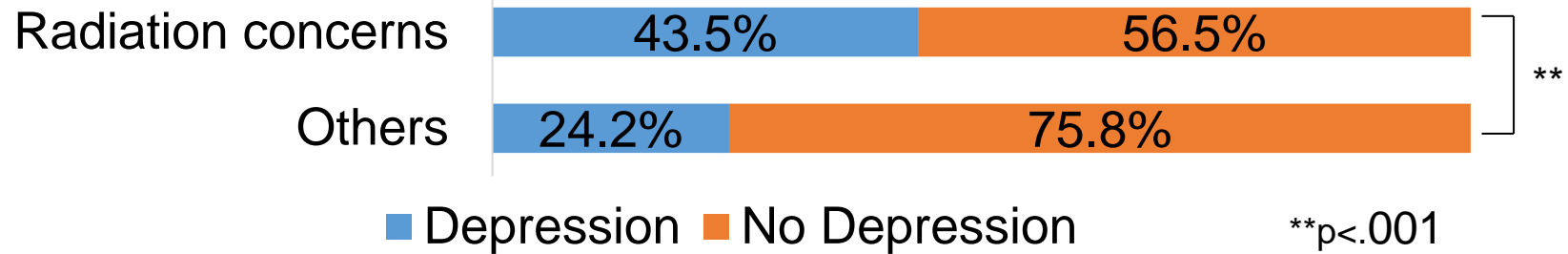
Goto A, Bromet EJ, Ota M, et al. Asia Pac J Public Health. 2017; 29: 139S-150S.

Depressive symptoms and reasons for bottle-feeding

FY2012



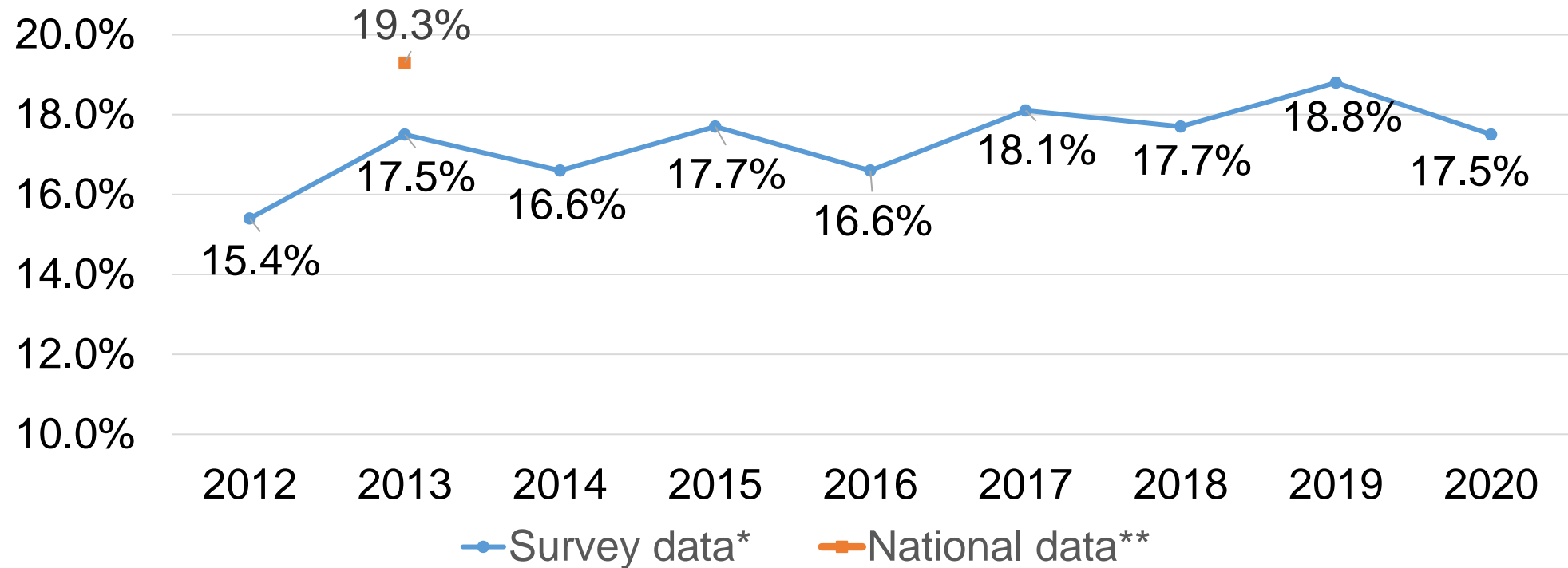
FY2013



Mothers who chose bottle-feeding due to concerns about radioactivity in breast milk showed a higher prevalence of depressive symptoms.

Goto A, Bromet EJ, Ota M, et al. Asia Pac J Public Health. 2017; 29: 139S-150S.

Lack of confidence in child-rearing (by fiscal year)



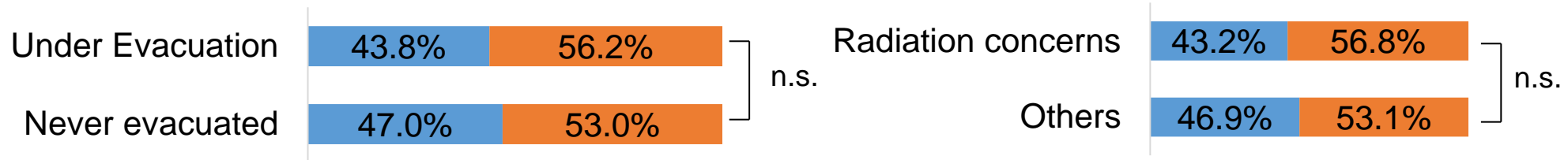
* Pregnancy and Birth Survey reports

** Proportion of mothers lacking confidence in child-rearing at children's 3–4-month health checkups: Health and Labor Sciences Research in FY2013

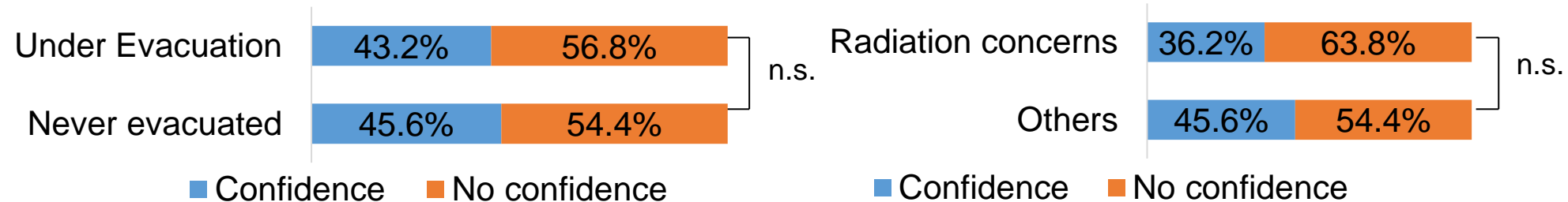
The proportion of mothers lacking confidence in child-rearing is similar to national survey data.

Confidence in child-rearing, evacuation status and reasons for bottle-feeding

FY2012



FY2013



The disaster affected maternal depressive symptoms but did not affect mothers' confidence in child-rearing.

Goto A, Bromet EJ, Ota M, et al.: Asia Pac J Public Health. 2017 Mar;29(2_Suppl):139S-150S.

Factors related to no planning a future pregnancy (FY2012-2014)

	2012	2013	2014	2015	2016	2017	2018	2019	2020
No Planning (%)	45.4	45.6	41.3	45.7	44.4	46.5	46.6	47.9	49.2

Characteristics of mothers not planning a future pregnancy

Older maternal age, Depressive symptoms, Poor subjective health

Primipara

- Bottle-fed because of radiation concerns
- Child's congenital disorders
- Dissatisfaction with obstetric care
- Separated from partner

Multipara

- Infertility treatment

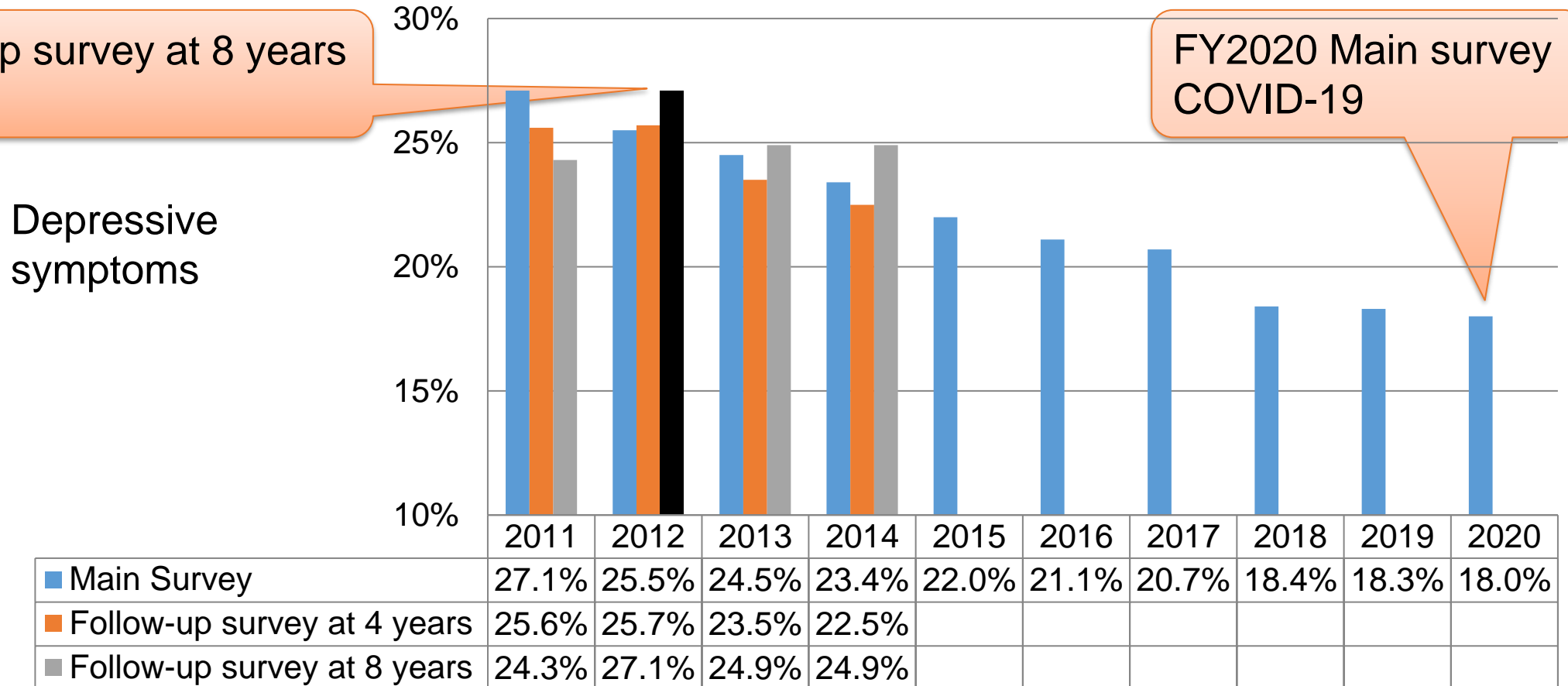
Goto A, Tsugawa Y, Fujimori K, et al.: J Epidemiol 2019; 29(8): 308-314.

Follow-up survey: Depressive symptoms

- Mothers who gave birth soon after the disaster had higher depressive symptoms and greater concerns about radiation effects on their children.
- Their depressive symptoms remained relatively high even 4 and 8 years after the disaster.



FY2020 Follow-up survey at 8 years
COVID-19

FY2020 Main survey
COVID-19





Developing and recovering from depression at 4 years after childbirth

Developing Depression Group

No depressive symptoms postpartum  ⇒ Depressive symptoms at 4 years postpartum 

- **Not so healthy and Not healthy** (*3.78 times higher than those reporting Very healthy*)
- **History of mental illness** (*1.66 times higher than those with no such history*)
- **Lack of confidence in child-rearing** (*1.67 times higher than those with confidence*)
- **Reason for not planning a future pregnancy was concern about radiation effects** (*1.82 times higher than reasons other than radiation*)

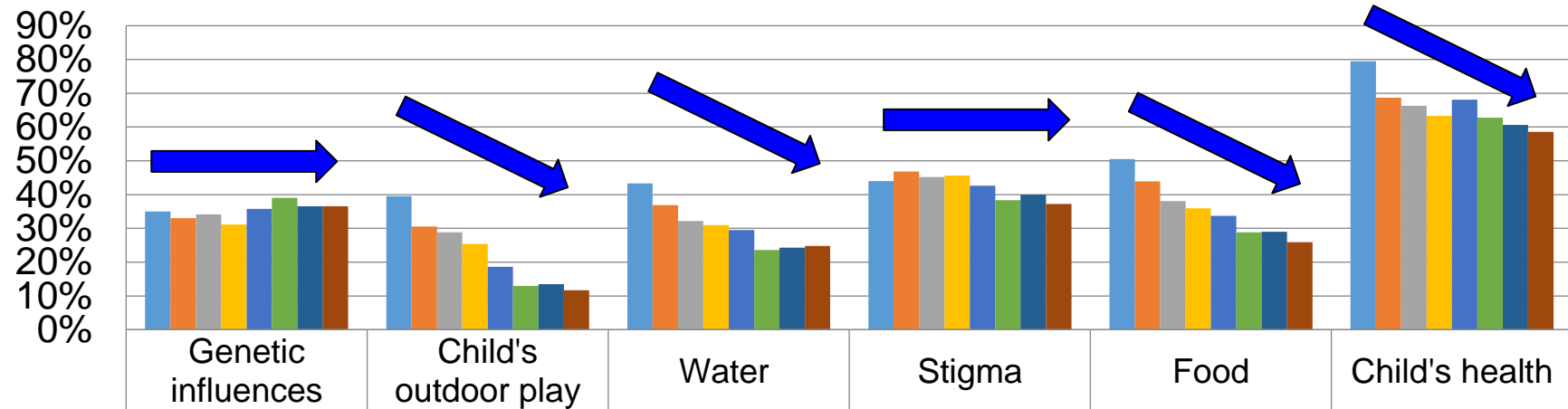
Depression Recovery Group

Depressive symptoms postpartum  ⇒ No depressive symptoms at 4 years postpartum 

- **Very healthy** (*2.47 times higher than those reporting Not so healthy and Not healthy*)
- **No history of mental illness** (*1.65 times higher than those with such a history*)
- **Confidence in child-rearing** (*1.53 times higher than those without confidence*)
- **Planning a future pregnancy** (*1.40 times higher than those without planning*)
- **Received sufficient antenatal or delivery care** (*2.15 times higher than those who did not feel they received sufficient care*)

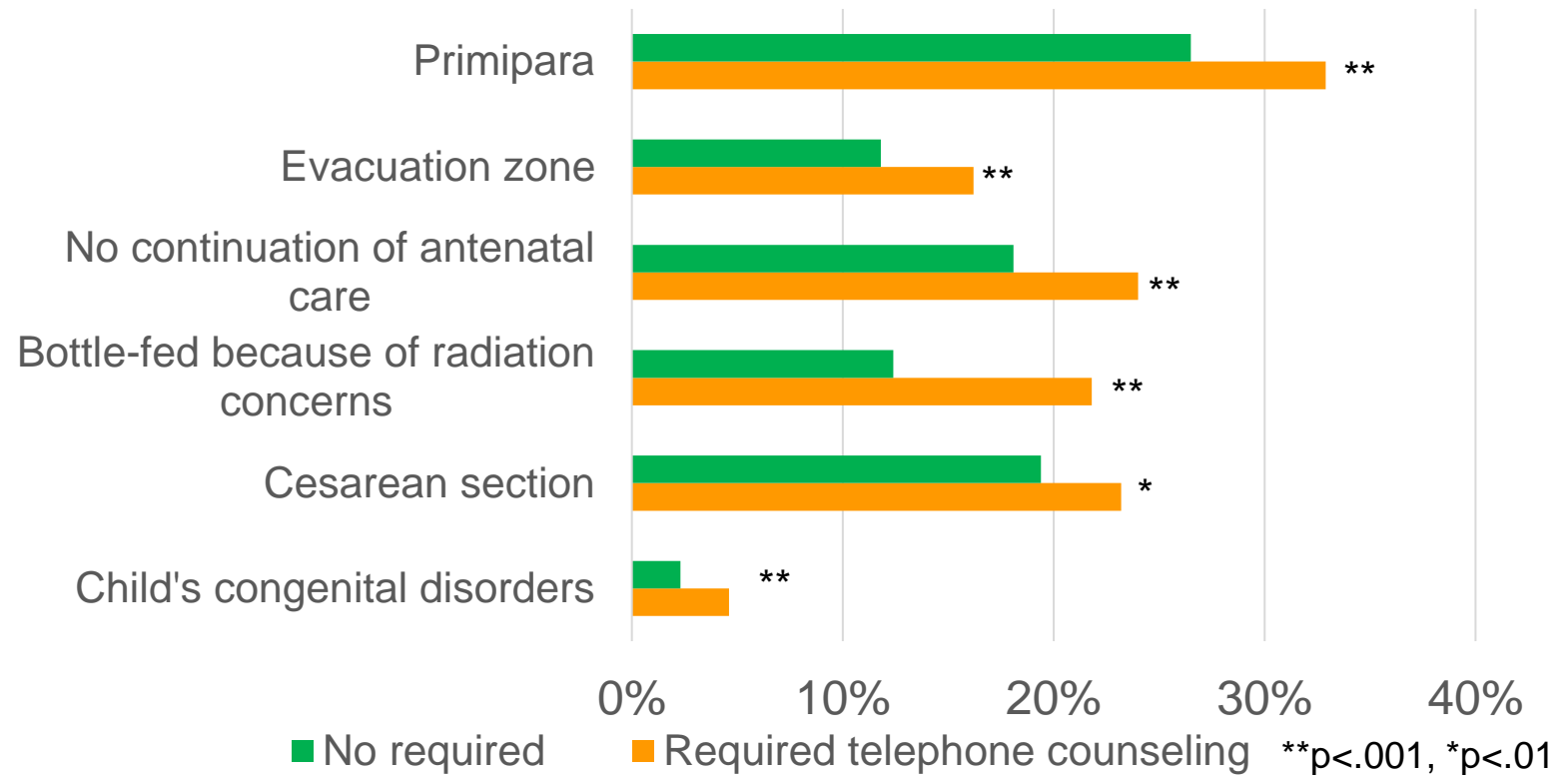
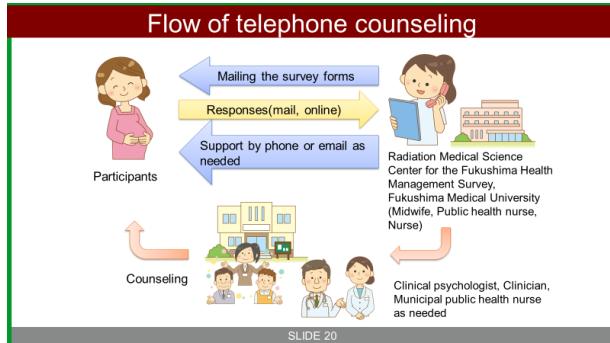
Follow-up: Concerns about the effects of radiation

- Concerns about outdoor play, water, food, and children's health have decreased over time.
- Concerns about genetic effects and social stigma have shown little change.



	Genetic influences	Child's outdoor play	Water	Stigma	Food	Child's health
FY2011's Follow-up	35.0%	39.5%	43.3%	44.0%	50.5%	79.5%
FY2012's Follow-up	33.0%	30.5%	36.9%	46.8%	43.9%	68.7%
FY2013's Follow-up	34.1%	28.8%	32.2%	45.2%	38.1%	66.3%
FY2014's Follow-up	31.1%	25.4%	31.0%	45.6%	35.9%	63.3%
2nd FY2011's Follow-up	35.8%	18.6%	29.5%	42.6%	33.7%	68.1%
2nd FY2012's Follow-up	39.0%	13.0%	23.6%	38.3%	28.8%	62.8%
2nd FY2013's Follow-up	36.5%	13.5%	24.3%	40.0%	29.0%	60.6%
2nd FY2014's Follow-up	36.5%	11.7%	24.8%	37.2%	25.9%	58.6%

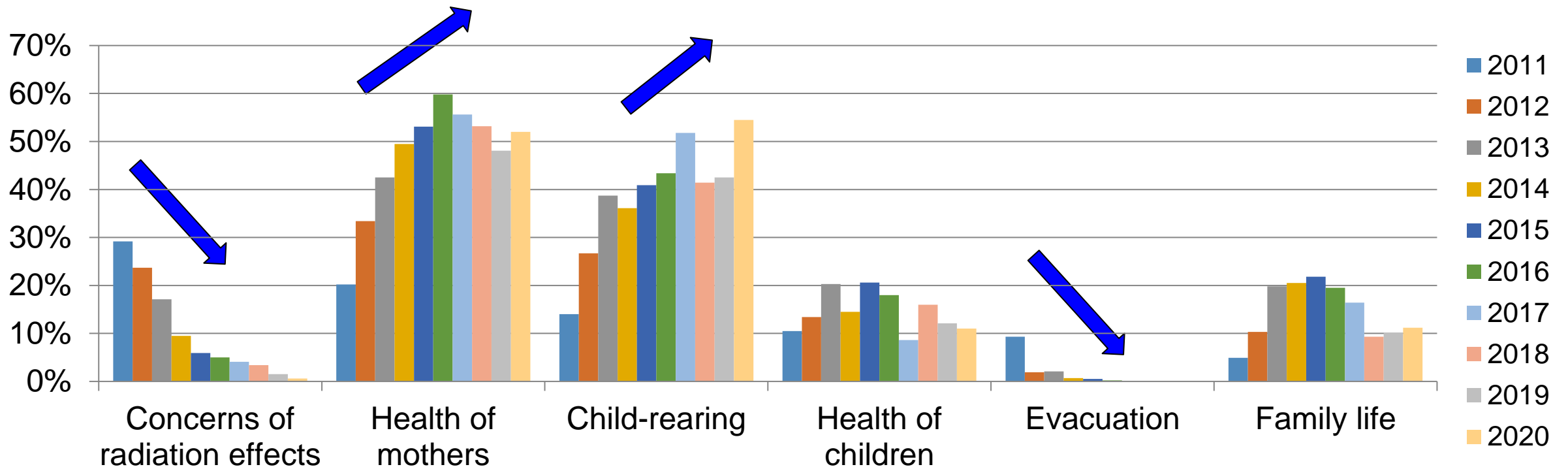
Characteristics of mothers who required telephone counseling (FY2011)



In addition to addressing concerns about radiation, routine child-rearing support, comparable to that provided in non-disaster settings, is also necessary.

Ishii K, Goto A, Ohta M, et al.: *Japan Soc Matern Health*. 2017; 57(4): 652-659.

Contents of consultations among mothers requiring telephone counseling



*Excluding others

Source: Pregnancy and Birth Survey reports

Number of consultations about concerns of radiation effects and/or evacuation is decreasing. Currently, the focus of consultation has shifted to mental and physical health and child-rearing.

Summary

- ❖ No significant association was observed between measured radiation exposure and adverse perinatal outcomes (preterm birth, low birth weight, congenital disorders) in this survey. However, psychological impacts—particularly postpartum depressive symptoms—increased immediately after the disaster.
- ❖ Although depressive symptoms gradually declined, follow-up surveys showed a resurgence during the COVID-19 pandemic among mothers who gave birth after the disaster.
- ❖ Even 4 and 8 years after childbirth, concerns about radiation-related genetic effects and stigma persisted among those who gave birth after the disaster.
- ❖ Even during disasters, not only disaster-specific care but also routine child-rearing support is essential.

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