

Unequal Impact

*Women's & Children's Human Rights Violations
and the Fukushima Daiichi Nuclear Disaster*

GREENPEACE

Contents

Executive Summary	04
Introduction	10
Political and Legal Framework	13
Gender Difference: Cultural Constructs and Power Dynamics	16
Evacuation	19
Economic Impacts	23
Atomic Divorce	25
Radiation Stigma and Marriage Discrimination	27
Radiation Impacts	29
Mental Health Consequences	35
Children's Rights Violations	37
Women's Activism	42
Conclusion	45

Kendra Ulrich, Greenpeace Japan

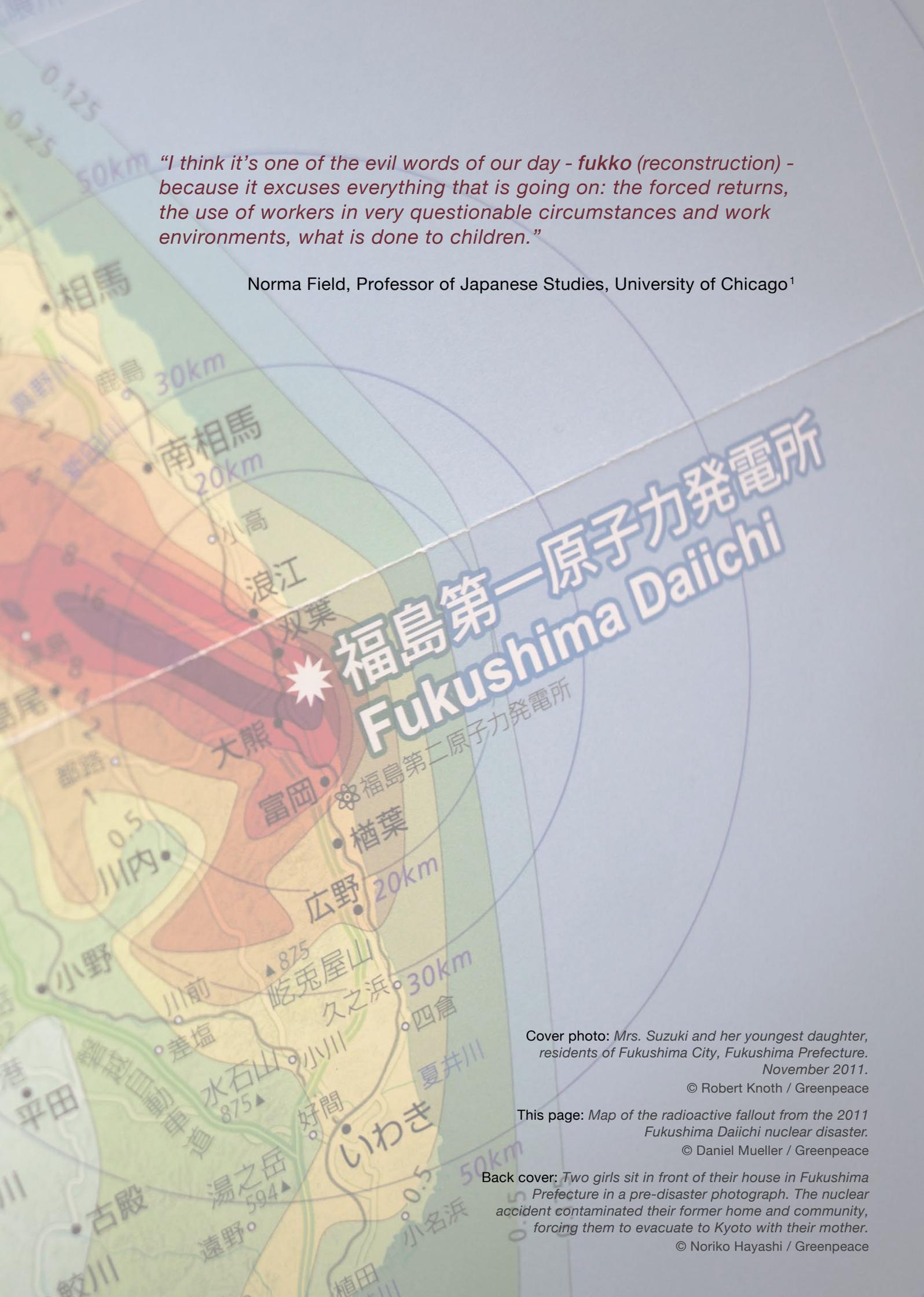
Edited by Ai Kashiwagi and Kazue Suzuki, Greenpeace Japan

Special thanks to Dr. Nanako Shimizu of Utsunomiya University and
Dr. Rianne Teule for their valuable input and insights

March 2017

*"I think it's one of the evil words of our day - **fukko** (reconstruction) - because it excuses everything that is going on: the forced returns, the use of workers in very questionable circumstances and work environments, what is done to children."*

Norma Field, Professor of Japanese Studies, University of Chicago¹



Cover photo: Mrs. Suzuki and her youngest daughter, residents of Fukushima City, Fukushima Prefecture. November 2011.

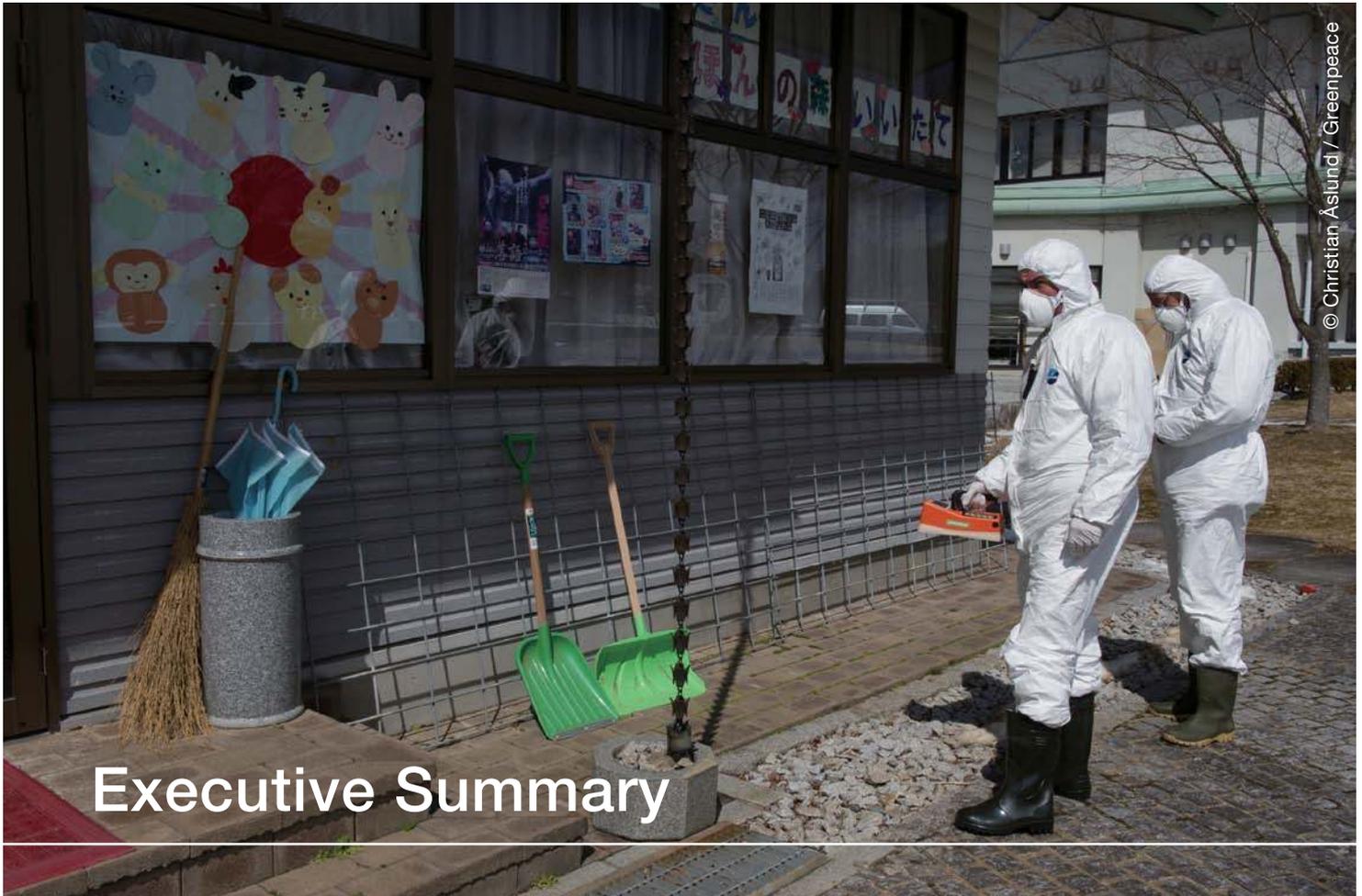
© Robert Knoth / Greenpeace

This page: Map of the radioactive fallout from the 2011 Fukushima Daiichi nuclear disaster.

© Daniel Mueller / Greenpeace

Back cover: Two girls sit in front of their house in Fukushima Prefecture in a pre-disaster photograph. The nuclear accident contaminated their former home and community, forcing them to evacuate to Kyoto with their mother.

© Noriko Hayashi / Greenpeace



© Christian Åslund / Greenpeace

Executive Summary

Greenpeace measures radiation levels far above the internationally accepted limit outside a school in Iitate, approximately 40km from Fukushima Daiichi Nuclear Power Station, in March 2011. The organization called for the immediate evacuation of the community on 27 March 2011. The government did not begin the evacuation until 22 April 2011.

Japan is party to multiple international human rights treaties, under which it is obligated to protect individuals' right to "the highest attainable standard of mental and physical health." These include the International Covenant on Economic, Social and Cultural Rights; the Convention on the Elimination of All Forms of Racial Discrimination; the Convention on the Elimination of All Forms of Discrimination Against Women; the Convention on the Rights of the Child, including its two Optional Protocols, and the International Convention for the Protection of All Persons from Enforced Disappearance. The right to health as it is defined in the terms of these treaties includes the right to complete and accurate information and the right to participation. The country is further obligated under its international commitments to uphold the rights of internally displaced persons, with particular recognition of the special needs

of vulnerable groups (women, children, the elderly and the disabled), e.g. protection against outrages against personal dignity, such as gender-based violence, and the right of children to play.

However, the Japanese government's response to the Fukushima Daiichi nuclear disaster of March 2011, in both the immediate aftermath and the ensuing years, resulted in multiple human rights violations – particularly for women and children.

Emergency Response and Evacuation

In the immediate aftermath of the disaster women were faced with multiple gross violations of their rights. Sexual violence increased, particularly during blackouts. Domestic violence also increased and persisted long after people left the evacuation centers. The

Japanese government both failed to enact adequate preventative measures to protect women from these attacks and to provide the needed formal support networks for survivors.

Evacuation centers were further run by men. Women had little say in the decisions that directly impacted them, which resulted in their needs being ignored, e.g. the centers lacked privacy for changing clothing and breastfeeding, as well as basic sanitary products. Disaster-traumatized women were further burdened with significantly increased domestic chores, as it was expected that they would be responsible for nursing the sick and cooking the meals for the entire center.

The evacuation centers also neglected the needs of children, as safe spaces for children to play were not provided in most evacuation centers. This is recognized as an essential tenet of the rights of the child under the UN Convention on the Rights of the Child (CRC), as well as an important tenet of the Children's Charter for Disaster Risk Reduction (DRR).

Economic Hardship: the feminization of (nuclear) poverty

Japan is a nation with a yawning gender gap. In 2012, women employed full-time only earned 69.3% of their male counterparts' wages. With part-time workers included, women only made 51.0% of the salaries of their male counterparts were paid. This enormous resource disparity meant that women were at a significant disadvantage for coping with the impacts of the disaster. This was compounded by the fact that in the aftermath, part-time work was heavily impacted. As women comprised the majority of the part-time workforce, they suffered greater economic insecurity as a result.

In addition, compensation payments were made to married couples as a family unit – dispensed to the head of the household, which was usually the adult male. This meant that women's access to compensation funds was solely at the discretion of their husbands. This was particularly cruel in situations where women were victims of domestic violence, as both financial and formal support networks to leave an abusive situation were utterly lacking in disaster response.

Many women evacuated without their husbands, who chose to remain in the Fukushima-contaminated region. Some women lived separated from their spouses, while others divorced. Women who have suffered both the economic consequences of the disaster and have left their partners are particularly vulnerable to poverty. As was noted by the Fukushima Bar Association in 2013, this issue has been ignored by the government in the disaster recovery efforts. No emphasis was placed on assisting women to achieve financial independence, exacerbated by a notable lack of support for foundations that assist women's business startups and a failure to address conditions at, and support, women's workplaces.

Mistakes, (Mis)Information, and Health Risks

Women's and children's rights to accurate and complete information have been repeatedly violated in both the aftermath of the disaster and in the ensuing years. This is due to the failures and deliberate obfuscation of both the Japanese government and Tokyo Electric Power Company (TEPCO) regarding the situation at the crippled reactor site and in affected areas.

In June 2016, over five years after the disaster began, TEPCO President Naomi Hirose, acknowledged that its then-President ordered that the term "core meltdown" not be used at a press conference on March 14, 2011 and for two months afterward. Yet that same day, the 14th of March, TEPCO's own computer modelling had shown that 25 – 55% of the fuel rods had been damaged. TEPCO's internal manuals defined a meltdown as damage to 5% of the fuel rods.²

In the acute phase of the disaster, government failures also led to unnecessary exposures. It chose not to disclose radiation dispersion modelling data, which meant that some people evacuated to areas with higher radiation levels than where they had been living. Delays in evacuating more distant contaminated communities, like Iitate which is located approximately 30 - 50km away, also exposed the public – including women and children – to unnecessarily high doses over days and weeks. The lack of accurate and complete information also meant that elementary and

junior high schools in Fukushima prefecture were permitted to resume classes in the spring of 2011, prior to decontamination.

Women and children – and particularly female fetuses, infants, and girls – are more vulnerable to the health effects of radiation exposure than their male and/or adult counterparts. Epidemiological studies of atomic bomb survivors have shown significantly greater cancer risk, excluding leukemia, for women as compared to men. This is consistent with the findings of medical CT scan exposure studies, which have also shown greater vulnerability for all-cancer mortality, excluding leukemia, for women. Other documented health consequences of radiation exposure include, but are not limited to: miscarriage, perinatal mortality, deformities, and cardiovascular disease.

In the wake of the disaster, the government raised the officially “acceptable” level of radiation exposure to 20 mSv/year, where it still remains nearly six years later. This standard is applied to the general population in Fukushima-contaminated areas – including those that are known to be more vulnerable. As stated by the UN Human Rights Rapporteur following his

investigation in 2012, this violates survivors’ right to the highest attainable standard of health. Data from contaminated regions show an abrupt increase in perinatal mortality at 10 months post-disaster. The heavily contaminated prefectures saw a greater increase at 15% than the concurrent increase of 6.8% in the moderately contaminated prefectures. No similar increase was seen in the unaffected prefectures throughout Japan in this timeframe. The sudden increase in perinatal mortality rates in January 2012 in affected prefectures was followed by a decreasing trend, albeit at a higher level than the initial pre-disaster downward trend. This is consistent with perinatal mortality data in Europe, post-Chernobyl.

Children are particularly vulnerable to developing thyroid cancer as a result of exposures to radioactive iodine. Delays in the distribution of iodine pills that can help reduce this risk meant that many children in contaminated communities were likely exposed to preventable high doses of radioactive iodine.

Higher-than-expected rates of thyroid lesions, cysts and cancers were discovered as a result of post-Fukushima testing, but a dispute remains over causation, i.e. whether



Bags of radioactive waste piled next to a home in Iitate, Fukushima Prefecture. October 2014.

© Noriko Hayashi / Greenpeace



these findings are the effects of exposure to radiation or “overdiagnosis” due to screening bias. Patients were given a poor-quality copy of their ultrasound images, (supposedly to prevent falsification), but they were forced to file Freedom of Information (FOI) requests to access their own complete medical files.

Further, public relations campaigns sought to minimize the economic impacts of the disaster on the Fukushima agricultural industry, which resulted in the dissemination and consumption of contaminated foods in at least eight prefectures before this was caught. In at least one confirmed instance, which occurred in Tochigi prefecture, potentially contaminated beef was deliberately fed to children in their school lunches – purportedly to demonstrate its “safety”.

Children were also intentionally targeted with misinformation, including required reading in their school textbooks that presented misleading information regarding radiation risks and neglected to mention the additional vulnerability of children to the effects of ionizing radiation exposures. This could create a false

sense of security for children and their parents, thus leading to behaviors that could increase children’s exposures.

Resettlement: Japan’s Sacrificial System and Economic Coercion

Unfortunately for the victims of Fukushima, and reactor communities across Japan, the Abe government’s resettlement and nuclear restart policies are a politically-driven effort to minimize the impact of the disaster on the industry, to the detriment of the nuclear evacuees themselves. This has resulted in deliberate efforts to obscure the facts related to the decontamination and unjustifiably downplay the risks of radiation exposure.

The estimated costs related to the Fukushima disaster were recently revised to a staggering 21.5 trillion JPY. This includes 12 trillion JPY for decontamination and decommissioning, though these massive efforts have delivered very limited results. Greenpeace investigations have shown that contamination in areas where evacuation orders are to be lifted remain far in excess of internationally recommended maximum dose



limits. Cumulative lifetime exposures are particularly concerning for women and children, as they are more vulnerable to physical impacts of radiation exposure.

The lifting of evacuation orders in parts of the contaminated region in March 2017 also means that survivors from these areas will lose their already inadequate compensation payments a year later. Many evacuees are already faced with the loss of housing support. As women are at significant economic disadvantage, the loss of essential financial support for evacuees has potentially far greater impacts for them. Many may be forced to return to contaminated communities against their wishes because they cannot afford to stay where they are currently living. This is economic coercion, not a choice freely made.

Women have not, however, been silent victims. They have shown immense resiliency and leadership in the face of unthinkable hardships. They have been at the forefront of legal challenges from spearheading cases that brought criminal charges against TEPCO to filing lawsuits

to secure fair compensation. They have been a driving force behind mass demonstrations and nonviolent direct actions. Many are involved in the fights to keep reactors throughout Japan offline. They have started online networks to share information and even founded radiation testing labs for their communities.

Fixing What's Broken

Although the Japanese government cannot reverse the ongoing radiological crisis in Fukushima-impacted areas, it can enact policies that protect the human rights of nuclear disaster survivors. Thus, Greenpeace urges the government of Japan to:

1. Ensure survivors are fully compensated for their losses – including continuation of compensation payments and housing support for those who choose to remain evacuated, and compensation for those returning for their loss of community, in order that individuals may freely exercise their right to choose where to live; and,

2. Provide full, complete, accurate, and easily accessible information regarding radiation levels, the scope of decontamination efforts, and radiation risks to the public, including age-appropriate materials for children; and,
3. Provide full, readily available access for Fukushima victims to their own and their dependents' medical files and test results; and,
4. Reduce the acceptable additional annual exposure level in Fukushima-impacted areas to a maximum of 1 mSv/year, which would reflect the international standard; and,
5. Ensure full and equal public participation and a formal role for women as well as men in all decision-making processes regarding future lifting of evacuation orders, emergency planning schemes, and nuclear restart decisions; and,
6. Ensure the equal representation of women in leadership positions on emergency planning entities, and full consultation and inclusion of the elderly and disabled; and,
7. Develop and support initiatives aimed at helping Fukushima-impacted women achieve financial independence including, but not limited to, supporting women's startup businesses, addressing income gaps, and improving the conditions and workplaces of women; and,
8. Appoint a public ombudsperson for children, responsible for safeguarding the rights of children and young persons, especially those affected by the Fukushima Daiichi nuclear disaster.



An elderly woman sets flowers outside the temporary, prefab housing in the evacuation center of Tamura City, Fukushima Prefecture. October 2013.

© Noriko Hayashi / Greenpeace



© Digital Globe

Introduction

*Fukushima Daiichi Nuclear Power Plant,
Fukushima Prefecture. March 2011.*

The massive disaster that struck the east coast of Japan on 11 March 2011 has been referred to as a “triple disaster” – earthquake, tsunami, and triple reactor core meltdowns. The tsunami and earthquake claimed tens of thousands of lives and devastated coastal communities. The Fukushima Daiichi nuclear disaster forced many more people from their homes, communities, and livelihoods and has prevented their return. Nearly six years later, as of December 2016, approximately 81,000 are still evacuated – a figure that excludes those that could buy permanent housing and settle elsewhere. It does not fully reflect the number of self-evacuated persons, who are not well-tracked by government agencies.³

The radiological disaster has resulted in an ongoing human security crisis due to the failures of successive Japanese governments to protect the human rights of nuclear survivors. And, while the disaster had an undeniably enormous impact on all those in the affected communities

– whether they chose to evacuate or to stay – the burden and consequences have created a disproportionate and continuing impact on vulnerable populations, notably women, children, the elderly, and the disabled.⁴

These vulnerable groups were not only inordinately impacted by the nuclear accident, but will also bear the greatest hardships and injustices from the Abe government’s coercive repopulation program. This is particularly true for women and children.

This report will thus begin with gender as the initial point of analysis and examine the way in which gender impacted both individual response and women’s experience of the Fukushima disaster, including: disproportionate economic impacts; escalated violence – both rape and domestic violence; perceptions of risk, labeling and stigmas; and exclusion from decision-making roles in evacuation and recovery. In addition, it examines the violations of children’s

rights as well as the impacts of these violations on the women in their culturally-valued motherhood roles.

Women and children are not only in a socially disadvantaged position, but are also more vulnerable to both the physical impacts of ionizing radiation⁵ as well as adverse mental health outcomes. Mothers with young children are a particularly high risk group for the latter.⁶

Moreover, the current policies of the Abe government to push for nuclear reactor restarts and repopulation of the contaminated zones can only be characterized as deliberate, structural violence against the victims of the Fukushima disaster. It is the direct result of the pressure from both the domestic and international ‘nuclear village’⁷ to minimize the political and social costs of the Fukushima disaster.

And, minimizing the impacts on the industry has required a deliberate effort to downplay radiation risks and advocate resettlement. Avoiding a large exclusion zone that would serve as a constant reminder of the impacts of a nuclear disaster – like the Chernobyl exclusion zone – has been the driving force behind policy decisions – irrespective of the reality that many of the contaminated areas cannot be decontaminated.⁸

The repopulation policy also means that Fukushima victims will lose their already inadequate compensation payments one year after the evacuation designations are lifted. Many are already faced with the loss of their housing support. Women, already at a severe economic disadvantage, will be more heavily impacted. Many may be forced to return against their wishes.

This impossible decision of whether to return for economic reasons is a looming human rights crisis – and one in a successive list of human rights violations perpetrated by the Japanese government against the Fukushima nuclear victims.

Tetsuya Takahashi, philosophy professor at University of Tokyo and a native of Fukushima, has characterized Japan’s nuclear policy as a “sacrificial system”, which is quite apt when considering the Abe government’s resettlement policy.⁹ He defines it thus: “a system in which the benefits accruing to some parties are made possible at the expense of others’ lives (whether as biological existence, health, daily routine, property, dignity, or hope).”¹⁰

While some might point out that Fukushima residents willfully embraced the siting of



a nuclear reactor in their community and benefitted from both subsidies and employment, these communities are largely economically vulnerable.¹¹ As a result, they are compelled to accept the risk of radiation exposure posed by a nuclear plant in order to secure a means of livelihood – a decision which is not faced in such terms by those in economically privileged positions.¹² Takahashi further asserts that this choice between life and livelihood in the sacrificial system is a violation of an individual's right to life.¹³

In the case of Fukushima, the beneficiaries were the economically-privileged Tokyo residents that consumed the electricity produced at Fukushima Daiichi from the far safer distance of approximately 200km away, while the rural, poorer communities in Fukushima bore the primary radiological risk. Further, the Soso district – where Fukushima Daiichi is located – is the most economically depressed area in the region.¹⁴

To extend this concept, while Fukushima and surrounding prefectures were at an economic disadvantage to Tokyo, so women are at a disadvantaged position to men. As a result, some women have remained in the contaminated region as a result of their husband's decision to do so, even if they wished to evacuate – thus accepting increased radiological risks due to a lack of other economic options for supporting oneself. Others left their husbands to evacuate, though many Fukushima-impacted women are now facing poverty.¹⁵

Women are not only at an economic and social disadvantage, but are also more vulnerable to the effects of radiation exposure. Women, female fetuses, infants, and girls are at greater risk of all cancer mortality, excluding leukemia, as a result of radiation exposures than their male counterparts.¹⁶ Other health consequences include: miscarriage, perinatal mortality, deformities, and cardiovascular disease.

Women, especially mothers with young children, are also one of the two highest risk groups for mental health consequences – the other high-risk group being first responders.¹⁷ Further, human-made toxicological disasters, like nuclear disasters,¹⁸ have more severe mental health

impacts than natural disasters alone.¹⁹ Due to the long latency periods for other potential health outcomes (e.g. cancers, cardiovascular diseases, and birth defects), mental health effects should be regarded as simply the first measurable serious health consequence to manifest following a catastrophic nuclear disaster.

This report evaluates the impact of the Fukushima catastrophe on women as a particularly vulnerable population within the context of specific cultural norms and circumstances. And though they have borne some of the greatest burdens of the disaster, they have also been instrumental in the opposition to nuclear restarts; legal challenges against TEPCO, the government, and the nuclear village; organizing nonviolent direct actions and protests for victims' rights; establishing online networking communities for information sharing; and even establishing radiation testing and monitoring centers. Thus, women's leadership in the antinuclear movement and personal agency will also be explored.

This analysis presents some perspectives and theories based on the research of social and behavioral scientists that are useful when considering the unique intersections of natural disaster, human-created technological/industrial disaster, and the social and cultural constructs that influence individual responses and ability to recover from the Fukushima Daiichi disaster. This is not to say every person was impacted in the same way, but this analysis identifies some overarching trends.



© Greenpeace

Political and Legal Framework

Fukushima survivors delivered 123,455 petition signatures to the National Diet calling for the implementation of the 'Nuclear Disaster Victims Support Act' on May 27, 2015. The Act was passed unanimously by the Diet on June 21, 2012, but the government failed to put its terms into practice.

Long before the Fukushima Daiichi disaster, Japan had made human security issues as they relate to structural violence, such as underdevelopment, a major centerpiece of its international aid work.²⁰ It has also championed the concept of structural violence threats to human security within the United Nations, including establishing the UN Trust Fund for Human Security in 1999.²¹

Per a document issued by Japan's Ministry of Foreign Affairs, Global Issues Cooperation Division in 2010, human security: "aims to protect people from critical and pervasive threats to human lives, livelihoods and dignity, and to enhance human fulfillment."²²

Japan has further ratified multiple international human rights treaties that acknowledge the right of everyone to the highest attainable standard of physical and mental health. These include:

the International Covenant on Economic, Social and Cultural Rights; the Convention on the Elimination of All Forms of Racial Discrimination; the Convention on the Elimination of All Forms of Discrimination Against Women; the Convention on the Rights of the Child, including its two Optional Protocols; and the International Convention for the Protection of All Persons from Enforced Disappearance.

The right to health is defined by the UN as the "right of everyone to the enjoyment of the highest attainable standard of physical and mental health."

Japan's constitution, Articles 13 and 25, also enshrines the protection of Personal Rights – so much so that a district court judge ruled in 2014 that the threat to individuals' personal rights, particularly the threat to health and lifestyle, by an impending restart of the Ohi 3&4 nuclear

reactors violated Japan's constitution.²³ In a similar ruling, the Otsu district court in 2016 barred the operation of the Takahama 3&4 reactors. This resulted in the immediate shutdown of the Takahama 3 reactor, which had restarted just weeks prior, and prevented the restart of the unit 4 reactor.²⁴

Despite this legal and political framework, when the 2011 Fukushima disaster created nearly 163,000 nuclear evacuees,²⁵ the government failed to extend the same people-centered approach to resolving human insecurity issues to its own citizens that it had championed in its foreign policies. Further, the ensuing policies of the Abe government to promote nuclear power and to resettle the contaminated areas not only threatens citizens' right to health, but represent the very kinds of structural violence that the Japanese government has worked to end in other countries.

Building on the sacrificial system concept within the framework of human security, Nanako Shimizu, an Associate Professor in the Faculty of International Studies, Utsunomiya University, characterized the situation thus:

Since the disaster, citizens have learnt a bitter lesson that their rights and securities can be endangered not only by "foreign enemies" but by the policies of their own governments. The victims of "dysfunction of the state" usually reside in rural municipalities such as Fukushima, and it is the corporate managers and policy makers in metropolitan cities who decide where to build or whether to restart nuclear power plants, so that the sacrifices of the victims are often neglected or left unnoticed. The typical structural violence arising from this center-periphery structure, which is called a "sacrificial system," has become a major problem in post-Fukushima Japan.²⁶

In addition to its international commitments and constitutional mandate, in June 2012, Japan also passed the 'Nuclear Disaster Victims Support Act.' This legislation clearly defined the legal obligations of the Japanese government to Fukushima survivors.

The basic principles stipulated under Article 2 of the Act²⁷ state:

1. Support Measures for the Lives of Disaster Victims must be implemented while trying to provide accurate information on the status of the disasters resulting from the TEPCO Nuclear Accident and the status of reconstruction, etc. following said disasters.
2. Support Measures for the Lives of Disaster Victims must be implemented so as to enable each Disaster Victim to make a voluntary choice as to whether to reside in an area under the support measures set forth in Article 8, paragraph (1), to relocate to another area, or to return to the area they lived in prior to relocation, while ensuring that appropriate support is offered irrespective of their choices.
3. Support Measures for the Lives of Disaster Victims must be such that the utmost efforts are made to eliminate any health concerns of the Disaster Victims as regards external and internal exposure to radiation pertaining to the TEPCO Nuclear Accident at an early date.
4. When implementing Support Measures for the Lives of Disaster Victims, appropriate consideration must be given so as not to generate unreasonable discrimination against them.
5. When implementing Support Measures for the Lives of Disaster Victims, special consideration must be given to children and pregnant women, considering the fact that children (including fetuses) are more susceptible to radiation, while ensuring all possible means of reducing radiation doses and caring for the health of such individuals from the viewpoint of preventing health hazards from affecting them.
6. Considering the possibility that the effect of radiation pertaining to the TEPCO Nuclear Accident may continue for a long period of time, there should be a commitment to reliably implementing Support Measures for the Lives of Disaster Victims for as long as there is a need for Disaster Victims to be supported.

United Nations Headquarters in New York, USA.



© Drop of Light / Shutterstock, Inc.

While this Act was passed unanimously in the Diet,²⁸ the federal government subsequently failed to create regulatory enforcement mechanisms.²⁹

Thus, while this is currently a law, it has not been fully implemented. It is quite clear that the Abe Government's resettlement policy violates its terms, particularly principles two and six.

Further, the misinformation regarding radiation health risks and the enormous challenges faced by survivors in accessing medical files clearly violate principles one and three.

Thus, Japan's response to the Fukushima disaster has not only resulted in a failure to meet its obligations under multiple human rights treaties, but also clearly violates its own domestic law regarding the treatment of Fukushima-impacted peoples.



Gender Difference: Cultural Constructs and Power Dynamics

An evacuee returns to her home for a short visit in Tamura City, Fukushima Prefecture. October 2013.

Disasters exacerbate underlying social issues within a society³⁰ – and the ongoing Fukushima nuclear disaster is no exception. To better understand the gendered difference in the impact and response of the Fukushima nuclear catastrophe, it is helpful to first explore the underlying social framework that created and supported these responses.

Japan has long been a nation characterized by a significant gender imbalance in power and resource distribution. For the past decade, it has consistently been ranked in approximately the bottom third of nations evaluated in the World Economic Forum's Gender Gap Index – together with countries like Cambodia, Qatar, Nigeria, and the United Arab Emirates, among others. In 2006, Japan was 79th out of 115 countries evaluated.³¹ In 2016, it had fallen to the bottom quartile, ranking at 111th out of 144 countries evaluated.³²

Social roles and everyday activities are still predominantly dictated by gender, wherein women are placed largely within the domestic sphere and men engaged in business, politics, science and as the primary breadwinners.³³ Masculinity, in this context, is contingent on economic prowess and maintaining stability, which leads to a preoccupation with work. Men are expected to prioritize work over private life.³⁴

One perspective in the field of social psychology asserts that gender is a cultural construct, and thus:

... masculinity is an aspect of institutions produced by institutional life, as much as it is an aspect of personality. In this perspective, men and women think and act as they do not because of innate characteristics or internalized socialization, but because concepts about femininity and masculinity are adopted from the general

culture. In this view, gender is a normative category of thoughts, feelings and actions that are adopted and reinforced through social interactions. Based on this perspective, *men's risk taking behaviors can be seen as a means to demonstrate masculinity*. Hegemonic masculinity, gendered practices that ensure the dominant social position of men, is historically associated with industrial capitalism. *It discourages men from doubting institutions in control of risk management, and emphasizes technical management of risk problems through mastery over nature rather than concerns for broader social and ecological considerations* [emphasis added].³⁵

Further, men are more accepting of risks³⁶ and more trusting of institutions due to their privileged position within society that shields them from much of the negative consequences these create. As such, the findings of the “white male effect” in the U.S. are potentially useful when considering differential risk perception between men and women in the context of the Fukushima disaster, which concludes:

White males with better education, income, and conservative views put more trust in authorities and have less concern about environmental risks. *Their historically privileged position and membership in the most advantaged group socializes them for risk taking, while women rely more on collective resources. Since risks are often created and handled by men, men perceive risks as more acceptable than women.*³⁷ ... The privileged social position of men and their need to maintain a sense of control and stability can influence their evaluations of risk created by central institutions ... trust in social institutions [has been referred] to as a ‘protective cocoon’ that guards the self against overwhelming threats of change [emphasis added].³⁸

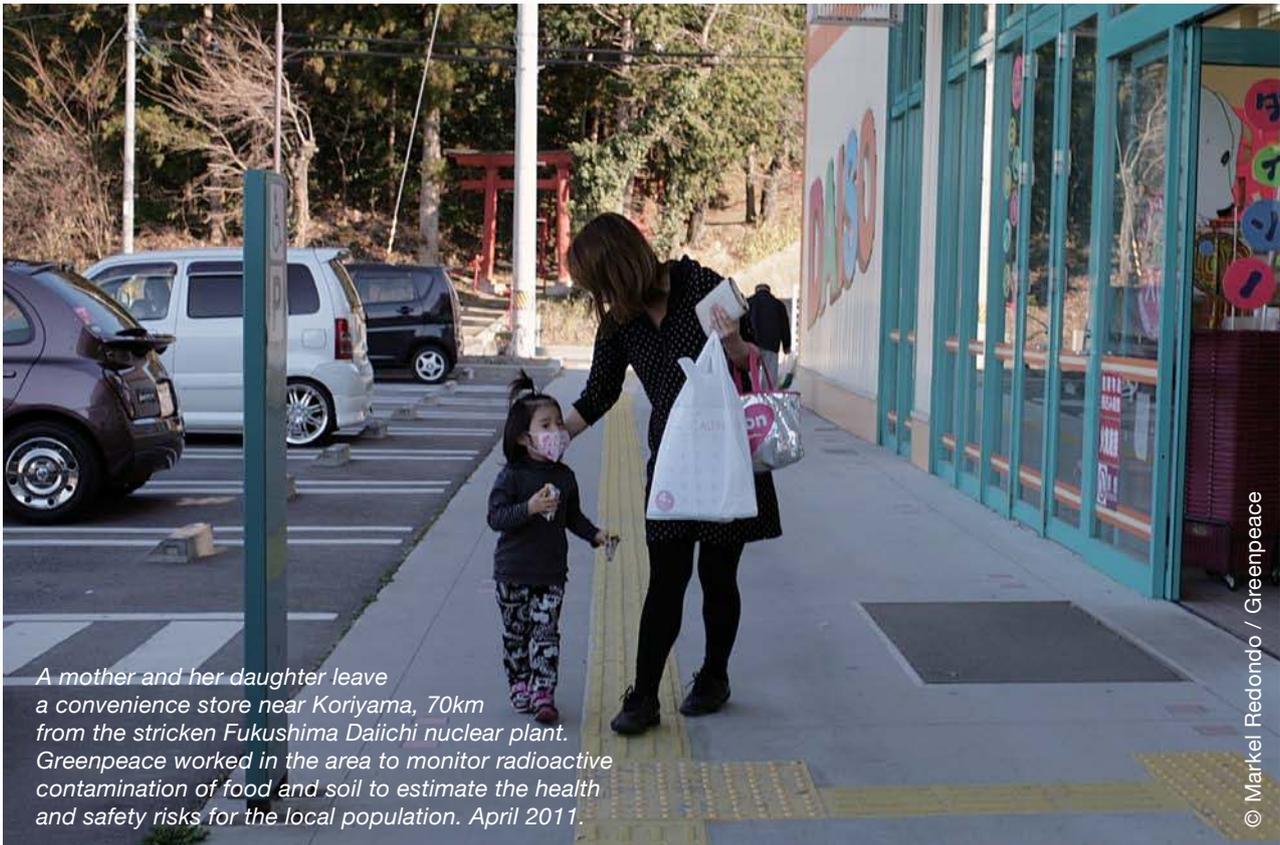
As discussed above, educated Japanese men occupy a distinctly privileged position within Japanese society that in many ways mirrors

their white male counterparts in the U.S. Of the most recent ranking of the 34 OECD countries on gender wage gap, Japan was one of the bottom three with only South Korea and Estonia ranking lower.³⁹

This huge income disparity put women in a uniquely disadvantaged position for coping with the impacts of the Fukushima Daiichi disaster. To further illustrate, in 2012 women employed full-time only earned 69.3% of what their male counterparts earned. With part-time workers included, women only made 51.0% of the salaries their male counterparts were paid.⁴⁰ Further, while just 20.1% of Japan's male workforce were employed in part-time positions, for women this was more than double with 54.6% of the female workforce employed part-time.⁴¹ The impacts of this yawning wage and employment gap will be explored further below.

But, regarding the differentiated responses between the sexes in the aftermath of the Fukushima nuclear disaster, Morioka (2014) notes that: “men's memberships in work organizations exposed fathers to masculine social norms that prioritized economic stability and recessed the risk of radiation.”⁴² This is further summarized as:

Long work hours and an inability to enforce labor laws reflect the corporate driven national policies that prioritize economic stability and growth. The resultant work culture extols masculine self-sacrifice to the company and pushes male workers to adopt the perspectives of “corporate warriors.” The phenomenon called *karoshi*, deaths from overwork, is one reflection of the “corporate centered society” which distorts worker's health perceptions ... Japanese salary men [have been depicted] as “beneficiaries of the patriarchal dividend” expressed in power and material resources, but who are also expected to put loyalty to their companies above personal family needs ... Father's disinterest in radiation risk can be viewed as the cost for the “patriarchal dividend” that families pay under the banner of economic recovery.⁴³



A mother and her daughter leave a convenience store near Koriyama, 70km from the stricken Fukushima Daiichi nuclear plant. Greenpeace worked in the area to monitor radioactive contamination of food and soil to estimate the health and safety risks for the local population. April 2011.

© Markel Redondo / Greenpeace

Also, it is important to note that the very presence of radioactive contamination represents the imminent possibility of drastic changes, presenting a very real threat of instability – particularly economic instability. This directly affronts the cultural expectation that men maintain stability for the family and provide economically. As such, men are primed to seek to reduce this instability, in order to reduce the threat to their definition of self and place within their family and societal structures. This, paired with the greater risk acceptance and greater innate trust in institutions due to socially privileged positions, meant men were more likely to accept government assurances of safety.⁴⁴

Additionally, men “are more likely than women to see environmental risk as being counterbalanced by economic benefits.”⁴⁵ Conversely, women are more likely to express concern about the environment – a difference that persists even among women employed full-time.

Thus, once fathers had decided to trust the “official” interpretations of facts regarding

radiation by perceived authorities, listening to and weighing the concerns of their wives became too onerous. Many became angry and frustrated, telling their wives they were neurotic and obsessive – and women, in their subordinate position in the home and society, are particularly vulnerable to being labeled and dismissed.⁴⁶

Unfortunately, this view is also reflected in the wider discourses both within Japan and internationally, which misuse radiophobia to dismiss anyone who expresses concerns over radiation exposure.⁴⁷ Given that most decision-makers were and are male, women’s ability to express and act on their concerns, much less see them reflected in policy, were severely limited.



© Christian Åslund / Greenpeace

Evacuation

A mother comforts her child in an evacuation center in Yonezawa City, Yamagata Prefecture. They had fled from Fukushima Prefecture to escape the radiological contamination in the days following the nuclear accident. March 2011.

The evacuation of Fukushima Daiichi-impacted communities was fraught with problems that violated citizens' right to health. While the magnitude of the triple disaster would challenge any government to respond effectively, the lack of public transparency regarding reactor risks, as well as issues related to accident prevention and response, were raised by international bodies a decade before the 2011 catastrophe.

In 2001, the UN Committee on Economic, Social and Cultural Rights stated that:

The Committee is concerned about reported incidents in nuclear power stations and the lack of transparency and disclosure of necessary information regarding the safety of such installations, and also the lack of advance nationwide and community preparation for the prevention and handling of nuclear accidents.⁴⁸

And that:

The Committee recommends increased transparency and disclosure to the population concerned of all necessary information, on issues relating to the safety of nuclear power installations, and further urges the State Party to step up its preparation of plans for the prevention of, and early reaction to, nuclear accidents.⁴⁹

The Japanese government responded with the Third Periodic Report by the Government of Japan (December 2009) under Articles 16 and 17 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) in which it committed to ramping up information disclosure and public communication efforts, as well as emergency planning measures.⁵⁰

Under the UN Guiding Principles on Internal Displacement⁵¹:

- Principle 11 stipulates internally displaced persons' rights to be protected against outrages upon personal dignity such as gender-based violence.
- Principle 18 stipulates internally displaced persons' rights to adequate standards of living. It requests the authorities in charge to assure adequate food, drinking water, basic shelter and housing, clothing, medical services and sanitation facilities. It also requests that special efforts to be made to ensure full participation of women in planning and distribution of these basic supplies.
- Principles 4 and 19 stipulate the rights of children, women, persons with disabilities and the elderly to receive treatment and services that meet their special needs.

Further, as the UN Special Rapporteur to the Human Rights Council Anand Grover stated following his post-Fukushima special mission to Japan:

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 . . . 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 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 [emphasis added].⁵²

Unfortunately, the Fukushima disaster highlighted the utter failure of the Japanese government to meet its human rights commitments.⁵³ For example, the evacuation centers themselves largely excluded women from decision-making roles, as they were run by men.⁵⁴ As a result, women's needs were ignored, such as privacy for breastfeeding and changing clothing, as well as meeting basic needs such as sanitary materials.⁵⁵

Women – traumatized and suffering as a result of the disaster and evacuation conditions – also found their domestic burden dramatically increased due to the strict gender roles within Japanese society that shifted these domestic tasks solely into women's realm of 'responsibility.'⁵⁶ As a result, women were expected to cook for the entire center and nurse the sick (as public nursing services were largely discontinued).⁵⁷ As Ando notes in an analysis of the situation for the Fukushima Bar Association: "It is quite a different thing to perform domestic chores at home in a familiar setting than in an evacuation center or in a community where everything has turned upside down."⁵⁸

Even more appalling was the complete failure on the part of the government to protect the female victims of the Fukushima disaster from gendered violence – despite the government's commitment in Principle 11 under the ICESCR which explicitly acknowledges that women must be protected in these circumstances from outrages against personal dignity.⁵⁹

Post-disaster Japan saw a severe problem with escalated gender-based violence⁶⁰ in impacted areas, including rape during blackouts and increased domestic violence – particularly when families moved from the evacuation centers to temporary housing.⁶¹ This escalating trend in violence against women and other social issues persisted long after people had left the evacuation centers. As Noriko Kubota, a professor of clinical psychology at the local Iwaki Meisei University stated in 2013: "We are starting to see more cases of suicide, depression, alcoholism, gambling and domestic violence across the area."⁶²

According to a submission by the Japanese government posted on the Human Rights

Advisory Committee's website, Japan made efforts to uphold its commitments to human rights including protecting the rights of women and children,⁶³ stating that it:

- Took measures to ensure as much privacy as possible to evacuees
- Provided meals prepared by professionals
- Implemented routine inspections by public health workers
- Organized study groups led by college students for elementary and junior high school students,
- Secured a playing space for kids.
- Fukushima Prefecture also secured a space for women and girls by reserving a room in shelters. The Fukushima Gender Equality Centre supervised the operation of such a space with assistance from volunteer groups. This space aimed to provide women with a place where they can stay with security and comfort. Women living in the shelter have been able to talk to staff about their worries, and staffs also helped them receive special assistance from specialised counselling organizations in case of, inter alia, domestic violence and sexual abuse.⁶⁴

Further, the Cabinet Office issued a report in 2012 stating that crime rates had fallen in the Fukushima-impacted prefectures. It asserts that confirmed cases of sexual violence fell from preceding years and that it provided support and counselling services to victims.⁶⁵

The use of the word “confirmed” is critically important, as it has been noted that in the wake of the disaster:

[e]ffective means to prevent this kind of [sexual and domestic] violence have not been established however and *even in cases where abuse victims have been publicly noted, most of these have not resulted in an official notification to the police.* There is no system in place for personal consultations that abused women can utilize, so there is an urgent need to establish mechanisms to protect disaster victims from violence [emphasis added].⁶⁶

And, while the Japanese government's white paper on this issue may contain some elements of truth, the credibility of this version of the evacuation centers and the protection of vulnerable populations is further called into

Evacuees sit in an evacuation center. The evacuation centers throughout the region were largely run by men, and women had difficulty getting basic needs met, such as the provision of sanitary materials and privacy for breastfeeding or changing clothing. Yonezawa, Yamagata prefecture. March 2011.



© Christian Åslund / Greenpeace

question when one considers the stark contrast to the findings of the UN Special Rapporteur on the right to health, Anand Grover. In his summary report of his mission to Japan to meet with nuclear evacuees as well as officials with local and national governments and relevant regulatory agencies from November 15th – 26th 2012, he stated:

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 ... Older persons, children, women and persons with disabilities are more susceptible to ill effects of disasters. 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 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 [emphasis added].⁶⁷

It is important to note that the March 2011 triple disaster was not the first major disaster to highlight the impact of gendered social problems within Japanese society on emergency response consequences. In 1995, Japan experienced the Great Hanshin-Awaji Earthquake; and in 2004, the Niigata Chuetsu Earthquake, followed by the more severe 2007 earthquake near the same site. Due to the fact that many women and elderly were left behind in the earlier two disasters, amendments were made to the Basic Disaster Management Plan in 2005. The second and third Basic Plan for Gender Equality also emphasized the need for equal participation between the sexes for disaster prevention and environment.⁶⁶

While these stated objectives are commendable, the national and local governments utterly failed to realize them in practice. Ando notes that:

... only one of the 15 members of the government's Reconstruction Design Council in response to the Great East Japan Earthquake is a woman and the Committees for earthquake recovery in each of the three prefectures of Iwate, Miyagi and Fukushima have only one female member. The rate of participation of women in planning in the autonomous government organs, regional government bodies and in different industries is abysmal. Of course, it is not satisfactory to just make up the numbers, but with conditions as they are, it is hardly possible for the views of women, who hardly have a voice, to be properly represented and reflected in policy.⁶⁹

Thus, women had, and continue to have, little opportunity to contribute to the systems that impact their lives or to enact preventative measures and safe community systems. As a result, many of the hardships unnecessarily borne by women in the evacuation centers and the violence perpetrated against them in the wake of the disaster resulted from systemic failures in inclusion, prevention, and adequate support.



Economic Impacts

Ms. Ikeda, whose family had lived in litate for nine generations, ran a farm together with her sons. The nuclear accident heavily contaminated litate, forcing her to leave the farm and evacuate to Fukushima City. She sometimes goes back for a day or so to check on and maintain her house. November 2011.

Women are at a significant economic disadvantage in Japanese society due to the enormous disparity in earned income between the sexes. Prior to the disaster, women were already in a severely disadvantaged position to respond to it according to their own wishes and knowledge.

This was exacerbated by the fact that in the wake of the earthquake and Fukushima Daiichi disaster, initiatives for industrial recovery in the impacted areas were suspended. As funds dried up, temporary workers were targeted for termination – and women made up 70% of those temporary workers. It was their employment and income that faced the greatest insecurity and was most impacted.⁷⁰

Compounding the economic hardships faced by impacted women, the Japanese Civil Code treats each household as a unit. Support and compensation payments are directed solely to

the head of household, which was typically the adult male. This not only worsened unequal household power distribution and decision-making ability, but was particularly cruel in domestic violence situations.⁷¹

The Japanese government continues to completely fail to address this problem. According to a 2013 analysis by Y. Ando, of the Fukushima Bar Association, in the disaster recovery efforts, “[t]here is no emphasis however, on assisting women to become financially independent, women’s workplaces and the conditions and foundations for business start-ups by women are not being supported, and many women are now left facing poverty. Single mothers are especially challenged by these conditions.”⁷²

As will be discussed further below, the nuclear disaster is also linked to divorce and separation, as mothers seek to protect themselves and their



An elderly farmer carries a basket of products on the outskirts of Koriyama City. Greenpeace worked in the area in 2011 to monitor radioactive contamination of food and soil. April 2011.

© Christian Åslund / Greenpeace

children from radiation and/or leave abusive domestic situations – leading to increasing numbers of such single mothers. This is certainly a concern, as a pre-disaster report from 2010 stated that roughly half of Japan's single mothers were poor or impoverished.⁷³

Female Fukushima evacuees face a unique set of circumstances, including: loss of income and property, marital discord and a potential split with the primary income earner in the household, lack of access to compensation money and/or inadequate compensation, relocation and child rearing costs, and radiation discrimination (which will be discussed more fully later). Given this, there are several factors that would make it increasingly likely that many Fukushima single mothers could face poverty.

These same women are now facing another impossible economic dilemma – however, this one is calculated and intentional.

In March 2017, just six years after the disaster, the Japanese government plans to lift evacuation orders in parts of Iitate and Kawamata. The lifting of orders in much of Tomioka and Namie

is currently under negotiation, with the aim to lift orders by April 1, 2017.⁷⁴ By 2022, the government plans to partially lift the evacuation orders in the “difficult-to-return” zone (Area 3: annual integrated doses exceeding 50 mSv/year). It plans to completely lift the orders in Area 3 at an undetermined date.⁷⁵ For those evacuees affected by the March 2017 order, they will lose their already inadequate compensation payments one year after the orders are lifted. Further, though the timing varies from prefecture to prefecture depending on where former Fukushima victims evacuated to, the housing support victims receive will also be lost.

As a result, nuclear disaster victims are being forced to make the impossible choice between returning to areas where orders are lifted but radiation levels remain far in excess of internationally recommended maximum dose limits, or attempt to survive without financial support once that is ended a year later. In the face of having lost everything in the disaster, and the much greater vulnerability to poverty for women, such policies are economic coercion, not choices freely made.



Atomic Divorce

Toys sit on a shelf in the home of a mother of three. After her original house was designated for evacuation due to localized high radiation levels, her family evacuated to a home in a lower radiation area in the same city. Her grandmother still lives in their former house. January 2014.

Women have frequently been labeled as neurotic or irrational and their concerns about radiation exposure dismissed, by both their partners and as a matter of policy.⁷⁶ Many women found it impossible to insist on taking precautions against radiation when their husbands became angry or accusatory. Some gave up – either on enacting preventative measures and/or evacuating – in the face of their husband’s opposition.⁷⁷

Many men chose to believe the official assurances of safety despite the radiation levels, and made decisions based on what they thought would guarantee the economic security of their families. As a male resident stated in an interview on this subject:

I am not moving because I believe things will be fine. There is some information that makes me worried a little, and I might have

been radiated(sic) to a degree, but it must be within an acceptable limit. Deep down, I think I have decided that I will be ok. I want to believe that everything will be fine. I am not working for a company that allows me to move. My wife has asked why I don’t evacuate with them, but all I could say was if you want to go, you could go. But I will stay here working and making a living.

... for my child, I do need to be careful. I need to pay for living expenses, mortgage, and school fees. If I was alone, I could make a living anywhere. But I have to think about my child’s future.

Honestly, I think it was this company who made me who I am today ... I was able to grow this much because of this company ... The part that work occupies in my life is huge.⁷⁸

Thus, as noted by R. Morioka (2014), his response illustrates the crux of the difference between his response and his wife's – while he was concerned for his child, his concern was for financial security for his child, not necessarily health. And in addition, his work was also a source of identity and self-worth – something that was impossible for him to part with. His wife eventually gave up hope of relocating.⁷⁹

Others, many others, separated or filed for divorce, as a result of constant low-level anxiety, plus differences in highly personal decisions such as whether to leave or stay, radiation risk perception, and whether to have children post-disaster.⁸⁰ Many of these women have expressed that they felt they had no other choice but to split with their partners in order to move themselves and their children to a safer, uncontaminated environment.⁸¹

While there are not firm figures for the number of families that have split as a result of the disaster, it is common enough that there is a name for it, “*genpatsu rikon*.” This literally translates to “atomic divorce.”

As one former female Fukushima City resident explained of her decision to divorce her husband when he refused to leave, “I think [my husband] believed I was overreacting ... I felt like that if I stayed with him, I wouldn't be able to keep my children from harm, and that's how I got here.”⁸²



An old telephone hangs in a vacant house in Tamura City, Fukushima Prefecture. The homeowners evacuated in the wake of the nuclear disaster. October 2013.

© Noriko Hayashi / Greenpeace



Radiation Stigma and Marriage Discrimination

A doll sits on the balcony of a house in the abandoned town of Namie, Fukushima Prefecture. March 2013.

In addition to personal health concerns and the enormous evacuation and economic hardships, the Fukushima survivors are further subjected to discrimination from their fellow countrymen and women due to an unfounded belief in radiation contagion.⁸³

Evacuees face a wide range of discrimination and prejudice, ranging from bullying in school, refused entry in shelters and centers, requests to provide radiation testing results on job applications, and social isolation in wider Japanese society.⁸⁴

Fukushima women are often portrayed as “damaged goods” by wider Japanese society – as has been insinuated in many Japanese websites and articles since the disaster.⁸⁵ Even some of those who are supposedly allies of the victims, like prominent environmentalist and antinuclear activist, Hobun Ikeya, have instead thrown the women of the affected areas on the garbage pile. Ikeya, who is the head of

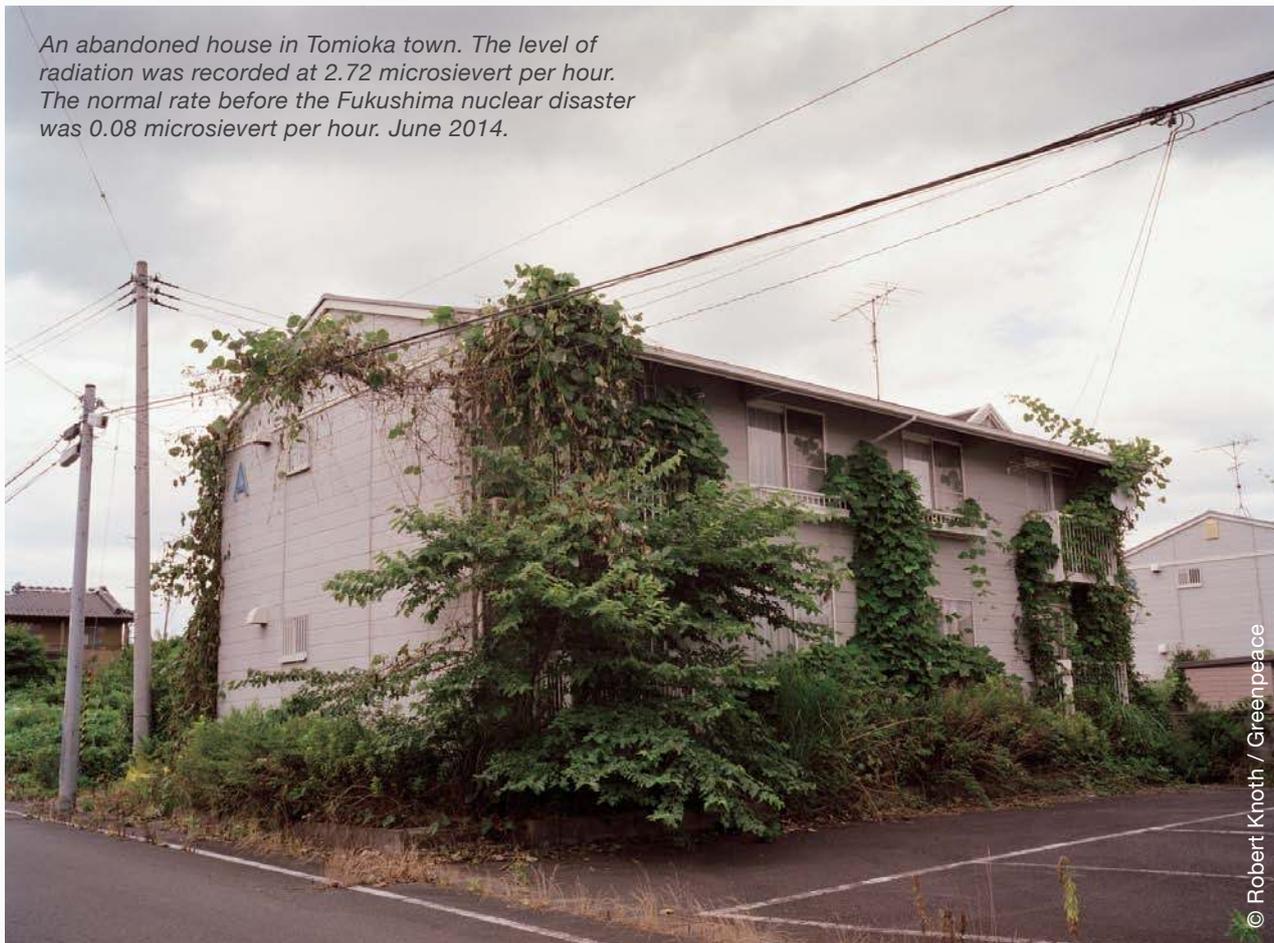
the Ecosystem Conservation Society of Japan, stated in a public meeting that: “People in areas over which the radioactive plumes passed should not marry ... If they give birth to their children after getting married, the incidence of deformities will become way higher.”⁸⁶

The statement was met with outrage and an enormous backlash from the Fukushima City Assembly members. However, the city assembly cannot respond to every incident or prevent the pervasive societal discrimination against Fukushima disaster survivors.

Many victims, themselves, fear to have children in the wake of the disaster due to concern that they will have genetically damaged offspring.⁸⁷

The sentiment is akin to the discrimination and bullying faced by atomic bomb survivors in Japan. As one study on the social impacts of the bombings notes:

An abandoned house in Tomioka town. The level of radiation was recorded at 2.72 microsievert per hour. The normal rate before the Fukushima nuclear disaster was 0.08 microsievert per hour. June 2014.



“Survivors of the atomic bombing were stigmatized by harmful rumors after the war. It was said that female survivors would bear retarded children, and that false belief excluded many A-bomb survivors from marriage ... the rumor that all survivors were more likely to bear children with birth defects was so powerful that it was treated as if it had been true.”⁸⁸

This stigma may be particularly damaging to the social standing and the emotional and psychological health of Fukushima women, given that their role in Japanese society as women is largely defined by traditional gender roles, and therefore tied to the domestic sphere and responsibilities. Being viewed as unable to marry or start a healthy family fundamentally denies these culturally defined characteristics of womanhood to the victims of the disaster.



© Christian Åslund / Greenpeace

Radiation Impacts

An emergency worker directs a young woman at a government screening center in Kawamata, Fukushima Prefecture. March 2011.

Given the long latency times between exposure to ionizing radiation and its effects, the impacts of the Fukushima Daiichi disaster on physical health will largely remain to be seen in the coming years and decades.

While environmental contamination, even to known carcinogens such as radiation, is impossible to link definitively to individual cases of cancer or other known health outcomes, numerous studies of chronic low-dose exposure across diverse populations have demonstrated significant effects on human health.

For example, a 15-country collaborative research study on the health effects of low-dose exposure for 400,000 nuclear workers, which encompassed 5.2 million person-years of follow-up, found a significant association between radiation dose and all-cause mortality.⁹⁰ This was primarily due to dose-related increases in all-cancer mortality, excluding leukemia.

Despite this, the Japanese government has maintained its post-disaster elevated standard of up to 20 mSv/year for resettlement. It should be noted that the 20 mSv/year standard is the same level as nuclear workers' annual limit, averaged over a 5-year period, per the International Commission on Radiological Protection (ICRP) recommendations.⁹¹ For children aged 16-18 that are in apprenticeships for radiation-related fields, the International Atomic Energy Agency (IAEA) stipulates that exposures should be no more than 6 mSv/year.

The increased mortality risks of long-term low dose exposures for nuclear workers is obviously concerning. Yet, it is quite a different situation for employees to willingly accept these increased risks than it is for the public, including women and children, to be exposed in their daily lives to the same radiation risks as nuclear workers. This level is also 20 times higher than the international and Japanese standards (outside Fukushima-impacted areas) for "acceptable" exposures of

the general public to human-made radiation, as well as the long-term decontamination targets for the contaminated region.

This concern for vulnerable populations being exposed up to 20 mSv per year was expressed on May 12, 2011 by the Japan Medical Association, which said in a statement:

The scientific basis for choosing the maximum amount of 20 mSv in the band of 1 to 20 mSv is not clear. The government's action should be more carefully deliberated considering the fact that growing children are more sensitive to radiation exposure compared to adults. We as a nation should make the utmost effort to reduce the exposure to radiation of children, as well as adults. We are responsible for the children's health and life ... We urgently request that the Japanese National government strive to reduce children's exposure to radiation in the fastest and most effective way possible.⁹² [translated from Japanese⁹³]

The concern regarding the 20 mSv per year standard was echoed in 2013 by the UN Special Rapporteur Grover. His report to the Human Rights Council stated:

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. *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* [emphasis added].⁹⁴

The policies of the Japanese government are particularly concerning, as in the wake of the disaster, it instituted a propaganda campaign to encourage the consumption of foods from Fukushima, without adequate testing regimes in place to ensure its safety.⁹⁵ This resulted in potentially increased radiation exposures and the spread of contaminated food far from the impacted region.

Just one month after the disaster, the Ministry of Agriculture, Forests and Fisheries (MAFF) launched a "let's support by eating!" campaign. Together, the head of the Consumer Affairs Agency and the MAFF minister also issued a joint statement encouraging the consumption of products from the affected areas.⁹⁶ Three months later, it was discovered that cesium-contaminated beef was on the market and had been consumed in eight prefectures.⁹⁷

In another example, after a shipment ban on beef from Tochigi prefecture was lifted – which had been put in place only 2 months earlier due to cesium levels in beef far exceeding the provisional safety limits⁹⁸ – Kanuma City, in Tochigi prefecture, attempted to demonstrate the beef was "safe." To do this, they fed the potentially contaminated beef to elementary children in their school lunches.⁹⁹

Children are at greater risk for developing thyroid cancer following exposures to radioactive iodine (¹³¹I), as was seen in Chernobyl.¹⁰⁰ The risk can be greatly reduced if stable iodine pills are distributed immediately following an accident, which saturates the thyroid and inhibits the uptake of ¹³¹I. In Fukushima, orders to distribute the iodine pills that were waiting in stock in the towns in the emergency planning zone were delayed until 5 days after the accident. By then, many residents had already fled the nuclear disaster area, and the window had passed for the pills to be effective in their preventative role.¹⁰¹ This likely meant that many children were exposed to preventable high doses of radioactive iodine.

In June 2011, the Fukushima Prefectural People's Health Management Survey was launched to conduct thyroid screenings of people who were under the age of 18 at the time of the radioactive releases due to the triple reactor core meltdowns. The study was headed by Professor Yamashita Shunichi and Prof. Suzuki Shinichi, who stated that its purpose was, "to calm the anxiety of the population" and to convince the public that "the health impact of the nuclear accident of Fukushima can be assumed to be very minor."¹⁰²

The credibility of this research has been called into question by outside observers,¹⁰³ given that the head researchers began with the



commitment to a stated outcome before the study even began – much less any results known. In addition, Professor Yamashita also notoriously said in the wake of the disaster:

The effects of radiation do not come to people who are happy and laughing, they come to people who are being weak-spirited. This has been clearly proven through animal experiments. For good or for bad, those who drink alcohol are less susceptible to the impacts of radiation. I am not saying you should drink. But, laughing will remove your phobic fear of radiation.¹⁰⁴

This statement is, of course, completely contradictory to the findings of over seven decades of research on the impacts of ionizing radiation. The study also failed to properly account for migration, and there are significant issues with patient follow up.¹⁰⁵

But perhaps the worst aspect of this study is not the failure of its lead researchers to approach the subject objectively nor the flaws in the study's methods, but rather the difficulty for patients and their parents to gain access to their

own medical files. While patients were given a poor-quality print of their ultrasound results (supposedly to prevent forgery), they have been forced to file Freedom of Information (FOI) requests to gain access to their own complete medical files.¹⁰⁶ This is not only wholly unfair, but is a gross violation of their right to health – including their right to information.

There is an ongoing contentious debate over the causes of the higher-than-expected thyroid abnormalities and cancers amongst Fukushima children. It is unclear whether this is a result of radiation exposure or of screening bias (i.e. more abnormalities and cancers are found due to widespread screening). As of December 2016, 145 children were found to have thyroid cancer.¹⁰⁷

Numerous bodies and scientists have proposed that the increase in the detection of thyroid abnormalities in Fukushima children in the years immediately following the accident is due to screening bias and more sensitive ultrasonic testing.¹⁰⁸ The Fukushima prefectural review panel conclusion is that the results can be most likely explained through the screening effect and is unlikely to be due to radiation exposure.¹⁰⁹

This is not the view of others, who contend that the incidence of thyroid cancer detected in Fukushima, when compared to national levels, cannot be explained solely based on screening. These experts assert that the high incidence can be explained, to a significant degree, by exposure to radiation.¹¹⁰

The French national nuclear research organization, Institute for Radiological Protection and Nuclear Safety (IRSN), analyzed studies of children from four prefectures not effected by the Fukushima Daiichi accident, as a control group. IRSN then concluded that:

... during the period 2011-2014, four systematic screening campaigns for thyroid cancer were carried out in children under 18 years of age in prefectures not affected by the Fukushima accident. The data from these studies shows that the annual incidence estimated on the basis of systematic screening of thyroid cancer in children is between 23 and 130 out of 100,000.

In conclusion, this data shows that there is no significant difference between the annual incidence observed in the Fukushima prefecture and that estimated on the basis of a systematic screening programme in prefectures that were unaffected by the fallout from the Fukushima accident.¹¹¹

At the same time, the IRSN also holds that the screening program must continue and that, “a connection with the Fukushima accident may only be made if the annual incidence of thyroid cancer in children increases starting from the period 2016-2018.”

This is not to say that there will be no health impact in the future. This is recognition that thyroid cancer has a long latency period. In fact, significant increases in thyroid cancer incidence for those who were children and teenagers at the time of the 1986 Chernobyl nuclear disaster did not become evident in most regions until between 4-5 years after the disaster.¹¹²

As previously stated, pregnant women are more vulnerable to the impacts of radiation – and one study appears to show the effects of the Fukushima nuclear disaster less than a year after the disaster. The authors noted that in the aftermath of the Chernobyl disaster, perinatal mortality rates increased after a 10-month time lag. In an effort to determine whether a similar uptick in perinatal deaths was evident after the Fukushima disaster, the researchers analyzed perinatal mortality data for the 47 prefectures of Japan from live births at 22 weeks of pregnancy to seven days after birth from 2001 - 2014.¹¹³ The data was solely sourced from the Japanese government’s records. The study compared unaffected and less affected prefectures nationwide with the heavily contaminated (Fukushima, Gunma, Ibaraki, Iwate, Miyagi, and Tochigi) and moderately contaminated prefectures (Chiba, Saitama, and Tokyo).

To evaluate the impacts of the tsunami and earthquake, which might also influence perinatal mortality, the authors further divided the heavily contaminated prefectures into two groups based upon the number of dead and missing. Group 1 (Iwate and Miyagi) suffered the high rates of dead and missing due to the tsunami and earthquake. Group 2 (Fukushima, Ibaraki, Tochigi, and Gunma) were heavily impacted by the nuclear disaster, but suffered casualty and missing person rates 20 times lower than those of Group 1.

The results showed that for Group 1, there was a significant increase of more than 50% in perinatal mortality immediately following the earthquake and tsunami in March and April 2011, with no further increases the rest of the year. In Group 2, there was no significant increase in perinatal mortality in the immediate aftermath and for the remainder of 2011. However, all six of these heavily contaminated prefectures showed a long-term jump in infant mortality rates 10 months after the nuclear disaster, from January 2012 onwards, of approximately 15%. In the less contaminated prefectures of Chiba, Saitama, and Tokyo, perinatal mortality also increased 10 months after the disaster, albeit at the lower rate of 6.8%.

In these prefectures, perinatal mortality has steadily fallen, though at an elevated rate from previous trends.

No similar jump in perinatal rates was observed in prefectures unaffected by the disaster, where perinatal mortality continued to steadily fall with national trends over the time period studied. The authors conclude that these findings are consistent with those seen in Europe following the Chernobyl nuclear accident, though more study is needed. Given the 10-month time lag, the authors also note that this suggests an impact on ovum and sperm, rather than an impact on embryo and fetus.

There is further a significant body of evidence from atomic bomb survivors, to support the conclusion not only that radiation dose increases mortality, and that there are potential health risks even at low doses, but also that women, girls, and female fetuses are more vulnerable to a number of radiation-induced health problems.

According to a report from the U.S. National Academy of Sciences, which examined research on the health effects of radiation dose in atomic bomb survivors, “dose related increases in

both cancer and non-cancer mortality imply that longevity is related to dose ... there is a clear decrease in median life expectancy with increasing radiation dose ...”¹¹⁴

There were 10 cancers related to in utero radiation exposure, with a statistically significant dose-response correlation; *the findings for fetuses were not significantly different from those exposed at 5 years or younger*. However, it is important to note that *9 of these 10 cancers occurred in females*, and the significant difference between the sexes persisted even when female-specific cancers were excluded (breast, ovary, and uterus).¹¹⁵

The decrease in risk for developing leukemia with attained age was more rapid for men than for women.¹¹⁶ The Excess Relative Risk (ERR, which quantifies the increased risk for persons with a given radiation dose compared to non-exposed persons) for all solid cancer mortality, excluding leukemia and other hematopoietic (i.e. blood) cancers, for females was double that of males.¹¹⁷

For site-specific cancers (stomach, colon, liver, lung, and female breast) the largest ERR per Sievert radiation dose (ERR/Sv) was for breast cancer.¹¹⁸ Proliferative breast disease,

Wheelchair-bound Annya Pesenko, born in a Chernobyl-contaminated area, was diagnosed with brain cancer at age of four. She carries certificate no. 000358. It reads: ‘This person has the right to the privileges that are given by the government of the Republic of Belarus for the victims of the Chernobyl catastrophe as specified under article 18/ issued by the Gomel Municipality’. March 2011.



© Robert Knoth / Greenpeace

both in general and atypical hyperplasia (i.e. precancerous accumulation of abnormal breast cells), was positively associated with radiation dose, with the strongest association in the 40-49 age-at-exposure cohort.¹¹⁹ Researchers hypothesize that this is related to the age-at-exposure risk for radiation-induced breast cancer, and that potential cancers induced in this age group received too little hormonal exposure to progress to full-blown cancers.¹²⁰

The ERR/Sv for females for stomach cancer was found to be about three times that of males.¹²¹ The sex association for lung cancer is similarly strong, with female ERR/Sv at about 4 times that of males.¹²²

It is also worth noting that, despite misleading information presented to Fukushima survivors – including pregnant women and children – regarding risks at doses below 100 mSv, the report highlights research that found evidence of a statistically significant dose-response ratio for solid cancers at low radiation dose levels (0 - 100 mSv).¹²³ Statistically significant dose-response was also found for nervous system cancers and schwannomas¹²⁴ (i.e. nerve sheath tumors) at low dose levels (less than 1Sv).¹²⁵ Similarly, while non-cancer radiation-induced diseases were not found to differ significantly between the sexes, researchers did note statistically significant dose-response relationships for heart disease, stroke, respiratory disease and digestive disease.¹²⁶

The increased vulnerability of women to the impacts of radiation exposure is further corroborated by studies of diagnostic medical exposures. One study of CT scans found that though there was variance of exposure levels between hospitals and procedures, women – particularly young women – were at significantly greater risk than men for developing cancer from diagnostic procedures.¹²⁷ For example, for women who underwent a coronary angiography CT at the age of 40, their risk of developing cancer from the procedure was 1 in 270. For men, the risk was 1 in 600. For 20 year olds, the risk doubled.

Further, fetuses, infants and children are particularly vulnerable. One study analyzed the lifetime cancer mortality risks of individuals

who had undergone pediatric (under 15 years at the time of the procedure) CT brain and/or abdominal scans.¹²⁸ It concluded that the lifetime cancer mortality rates attributable to the CT scans were an order of magnitude higher for pediatric patients than for individuals who were adults at the time of receiving the scan. Women were also at greater risk for developing cancer as a result of the pediatric CT scans, though this increased risk was primarily for abdominal examinations.

Other studies of fetal low-dose exposures appear to confer greater health risk than for any other group, including infants and children. Studies have also shown that a single x-ray examination of the abdomen of a pregnant woman increased the likelihood of childhood cancers by 40-50%.¹²⁹ These studies also found that the risk for childhood cancers increased proportionately to the amount of in utero x-ray exposure.

The placenta can also transfer radionuclides that have been ingested or inhaled to the developing fetus.¹³⁰ Radionuclides that accumulate in the bladder can cause radiation exposure to the nearby fetus as well.¹³¹ Depending on the stage of development and the dose received, such exposures can result in a wide range of impacts, such as pregnancy loss, malformations, neurobehavioral abnormalities, fetal growth retardation, and cancer.¹³²

It follows that it is particularly important for women who are pregnant or may become pregnant to avoid unnecessary ionizing radiation exposures, both internal and external. Thus, the violation of women's human rights in the wake of the Fukushima disaster and Abe's resettlement policy is particularly pointed in this area: while radiation exposure poses a myriad of potential health risks for all people, it is women and girls who are most vulnerable to its effects in multiple areas – the same population that is less likely to be able to protect themselves from radiation exposure due to unequal power distribution between the sexes within households and broader Japanese society.



Mental Health Consequences

Candles illuminate the hopes of attendees at the “Peace on Earth” commemoration event marking the 5th anniversary of Great East Japan Earthquake, tsunami, and the Fukushima nuclear disaster. Tokyo, March 2016.

Trauma research has clearly shown that exposure to disasters increases the likelihood for Post-Traumatic Stress Disorder (PTSD) and other mental illnesses, including anxiety, depression, and other negative outcomes. Further, a review of studies of the psychological impacts of disasters, encompassing human-made (mass shootings, acts of war, etc.), technological (radiological and chemical accidents, plane crashes, etc.) and natural disasters, found that PTSD rates for natural disasters were significantly lower among survivors than they were for human-made and technological disasters.¹³³

Another study that focused specifically on the mental health impacts of nuclear disasters on survivors – Three Mile Island, Chernobyl, and Fukushima – found not only increased rates of mental illness, but that mothers with young children were one of the two highest risk groups – the other being first responders.¹³⁴

It is quite clear that the mental health consequences of the Fukushima disaster are pervasive and potentially life-threatening. In a region of Japan that already was economically disadvantaged¹³⁵ and suffered much higher suicide rates before the disaster than the average for Japan, the ongoing radiological crisis has exacerbated the problem.¹³⁶ In 2014, the suicide rates in the three hardest hit prefectures (Fukushima, Iwate, and Miyagi) ranged between 110 -138 suicides per 100,000 people. The average for Japan that year was only a fraction of that at 19.9 suicides/100,000 people.¹³⁷

Post-disaster mental health assessments of Fukushima victims have shown shockingly high rates of depression and PTSD symptoms. One case study of survivors from Hirono in Fukushima prefecture found that “53.5% [of participants] exhibited the clinically concerning symptoms of PTSD, and among them 33.2% indicated clinical PTSD symptoms. Additionally,

66.8% reported symptoms of depression, and among them 33.2% showed mildly depressive symptoms, while 19.1% and 14.5% demonstrated moderate and severe depressive symptoms, respectively.”¹³⁸

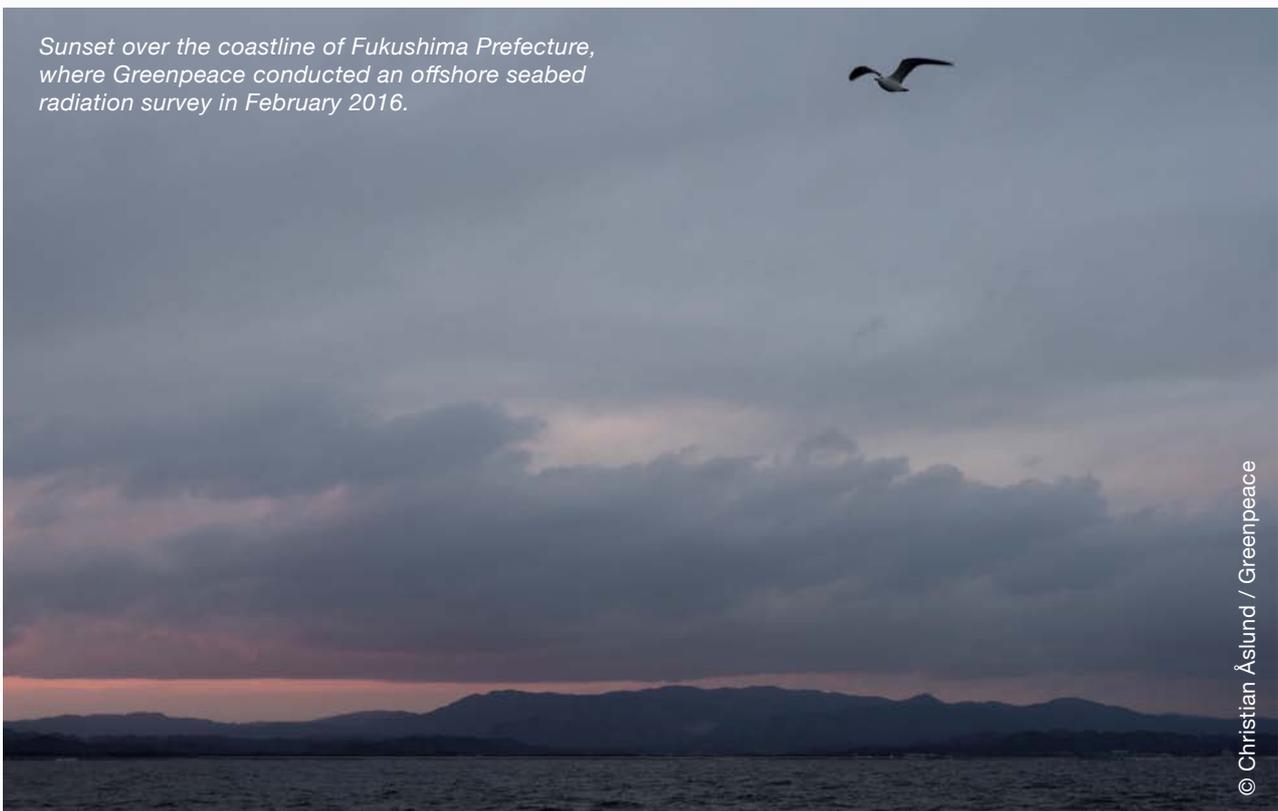
This would be consistent with another study of Fukushima mothers, which found that depression rates were highest in the areas closest to the Fukushima Daiichi site and lowest in areas least affected by the nuclear disaster.¹³⁹ In addition, the authors note that the percentage of Fukushima-impacted women with depressive symptoms six months after giving birth was remarkably high at 27.6%. Predictive models would indicate only 14% of mothers in this study should screen positive for depressive post-partum symptoms after that length of time following giving birth.

Thus, women are not only at greater risk due to the physical impacts of radiation, but are at greater risk of suffering mental health consequences as well. And while human-made, technological disasters increase the likelihood of mental illnesses in both genders, this greater mental health vulnerability for women may be

due to a number of confounding factors that are directly related to the nuclear disaster, though not related to physical effects of radiation itself, including: increased domestic tensions, violence, and/or sexual assault; loss of support networks and lack of legal protections; loss of income and employment; inability to access compensation payments due to distribution to male heads of household; challenges in taking action to evacuate and/or take actions to protect oneself and family against radiation due to domestic disagreements and lack of resources for women; and, of course, concern about radiation exposure of themselves and their children.

Further, it should be noted that non-Japanese, foreign-born women, who lacked strong community ties, were particularly isolated in the aftermath of the disaster. Though the vast majority of victims were Japanese, the lack of both formal and social support networks for foreign-born Fukushima survivors meant these women had even fewer resources for coping with psychological stresses wrought by the disaster and evacuation.¹⁴⁰

Sunset over the coastline of Fukushima Prefecture, where Greenpeace conducted an offshore seabed radiation survey in February 2016.



© Christian Áslund / Greenpeace



© Noriko Hayashi / Greenpeace

Children's Rights Violations

Bags of radioactive waste piled near the swings and slide in an elementary school playground in Iitate village, Fukushima Prefecture. October 2014.

As mentioned previously, Japan is party to multiple international human rights agreements that explicitly acknowledge the right to health, including those that protect the specific rights of children, including the Convention on the Rights of the Child (CRC) and its two Optional Protocols. A systemic approach to reducing disaster risks to children is the Children's Charter for Disaster Risk Reduction (DRR), which was developed with the participation of 600 children in 21 countries in Africa, Asia, the Middle East and Latin America.¹⁴¹ As is noted by UNICEF, the DRR and the CRC are mutually reinforcing.¹⁴² Under the CRC, Japan is obligated to use the best interest of the child as the guiding principle, and guarantee children's right to life, survival, and development, as well as the right to health.¹⁴³ The Convention of the Rights of the Child stresses, "the child's right to participation, including the right to be heard, to express his or her views freely in all matters affecting the child and to have access to appropriate information

(Article 12.CRC)."¹⁴⁴ The DRR further asserts that children have the right to participate and to access needed information.¹⁴⁵

Unfortunately, Japan's response to the Fukushima nuclear disaster has utterly failed to meet its international commitments to protect children's human rights. These violations have been, and continue to be, systematic and deliberate. The situation is only set to worsen with the impending lifting of evacuation orders in contaminated areas.

Like women, children are particularly vulnerable to both the physical impacts of radiation and the mental health consequences of a nuclear disaster. Both the unnecessary delays in evacuating populations and the distribution of iodine pills in the immediate aftermath of the disaster were direct violations of children's right to health.¹⁴⁶ These led to potentially significant exposures that could have been avoided.¹⁴⁷

Further, a lack of adequate government monitoring – especially in schools – in the initial weeks after the disaster resulted in opening ceremonies being held for schools in the prefecture prior to decontamination. As a result, some children that had evacuated with their families were brought back to the contaminated zone.¹⁴⁸

A joint NGO submission to the UN Human Rights Council summarized the situation as follows:

Fukushima Prefecture did answer the parents' demand that school grounds be measured for radioactive contamination, undertaking a survey on 5th - 7th April which covered the 1,638 schools in the prefecture. The result showed that 76% of Fukushima prefecture schools had levels of contamination exceeding what triggers designation of a workplace as "radiation-controlled" (0.6 microsievert per hour) where individuals under 18 are not legally permitted to enter. At over 20% of the schools even higher radiation levels were recorded, levels warranting "individual exposure control" if occurring in a workplace.

Elementary and junior high schools in Fukushima prefecture commenced the new semester on 5 April, even though radiation contamination was at very high levels and in spite of the greater health risks and vulnerability of children to radiation.

On 17 April, compiling the information from the prefectural study of school grounds, the Fukushima Conference for Recovery from the Nuclear-Earthquake Disaster issued an advisory to Fukushima Prefecture and the national government. The advisory stated that measures should be taken to close schools for the time being, and that evacuation of the children should be undertaken quickly. In the meantime, the advisory sought prompt decontamination of school grounds.¹⁴⁹

This lack of proactive monitoring utterly failed to put the best interest of the child first, and violated children's right health, information, and safe areas to play.

In the aftermath of the disaster, safe play areas for children were not secured, violating children's right to play.¹⁵⁰ The impacts on children's health were evident in the months following the triple disasters as the Body Mass Index (BMI) of pre-school children significantly increased in the two of the three most heavily impacted prefectures (Fukushima, Iwate).¹⁵¹ Particularly in Fukushima, the most heavily impacted by the nuclear disaster, BMIs remained significantly higher for both boys and girls 19 months after the catastrophe began.¹⁵²

Further, though decontamination and decommissioning are projected to cost a staggering 12 trillion JPY, the efforts have yielded limited results.¹⁵³ In many rural areas, decontamination efforts are concentrated in 20 meter strips along roads, around houses, and in agricultural fields and paddies.¹⁵⁴

Though the decontamination efforts are limited in scope and effect, these are often presented in a deliberately misleading way by the Abe government. For example, the decontamination landing page on the Ministry of Environment (MOE) website states that 100% of the litate target area has been decontaminated. This includes the completion of residential, farmland, forests, and roads – the target areas for each being 2000, 1900, 1500, and 310ha respectively.¹⁵⁵ That is a total of 5,710 ha of litate decontaminated. Nowhere on this page nor on the litate detail page¹⁵⁶ does the website disclose that the total area of litate is 23,013ha.¹⁵⁷ In other words, though the decontamination is 100% complete according to the MOE, over 75% of the heavily contaminated area of litate has not been touched.

Evacuation orders are set to be lifted in litate on 31 March 2017.

A Greenpeace radiation monitoring study in litate, conducted in November 2016, showed levels of radiation that exceed long-term decontamination targets, both in areas that had been decontaminated as well as those that had not. Cumulative lifetime exposures could therefore far exceed the accepted international limit, should former residents permanently return.¹⁵⁸ The increased health and safety risks associated with these lifetime doses are particularly concerning for vulnerable groups.

As a result, such limited decontamination efforts will have effectively created an invisible, open-air prison for citizens to return to should the lifting of orders go forward as planned.¹⁵⁹ Those who return would be expected to remain in these cleaned corridors and islands. Not only are they surrounded by contamination, but these then pose the threat of recontamination for the limited areas that have been “cleaned.”¹⁶⁰ This not only poses a significant risk to the right to health for both children and adults, but directly impinges upon children’s right to play.

In addition, the government has relied on Whole Body Counters (WBC) to determine population doses. This is problematic for several reasons: it only measures gamma radiation (hence the effect of beta and alpha emitting particles is not assessed), the detection limit for ¹³⁴Cs and ¹³⁷Cs is usually only about 300 Bq/kg (meaning lower doses that may still impact human health are disregarded), and there are large uncertainties in evaluating the equivalent radiation dose based on the WBC measurements.¹⁶¹ As children are more vulnerable than adults, this may have greater implications for them.

This also means that the doses recorded are based upon lifestyle changes that violate children’s human rights – namely the right to

play – as children are often kept indoors by their caretakers to avoid radiation exposure. The government has been using the measurements taken by the WBC as justification for people living in or returning to contaminated areas. However, this then embeds this obstructed childhood into formal policy, wherein kids cannot safely play outside and must avoid doing so in order to meet the levels measured by the WBC that form the basis for their being permitted to live there to begin with. Thus, Japan is utterly ignoring its obligation to form policies based upon what is in the best interest of the child, and instead has chosen to create policies that are in direct violation of children’s internationally recognized human rights – the right to health, survival, and development – which include the right to play.

While the international conventions to which Japan is party also make clear that children have the right to access accurate information to make informed choices, the Japanese government instead opted to specifically target children with a misinformation campaign regarding the risks of radiation in the environment. Specifically, materials that have been provided – and even mandated school reading – downplay the risks of radiation exposure such that it may provide a false



A child sleeps in an evacuation center in Yonezawa City, Yamagata Prefecture. April 2011.

© Markel Redondo / Greenpeace

sense of security, leading to greater radiation exposures. As UN Special Human Rights Rapporteur Grover noted following his visit:

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 [emphasis added].¹⁶²

It is important to note that ICRP recommends a maximum exposure limit to artificial radiation of 1 mSv/year for members of the public. For post disaster emergency scenarios, the maximum dose for members of the public should be below 20 mSv/year – though long-term targets should be as close as possible to the 1 mSv/year standard. As was noted by the Istituto

Internazionale Maria Ausiliatrice (IIMA) and Save the Children, the Japanese government raised the acceptable level of radiation exposure to 20 mSv/year for Fukushima-impacted areas.¹⁶³ This is the same maximum allowable annual dose recommended by the ICRP for adult nuclear workers – which is now being applied to men, women, children, and infants alike.

It is important to understand that an area with a 20 mSv/year dose rate in 2011 means quite a different lifetime dose than an area at 20 mSv/year in 2017. This is because an area with contamination causing dose exposures up to 20 mSv/year in 2011 would include both long- and shorter-lived radionuclides. For these areas, fairly rapid reductions in radiation levels would be expected in the next 5 years due to the fast decay of short-lived radionuclides. In contrast, in 2017, as short-lived radionuclides have largely decayed, contamination is primarily from longer-lived radionuclides that persist in the environment for decades to centuries. Thus, an area with contamination causing dose exposures up to 20 mSv/year currently will remain persistently contaminated at these high levels for the foreseeable future.

The use of metaphor, euphemism, or technical jargon to portray nuclear technology in a neutral or positive way¹⁶⁴ has been enshrined in the educational requirements for Fukushima children. The misleading information being presented to children in their textbooks means that decisions taken by children cannot be said to be freely made as they are likely based upon inaccurate or incomplete representations of the facts. This is very concerning with relation to older children as well – particularly senior high school students who are more likely to instigate events that put them at significant and unnecessary risk for radiation exposure.

The effort to normalize the ongoing radiological disaster through the indoctrination of young people with misleading information regarding the risks of radiation appears to be a deliberate public relations campaign. And, these efforts go far beyond the textbook material noted by the UN Human Rights Rapporteur and international human rights organizations.

For example, National Road 6 – which runs along the coast past the Fukushima Daiichi nuclear plant – was identified for clean-up by the “Happy Road Network.” Middle and high school children who were members of beautification clubs were then mobilized to participate in cleaning up sections of the road in Fukushima prefecture.¹⁶⁵ Although children were not allowed in the most heavily contaminated sections of road, basic radiation protection measures were not taken. Few used gloves, and fewer still wore masks.¹⁶⁶

In an even more shocking example, Fukushima High School requested that students be allowed to tour the destroyed reactor site. With parental permission, 13 students spent an hour touring Fukushima Daiichi – including near the number 1 reactor which had its cover recently removed at the time of the visit.¹⁶⁷ Prior to this visit, TEPCO had not permitted anyone under the age of 18 to visit the reactor site, due to the prohibition under the Labor Standards Act on employing people under this age in areas with harmful radiation.¹⁶⁸

The students visiting the plant were guided by their teachers and a Tokyo University physics professor.¹⁶⁹ This is a clear case where children, including young girls who are far more vulnerable to the effects of radiation, were encouraged and guided by adults in whom they trusted to take an unnecessary risk. They were thus unjustifiably exposed to excess human-made radiation, which is in breach of the justification and ALARA (As Low As Reasonably Achievable) principles, the internationally agreed basic radiation protection concepts. This is a definitive case wherein children’s right to participation – based upon their ability to access accurate information – was deliberately violated by adults that were perceived authority figures.

This also may well be the beginning of more such visits of underage children to the destroyed reactor site.

In 2015, a new high school opened in Hirono, Fukushima in the Futaba county called the “Futaba Future High School”, which has been designated as a part of Japan’s Super Global High School program.¹⁷⁰ One of the primary objectives listed on the school’s website states:

We are determined to actively tackle local and global issues such as the nuclear power plant disaster and the revitalization ... by appealing to people in Japan and overseas regarding the recovery from the nuclear power plant disaster, we try to draw the world’s attention to Fukushima, provide people with deeper knowledge about the accident, keep it fresh in their minds, and ***wipe out the damage caused by rumors. Finally, we produce human resources to contribute to the revitalization*** [emphasis added]¹⁷¹.

The reference to “damage caused by rumors” is quite important. As Shimizu noted in her analysis of the human insecurity issues resulting from the dysfunction of the state in post-Fukushima Japan:

Where food security is concerned, the local and national governments have tried to convince the public that low doses of radiation are safe by mobilizing experts, celebrities, and the mass media. The phrase “rumor-related damage” is regularly used by officials, experts, and the media to criticize the choices of consumers who want to avoid products made in the affected areas or of tourists who want to avoid travelling there.¹⁷²

It was just such rhetoric that was used to downplay concerns and encourage the consumption of Fukushima produce in the immediate aftermath, prior to adequate testing, that led to the consumption of contaminated foodstuffs in eight prefectures, as mentioned earlier.¹⁷³

When viewed in this context, the objective of the new high school in Futaba county appears particularly cynical.



Women's Activism

Ms. Fukushima, who evacuated from Fukushima to Kyoto Prefecture with her two young children, is the co-coordinator of a plaintiffs' group in a lawsuit demanding fair compensation. Kyoto City, Kyoto Prefecture. January 2017.

Fukushima women have not been silent victims in this grossly unjust, human-made crisis. They have been at the forefront of legal, political, and protest actions in the wake of the disaster demanding justice for themselves and for their children.

And, despite the enormous economic, cultural and political barriers women face, their activism within Japanese society has a rich history.¹⁷⁴ The use of motherhood as a galvanizing force is paralleled in many social movements, particularly those related to labor rights and environmental issues, across the planet.

Women's leadership in Japan during the 1960s and 70s citizens' and environmental movements was instrumental in the passage of 14 new anti-pollution laws during a Special Diet Session in 1970.¹⁷⁵ Women's leadership was also central to the antinuclear movement during the 1970s and 80s.¹⁷⁶

The Chernobyl disaster in 1986 mobilized a new demographic of women leaders in the Japanese antinuclear movement. According to sociologist, Koichi Hasegawa of Tohoku University:

[The post-Chernobyl] fear served to revitalize and reenergize the anti-nuclear movement with new styles and new actors including concerned women in urban or metropolitan areas. These new opponents were mainly highly educated, unemployed housewives with pre-school- or school-age children. Many of the women activists had experience in the student struggles in late 1960s, opposition to the [Liberal Democratic Party (LDP)] government, the Vietnam War, and many had supported the feminist movement ...

Women nuclear-power opponents intentionally stressed a "women's point

of view” and effectively linked ecological issues with personal concerns of family safety. Many activists framed their activist identities as “concerned mothers” and utilized the symbol of motherhood to mobilize other women and securing the support of their husbands and other family members. This was effective in garnering public support for opposition to nuclear power and served to deflect negative public reactions.¹⁷⁷

The Fukushima disaster has revitalized the role and leadership of women as a matter of necessity – especially concerned mothers – within Japan’s antinuclear movement.

Whether the women affected by the disaster chose to stay, could not leave due to financial or personal constraints, left the impacted areas, or even divorced their partner due to fundamental disagreements over radiation and evacuation, one thing is very clear: the women of Fukushima have shown extraordinary courage, resolve, and leadership in the face of an unconscionable, human-created tragedy.

And, precisely because of their roles as mothers, and especially in the current context of Japanese society when declining childbirth rates have become a national concern, the demands of women in this motherhood sphere place them at the center of mainstream Japanese society.¹⁷⁸

Thus, the importance of women in post-Fukushima activism cannot be understated. As Dr. Heidi Hunter, of Stony Brook University, stated:

... mothers have emerged as a powerful voice in Japan’s growing anti-nuclear movement. To call attention to their message, the mothers have organized marches, petitioned government officials, fasted, and held months-long sit-ins in public locations. They regularly wear symbols of maternity and motherhood in deliberately confrontational ways.

The mothers call for action on multiple fronts. Most immediately, they demand the

evacuation of all the families of Fukushima, where radiation emissions continue. They ask for tougher safety standards for food and drink in Japan, and an end to the practice of spreading and burning radioactive rubble from the contaminated zone throughout the country’s various prefectures. And, to prevent future disasters, they call for the permanent closure of all nuclear power plants in Japan and throughout the world.¹⁷⁹

Frustrated by a lack of accurate information regarding radiation risks and levels in the wake of the disaster, women employed a variety of new media platforms to share information and increase support, including websites, personal blogs and social media outlets such as Facebook, Twitter and YouTube.¹⁸⁰ These online networks also gave women the opportunity to connect with others worldwide, sharing information regarding Fukushima and also gathering information that could be used to support their work.¹⁸¹

In the aftermath of the disaster, women were also at the forefront of organizing mass protests. For example, in October 2011, prominent leaders of the grassroots mothers’ networks, including Aileen Mioko Smith of Green Action and others, organized a three-day sit-in of the Ministry of Economy, Trade and Industry (METI) in Tokyo.¹⁸² They demanded the permanent closure of Japan’s entire nuclear fleet. Over 700 people participated in the sit-in, including 100 women from Fukushima.

Others have been leading the battle against nuclear restarts and for fair compensation – such as Ms. Fukushima, a nuclear evacuee living in Kyoto. She is both the co-coordinator of a plaintiffs’ group in the legal battle for fair compensation for evacuees in Kyoto, and a plaintiff in a case against the restart of the Ohi nuclear reactors. In 2014, a district court sided with the plaintiffs in the Ohi case, holding that restarting the reactors constituted a violation of citizens’ protected rights. The reactors were barred from restart.¹⁸³

The fight for compensation is ongoing. In the Kyoto case, there are 58 households - 178 people, mostly young mothers - that are

plaintiffs in the case. There are thousands of Fukushima evacuees engaged in similar legal challenges in prefectures across Japan.

Thus, women have played and continue to play a vital role in holding the government and TEPCO accountable for the disaster, securing compensation for victims, information sharing and mobilizing others, and stopping the restart of nuclear reactors in Japan.

It is also important to note that women are not only speaking about energy and nuclear risks within the context of motherhood. This has been an entry point for their demands within the context of family health and children's rights, but women have expanded this to engage in broader discourses and demands regarding Japan's energy future, alternatives, policies and reconstruction.¹⁸⁴

Witnesses from Fukushima, Japan, take part in a protest in Germany of the Castor nuclear waste transport to the interim storage site in Gorleben. They joined the demonstration and were keynote speakers. The banner they carried read: "Nuclear never again." November 2011.



© Michael Loewa / Greenpeace



Conclusion

Ms. Takagi evacuated with her children from from Fukushima Prefecture to Kyoto Prefecture. She is an organizer for a Fukushima evacuee mothers' network. Kyoto City, Kyoto Prefecture. January 2017.

Nearly six years after the beginning of the ongoing Fukushima Daiichi nuclear disaster, the impacts on its victims are still immense. While all those in areas contaminated by the disaster have suffered hardships and negative consequences, these impacts were most significant for vulnerable populations: women, children, the elderly, and disabled.

Due to the significant economic and social disadvantage of women within Japanese society as a result of the enormous wage and gender equality gaps, they were less able to cope with the disaster. Increased domestic and sexual violence, lack of formal support networks, lack of representation in evacuation center management and reconstruction planning committees, distribution of compensation solely to the male head of household in married families, marital separation and divorce, and radiation stigmas resulting in marriage discrimination have all resulted in significantly greater social, economic,

psychological, and physical costs of the disaster for women than for men.

Further, women – especially mothers with young children – are one of the highest risk groups for mental illness. This may well be related to the greater social and economic hardships, as well as gender-based violence, faced by women as a result of the disaster – in addition to concern for their health and that of their children.

To be clear, the physical concerns related to radiation exposures are not unfounded, especially for women and children. It is widely accepted in the scientific community that ionizing radiation is a mutagen and linked to multiple health effects including: cancer, miscarriage, deformity and retardation, perinatal mortality, and cardiovascular disease. Numerous studies have shown that women, infants, children, and the developing fetus are at greater health risk from radiation exposure than are adult men.

Further, girls and female fetuses also appear to be at greater risk of health effects than are boys. Some effects are already being seen, with data showing a significant jump in perinatal mortality rates in contaminated prefectures 10 months after the nuclear disaster began.

The Japanese government's response to the Fukushima disaster has resulted in the significant violations of women and children's human rights. These violations are further being embedded into public policy. With the March 2017 resettlement of parts of the contaminated area looming as of this writing, the human rights situation for evacuees is only set to worsen.

The violations resulting from the immediate aftermath of the disaster resulted from the dysfunction of the state and its ignoring known issues throughout the decade preceding the disaster. This includes the failure to address issues with transparency regarding nuclear risk communication and emergency planning and response.

To add insult to injury, the resettlement policies of the Abe government can only be characterized as deliberate and intentional structural violence perpetrated by the State

against women and children. These populations have been targeted with misinformation or incomplete information, which constitutes a violation of their human rights as outlined in multiple international human rights treaties that Japan has ratified.

Further, the lifting of evacuation orders will mean the loss of compensation payments for evacuees a year later – many of whom are already faced with losing their housing support. As women are already economically disadvantaged and burdened by higher poverty rates – particularly among single mothers – many may have no choice but to return to contaminated areas. This amounts to nothing short of economic coercion.

When one considers the increased vulnerability of women and children to the health effects of ionizing radiation, and that orders are to be lifted in areas where radiation levels could potentially far exceed the recommended maximum limit of 1 mSv/year, the resettlement policy appears particularly cynical.



Children walk along a road which had earlier been assessed by Greenpeace for radioactive contamination and found to have high, unsafe levels, in Fukushima city, Fukushima prefecture. June 2011.

© Jeremy Sutton-Hilbert / Greenpeace

Greenpeace fully supports those impacted by the Fukushima Daiichi nuclear accident in making their own informed choices regarding their health and, for those who evacuated, whether to return to their former homes. In order to do this, it is imperative that evacuees be provided with accurate and complete information, and well as the financial support to be able to freely make that choice. Should an individual choose to return, they should be compensated for the additional health risk they will incur as a result. Should they choose to establish a life elsewhere, they should be given the financial means to do so.

The Japanese government has chosen to do the opposite of this. In so doing, it is utterly failing to fulfill its human rights obligations. Instead, it has enshrined these violations into policy and practice.

Greenpeace urges the Japanese government to:

1. Ensure survivors are fully compensated for their losses – including continuation of compensation payments and housing support for those who choose to remain evacuated, and compensation for those returning for their loss of community, in order that individuals may freely exercise their right to choose where to live; and,
2. Provide full, complete, accurate, and easily accessible information regarding radiation levels, the scope of decontamination efforts, and radiation risks to the public, including age-appropriate materials for children; and,
3. Provide full, readily available access for Fukushima victims to their own and their dependents' medical files and test results; and,
4. Reduce the acceptable additional annual exposure level in Fukushima-impacted areas to a maximum of 1 mSv/year, which would reflect the international standard; and,
5. Ensure full and equal public participation and a formal role for women as well as men in all decision-making processes regarding future lifting of evacuation

orders, emergency planning schemes, and nuclear restart decisions; and,

6. Ensure the equal representation of women in leadership positions on emergency planning entities, and full consultation and inclusion of the elderly and disabled; and,
7. Develop and support initiatives aimed at helping Fukushima-impacted women achieve financial independence including, but not limited to, supporting women's startup businesses, addressing income gaps, and improving the conditions and workplaces of women; and,
8. Appoint a public ombudsperson for children, responsible for safeguarding the rights of children and young persons, especially those affected by the Fukushima Daiichi nuclear disaster.

The women impacted directly by the Fukushima catastrophe have shown enormous courage, strength, and perseverance in the face of unimaginable obstacles. Their voices must be heard.

This report is dedicated to them.



A boy draws a picture in a daycare in Fukushima City. In the aftermath of the disaster, children were only allowed to play inside. There were originally 24 kids at this school, but most of them evacuated to other prefectures. Only 7 were left as of the date of this picture, 6 May 2011.

Endnotes

1. McInerney, P. (7 July 2016). "Grappling with Nuclear Catastrophe in Japan." *UCLA International Institute: Terasaki Center for Japanese Studies*. <http://www.international.ucla.edu/japan/article/165856>
2. "Tepco head apologizes for 3/11 ban issued on 'meltdown'." (21 June 2016). *The Japan Times*. http://www.japantimes.co.jp/news/2016/06/21/national/tepc-head-apologizes-311-ban-issued-meltdown/-WKFXn7Z97_Q
3. 平成23年東北地方太平洋沖地震による被害状況即報 (第1680報)
<http://www.pref.fukushima.lg.jp/site/portal/shinsai-higaijokyo.html>
4. Ben Wisner, a visiting researcher at the Aon-Benfield Hazard Research Centre, University College London, and scientific advisor to the Global Network of Civil Society for Disaster Reduction, defines vulnerability as: "the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist, and recover from the impact of a natural disaster. It involves a combination of factors that determine the degree to which someone's life, livelihood, property and other assets are put at risk by a discrete identifiable event (or series of 'cascade' events) in nature or society.
See: Wisner, B., et al. (2003). "At Risk: Natural hazards, People's Vulnerability and Natural Disasters. 2nd Ed. Pg. 11. http://www.preventionweb.net/files/670_72351.pdf
See also: "Written statement" submitted by Human Rights Now, a nongovernmental organization in special consultative status." (2016, August) UN Human Rights Council. General Assembly. Thirty-third session. Agenda Item 3. <http://hrn.or.jp/wpHN/wp-content/uploads/2016/08/HRN-written-statement-on-Fukushima-for-33rd-HRC.pdf>
See also: "Sugimoto, A., et al. (2012). "The voice of the most vulnerable: lessons from the nuclear crisis in Fukushima, Japan." *Bull World Health Organ* 90:629-630. <http://www.who.int/bulletin/volumes/90/8/11-094474/en/>
5. Physicians for Social Responsibility, et al., (18 October 2013). "Annotated Critique of United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) Fukushima Report to the UN General Assembly." <http://www.psr.org/assets/pdfs/critique-of-unscear-fukushima.pdf>
6. Goto, A., E. Bromet and K. Fujimori (2015). "Immediate effects of the Fukushima nuclear power plant disaster on depressive symptoms among mothers with infants: a prefectural wide cross-sectional study from the Fukushima Health Management Survey." *BCM Psychiatry (for the Pregnancy and Birth Survey Group of the Fukushima Health Management Survey)*. 15:59. DOI 10.1186/s12888-015-0443-8
7. The nuclear village has been defined as, "the institutional and individual pro-nuclear advocates who comprise the utilities, nuclear vendors, bureaucracy, Diet (Japan's parliament), financial sector, media and academia."
See: Kingston, J. (September 2012). "Japan's Nuclear Village." *The Asia-Pacific Journal: Japan Focus*. 10:37. No. 1. <http://apjif.org/2012/10/37/Jeff-Kingston/3822/article.html>
8. "Radiation Reloaded: The Ecological Consequences of the Fukushima Daiichi Nuclear Disaster – 5 years later." *Greenpeace Japan*. (March 2016). <http://www.greenpeace.org/japan/Global/japan/pdf/GPJ-Fukushima-Radiation-Reloaded-Report.pdf>
9. Tetsuya, T. (2014, May). "What March 11 Means to Me: Nuclear Power and the Sacrificial System." *Asia-Pacific Journal: Japan Focus*. Vol. 12, 19:1. <http://apjif.org/2014/12/19/Takahashi-Tetsuya/4114/article.html>
10. *Ibid.*
11. "After 'Peace and Prosperity': Interview with Norma Field, Professor Emerita, University of Chicago" ("Heiwa to han'ei" no ato d e). (1 March 2014). *Asahi Shimbun*. Cited in: Tetsuya, *op. cit.* (2014)
12. *Ibid.*
13. Tetsuya, T., *op. cit.* (2014)
14. Goto, A., et al., *op. cit.* (2015).
15. 女たちの21世紀 = Women's Asia 21 (87), 26-30, 2016-09 アジア女性資料センター
<http://ci.nii.ac.jp/naid/40020969595>
16. National Academy of Sciences. (2006). *Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2*. Committee to Assess the Health Risks of Low Levels of Ionizing Radiation. Board on Radiation Effects Research. Division on Earth and Life Studies. National Research Council of the National Academies. National Academies Press. Washington D.C. <https://www.nap.edu/read/11340/chapter/1-vii>
17. Bromet, E.J. (February 2014). "Emotional Consequences of Nuclear Power Plant Disasters." *Health Phys*; 106(2): 206–210. http://journals.lww.com/health-physics/Fulltext/2014/02000/Emotional_Consequences_of_Nuclear_Power_Plant.9.aspx
18. *Ibid.*
19. Goto, A., et al., *op. cit.* (2015).

Endnotes

20. Shimizu, N. (2015). "Human Insecurity Caused by the Dysfunction of the State: New Security Issues in Post-Fukushima Japan." *Asian Journal of Peacebuilding* Vol. 3 No. 2 (2015): 165-187. [http://tongil.snu.ac.kr/ajp_pdf/201512/02_Nanako Shimizu.pdf](http://tongil.snu.ac.kr/ajp_pdf/201512/02_Nanako%20Shimizu.pdf)
21. *Ibid.*
22. *Ibid.*
23. On 21 May 2014, a district court judge found in favor of community members seeking an injunction against the restart of the Ohi 3&4 reactors due to the unacceptable risk posed by the reactors to the lives and livelihoods of surrounding community members. The legal challenge contended that Kansai Electric not only underestimated the seismic risk, but has also failed to develop an effective evacuation plan for the region's citizens. The judge's opinion stated that, "It is appropriate that, if involved in a business whereby severe damage would be caused to the lives, health, and livelihood of many people should a serious accident occur, an organization should be expected to provide safety and a high degree of reliability in accordance with the size and extent of that damage . . . interests relating to the life, body, soul, and lifestyle of an Individual are fundamental to the individuality of each person, and the entirety of these can be considered to be personal rights. Personal rights are enshrined in the Constitution (Articles 13 and 25), are the foundation for people's lives, and under the laws of our country there are no rights that have greater value. Accordingly, when there is a risk of a tangible violation of a fundamental aspect of these personal rights, namely the personal right to protect life and maintain one's lifestyle, a claim can be made for an injunction against violating acts on the basis of these personal rights. Personal rights belong to each individual, but when the form of the violation has the characteristics of simultaneously violating the personal rights of many people, it stands to reason that the claim for an injunction there against is strong." [Note: opinion translated for Greenpeace].
See: Outline of Judgment on Claim for Injunction on Operation of No. 3 and No. 4 Units at Ohi Nuclear Power Plant Fukui District Court, (21 May 2014). <http://www.greenpeace.org/international/Global/international/briefings/nuclear/2014/Ohi-ruling-translation.pdf>
See also: Adleman, J. and e. Urabe. (21 May 2014). "Kansai Electric's Ohi Nuclear Reactors Restart Barred by Court." *Bloomberg*. <http://www.bloomberg.com/news/articles/2014-05-21/kansai-electric-s-ohi-nuclear-reactors-restart-barred-by-court>
24. "Court orders Takahama reactors shuttered." (9 March 2016). *DW*. <http://www.dw.com/en/court-orders-takahama-reactors-shuttered/a-19103482>
25. Hasegawa, R., (13 May 2013). "Disaster Evacuation from Japan's 2011 Tsunami Disaster and the Fukushima Nuclear Accident." *Institut du développement durable et des relations internationales (IDDRI)*. [http://www.iddri.org/Publications/Collections/Analyses/STUDY0513_RH_DEVAST report.pdf](http://www.iddri.org/Publications/Collections/Analyses/STUDY0513_RH_DEVAST%20report.pdf)
26. Shimizu, N., *op. cit.* (2015).
27. "Act on Promotion of Support Measures for the Lives of Disaster Victims to Protect and Support Children and Other Residents Suffering Damage due to Tokyo Electric Power Company's Nuclear Accident." *Act No. 48 of June 27, 2012*. <http://www.japaneselawtranslation.go.jp/law/detail/?kn%5B%5D=%E2%97%9C&ky=%E2%97%9C&page=2>
28. 子ども被災者支援法基本方針概要 Summary of basic policy of Nuclear Disaster Victims Support Act (In Japanese) <http://www.reconstruction.go.jp/topics/main-cat2/20151002gaiyou.pdf>
29. Save Fukushima Children Lawyers' Network. (22 August 2013). <http://www.saflan.jp/info/798>
See also: 原発事故子ども・被災者支援法の基本方針改定を求める声明 (22 June 2014) Save Fukushima Children Lawyers' Network. <http://www.saflan.jp/opi/879>
30. Wisner, B., et al., *op. cit.* (2003).
See also: Ando, Y. (30 April 2013). "Fukushima and Nuclear Crisis 2011 with Gender View." Fukushima Bar Association, Japan. Chapter 15. Healthcare Management and Economics: Perspectives on Public and Private Administration: Perspectives on Public and Private Administration. Merviö, Mika Markus.. IGI Global. <http://www.igi-global.com/book/healthcare-management-economics/72354>
31. "The Global Gender Gap Report 2006." *The World Economic Forum*. http://www3.weforum.org/docs/WEF_GenderGap_Report_2006.pdf
32. "The Global Gender Gap Report 2016." *World Economic Forum*. <http://reports.weforum.org/global-gender-gap-report-2016/economies/-economy=JPN>
33. Morioka, R. (2014). "Gender difference in the health risk perception of radiation from Fukushima Japan: The role of hegemonic masculinity." *Social Science & Medicine*. 107 105-112. <http://www.sciencedirect.com/science/article/pii/S027795361400118X>
See also: Ando, Y. *op. cit.* (2013).

Endnotes

- See also: “Ingrained ideas on gender roles.” (19 July 2014). *The Japan Times*. <http://www.japantimes.co.jp/opinion/2014/07/19/editorials/ingrained-ideas-gender-roles/> - .VPmTkHZcLKA
34. Morioka, R *op. cit.* (2014).
 35. *Ibid.*
 36. Lemyre, L., et al. (15 May 2009). “Emergency Preparedness For Higher Risk Populations: Psychosocial Considerations.” *Radiation Protection Dosimetry*, Vol. 134, No. 3–4, pp. 207–214. doi:10.1093/rpd/ncp084
 37. Morioka, R. *op. cit.* (2014).
 38. *Ibid.*
 39. “Data: Gender Wage Gap.” *OECD: Gender Equality*. <https://www.oecd.org/gender/data/genderwagegap.htm>
 40. New Japan Women’s Association. “UPR Submission on the Human Rights Situation in Japan.” *UN Human Rights Council*. 14th Session of the Universal Periodic Review – 2012. http://lib.ohchr.org/HRBodies/UPR/Documents/Session14/JN/NJWA_UPR_JPN_S14_2012_NewJapanWomensAssociation_E.pdf
 41. *Ibid.*
 42. Morioka, R. *op. cit.* (2014).
 43. *Ibid.*
 44. *Ibid.*
 45. *Ibid.*
 46. *Ibid.*
 47. Folkers, C. (22 August 2013). “Can nuclear ever comply with the human right to health? Part III.” *Beyond Nuclear*. <http://www.beyondnuclear.org/radiation-health-whats-new/2013/8/22/can-nuclear-power-ever-comply-with-the-human-right-to-health.html>
 48. Japan Federation of Bar Associations. (17 February 2012). “Submission to the Pre-Sessional Working Group of the Committee on Economic, Social and Cultural Rights.” Pg. 100. http://www.nichibenren.or.jp/library/ja/kokusai/humanrights_library/treaty/data/Submission_to_the_PSWG_of_CESCR_en.pdf
 49. *Ibid.*
 50. *Ibid.*
 51. “Guiding Principles on Internal Displacement.” (September 2004). United Nations. <http://www.unhcr.org/en-us/protection/idps/43ce1cff2/guiding-principles-internal-displacement.html>
See also: Japan Federation of Bar Associations. *op cit.* (2012). Pg. 103.
 52. Grover, A. (2 May 2013). “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).” Human Rights Council. United Nations. Twenty-third Session. Agenda Item 3. Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development. http://www.ohchr.org/Documents/HRBodies/HRCouncil/RegularSession/Session23/A-HRC-23-41-Add3_en.pdf
 53. Japan Federation of Bar Associations. *op cit.* (2012). Pg. 101.
 54. Ando, Y. *op. cit.* (2013).
 55. *Ibid.*
See also: Human Rights Now. “Universal Periodic Stakeholder Submission” United Nations. Office of the High Commissioner on Human Rights. http://lib.ohchr.org/HRBodies/UPR/_layouts/15/WopiFrame.aspx?sourcedoc=/HRBodies/UPR/Documents/Session14/JP/HRN_UPR_JPN_S14_2012_HumanRightsNow_E.pdf&action=default&DefaultItemOpen=1
 56. Ito, K. & Y. Ando (7 March 2012). “Situation of Rural Women affected by the Great Japan Earthquake and Nuclear Power Plant Accident: Recovery and Rebirth with Gender View.” <http://www.gender.go.jp/kaigi/renkei/ikenkoukan/52/pdf/siry07.pdf>
 57. Ando, Y. *op. cit.* (2013).
 58. *Ibid.*
 59. Japan Federation of Bar Associations. *op cit.* (2012). Pg. 103.
 60. “Domestic violence higher in tsunami zone.” (8 March 2013). *AFP*. http://www.fukuleaks.org/web/wp-content/uploads/2012/10/Domestic-violence-higher-in-tsunami-zone--Japan-Today_-Japan-News-and-Discussion.pdf
 61. Ando, Y. *op. cit.* (2013).
 62. Haworth, A. (24 February 2013). “After Fukushima: families on the edge of meltdown.” *The Guardian*. <http://www.theguardian.com/environment/2013/feb/24/divorce-after-fukushima-nuclear-disaster>
 63. “Human Rights in post-disaster and post-conflict situations: QUESTIONNAIRE”. *Human Rights Advisory Committee*. <http://search.ohchr.org/results.aspx?k=Fukushima - k=Human Rights in post-disaster and post-conflict situations%3A QUESTIONNAIRE Fukushima>

Endnotes

64. *Ibid*
65. “Disaster Prevention and Reconstruction from a Gender Equal Society Perspective: Lessons from the Great East Japan Earthquake.” From the “White Paper on Gender Equality 2012”; Summary. <http://www.preventionweb.net/publications/view/29144>
66. Ito, K. & Y. Ando. *op. cit.* (2012).
67. Grover, A. *op. cit.* (2013).
68. Ando, Y. *op. cit.* (2013).
69. *Ibid.*
70. *Ibid.*
71. *Ibid.*
72. *Ibid.*
73. Fackler, M. (21 April 2012). “Japan Tries to Face Up to Growing Poverty Problem.” *The New York Times*. http://www.nytimes.com/2010/04/22/world/asia/22poverty.html?_r=1&
74. 避難指示解除の状況について 平成29年1月28日 内閣府原子力災害対策本部 原子力被災者生活支援チーム http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-4/20170128_kyougikai_4shiryo3-2.pdf
75. 帰還困難区域の取扱いに関する考え方 平成28年8月31日 原子力災害対策本部 復興推進会議 Ministry of Energy, Trade and Industry. Japanese Government. http://www.meti.go.jp/earthquake/nuclear/kinkyu/pdf/2016/0831_01.pdf
76. Morioka, R. *op. cit.* (2014).
77. *Ibid.*
See also: Ando, Y. *op. cit.* (2013).
78. Morioka, R. *op. cit.* (2014).
79. *Ibid.*
80. Torres, I. (25 February 2013). “Atomic divorce: Fukushima disaster survivors suffering marital discord.” *Japan Press Daily*. <http://japandailynews.com/atomic-divorce-fukushima-disaster-survivors-suffering-marital-discord-2524003/>
81. “‘Radiation divorce’ enters Japanese vernacular.” (23 January 2012). *Japan Today*. <http://www.japantoday.com/category/kuchikomi/view/radiation-divorce-enters-japanese-vernacular>
82. Torres, I. *op. cit.* (2013).
83. Ando, Y. *op. cit.* (2013).
84. Tone, M. & Stone, T. (2014). “What we can learn about recovery: Lessons from the Fukushima survivors.” *Nursing and Health Sciences* (2014), 16, 52–55.
See also: Haworth, A. *op. cit.* (2013).
85. Haworth, A. *op. cit.* (2013).
86. Fukushima blasts environmentalist’s remark about marriage, deformed babies. (30 August 2012). *The Asahi Shimbun*. *See:* <http://ennews.com/asahi-fukushima-govt-trying-to-stamp-out-harmful-rumors-targets-group-leader-who-discussed-deformed-babies>
87. Haworth, A. *op. cit.* (2013).
88. Cantrell, A. & Nilep, C. (2012). “You Are Contagious”: When Talk of Radiation Fears Overwrites the Truth.” *NU Ideas*. Volume 1. Nagoya University Institute of Liberal Arts & Sciences. http://nuideas.ilas.nagoya-u.ac.jp/Volume1/Cantrell-Nilep_NUIdeas.pdf
89. Physicians for Social Responsibility, et al., *op. cit.* (2013).
90. Cardis, E., et al. (April 2007). “The 15-Country Collaborative Study of Cancer Risk among Radiation Workers in the Nuclear Industry: Estimates of Radiation-Related Cancer Risks.” *Radiation Research*. Vol. 167, No. 4 (Apr., 2007), pp. 396-416. <http://www.jstor.org/stable/4138642>
91. ICRP, (1997). “General Principles for the Radiation Protection of Workers.” *ICRP Publication 75*. Ann. ICRP 27 (1). <https://www.bookdepository.com/ICRP-Publication-75-v-27-1-Icrp/9780080427416>
92. 文部科学省「福島県内の学校・校庭等の利用判断における暫定的な考え方」に対する日本医師会の見解 (12 May 2011). http://dl.med.or.jp/dl-med/teireikaiken/20110512_31.pdf
93. The Fukushima Network for Saving Children from Radiation, et. al. (17 August 2011). “Violation of the Human Rights of the Children of Fukushima” *NGO submission to the Office of the High Commissioner for Human Rights/OHCHR*. <http://www.foejapan.org/en/news/110819.pdf>
94. Grover, A. *op. cit.* (2013).
95. Fackler, M. (21 January 2012). “Japanese Struggle to Protect Their Food Supply.” *The New York Times*. <http://www.nytimes.com/2012/01/22/world/asia/wary-japanese-take-food-safety-into-their-own-hands.html>
96. Shimizu, N. *op. cit.* (2015).

Endnotes

97. “Radiation-Tainted Beef Raises Safety Concern in Japan.” (14 July 2011). *Bloomberg Business*.
<http://www.bloomberg.com/news/articles/2011-07-14/beefcontaminated-byradiation-intensifies-food-safety-concerns-in-japan> Cited in: Shimizu, N. *op cit.* (2015).
 See Also: Physicians for Social Responsibility, et al., *op. cit.* (2013). Pg. 10.
98. Morioka, R., *op. cit.* (2014).
99. *Ibid.*
100. Kurtzman, L. (27 October 2014). “Radiation Exposure Linked to Aggressive Thyroid Cancers: International Team Studied Children and Teens Exposed After Chernobyl.” *University of California San Francisco*.
<https://www.ucsf.edu/news/2014/10/120011/radiation-exposure-linked-aggressive-thyroid-cancers>
101. Hayashi, Y. (29 September 2011). “Japan Officials Failed to Hand Out Radiation Pills in Quake’s Aftermath.” *The Wall Street Journal*. <http://www.wsj.com/articles/SB10001424052970204010604576596321581004368>
102. Ribault, N., Ribault, T., & Wataru, I. (8 October 2012). “Thyroid Cancer in Fukushima: Science Subverted in the Service of the State 福島における甲状腺癌 – 国の都合で歪められる科学” *Asia-Pacific Journal: Japan Focus*. Vol. 10. 41:2. <http://apjif.org/2012/10/41/Nadine-Ribault/3841/article.html>
103. *Ibid.*
104. The Fukushima Network for Saving Children from Radiation, et. al., *op. cit.* (2011).
105. Ribault, N., et. al. *op. cit.* (2012).
106. *Ibid.*
 See also: Kikuchi, K. (19 December 2013). 福島県県民健康管理調査の甲状腺検査から2年半 これまで、そして今、こんなことが起こっています レポート：菊池京子. <http://311.yanesen.org/wp-content/uploads/2013/12/2f46387fbc23371adaba57ad8dd7b11b.pdf>
107. “10 more thyroid cancer cases diagnosed in Fukushima.” (28 December 2016). *The Mainichi*.
<http://mainichi.jp/english/articles/20161228/p2a/00m/0na/008000c>
108. “Fukushima Daiichi in 2016: Health Impact.” (2016). *Institute for Radiological Protection and Nuclear Safety (IRSN)*. <http://www.irsn.fr/EN/publications/thematic-safety/fukushima/fukushima-2016/Pages/Fukushima-in-2016-Health-impact.aspx>
109. Takamura, N., M. Orita, et al. (August 2016). “Radiation and risk of thyroid cancer: Fukushima and Chernobyl.” *The Lancet*. [http://thelancetnorway.com/pdfs/journals/landia/PIIS2213-8587\(16\)30112-7.pdf](http://thelancetnorway.com/pdfs/journals/landia/PIIS2213-8587(16)30112-7.pdf)
110. Tsuda, T., Tokinobu, A., et al. (May 2016). , “Thyroid Cancer Detection by Ultrasound Among Residents Ages 18 Years and Younger in Fukushima, Japan: 2011 to 2014.” *Epidemiology*. 27(3):316-22.
<https://www.ncbi.nlm.nih.gov/pubmed/26441345>
111. IRSN, *op. cit.* (2016).
112. “The Chernobyl Catastrophe: Impacts on Human Health.” (2006). *Greenpeace International*.
<http://www.greenpeace.org/international/Global/international/planet-2/report/2006/4/chernobylhealthreport.pdf>
113. Scherb, H. H., et al. (2 September 2016). “Increases in perinatal mortality in prefectures contaminated by the Fukushima nuclear power plant accident in Japan: A spatially stratified longitudinal study.” *Medicine*.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5044925/>
114. National Academy of Sciences. *op. cit.* (2006). pg. 153.
115. *Ibid.* pg. 151
116. *Ibid.* pg. 144
117. *Ibid.* pg. 145
118. *Ibid.* pg. 148
119. *Ibid.* pg. 151
120. *Ibid.* pg. 151
121. *Ibid.* pg. 150
122. *Ibid.*
123. *Ibid.* pg. 146
124. Nerve Sheath Tumors. For further information on this type of tumor, see: <http://www.webmd.com/cancer/neurofibrosarcoma-and-schwannoma>
125. National Academy of Sciences. *op. cit.* (2006). pg. 152
126. *Ibid.* pg. 152
127. Smith-Bindman, R., et al. (14 December 2009). “Radiation Dose Associated with Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer.” *Arch Intern Med.*; 169(22): 2078–2086. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4635397/>
128. Brenner, D.J., et al. (February 2001). “Estimated Risks of Radiation-Induced Fatal Cancer from Pediatric CT.” *American Journal of Roentgenology*. 176:289-296. <http://www.ajronline.org/doi/pdf/10.2214/ajr.176.2.1760289>

Endnotes

129. Physicians for Social Responsibility, et al., *op. cit.* (2013). Pg. 12.
130. Groen, R.S., et al. (2012 June). "Fear of the Unknown: Ionizing Radiation Exposure During Pregnancy." *American Journal of Obstetrics and Gynecology*. 206(6):456-62. doi: 10.1016/j.ajog.2011.12.001. Epub 2011 Dec 11. <https://www.ncbi.nlm.nih.gov/pubmed/22244469>
See also: Physicians for Social Responsibility, et al., *op. cit.* (2013).
131. Groen, R.S., et al. *op. cit.* (2012).
132. *Ibid.*
133. Neria, Y. et al. (April 2008). "Post-traumatic stress disorder following disasters: a systematic review." *Psychol Med.*; 38(4): 467–480. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4877688/>
134. Bromet, E.J. *op. cit.* (2014).
135. Goto, A., et. al., *op. cit.* (2015).
See also: Tetsuya, T., *op. cit.* (2014).
136. Worland, J. (11 March 2016). "This May Be the Biggest Health Threat From Fukushima—And It's Still Ongoing." *TIME*. <http://time.com/4256088/fukushima-mental-health/>
137. "TABLE: Suicide deaths in prefectures affected by the earthquake and tsunami of March, 2011." *Sourced from Cabinet Office, Japan & Japan Reconstruction Agency*. <http://www.thelancet.com/action/showFullTableImage?tableId=tbl1&pii=S014067361560890X>
138. Kukihara, H., et al. (2014). "Trauma, depression, and resilience of earthquake/tsunami/ nuclear disaster survivors of Hirono, Fukushima, Japan." *Psychiatry and Clinical Neurosciences*; 68: 524–533. doi:10.1111/pcn.12159
139. Goto, A., et. al., *op. cit.* (2015).
140. Ando, Y. *op. cit.* (2013).
141. "Children's Charter: An Action Plan for Disaster Risk Reduction for Children by Children." *Save the Children*. <http://www.savethechildren.org.uk/resources/online-library/children's-charter-action-plan-disaster-risk-reduction-children-children>
142. "UNICEF and Child-Centred Disaster Risk Reduction." *UNICEF*. <http://unicefinemergencies.com/downloads/eresource/docs/DRR/Child-centred DRR.pdf>
143. Save the Children. (November 2012). "NGO Submission to the Universal Periodic Review of Japan - November 2012." *Submitted to the UN Human Rights Council*. <http://www.savechildren.or.jp/scjcms/dat/img/blog/864/1340084800334.pdf>
144. *Ibid.*
145. *Ibid.*
146. Grover, A. *op. cit.* (2013).
147. *Ibid.*
148. The Fukushima Network for Saving Children from Radiation, et. al., *op. cit.* (2011).
149. *Ibid.*
150. *Ibid.*
See also: Grover, A. *op. cit.* (2013).
151. Yokomichi, H., et al. (2016). "Impact of the great east Japan earthquake on the body mass index of preschool children: a nationwide nursery school survey." *BMJ Open*. 6:e010978. doi:10.1136/bmjopen-2015-010978
152. *Ibid.*
153. Obayashi, Y. (9 December 2016). "Japan nearly doubles Fukushima disaster-related cost to US\$188 billion." *Reuters*. Channel NewsAsia. <http://www.channelnewsasia.com/news/asiapacific/japan-doubles-fukushima-disaster-related-cost-to-21-5-trillion/3354116.html>
154. Greenpeace Japan. *op. cit.* (March 2016).
See Also: Greenpeace International. (July 2015). "Greenpeace investigation exposes failure of Fukushima decontamination program: Abe's forced return policy condemns residents to radiation risk." <http://www.greenpeace.org/international/en/press/releases/2015/Greenpeace-investigation-exposes-failure-of-Fukushima-decontamination-program/>
155. Ministry of Environment. "Environmental Remediation." *Government of Japan*. <http://josen.env.go.jp/en/decontamination/> Accessed 27 January 2017
156. 住民の皆さまへ 安心できる毎日を 除染情報サイト 飯舘村 <http://josen.env.go.jp/area/details/iitate.html> Accessed 27 January 2017
157. Ministry of Agriculture Forestry and Fisheries. Iitate Village. *Government of Japan*. <http://www.machimura.maff.go.jp/machi/contents/07/564/details.html> Accessed 27 January 2017.

Endnotes

158. "No Return to Normal." February 2017. *Greenpeace Japan*. http://www.greenpeace.org/japan/Global/japan/pdf/NRN_FINweb4.pdf
159. Greenpeace Japan. *op. cit.* (March 2016).
See Also: Greenpeace International. *op. cit.* (July 2015).
160. *Ibid.*
161. Physicians for Social Responsibility, et al., *op. cit.* (2013).
162. Grover, A. *op. cit.* (2013).
163. Istituto Internazionale Maria Ausiliatrice (IIMA). (14 October 2012). "The Situation on the Rights of the Child in Japan." *Submitted to the Human Rights Council: Universal Periodic Review of Japan*.
http://lib.ohchr.org/HRBodies/UPR/Documents/Session14/JP/IIMA_UPR_JPN_S14_2012_InstitutInternatioMariaAulistair_E.pdf
See also: Save the Children. *op. cit.* (November 2012).
164. "the use of metaphor, euphemism, or technical jargon to portray nuclear technology in a neutral or positive way . . . [and] becomes the privileged argument which perpetuates an ideology informed by politics, bureaucracy, and technology (devoid of contextual analysis), which benefits the nuclear industry, while simultaneously undermining other public discourses around nuclear power." Culley, M. R., & Anquelique, H. (2010). Participation, Power, and the Role of Community Psychology in Environmental Disputes. *American Journal of Community Psychology*, (47), 410-426. DOI: 10.1007/s10464-010-9395-9 <http://www.ncbi.nlm.nih.gov/pubmed/21174146>
165. McInerney, P., *op. cit.* (2016).
166. *Ibid.*
167. "High school takes students to see Fukushima nuclear reactor decommissioning." (19 November 2016). *The Mainichi*. <http://mainichi.jp/english/articles/20161119/p2a/00m/0na/008000c>
168. *Ibid.*
169. *Ibid.*
170. "SGH (Super Global High-school): Producing global leaders to accomplish revitalization after the nuclear disaster." http://www.futabamiraigakuen-h.fks.ed.jp/?page_id=130 Accessed 15 December 2016.
171. *Ibid.*
172. Shimizu, N., *op. cit.* (2015).
173. *Ibid.*
174. Slater, D. (9 November 2011). "Fukushima women against nuclear power: finding a voice from Tohoku." *The Asia-Pacific Journal: Japan Focus*. <http://japanfocus.org/events/view/117>
See also: Freiner, N. (Fall 2013). "Mobilizing Mothers: The Fukushima Daiichi Nuclear Catastrophe and Environmental Activism in Japan." *ASIANetwork Exchange*. Vol. 21. <http://www.asianetworkexchange.org/articles/abstract/10.16995/ane.37/>
175. Freiner, N., *op. cit.* (2013).
176. Miller, A.S. and C. Moore. (1991) "Japan and the Global Environment." <http://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1202&context=delpf>
177. Hasegawa, K. (2011) *A Comparative Study of Social Movements for a Post-nuclear Energy Era in Japan and the USA*. East Asian Social Movements: Power, Protest, and Change in a Dynamic Region. Broadbent, J. & Brockman, V. (eds). Springer. Pg. 71. <http://graduateinstitute.ch/files/live/sites/iheid/files/sites/developpement/shared/developpement/cours/IA029/East-Asian-Social-Movements.pdf>
178. Slater, D., *op. cit.* (2011).
179. Hunter, H. (25 April 2012). "In Japan, a Mothers' Movement Against Nuclear Power." *Yes Magazine*. <http://www.yesmagazine.org/peace-justice/in-japan-a-mothers-movement-against-nuclear-power>
180. Freiner, N., *op. cit.* (2013).
181. *Ibid.*
182. *Ibid.*
183. "Court rules against restart of Ohi reactors." (12 May 2014). *World Nuclear News*. <http://www.world-nuclear-news.org/RS-Court-rules-against-restart-of-Ohi-reactors-2105146.html>
184. Slater, D., *op. cit.* (2011).

Greenpeace is an independent campaigning organisation. Founded in 1971, it acts to change attitudes and behavior, to protect and conserve the environment, and promote peace and sustainability.



Greenpeace Japan

8-13-11 NF Bldg. 2F, Nishi-Shinjuku,
Shinjuku, Tokyo 160-0023

www.greenpeace.org/japan/ERJ