Fukushima: health effects on the residents

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Director of PCU(prefecture/city/university)-Nagasaki council
Moved in 1942 to Nagasaki

3-year prior to A-bomb disaster
Family moved from Korea to Nagasaki
Nagasaki University sent ship with food, water and students.
When I visited Fukushima, I felt I was at destroyed Nagasaki by Atomic Bomb.
There was no research center for peace and abolition of nuclear weapons at Nagasaki.

We, Nagasaki University, decided to make RECNA by our own expense.

President Obama’s speech in Prague boosted us.
Number of death due to the 2011 earthquake of the Pacific coast of Tohoku

- Iwate: 4,632
- Miyagi: 9,391
- Fukushima: 1,601

Additional numbers:
- 4
- 1
- 2
- 3
- 4
- 1
- 2
- 7
- 4
- 20
- 24
Initial phase of evacuation
(12-16 March, 2011)

Distribution of meals
A long line to receive the relief supplies
## Health management after the NPP accident

<table>
<thead>
<tr>
<th>Object</th>
<th>Situation</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant workers</td>
<td>High risk in radiation exposure &amp; contamination, accident</td>
<td>Radiation emergency medicine</td>
</tr>
<tr>
<td>Emergency responder</td>
<td>High risk in radiation exposure &amp; contamination</td>
<td>Consultation clinic for mental &amp; physical health, radiation</td>
</tr>
<tr>
<td>Residents</td>
<td>Chronic low dose exposure, stress &amp; fear</td>
<td>Monitoring, communication, information, education</td>
</tr>
</tbody>
</table>
Thyroid monitoring of children

Thyroid monitored of children in Iwaki-City, Kawamata-Town, and Iitate-Village was conducted from March 24 to March 30 in 2011. The screening survey indicated that thyroid doses were less than 0.2 μSv per hour for all the children, which is below the cutoff level defined by the Nuclear Safety Commission of Japan.

Based on the results of SPEEDI on 23rd Mar 2011, the Local Nuclear Emergency Response Headquarters conducted thyroid monitoring of 1,149 children to examine exposure levels. Valid data was obtained for 1,080 subjects, and all values were less than 0.2 μSv/h (equal to 100mSv).
Fukushima Health Management (FHM) Survey

External Exposure Estimate

**Basic survey**
Subjects: Residents (2 million) as of March 11, 2011
Method: Self-administered questionnaire survey (three month)
Content: Details of whereabouts and daily routine from March 11 onwards to estimate exposure.

**Follow-up**

*Health Management File*
- To keep health check up records
- To provide information on radiation

*Data base*
- To provide long-term monitoring of residents’ health
- To guide treatment
- To inform and guide future generations

Thyroid Ultrasound Examinations
Subjects: Residents aged 18 years or younger
Content: Ultrasound examination
Survey period: Every three years

Comprehensive Health Checks
Subjects: Residents in evacuation zones
Content: General health checkup items will differential leukocyte count
Subject: Residents outside evacuation zones
Content: General health checkup items
Promotion of municipal and workplace health checks
Additional health checkups to reach residents not included in current services

Mental Health and Lifestyle Survey
Pregnancy and Birth Survey

Consultation and support  Follow up  Treatment
Thyroid screening
## Thyroid Screening Results

<table>
<thead>
<tr>
<th>Results</th>
<th>Status</th>
<th>April 2011 - March 2012</th>
<th></th>
<th>April 2012 – January 2013</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Number of Participants</td>
<td></td>
<td>38,114</td>
<td>94,975</td>
<td></td>
</tr>
<tr>
<td>A1</td>
<td>No nodules/cysts</td>
<td>24,469 (64.2%)</td>
<td>99.5</td>
<td>53,028 (55.8%)</td>
<td>99.4</td>
</tr>
<tr>
<td>A2</td>
<td>Nodules ≤ 5.0 mm or cysts ≤ 20.0mm</td>
<td>13,459 (35.3%)</td>
<td></td>
<td>41,398 (43.6%)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Nodules ≥ 5.1 Mm or cysts ≥ 20.1mm</td>
<td>186 (0.5%)</td>
<td></td>
<td>548 (0.6%)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Immediate need for secondary examination</td>
<td>0 (0.0%)</td>
<td></td>
<td>1 (0.001%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test results</th>
<th>April 2011 – March 2012</th>
<th>April 2012 – January 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodules</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥5.1mm</td>
<td>185 (0.48%)</td>
<td>385 (1.01%)</td>
</tr>
<tr>
<td>≤5.0mm</td>
<td>201 (0.53%)</td>
<td>413 (0.43%)</td>
</tr>
<tr>
<td>Cysts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤20.1mm</td>
<td>1 (0.003%)</td>
<td>10 (0.006%)</td>
</tr>
<tr>
<td>≤20.0mm</td>
<td>13,382 (35.11%)</td>
<td>41,433 (43.63%)</td>
</tr>
</tbody>
</table>
Numbers of thyroid cancer identified by Fukushima Health Management Survey

Total: 44 cases
(Male: 17 cases, Female 27 cases)
Relationship between age at time of accident and frequency of thyroid cancer at Chernobyl (from exams performed between May 1990 and April 1996)
Incidence of pediatric thyroid cancer: Fukushima vs. Japan historical data

- **Fukushima screening**
  - Age in years at time of diagnosis
  - Cases

- **Ito thyroid Hospital**
  - 1962 – 1990: 47 cases
  - Age in years at time of surgery
  - Cases

- Gender distribution:
  - **Female**
  - **Male**
External radiation exposure levels for all residents (386,572 persons) of Fukushima Prefecture

- TEPCO Daiichi Fukushima Nuclear Power Plant
- Surveyed area: Fukushima Prefecture
- Note: Excludes radiation workers.
Comparison of external radiation exposure in Fukushima and Chernobyl evacuees

Accident at Chernobyl
(evacuees in Belarus and Ukraine)

Accident at Fukushima
(children in Iitate Village, Kawamata Town, and Iwaki City)
Difference between Chernobyl and Fukushima in terms of thyroid radiation exposure
Death caused by disaster

Direct death

- Acute phase
- On the scene
- Trauma, drowning and crush syndrome

Indirect Death

\[ \cong \text{Disaster related death} \]

- Subacute and chronic phase
- Shelter, hospital and temporary housing
- Worsened chronic diseases
- “disuse syndrome”
- So-called “Inactive life-style disease”
- Depressive state-related
The number of direct and indirect death due to the 2011 earthquake of Pacific coast of Tohoku

Fukushima Prefecture
- Direct death: 1,599 (51.3%)
- Indirect death: 1,524 (48.7%)

Miyagi Prefecture
- Direct death: 9,582 (91.6%)
- Indirect death: 873 (8.4%)

Iwate Prefecture
- Direct death: 4,672 (91.8%)
- Indirect death: 417 (8.2%)
Number of evacuees to other prefectures

- Fukushima Prefecture: 50,633 (85.0%)
- Miyagi Prefecture: 7,373 (12.4%)
- Iwate Prefecture: 1,531 (2.6%)

Evacuated because there houses and life-line is broken at Miyagi and Iwate
Physicians responding that their health was not good: pre-disaster vs. post-disaster

Source: Japan Medical Association
### Post-disaster: decrease in number of full-time physicians in Fukushima

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of physician</th>
<th>Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar, 2011</td>
<td>2024</td>
<td></td>
</tr>
<tr>
<td>Dec, 2011</td>
<td>1953</td>
<td>-71</td>
</tr>
<tr>
<td>Aug, 2012</td>
<td>1945</td>
<td>-8</td>
</tr>
</tbody>
</table>
The disaster still processing. Without countermeasure for indirect death, preventable indirect death would continue to increase.
Declaration of return from Koriyama city to Kawauchi village
Decontamination of Kawauchi village
Establishment of Nagasaki University Satellite Office in Kawauchi Village (April 2013)

Mission of Satellite Office
1. Evaluation of effectiveness of decontamination through the measurement of radionuclides in soils.
2. Evaluation of risks of internal exposure through the measurement of foods and waters.
3. Health consultation with inhabitants including evacuees according to the results of above mentioned measurements.
4. Health promotion of inhabitants including evacuees.
Ratio of residents who returned to Kawauchi Village

Age(years):

- 10才未満: (18) 15%
- 10代: (32) 17%
- 20代: (81) 30%
- 30代: (78) 33%
- 40代: (80) 30%
- 50代: (237) 53%
- 60代: (278) 60%
- 70代: (244) 66%
- 80代: (222) 58%
- 90代以上: (29) 36%
- 合計: (1299) 46%

Not returned

Returned

Total: 2818
未来から、福島をはじめよう。