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**Promotion and protection of all human rights, civil,  
political, economic, social and cultural rights,  
including the right to development**

### **Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover**

#### **Addendum**

#### **Mission to Japan (15 - 26 November 2012)<sup>\*,\*\*</sup>**

##### *Summary*

The Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover, visited Japan from 15 to 26 November 2012. During the visit he ascertained, in a spirit of dialogue and cooperation, the country's endeavour to implement the right to health, and in particular considered issues related to realization of the right to health within the context of the nuclear accident at the Fukushima Daiichi Nuclear Power Plant on 11 March 2011, the events leading to it and emergency response, recovery and mitigation.

In this report, the Special Rapporteur commends Japan on steps taken to monitor the health of the affected population, designate evacuation zones, monitor radiation levels and decontaminate the affected areas, as well as on its commitment to realizing the right to physical and mental health. However, in order to fully realize the right, the Special Rapporteur encourages the Government to address a number of serious challenges and consider particular areas for improvements in the nuclear emergency response system; the scope and extent of the basic and detailed health management surveys; dose limits of radiation; access to accurate information on radiation and its health effects; transparency and accountability of the nuclear industry and regulatory authority; and participation of

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\* The summary of the present report is circulated in all official languages. The report itself, contained in the annex to the summary, is circulated in the language of submission only.

\*\* Late submission.

affected communities in decision-making processes. With a view to facilitating that endeavour, the Special Rapporteur provides a number of recommendations to the Government of Japan.

**Annex***[English only]***Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover, Mission to Japan (15- 26 November 2012)****Contents**

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## **I. Introduction**

1. The Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health undertook a visit to Japan, at the invitation of the Government, from 15 to 26 November 2012. The purpose of the mission was to ascertain, in a spirit of dialogue and cooperation, measures taken by the Government of Japan for successful realization of the right to health.

2. During the mission, the Special Rapporteur considered issues related to the realization of the right to health within the context of the nuclear accident at the Fukushima Daiichi nuclear power plant on 11 March 2011, the events leading to it and emergency response, recovery and mitigation. The Special Rapporteur visited Tokyo, Sendai, as well as numerous communities and cities in the Fukushima prefecture.

3. The Special Rapporteur held meetings with senior Government officials from the Ministries of Foreign Affairs; Health; Labour and Welfare; Education, Culture, Sports, Science and Technology; Environment; as well as with senior officials from the Reconstruction Agency and Nuclear Regulatory Authority. He also met with the representatives of United Nations agencies, health professionals, academics, representatives of civil society organisations and community members. He also met with senior Government officials in Fukushima and Miyagi prefectures. The Special Rapporteur is grateful to the Government of Japan for its invitation and full cooperation during his visit. He also would like to thank all those who met with him, gave their time and extended cooperation to him during the mission.

## **II. Legal framework**

4. Japan has ratified a number of international human rights treaties recognizing the right to health, including the International Covenant on Economic, Social and Cultural Rights, Convention on the Elimination of All Forms of Racial Discrimination, Convention on the Elimination of All Forms of Discrimination Against Women, Convention on the Rights of the Child, including its two Optional Protocols, and International Convention for the Protection of All Persons from Enforced Disappearance. Japan signed but has not yet ratified the Convention on the Rights of Persons with Disabilities. The 1946 Constitution of Japan does not explicitly guarantee the right to health. However, article 25 of the Constitution obligates the State to promote public health.

5. The Act on Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Reactors, the Act on Basic Act on Disaster Control Measures, and the Act on Special Measures Concerning Nuclear Emergency Preparedness provide the basic legal framework for the nuclear disaster countermeasures and the emergency response of Japan after the nuclear accident.

## **III. The Fukushima Daiichi nuclear power plant accident**

6. The nuclear accident occurred soon after the Great East Japan Earthquake and tsunami hit Japan on 11 March 2011. The earthquake of magnitude 9.0 occurred off the east coast of Japan in the Pacific Ocean. It gave rise to a tsunami with waves up to 40 meters.

The earthquake and tsunami resulted in 15,879 deaths and 6,126 injured people.<sup>1</sup> Nuclear power reactors at Tokai Daini, Higashi-Dori, Onagawa, and the Fukushima Daini plant were also affected. However no major harm was caused to any of these nuclear reactors.<sup>2</sup>

7. At the time of the earthquake, reactors four to six of the Fukushima Daiichi nuclear power plant, owned by the Tokyo Electric Power Company (TEPCO), were suspended due to routine inspection. Though units one to three went into automatic shut-down mode as soon as the earthquake struck, electricity at the power plant was lost. Tsunami waves as high as 14 metres hit the plant approximately 50 minutes after the earthquake, overwhelming the walls of the plant. Designed to withstand waves of a maximum of 5.7 metres, the walls failed to contain the impact of the tsunami, causing a complete power blackout in units one to five. Communication systems within and outside the plant site were also severely compromised.<sup>3</sup> Due to complete power outage, units one to three of the Daiichi Plant lost the ability to maintain proper reactor cooling and suffered a meltdown. Consequently, fuels in the reactors were exposed and damaged and a series of explosions occurred. Unit four suffered a hydrogen explosion on 15 March 2011.<sup>4</sup> Since the nuclear accident, reactors one to four have been decommissioned.<sup>5</sup>

8. The amount of radioactive caesium ( $^{137}\text{C}$ ) released due to the nuclear accident at the Daiichi Plant is estimated to be 168 times higher than that released by the atomic bomb in Hiroshima.<sup>6</sup> According to TEPCO, the accident released 900 petabecquerel of radioactive iodine and caesium (iodine conversion).<sup>7</sup> Other radioactive materials released due to the nuclear accident include radioactive Tellurium ( $^{129\text{m}}\text{Te}$ ,  $^{129}\text{Te}$ ), Silver ( $^{110\text{m}}\text{Ag}$ ), Lanthanum ( $^{140}\text{La}$ ) and Barium ( $^{140}\text{Ba}$ ).<sup>8</sup>

9. Owing to similarities between the nuclear accidents at Chernobyl, Three Mile Island and Fukushima,<sup>9</sup> it is understandable that lessons from Chernobyl and Three Mile Island were drawn in devising strategies in Fukushima. The Special Rapporteur emphasises,

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- <sup>1</sup> National Police Agency of Japan, Emergency Disaster Countermeasures Headquarters, *Damage Situation and Police Countermeasures associated with 2011 Tohoku District – off the Pacific Ocean Earthquake*, (26 December 2012), [http://www.npa.go.jp/archive/keibi/biki/higaijokyo\\_e.pdf](http://www.npa.go.jp/archive/keibi/biki/higaijokyo_e.pdf).
- <sup>2</sup> International Atomic Energy Agency (IAEA), *The Great East Japan Earthquake Expert Mission: International Fact Finding Expert Mission on the Fukushima Dai-ichi NPP Accident Following the Great East Japan Earthquake and Tsunami* (16 June 2011), p.11.
- <sup>3</sup> *Ibid.*, p.12.
- <sup>4</sup> The National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC), *Full Report, Executive Summary* (2012), p.13.
- <sup>5</sup> Ministry of Economy, Trade and Industry, Nuclear Emergency Response Headquarters, *Government and TEPCO's Mid-to-Long Term Countermeasure Meeting* (21 December 2011), [http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/111221\\_02.pdf](http://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/111221_02.pdf).
- <sup>6</sup> The Telegraph, *Fukushima caesium leaks 'equal 168 Hiroshimas'*, (25 August 2011), <http://www.telegraph.co.uk/news/worldnews/asia/japan/8722400/Fukushima-caesium-leaks-equal-168-Hiroshimas.html>; [http://www.enecho.meti.go.jp/radi\\_qa/45.pdf](http://www.enecho.meti.go.jp/radi_qa/45.pdf).
- <sup>7</sup> TEPCO, *Estimation of the released amount of radioactive materials into the atmosphere as a result of the accident in the Fukushima Daiichi Nuclear Power Station* (24 May 2012), [http://www.tepco.co.jp/en/press/corp-com/release/betu12\\_e/images/120524e0201.pdf](http://www.tepco.co.jp/en/press/corp-com/release/betu12_e/images/120524e0201.pdf).
- <sup>8</sup> See PD McLaughlin et al, "An update on radioactive release and exposures after the Fukushima Daiichi Nuclear Disaster", *The British Journal of Radiology* (September 2012), vol.85, no.1017, pp.1222–1225, p.1222; TEPCO also detected Strontium ( $^{90}\text{Sr}$ ) in the soil, *Fukushima Daiichi Nuclear Power Station: Strontium analysis result in the soil*, [http://www.tepco.co.jp/en/press/corp-com/release/betu11\\_e/images/110508e7.pdf](http://www.tepco.co.jp/en/press/corp-com/release/betu11_e/images/110508e7.pdf).
- <sup>9</sup> The nuclear accidents in Chernobyl and Fukushima are the only two accidents designated as level 7 (major accident) on the International Nuclear and Radiological Event Scale (INES). The Three Mile Incident was designated level 5 (accident with wider consequences) on the INES.

however, that crucial and complete information regarding the Chernobyl accident was not made public until 1990.<sup>10</sup> Thus, studies on Chernobyl may not fully cognize the effects of contamination and radiation exposure.<sup>11</sup> In that context, it is of concern that only the increased prevalence of thyroid cancer following the Chernobyl accident is acknowledged and applied to the Fukushima accident. Reports on health effects of radiation exposure after the Chernobyl accident have characterised evidence of other health anomalies as inconclusive.<sup>12</sup> This regrettably neglects other health effects of radiation exposure such as chromosomal aberrations<sup>13</sup> increased childhood and adult morbidity, impairment<sup>14</sup> and leukaemia<sup>15</sup>, which may require monitoring.<sup>16</sup>

10. The Government has relied on recommendations from the International Commission on Radiological Protection (ICRP), which provide a reference level for radiation dose of 1mSv/year to 20 mSv/year for resettling people in contaminated areas.<sup>17</sup> However, life span epidemiological studies of survivors of Hiroshima and Nagasaki bombings point to causal links between long-term exposure to low doses of radiation and the increased incidence of cancer.<sup>18</sup> The Special Rapporteur considers that disregarding these findings diminishes the understanding of and increases vulnerability to health effects of long-term exposure to low-dose ionising radiation.

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- <sup>10</sup> International Physicians for the Prevention of Nuclear War, *Health effects of Chernobyl: 25 years after the reactor catastrophe* (Berlin, April 2011), p.13; Letter dated 6 July 1990 from the Deputy Minister for Foreign Affairs of the Union of Soviet Socialist Republic and the representatives of the Byelorussian and Ukrainian Soviet Socialist Republics to the United Nations addressed to the Secretary General, Doc. A/45/342 E/1990/102 (9 July 1990), <http://chernobyl.undp.org/spanish/documentos/45-342.pdf>.
- <sup>11</sup> Alexey V. Yablokov et al, *Chernobyl: Consequences of the Catastrophe for People and the Environment* (Boston, 2009), <http://www.strahlentelex.de/Yablokov%20Chernobyl%20book.pdf>.
- <sup>12</sup> United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), *Sources and Effects of Ionizing Radiation, Volume II, Annex D: Health effects due to radiation from the Chernobyl Accident* (United Nations, 2011), pp.65-66, para.110; UNDP, WHO, *The Human Consequences of the Chernobyl Nuclear Accident: A strategy for recovery* (2002), [http://www.who.int/ionizing\\_radiation/chernobyl/UN%20Report%20Strategy%20for%20Recovery%20Jan%202002.pdf](http://www.who.int/ionizing_radiation/chernobyl/UN%20Report%20Strategy%20for%20Recovery%20Jan%202002.pdf), p.7.
- <sup>13</sup> Nussbaum and Kohnlein, Inconsistencies and Open Questions Regarding Low-Dose Health Effects of Ionizing Radiation, *Environmental Health Perspectives* (August 1994), vol.102, no.8, pp.656-667, p.664.
- <sup>14</sup> Yablokov et al, op cit, pp.42-54.
- <sup>15</sup> Steven Wing et al, A Re-evaluation of Cancer Incidence Near the Three Mile Island Nuclear Plant: The Collision of Evidence and Assumption, *Environmental Health Perspectives* (January 1997), vol.105, no.1, pp.52-57, p.56.
- <sup>16</sup> E. Cardis et al, The Chernobyl accident — an epidemiological perspective, *The Royal College of Radiologists* (May 2011), vol. 23, no.4, pp.251-260, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3107017/pdf/nihms281413.pdf>.
- <sup>17</sup> ICRP, *Fukushima Nuclear Power Plant Accident*, <http://www.icrp.org/docs/fukushima%20nuclear%20power%20plant%20accident.pdf> (21 March 2011).
- <sup>18</sup> National Research Council, *Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2* (Washington DC, The National Academies Press, 2006), p.30; Kotaro Ozasa et al, Studies on the Mortality of Atomic Bomb Survivors, Report 14, 1950-2003: An Overview of Cancer and Non-cancer Diseases, *Radiation Research* (March 2012), vol.177, no.3, pp.229-243, pp. 229,236.; David J. Brenner et al, Cancer Risks Attributable to Low Doses of Ionizing Radiation: Assessing what we really know, *PNAS* (November 2003), vol.100, no.24, pp.13761-13766; Pierce and Preston, Radiation-Related Cancer Risks at Low Doses among Atomic Bomb Survivors, *Radiation Research* (2000), vol.154, pp.178-186, p.185.

## IV. The right to health and nuclear disaster management

11. The nuclear accident in Japan has affected the right to health of evacuees and residents alike and has had an impact on physical and mental health, particularly of pregnant women, older persons, and children. The precise health implications of radiation exposure are still not clear, as long-term health effects of low-dose ionising radiation are still being studied. The evacuation has caused the breakdown of families and communities, giving rise to mental health concerns, especially among first responders, older persons, mothers and children.

12. The enjoyment of the right to health is dependent on underlying determinants such as safe and nutritious food, access to safe and potable water, a healthy environment and housing.<sup>19</sup> The accident caused widespread contamination of soil, water, food and the environment. Authorities in Tokyo, Fukushima, Ibaraki, Chiba and Tochigi therefore imposed restrictions on the consumption of tap water when radioactive iodine and caesium higher than the permissible limit were detected in tap water.<sup>20</sup>

13. The right to health requires the State to ensure availability and accessibility of quality health facilities, goods and services.<sup>21</sup> This includes information that enables individuals to make informed decisions regarding their health. Further, monitoring the health of people for adverse effects of radiation and providing timely healthcare is an important aspect of fulfilment of the right to health. The State is also required to have in place evidence-based policies for the decontamination of affected areas to restore the life and health of people at the earliest. Finally, transparency and accountability in governance,<sup>22</sup> access to remedies<sup>23</sup> and participation of affected population<sup>24</sup> in decision-making processes are necessary to the enjoyment of the right to health.

### A. Nuclear emergency response

14. Soon after the earthquake and the tsunami hit the Daiichi plant, the Government of Japan announced a 'Nuclear Emergency Situation' pursuant to article 15 of the Act on Special Measures Concerning Nuclear Emergency Preparedness.<sup>25</sup> This was the first step in initiating the emergency response system<sup>26</sup> aimed at containing the nuclear accident and protecting individuals from adverse health effects arising from radiological and non-radiological causes.<sup>27</sup>

<sup>19</sup> Committee on Economic Social and Cultural Rights (CESCR), General Comment 14 (2000), E/C.12/2000/4, para.11.

<sup>20</sup> Ministry of Health, Labour and Welfare, *Press Release: Detection of radioactive materials in tap water* (23 March 2011); Health Services Council, *The Survey Results of Radioactive Materials in Tap Water* (19 April 2011).

<sup>21</sup> CESCR, *op cit*, para.12.

<sup>22</sup> *Ibid.*, para.55.

<sup>23</sup> *Ibid.*, para.59.

<sup>24</sup> *Ibid.*, para. 11.

<sup>25</sup> Tessa Morris-Suzuki et al, *Lessons from Fukushima*, Greenpeace International (February 2012), p.16.

<sup>26</sup> IAEA, *Preparedness and Response for a Nuclear or Radiological Emergency: Safety Requirements*, IAEA Safety Standards Series, No. GS-R-2, (Vienna, 2002), p.14.

<sup>27</sup> *Ibid.*, pp.4-5.

### Information on the nuclear accident and evacuation

15. Access to information is an essential component of the right to health, as it enables individuals to make informed decisions regarding their health. Information about the nuclear accident, including contaminated and potentially contaminated areas should be made public immediately and in a coordinated manner. In addition, an effective emergency response system requires that the public be provided with useful, timely, truthful, consistent and appropriate information promptly throughout a nuclear or radiological emergency.<sup>28</sup>

16. According to the independent investigation committee, the System for Prediction of Environment Emergency Dose Information (SPEEDI), a computer-based system for estimating potential radiation contamination based on real-time information, was not utilized by the Government in a timely and efficient manner.<sup>29</sup> Consequently and contrary to IAEA requirements for a nuclear emergency response,<sup>30</sup> on 11 March 2011, only 20 per cent of Fukushima residents near the plant came to know of the accident.<sup>31</sup> Most people in the 10km radius were informed of the accident simultaneously with evacuation orders on 12 March 2011.<sup>32</sup>

17. Evacuation zones, designated by the Government, were based on proximity to the nuclear plant, rather than on scientific data indicating areas likely to be contaminated due to radioactive plume. Mandatory evacuation zones were periodically altered from a radius of three kilometres from the Daiichi plant to ten and later to 20km.<sup>33</sup> Voluntary evacuation was eventually endorsed within the 20-30km radius area.<sup>34</sup> Evacuation orders for some areas with high radiation doses were not issued until one month later. On 22 April 2011, the Government issued evacuation orders for areas up to 50km north-west of the plant, including Katsurao, Iitate, Namie, and parts of Minami-soma and Kawamata, due to high-dose radiation detected in the area<sup>35</sup> brought by winds carrying radioactive material from the plant. People in these areas thus remained exposed to high-dose radiation for a significant period. Even after SPEEDI was used, the resulting data was not made immediately available to the public.<sup>36</sup>

18. A coordinated and effective response at local and national levels is a key goal of emergency preparedness.<sup>37</sup> Japan's emergency response did not meet up to the requirements. Poor coordination between the authorities was evident when the Fukushima authorities initially ordered evacuation of the 2km area, after which the Government ordered a 3km evacuation area.<sup>38</sup> Due to insufficient training in the response system, including inefficient use of SPEEDI, 573 deaths have been certified by the Government as 'nuclear disaster-related deaths'.<sup>39</sup>

<sup>28</sup> IAEA, *Safety Standards*, op cit, p.31.

<sup>29</sup> Investigation Committee of the Accident at Fukushima Nuclear Power Stations of Tokyo Electric Power Company (Investigation Committee), *Executive Summary of the Final Report* (23 July 2012),p.11.

<sup>30</sup> IAEA, *Safety Standards*, op cit, p.25.

<sup>31</sup> NAIIC, op cit, *Executive Summary*, p.19.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid, p.38.

<sup>34</sup> Morris-Suzuki et al, op cit, p.16

<sup>35</sup> Ibid.

<sup>36</sup> Ibid, p. 18

<sup>37</sup> IAEA, *Safety Standards*, op cit, p.6.

<sup>38</sup> NAIIC, op cit, p.62.

<sup>39</sup> Morris-Suzuki et al, op cit, p.19.



### Distribution of iodine prophylaxis

19. The obligation to fulfil the right to health requires the State to take measures that assist individuals in realizing their right to health when they are unable to do so.<sup>40</sup> This is especially significant in cases of nuclear emergency where the ill effects of radiological contamination, such as thyroid cancer, on the health of people are immense and long-term. In the aftermath of the nuclear accident in Chernobyl, more than 4000 cases of thyroid cancer were documented in Belarus, Russian Federation and Ukraine from 1992 to 2002 among those who were children and adolescents at the time of the accident.<sup>41</sup> In such circumstances, the State should take all efforts to ensure that such health goods as stable iodine tablets are made available and accessible, in a timely manner, to mitigate the effect of radioactive iodine on the health of the exposed population.

20. The Government, in its interim report to the IAEA, estimated that the quantity of radioactive iodine (<sup>131</sup>I) released to the environment was about  $1.6 \times 10^{17}$  Bq.<sup>42</sup> Exposure to radioactive iodine increases the risk of thyroid cancer, especially in children, infants and new-borns.<sup>43</sup> To block or reduce the accumulation of radioactive iodine in the thyroid gland, stable iodine is administered before, or soon after, the possible intake of radioactive iodine.<sup>44</sup> Although the optimal time for ingesting stable iodine is before a nuclear accident, it can reduce the intake of radioactive iodine by 50 per cent if administered a few hours after the accident.<sup>45</sup>

21. Regrettably, the Government did not give prompt orders for administering stable iodine after the nuclear accident. Even though some municipal authorities had stocks of stable iodine, they were not distributed. Some municipalities, such as Futaba and Tomioka, distributed stable iodine without orders from the Government.<sup>46</sup> During the meeting with officials of the Fukushima Medical University, the Special Rapporteur learnt that the decision to administer stable iodine had been delayed because of apprehension of potential harmful side effects that iodine prophylaxis could cause. However, it is an accepted position in radiological medicine that even where the absorbed dose is less than 100mGy, stable iodine should be administered, as it does not entail any significant health hazards.<sup>47</sup>

## B. Monitoring the health effects of the nuclear accident

22. In the immediate and long-term aftermath of a nuclear accident, the right to health necessitates rigorous and prolonged monitoring of individual health, as the health effects of radiation exposure are not always immediately known or treatable. Though experiences from the Three Mile Island and Chernobyl accidents provide invaluable guidance, a narrow appreciation of the accidents would not provide proper guidance. The Special Rapporteur

<sup>40</sup> CESCR, op cit, para.37.

<sup>41</sup> IAEA, Chernobyl's Legacy: Health, Environmental and Socio-economic Impacts and Recommendations to the Governments of Belarus, the Russian Federation and Ukraine (Second revised version), The Chernobyl Forum: 2003-2005 (Austria, April 2006), p.7.

<sup>42</sup> Report of Japanese Government to IAEA Ministerial Conference on Nuclear Safety, Accident at TEPCO's Fukushima Nuclear Power Stations, p.VII, <http://www.iaea.org/newscenter/focus/fukushima/japan-report/chapter-6.pdf>

<sup>43</sup> WHO, Guidelines for Iodine Prophylaxis following Nuclear Accidents: Update 1999, p.8, [http://www.who.int/ionizing\\_radiation/pub\\_meet/Iodine\\_Prophylaxis\\_guide.pdf](http://www.who.int/ionizing_radiation/pub_meet/Iodine_Prophylaxis_guide.pdf),

<sup>44</sup> Ibid, p.7.

<sup>45</sup> Ibid, p.19.

<sup>46</sup> Morris-Suzuki et al, op cit, p.20.

<sup>47</sup> WHO, *Guidelines*, op cit, p.14; IAEA, *Safety Standards*, op cit, p.52.

encourages the Government to monitor any increased morbidity and leukaemia, since they have been detected among the survivors of Chernobyl and Three Mile Island.<sup>48</sup> Due to limited knowledge regarding the health effects of long-term exposure to low-dose ionizing radiation, the Government's orders for resettlement of residents into areas with accumulated dosage of 20 mSv/year and less should be followed by long-term health monitoring of affected people.

23. The health management survey in Fukushima is implemented by the prefecture authorities, which reportedly received 78.2 billion Yen from the Government, in coordination with the Fukushima Medical University. It comprises a basic survey and four detailed surveys. The basic survey estimates levels of external irradiation among residents. The detailed surveys include a thyroid ultrasound examination for all children in Fukushima aged up to 18 years, a comprehensive health check for all residents from the evacuation zones, an assessment of mental health and lifestyles of all residents from the evacuation zones, and recording of all pregnancies and births among all women in the prefecture who were pregnant on 11 March 2011.<sup>49</sup>

24. Despite the funding reportedly given by the government mentioned above, during the visit, the Special Rapporteur heard concerns about the slow progress of implementing the survey due to the reported lack of capacity of the Fukushima authorities. He urges the Government to assume the central role in the implementation of the survey and make more financial and human resources available for its implementation.

#### **Basic health management survey**

25. Three months after the nuclear accident, Fukushima authorities sent the health management survey to people who had resided in the prefecture on 11 March 2011.<sup>50</sup> The objective was to evaluate individual radiation exposure from March 2011 to July 2011.<sup>51</sup> Basic data collected will be used in health examinations of the target population and in their future long-term health care.<sup>52</sup>

26. The basic survey would gather information about the whereabouts of individuals during various periods from 11 March to 11 July 2011, and the consumption of food, dairy products and water between 11 March and 31 March 2011.<sup>53</sup> The survey did not inquire into the health status of the individual at the time of the accident or in the time following the accident. A standard medical question regarding injuries – conventional/radiation induced/combined – around the time of the accident was absent from the survey.<sup>54</sup> In contrast to other surveys, it did not incorporate questions enquiring into the cancer history of the respondents, including cancer diagnosis, thyroid disorders, radiation treatment, prior exposure to ionizing radiation at work and risk factors such as smoking.<sup>55</sup>

<sup>48</sup> Nussbaum and Kohnlein, op cit; Wing et al, op cit.

<sup>49</sup> Seiji Yasumura et al, Study Protocol for the Fukushima Health Management Survey, *Journal of Epidemiology* (August 2012), vol.22, op cit, pp.375-383, p.376.

<sup>50</sup> Ibid., p.377.

<sup>51</sup> Fukushima Medical University, *Information about the Fukushima Health Management Survey*, [http://www.fmu.ac.jp/univ/chiiki/health\\_survey/pdf/en/en\\_zip.pdf](http://www.fmu.ac.jp/univ/chiiki/health_survey/pdf/en/en_zip.pdf).

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> See IAEA, *Generic Procedures for Medical Response During a Nuclear or Radiological Emergency, Emergency Preparedness and Response* (Vienna 2005), p.138.

<sup>55</sup> Marilyn Goldhaber et al, The Three Mile Island Population Registry, *Public Health Reports* (November-December 1983), vol.98, no.6, pp.603-609.

27. Early capture of information is crucial to an effective monitoring of the human health impact from radiation exposure.<sup>56</sup> However, the basic survey was sent out three months after the nuclear accident and relied solely on the memory of the respondent about his/her activities around the time of the accident. Additionally, the cohort size has a significant role to play in analysing and understanding the health effects of radiation exposure. For instance, in a survey conducted following the Three Mile Island incident, data from 92-93 per cent of the affected population was captured within six weeks.<sup>57</sup> The Fukushima authorities informed the Special Rapporteur that the response rate to their survey was as low as 23 per cent as of October 2012. The low response rate and the ambiguous nature of replies due to a three-month time lag may not ensure an accurate capture and evaluation of the health effects of the nuclear accident. The Special Rapporteur therefore encourages the Government to put in additional measures to ensure adequate health monitoring of affected residents. Moreover, given that the fallout from the accident seems to have reached prefectures other than Fukushima,<sup>58</sup> he also urges the Government to expand the health monitoring to other affected prefectures, where radiation exposure is higher than additional 1 mSv/year in effective dose.

### Thyroid screening of children

28. The right to health requires the State to pay special attention to vulnerable groups such as children. As children are most vulnerable to thyroid cancer due to radioactive iodine intake, the Fukushima authorities initiated thyroid check-ups of all children who were up to 18 years old as of 11 March 2011. The Special Rapporteur commends the Government for this effort, and encourages it to explore other health effects of radiation on children such as leukaemia, as epidemiological studies have not ruled out the possibility of leukaemia in children who were exposed to radiation following the Chernobyl accident.<sup>59</sup>

29. The thyroid check-ups commenced in October 2011 and will continue to March 2014, after which they will continue every two years until the individual is 20 years old and thereafter will continue every 5 years.<sup>60</sup> The results of the thyroid check-up are divided into four categories. An 'A1' outcome reflects detection of no nodule or cyst. 'A2' means that the size of the nodule present is less than 5.0 mm and/or the cyst is less than 20.0 mm. Children with A1 and A2 result are not eligible for a secondary examination. Result 'B' indicates that the nodules and cysts are larger than 5.1 mm and/or 20.1mm respectively and qualifies the child for secondary examination. 'C' indicates an urgent need for secondary examination.<sup>61</sup>

30. It is important to note that the size of the nodule may not always be indicative of its malignancy, as the likelihood that a nodule is malignant is independent of the number of

<sup>56</sup> IAEA, *Generic Procedures*, op cit.

<sup>57</sup> Goldhaber et al, op cit, p.605.

<sup>58</sup> Tomoka Ohta et al, Prediction of groundwater contamination with 137Cs and 131I from the Fukushima nuclear accident in the Kanto district, *Journal of Environmental Radioactivity* (December 2011), vol.111, pp.38-41; Hikaru Amano et al, Radiation measurements in the Chiba Metropolitan Area and radiological aspects of fallout from the Fukushima Dai-ichi Nuclear Power Plants accident, *Journal of Environmental Radioactivity* (December 2011), vol.111, pp.42-52.

<sup>59</sup> Andrey G. Noshchenko, Patterns of acute leukaemia occurrence among children in the Chernobyl region, *International Journal of Epidemiology* (February 2001), vol.30, no.1, pp.125-129; S. Davis et al, Childhood leukaemia in Belarus, Russia and Ukraine following the Chernobyl power station accident: results from an international collaborative population-based case-control study, *International Journal of Epidemiology* (April 2006), vol.35, no.2, pp.386-396.

<sup>60</sup> Yasumura et al, op cit, p.378.

<sup>61</sup> Data from the Fukushima prefecture, at: <http://wwwcms.pref.fukushima.jp/>

nodules and the size of the nodule.<sup>62</sup> Moreover, follow up treatment for children in A2 categories will take place after two years. This may be too long a period to check the rate of growth of a tumour, which is an indicator of increased risk of malignancy.<sup>63</sup> According to the latest official information, 186 out of 38,114 children examined in 2011 fell into category B (0.5 per cent) while, in 2012, 548 children out of 94,975 were in that category (0.6 per cent).<sup>64</sup>

31. During the visit, the Special Rapporteur was informed that the Japan Thyroid Association was instructed against providing secondary examinations to children in the A2 category. Parents and children will therefore have to wait for the second round of check-ups after March 2014, before they are able to take any mitigating action against possible thyroid cancer. The Special Rapporteur calls on the Government to remove such barriers which prevent people from exercising their right to health and to ensure that children and parents are able to access second opinions and secondary health examinations, as required under the right to health.

32. The Special Rapporteur was also informed that parents of children found it difficult to access the results of their children's thyroid check-ups due to red tape and the cumbersome freedom of information act procedure that Fukushima authorities insist on applying to parents' requests. Though confidentiality of information is an important aspect of the right to health, it should not become a barrier to obtain information regarding one's own health. In accordance with the right to health, the State is required to ensure an individuals' right to informed decisions regarding his/her health by enabling them to access information relating to their health, which will have a bearing on their decision-making ability.

#### **Comprehensive health management survey**

33. The comprehensive survey seeks to review health information, assess the incidence of various diseases and improve the health status of the respondents. The target population is restricted to residents of the evacuation zone specified by the government and residents of Yamakiya in Kawamata-machi, Namie-mach and Iitate-mura.<sup>65</sup> Due to high levels of contamination in the soil, water and foodstuff, including marine life, there is a possibility of internal irradiation.<sup>66</sup> Following the Chernobyl accident, increased morbidity due to diseases of the endocrine, haematopoietic, circulatory and digestive systems have been found among those affected.<sup>67</sup> The comprehensive health management survey should therefore include check-ups for internal radiation exposure. Radioactive caesium has already been found in urine samples of people as young as 8 years old in Japan.<sup>68</sup> However,

<sup>62</sup> Dan Mihailescu and Arthur Schneider, Size, number and distribution of thyroid nodules and their risk of malignancy in radiation-exposed patients who underwent surgery, *The Journal of Clinical Endocrinology and Metabolism* (June 2008), vol.93, no.6, pp.2188-2193; Mary Frates et al, Management of thyroid nodules detected at US: Society of Radiologists in Ultrasound consensus conference statement, *Radiology* (December 2005), vol.237, no.3, pp.794-800.

<sup>63</sup> Frates et al, *ibid*, p.799.

<sup>64</sup> Thyroid Ultrasound Examination (Thyroid Screening) in 2012/2013, at [http://www.fmu.ac.jp/radiationhealth/results/media/10-2\\_ThyroidUE.pdf](http://www.fmu.ac.jp/radiationhealth/results/media/10-2_ThyroidUE.pdf).

<sup>65</sup> Yasumura et al, *op cit*, p.378.

<sup>66</sup> Teppei J. Yasunari et al, Cesium-137 deposition and contamination of Japanese soils due to the Fukushima nuclear accident, *PNAS* (December 2011), vol.108, no.49, pp.19530-19534.

<sup>67</sup> WHO, *Health Effects of the Chernobyl Accident and Special Health Care Programmes* (Geneva, 2006), p.74.

<sup>68</sup> Results of ACRO's monitoring in Japan (12 of July 2012), [http://www.acro.eu.org/O CJ\\_en.html#33](http://www.acro.eu.org/O CJ_en.html#33).

the survey does not include urine tests for people under the age of 16 years.<sup>69</sup> Tests<sup>70</sup> should also be conducted to check for radioactive strontium<sup>71</sup> as it presents a large risk for internal radiation exposure via ingestion of contaminated agricultural crops and can cause leukaemia.<sup>72</sup>

34. The Special Rapporteur was informed that whole-body counters, used for measuring internal exposure to gamma radiation, are not available in healthcare facilities throughout Fukushima prefecture, as required.

35. The Special Rapporteur commends the Government for lowering the permissible limit of radionuclides in food for consumption.<sup>73</sup> Careful scientific sampling is important to measure radioactivity in food. He however notes dissatisfaction among people about government sampling and preferred community measurement centres. It is important that the Government take steps in bridging the trust deficit with the people of Japan.

### **Mental health survey**

36. The right to health extends not only to provision of medical health facilities, goods and services but also to facilitating an environment within which the affected population is enabled to enjoy the right. The State is therefore under an obligation to minimize the effect of the accident on the mental health of people by, among other things, reducing stress and anxiety related to radiation exposure and separation from families.

37. The effect of nuclear disasters on mental health has been documented in the context of Three Mile Island and Chernobyl.<sup>74</sup> A year after the Three Mile Island accident, mothers had an excess risk of experiencing clinical episodes of anxiety and depression.<sup>75</sup> After the Chernobyl accident, women with young children were found to be most vulnerable to the mental health effects of the nuclear accident,<sup>76</sup> and its continued impact on mental health was visible even after six years of the accident.<sup>77</sup> In a study conducted by the IAEA, a significant amount of stress and anxiety was found to be related to the Chernobyl

<sup>69</sup> Yasumura et al, op cit, p.379.

<sup>70</sup> Patrick C.D'Haese et al, Measurement of strontium in serum, urine, bone, and soft tissues by Zeeman atomic absorption spectrometry, *Clinical Chemistry* (1996), vol.43, no.1, pp.121-128.

<sup>71</sup> IAEA, *Fukushima Update Log*, <http://www.iaea.org/newscenter/news/2011/fukushima130411.html>.

<sup>72</sup> Norikazu Kinoshita et al, Assessment of individual radionuclide distributions from the Fukushima nuclear accident covering central-east Japan, *PNAS* (December 2011), vol.108, no.49, pp.19526–19529.

<sup>73</sup> Ministry of Health, Labour and Welfare, New Standard limits for Radionuclides in Foods, [http://www.mhlw.go.jp/english/topics/2011eq/dl/new\\_standard.pdf](http://www.mhlw.go.jp/english/topics/2011eq/dl/new_standard.pdf).

<sup>74</sup> Evelyn Bromet, Lessons learned from radiation disasters, *World Psychiatry* (June 2011), vol. 10, no.2, pp.83-84; Evelyn Bromet & John Havenaar, Psychological and perceived health effects of the Chernobyl disaster: a 20-year review, *Health Physics* (November 2007), vol.93, no.5, pp.516-521.

<sup>75</sup> Evelyn Bromet et al, Mental health of residents near the Three Mile Island reactor: A comparative study of selected groups, *Journal of Preventive Psychiatry* (October 1982), vol.1, no.3, pp.225-276.

<sup>76</sup> John Havenaar et al, Long-Term Mental Health Effects of the Chernobyl Disaster: An Epidemiologic Survey in Two Former Soviet Regions, *American Journal of Psychiatry* (November 1997), vol.154, no.11, pp.1605-07, p.1606.

<sup>77</sup> *Ibid*, p.1607.

accident.<sup>78</sup> Moreover, post-traumatic stress disorder reportedly have high prevalence rate among survivors of man-made disasters.<sup>79</sup>

38. The Fukushima nuclear accident resulted in breakdown of families and communities and feelings of isolation. The Special Rapporteur personally observed the anxiety and stress among evacuees, residents and their families, which were related to the effect of radiation leakage on health, especially of children, cost of evacuation, loss of livelihoods as well as uncertain future and delays in receiving compensation that hindered rebuilding of their lives.

39. The Special Rapporteur notes with concern that the mental and physical health of children has been especially affected by the lack of outdoor activities, safe areas to play and restrictions on activities in school. He calls on the Government to make quality mental health facilities, goods and services available and accessible to residents of Fukushima, evacuees and their families, with a focus on vulnerable groups such as first responders and children when they want it. The Government should also provide and support programmes such as recuperation camps organised by NGOs to reduce stress and anxiety of the affected communities.

40. The Government developed a detailed mental health survey for residents of the evacuation zone. However, the target population does not include all people who have been affected by the accident. As with the comprehensive health survey, the survey should at least include residents of the voluntary evacuation zone. Further, the response rate was less than 50 per cent.<sup>80</sup> The Special Rapporteur welcomes the Government's effort to provide direct care to those who require it per the survey. Efforts are still required to ascertain and deliver services to the rest of the target population. Though the survey inquires about the responder's experience during the earthquake, tsunami and nuclear accident, it is important to record past experiences with radiation exposure as it may be an aggravating factor.

#### **Pregnancy and birth survey**

41. The obligation to respect, protect and fulfil the right to health is a continuous obligation and extends to progeny. The pregnancy and birth survey, however, is based on the assumption that the Chernobyl accident did not significantly increase child anomalies or foetal deaths.<sup>81</sup> The survey includes antenatal health, delivery records and mental health of women.<sup>82</sup> It does not include a provision to either monitor the health of the foetus or the health of the child after birth. With a view to ensuring the highest standard of physical and mental health, the Special Rapporteur encourages the Government to revise the survey and take into account studies, which have linked in utero radiation exposure with mental

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<sup>78</sup> Harold Ginzburg, The Psychological Consequences of the Chernobyl Accident – Findings from the International Atomic Energy Agency Study, *Public Health Reports* (March-April 1993), vol.108, no.2, pp.184 - 191, p.188.

<sup>79</sup> Y. Neria et al, Post-traumatic stress disorder following disasters: a systematic review, *Psychological Medicine* (2008), vol.38, pp.467-480.

<sup>80</sup> Yasumura et al, op cit, p.380.

<sup>81</sup> Ibid. p. 379

<sup>82</sup> Ibid.,p.380.

disability.<sup>83</sup> Further, the Government should explore the still unclear relation between in-utero exposure and leukaemia.<sup>84</sup>

### Health of the nuclear power plant workers

42. In the aftermath of Chernobyl, workers involved in cleaning operations and first responders were exposed to the highest doses of radiation.<sup>85</sup> During the Fukushima accident, an estimated 167 workers were exposed to more than 100mSv of radiation, a dose level unequivocally recognized to increase the risk of cancer.<sup>86</sup> Two operators received doses above 600mSv.<sup>87</sup> In addition, first responders face a high prevalence of post-traumatic stress disorder in man-made disasters.<sup>88</sup>

43. The law requires medical check-up of all workers who have worked in controlled areas every six months<sup>89</sup> and guidelines provide for additional medical check-ups of workers exposed to 50 mSv/year of radiation.<sup>90</sup> Despite this, the Special Rapporteur was concerned to learn that the results do not always get reported to the Government. In order to protect the right to health of workers, it is important to give health check-ups regularly and report their results. While acknowledging the Government's reiteration that health monitoring of nuclear workers is carried out under relevant laws and regulations, the Special Rapporteur notes concerns by nuclear power plant workers that such health monitoring is not conducted.

44. The Special Rapporteur was informed that many workers employed in the nuclear power industry are poor and some even homeless, increasing their vulnerability. Even though the law<sup>91</sup> requires compulsory medical check-ups for workers when they are hired, a significant number of workers, employed through layers of sub-contractors for short periods of time, are not provided with proper and effective monitoring of their health.<sup>92</sup> The Government should take all measures to provide an environment that does not exacerbate their vulnerability and provide access to affordable and quality health facilities, goods and services at all times to all workers.

<sup>83</sup> Otake and Schull, *In utero* exposure to A-bomb radiation and mental retardation: a reassessment, *The British Journal of Radiology* (May 1984), vol.57, pp.409-414; European Commission, *Effects of in utero exposure to ionizing radiation during the early phases of pregnancy* (Luxembourg, 2002).

<sup>84</sup> E.Cardis et al, Cancer consequences of the Chernobyl accident: 20 years on, *Journal of Radiological Protection* (2006),vol.26,pp.127-140,p.135;Richard Wakeford, Childhood leukaemia following medical diagnostic exposure to ionizing radiation *in utero* or after birth, *Radiation Protection Dosimetry* (October 2008), vol.32, no.2, pp.166-174.

<sup>85</sup> UNSCEAR, op cit; WHO, *Health effects*, op cit.

<sup>86</sup> NAIIC, op cit, *Executive Summary*, p.9.

<sup>87</sup> Nature: News, *Fukushima's doses tallied* (23 May 2012), <http://www.nature.com/news/fukushima-s-doses-tallied-1.10686>.

<sup>88</sup> Y. Neria et al, op cit; Jun Shigemura et al, Psychological Distress in Workers at the Fukushima Nuclear Power Plants, *Journal of the American Medical Association* (August 2012), vol.308, no.7.

<sup>89</sup> Article 56, Ordinance on Prevention of Ionizing Radiation Hazard.

<sup>90</sup> Guidelines on Health Promotion for Emergency Workers in TEPCO Fukushima Daiichi APP.

<sup>91</sup> Article 56(1), Ordinance on Prevention of Ionizing Radiation Hazard.

<sup>92</sup> Gabrielle Hecht, *Nuclear nomads: A look at the subcontracted heroes* <http://www.thebulletin.org/web-edition/features/nuclear-nomads-look-the-subcontracted-heroes>; The Asahi Shimbun, *Nuclear power plants: A hidden world of untruths, unethical behavior*, <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201208060093>.

## C. Policy decisions and information on dose limits

### Evacuation Zones

45. In December 2011, the Government categorized evacuation zones in areas affected by the nuclear accident. Areas with radiation dose exceeding 50mSv/year were designated as restricted areas; entry in such areas is prohibited for five years. Entry has been restricted to areas with radiation dose between 20mSv/year to 50mSv/year, and residents are allowed to return for short periods, but staying overnight is prohibited. In areas where radiation exposure is below 20mSv/year, people are returning.

46. The Ordinance on Prevention of Ionizing Radiation Hazards in Japan (article 3), which requires that areas where radiation dose exceeds 1.3mSv/quarterly be designated as controlled zones. The recommended limit of radiation exposure for the general public is 1mSv/year.<sup>93</sup> In Ukraine, the 1991 law 'On the status and social protection of the citizens who suffered as a result of the Chernobyl catastrophe' limited radiation dose for living and working without limitations to 1mSv/year.

47. The dose limit of 20mSv/year is being applied by the Government due to the nuclear emergency. In this behalf the Government seeks support from the letter issued to it by the ICRP, recommending a reference level of 1mSv/year to 20mSv/year for determining an area as inhabitable after the nuclear accident.<sup>94</sup> 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.<sup>95</sup> 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.

48. The Government assured the Special Rapporteur that it was safe to inhabit areas with radiation dose of up to 20mSv/year, as there was no excessive risk of cancer below 100mSv. However, even the ICRP acknowledges the scientific possibility that the incidence of cancer or hereditary disorders will increase in direct proportion to an increase in radiation dose below about 100mSv.<sup>96</sup> Furthermore, epidemiological studies monitoring the health effects of long-term exposure to low-ionizing radiation conclude that there is no low-threshold limit for excess radiation risk to non-solid cancers such as leukaemia.<sup>97</sup> The additive radiation risk for solid cancers continues to increase throughout life with a linear dose-response relationship.<sup>98</sup>

<sup>93</sup> See IAEA, *Radiation protection and safety of radiation sources: International Basic Safety Standards – Interim Edition*, General Safety Requirements, No.GSR Part 3(Interim)(Vienna 2011),p.90; ICRP, *1990 Recommendations of the International Commission on Radiological Protection*, ICRP Publication 60, Ann. ICRP 21 (1-3); and ICRP, *2007 Recommendations of the International Commission on Radiological Protection*, ICRP Publication 103, Ann. ICRP 37 (2-4).

<sup>94</sup> ICRP op cit, n.17; ICRP, *2009b Application of the Commissions 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), (2009), para.48-50.

<sup>95</sup> ICRP, *2009b Recommendations*, op cit, p.26; ICRP, *2007 Recommendations*, op cit.

<sup>96</sup> ICRP, *2007 Recommendations*, op cit, (Spanish) p.46; A.D., Wrixon, *New ICRP Recommendations*, *Journal of Radiological Protection* (2008), vol.28, pp.161-168,p.162.

<sup>97</sup> David Richardson et al, *Ionizing Radiation and Leukaemia Mortality among Japanese Atomic Bomb Survivors, 1950-2000*, *Radiation Research* (September 2009), vol.172, no.3, pp.368-82.

<sup>98</sup> National Research Council, op cit; Kotaro Ozasa et al, op cit; David J. Brenner et al, op cit; Pierce and Preston, op cit.



49. Health policies put in place by the State should be grounded in scientific evidence. Policies should be formulated so as to minimize the interference with the enjoyment of the right to health. In setting radiation dose limits, the right to health dictates limits that have the least impact upon the right to health of people, taking into account the greater vulnerability of such groups as pregnant women and children. As the possibility of adverse health effects exists in low-dose radiation, evacuees should be recommended to return only when the radiation dose has been reduced as far as possible and to levels below 1 mSv/year. In the meantime, the Government should continue providing financial support and subsidies to all evacuees so that they can make a voluntary decision to return to their homes or remain evacuated.

#### **Government monitoring stations**

50. The State should facilitate access to information about radiation levels in the affected areas, as this knowledge is crucial to decisions people make and have a bearing on their health. The Special Rapporteur was pleased to observe that the Government has set up monitoring stations to monitor the ambient air dose in Fukushima Prefecture. The Government informed the Special Rapporteur that around 3,200 monitoring stations have been installed in the prefecture. However, the air dose measured by these fixed stations only reflects the radiation dose in the immediate vicinity of the instrument. Readings by fixed monitoring stations do not reflect the actual and varied dosage levels in nearby areas, which may be higher than that at the monitoring station. Reliance on unrepresentative information unwittingly exposes people, especially vulnerable groups such as children, to higher radiation levels. During the visit, the Special Rapporteur observed substantial variance, including in schools and public areas used by children, as well as radiation ‘hot-spots’ close to the monitoring stations that were not reflected. Such incidents have regrettably led many people to doubt the reliability of Government monitoring stations.

#### **Information in school textbooks**

51. The State should ensure accurate and scientifically sound information on radiation and radioactivity is provided to children and, where appropriate, their parents to facilitate informed decision making regarding their health. Additionally, respecting the right to health requires the State to refrain from misrepresenting information in health-related matters. The Special Rapporteur was informed about the Fukushima official curriculum for compulsory radiation education in public schools. The supplementary reading and presentation materials mention that there is no clear evidence of excess risk of diseases, including cancer, when exposed for a short time to radiation levels of 100mSv and below. This gave the impression that doses below 100mSv are safe. As noted above, this is not consistent with the law in Japan, international standards or epidemiological research. Additionally, the Special Rapporteur notes that the textbooks do not mention the increased vulnerability of children to the health effects of radiation. Such information may give children and parents a false sense of security, which may result in children’s exposure to high levels of radiation. The Special Rapporteur urges the Government to ensure accurate representation of the health effects associated with nuclear accident and include methods of preventing and controlling health problems in a manner that is effective, age-appropriate and easy to understand.

## D. Decontamination

### Decontamination policy

52. The Act on Special Measures Concerning the Handling of Radioactive Pollution was promulgated in August 2011 to create a legal framework for decontamination activities. However, the ‘Basic Principles’ and fundamentally important regulations under the Act did not come into force until January 2012. The Act covers the planning and implementation of decontamination work, including collection, transfer, temporary storage, and final disposal of contaminated material.<sup>99</sup> The Special Rapporteur notes with appreciation the Government’s efforts, and those of municipalities under the Basic policy for Emergency Response on Decontamination Work, towards decontamination. However, decontamination policies should have already formed part of the regulatory framework for the nuclear power industry.<sup>100</sup> This would have enabled the Government to undertake decontamination activities earlier than November 2011.

53. Areas for decontamination extend beyond Fukushima prefecture and are prioritized by radiation levels, with a focus on living environments for children.<sup>101</sup> By August 2013, the aim is to reduce by 50 per cent the exposure in areas with radiation levels of less than 20mSv/year for the general public and by 60 per cent for children. Exposure dose is to be reduced to less than 20mSv/year by March 2014 in areas with radiation between 20-50mSv/year. Demonstration projects were established to secure the safety of workers in areas with radiation above 50mSv/year. The long-term goal is to reduce radiation levels below 1mSv/year.<sup>102</sup>

54. Although the right to health is subject to progressive realization, the obligation to formulate and implement deliberate, concrete and targeted steps is an immediate obligation of the State. It is regrettable that there are neither specific measures nor a timeline for decontamination beyond 2013 and to levels less than 1mSv/year. The Special Rapporteur urges the Government to urgently formulate a long-term decontamination policy with the aim of reducing radiation to less than 1mSv/year at the earliest.

55. The Special Rapporteur notes the special attention paid by the Government to vulnerable groups such as children in conducting the decontamination by prioritising decontamination of schools and playgrounds. However, isolated decontamination of schools and playgrounds is not sufficient, as winds can deposit radiation from surrounding areas on already decontaminated sites. Decontamination of schools and playgrounds should therefore include surrounding areas, such as roads, ditches and fields, which can be radiation hot-spots. The decontamination policy should address radiation hot-spots, as a priority, because they can exist even within areas where radiation dose is less than 20 mSv/y.

56. The Special Rapporteur notes that the Government is encouraging participation of the community in undertaking decontamination. He, however, recalls that the State is mandated to fulfil the right to health by giving necessary information and protective

<sup>99</sup> Progress on Offsite Cleanup Efforts in Japan, [http://josen.env.go.jp/en/documents/pdf/documents\\_01.pdf](http://josen.env.go.jp/en/documents/pdf/documents_01.pdf),p.4.

<sup>100</sup> See IAEA, Planning for Clean-up of Large Areas Contaminated as a Result of a Nuclear Accident, Technical Report Series No. 347 (Vienna, 1991),p.8.

<sup>101</sup> Priority-setting measures are also recommended by IAEA, International Basic Safety Standards for Protection Against Ionizing Radiation and for the Safety of Radiation Sources, Safety Series No. 115 (Vienna 1996),p.24.

<sup>102</sup> Progress on Offsite Cleanup Efforts in Japan, op cit,p.9.

equipment to individuals engaged in hazardous activities.<sup>103</sup> While the Act on Special Measures requires provision of appropriate information or equipment for individuals engaging in decontamination activities, the Special Rapporteur is concerned that in some areas these requirements were not strictly followed. He therefore calls on the Government to provide information, safety equipment and appropriate protective gear to residents who voluntarily undertake decontamination activities.

#### **Storage of contaminated materials**

57. Decontamination activities involving the removal of 5-10cm of topsoil<sup>104</sup> pose challenges for the Government regarding safe storage of the contaminated soil. Currently, authorities are storing the radioactive debris in residential areas in sandbags covered with plastic or by burying it underground, including under playgrounds, in protective containers. During the visit, the Special Rapporteur did not find any signs informing people of the presence of radioactive materials in these areas, contrary to the right to health.

58. The Special Rapporteur was informed that temporary and final storage and disposal facilities would be prepared to deal with the contaminated waste, estimated to be 2.3 million tonnes.<sup>105</sup> However, there were no concrete plans for the storage of the radioactive debris. As the contaminated waste is stored in residential areas and under playgrounds, thereby posing a health hazard to residents, establishing temporary storage facilities away from residential areas is urgently required. The Government should formulate a timeline and take urgent measures towards establishing temporary and final waste storage and disposal facilities, with active participation of the community in the decision-making process.

## **E. Transparency and accountability**

#### **Transparency and independence in the regulatory framework**

59. The reports by the Nuclear Accident Independent Investigation Commission and the Investigation Committee on the Accident at Fukushima Nuclear Power Stations of TEPCO set up by the Parliament and the Government respectively, criticise the close association between the nuclear regulatory bodies and the Federation of Electric Power Companies in Japan, which greatly reduced the independence of the regulatory bodies.<sup>106</sup> As a result, the regulatory bodies failed to hold TEPCO accountable for non-compliance with domestic and international safety standards, compromising the safety of the Daiichi plant.<sup>107</sup>

60. Transparency in governance and in implementing national policies and regulatory frameworks is key to the right to health. Effective transparency and independence of the governing and regulatory authorities also ensures accountability. The Special Rapporteur notes that recognizing the need for independence and transparency, the Government created the Nuclear Regulation Authority (NRA).

<sup>103</sup> See also IAEA, *Planning for Clean-up of Large Areas*, op cit, p.42.

<sup>104</sup> This is one of the recommended methods for decontamination, see IAEA, *Decontamination of Settlements*, <http://www-ns.iaea.org/downloads/rw/projects/emras-urban-decontamination-of-settlements-golikov.pdf>.

<sup>105</sup> IAEA, *Final Report of the International Mission on Remediation of Large Contaminated Areas Off-site the Fukushima Dai-ichi NPP* (October 2011), [http://www.iaea.org/newscenter/focus/fukushima/final\\_report151111.pdf](http://www.iaea.org/newscenter/focus/fukushima/final_report151111.pdf), p.61.

<sup>106</sup> NAIIC, op cit; Morris-Suzuki et al, op cit, pp.37-45.

<sup>107</sup> NAIIC, Ibid; Investigation Committee, *Executive Summary*, op cit, p.22.

61. The Special Rapporteur stresses that information and data collected by the NRA regarding domestic regulations and compliance of nuclear operators with domestic and international safety standards should be made publicly available to facilitate independent monitoring and accountability within NRA and the nuclear power industry as a whole.

#### **Accountability of TEPCO**

62. The Special Rapporteur is pleased to note that nuclear operators are strictly and absolutely liable for injury resulting from nuclear operations in Japan.<sup>108</sup> This renders private non-State actors liable for violating the right to health of individuals and is consistent with the State's obligation to protect the right to health.

63. However, the Government's acquisition of TEPCO's majority stakes in June 2012 has arguably helped TEPCO to effectively avoid accountability and liability for damages. Payment of compensation is made from government funds, funded by taxpayers. The Special Rapporteur was informed that TEPCO would have to repay the Government eventually. Nevertheless, under the current arrangement, the taxpayers may have to continue bearing the liability of the nuclear damage, for which TEPCO should solely be liable.

### **F. Compensation and relief measures**

64. Where a violation of the right to health occurs, victims should have access to effective remedies, including adequate reparation and compensation. The provision of compensation and other forms of relief are also essential to the recovery of individuals affected by the nuclear accident.

65. After the nuclear accident, TEPCO provided 120 billion Yen in financial security for claims,<sup>109</sup> even though compensation costs estimated by TEPCO were around 4,500 billion Yen. The Government, therefore, established the public-private Nuclear Damage Liability Facilitation Fund in September 2011.<sup>110</sup>

66. The Dispute Reconciliation Committee for Nuclear Damage Compensation was created to formulate guidelines for payment of compensation due to a lack of guidelines within the existing Compensation Act.<sup>111</sup> The Special Rapporteur notes that the original compensation application forms comprised around 60 pages and 2,215 sections, accompanied with a 158-page instruction manual.<sup>112</sup> He was also informed of the delays caused at the Dispute Settlement Centre, which hinder the availability of compensation for the affected population. While these application forms have since been streamlined, the Government should address concerns frequently raised by affected persons regarding TEPCO's attempts to reduce compensation levels and delay settlement.

67. The Special Rapporteur commends the passing of the Statute on Protection and Support for the Children and other Victims of Tokyo Electric Power Company Nuclear Power Plant Disaster (Victims Protection Law), which recognizes the right of victims to choose whether to evacuate or not. It includes persons voluntarily evacuating or living in areas outside the Government-designated zones, whose relief needs were reportedly

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<sup>108</sup> *Act on Compensation for Nuclear Damage, 1961*, §§3 and 4.

<sup>109</sup> Eri Osaka, Corporate Liability, Government Liability, and the Fukushima Nuclear Disaster, *Pacific Rim Law & Policy Journal* (June 2012), vol.21, no.3, pp.433-459, p.437.

<sup>110</sup> *Nuclear Damage Liability Facilitation Fund Act*, Law No.94 of 2011, as cited in Osaka, op cit, p.443.

<sup>111</sup> Morris-Suzuki et al, op cit, p.30.

<sup>112</sup> Osaka, op cit., p.441; Morris-Suzuki et al, op cit, p.29.

neglected. The Law also contains provisions relating to long-term health impacts of exposure to radiation.

68. The Special Rapporteur is concerned that despite the Law's adoption in June 2012, implementing instruments have not yet been adopted. In implementing the Law, clarification is required with respect to 'Covered Areas' under article 8. The Special Rapporteur believes that 'Covered Areas' should include those where radiation levels exceed 1mSv/year. As the exact health effects of long-term exposure to low-dose ionizing radiation cannot be accurately predicted, the implementing measures should also expressly provide free, life-long health screening and medical treatment relating to radiation exposure for all affected persons. The 20-year time limit contained in the Civil Code should not apply to financial assistance for medical care related to the nuclear accident.

69. The obligation to fulfil the right to health requires the State to ensure the provision of the underlying determinants of health by, *inter alia*, providing positive measures that facilitate enjoyment of the right to health. The Special Rapporteur urges the Government to adopt implementing measures to the Victims Protection Law and provide funding for relocation, housing, employment, education and other essential support needed by those who chose to evacuate, stay or return to any area where radiation exceeds 1mSv/year. These measures should include relief packages reflecting the cost of rebuilding lives.

## G. Participation of vulnerable groups and affected communities

70. The right to health requires the State to pay special attention to the needs of vulnerable groups. The State is also under an immediate obligation to prevent discrimination, especially against vulnerable groups in its policies or practice, even during times of resource constraint.

71. By August 2011, 146,520 people evacuated from Fukushima Prefecture.<sup>113</sup> Owing to frequent changes in evacuation orders more than 10,000 people had to change evacuation centres three or more times, with some people moving as many as ten times.<sup>114</sup> Even after evacuation orders were given on 12 March 2011 for areas within a 20km radius of the Daiichi plant, approximately 840 hospital and nursing home patients remained until 13 March 2011.<sup>115</sup> Additionally, 60 hospital patients died during evacuation.<sup>116</sup> The stress, ill-health, and deaths, could have been prevented had there been coordinated evacuation orders and plans in place. In this context, mapping vulnerable groups and encouraging broad community engagement may help in creating more appropriate emergency responses with respect to vulnerable communities.<sup>117</sup>

72. Older persons, children, women and persons with disabilities are more susceptible to ill effects of disasters.<sup>118</sup> During the visit, such groups shared grievances with the Special Rapporteur that they had no say in decisions that affected them. He was also pained to learn that evacuation centres often did not have an accessible environment for persons with

<sup>113</sup> NAIC, *Executive Summary*, op cit, p.38.

<sup>114</sup> Toshiaki Keicho, Evacuation Centre Management, *Knowledge Note 3-5, Cluster 3: Emergency Response*, World Bank, [http://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/drm\\_kn3-5.pdf](http://wbi.worldbank.org/wbi/Data/wbi/wbicms/files/drupal-acquia/wbi/drm_kn3-5.pdf), p.3.

<sup>115</sup> Koichi Tanigawa et al, Loss of life after evacuation: lessons learned from the Fukushima accident 379, *The Lancet* (March 2012), vol.379, no.9819, pp.889–891, p.890.

<sup>116</sup> NAIC, *Chapter 4*, op cit, p.6.

<sup>117</sup> Louise Lemyre et al, Emergency Preparedness for High Risk Populations: Psychological Considerations, *Radiation Protection Dosimetry* (2009), vol.134, no. 3–4, pp.207–214, p.211.

<sup>118</sup> *Ibid.*

disabilities and women, including women with young children. Despite the existence of Japan's Third Basic Plan for Gender Equality 2010, which promotes gender equality in disaster prevention and response, women faced greater disadvantage in evacuation centres, as the Plan's regulations were not fully implemented.<sup>119</sup>

73. Participation of the population at all stages of decision-making processes at national and community levels is a critical feature of the right to health framework. Health-related laws and policies should be instituted only with direct, active and effective involvement of communities, since they are most impacted by these decisions. The Special Rapporteur urges the Government to take this opportunity to ensure the effective involvement of communities in the health management survey. Community participation would also help the Government to address the concerns of the people more effectively, thereby creating a more efficient health system.

74. The Special Rapporteur commends the Government for ensuring community participation in the Victims Protection Law. The Government should continue facilitating broad-based participation and effective engagement of affected communities with a view to addressing their concerns. Participation of affected communities also encourages community-led awareness raising and initiatives. Community participation should include participation of vulnerable groups, as it is crucial for their empowerment and creating an inclusive society.

75. The Special Rapporteur urges the Government to involve individuals and community organizations in current and future nuclear and health policies, including in data collection and radiation monitoring, planning evacuation centres, designing health management surveys, decisions regarding radiation levels and evacuation zones and in setting compensation amounts.

## V. Recommendations

**76. The Special Rapporteur urges the Government to implement the following recommendations in the formulation and implementation of its nuclear emergency response system:**

- (a) Establish regularly updated emergency response plans that clearly demarcate the command structures and specify evacuation zones, evacuation centres, and provide guidelines for assisting vulnerable groups;**
- (b) Communicate disaster management plans, including response and evacuation measures, to residents of areas likely to be affected by a nuclear accident;**
- (c) Release disaster-related information to the public as soon as a nuclear accident occurs;**
- (d) Distribute promptly iodine prophylaxis before or as soon as the accident occurs;**
- (e) Provide for prompt and effective usage of such technology as SPEEDI in gathering and disseminating information on affected areas;**

**77. With respect to health monitoring of the affected population, the Special Rapporteur urges the Government to implement the following recommendations:**

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<sup>119</sup> Fumie Saito, Women and the 2011 East Japan Disaster, *Gender & Development* (June 2012), vol.20, no.2, pp.265-279, p.268.

- (a) Continue monitoring the impact of radiation on the health of affected persons through holistic and comprehensive screening for a considerable length of time and make appropriate treatment available to those in need;
- (b) The health management survey should be provided to persons residing in all affected areas with radiation exposure higher than 1 mSv/year;
- (c) Ensure greater participation and higher response rates in all health surveys;
- (d) Ensure that the basic health management survey includes information on the specific health condition of individuals and other factors that may exacerbate the effect of radiation exposure on their health;
- (e) Avoid limiting the health check-up for children to thyroid checks and extend check-ups for all possible health effects, including urine and blood tests;
- (f) Make follow-up and secondary examination for children's thyroid check-up available to all requesting children and parents;
- (g) Simplify children's and their parents' access to information regarding their test results, while ensuring the protection of private information;
- (h) Refrain from restricting examination for internal exposure to whole-body counters and provide it to all affected population, including residents, evacuees, and to persons outside Fukushima prefecture;
- (i) Ensure mental health facilities, goods and services are available to all evacuees and residents, especially vulnerable groups such as older persons, children and pregnant women;
- (k) Monitor the health effects of radiation on nuclear plant workers and provide necessary treatment.

78. The Special Rapporteur urges the Government to implement the following recommendations regarding policies and information on radiation dose

- (a) Formulate a national plan on evacuation zones and dose limits of radiation by using current scientific evidence, based on human rights rather than on a risk-benefit analysis, and reduce the radiation dose to less than 1mSv/year;
- (b) Provide, in schoolbooks and materials, accurate information about the risk of radiation exposure and the increased vulnerability of children to radiation exposure;
- (c) Incorporate validated independent data, including that from the communities, to monitor radiation levels.

79. Regarding decontamination, the Special Rapporteur urges the Government to adopt the following recommendations:

- (a) Formulate urgently a clear, time-bound plan to reduce radiation levels to less than 1mSv/year;
- (b) Clearly mark sites where radioactive debris is stored;
- (c) Provide, with the participation of the community, safe and appropriate temporary and final storage facilities for radioactive debris;

80. The Special Rapporteur urges the Government to implement the following recommendations regarding transparency and accountability within the regulatory framework:

(a) Require compliance of the regulatory authority and the nuclear power plant operators with internationally agreed safety standards and guidelines;

(b) Ensure disclosure by members of the Nuclear Regulation Authority of their association with the nuclear power industry;

(c) Make information collected by the Nuclear Regulation Authority, including regulations and compliance of nuclear power plant operators with domestic and international safety standards and guidelines, publicly available for independent monitoring;

(d) Ensure that TEPCO and other third parties are held accountable for the nuclear accident and that their liability to pay compensation or reconstruction efforts is not shifted to taxpayers.

81. In relation to compensation and relief, the Special Rapporteur urges the Government to implement the following recommendations:

(a) Formulate, with the participation of the affected communities, the implementing framework under the Victims Protection Law;

(b) Include cost of reconstruction and restoration of lives within the relief package;

(c) Provide free health check-ups and treatment that may be required for health effects from the nuclear accident and radiation exposure;

(d) Ensure that compensation claims by affected persons against TEPCO are settled without further delay;

82. The Special Rapporteur urges the Government to ensure effective community participation, especially participation of vulnerable groups, in all aspects of the decision-making processes related to nuclear energy policy and the nuclear regulatory framework, including decisions regarding nuclear power plant operations, evacuation zones, radiation limits, health monitoring and compensation amounts.

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