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2023 年 福島県立医科大学『県民健康調査』国際シンポジウム
公立大学法人福島県立医科大学放射線医学県民健康管理センター
国際シンポジウム事務局(広報・国際連携室)
kenkani@fmu.ac.jp Tel: 024-581-5454 (平日9〜17時)
2023 Fukushima Medical University International Symposium on the Fukushima Health Management Survey
Secretariat of International Symposium
Office of Public Communications and International Cooperation, Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University
kenkani@fmu.ac.jp, TEL: +81-24-581-5454 (Weekday, 9a.m. - 5 p.m. JST)
Overview of this year’s results from the Fukushima Health Management Survey

Following up the health of Fukushima’s people over a long time to support their healthier future

KAMIYA Kenji
Radiation Medical Science Center for the Fukushima Health Management Survey, Fukushima Medical University
### Outline of the Fukushima Health Management Survey

#### Surveys (Basic Survey to estimate individual external exposure dose for four months after the accident and Detailed Survey to understand individual health conditions)

<table>
<thead>
<tr>
<th>Type</th>
<th>Participants</th>
<th>Number</th>
<th>Method of survey &amp; response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Survey</strong></td>
<td>Residents of and visitors to Fukushima during the disaster</td>
<td>Approx. 2.06 million</td>
<td>Self-report questionnaire to be submitted by post</td>
</tr>
<tr>
<td><strong>Detailed Surveys</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thyroid Ultrasound</strong></td>
<td>Preliminary Baseline Survey: All residents aged 18 or younger at the time of the disaster</td>
<td>Approx. 368,000</td>
<td>Thyroid examinations are performed at schools, medical facilities, and public facilities.</td>
</tr>
<tr>
<td></td>
<td>Full-Scale Surveys: In addition to those mentioned above, people who were born from April 2, 2011 to April 1, 2012</td>
<td>Approx. 381,000</td>
<td></td>
</tr>
<tr>
<td><strong>Comprehensive Health Check (CHC)</strong></td>
<td>Residents of 13 municipalities designated as evacuation zones (Other municipalities are covered by the prefectural health check program)</td>
<td>Approx. 210,000</td>
<td>Health checks are provided at medical facilities, municipal health check venues, etc.</td>
</tr>
<tr>
<td><strong>Mental Health and Lifestyle Survey (MHLS)</strong></td>
<td>Residents of 13 municipalities designated as evacuation zones</td>
<td>Approx. 210,000</td>
<td>Self-report questionnaire to be submitted by post or online</td>
</tr>
<tr>
<td><strong>Pregnancy and Birth Survey (PBS)</strong></td>
<td>Main Survey: Those who received a Maternal and Child Handbook in Fukushima Those who give birth in Fukushima Follow-up Survey: Respondents to the Main Survey</td>
<td>12,000 - 16,000/year</td>
<td>Self-report questionnaire to be submitted by post or online</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5,000 - 7,000/year</td>
<td></td>
</tr>
</tbody>
</table>
Summary of External Exposure Effective Dose during the First 4 Months after the Disaster

Excluding those engaged in radiation work

Participants: 466,972 residents
Results: Total 93.8%
- Kenpoku 87.0% below 2 mSv
- Kenchu 92.3%
- Kennan 88.2%
- Aizu, Minami-aizu 99.3%
- Iwaki 99.1%
- Soso 77.3%

Highest: 25 mSv, Average: 0.8 mSv, Median: 0.6 mSv

As of Mar. 31, 2022

The dose estimation results obtained from this survey were considered as "not being at a level where health effects can be confirmed with a statistical significance in light of the scientific knowledge obtained to date."
Thyroid Ultrasound Examination – Method

Preliminary baseline survey: Approx. 368,000
All residents of age 18 or less at the time of the disaster

Full-scale survey: Approx. 381,000
In addition, people who were born from April 2, 2011 to April 1, 2012

Procedure

Primary Examination (Ultrasonography)

- Ultrasound imaging

  - **Cyst**
    - Grade: A1, A2
      - Cyst ≤ 20.0 mm
      - Nodule ≤ 5.0 mm

  - **Nodule**
    - Grade: B, C
      - Cyst ≥ 20.1 mm
      - Nodule ≥ 5.1 mm

Confirmatory Examination
Advanced ultrasonography, blood test, urine test and fine needle aspiration cytology (if needed)

Next examination

Medical follow-up or treatment
Thyroid Ultrasound Examination – Provision of information

**Explanation sessions for parents**

**Participants**
Guardians, teachers, school staff, local gov’t officials, Residents, etc.

**Contents**
Briefing by the doctors about details of the examination, the latest findings, medical characteristics of thyroid and thyroid cancer, etc.

**Visiting lectures for students**

**Participants**
From the 5th grade of elementary school to senior high school students

**Contents**
- Lectures upon request by the school for a lesson period etc.
- Doctors explain about the thyroid examination simply with purpose-made educational textbooks
- Demonstration of ultrasonography by medical technologist

**Video**

Advantages and Disadvantages of Thyroid Examination

**Contents**
Explanation in detail of advantages and disadvantages of thyroid examinations using ultrasonography (“echo”).

Released on April 1st, 2020


**Thyroid Newsletter**

**Contents**
A regular publication with the latest information on thyroid examinations, Q&A, findings, etc.

Issued 19 times since FY2012

https://fukushima-mimamori.jp/thyroid-examination/merit-dem erit.html
# Advantages and Disadvantages of Thyroid Examinations

## Advantages

- Analysis of results provide information regarding radiation effects in Fukushima Prefecture.
- If no irregularities are found, it may bring peace of mind.
- Early diagnosis reduces the risk of recurrence and complications.

## Disadvantages

- Participants may have anxieties regarding the examination results.
- Burdens may increase from thyroid cancer treatment and/or follow-ups.
- Extremely low-risk cancer may be overdiagnosed.

---

### Efforts to promote understanding of thyroid examinations

- **Explanation about the examination at primary examination venues**
  - Visiting lectures for students
  - Brochure for elementary school students
  - Brochure for junior/senior high school students
  - Publication of brochure used in visiting lectures

---

The chart above illustrates the balance between the advantages and disadvantages of thyroid examinations, highlighting the efforts made to promote understanding and mitigate any potential concerns.
Dissemination of Advantages and Disadvantages of Thyroid Examinations

**Explanation in invitation letter**
An "Invitation to Thyroid Ultrasound Examination" are sent to eligible people, explaining the purpose of the examination, and its advantages and disadvantages.

**Distribution of a leaflet**
Distribution of a leaflet started since the Full-Scale Survey (fifth-round). The leaflet contains explanations suitable for elementary school and junior high school students.

**Website**
Reviewing the form and function of the website to make it easier to search for information on the Thyroid Ultrasound Examination and enhancing the content.

**Video**
Playing the video titled "Advantages and Disadvantages of Thyroid Examinations" at general venues of the Thyroid Ultrasound Examination.

**TV program**
Informing to watch the TV program of the prefectural government for understanding advantages and disadvantages of the examination and encouraging people to think for themselves about the examination before deciding.

**Efforts at event venues**
Displaying panels at the venue of the "Iki Iki Kenkozukuri (Fitness) Forum" held in November 2022.

**Website**

Released on April 1st, 2020
## Thyroid Ultrasound Examination – Implementation Status

### Schedule and Coverage

<table>
<thead>
<tr>
<th>Category</th>
<th>Duration</th>
<th>Venues</th>
<th>Covered population</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preliminary Baseline Survey</td>
<td>Oct 2011  ~ Mar 2014</td>
<td>FMU, schools, public facilities and credentialed medical facilities outside Fukushima</td>
<td>Residents of Fukushima Prefecture aged 18 or younger as of Mar. 11, 2011 (Approx. 368,000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2nd round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full-Scale Surveys</td>
<td>Apr 2014  ~ Mar 2016</td>
<td>Schools, public facilities and credentialed medical facilities in and outside Fukushima</td>
<td>In addition to the aforementioned residents, those who were born between Apr. 2, 2011 and Apr. 1, 2012. (Approx. 381,000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3rd round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>May 2016  ~ Mar 2018</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4th round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 2018  ~ Mar 2020</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5th round</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Apr 2020  ~ Mar 2023</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Survey for Age 25</strong></td>
<td>May 2017  ~</td>
<td>Public facilities and credentialed medical facilities in and outside Fukushima</td>
<td>Eligible persons are recommended to receive an examination every 2 years until they reach age 20 and at ages that are multiples of 5 after age 21.</td>
</tr>
<tr>
<td>Pathological Diagnosis</td>
<td>Preliminary Baseline Survey (1st round) *1</td>
<td>Full-Scale Survey (2nd round) *2</td>
<td>Full-Scale Survey (3rd round) *2</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Participation rate for primary examination</td>
<td>81.7%</td>
<td>71.0%</td>
<td>64.7%</td>
</tr>
<tr>
<td>Those referred for confirmatory exam</td>
<td>2,293</td>
<td>2,230</td>
<td>1,502</td>
</tr>
<tr>
<td>Participation rate for confirmatory examination</td>
<td>92.9%</td>
<td>84.2%</td>
<td>73.5%</td>
</tr>
<tr>
<td>Malignant or suspicious for malignancy (FNAC)</td>
<td>116</td>
<td>71</td>
<td>31</td>
</tr>
<tr>
<td>Those who received surgery</td>
<td>102</td>
<td>56</td>
<td>29</td>
</tr>
<tr>
<td>Papillary cancer</td>
<td>100</td>
<td>55</td>
<td>29</td>
</tr>
<tr>
<td>Undifferentiated cancer</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other type of thyroid cancer</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benign nodules</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 As of Mar. 31, 2018  *2 As of Mar. 31, 2021  *3 As of Mar. 31, 2022
Average absorbed dose to the thyroid in the first year to infants for each evacuation scenario.

### Fukushima Radiation Exposure Dose among Evacuation Groups from the Chornobyl and Fukushima Nuclear Accidents

#### Average absorbed dose to the thyroid in the first year to infants

**About 2mGy-30mGy**

#### Chornobyl Accident

<table>
<thead>
<tr>
<th>Country</th>
<th># of people (x1,000)</th>
<th>Mean effective dose (mSv)</th>
<th>Mean Thyroid dose (mGy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belarus</td>
<td>25</td>
<td>30 6</td>
<td>1,100</td>
</tr>
<tr>
<td>Russia</td>
<td>0.19</td>
<td>25 10</td>
<td>440</td>
</tr>
<tr>
<td>Ukraine</td>
<td>90</td>
<td>20 10</td>
<td>330</td>
</tr>
</tbody>
</table>
Adjusted odds ratio (95% CI) for thyroid cancer risk among children according to absorbed doses in thyroid, estimated by UNSCEAR 2020 ~ Cross-sectional survey ~

The 18th Thyroid Examination Evaluation Subcommittee of Prefectural Oversight Committee of the “Fukushima Health Management Survey” (Jan. 18, 2022)
Adjusted odds ratio (95% CI) for thyroid cancer among children according to absorbed doses in thyroid, estimated by UNSCEAR 2020

~Longitudinal survey~

<table>
<thead>
<tr>
<th>Quartile (%)</th>
<th>Age-Sex Adjusted</th>
<th>Age-Sex-Exam Year</th>
<th>Age-Sex-Exam Interval</th>
<th>Age-Sex-Exam Year - Exam Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>(mGy)</td>
<td>Odds Ratio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25%</td>
<td>0.5-2.6</td>
<td>2.7-4.3</td>
<td>4.5-7.0</td>
<td>7.0-15.0</td>
</tr>
<tr>
<td>25-50%</td>
<td>2.7-4.3</td>
<td>4.5-7.0</td>
<td>7.0-15.0</td>
<td></td>
</tr>
<tr>
<td>50-75%</td>
<td>4.5-7.0</td>
<td>7.0-15.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>75-100%</td>
<td>7.0-15.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Preliminary Baseline (1st Exam) | Full-Scale Survey (2nd Exam) | Full-Scale Survey (3rd Exam)

Fiscal Year (period)

- 2011-2013 (First 3 years)
- 2014-2015 (4-5 years)
- 2016-2017 (6-7 years)

Malignant or suspicious for malignancy (FNAC)

- 116
- 71
- 31

The 18th Thyroid Examination Evaluation Subcommittee of Prefectural Oversight Committee of the “Fukushima Health Management Survey”
Study of the association between radiation dose and the development of malignant/suspected malignant thyroid tumors

**Exposure Doses**
- External Exposure Doses from FHMS
- UNSCEAR Absorbed Thyroid Dose by Region
- Individuals Equivalent Thyroid Doses resulting from the Sum of External and Internal Exposure Doses

**Eligible Persons**
- Thyroid Examination (TUE) Examinees
- Registrants in the Cancer Registry

**Analytical Method**
- Ecological Study
- Dose-based Cross-sectional Surveys
- Longitudinal Survey (LS)
- LS (Nested case-control study)

**Matching Model 1**
- Case group 131 people
- Control group 1310 people
- Matching Items
  - Sex, Age
  - Examination status at the time of diagnosis

**Matching Model 2**
- Case group 131 people
- Control group 1310 people
- Matching Items
  - Matching Model 1
  - Pattern of Thyroid Examination (TUE)
Age at Exposure (Years)

Age distribution of thyroid tumors diagnosed by Fukushima TUE at the time of the earthquake

Fukushima Health Management Survey
Average age at diagnosis of thyroid tumor

Number of thyroid examinations (TUE)
- Age at Confirmatory Examination
- Age at time of Earthquake

Average Age (±SD)

 UNSCEAR 2020/2021 Reprt, pp89, Figure XXI
Based on comprehensive evaluation of the results of the Preliminary Baseline Survey, thyroid cancers found thus far cannot be attributed to radiation from the Fukushima accident.

Because…

- Exposure doses in the Fukushima accident were generally lower.
- Latent period of thyroid cancers is short (approximately one to four years).
- Cancers have not been found in those aged five and younger.
- There are no significant regional differences in detection rates.

Oversight Committee confirmed its subcommittee’s view that no causal relationship could be established between radiation exposure and prevalence of thyroid cancer found in the 2nd-round survey.

Because…

- Analyses of an association between thyroid cancer detection rates and thyroid doses estimated by UNSCEAR revealed no dose-effect relationship.
- The age distribution of thyroid cancers in Fukushima is different from that of Chornobyl.

Analyses classified into quartiles based on the distribution of estimated doses by UNSCEAR among the thyroid examination participants showed no significant association and no dose-response relationship. (The 18th Thyroid Examination Evaluation Subcommittee)
Thyroid Ultrasound Examination – Support

〇 Support for Primary Examination

The Diagnosis Explanation Booth
- Set up at public location/facility
- Provisional explanation by a doctor showing the scanned image

Provided explanation to 33,451 people since FY2015
(The figure as of the end of March 2021)

In the booth (image)

〇 Leaflet

- Distribution at the examination venue
- Explanation of nodules & cysts, diagnostic criteria, follow-up exams, etc.

〇 Support for Confirmatory Examination

Thyroid Support Team

【Members】
Nurse, Psychiatric Social Worker, Clinical Psychologist, Medical Social Worker, etc.

Primary Exam → Secondary Exam (two visits to hospital) → Cytology → Observation, Operation, etc.
→ Next Primary Exam

【Activities】
Psychosocial support for the confirmatory examination examinees and their families

Supported 2,039 people (4,062 times) since FY2013
(Figures as of the end of March 2022)

〇 Exclusive Medical Call Center

【Coverage】
Thyroid exam patients and their families

444 calls since FY2016
(The figure as of the end of December 2022)

【Activities】
- Medical consultation on the diagnosis and thyroid diseases, etc.
- Doctors respond while checking the result and scan.
Better to have evacuated?

What effects do we have from radiation?

Accept the examination?

No way! Thyroid cancer?

Confirmatory examination = Detailed examination

I’m the only one who was referred to a confirmatory exam.

A needle stick exam? I’m scared!

Thyroid cancer?

I’m the only one who was referred to a confirmatory exam.

Participants

Detailed examination

Accept the examination?

Better to have evacuated?

Family
Roles of Thyroid Support Team

_Before_ examination

- Listen carefully, and address anxieties

_During_ examination

- Attend ultrasonography, doctor’s consultation, and other examinations

_After_ examination

- Ask if there are any unclear points, explain and provide information if necessary

Thyroid Support Team helps with:

- **Responding to anxiety**
  - With warm attitude, Team explains what to expect

- **Answering all questions**
  - Team clarifies all the questions that participants may have.

- **Information provision**
  - Team provides necessary information.

- **Decision making**
  - Team supports for independent & autonomous decision making.
Contents of Consultation at the First Visit of the Confirmatory Examination

- Examination findings
- TUE program
- Anxiety about causes
- Health insurance treatment
- Participant's health
- Participant's mental and...
- Participant's future matters
- Reflections on the time of...
- Social support
- Medical subsidies and...
- Dietary habits and...
- Other

Reasons for anxiety

- 43% Radiation
- 28% Heredity
- 29% Other

Analysis of 233 support records
Coverage: Participants (with their family members) who underwent a confirmatory examination in the Full-Scale Survey (4th round survey).

Setou, et al. (2021): Psychosocial support for the examinees and their families during the secondary confirmatory examination. FJMS 67(2):53–63
Efficacy of Thyroid Support Team at the Confirmatory Examination

Contents of Consultation at the 1st Visit for the Confirmatory Examination

- Listening to participant's thoughts
- Listening to family's thoughts
- Confirmation of the doctor's explanation
- Responding to questions
- Feedback to medical doctors
- Providing information
- Daily life and dietary habits support
- Self health management
- Decision-making support for future rounds of TUE
- Decision-making support for FNAC and medical care

Contents of Consultation at the 2nd Visit for the Confirmatory Examination

- Listening to participant's thoughts
- Listening to family's thoughts
- Confirmation of the doctor's explanation
- Responding to questions
- Feedback to medical doctors
- Providing information
- Daily life and dietary habits support
- Self health management
- Decision-making support for future rounds of TUE
- Decision-making support for FNAC and medical care

(Setou, et al. FJMS 2021)
Efficacy of Thyroid Support Team at the Confirmatory Examination

Change in Anxiety Level in **Confirmatory Examination Participants** at the First Visit

**Before**
- Very low: 14%
- Low: 54%
- High: 24%
- Very high: 5%
- Unknown: 3%

**After**
- Very low: 60%
- Low: 28%
- High: 8%
- Very high: 3%
- Unknown: 1%

High + Very high decreased both in participants and family members after the visit

Our support was effective!

(Setou, et al. FJMS 2021)

Change in Anxiety Level in **Family Members** at the First Visit

**Before**
- Very low: 3%
- Low: 9%
- High: 40%
- Very high: 5%
- Unknown: 3%

**After**
- Very low: 42%
- Low: 45%
- High: 6%
- Very high: 6%
- Unknown: 1%

High + Very high decreased both in participants and family members after the visit

Our support was effective!
Comprehensive Health Check – Outline

Covered Population: About 210,000

Residents of nationally designated evacuation zones as of 2011

Those who were recommended to have follow-up based on the results of the Basic Survey

Fukushima, Daiichi Nuclear Power Plant
13 Municipalities designated as evacuation zones in 2011

Fukushima Prefecture

<table>
<thead>
<tr>
<th>Age group</th>
<th>Check items</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0 – 6</strong> (Preschool)</td>
<td>Height, weight [Additional items on request] CBC (Complete Blood Count: red cell count, differential white cell count, platelet count, hematocrit, hemoglobin)</td>
</tr>
<tr>
<td><strong>7 – 15</strong> (Elementary school Grade 1 – Junior high school Grade 3)</td>
<td>Height, weight, blood pressure, CBC [Additional items on request] Blood biochemistry (AST, ALT, γGT, TG, HDL-C, LDL-C, HbA1c, plasma glucose, serum creatinine, uric acid)</td>
</tr>
<tr>
<td><strong>16 or over</strong></td>
<td>Height, weight, abdominal circumference or BMI, blood pressure, CBC, urine protein, urine sugar, urine occult blood), blood biochemistry (AST, ALT, γGT, TG, HDL-C, LDL-C, HbA1c, plasma glucose, serum creatinine, estimated glomerular filtration rate [eGFR], uric acid)</td>
</tr>
</tbody>
</table>

※The underlined items are not usually performed in Specific Health Checkups.
No findings indicating radiation effects were found in the results of the Comprehensive Health Check.

Health status after the Great East Japan Earthquake (15 yo or younger)

- Obesity has improved, but dyslipidemia has been delaying.

Health status after the Great East Japan Earthquake (16 yo or over)

- Obesity
- Hypertension
- Dyslipidemia (low HDL-C)
- Diabetes

Diseases that are considered as being attributable to changes in lifestyle including evacuation due to the disaster (16 yo or over)

- Renal dysfunction
- Hyperuricemia
- hepatic dysfunction
- Polycythemia

Risk factors for circulatory diseases are increasing.

Diseases that had increased after the disaster but reduced thereafter (16 yo or over)

- Blood pressure, LDL-C : Improved treatment rate
- Hepatobiliary system enzyme abnormality (hepatic dysfunction) : Daily exercise and eating of breakfast
Association of new onset of dyslipidemia with lifestyle and evacuation (95% CI)

<table>
<thead>
<tr>
<th>Lifestyle (physical)</th>
<th>Obesity (BMI ≥ 25)</th>
<th>Experience of evacuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age-Sex adjusted OR</td>
<td>Multiple adjusted OR</td>
<td></td>
</tr>
</tbody>
</table>

Crude OR: 0.82
Age-gender-adjusted OR: 1.47
Mode 1 OR: 1.19
Model 2 OR: 1.14

Odds ratio (OR) of new onset of hyper LDL cholesterolemia in evacuees (95% CI)

- Crude OR: 1.50 (1.41-1.61) < 0.0001
- Age-gender-adjusted OR: 1.49 (1.40-1.60) < 0.0001
- Mode 1 OR: 1.46 (1.36-1.56) < 0.0001
- Model 2 OR: 1.42 (1.32-1.52) < 0.0001

Hiroaki Satoh et al.
J Epidemiol 2022;32(6):277-282
Comprehensive Health Check – Support

Radiation Medical Science Center

Results Report

Leaflet

“Health Check is Your Body's Report Card.”

Deepening understanding and raising awareness of health condition

Analytical Report

- Results by each municipality
- Health promotion suiting the needs of each municipality etc.

Explanation/Proposal to local gov’t

13 municipalities designated as evacuation zones

Residents

- Use for promotional activities and health advice etc.
- “Health Seminars” at health check results reporting meetings, etc.
- Conducted 322 times from FY2013 to FY2021

Learn and apply knowledge from our leaflet

Exercise

Sleep

Meals

Health checks

Conducted 152 times from FY2016 to FY2021
## Briefing sessions with 13 municipalities

Radiation Medical Science Center for the Fukushima Health Management Survey

- Survey results collated for each municipality
- Health promotion measures, etc., according to the needs of each municipality

### Requests from municipalities

<table>
<thead>
<tr>
<th>Request</th>
<th>Our response</th>
</tr>
</thead>
<tbody>
<tr>
<td>We need help when explaining health check results to residents, including lipid abnormalities and hypertension data, in an easy-to-understand manner.</td>
<td>Assisted in explaining health check results</td>
</tr>
<tr>
<td>We need help with doctor’s consultation during the town’s health checks.</td>
<td>Dispatched health check staff</td>
</tr>
<tr>
<td>We have concerns about depression among mothers who are rearing children in other municipalities they relocated to. The proportion of mothers with depressive symptoms is high even among those with children of higher ages. Please investigate the cause.</td>
<td>Liaised to our Office of Pregnancy and Birth Survey</td>
</tr>
<tr>
<td>Please make door-to-door visits and teach residents how to do exercising.</td>
<td>Dispatched physiotherapist (FMU faculty)</td>
</tr>
<tr>
<td>We want to compare Mental Health and Lifestyle Survey results of our town with those of other 12 municipalities.</td>
<td>Format of reporting is to be revised.</td>
</tr>
</tbody>
</table>

13 municipalities designated as evacuation zones

- Tamura, Minamisoma, Kawakubo, Hirono, Naraha, Tomioka, Kawauchi, Okuma, Futaba, Namie, Katsurao, Iitate, Date (specific spots recommended for evacuation partially)

- 322 sessions were held from FY2013 to FY2021

Comprehensive Health Check – Support

Health support based on survey results and findings

(Briefing session in Minamisoma)
Direct explanation on analysis results to residents of the covered municipality through lectures by doctors
• Individual consultation and blood pressure measurement by health professionals

Active feedback of CHC results to communities

Blood pressure values improved due to continued participation in health checks and increased treatment rates.

<An example of our feedback to a municipality>
Changes in blood pressure values during 9 years after the disaster (Tamura City)

<table>
<thead>
<tr>
<th>Year</th>
<th>No EBP</th>
<th>Untreated</th>
<th>In treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011-2012</td>
<td>48.8%</td>
<td>14.0%</td>
<td>37.2%</td>
</tr>
<tr>
<td>2018-2019</td>
<td>40.1%</td>
<td>9.9%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>

⇒ The proportion of patients on hypertension treatment increased and the mean diastolic blood pressure decreased.
### Past Health Seminars

#### 【FY2020】Conducted 17 times

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Event name</th>
<th>Times</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naraha Town</td>
<td>General health check</td>
<td>8</td>
<td>Individual consultation by specialists Panel exhibition</td>
</tr>
<tr>
<td></td>
<td>Individual consultation by specialists</td>
<td>7</td>
<td>Individual consultation by specialists Panel exhibition</td>
</tr>
<tr>
<td>Hirono Town</td>
<td>Reporting meeting on Health check results</td>
<td>1</td>
<td>Individual consultation by specialists Blood pressure measurement</td>
</tr>
<tr>
<td>Tamura City</td>
<td>Health promotion lectures for citizen</td>
<td>1</td>
<td>Health lecture by doctors Individual consultation by specialists Blood pressure measurement</td>
</tr>
</tbody>
</table>

#### 【FY2021】Conducted 18 times

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Event name</th>
<th>Times</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naraha Town</td>
<td>Individual consultation by specialists</td>
<td>2</td>
<td>Individual consultation by specialists Panel exhibition Leaflet distribution</td>
</tr>
<tr>
<td></td>
<td>General health check</td>
<td>7</td>
<td>Panel exhibition</td>
</tr>
<tr>
<td>Katsurao Village</td>
<td>Health check results reporting meeting</td>
<td>7</td>
<td>Individual consultation by specialists Panel exhibition Leaflet distribution</td>
</tr>
<tr>
<td>Tamura City</td>
<td>Health promotion lectures for citizens</td>
<td>2</td>
<td>Health lecture by doctors Individual consultation by specialists Blood glucose measurement</td>
</tr>
</tbody>
</table>
Basic knowledge of CKD (chronic kidney disease) and its relationship to dietary patterns revealed by CHC results.

Explanation of findings from the pediatric health checks and advice to avoid obesity and dyslipidemia.
Covered Population (FY2020) 199,461 people who resided in 13 municipalities designated as evacuation zones by Japanese government. These people are divided into 5 age groups (ages 0-3, 4-6, 7-12, 13-15, 16+ years).
Mental Health and Lifestyle Survey – Results

Trends in smoking (Adults: 20 or older)

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
Mental Health and Lifestyle Survey – Results

Trends in problematic drinking (with CAGE score of 2 or higher) (Adults: 20 or older)

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
## Mental Health and Lifestyle Survey – Results

### Trends in sleep satisfaction (Adults: 16 or older)

<table>
<thead>
<tr>
<th>Year</th>
<th>Satisfied</th>
<th>Slightly dissatisfied</th>
<th>Quite dissatisfied</th>
<th>Very dissatisfied, or couldn't sleep at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2011</td>
<td>33.3</td>
<td>46.8</td>
<td>15.5</td>
<td>4.4</td>
</tr>
<tr>
<td>FY2012</td>
<td>37.6</td>
<td>45.7</td>
<td>13.6</td>
<td>3.1</td>
</tr>
<tr>
<td>FY2013</td>
<td>39.7</td>
<td>45.0</td>
<td>12.8</td>
<td>2.6</td>
</tr>
<tr>
<td>FY2014</td>
<td>38.3</td>
<td>46.3</td>
<td>12.8</td>
<td>2.6</td>
</tr>
<tr>
<td>FY2015</td>
<td>39.5</td>
<td>45.9</td>
<td>12.3</td>
<td>2.3</td>
</tr>
<tr>
<td>FY2016</td>
<td>39.3</td>
<td>46.1</td>
<td>12.0</td>
<td>2.6</td>
</tr>
<tr>
<td>FY2017</td>
<td>40.7</td>
<td>45.4</td>
<td>11.6</td>
<td>2.3</td>
</tr>
<tr>
<td>FY2018</td>
<td>41.1</td>
<td>45.8</td>
<td>11.0</td>
<td>2.2</td>
</tr>
<tr>
<td>FY2019</td>
<td>41.9</td>
<td>45.6</td>
<td>10.5</td>
<td>2.0</td>
</tr>
<tr>
<td>FY2020</td>
<td>41.5</td>
<td>45.7</td>
<td>10.7</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
### Trends in exercise frequency (Adults: 16 or older)

<table>
<thead>
<tr>
<th>Year</th>
<th>Almost everyday</th>
<th>2-4 times a week</th>
<th>Once a week</th>
<th>Rarely</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2011</td>
<td>14.9</td>
<td>20.3</td>
<td>13.9</td>
<td>50.9</td>
</tr>
<tr>
<td>FY2012</td>
<td>15.0</td>
<td>22.0</td>
<td>15.7</td>
<td>47.3</td>
</tr>
<tr>
<td>FY2013</td>
<td>15.5</td>
<td>22.3</td>
<td>15.5</td>
<td>46.7</td>
</tr>
<tr>
<td>FY2014</td>
<td>15.3</td>
<td>24.4</td>
<td>16.5</td>
<td>43.8</td>
</tr>
<tr>
<td>FY2015</td>
<td>16.2</td>
<td>24.8</td>
<td>16.2</td>
<td>42.7</td>
</tr>
<tr>
<td>FY2016</td>
<td>15.9</td>
<td>24.9</td>
<td>17.0</td>
<td>42.2</td>
</tr>
<tr>
<td>FY2017</td>
<td>16.0</td>
<td>25.5</td>
<td>17.1</td>
<td>41.4</td>
</tr>
<tr>
<td>FY2018</td>
<td>16.5</td>
<td>26.0</td>
<td>17.1</td>
<td>40.4</td>
</tr>
<tr>
<td>FY2019</td>
<td>17.3</td>
<td>26.5</td>
<td>17.4</td>
<td>38.8</td>
</tr>
<tr>
<td>FY2020</td>
<td>18.3</td>
<td>26.1</td>
<td>17.4</td>
<td>38.8</td>
</tr>
</tbody>
</table>

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
General mental health measured by K6 (Adults: 16 or older)
Trends in K6 score of 13 or higher

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
Mental Health and Lifestyle Survey – Results

General mental health measured by K6 (Adults: 16 or older)
Trends in K6 score of 13 or higher, by place of residence at the time of this survey

Source: 31st, 35th, 38th, 42nd, and 45th meetings of the Oversight Committee for the Fukushima Health Management Survey
Mental Health and Lifestyle Survey – Results

Trends in SDQ score of 16 or higher among children

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
## Changes in radiation risk perception on hereditary effects

**Adults: 16 or older**

<table>
<thead>
<tr>
<th>Year</th>
<th>Very Low</th>
<th>Low</th>
<th>High</th>
<th>Highly Likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2011</td>
<td>15.2</td>
<td>24.6</td>
<td>25.3</td>
<td>34.9</td>
</tr>
<tr>
<td>FY2012</td>
<td>23.9</td>
<td>28.0</td>
<td>23.2</td>
<td>24.9</td>
</tr>
<tr>
<td>FY2013</td>
<td>21.4</td>
<td>30.5</td>
<td>25.9</td>
<td>22.2</td>
</tr>
<tr>
<td>FY2014</td>
<td>29.2</td>
<td>32.7</td>
<td>22.1</td>
<td>15.9</td>
</tr>
<tr>
<td>FY2015</td>
<td>29.0</td>
<td>33.3</td>
<td>22.0</td>
<td>15.6</td>
</tr>
<tr>
<td>FY2016</td>
<td>31.0</td>
<td>32.9</td>
<td>20.9</td>
<td>15.2</td>
</tr>
<tr>
<td>FY2017</td>
<td>18.9</td>
<td>43.9</td>
<td>28.9</td>
<td>8.3</td>
</tr>
<tr>
<td>FY2018</td>
<td>19.3</td>
<td>44.8</td>
<td>28.3</td>
<td>7.7</td>
</tr>
<tr>
<td>FY2019</td>
<td>22.1</td>
<td>47.5</td>
<td>24.4</td>
<td>6.0</td>
</tr>
<tr>
<td>FY2020</td>
<td>23.9</td>
<td>48.9</td>
<td>22.4</td>
<td>4.8</td>
</tr>
</tbody>
</table>

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
Mental Health and Lifestyle Survey – Results (Adults: 16 or older)

General mental health measured by K6
Trends in K6 score of 13 or higher, by place of residence at the time of the survey

- In Fukushima
  - FY2015: 6.6%
  - FY2016: 6.4%
  - FY2017: 6.0%
  - FY2018: 5.3%
  - FY2019: 4.6%
  - FY2020: 4.8%

- Outside Fukushima
  - FY2015: 9.7%
  - FY2016: 9.4%
  - FY2017: 9.0%
  - FY2018: 8.1%
  - FY2019: 7.2%
  - FY2020: 7.6%

FY2020 Radiation risk perception on hereditary effects, by place of residence at the time of the survey

- In Fukushima:
  - The possibility is very low: 23.9%
  - The possibility is low: 49.7%
  - The possibility is high: 22.0%
  - Highly likely: 4.4%

- Outside Fukushima:
  - The possibility is very low: 24.3%
  - The possibility is low: 44.2%
  - The possibility is high: 24.7%
  - Highly likely: 6.8%

Source: 45th meeting of the Oversight Committee for the Fukushima Health Management Survey (Sept. 1, 2022)
Mental Health and Lifestyle Survey – Support

**Personal Approach**

**Addressing the People with High Risk**

- Health information
- Referring to a medical facility or a consultation center

**Population Approach**

**Approaching to Groups to Reduce Risk**

- Physical and mental health check
- Identifying needs
- Professional advice

**Brochure**

- Visiting Covered Municipalities
  - Briefing sessions with 13 municipalities
  - Advice based on the results (Health workers and health & welfare officials)

**Telephone Support**

- Organizing Symposiums
  - Providing information useful for support activities (Specialists, teachers, students, etc.)

**Feedback of knowledge**

- Exhibiting at health events
  - Dialogue with residents
  - Information dissemination
### Pregnancy and Birth Survey – Outline

**Main Survey:** Covered population 12,000 - 16,000
- Those who were pregnant and gave birth in Fukushima Pref. from FY2011 to FY2020

**Follow-up Survey:** Covered population 5,200 - 7,300
- Those who responded to the Main Survey from FY2011 to FY2014

**Questionnaire items:**
- Mental health of pregnant and nursing mothers
- Current living conditions/child-rearing situation
- Outcomes of pregnancy and childbirth
- Expectations for the next pregnancy

Midwives, public health nurses, and certified public psychologists provide consultation for anxieties and/or worries.

Radiation Medical Science Center for the Fukushima Health Management Survey
## Pregnancy and Birth Survey – Results

44th Oversight Committee for the Fukushima Health Management Survey

<table>
<thead>
<tr>
<th></th>
<th>Preterm deliveries (%)</th>
<th>Low birth weight infants (%)</th>
<th>Congenital anomalies (%)</th>
<th>General Incidence in Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fukushima</td>
<td>National*</td>
<td>Fukushima</td>
<td>National*</td>
</tr>
<tr>
<td>FY 2011</td>
<td>4.6</td>
<td>5.7</td>
<td>8.6</td>
<td>9.6</td>
</tr>
<tr>
<td>FY 2012</td>
<td>5.6</td>
<td>5.7</td>
<td>9.2</td>
<td>9.6</td>
</tr>
<tr>
<td>FY 2013</td>
<td>5.2</td>
<td>5.8</td>
<td>9.6</td>
<td>9.6</td>
</tr>
<tr>
<td>FY 2014</td>
<td>5.3</td>
<td>5.7</td>
<td>9.8</td>
<td>9.5</td>
</tr>
<tr>
<td>FY 2015</td>
<td>5.6</td>
<td>5.6</td>
<td>9.4</td>
<td>9.5</td>
</tr>
<tr>
<td>FY 2016</td>
<td>5.3</td>
<td>5.6</td>
<td>9.2</td>
<td>9.4</td>
</tr>
<tr>
<td>FY 2017</td>
<td>5.3</td>
<td>5.7</td>
<td>9.2</td>
<td>9.4</td>
</tr>
<tr>
<td>FY2018</td>
<td>5.2</td>
<td>5.6</td>
<td>9.0</td>
<td>9.4</td>
</tr>
<tr>
<td>FY2019</td>
<td>5.1</td>
<td>5.6</td>
<td>9.1</td>
<td>9.4</td>
</tr>
<tr>
<td>FY2020</td>
<td>4.4</td>
<td>5.5</td>
<td>8.1</td>
<td>9.2</td>
</tr>
</tbody>
</table>

* Vital Statistics (Ministry of Health, Labor and Welfare) ** Guidelines for Obstetrical Practice in Japan 2020
Depressive symptoms among mothers have been decreasing year by year. FY2020 result was at the same level as the percentage of mothers with postpartum depressive symptoms found in a national survey.

Source: 44th meeting of the Oversight Committee for the Fukushima Health Management Survey (May 17, 2022)
Depressive symptoms among mothers have been decreasing year by year. FY2020 result was at the same level as the percentage of mothers with postpartum depressive symptoms found in a national survey.

Source: 44th meeting of the Oversight Committee for the Fukushima Health Management Survey (May 17, 2022)
Pregnancy and Birth Survey – Support

Source: 44th meeting of the Oversight Committee for the Fukushima Health Management Survey (May 17, 2022)

Incidence rates of depression needing support reduced to about half from rates immediately after the disaster.

“Concerns about the effect of radiation” were highest immediately after the disaster and reduced over time.

Concerns expressed at consultation and changes in radiation-related concerns

Telephone Support Rate

FY 2011 '12 '13 '14 '15 '16 '17 '18 '19 '20

Overall About depression Found from the Free Note

Mother's physical and mental state
Child rearing-related (daily life) issues
Child's physical and mental health
Family life-related issues
Concerns about radiation effects
Disseminating information on the results of the FHMS

- Special Issue on Fukushima –
  A Decade After the Great East Japan Earthquake
Guest Editors: Kotaro Ozasa and Kota Katanoda
J-STAGE: Volume 32, Supplement 12, 2022
Thinking Together about Health, Life, and our Future in Fukushima

Fukushima Health Management Survey

We are here to support your health!

Radiation Medical Science Center
For the Fukushima Health Management Survey
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