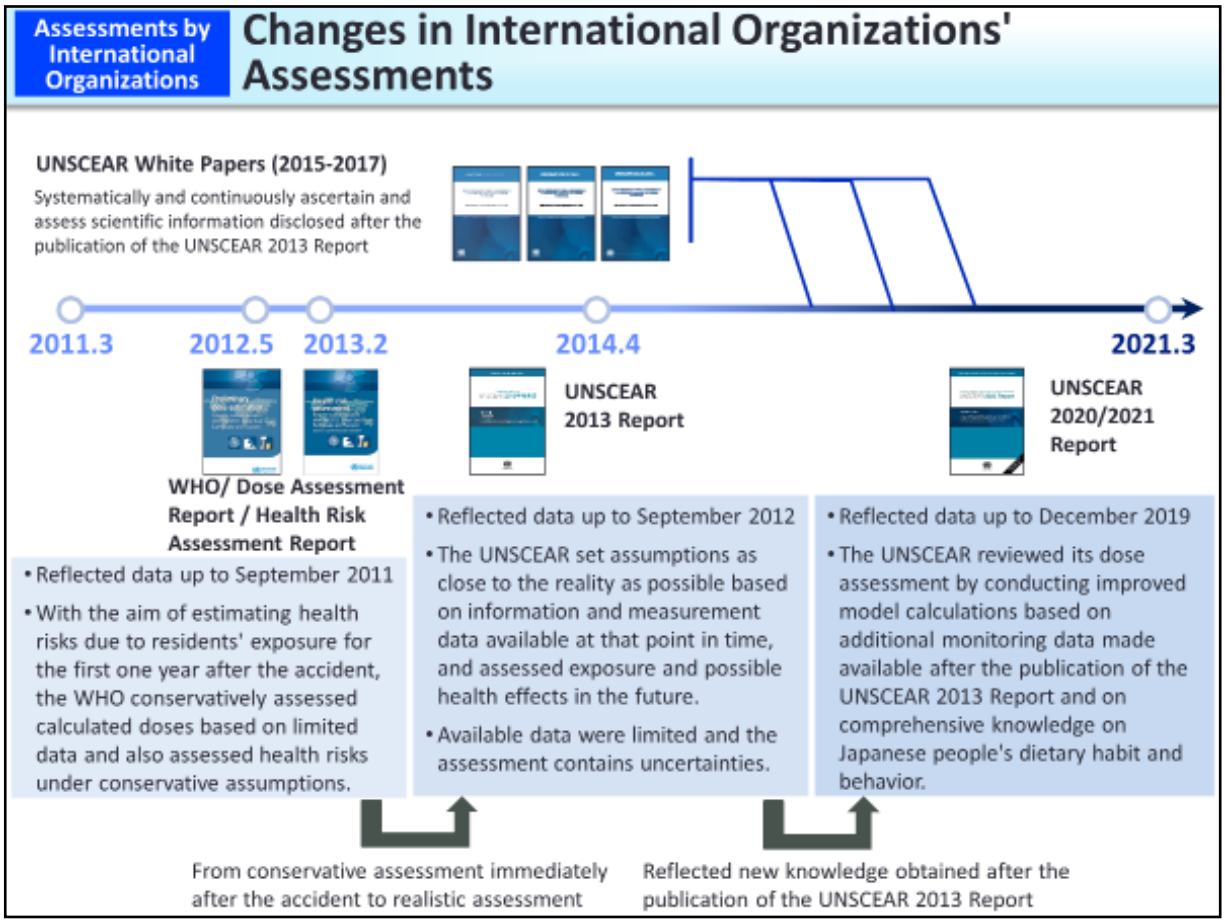

After the accident at Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi NPS, the World Health Organization (WHO) and the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) published reports on assessment of exposure doses due to the accident and on health effects of radiation exposure.

The WHO published a report on provisional exposure dose assessment in May 2012, and a report on provisional health risk assessment in February 2013. The assessment by the WHO aimed to estimate people's exposure doses for the first one year after the accident and identify areas requiring emergency measures. Accordingly, based on limited information and by setting conservative assumptions in order to avoid underestimation, the WHO assessed the maximum exposure doses that could be possible.

The UNSCEAR 2013 Report aimed to achieve the most realistic assessment of exposure levels and radiation risks due to the accident to the extent possible. However, the Report also states that all the results of such assessment contain certain uncertainties due to the incompleteness of knowledge or information and depending on setting of assumptions.

Therefore, the UNSCEAR conducted ongoing follow-ups to systematically collect and assess new information published after the publication of the UNSCEAR 2013 Report. The results of the follow-ups were compiled into three White Papers from 2015 to 2017, and the UNSCEAR 2020/2021 Report, which reflects new knowledge obtained after the publication of the UNSCEAR 2013 Report, was published in March 2021.

In the UNSCEAR 2020/2021 Report, doses are estimated using new knowledge on exposure dose assessment in order to reduce the uncertainties in the dose estimation in the UNSCEAR 2013 Report.

1. WHO Reports on preliminary dose estimation and health risk assessment:
- Preliminary dose estimation from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami (2012)
- Health risk assessment from the nuclear accident after the 2011 Great East Japan earthquake and tsunami, based on a preliminary dose estimation (2013)

2. 2013 Annual Report by the UNSCEAR:
- SOURCES, EFFECTS AND RISKS OF IONIZING RADIATION UNSCEAR 2013, Report, Volume I, REPORT TO THE GENERAL ASSEMBLY SCIENTIFIC ANNEX A: Levels and effects of radiation exposure due to the nuclear accident after the 2011 great east-Japan earthquake and tsunami (2013)

3. 2020 Annual Report by the UNSCEAR:
- SOURCES, EFFECTS AND RISKS OF IONIZING RADIATION UNSCEAR 2020/2021, Report, SCIENTIFIC ANNEX B: Levels and effects of radiation exposure due to the accident at the Fukushima Daiichi Nuclear Power Station: Implications of information published since the UNSCEAR2013Report (2020)

Included in this reference material on March 31, 2023

Assessments by International Organizations

Major Conclusions of the Reports of International Organizations

	Major conclusions
WHO Reports	• Even in the area where the highest exposure dose was estimated, no significant increase would be observed in risks of childhood thyroid cancer and other types of cancer or leukemia and increased incidence of these diseases exceeding natura variation is hardly expected. • The results suggest that increases in the incidence of diseases attributable to the additional radiation exposure are likely to remain below detectable levels.
UNSCEAR 2013 Report	• It is not likely that any significant changes attributable to radiation exposure due to the accident would arise in future cancer statistics. • There is the possibility that thyroid cancer risks may theoretically increase among the group of children whose estimated exposure doses were at the highest level. Therefore, their situations need to be closely followed up and assessed.
UNSCEAR 2020/2021 Report	• **No adverse health effects among Fukushima residents directly attributable to radiation exposure have been observed, and future health effects directly related to radiation exposure are unlikely to be discernible.** • **Increases in incidence of thyroid cancer in the Thyroid Ultrasound Examination that has been conducted in Fukushima after the nuclear accident are considered to be the result of sensitive ultrasound screening procedures.**

The WHO Reports published in 2012 and 2013, along with the UNSCEAR 2013 Report, state that their assessments of exposure doses contain certain uncertainties due to uncertainties inherent to basic data. However, the UNSCEAR 2020/2021 Report shows conclusions with less uncertainties on many issues as a broader range of knowledge became available.

The UNSCEAR 2020/2021 Report compiles all pieces of scientific information concerning levels and effects of radiation exposure due to the accident at Tokyo Electric Power Company (TEPCO)'s Fukushima Daiichi NPS that were published by the end of 2019 and assesses the influence on the knowledge and conclusions of the UNSCEAR 2013 Report.

Based on new knowledge, etc. on exposure dose assessment that became clear after the publication of the UNSCEAR 2013 Report, it became possible for the UNSCEAR to conduct improved and more realistic assessment of levels and effects of radiation exposure after the accident in its 2020/2021 Report. Based on the fact that public exposure doses that were reviewed based on new knowledge were lower or at the same level compared with those in the 2013 Report, the UNSCEAR concluded that "future health effects directly related to radiation exposure are unlikely to be discernible." With regard to many cases of thyroid cancer detected in Thyroid Ultrasound Examination, which was conducted as part of the Fukushima Health Management Survey, the UNSCEAR assessed that "these cases are not stem from the result of radiation exposure but rather arise from the result of sensitive ultrasound screening procedures." Furthermore, the UNSCEAR concluded that "there has been no evidence of excess congenital anomalies, stillbirths, preterm deliveries related to radiation exposure among general public."

Included in this reference material on March 31, 2023

Assessments by International Organizations

Comparison of Reports (Assessment Results)

- Estimated ranges of average effective doses for groups of evacuees for the first one year after the accident (The unit is mSv.)

UNSCEAR 2020/2021 Report

	20 years old (adults)	1 year old (infants*3)
(Group 1) Residents in Fukushima Prefecture who were evacuated：	0.046 - 5.5	0.15 - 7.8
(Group 2) Residents in Fukushima Prefecture who were not evacuated：	0.079 - 3.8	0.12 - 5.3
(Group 3) Prefectures neighboring Fukushima Prefecture*1：	0.10 - 0.92	0.15 - 1.3
(Group 4) The rest of Japan：	0.004 - 0.36	0.005 - 0.51

UNSCEAR 2013 Report

	20 years old (adults)	1 year old (infants*3)
① Precautionary evacuation areas：	1.1 - 5.7	1.6 - 9.3
② Deliberate evacuation areas：	4.8 - 9.3	7.1 -13
③ Non-evacuated areas in Fukushima Prefecture：	1.0 - 4.3	2.0 - 7.5
④ Prefectures neighboring Fukushima Prefecture*2：	0.2 - 1.4	0.3 - 2.5
⑤ The rest of Japan：	0.1 - 0.3	0.2 - 0.5

WHO Reports

	20 years old (adults)	1 year old (infants*3)
① Fukushima Prefecture：	1 - 50	1 - 50
② Prefectures neighboring Fukushima Prefecture：	0.1 - 10	0.1 - 10
③ The rest of Japan：	0.1 - 1	0.1 - 1

*1: Miyagi, Yamagata, Ibaraki and Tochigi Prefectures (Group 3)
The radionuclide deposition density information in parts of these prefectures was sufficient for estimates of doses to be made from inhalation and external exposure pathways at the municipality-average level on a 1-km square basis. As a result, prefectures making up Group 3 are different from those considered in the UNSCEAR 2013 Report.
*2: Iwate, Miyagi, Ibaraki, Tochigi, Gunma, and Chiba Prefectures
*3: The original text in English, the term "infant" is used for young children and babies. This table uses the descriptions in the original texts of Japanese versions of the Reports. As the WHO Reports are not translated into Japanese, the same expressions as used in the UNSCEAR 2020/2021 Report are used here.

The estimated effective doses to the public for the first year after the accident in Reports of the UNSCEAR and the WHO are as shown in the table above. The ranges of doses here show those of average values for prefectures, municipalities in the targeted areas, or evacuation scenarios for targeted groups.

The results of dose assessment in the UNSCEAR 2020/2021 Report are lower or at the same level compared with those presented in the UNSCEAR 2013 Report (p.194 of Vol. 1, “UNSCEAR 2020/2021 Report (3/8) Update from the UNSCEAR 2013 Report upon Assessing Public Exposure Doses”). The UNSCEAR 2020/2021 Report also assesses the uncertainties in dose assessment.

The WHO Reports and the UNSCEAR 2013 Report state that their assessments of exposure doses contain certain uncertainties due to uncertainties inherent to basic data. However, in the UNSCEAR 2020/2021 Report, dose estimation with less uncertainties became possible as a broader range of knowledge was made available.

[Relevant parts in the Reports]

- WHO’s Preliminary dose assessment (prepared based on pages 40 to 45 (3. Results))
- UNSCEAR 2013 Report (prepared based on paragraphs 209 to 214 on pages 86 to 87, Annex A)
- UNSCEAR 2020/2021 Report (prepared based on paragraphs 166 to 169 on pages 64 to 66, ANNEX B)

Included in this reference material on March 31, 2023