The Limitations of Radiological Protection in the Fukushima Nuclear Accident from the Citizens' Perspectives: Towards a Revision of the General Recommendations

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Abstract- The aim of this research is to identify the radiological protection problems after the Fukushima accident from the citizens' perspective and to clarify the major points which should be included in the revised General Recommendations. As research methods, both qualitative and quantitative methods were employed to clarify the damage of residents in and outside of Fukushima Prefecture. For these reasons, we critically review the description of the ICRP 146 Annex B Fukushima nuclear accident (ANNEX B. THE FUKUSHIMA NUCLEAR ACCIDENT). Our team includes researchers who were affected by the disaster directly; their personal experiences were also reflected. Through this research, important insights of affected citizens missed in ICRP Publ. 146 were obtained. ICRP Publ. 146 and the General Recommendation should be revised to address these issues pointed out by the affected population.

Keywords: Radiological Protection; Fukushima Accident; Citizens' Perspectives; Revision of the General Recommendations.

1. BACKGROUND AND AIM

Although there are various problems with radiation protection after the Fukushima nuclear accident, few have discussed them from the affected citizens' perspectives. The aim of this research is to identify the radiological protection problems after the Fukushima accident from the citizens' perspective and to clarify the major points which should be included in the revised General Recommendations. For these reasons, we critically review the description of the ICRP 146 Annex B Fukushima nuclear accident.

2. METHOD

Both qualitative and quantitative research methods were employed to clarify the damage of residents in and outside of Fukushima Prefecture. Our team includes researchers affected by the disaster directly; their personal experiences were also reflected.

3 RESULTS

3.1. Major Events That Are Not Described in Annex B of ICRP Publication 146

The trend of the number of events described in Annex B of ICRP 146 is displayed in the Figure. The events described in the Annex are concentrated in March, 2011 or ICRP Publication 146 missed important events in the later stage shown in the following section.

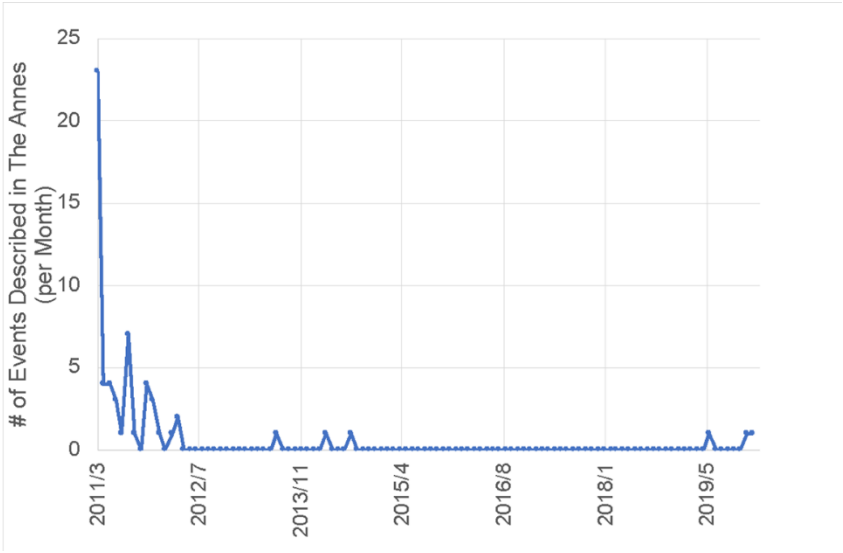
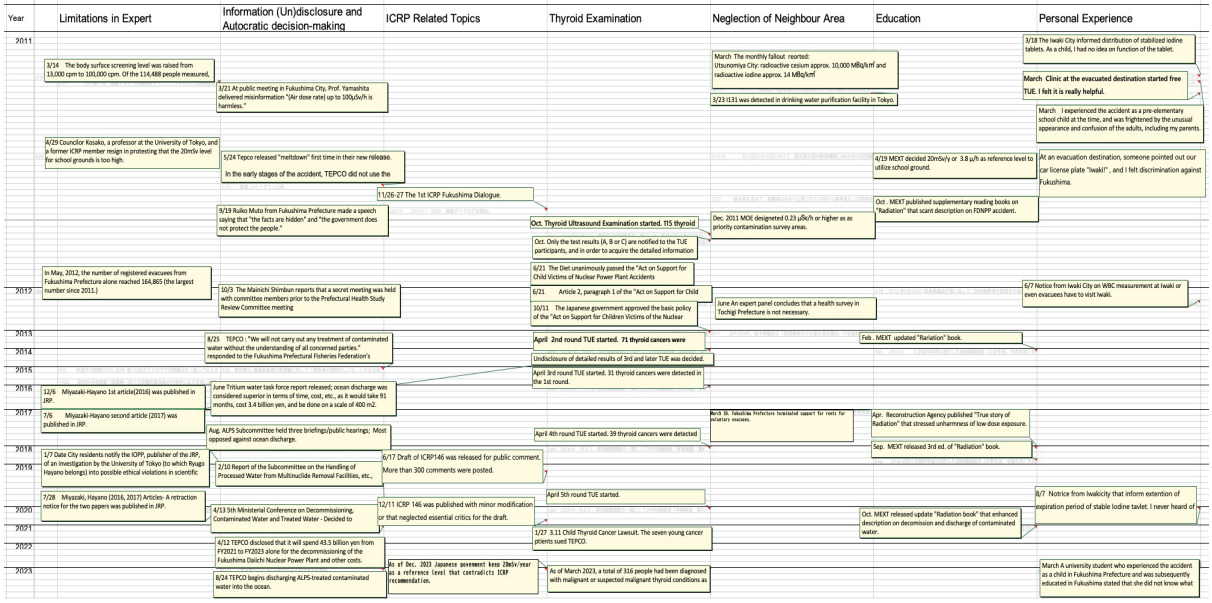


Figure: Number of Events Described in the Annex B of ICRP Publication 146

Major events that are not described in Annex B of ICRP 146 are compiled from various sources, including official documents and news coverage. They are classified into "Limitations in Expert", "Information (Un)disclosure and Autocratic decision-making", "ICRP Related Topics", "Thyroid Examination", "Neglection of Neighbouring Area", "Education", and "Personal Experience", then they are arranged in the timeline (Table).

Table: Timeline of Major Events that are not described in Annex B of ICRP Publication 146



Note: Detailed description including source is available at https://bit.ly/48ddzmP (in Japanese)

3.2. "Information (Un)disclosure" and “Limitations in Experts”

In the early stage of the accident, essential information, such as the possibility of a meltdown, was not provided by Tokyo Electric Power Company (TEPCO) nor by the Japanese government (TEPCO HD et. al., 2018). Officials from local governments near the Fukushima Daiichi Nuclear Power Plant later testified that neither TEPCO nor the government provided them with any information regarding the nuclear power plant accident and that they only learned about it through television and other media reports. It has been pointed out that some of the initial exposure could have been avoided if TEPCO and the Japanese government had properly provided information. (NAIIC 2012). Experts delivered incorrect information on the health effects of radiation exposure. The most famous example was the following statement: “Radiation exposure less than 100mSv is safe” (Our Planet-TV 2020). This misleading information caused serious distrust toward TEPCO, the Japanese government, and the experts of radiological protection and aroused a lot of anxiety, including children at the time of the accident (Tsujiuchi 2020).

3.3. "Neglection of Neighbouring Areas": Disproportionated Support Measures by National and Local Governments that caused “division of community”

A few months after the accident, the problem of “the division of community” emerged from a rigid operation of the reference level. For example, only one part of the town was designated as an “evacuation zone” with governmental support; despite demand, no support was provided for the rest of the area of the same town (Takahashi 2016). The similar issue of the division was observed in decontamination projects as Cesium-contaminated areas near Fukushima Prefecture are excluded from decontamination areas (Shimizu 2015). Moreover, merely six years after the accident, support for evacuees from outside the designated evacuation zone was cut off, while the Japanese and local governments have supported returnees disproportionately. Ms. Cecilia Jiménez-Damary, who was dispatched to Japan by the United Nations Human Rights Council in 2022 to investigate human rights information for people evacuated by the nuclear accident as a special rapporteur on the human rights of internally displaced persons, points out in her report submitted to the Council in May 2023 that the termination of support for evacuees by the Japanese government may violate the rights of evacuees (Jiménez-Damary 2023).

3.4. 20mSv/ year Reference Level and the Thyroid Examination

In addition, ICRP 111 and ICRP 146 recommend that the reference level should be lowered in the long term, but the Japanese government keeps 20 mSv/year as the reference level, which contradicts the recommendations. In the 2013 Report of the UN Human Rights Council’s Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, this 20mSv/ year reference level was critically commented as follows; “The ICRP recommendations are based on the principle of optimisation and justification, according to which all actions of the Government should be based on maximizing good over harm. Such a risk-benefit analysis is not in consonance with the right to health framework, as it gives precedence to collective interests over individual rights. Under the right to health, the right of every individual has to be protected. Moreover, such decisions, which have a long-term impact on the physical and mental health of people, should be taken with their active, direct and effective participation” (Grover 2013).

For thyroid examination in Fukushima, the Prefectural Oversight Committee for the Fukushima Health Management Survey concludes, "As of this time, no correlation can be found between thyroid cancer cases detected through the Full-Scale Survey (second-round survey) and radiation exposure." However, this assessment has been criticized due to a number of problems with the way the data that led to the conclusion was analysed (Hamaoka 2016, 2017, 2021). Meanwhile, of the approximately 300,000 people examined, more than 300 were found to have thyroid cancer, and seven young patients filed lawsuits against TEPCO (Yamaguchi 2022).

3.5. “Problems in Education Material”: Biased Information in the School Textbooks

Furthermore, descriptions in educational materials by the Japanese Ministry of Education (MEXT) also emphasize that the damage was minor, not serious (Goto 2020). In October 2011, MEXT published supplementary readers (for elementary school, junior high school, and high school students) focusing on radiation. This 2011 readers did not fully reflect the facts and lessons learned, barely mentioning the Fukushima Daiichi Nuclear Accident, emphasizing the use of radiation, and failing to convey the dangers of radiation exposure (MEXT 2011). In February 2014, MEXT published revised radiation supplementary readers, and the problematic descriptions has been significantly improved. 2014 readers began with an explanation of the Fukushima Daiichi nuclear power plant accident, which took up about half of the total number of pages. There has been an increase in neutral and cautious expressions regarding uncertain issues such as the health effects of low-dose exposure. They also mentioned the Linear Non Threshold (LNT) model for radiation and the susceptibility of children to radiation exposure, which were not included in 2011 supplementary readers (MEXT 2014).

However, in the supplementary readers revised in September 2018, important information such as INES level 7, which was added in the 2014 supplementary readers, was removed (MEXT 2018). In October 2021, the MEXT again published revised radiation supplementary readers. The most significant change is the addition of "Issues towards decommissioning," which unilaterally conveys the government's official position regarding the release of ALPS treated water into the ocean. The voices of the people most affected at the time, such as fishermen, were not introduced (MEXT 2021).

4. CONCLUSION

Through this research, important insights of affected citizens missed in ICRP Publication 146 were obtained. As listed in the reference, after the Fukushima Daiichi Nuclear Accident, many qualitative and quantitative studies on the wide-spread damages of the accident were conducted and published. Additionally, as pointed out in this article, the United Nations Human Rights Council has dispatched special rapporteurs to Japan on important human rights, including the right to health and the human rights of internally displaced persons, and detailed reports have also been published. By making full use of these previous researches and reports, ICRP Publication 146 need to be modified. Moreover, the new General Recommendations should respond to the experiences and support needs of those severely affected by the Fukushima nuclear disaster.

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REFERENCES

Goto, Shinobu., 2020, Content Analysis of Educational Materials on Radiation Issued by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) after the Fukushima Daiichi Nuclear Power Plant Accident (in Japanese). Environmental Education, 30, 19-28. Available from: https://www.jstage.jst.go.jp/article/jsoee/30/1/30_1_19/_pdf

Grover, Anand., 2013, Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Addendum, Mission to Japan (15 - 26 November 2012). United Nations Human Rights Council, A/HRC/23/41/Add.3, 2 May 2013. Available from: https://documents-dds-ny.un.org/doc/UNDOC/GEN/G13/160/74/PDF/G1316074.pdf?OpenElement.

Hamaoka, Yutaka., 2016, Comment on "Comparison of childhood thyroid cancer in Fukushima". Medicine, Correspondence Blog, Wolters Kluwer Health, Philadelphia, PA. Available from: http://journals.lww.com/md-journal/Blog/MedicineCorrespondenceBlog/pages/post.aspx?PostID=39.

Hamaoka, Yutaka., 2017, Re: "Comprehensive survey results of childhood thyroid ultrasound examinations in Fukushima in the first four years after the fukushima daiichi nuclear power plant accident" by Suzuki et al. (thyroid 2016;26:843-851). Thyroid 27, 1105–1106.

Hamaoka, Yutaka., 2021, Thyroid Cancers in Fukushima: Critical Review and Analysis of the 1st and 2nd Round Examination. International Journal of Epidemiology, 50, i91, i92. Available from: https://academic.oup.com/ije/article/50/Supplement_1/dyab168.257/6361687

ICRP, 2009. Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas After a Nuclear Accident or a Radiation Emergency. ICRP Publication 111. Ann. ICRP 39 (3). Available from:https://www.icrp.org/publication.asp?id=ICRP%20Publication%20111

ICRP, 2020. Radiological protection of people and the environment in the event of a large nuclear accident: update of ICRP Publications 109 and 111. ICRP Publication 146.Ann. ICRP 49(4). Available from: https://www.icrp.org/publication.asp?id=ICRP%20Publication%20146

Jiménez-Damary, Cecilia., 2023, Visit to Japan, Report of the Special Rapporteur on the human rights of internally displaced persons, United Nations Human Rights Council, A/HRC/53/35/Add.1, 24 May 2023. Available from: https://digitallibrary.un.org/record/4013281.

MEXT, 2011, Supplementary Readers on Radiation (in Japanese). Available from: https://www.mext.go.jp/b_menu/shuppan/sonota/detail/1311072.htm.

MEXT, 2014, Supplementary Readers on Radiation (in Japanese). Available from: https://www.mext.go.jp/b_menu/shuppan/sonota/detail/1344732.htm.

MEXT, 2018, Supplementary Readers on Radiation (in Japanese). Available from: https://www.mext.go.jp/b_menu/shuppan/sonota/detail/1409740.htm.

MEXT, 2021, Supplementary Readers on Radiation (in Japanese). Available from: https://www.mext.go.jp/a_menu/shotou/housyasen/1410005_00001.htm.

National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC)., 2012, Report by the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC) (in Japanese). Available from: https://www.mhmjapan.com/content/files/00001736/naiic_honpen2_0.pdf.

Our Planet-TV., 2020, Smiling comment ‘To relieve tension’ - Shunichi Yamashita explains his comment 9 years ago (in Japanese). Available from: https://www.ourplanet-tv.org/39911/.

Shimizu, Nanako., 2015, Human Insecurity Caused by the Dysfunction of the State: New Security Issues in Post-Fukushima Japan. Asian Journal of Peacebuilding 3, 165-187. Available from: https://ipus.snu.ac.kr/eng/archives/ajp/volume-3-number-2-november-2015/research-article/human-insecurity-caused-by-the-dysfunction-of-the-statenew-security-issues-in-post-fukushima-japan

Takahashi, Wakana., 2016, Divided fates of victims after the Fukushima nuclear power plant accident. Asian Laws in Disasters: Toward a Human-Centered Recovery. Routledge, UK.

TEPCO HD/Niigata Prefecture Joint Verification Committee., 2018, TEPCO HD/Niigata Prefecture Joint Verification Committee Verification Report (in Japanese). Available from: https://www.pref.niigata.lg.jp/uploaded/attachment/38274.pdf.

Tsujiuchi, Takuya., 2020, Post-traumatic stress due to structural violence after the Fukushima. Japan Forum 33. 161-188. Available from:https://www.tandfonline.com/doi/abs/10.1080/09555803.2018.1552308

Yamaguchi, Mari., 2022, Cancer patients seek damages from Fukushima nuclear plant. 26 May 2022. Associate Press. Available from: https://apnews.com/article/science-health-accidents-tokyo-ddfe7c7477e9eb87b1fe0fc81c1ad204.