

Assessments by International Organizations

WHO Reports and UNSCEAR 2013 Report (2/3)

Comparison of Assessments (2/2): Assessment of Public Exposure Doses and Major Uncertainties

	WHO	UNSCEAR
	20 years old (adults); 1 year old (infants)	20 years old (adults); 1 year old (infants)
Estimation of effective doses for the first one year after the accident (in millisieverts)	(i) Fukushima Prefecture: 1-50 1-50 (ii) Neighboring prefectures: 0.1-10 0.1-10 (iii) Rest of Japan: 0.1-1 0.1-1	(i) Precautionary Evacuation Areas: 1.1-5.7 1.6-9.3 (ii) Deliberate Evacuation Areas: 4.8-9.3 7.1-13 (iii) Non-evacuated districts of Fukushima Prefecture: 1.0-4.3 2.0-7.5 (iv) Neighboring prefectures: 0.2-1.4 0.3-2.5 (v) Rest of Japan: 0.1-0.3 0.2-0.5
Uncertainties	Large (prioritized the promptness in assessment)	Uncertainties remain although the report intends to achieve more realistic assessment than that in the WHO Reports.
Major causes of uncertainties in dose assessments	<ul style="list-style-type: none"> <li>Estimation of radioactivity concentrations in the air based on measured values of radiation deposited on the ground surface</li> <li>Information on release of radioactive materials (source terms) and ATDM simulation</li> <li>Compositions and chemical forms of radionuclides</li> <li>Shielding effects of buildings</li> <li>Assumptions for estimation of exposure doses through ingestion of foods</li> <li>Variation in dose coefficients depending on dietary habits</li> </ul>	<ul style="list-style-type: none"> <li>Measured values for radionuclides with short half-lives deposited on the ground surface</li> <li>Changes over time in release rates of radionuclides and knowledge on weather information at the time of their release</li> <li>Composition of particulate and gaseous I-131 in the air</li> <li>Biased selection of samples in food monitoring (highly contaminated items are prioritized)</li> <li>Japanese people's metabolism of iodine (thyroid iodine uptake rate)</li> </ul>

Note: The WHO's dose estimation is more conservative (overestimated) than that by the UNSCEAR.

Explanation of terms:

- Source terms collectively refer to data necessary for dose assessment, i.e., types, chemical forms and release amounts of radioactive materials.
- Diffusion simulation means to calculate the tendency of diffusion of radioactive materials by combining the source term data and other data such as weather conditions and wind directions, etc.

For effective dose estimation, the WHO divided Japan into three zones, (i) Fukushima Prefecture, (ii) neighboring prefectures (Chiba, Gunma, Ibaraki, Miyagi and Tochigi Prefectures), and (iii) the rest of Japan, while the UNSCEAR divided Fukushima Prefecture into three zones, and the other prefectures into (iv) neighboring prefectures (Miyagi, Gunma, Tochigi, Ibaraki, Chiba and Iwate Prefectures) and (v) the rest of Japan.

Both the WHO Reports and the UNSCEAR Report state that their assessments of internal and external exposure doses contain certain uncertainties due to uncertainties inherent to basic data. Sources of such uncertainties explained in these Reports are mostly the same despite some differences in expressions. The assessment by the WHO is generally overestimated than that by the UNSCEAR.

(Related to p.193 of Vol. 1, "WHO Reports (2/4) Effective Dose Estimation Method," p.195 of Vol. 1, "WHO Reports (4/4) Evaluation of Uncertainties," p.199 of Vol. 1, "UNSCEAR 2013 Report (4/9) Estimation of Public Exposure Doses for Each of the Four Groups," p.201 of Vol. 1, "UNSCEAR 2013 Report (6/9) Assessment of Public Exposure Doses: Results," and p.203 of Vol. 1, "UNSCEAR 2013 Report (8/9) Assessment of Public Exposure Doses: Uncertainties")

[Relevant parts in the reports]

Results of effective dose estimation:

- WHO Report on preliminary dose estimation (prepared based on pages 40 to 45 (3. Results))
  - UNSCEAR Report (prepared based on paragraphs 209 to 214 on pages 56 to 57, Annex A (Japanese-language version)) (Original English version: paragraphs 209 to 214 on pages 86 to 87)
- Uncertainties in dose assessments:
- WHO Report on preliminary dose estimation (prepared based on sections 4.7.1 to 4.7.7 of 4.7 on pages 60 to 62)
  - UNSCEAR Report (prepared based on paragraphs 110 to 115 on pages 35 to 36, Annex A (Japanese-language version)) (Original English version: paragraphs 110 to 115 on pages 60 to 61)

Included in this reference material on March 31, 2015