Living in Post-Fukushima Grey Zones: Family Decisions in the Wake of Nuclear Disaster

by

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Dedication

To my mom and the mothers of Fukushima.

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Preface

I went to Yamagata in 2014 to conduct ethnographic fieldwork on family decisions following the Fukushima Daiichi nuclear power plant accident. I was especially interested in "voluntary evacuees," who had evacuated with their children from areas that were never deemed official compulsory evacuation areas by the Japanese government. How do people live *through* nuclear disaster? How do families navigate differing opinions of initial and residual nuclear danger, care for children at the interface of family and society, and continue to live their family lives? Broadly speaking, I came to this research about and with Fukushima families as a result of convergences and echoes between my family history in Ukraine, my own experience of the March 11, 2011 Disasters in Japan, and the Fukushima families whose stories I wished to better understand.

This fieldwork was my first long-term stay in northeast Japan. However, it was not my first time in Japan, nor was it my first time working on nuclear issues in Japan, nor my first time seeking to chronicle and understand familial stories about living through nuclear disaster. I have studied Japanese language and culture in Japan and the United States since 2007. I had also already lived, studied, and conducted ethnographic research in urban and rural Japan over the course of five prior trips between 2008 and 2012: in Kyoto, Nagasaki, Himi, Ogasawara, Yokohama, and Tokyo, with shorter trips to Hokkaido, Hiroshima, Iwate, Shikoku, and beyond.

As a Ukrainian-American immigrant, I grew up hearing about Chernobyl, wrote undergraduate research papers on the Soviet media coverage of Chernobyl, and interviewed

family friends who had been liquidators (Chernobyl disaster remediation workers) or mothers with young children at the time. My interest in Japan had nothing to do with nuclear issues at first, but upon learning about and meeting atomic bombing survivors from Hiroshima and Nagasaki, listening to and doing what I could to share their stories became an important part of my studies and research. I first visited the atomic-bombed cities of Hiroshima and Nagasaki in 2008, and in summer 2010, I conducted oral history interviews with atomic bombing survivors in Nagasaki as part of the Nagasaki-America Peace Project (Sklyar, Butcher, and Kelsey 2016). Lastly, I was in Japan at the time of the March 11, 2011 Disasters.

When the massive 9.0 earthquake struck off the coast of Tohoku (Japan's northeast region) at 2:46pm on Friday, March 11, 2011, I was having tea with a friend in Yokohama, near the Japanese language school I was attending at the time. As tsunamis ravaged Tohoku, I was with my classmates and senseis, uncertain if the waters of Tokyo Bay would also rise to engulf our everyday existence. After dinner that evening, it dawned on me that nuclear power stations had also probably been affected by the megaquake. Moments later, I saw the first news coverage of troubles reported at the Fukushima No. 1, Fukushima No. 2, and Onagawa nuclear power stations. Incredulous, I watched as my worst nightmare came true before my eyes: just shy of Chernobyl's twenty-fifth anniversary, Chernobyl was recurring. Only this time, I was alive. This time, it was not my parents, but I, who was 250 kilometers away from exploding nuclear reactors. Three days later, I left everything behind and evacuated to the United States. I had heard enough from my parents and the diasporic Ukrainian community over the years to know that if there is a radiation leak, no good or medical certainty can come of it.

I went back to Japan to visit my senseis in Yokohama in July 2011, and then again for preliminary dissertation fieldwork from June-August 2012, long-term fieldwork from September

2014 through May 2016, and on a two-week follow-up research trip in July 2018. In 2012-2014, I was still afraid to go to Fukushima for long stretches of time. I feared Fukushima and exposing myself to radiation. At the Atomic Age II Conference at the University of Chicago in May 2012, I was personally advised by renowned professor of Japanese Studies Norma Field,[1] Ruiko Muto (lifelong anti-nuclear activist and frontline spokesperson for plaintiffs in the criminal court case brought by citizens against the Tokyo Electric Power Company),[2] and acclaimed anti-nuclear documentary filmmaker Hitomi Kamanaka[3] to avoid all of eastern Japan. By summer 2012, heightened levels of radiation in areas far beyond the official exclusion zones were widely documented and reported on in national and regional Japanese newspapers. Radioactive materials were found as far away from Fukushima as Tokyo Bay and hotspots abounded all across northeast and northern-eastern Japan. I did not follow Professor Field's, Ms. Muto's, and Director Kamanaka's advice, but I did focus my summer 2012 research activities in Tokyo and kept my time in Fukushima to a minimum, going only for two two-day trips. It was on one of those trips that I learned about voluntary evacuees who clearly shared my and many outsiders' concerns about radiation in central Fukushima and had left in droves with their children to neighboring Yamagata.

Considering my own hesitation to risk low-dose exposure as well as research ethics with disaster populations, I proposed a two-pronged study. First, I wanted to know more about

1 A list of Field's publications The Asia-Pacific Journal Japan Focus, including translations of interviews with anti-nuclear activists and scientists, can be found here: https://apjjf.org/-Norma-Field (Field 1991).

2 Ruiko Muto continues to live in Miharu Town, Fukushima Prefecture. In English, her views on the nuclear accident and its effects on Fukushima society can be found in Yamaguchi and Muto (2012) and Hirano (2016). For news and academic coverage of the citizens' criminal suit against TEPCO, see McCurry (2017), BBC (2017), and Complainants for Criminal Prosecution of the Fukushima Nuclear Disaster (2015).

3 For an English-language interview with Director Kamanaka, see Kamanaka (2015, 2018).

moments when nationwide civil society support groups extended a helping hand and Fukushima families took it. Second, I wanted to learn about voluntary evacuees' navigation of family decisions through nuclear disaster.

The civil society supporters who took me under their wings in all corners of Japan, and especially in Yamagata and Fukushima, were part of the "Accept and Welcome Nationwide Association" (AWNA; *311 Ukeire Zenkoku Kyōgikai*), a Japan-wide network of small-scale grassroots supporters of Fukushima families. Rest and recuperation activities (*hoyō katsudō*) were the central focus of AWNA members, though they also provided phone consultations for those considering voluntary evacuation and could link people to voluntary evacuee supporter groups throughout Japan. In both a biopolitical and micropolitical sense, voluntary evacuation and civil society support were political actions, but they were not the kind of political action undertaken by activist, anti-nuclear groups, or on-the-street protestors.

In a sharply divided sociopolitical context, where not only political groups, but also families, academics, and industries were divided in their views and understandings of danger, safety, risk, and socioeconomic values, to support these kinds of in-between political and life choices was not easy. Rest and recuperation, voluntary evacuation, and the insinuation that produce from around the Fukushima area might not be safe to eat were all at odds with government-supported reconstruction-recovery (*fukkō*) and "Support Fukushima by Eating!" produce destigmatization initiatives. On the other side of things, AWNA-related civil society groups tried to distance themselves from activist groups, which brought anti-establishment baggage and memories of violence from the 1960s and 70s. These civil society supporters were doing their best to support the people of Fukushima who self-evacuated or were considering self-

evacuating from, continued to live in, or returned to live in grey zones of nuclear contamination.[4] They focused on children's health, family lives, and the needs of people living their everyday lives.

The current state of Japanese society, politics, and economy is by no means comparable to the state of Ukraine or Belarus in the 1990s. Nevertheless, Fukushima families have also been faced with the physical, politico-economic, and moral navigation of a radiologically-contaminated world. What follows is a study of how Fukushima families, and especially mothers with young children, navigated nuclear reality and toxic nuclear uncertainty in their physical, emotional, psychological, and interpersonal worlds, all while still eating every day, being together through meals and events, supporting their children through school, and moments of laughter. This dissertation is my attempt to account for their experiences of living through nuclear disaster and the uncertainties of life in nuclear grey zones.

[4] I follow Yamakawa and Yamamoto in their understanding of post-nuclear disaster "gr[e]y zones" as, "the large areas located in the complex and indeterminate geographical spectrum beyond the uninhabitable evacuated areas, but still within areas where above-normal radiation levels remain a concern" (2017a, 2). Yamakawa, Nakai, and Yamamoto also gloss "gr[e]y zones" thusly: "[areas] outside of areas that are unlikely to be inhabitable for the foreseeable future but still within areas where above-normal radiation levels are a concern" (2017, 2). I provide a more extensive discussion of "grey zones" in the Introduction.

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Abstract

This dissertation examines how Fukushima mothers who were pregnant or had school-aged children at the time of the Fukushima Daiichi nuclear accident of March 11, 2011, navigated constrained choices and conflicting values in a world the Japanese government deemed permissibly toxic for them and their children. This would seem an extraordinary set of circumstances, and yet living through nuclear and other manmade disasters has become a regularly recurring part of being human the world over—in the global North and South, East and West; within former communist states, emerging and established liberal democracies, and global neoliberal orders. Concurrently, we all seek to live "normally" in, through, and within a permissibly toxic world—full of not only nuclear materialities, but also things like permissible food additives, ingestible and otherwise circulating carcinogens, air pollution, and climate change.

How can we understand the material and social reconstitution of a world that contains radioactive materials, where things, people, places, and social relations have been exposed to radiation, contaminated by a kind of toxicity that is invisible to the human eye, but made visible and knowable through other means? How do these toxic and nuclear normalities and abnormalities articulate with the contingencies of everyday life, raising and caring for children, and living as families? How do people agentively live—or to use Bourdieu's (1977) term, strategize—through nuclear contamination? How do people navigate trust in expertise and authorities, their environments, and their interpersonal relationships when knowledge about that

toxicity is debated and disagreements abound? *Living in Post-Fukushima Grey Zones* offers ethnographic answers to these questions for different Fukushima families.

My central analytic is what I call "everyday nuclearity." Hecht (2012) argues that "nuclearity" refers to disagreements about what is radiologically acceptable and unacceptable, exceptional and banal in a given historical, technological, and political moment. Nuclearity "emerges from political and cultural configurations of technical and scientific things, from the social relations where knowledge is produced" (Hecht 2012, 15). I build on this insight to argue that in post-Fukushima accident grey zones, the "social relations where knowledge [about nuclear things] [was] produced" became the social relations of people's homes, families, communities, and economic and non-economic forms of exchange, including everyday life, kinship, gifts, and produce. Everyday life already involves navigating contrasting perspectives on and practices of consumption, social and economic values, food, child rearing, outdoor play, and so much more. Everyday nuclearity refers to the navigation of disagreements between radiation-related considerations and the demands and practicalities of interpersonal relations, extant differences of opinions, and already varied practices of daily life. Everyday nuclearity acknowledges, on the one hand, that citizens are empowered to make decisions about safety and danger, banality and exceptionality of nuclear things. On the other, it underscores how the displacement of radiation-related decisions into everydayness and family life created strain within those already varied social relations.

Living in Post-Fukushima Grey Zones tells the stories of Fukushima mothers learning to live and raise their children "normally" (*futsū ni*) in a nuclear grey zone despite criticism, misunderstanding, and conflict resulting from their decisions not to return to the status quo ante and how Japanese civil society sought to support them, their children, and their family choices.

Introduction

Summer 2015

Central Fukushima (29-37 miles/46-60 km from Fukushima No. 1)

Five years after the start of the nuclear disaster, Satoko Haraguchi only let her sixth-grader daughter Mari eat one slice of a well-intentioned gift of large, plump, fresh, delicious peaches from Aunt Natsuko's orchard in nearby Date City. In Kawamata Town, the next town over, Chinatsu Yamata accepted her farmer neighbor's generous gift of daikon radishes, but regrettably threw them away the next day, saying to herself, "I'm sorry to do this." Neither Satoko nor Chinatsu doubted the deliciousness of these local food gifts. In addition to deliciousness and valued local ties, consuming Fukushima produce shows one's support of recovery efforts and for the particular recovery of the stocks, lands, and sense of self of the very individuals who give you these gifts of local produce. However, Satoko and Chinatsu were also concerned that the gifts might be invisibly contaminated, however slightly, with radioactive materials. And yet, they both physically accepted the local food gifts, allowing them to pass into private spaces. The peaches entered the Haraguchis' home; Chinatsu took the radishes into her car as she drove away from her neighbor's house. Through the acceptance of these gifts of local produce, Satoko and Chinatsu acknowledged the social relations sustained through local food sharing and seasonal gift-giving customs. Although they accepted these gifts, Satoko and Chinatsu then had to decide for themselves whether these risky Fukushima foods would enter their bodies or their children's bodies.

Satoko and Chinatsu have local knowledge of uneven fallout deposition patterns. Satoko knows that air dose levels in her neighborhood are low for Fukushima City; Chinatsu knows that the water in her "business as normal" half of Kawamata Town flows down from the mountainous Yamakiya district, which was officially recognized as contaminated six weeks after the start of the nuclear accident. Patchy radiation monitoring techniques combined with uneven and unfinished decontamination work also contributed to Satoko and Chinatsu's concerns about the physical safety of the produce they received. This was especially true since the peaches were given as a direct gift to Satoko from her farmer aunt and the radishes were given as an everyday kind of food sharing, also by a local farmer. This meant that neither the peaches nor the daikon were monitored even to the level of government standards, the legitimacy of which was also debated. Furthermore, given Kawamata Town's status as half-evacuated-half-business-as-normal, Chinatsu was well-aware of the hyper-local, hyper specific, decimally-thin ways in which even adjacent houses and fields were designated. These designations included "business as normal" districts not requiring decontamination, "business as normal" districts with optional decontamination, compensated evacuation zones to which residents could return during the daytime, compensated evacuation zones to which residents could not return without special permission even in the daytime, or barricaded no-go zones. Chinatsu drove through all but the barricaded zones almost every day as part of her job inspecting septic tanks. Chinatsu also had no way to know if the farmers had the soil in all parts of their fields tested. These food gifts, lands, and air were both everyday and debatably nuclear. Were the social relations involved in the exchanges also everyday and nuclear?

Living in Post-Fukushima Grey Zones: Family Decisions in the Wake of Nuclear Disaster examines how Fukushima mothers who were pregnant or had school-aged children at the time of

the Fukushima Daiichi nuclear accident of March 11, 2011, navigated constrained choices and conflicting values in a world that the Japanese government deemed permissibly toxic for them and their children. This would seem an extraordinary set of circumstances, and yet living through nuclear and other manmade disasters has become a regularly recurring part of being human the world over—in the global North and South, East and West; within former communist states, emerging and established liberal democracies, and global neoliberal orders. Concurrently, we all seek to live "normally" in, through, and within a permissibly toxic world—full of not only nuclear materialities, but also things like permissible food additives, ingestible and otherwise circulating carcinogens, air pollution, and climate change. *Living in Post-Fukushima Grey Zones* tells the stories of Fukushima mothers learning to live and raise their children "normally" (*futsū ni*) in a permissibly toxic world and how Japanese civil society sought to support them, their children, and their family choices.

Following the nuclear accident in Fukushima, the Japanese government followed a method of zoning, thresholding, and folding gradations of nuclear risks into the everyday—what many call the externalization and privatization of risk (Nadesan 2013). I follow Yamakawa and Yamamoto in their understanding of post-nuclear disaster "gray zones" in Japan as, "the large areas located in the complex and indeterminate geographical spectrum beyond the uninhabitable evacuated areas, but still within areas where above-normal radiation levels remain a concern" (2017a, 2). Yamakawa, Nakai, and Yamamoto also gloss "gray zones" thusly: "[spaces] outside of areas that are unlikely to be inhabitable for the foreseeable future but still within areas where above-normal radiation levels are a concern" (2017, 2). A focus on grey *zones* and *areas* retains a geographic, spatial dimension as primary to understanding *where* there are above-normal radiation levels. There are, of course, also added questions of *what* and *who* might be "above-

normal," for *how long* and *in what ways*, all of which are dimensions that Yamakawa and Yamamoto and their collaborators keep duly in view.

How can we understand the material and social reconstitution of a world that contains radioactive materials, where things, people, places, and social relations have been exposed to radiation, contaminated by a kind of toxicity that is invisible to the human eye, but made visible and knowable through other means? How do these toxic and nuclear normalities and abnormalities articulate with the contingencies of everyday life, raising and caring for children, and living as families? How do people agentively live—or to use Bourdieu's term (1977), strategize—through nuclear contamination? How do people navigate trust in expertise and authorities, their environments, and their interpersonal relationships when knowledge about that toxicity is debated and disagreements abound? *Living in Post-Fukushima Grey Zones* offers ethnographic answers to these questions for different Fukushima families.

At the end of chapter 1, I develop my central analytic of "everyday nuclearity." Because it is central to the conceptual apparatus of the dissertation as a whole, I also explain what I mean by "everyday nuclearity" here. Science and technology historian Gabrielle Hecht's notion of "nuclearity" refers to disagreements about what is radiologically acceptable and unacceptable, exceptional and banal in a given historical, technological, and political moment (Hecht 2012). In the case of Fukushima, such disagreements about the acceptability or unacceptability of post-nuclear accident radiological things (evacuation zone designations, food monitoring standards and procedures, environmental exposures, population exposures, the radiological safety of schoolgrounds, the safety of grandpa's home-grown radishes) have raged publicly and privately. Hecht argues that *nuclearity* "emerges from political and cultural configurations of technical and scientific things, from the social relations where knowledge is produced" (2012, 15). I build on

this insight to argue that in post-Fukushima accident grey zones, knowledge about nuclear things was also produced through the social relations of people's homes, families, communities, and economic and non-economic forms of exchange, including everyday life, kinship, gifts, and produce. Given that everyday life already involves contrasting perspectives and practices of and on consumption, values, food, child rearing, outdoor play, and so much more, the issues involved in dealing with nuclear contamination had the potential to be in tension with the practicalities and demands of navigating interpersonal relations, differences of opinions, and daily life. Everyday nuclearity acknowledges, on the one hand, that citizens are empowered to make decisions about safety and danger, banality and exceptionality of nuclear things. On the other, it also underscores how the displacement of these decisions into fundamental dimensions of everydayness and family life creates strain within those dimensions of everydayness into which nuclear meanings permeate. Put another way, everyday nuclearity involves the navigation of the micro-politics of radiation (Slater, Morioka, and Danzuka 2014) in spaces and relations onto which nuclear materialities and disagreements about the implications of those nuclear things have been externalized by the post-nuclear disaster privatization of risk (Nadesan 2013).

At the broadest level, this dissertation is an ethnographically textured account of what I have come to see as the "middle classes of risk society." I explain what I mean by "middle classes of risk society" later in the introduction, but there are several points I want to make clear from the start regarding "ethnographic texturing." In the presentation of this ethnography, I follow analytical approaches in anthropology that attend to the power of social and material worlds as understood and articulated within decidedly human processes of world-making, remaking, and unmaking (Weiss 1996, Fehérváry 2013, Keane 2003). It is my goal to show how people on the ground tried to make sense of, live in and through, and cope with imperfect

realities and less-than-perfect choices. As a result, I fully intend for my ethnography to show what some might call the "all-too-human" (Reno 2016, 230) ways of dealing with undesired and simultaneously normalzing anomalous materials.[5] Although other scholars might choose to interrogate how radioactive materials think or make humans think in turn (à la Kohn 2013 in *How Forests Think*); speculate on what Weston calls the invisible "bio-intimacies" of radioactive materials with human biologies in ways other than how my interlocutors did (cf. Weston 2017; Adam 1998); or invoke the specter of the Anthropocene or Capitalocene as an apocalyptically self-evident story that overshadows the enormity of just living everyday life (Hinkins 2017), I have chosen to focus on lived intimacies. By repeatedly drawing out the complexities of my interlocutors' choices and decisions within their social relations, I seek to show what it took for these Fukushima mothers to navigate nuclear reality and toxic nuclear uncertainty.

Having set out the main argument of the dissertation as a whole, I now turn to an ethnographic vignette that will introduce us to the ethnographic scenes of this dissertation: cars, cafes, and kitchen tables in northeast Japan. We begin with me as your narrator on a typical trip aboard the Tsubasa Superexpress bullet train from Tokyo to Yamagata. We then sit down for a coffee with my friend and key interlocutor Nishimura as he tells us how he moved from western Japan to Yamagata as part of his 3-11 civil society support activities. We then travel together in

[5] Tired of being misrepresented as saying "it's all in people's heads," and tired of actually saying "it's all people's heads," some strands of anthropology hail the Anthropocene as the newest version of "we know better how wrong we are," while other anthropologists have tried to reach into arguments about the material as a way to move beyond "all-too-human" explanations about order and disorder (Reno 2016, 230). Reno writes, "whether one prefers a cognitive, linguistic, ideological, or psychoanalytical explanation, each privileges uniquely human schemas for making the world meaningful, while downplaying the role of the material world in shaping representational practice" (2016, 230). Though attempting to jettison "all-too-human" explanations might have helped Reno devise his analytical apparatus for engaging with a North American landfill in English, by virtue of himself being a human and writing in a particular language, place, time, and genre, he is inescapably part of many "all-too-human" representational systems. It is my view that given the limitations of our methods for communicating understanding (English writing), we can never elude or transcend the submission of the social and material into "all-too-human" representational systems.

Nishimura's car to arrive in the home and sit around the kitchen table of a Fukushima family who continued to live their everyday life in Fukushima, but regularly left the prefecture for "rest and recuperation" for their daughter and ordered clean food through personal Japan-wide grassroots networks of food shipments. This vignette primes us for the rest of the ethnography, which is full of movement, conversations, and practices surrounding "clothing-food-shelter" (*ishokujū*) and "childcare-employment-shelter" (*hoshokujū*) as my interlocutors navigated living life in nuclear grey zones.

After the vignette, I zoom out to larger questions about life in risk societies more broadly, give a brief overview of the 3-11 disasters in conversation with insights from disaster anthropology, introduce my main groups of interlocutors and key concepts that flow throughout the dissertation, and finally provide the methodology and narrative overview of the dissertation as a whole.

Part 1: Setting the Ethnographic Scene

From Tokyo to Tohoku

Late January 2015 was a turning point in my fieldwork. When I presented on how the first few months of fieldwork were going at the Sophia University Fieldwork Workshop, I was strongly encouraged to start doing recorded interviews with my interlocutors. It was four months into fieldwork and I hadn't done any audio recordings or individual interviews yet. My main focus had been rapport building. I had volunteered at a series of one-to-two-day long "rest and recuperation" camps in the Yamagata countryside, spent time with voluntary evacuee mothers' groups, joined civil society supporters at their regional meetings, and listened to what evacuee

mothers spoke with each other and volunteers about. It was now time to add formal, one-on-one interviews to the mix of qualitative methods. I started formal interviews with two civil society supporters who were by that point friends and key interlocutors.

Sophia University is in Tokyo, 2 hours and 43 minutes away from Yamagata by the Shinkansen super-express bullet train. It takes one hour and thirty-two minutes to get from Tokyo station to Fukushima station. During the two-minute stop at Fukushima station, the seventeen-car high-speed testament to modernity uncouples into the seven-car Yamagata Shinkansen and the ten-car Tohoku Shinkansen. Passengers are advised to make sure they are in the correct cars. Whereas the Tohoku Shinkansen will continue northeast at high speeds to Sendai, the Tsubasa remains a super-express in name only. Continuing northwest, it makes a steep, steady, and no longer high-speed climb through the Kuriko Mountain Pass. It takes another hour and nine minutes to get from Fukushima station to Yamagata station.

Upon detachment from the business corridor's Tohoku Shinkansen, the news ticker at the head of the Tsubasa train car suddenly switches over from news about the global economy and political strife to quaint touristic overtures. *Relieve your stress by taking a relaxing soak in Yamagata's wonderful hot springs. Savor the delicious Yonezawa beef and the various varieties of Yamagata cherries and fruit. How about an outing to a Takahata winery?* The switch is just as jarring going the other way. When you head from Yamagata to Tokyo and reconnect with the Tohoku Shinkansen at Fukushima station, overtures about grapes, cherries, and hot springs all of a sudden become news of Gross Domestic Product, the latest nationwide stabbings and killings, and what world leaders will discuss at the next global economic summit. Yamagata City is less than one hour by bus from Sendai, slightly over one hour from Fukushima City by car and train (as we just saw), and a car-friendly place. Like Fukushima City, Yamagata City is an urban and

peri-urban city, with well-supplied supermarkets, appliance and furniture stores, and no lack of mass-consumer wants.

Fukushima prefecture is known for lush peaches, delicious *Koshihikari* rice, sake made with the purest water, and countryside social relations that materialize in abundant gift-giving of produce among neighbors and the sharing of fresh produce among neighbors and extended family (*osusowake*) throughout the year. Fukushima fashions itself (and is fashioned by tour companies and government-sponsored public relations campaigns) as a tourist destination with hot springs and cherry blossoms. Lest we forget, for people who are from Fukushima, it is home and their hometowns (*furusato*). These are associations crafted through the work of branding and are positive associations that the central government, the Fukushima prefectural government, and many people in Fukushima have sought to emphasize following the accident.[6] "Hometown" also refers to the affective ties to place, being, self, and ancestors in rural areas of the country (Solomon 2017; Santos Alexandre 2019). These ties accrued through personal experience that predate the nuclear accident of March 11, 2011, and for some might go back generations.

Yamagata was the prefecture with the greatest number of Fukushima evacuees outside of Fukushima for the first two years after the disaster. The combination of Yamagata prefecture's proximity to Fukushima, lower radiation levels, and the availability of free apartment housing from June 2011 through March 30, 2017, contributed to making Yamagata the destination with the most "out of prefecture evacuees" from Fukushima for the first two years after the March 11, 2011, disasters. According to statistics gathered by Yamagata prefecture, at the peak of the exodus from Fukushima to Yamagata in January 2012, 94% of all registered evacuees in

6 The concepts of "hometown," nostalgia, and heritage have been critiqued extensively in the anthropology of Japan as a "flexible commodity" meant to attract tourism yen (McMorran 2008) and as invented tradition for the metropolitan masses (Creighton 1997; Ivy 1995).

Yamagata were from Fukushima—13, 033 out of 13,797 (Yamagata Prefectural Government 2011-2017).[7] This number also amounted to over 20% of all "out of prefecture evacuees" from Fukushima to locations nationwide at that time—13,033 in Yamagata out of 62,808 nationwide (Fukushima Prefecture Evacuees Support Division 2018).[8] Unfortunately, these statistics for "out of prefecture evacuees" do not differentiate between tsunami evacuees, compulsory nuclear evacuees, and voluntary nuclear evacuees, although, as I explain in greater detail in chapter 4, it was widely understood that the vast majority of evacuees to Yamagata were "mother-and-child" voluntary evacuees from Fukushima.

Yamagata and Fukushima are part of Tohoku, the Northeast cultural region in Japan, along with Miyagi, Iwate, Akita, and Aomori prefectures. With the exception of the city of Sendai, Tohoku is considered to be a predominantly rural region with a history of outmigration to the Tokyo metropolis, including a long history of supplying not only electricity and natural resources such as timber and coal, but also bodies and labor, for Tokyo's national and international political-economic projects (Hopson 2017). Structurally-informed academic accounts of Tohoku history are quick to point out the region's internally-colonized status vis-à-vis the Tokyo core. These analysts and critics interpret the radiation-exposed people of Fukushima to be the newest batch of "thrown away people" (*kimin*) (Wakamatsu 2012; Hino 2016) in a history of structural violence against the people and lands of the Northeast dating back to at least the colonization of Tohoku by the Imperial Meiji state in the nineteenth century

7 All statistics are for evacuees registered with Yamagata prefecture. Not all evacuees would have officially registered. Yamagata Prefectural Government reports are available for download at: http://www.pref.yamagata.jp/ou/kankyoenergy/020072/fukkou/hinansha-suu/23hinansya-suu.html [Accessed 23 May 2018].

8 These numbers are based on data from the Reconstruction Agency, which relies on prefectures' self-reporting of evacuee numbers based on self-decided collection methods and varying definitions of who counts as an evacuee. A change in who counts as an evacuee can suddenly increase the number of evacuees in a given prefecture by several thousand, as was the case in Saitama from July to August 2014 (Kansei Gakuin Daigaku et al. 2015, 32-33).

(Tsujiuchi 2018b; McVeigh 2004; Goodman 2002a). In such accounts, the Tokyo Electric Power Company (TEPCO) Fukushima No. 1 and No. 2 Nuclear Power Stations, which created electricity for the Tokyo metropolis rather than the people of Tohoku themselves, are but one recent manifestation of longer core-periphery relations (Kainuma 2011).

The people of Tohoku are said to be long-suffering (*gaman-dzuyoi*) and "well behaved" (*otonashii*), in the sense of falling in line and not being troublemakers for authority. A friend of mine – a reporter for a major national newspaper – once wrote to me in very broad strokes, saying that even as liberally-minded academics, supporters, and activists from Tokyo or other metropolitan areas (*toshibu no hito*) want desperately to see the people of Fukushima united against TEPCO and the national government, the reality was that even if the people of Fukushima felt frustration about the situation, generally speaking, they were more likely to turn on each other, in part because of their "regional territorial/prefectural character to not rebel against authority" (*okami ni somukanai chiikisei/kenminsei*). Civil society supporters from Tokyo and Yamagata who were critical or disheartened that the people of Fukushima did not raise their voices enough would often repeat the refrain that the people of Tohoku "don't rebel against the state/government/authority" (*okami ni sakarawanai*). Some essentialized this non-rebellion and long-suffering as just how these Fukushima and Tohoku locals are (*tochigara* literally "essential quality of the land"). One of my interlocutors, Mrs. B, herself a transplant to Fukushima from Osaka, even wondered if non-rebellion was in the blood (*chi ga chigau*) of the people of Fukushima. From what she saw, it was mothers who married into Fukushima families from other regions of Japan, herself included, who had been more likely to raise questions against schoolboards about radiation levels or organize to have clean food shipped to them, rather than believing the government's blanket safety appeals. I did not find such sweeping

statements about the people of Fukushima or Tohoku to be true. Fully Fukushima born-and-bred interlocutors were just as likely to be concerned about radiation and seek to do something about it for their children as those originally from outside the prefecture.

Amid the contradictory messages of radiation health effects and risks, the fear, and uncertainty of 2011, thousands of mothers in northeast Japan, many of whom were Tohoku born-and-bred, got into their cars and voted with their wheels, and "voluntarily evacuated" with their children. This predominantly mother-and-child self-evacuation from non-compulsory evacuation zones is called "voluntary evacuation" (*jishu hinan*) in Japanese.[9] In most cases, they left fathers/husbands and their own families behind in the debated "grey zones" of contamination. Fathers/husbands had to continue working their jobs. Families had houses, jobs, and businesses. Others were also concerned with the radiation but were prevented from evacuating by family obligations (such as sick family members who could not be moved), business obligations, lack of economic support, and/or a lack of a destination. As time wore on, those who voluntarily evacuated had to decide whether they would return to Fukushima or try to continue living in evacuation as the end of housing subsidies loomed[10] and as marriages were pushed to the brink. Fukushima mothers' accounts of how they navigated these multifactorial considerations for evacuation or staying is at the heart of this dissertation. Voluntary evacuation, remaining in Fukushima, and return out of voluntary evacuation were not single-issue ("radiation only") decisions.

9 There were, of course, also "father and child," "grandparent and grandchild," and "child only" evacuees (Horikawa 2017). Adult individuals who voluntarily evacuated on their own also fall outside of this "mother and child" and child-centric ideal type.

10 As I explain in greater detail in chapter 4, housing subsidies were discontinued at the end of March 2017.

For my interlocutors, the deeper academic history of core-periphery relations was of little importance. More important were the ways in which the state was allowing and disallowing evacuations, compensation, and support, thereby creating divisions among the people of Fukushima and within families, as I describe in chapter 1. More important were the implications of the government-sponsored official "decontamination" procedures (*josen sagyō*) of their everyday environments, which were abundantly visible all across central and coastal Fukushima (this in chapter 3). For those who self-evacuated, equally as important was upholding family ties between the mother and child in voluntary evacuation and the father/husband, as the mother's own parents and kin, and her in-laws remained in Fukushima (this in chapter 4). Unsurprisingly, my interlocutors were also concerned with figuring out what to eat and what to feed their children, while having their children succeed in an unfamiliar school. Protecting their children from radiation exposure was important, and so were many other considerations. Generally keeping quiet about the Tokyo Electric Power Company (the owners of the Fukushima No. 1 plant) and the national government did not make their actions any less biopolitically and micropolitically consequential (Slater, Morioka, and Danzuka 2014).

My Way In: Civil Society Supporters Linking to Fukushima Families

Encouraged to start audio recording one-on-one interviews, I needed practice. In the morning on January 24, I met with my friend Ms. Hikita[11] at Tokyo station. We spoke about her work with Tokyo-based and nationwide Fukushima support initiatives. In the afternoon, my friend and key interlocutor Nishimura picked me up from the train station in Yamagata and we

11 Since I refer to publications by Kasumi Hikita later in the dissertation, this is not a pseudonym. Ms. Hikita has given me written consent to use her real name in my dissertation and publications. All other names in this monograph are pseudonyms, unless otherwise noted.

drove to a café. After volunteering together for nearly four months, I finally mustered the courage to interview Nishimura formally about how he ended up in Yamagata.

Nishimura was 28 years old when we met in 2014, which means he was 25 at the time of the 3-11 disasters in March 2011. Nishimura and I followed similar nationwide grassroots paths into the Yamagata-based Fukushima support scene. Yuta and Reina were local Yamagata civil society supporters who were part of the "Accept and Welcome Nationwide Association" (AWNA) network of small-scale grassroots supporters of Fukushima families. I was introduced to Yuta and Reina in September 2014 by a soybean farmer from Fukui prefecture, over 600 kilometers away, who was part of AWNA. Yuta and Reina were the first to greet me upon my arrival in Yamagata on Thursday, October 9, 2014. When Nishimura arrived two weeks later, he came to stay with Yuta and Reina for about one and a half years. Jokingly, the matriarch of AWNA (Ms. H, about whom I write in chapter 2) referred to Nishimura as my Yamagata junior, since I had arrived to Yamagata two weeks before he did and we were both regular members of the Yamagata battalion at AWNA events in Fukushima between fall 2014 and spring 2016. Nishimura and I overlapped in other ways, as well. We overlapped in age (I was 26). We also overlapped in our volunteer activities with Fukushima voluntary evacuees in Yamagata. Then, once I officially interviewed him at the end of January 2015, after four months of volunteering together, he began to introduce me to Fukushima families whom he had hosted as part of his Fukushima support activities in western Japan. That's when we began going back and forth from Yamagata to central Fukushima almost weekly in his car.

Prior to getting swept up in post-3-11 support activities Nishimura had worked as a livelihood supporter for persons with mental disabilities (*chiteki shōgaisha shien no seikatsu shien'in)* at an incorporated nonprofit (NPO *hōjin*) that ran a communal workspace during the

day for persons with mental disabilities, such as Down's Syndrome and autism, and a group home for the same at night.

From the early days after the disaster, Nishimura became actively involved in organizing "Rest and Recuperation" camps in his hometown in western Japan, nearly 500 kilometers from Fukushima. R & R camps sprung up all across Japan in the summer of 2011, based on Soviet "rest and invigoration/recovery" camps for children after Chernobyl and "rest and recuperation" programs for the children of Chernobyl with international destinations, including Japan.[12] Civil society organizations and citizen volunteers throughout Japan wanted to host Fukushima children and families to give them a chance to spend anywhere from a few days to several weeks in a radiation-free environment, eating foods grown far away from northeast Japan. This might give camp participants the chance to excrete radioactive materials they might have accumulated in their bodies during the months they lived among radioactive materials. Since R & R camps were in areas with lower radiation levels and fallout, children could play outside without their parents having to worry about danger from radiation. In addition to the physical play outdoors, eating healthy food, and breathing air without radioactive materials, R & R camp organizers wanted their Fukushima guests to be able to take a mental and emotional break from worrying about radiation and a respite from the social pressures of society dealing with radiation.

By the time Nishimura left for Yamagata in October 2014, he was an R & R camp veteran, having co-organized nine camps, starting with a ten-day camp in August 2011.

[12] The flagship organization in Japan that took the lead in raising funds and hosting children from Belarus after Chernobyl was the NPO called Bridge to Chernobyl (*Cherunobuiri e no kakehashi*). Bridge to Chernobyl was founded by a group of housewives in Sapporo, on Japan's northernmost island of Hokkaido on April 8, 1992. Between 1992 and 2010, they were able to host 648 children from Chernobyl-contaminated areas of Belarus during the summers. Following the 3-11 disasters and the meltdowns at Fukushima No. 1, Bridge to Chernobyl shifted its efforts to supporting mothers and children from Fukushima-affected areas of Japan and has for now discontinued its hosting of children from Belarus. Please see Bridge to Chernobyl's homepage here: (https://www.kakehashi.or.jp/about-kakehashi).

Nishimura formed lasting bonds with the children and families who came to that first R & R camp. He went to visit several of these families in Fukushima in September 2011. For the families who came to that very first camp in August 2011 and especially those whom he visited on that trip in September 2011, Nishimura became a household name.

As Nishimura was trying to figure out how to go to Fukushima for the first time, he conferred with several people in his hometown who were involved with Fukushima and Chernobyl support. From his own studies and conversations with those who were more cautious, he was thinking about putting plastic covers on his car seats, so that radioactive materials would collect on the plastic, rather than seep into the fabric of the car seats. When he spoke with a woman who had been involved in Chernobyl support activities for many years, she questioned him as to what his motive was for going. Why was he thinking of going? He thought about it and fell silent even as he was retelling the story. "Because I want to go see the children," he answered.

"If that's the case, then good," she answered him back. She disapproved of young people who went to Fukushima out of some "skewed sense of righteousness" (*kawatta seigikan*).

Nishimura also went to consult with an organic farmer who had moved to his prefecture from Osaka. The organic farmer collected and grew crops only from traditional seeds. He lived deep in the mountains, at the end of a road with no streetlights. (I'm not sure if he had electricity at his house. If he did, it was probably made by a small-scale generator.) The night before his departure, Nishimura went to speak with this farmer about his motives for going and how he should go. He was told the same thing as the woman who did Chernobyl support told him, "If you're going because you want to see the children, that should be reason enough to go." The next

day, Nishimura departed for Fukushima with his R&R camp co-organizer collaborator. He did put plastic sheets on his car seats.

After four years and nine R & R camps, Nishimura was becoming worn out from the pressure he felt that he needed to continue organizing and running R & R camps. At the same time, he couldn't let himself just drop the whole Fukushima support matter altogether. "What am I supposed to say?" he asked me and himself rhetorically, "'I've stopped, so that's that…'?" It wasn't quite guilt (*ushirometasa dewa nai*) that he felt, but, what was it, he asked himself. He couldn't bring himself to tell the people he had met from Fukushima and Eastern Japan, "I'm quitting this now" (*mou yamemasu*). He couldn't do it; just suddenly stopping all interaction/support activities with Fukushima families just wasn't a choice for him (*jibun no naka wa dekinai, sentakushi to shite wa nakatta*). Through hesitation, sounding not entirely convinced himself, Nishimura told me that one thing he could do to continue—as a Fukushima supporter, as someone who knew these families and had gone through the disaster with them, in this difficult to express pressure that was not-quite a sense of duty or an obsession—one thing he could do was to "put his body/himself closer to the incident" (*karada jitai o kono jiken no motto chikaku ni oku koto*). That's when Ms. H, the matriarch of AWNA, suggested that Nishimura go stay with Yuta and Reina in Yamagata. Others whom he knew who had evacuated from eastern Japan to western Japan wanted to stop him from going, but he went nevertheless.

Nishimura tried to put the decision into words, "With regards to this problem… what is it?... how can I put it… I wanted to be in the problem itself, this was one way for me to do that. So that's how I came." Reflecting on us chatting over coffee, he chuckles as he says, "So I guess us sitting here relaxing contradicts all that." I would disagree that we were "relaxing," since through our conversation, he contributed to the global knowledge that I produced, but I do agree

with the sentiment that drinking coffee in a relaxed atmosphere doesn't seem like "work" or active volunteering. After the coffee, Nishimura wanted to introduce me to some of the families who had been to his R & R camps, and I accepted the offer. This interview became the turning point after which I began to go back and forth to central Fukushima almost weekly, oftentimes, though not always, with Nishimura.

A couple of weeks later, in mid-February 2015, Nishimura and I went to stay with a Fukushima family whom he knew well. The Haraguchi family had been regulars at Nishimura's R & R camps in western Japan from the very first ten-day camp in August 2011 until summer 2014. I knew that many families were split because of sharply contrasting opinions on the risks and dangers of radiation exposure and their understandings of radioactive materialities.[13] Prior to our visit, Nishimura had let me know that the Haraguchi family was no exception to the general pattern of generational split in opinions, though it was not a strictly gendered split. Satoko Haraguchi was the eldest of three sisters. She ran the family clothing store, which she took over from her father, who still lived with the family. Her youngest sister, Yuna, lived in the next house over, just barely a twenty second walk away, with a son and daughter. The middle sister lived in Sendai. They had no brother, so as the eldest daughter, Satoko was responsible for the family and the family business. Satoko's husband married into her family (*muko yōshi*) and took the

13 Slater, Morioka, and Danzuka (2014) show how Fukushima men farmers' concerns for economic recovery let them hear one thing in the government's assurances that things might possibly be alright, whereas women's concerns resulted in them experiencing the same messages as posing tremendous decisions that might have dire biological and health consequences if they were not made right now. Davis and Hayes-Conroy (2017) argue that "invisible radiation reveal[ed] who we are as people," since a person's response to radiation and messaging about radiation tended to differ along gender and generational lines. Morioka (2014a) makes the strongest case for gendered differences in perspectives on radiation: chauvinistic hegemonic masculinity informed most men's viewing the radiation situation in economic terms, whereas women's, and especially mothers', concerns over biological health informed their wanting to do something to protect their children's health. Horikawa (2017) rightly emphasizes that though such general patterns pertaining to gender and generation were observed, this is not to say that no men/fathers/grandfathers were concerned about their children/grandchildren's biological health. Furthermore, Horikawa demonstrates cases where mothers wanted to remain in Fukushima, but fathers/grandfathers asked them to evacuate with their child/grandchild. Even if there were general patterns that broke down along gender and generational lines, this does not mean that it would be so in a particular case.

Haraguchi family name. This is a common practice for families with no male heirs and second and third born sons from other families.

Satoko was always cheerful, full of laughter, asking question after question, wide eyed and curious about the world and what people think. When hosting me and Nishimura on our visits, she would often hover between the kitchen and the dining area, brewing all of us tea or organic coffee, showing me and Nishimura the latest vegetable or seafood shipment that had arrived from western Japan or the Japan Sea, which she would then make into a delicious dinner for the family, Yuna and her children, and us. The clothing store was at the end of the hallway, directly attached to the house. There was a video monitor in the dining area that would ding loudly whenever someone entered the store, in case Satoko was in the house and a customer came by. The clothing store was the primary reason the Haraguchis only ever evacuated for a few days to Yamagata, in the immediate moment after the nuclear plants started exploding on March 12, 2011. When we spoke again in July 2018, Satoko also reflected, "We couldn't just leave poor grandpa all alone. *(Kawaisō ni.)*" They renovated the house the same year after the disaster with a wood aesthetic and breathable, all-natural material for the walls. They used their own money because they didn't know they could make insurance claims.

Satoko and her husband were concerned about radiation and had changed parts of their daily lives and yearly practices to protect their daughter Mari, then in sixth grade, as best they could. This included eating organic, sending Mari to R & R camps, and ordering food shipments through grassroots networks throughout Japan, even while staying in their Fukushima house and community. Satoko's father, Mr. Haraguchi Sr., did not think that radiation was as large a problem as Satoko and her husband made it out to be. He and Satoko also strongly disagreed about other dimensions of ethical consumption and postwar Japanese capitalist (rapid economic

growth) economic practices. I return to this theme of economic growth juxtaposed with ethical consumption in Chapter 5.

That day on my first visit with Nishimura to the Haraguchis in February 2015, Satoko and Mari were at the dining table with Nishimura and me. Satoko's husband was at work and Mr. Haraguchi Senior was away on a short vacation. Satoko and Mari started asking me what my research was about. I tried to explain my research interests to them as best I could. I wrote for them in my field notebook the Japanese characters for dwelling/house/shelter, food, possessions (cell phone, bag, water bottle), clothes, family, interpersonal relations, everyday life, furniture, vehicles, the neighborhood, and friends (Figure 0.1). Each of these words was in its own circle. In the upper right corner, I drew an arrow with the words, "nuclear power plant accident" coming down at the rest of the circles. I then dabbed the paper with my pen to make some dots, to represent radioactive materials, following a representational technique that I took from Misato Yugi's "One Picture a Day Blog," which I had also seen at anti-nuclear protests in the summer 2012 (Figure 0.2).[14]

[14] As of [April 16, 2018], the blog website (http://www.mikanblog.com/?p=2367) has been taken down, though the illustrations continue to circulate. Conspiratorial thinking would suggest that this blog's being taken down might be part of internet and information censorship in the wake of Fukushima, perhaps targeted by the government's Secrets Law. But I cannot confirm that such was the reason for the blog's discontinuation without further research. It may also be due to the author's wanting to take down the blog; not paying for the domain name; or any number of other reasons.

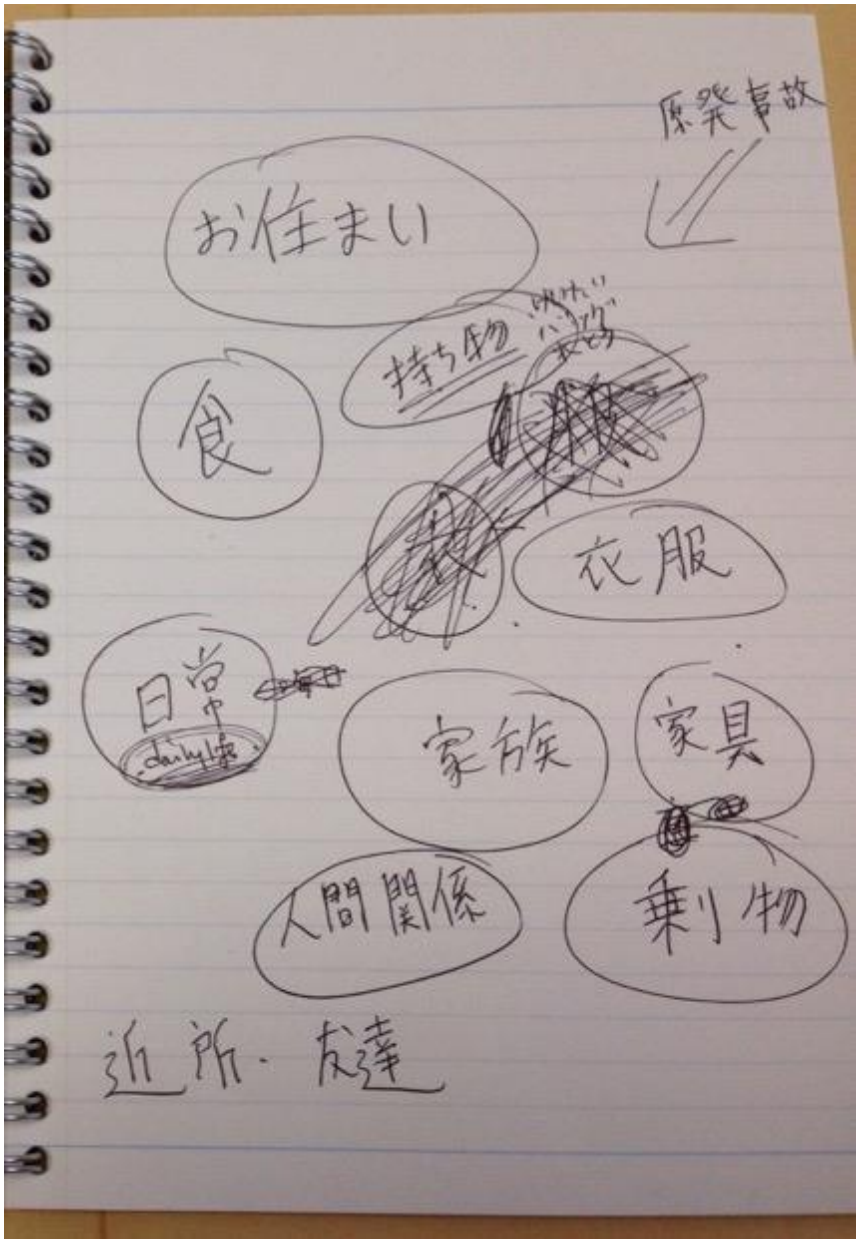


Figure 0.1 Photograph of field notes. February 13, 2015. Haraguchi household, Fukushima City.

Figure 0.2 Red Dots Posters by Misato Yugi.

Google Images Search for "*Akai tsubu tsubu houshanō*" [red dots radiation]. Accessed April 16, 2018. The artist depicts radiation and radioactive materials as red dots amassed on the ground, kicked up by wind and outdoor play, and packed into lunch boxes. She entreats viewers to protect children's health and lives from radiation, and to consider the genetic impact of radiation exposure on the fetus of pregnant mothers. These "red dot" images became symbols of the anti-nuclear movement early following Fukushima, and circulated on posters, tweets, Facebook posts, t-shirts, badges, among other material depictions (Sekiguchi 2011).

Sixth-grader Mari, elbows on the table, her face close to my notebook, looked over it and then said simply, "Oh, so you're looking at *ishokujū* (衣食住)."

衣	*i*	clothing
食	*shoku*	food
住	*jū*	shelter, dwelling

I was stunned. She was right. The kanji[15] compound *ishokujū* is taught to elementary schoolchildren across Japan in fourth grade, when they learn to write and read the kanji 衣 (*i*) for "clothing." As a sixth grader, Mari would have come across learning about "clothing-food-shelter" in formal elementary school education regardless of the nuclear accident and her living in Fukushima. Prideful and healthy localism in food consumption is arduously taught in social studies and home economics classes throughout elementary school, alongside compulsory school lunches filled to the brim with nationalistic state ideologies (*shokuiku*) (Yotova 2016). These (non-nuclear) lessons about food-clothing-shelter extend into lessons about proper community and environmental relations as children and responsible citizens. Compulsory food education and joint group participation in school-based food and community activities became a battleground for families in and beyond Fukushima who became concerned about radiation contamination of foodstuffs following the nuclear accident (Kimura 2016).

I was thinking of how radioactive materials can become lodged into clothing, onto shoes, and deposit on roads, fields, and vehicles; the dangers of internal and external exposure; and the all-encompassing transformation of lifeworlds that such material deposition and the sociomaterial responses to this deposition must have caused. I was thinking in terms of

15 Japanese has three writing systems. There are two syllabaries. Hiragana is used for native Japanese words that do not have a Chinese ideogram and for grammatical parts of sentences. Katakana is used for foreign loan words and onomatopoetic expressions. The third writing system consists of Chinese ideograms, called kanji.

materialities and ontologies, quite certain that such philosophical terms would be a hindrance to any conversation, still uncomfortable asking direct questions, and unsure how best to ask about people's personal experiences of the disasters. Mari's rendition of my research questions in terms of *ishokujū* was a far more accessible way of explaining my research interests. From that point onward, I began to use clothing-food-shelter (*ishokujū*) as a framing device to explain what I was interested in: voluntary evacuees' and Fukushima residents' perspectives and experiences of the nuclear power plant accident's effects on clothing-food-shelter.

One year later and 650 kilometers southwest of Fukushima, Ms. Kanata brought another equally important formulation to my attention in February 2016. Ms. Kanata was a single mother from central Fukushima who evacuated with her daughter to far-western Japan after two years of living in evacuation in Tokyo. For her, the reestablishment of daily life in evacuation had less to do with "clothing-food-shelter" (*ishokujū* 衣食住), and more with "childcare-employment-shelter" (*ho-shoku-jū* 保職住). *Ishokujū* sounds a lot like *hoshokujū.*

保	*ho*	childcare
職	*shoku*	employment
住	*jū*	shelter, dwelling

Ms. Kanata could not provide stability for her daughter unless she had a job (*shoku* 職).[16] She could not have a job unless she found childcare (*ho* 保) during the workday. She could not have a place to live (*jū* 住) unless she had a job to pay for rent, even if the price of rent was reduced. I could see how the "childcare-employment-shelter" formulation was more accurate when living,

[16] "Employment" (*shoku*) is a homophone with "food" (*shoku*), but each is written with distinctly different Chinese characters: 職 and 食, respectively.

thinking, and experiencing life in a complex modern society. Perhaps, I thought, I was trying too hard to reach into some kind of fundamental ontological building blocks by looking to materialities of clothing-food-shelter. Yet, both formulations and more are meaningful and important for different individuals in different ways when we look at life following nuclear disaster—or life in general in mass-consumption, mass-production, mass-waste, post-industrial "risk societies."

The Middle Classes of Risk Society

As already noted, at the broadest level, *Living in Post-Fukushima Grey Zones: Family Decisions in the Wake of Nuclear Disaster* is an ethnographically textured account of what I have come to see as the "middle classes of risk society." Beck's (1992) groundbreaking work on "world risk society" of the late 1980s, in which he argued that the advent of indiscriminate toxic risks such as nuclear contamination would supplant class-based society and externalize toxic risks onto all regardless of socioeconomic class, has since been critiqued for flattening all kinds of risk into only the most catastrophic and apocalyptic of toxic risks (Mythen 2018; Mythen, Burgess, and Wardman 2018). Most bluntly, historians Boudia and Jas argument portray Beck's argument as overstated and ahistorical, at best (2007). Beck's notion of "world" risk society has also been criticized for wrongly arguing that toxic risks would no longer be stratified according to socioeconomic class (Curran 2013). Furthermore, Mythen, Burgess, and Wardman point out, "it is clear that the global distribution of harms is uneven and unequal" (2018). Works in the environmental humanities abundantly note that rather than being globalized, toxic risks are localized along various axes of structural inequalities, including postcolonial and neoliberal axes of global north and south, urban and rural, and class and race (Nixon 2011).

After receiving Mari's and Ms. Kanata's help to articulate my research questions in terms of clothing-food-shelter and childcare-employment-shelter, I found Mythen's focus on the everyday in his critique of Beck especially striking. Mythen writes:

> Completing everyday tasks necessary for self and familial reproduction dictates much of the purposive action of individuals in the affluent West [and, I would add affluent industrial, capitalist Japan], rather than concentrated anxieties about the "mega hazards" on the risk society horizon. The habitual tasks undertaken within the realm of necessity—formal paid employment, raising children, caring for relatives, and maintaining family homes—tend to preoccupy the time, energies, and efforts of most people most of the time" (2018, 6).

This dissertation contributes to this literature by analyzing how nuclear risks were folded into the everyday through the experience of a quintessential risk society event—the second most severe nuclear accident in history. We see that "paid employment, raising children, caring for relatives, and maintaining family homes" are indeed what people must contend with, even when there is radiological fallout.

But before we can get to everyday living three to seven years after the 3-11 disasters, we need to revisit the March 11, 2011, disasters to note some of the less self-evident aspects of how natural and manmade disasters accrue local meanings.

Part 2: Analyzing "Fukushima"

The 3-11 Disasters

Earthquakes and tsunamis in Japan go back to time immemorial, and the northeast coast regularly experiences large earthquake and tsunamis. Even so, the massive 9.0 magnitude earthquake that struck off the northeast coast of Japan at 2:46pm on March 11, 2011 was unprecedented in its power, devastation, and social and material consequences. The massive earthquake caused tsunamis ranging in height from 2 to 21 meters to assail hundreds of kilometers of the northeastern prefectures of Fukushima, Miyagi, and Iwate within minutes of the initial quake. In some places, the ocean water flowed up rivers to up to 40 meters above sea level and several kilometers inland. Entire towns were swept into the sea as all of Japan and most of the world watched real-time broadcasts of the events. Close to 16,000 people have been reported dead. Over 2,500 are still missing, presumed dead. Over 121,000 buildings were fully destroyed; over 280,000 buildings were half-destroyed (Keisatsu Kinkyū Saigai Honbu 2018).

The heightened seismic activity triggered safety mechanisms at the Fukushima No. 1 (Fukushima No. 1), Fukushima Daini (Fukushima No. 2), and Onagawa nuclear power stations. In accordance with their design, control rods in all reactors scrambled, slowing down active chain reactions. Troubles at the Fukushima No. 1 and Fukushima No. 2 nuclear power plants began less than one hour after the initial quake, as tsunamis ravaged the northeast coast. Amid never-ending aftershocks of at-times over magnitude 7.0, the situation at the Fukushima No. 1

plant grew worse by leaps and bounds. The basic starting points of this series of events is best represented by a brief timeline.[17]

Brief Timeline of Events of 3-11

Friday, March 11
2:46pm: Initial 9.0 earthquake.

3:41pm: A 15-meter tsunami smashes into the nuclear reactors at Fukushima No. 1 nuclear power plant, flooding the site 4-5 meters.
3:50pm: A second wave hits, throwing the Fukushima No. 1 into Station Black Out. The water from the tsunamis completely floods the emergency power generators, which were housed in the basement of each of the six reactors at the plant. Workers are unable to hook up outside electrical generators due to the tsunami flooding. As a result, the cooling systems fails and temperatures in the cores of reactors 1, 2, and 3 begin to rise. Due to the Station Black Out, the water used for cooling the fuel rods could no longer circulate and be resupplied as necessary. As the cooling water began to evaporate due to the residual heat from the fuel rods, the fuel rods became uncovered, new reactions started, and the temperature in the fuel containment vessel began to rise. Attempts to vent a buildup of pressure were minimally successful.

A similar situation was occurring at the Fukushima No. 2 plant, 15 km south of Fukushima No. 1. However, at the Fukushima No. 2 nuclear power station, workers were able to secure the electrical power necessary to keep pumping and circulating the water necessary to cool the still-hot fuel rods and pools of used fuel rods. All four reactors at the Fukushima No. 2 plant were in cold shutdown within two days. The Onagawa plant was built on high enough ground to be saved from direct tsunami damage and was also able to maintain the electrical power necessary to keep cooling system active.

Evening: Evacuation orders are issued first to residents within a radius of two kilometers of *both* the Fukushima No. 1 and No. 2 plants. The evacuation radius around Fukushima No. 1 was then increased to 5 km, then 10 km, until, ultimately, a 20 km evacuation radius was established on March 12. This encompassed a 10 km evacuation radius around Fukushima No. 2 (Cabinet Office and Support Team for Residents Affected by Nuclear Incidents 2012).

Saturday, March 12, 3:36pm: A hydrogen explosion at Reactor 1 blows apart the outer walls of the reactor building.

Monday, March 14, 11am: A second hydrogen explosion blows the roof off Reactor 3, with debris and a stack of grey dust, rising like a mushroom cloud into the air.

Tuesday, March 15: Yet another hydrogen explosion rips through Reactor 2. In addition, highly radioactive fires begin in used fuel rod pools in Reactor 4, which had also lost cooling capabilities and where the cooling water had evaporated. In addition to the 20 km evacuation radius, people living within 20-30 km were ordered to in-house evacuation (Cabinet Office

[17] Many timelines of the events of 3-11 have been published, including ones easily attainable through a quick Google or Wikipedia search. For the sake of brevity, I present only some highlights in the table below.

and Support Team for Residents Affected by Nuclear Incidents 2012). Unfortunately, not everyone who was to be subject to these various evacuation orders knew about them or could evacuate on their own.

Figure 0.3 Brief Timeline of Events of 3-11.

In English, the events of March 11, 2011, are most commonly referred to as the "triple-disaster." This English "triple-disaster" nomenclature links together into one the singular 9.0 earthquake, *the* one tsunami, and *the* one nuclear accident at Tokyo Power Company (TEPCO) Fukushima No. 1 nuclear power plant. In Japanese, the events of March 11, 2011, are most commonly referred to as "the Earthquake-Disaster [*shinasai*]," the "Great Earthquake Disaster [*daishinsai*]" or "3-11 [*san ten ichi ichi*]," a nomenclature taken after the 9-11 terrorist attacks. In official documents, "The Great East Japan Earthquake" (*Higashi Nihon Daishinsai*) and "The 2011 earthquake off the Pacific Coast of Tōhoku" (*Heisei 23 nen tōhoku chihō taiheiyō oki jishin*) are commonly used. Each of the Japanese nomenclatures references the great event, with "the great earthquake" often already meaning the tsunamis and nuclear disaster.

I would add to these broad disaster nomenclatures even further multiplicities of the 3-11 disasters. The 9.0 earthquake was followed by thousands more aftershocks, of up to magnitude 8.4 on the Richter scale. There were multiple tsunamis. There were multiple nuclear power plant accidents: three reactors melted down at Fukushima No. 1; used fuel rod pool fires; on-going contamination; an accident at Fukushima No. 2. Equally as important are people's personal experiences of the disasters. Some might call this trauma and living through and with disaster. There will likely by delayed onset of symptoms (Nixon 2011; Adam 1998).

That said, there is a heuristic need to be able to refer to the events of March 11, 2011, under one umbrella term. In this dissertation, I refer to the events of March 11, 2011, and ensuing material and social upheavals as either "the March 11, 2011, disasters" or "3-11." Using the plural "disasters," as in "the March 11, 2011, disasters" avoids overdetermining the number

of disasters to just three. "3-11" also retains the Japanese nomenclature that refers to all associated 3-11 disasters as a single great event. "3-11" also does not overdetermine which aspects of a person's 3-11 experience should or should not be credited or discredited.

Analyzing the Slow Violence and Accumulated Damages of "Fukushima," the Humanmade Disaster

As environmental anthropologist Kim Fortun (2001, 351-354) notes in her work *Advocacy After Bhopal*, remembering certain associations around a disaster always entails forgetting others, no matter how hard one tries to "remember Bhopal," or, in this case, "not let Fukushima fade" (*fūka sasenai*). The meanings and associations of humanmade disasters expand and contract as different groups, organizations, and individuals, each with their own shifting goals, seek to define what the disaster is. These definitional struggles also occur in relation to natural disasters, as when insurance companies set parameters for what they will or will not pay for following hurricanes, floods, and wildfires. Seeking to confine disasters in time and space-place serves multiple purposes, not least of which are establishing or contesting legal, economic, and political liability; moving on in life, as done in trauma models that encourage victims to compartmentalize past traumas in accordance with a linear temporal model (Kleinman, Das, and Lock 1997); and expanding associations through advocacy and the politics of memory (Fortun 2001). There are also desired agentive or non-agentive ways of forgetting.

By invoking a temporal before and after in the dissertation's title *post*-Fukushima, I slip between English and Japanese understandings of "Fukushima." In English, "Fukushima" retains apocalyptic meanings—the second worst nuclear power plant accident in the history of the world; health effects; government cover-up; dangerous food—and refers overwhelmingly to

"Fukushima" as an event. In Japanese, Fukushima is predominantly a place name. The katakana writing of "Fukushima" in a way that would have it be associated as an apocalyptic event along the lines of the atomic bombings of "Hiroshima" and "Nagasaki" is widely rejected, save for in activist circles, from whom most of the people of Fukushima try to distance themselves (Gill, Steger, and Slater 2014, 13–14).

In line with these observations and the way that my interlocutors spoke of Fukushima, "Fukushima" in this dissertation does not only mean the nuclear accident at Fukushima No. 1 nuclear power plant, nor does "Fukushima" solely or overwhelmingly represent what anthropologist Ryo Morimoto calls, "[an] iconic source of anxiety about contamination" (2017, 362). As Morimoto notes: Fukushima is "the geographical site of the disaster, home to a diverse group of people with nuanced relationships to the nuclear accident" (2017, 362). Morimoto's point is well-taken. During the time of my fieldwork from September 2014 through May 2016, central Fukushima was simultaneously host to radioactive fallout, more than 100,000 compulsory evacuees from officially evacuated zones, and citizen scientists, journalists, and researchers from the world over that had descended on Fukushima in the wake of the accident. Fukushima was also host and home also to Fukushima people in myriad social roles, creating their own proximal social and material worlds, enacting their understandings of these worlds/the world, and themselves shifting and changing in perspectives, concerns, and materialities over time (Morimoto 2017, 362).

As for the events of 3-11, analytically, anthropologists Tom Gill, Birgitte Steiger, and David Slater argue that it is appropriate to refer to the events of 3-11 as a *double* disaster from an emic Japanese perspective (2014, 15–21). Gill, Steiger, and Slater argue that though the earthquake was very powerful, only minor damages resulted from the earthquake itself. They

argue that people's experiences of damages and suffering bifurcated depending on if they were survivor-victims of tsunami destruction or the nuclear accident. People saw the "natural disaster" (*tensai*; literally "heavenly disaster") as the ravaging violence of the tsunamis. The "manmade disaster" (*jinsai;* literally "human disaster") was the humanly-manufactured, humanly-caused, and humanly-exacerbated nuclear accident. Gill, Steiger, and Slater argue that the experiences of victims of each of these two disasters took on vastly different forms. The tsunami devastation was materially tangible and left communities to mourn the dead and missing, even as variegated reconstruction and recovery began all up and down the northeast coast.[18] In contrast, the nuclear disaster has been characterized by nondisclosure of important information, mistrust in the authorities, uncertainty, confusion, and irresolution.

Those who are unfamiliar with the political and legal discussions in Japan following 3-11 continue to speak of the tsunamis as the "cause" of the nuclear accident. Indeed, even in the narrative I have just crafted, a similar impression might come across to the reader. It is here that we need to remember that the meanings and associations of humanmade disasters expand and contract as different groups, organizations, and individuals, each with their own shifting goals, seek to define what the disaster is (Fortun 2001). Those who wish to downplay the Tokyo Electric Power Company's (TEPCO) and the government's responsibility in the accident sought hard to have the accident be acknowledged as caused by the "natural disaster." This would reduce their culpability in the matter. In actuality, the causes of nuclear disaster have been deemed entirely preventable and human-made (Bricker and Nihon Saiken Inishiatibu 2014; Hatamura, Abe, and Fuchigami 2013). In the Japanese nuclear industry, for decades, "descent from heaven" (*amakudari*) corruption practices saw lawmaker-regulators "descend from the

18 Reconstruction of areas devastated by tsunamis is beyond the scope of this dissertation.

heaven" of their regulatory roles over the nuclear industry into the welcoming arms of the very industry they were supposed to be regulating.[19] This *amakudari* corruption incentivized lax regulation and a dismissal of whistleblower concerns in favor of continued production of nuclear energy and the circulation of nuclear money, which would line lawmakers' pockets and give them cushy industry lives into which they could move later in their careers (Mizoguchi and Nguyen van Quyen 2012; Vivoda and Graetz 2015; Shadrina 2012).

Another often-heard refrain is that the hydrogen explosions and radioactive materials did not directly or immediately kill anyone. Other than the damaged reactor buildings themselves, they did not destroy any buildings. Such a characterization inherently privileges the "fast violence" spectacle of material devastation as opposed to what Rob Nixon calls the "slow violence" of slower temporally, materially, and socially unfolding disaster (Nixon 2011). To depict a nuclear accident in terms of its immediate material devastation downplays the social and future biological effects wrought by exposure to radiation, on the one hand, and impacts on people's lives of countermeasures to sufficiently prevent negative effects (such as evacuation), on the other. I would contend that in addition to possible biological damages caused by radiation exposure, examples of slow violence in the Fukushima case include "Disaster Related Deaths" (*hisai/shinsai kanrenshi*), property loss, and many "accumulated damages" noted by Yamakawa and Yamamoto (2017b, 155; see Figure 0.4, below).

"Disaster Related Deaths" (*hisai/shinsai kanrenshi*) usually refer to people who die during their time in evacuation centers or prolonged time in evacuation, including elderly who may have escaped the initial disaster zone but could not get their medications filled, and those who died from the stress of evacuation life. The designation of "Disaster Related Deaths" was

[19] Following the 2011 disaster, Japan's nuclear regulatory structure has been considerably changed. Though these changes are beyond the purview of my study, those interested in learning more can see Shiroyama (2015).

extended to include suicides from despair following the nuclear accident. Though these deaths are not connected to radiation exposure, they attest to the social costs of a nuclear accident. 3,676 Disaster Related Deaths have been registered as of June 30, 2018; of these, 60% (2,227 of 3,676) have been in Fukushima prefecture (Reconstruction Agency, Cabinet Office, Japan, Disaster Preparedness Division, and Fire and Disaster Management Agency 2018). 2,003 were aged 66 or older. 222 were between the ages of 21 and 65. Two were 20 years old or younger. Between November 29, 2012, and September 16, 2015, the local *Fukushima Minpō* newspaper ran 171 stories that are part of their "Nuclear Accident Related Deaths Archive" (Fukushima Minpō 2018; Fukushima Minpō 2012). These news stories chronicle the suicides, sudden deaths, despair, and mental and physical withering away of people eaten away at by guilt, blame, and the stress of life in evacuation resultant from the nuclear accident.

In terms of damage to buildings, infrastructure, and property, the compulsorily evacuated municipalities have decayed over the five or more years of enforced evacuation (the number of years depends on which compulsory evacuation designation zone one was from; more on this in Chapter 1). These damages have been unequally compensated. In compulsory evacuation areas, even as evacuation orders are lifted, rodents and wild animals have devoured people's houses; yards have been overgrown with wild grass; infrastructure is in disrepair. The slow violence of the nuclear accident abounds.

For victims in Fukushima, damage both material and immaterial extends beyond the initial days, weeks, and months of the start of the accident. Due to the breaking of long-promulgated promises and the vested interests that people saw in the government's response to the nuclear accident, there was considerable mistrust and anger among the general public toward the government's actions and proclamations related to the nuclear accident and the safety or

danger of radiation exposure (Yamakawa and Yamamoto 2017c, xiii). Yamakawa and Yamamoto also provide an excellent schema for "Accumulated damage from the nuclear accident" that notes prominent categories of damages for nuclear victims as correlated with three stages in evacuee housing (see Figure 0.4 below) (2017b, 155). In their schema, the prominent types of damages are physical, health, social, reputational, and financial. As affected areas (which is to say the people, environments, produce, biologies, reputations, social relations, and environmental relations in these areas) experienced first damages, they moved to emergency shelters (which one might also think of as emergency responses). Evacuees incurred a second level of damages in emergency shelters and as they moved from emergency shelters to temporary housing. Evacuees incurred and were subjected to a third level of damages when they lived in temporary housing and as they moved from temporary housing to permanent housing. Yamakawa and Yamamoto argue that these damages are cumulative.

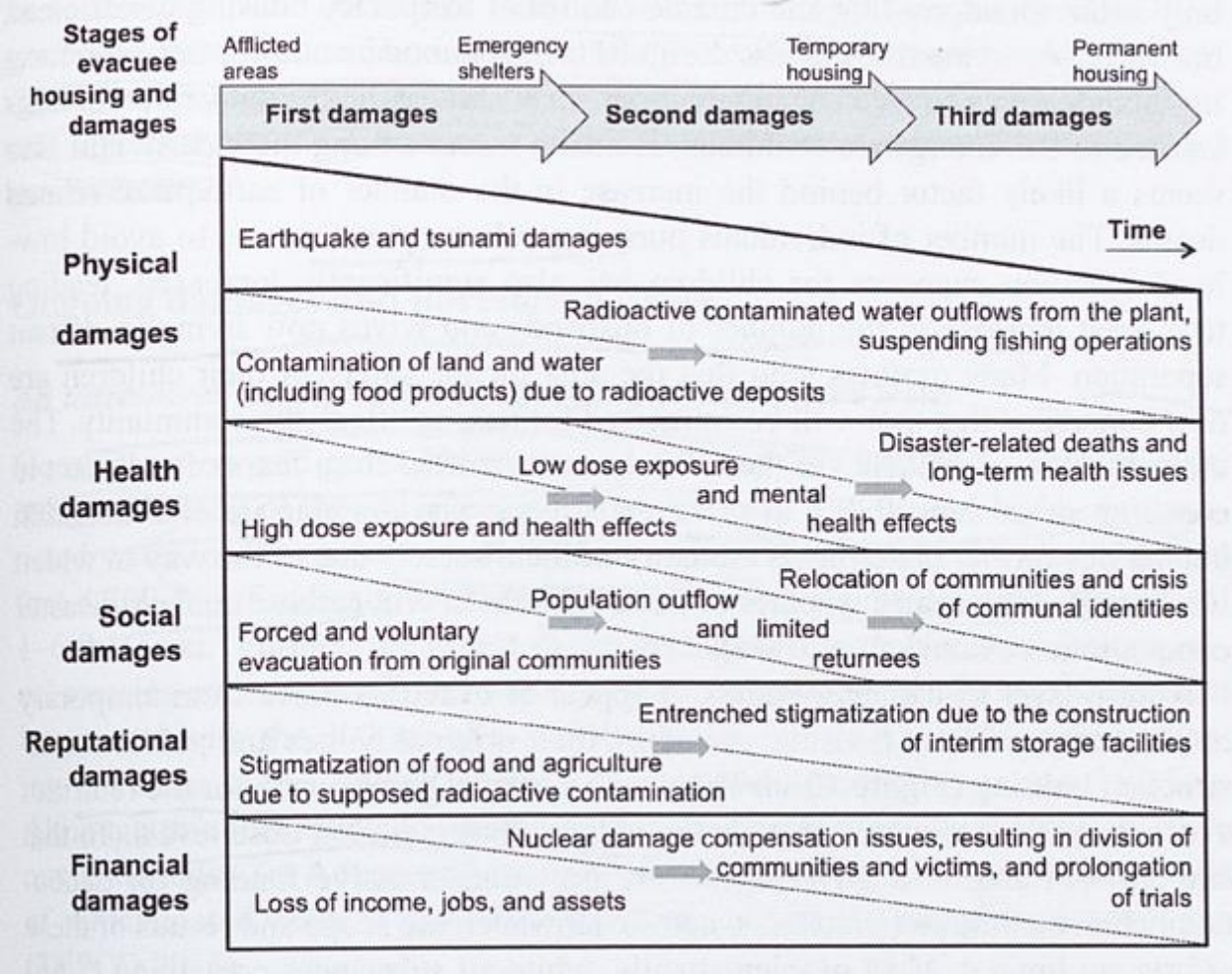


Figure 0.4 Yamakawa and Yamamoto's Schema for "Accumulated damage from the nuclear accident"

Source: Yamakawa and Yamamoto (2017b, 155)

This dissertation analyzes everyday life and family decisions in "business as usual" grey zones in towns on the edge of the compulsory evacuation zones and beyond, which had undeniable fallout but were never officially designated compulsory evacuation zones by the government. The most bureaucratically consequential divisions of the post-contamination world in Japan are the official evacuation zone designations, which have shifted considerably over the past eight years. In chapter 1, I introduce key shifts in official evacuation zone designations and

some salient debates about the validity of the criteria used to make these zone designations. What is crucial to note here in the introduction is that the official evacuation zones following the nuclear accident did not neatly align with the presence or absence of radioactive materials.

Beyond the proximate, immediate concerns for people living in and moving through environments where radioactive materials have been deposited, there were also concerns about the circulation of contaminated produce and objects through industrial systems that obscure the origin of commodities, particularly food (Sternsdorff-Cisterna 2015; Kimura 2016; Ishii 2017, 90–91). In the arena of food, the government is concerned with monitoring and controlling food that reaches the market, rather than crops or unprocessed foods in and of themselves, or "nature's bounty" – wild vegetables picked in the non-decontaminated mountain forests (Kaneko 2017). Further examples of unaccounted-for grey zones in food include labels for the catches from commercial fishing boats, possible alterations of the information on labels, and gifts not purchased from a monitored market source. To counteract the risk of possibly procuring contaminated food, concerned citizens only buy food after studying soil contamination levels, if they can; or they use a collage of relevant data and create shortcuts of meaning (Sternsdorff-Cisterna 2015; Kimura 2016; Edgington 2017). Others continuing to live in Japan following Fukushima have also had to navigate and cope with the possibility of contaminated food and commodities from affected areas. [20]

[20] For more on trust in food beyond the north-east region, see Reiher (2017). Sternsdorff-Cisterna (2015) and Kimura (2016) write mainly about consumers in the greater Tokyo area.

Part 3: Key Arguments, Terms, and Themes in Addition to Everyday Nuclearity

In addition to my main analytic of everyday nuclearity, the following are key arguments, terms, and themes that course throughout the dissertation. I note when a certain argument, term, or theme is particularly relevant to a specific chapter.

Visibility, Invisibility, and Toxic Hazards

The most entrenched battles in social theory about human societies dealing with disorder and risk have been waged between overly caricaturized poles of individual cognition and public sociocultural categories (Bickerstaff and Simmons 2009, 864). Recent work in geography and sociology seeks to reconcile overly-individualistic and overly-social approaches to explaining risk by focusing on Deleuze and Guattarian processes of rhizomal becoming (Davis and Hayes-Conroy 2017; Steinberg and Peters 2015, 248, 255–56, 258). Mary Douglas's self-proclaimed claim to fame in the arena of risk studies is that she extended her Durkheimian assertions that public categories apply to industrial risks, claiming to show "that risk perception depends on shared culture, not on individual psychology" (Douglas 2002, xix). [21] Works that more closely

21 Studies associated with Mary Douglas (2002 [1966]) and symbolic anthropology posit an inherent human need to create "order" based on local categories of what constitutes matter in and out of place. I choose an approach that deemphasizes the causality in Douglas's argument that humans organize "matter out of place" because of a human need for classification but acknowledges the observation that order and disorder are social categories, which become personal and inform how people order their worlds. Douglas and Wildavsky (1982) overextend the scope of applicability of Douglas's insights about "order" when they apply it to industrial risks. They were taken as rebuking the American environmentalist movement for over-focusing on statistically unlikely risks, but which were ideologically and culturally unpleasant for environmentalists: risks associated with big business. In response, Douglas and Wildavsky were skewered on the stakes of American environmentalists, who argued that the industrial risks were indeed quantitative and qualitatively different (Kaprow 1985).

Douglas herself reflected that her foray into a sociocultural theory of risk would be more predictive if she applied it to political groupings *within* the same society, rather than to a nation-state society as a whole (2002). In my view, even if we substitute "shared culture" with "shared politics," as Douglas retrospectively suggests would work better, the colloquial tinge of "it's in people's heads" and "people are overreacting" cannot be so easily gotten rid of. As evident from my argument about enunciatory communities on pages (## - ##) below, I furthermore distance myself from Douglas's earlier formulations of societies as bounded entities with a singular totalizing

contend with people's lived realities in post-nuclear accident societies show us that overwhelmingly human—which is to say political, economic, and social—systems structure sufferers' experiences, the possibilities of knowledge, and the validity of social, legal, and cosmological claims (Petryna 2013).

Knowable Radioactive Materialities

Radioactive materialities course through the entire dissertation, as they were part of my interlocutors' lives. I write in tension with studies that dramatically overemphasize the *in*visibility of radiation. Influential Western scholars' writings about the menace of radiation that predate Fukushima (Adam 1998; Beck 1992) and feminist, post-humanist, techno-focused writings that subsume Fukushima into the biopolitical concerns of Euro-American academe (e.g., Weston 2017) tend to fetishize radiation's invisibility and its workings as a "ticking time bomb" sense of biologies invisibly changing under the visible surface.[22] In this work, I seek to push back against fetishizations of radiation's invisibility, imperceptibility, or unsense-ability (Beck

cosmology. Societies, Japanese society included, are internally differentiated, with different communities having different cosmologies and experiences with the sociomaterial world and power.

22 A world full of invisible dangers is nothing new. Human societies have always had invisible but abundantly perceptible and tangible worlds that modernizing discourses and projects of modernity somehow manage to find surprising: ghosts, dreams, witches/witchcraft, mana, industrial risks, and class sensibilities being just a few examples (Mueggler 2001; Crapanzano 1975; Mittermaier 2011; Evans-Pritchard 1976; Frykman and Löfgren 1987). Modernity created its own batch of invisible dangers and fears, mainly in the form of microbes (Paxson 2008), which are invisible without the help of microscopes and other technologies of vision, but also codified in laws and medical and institutional practices that create a sociomaterial world in which the flu and DNA are real things, even if it is not visible.

Visibility and invisibility, perceptibility and imperceptibility have been privileged objects of analysis in sociocultural studies of biology, especially as latent invisibilities come to surface as visible, negative biological symptoms (Adam 1998; Murphy 2013). European authors note that the re*mark*able reality of symptoms surfacing in the *Merk*welt (natura naturata) and the reality *work*ing invisibly under the surface *Wirk*welt (natura naturans) (Adam 1998). It has been well established that there are time delays before the invisible becomes biomedically visible, and the concerns have been theorized in terms of slow violence (Nixon 2011), structural violence (Farmer), and structural determinants of health (Metzl and Hansen 2014). My ethnographic evidence does not allow me to make a structural critique of this sort.

1992; Adam 1998). In chapter 3, I show how radiation falls in and out of visibility and sense-ability, not only through technoscientific means and not only through symptoms that eventually surface, but also through the physicality of decontamination procedures and everyday templates for cleaning. When it came to the mounds and bags of soil removed through decontamination procedures, radioactive materials were just as visible and perceptible as any other kind of construction. Even in modernist epistemologies, radiation was just as visible or imperceptible as germs, dust, or pollen. Arguments that emphasize just how different and how much more dangerous industrial toxins are in the quantities in which they are now in production and circulation (Carson 1962; Adam 1998; Beck 1992; Boudia and Jas 2013) set the goalposts too far from the mundane ambivalences, material, symbolic, social, personal, and interpersonal struggles that living in and through such a world involves.

When not talking about levels and measurements, it is far more common to think about a radioactive event first in terms of cloud-plumes, wind, and deposition, and then, in terms of light and lightbulbs, soil, and dust. I turn to these materialities and qualities in greater ethnographic detail in chapter 3.

"Middle-Range Evacuees," Fukushima Families, and Nationwide Grassroots Supporters as Enunciatory Communities Navigating Double Binds

At the heart of this dissertation are voluntary evacuees to Yamagata, families concerned about radiation who nevertheless remained in Fukushima, and grassroots civil society supporters throughout Japan who sought to support both of these groups. All of these groups were in a kind of middle between three other groups:

1. compulsory evacuation areas/compulsory evacuees;

2. people and parts of the country who did not have any fallout deposit on them and their lives; and
3. voluntary evacuees who moved to much greater distances, categorically refusing to return to any part of Fukushima, northeast, or eastern Japan even on short-term visits, and saw all of eastern and northeastern Japan, including the greater Tokyo area as environmentally dangerous.

Thinking of my interlocutors as one internally-differentiated group between these three other groups has garnered me a perspective on the unifying in-between-ness of those who remain in grey zones and those who became what I call "middle-range evacuees."

Readers familiar with the situation in Japan might see my seeking to group voluntary evacuees together with those who never evacuated as misleading. Voluntary evacuees deliberately moved away from Fukushima, so for me to analytically group them back together with people who stayed undermines the central reason for why they evacuated. Reduction in dose from external and internal exposure of their children to radiation was precisely the reason why voluntary evacuees evacuated. Am I saying they failed to protect them? No, but we and they also can't know in any absolute sense. Those with whom I spoke knew that voluntary evacuation to Yamagata was not a perfect solution radiologically, in their families, or socially. Many of the voluntary evacuees with whom I spoke expressed that deciding to go into voluntary evacuation to Yamagata, visits back and forth, food decisions, and an eventual final return to Fukushima were all compromises (*dakyō*). People, things, and environments from each group and areas interacted with people, things, and environments from the other groups and areas. These continued interactions were not just governed by concerns about radiation. But they also were

not governed by the government. I cover this motion and navigation in greater detail for middle-range evacuees in Chapter 4 and throughout.

Given the unregulated flows of most objects, food, people, and vehicles between Fukushima, Yamagata, and the rest of Japan, middle-range evacuees had to negotiate and decide for themselves what was polluted and what was clean on a daily basis—just like those who were concerned about radiation but continued to live in central Fukushima. Furthermore, many of the voluntary evacuees with whom I spoke continued to interact with people and places in central Fukushima, where they were from, to where they made periodic visits, and to where the vast majority of them returned for good. Given the patchiness and micro-geographies of fallout deposition, it might well be possible that parts of central Fukushima, especially after decontamination, had lower radiation levels than the generally unmeasured and unmonitored parts of Yamagata. Fukushima prefecture had the most assiduous radiation monitoring in food out of all of the surrounding prefectures, so there were also people who believe Fukushima food to be safer because it was more thoroughly monitored. Of course, those who were critical of any government monitoring criticized the levels to which and procedures by which different foods were monitored and the impossibility of monitoring everything harvested from *every* field. At the same time, there were voluntary evacuees who bought Fukushima produce because it was cheaper, even as they lived in Yamagata.

Analytically, Kim Fortun's concept of "enunciatory communities" can help to articulate how I see grouping middle-range evacuees, families in Fukushima who were concerned about radiation, and nationwide civil society supporters. For Fortun, "enunciatory communities" are an extension of and in tension with "stakeholder communities." Whereas a stakeholder communities model acknowledges multiplicity of subject positions, it inherently seeks to bring the multiple

experiences and perspectives into consensus (Fortun 2001, 12). In theorizing advocacy, memory, and sufferers' experiences following Bhopal, Fortun finds problematic approaches that seek to group advocate-actors and sufferers into semi-static groupings. She also finds problematic approaches that cannot hold onto multiplicity and constantly morphing dimension of people's and groups' experiences and perspectives. This is how she comes up with her concept of "enunciatory communities." Fortun writes:

> Instead of locating enunciatory communities via indicators of interest or epistemological habit, I have focused on fields of force and contradiction – on the double binds that position enunciatory communities within new world orders. These double binds are more than "context" conventionally conceived. Enunciatory communities do not exist prior to the double bind, with which they deal according to an already coherent identity. Enunciatory communities are produced by double binds, which call into play both new and entrenched ways of engaging the world. The "identity" of enunciatory communities is strategically configured; collectivity is not a matter of shared values, interests, or even culture, but a response to a temporally specific paradox. (Fortun 2001, 12)

Here, Fortun means structural world orders of corporate pollution, environmentalism, justice and injustice.[23] I take "new world orders" to also mean new material and social world orders—new ontological materialities. There are several "temporally specific paradox[es]" to which my interlocutors were responding. One set of paradoxes involves trying to stave off exposure in the

[23] Fortun gives the example of double binds involved in deciding where to adjudicate the damages inflicted by Bhopal. To adjudicate in an American court would mean to perpetuate colonial hierarchies, in which the sovereign state of India is too weak to adjudicate on matters involving multinational corporations. However, a settlement in an American court would have meant much better compensation and greater damages. On the flip side, to adjudicate in Indian courts would mean asserting the power of India's courts, but meager compensation payments.

present to prevent the delayed onset of symptoms. Another had to do with social and economic support for their evacuations. In responding to these paradoxes, middle-range voluntary evacuees and families who remained in Fukushima were navigating what Fortun calls double binds: "[a] situation in which individuals are confronted with *dual or multiple obligations that are related and equally valued, but incongruent.*" (2001, 13, emphasis added). I see voluntary evacuee mothers, users of "rest and recuperation" camps, and those who took other radioprotection measures as enunciatory communities, especially given that their coming together into groups was transient and temporary.

Although their identity as mothers brought voluntary evacuees together, their identity as voluntary evacuees was new and formed as a result of the double binds they faced between radioactive contamination and wanting to remain close enough to their husbands and families. Many married voluntary evacuees left their husbands, their own families, and their in-laws behind in Fukushima when they took their children into mother-and-child evacuation. The tensions between the "good wife" and "wise mother" halves of the conservative "good wife, wise mother" ideal have been noted by other anthropologists writing about Fukushima women following the nuclear disaster (Slater, Morioka, and Danzuka 2014). I draw on and contribute to these discussions in chapter 4, where I discuss middle-range voluntary evacuees' "micro returns" to Fukushima. In addition to protecting their children from radiation, voluntary evacuee mothers also had to figure out how to continue upholding family and economic ties with relatives and property, including their homes, that remained in ambiguously contaminated grey zones inside Fukushima. Most of the evacuees I came to know during fieldwork, whether married, divorced, or single mothers from the start, made trips back and forth between Yamagata and Fukushima in part as a response to various family tensions. I call such short-term return visits by evacuees to

their Fukushima homes and families "micro returns." To go back and live in Fukushima forevermore is called the "final return" (*kikan*) out of evacuation, towards which voluntary evacuees are explicitly and implicitly guided by the government, bureaucracy, media, neighbours, friends, and family. What I call a "micro return" is anything short of "the" final return. Micro returns allowed voluntary evacuees to let fathers and grandparents see their children/grandchildren, participate properly in seasonal family functions, and when the time came to prepare for the "final return" (*kikan*).

Families who were concerned about radiation but could not self-evacuate lived in "decontamination in progress" Fukushima, rife with endless visible signs of a society dealing with radioactive contamination, including mounds of decontamination waste materials lining children's paths to and from school. To avoid possible internal radiation exposure, these families cultivated paths for clean food into Fukushima through grassroots food shipments from other parts of Japan; to lessen external exposure, they created periodic paths out of Fukushima for their children and themselves to grassroots "rest and recuperation" camps throughout Japan. Environmental exposures, however, remained a part of their everyday lives. Nationwide civil society supporters inside and outside Fukushima had to figure out ways to create networks with and for concerned Fukushima residents while still respecting Fukushima residents' dignity, self-empowerment, and choices. How could Fukushima be and be seen as both inhabitable, but abnormal enough to necessitate short-term "rest and recuperation" activities and food shipments? For how long could this irresolution continue?

By three to seven years after the initial fallout (2014 to 2018), on the one hand, everyday logics of habitation, cleanliness, and the procurement of clean food helped the Fukushima mothers with whom I spoke control nuclear risks for their children. On the other hand, they faced

economic constraints and encountered limits to what they could control as they continued to live everyday life in a mass consumption society, did their best to value kinship and community relations, and sought to support their children's proper socialization through schooling and family. They were tied to mortgages and lands, as well as to their families, whose views on the radiological situation differed.

Ultimately, I suggest that we can think of the experience of navigating double binds (dual or multiple obligations that are related and equally valued, but incongruent) through toxic and nuclear uncertainty as a constitutive experience of a kind of "middle classes" of risk society (Beck 1992). The middle classes of risk society are not protected by wealth or status, and only to a certain degree by mobility. Those in the middle classes of risk society can access alternative and scientific knowledge about risks. They can act on that knowledge, but only within economic and social constraints. The middle classes of risk society find themselves being told not to panic by governments and corporations whom they do not trust. They are encouraged to continue living their lives normally and to think rationally, in accordance with risk communication that sometimes verged on propaganda. Even as they do not trust the government's pronouncements of safety, they do not have the economic means to relocate without government or civil society support, so they alter their everyday lives to accommodate or mitigate the new risks.

A Neoliberal and Post-Developmentalist State

The modern Japanese state has been critiqued both as all-powerful in intervening in its people's lives, especially in kinship and gender (Germer, Mackie, and Wöhr 2014; Frühstück 2003; Goodman 2002b) and large-scale construction projects (McCormack 1996), including the creation of the nuclear power infrastructure across Japan (Apter and Sawa 1984; Aldrich 2008).

From the 1898 Meiji Constitution until former Prime Minister Jun'ichirō Koizumi's structural reforms in the early 2000s, family/kinship forms, nation/citizenship, Japan's and Japanese people's national and international economic participation, and central state intervention in kinship, regional administration, and economy have been intertwined in Japan. At the same time, the Japanese state has receded in neoliberal fashion since the restructuring of the late 1990s and early 2000s (Love 2007; Saito 2012; Kimura 2016). By looking closely at state support and intervention measures (and their absence) across the geographic and kinship levels I present in the dissertation, I articulate a bifurcated argument about the Japanese national state's response to the nuclear disaster. From the experiences of what I call "middle-range evacuees," we see that the government's response was not a monolithic, all-covering top-down response. It was also not entirely neoliberal.

In chapter 4, I show that the case of middle-range evacuees to Yamagata was one of moving between neoliberal "self-responsibility" and post-developmentalist interventions in Fukushima. Yamagata evacuees did have some financial government support, even though it was for a limited time. I pair this discussion of neoliberal governmentality with kinship, sense of identity through motherhood, and family obligations as relations and practices beyond an individuated "self," without which the "micro-politics" (drawing on Slater, Morioka, and Danzuka 2014) of voluntary evacuation cannot be understood. Post-developmentalist interventions, of which the widespread decontamination program is paradigmatically representative, apply to central Fukushima, and since Yamagata voluntary evacuees regularly interacted with central Fukushima, the post-developmentalist, interventionist measures were also part of their world.

"Self-responsibility" within the Context of Family

As with many aspects of life, the modernist Japanese state has been heavy-handed in prescribing kinship norms. Kinship in Japan is also notably changing. One of the ironies of the nuclear accident is that it destabilized conservative family structures in a moment when marriage and birth rates are historically low. Fukushima women's continuing to have and raise children now involves not only the preexisting considerations of domestic childcare, but also the added strife around disagreements about proper comportment in the face of, alongside, and in tandem with nuclear contamination. Even if an individual acts as an ideal neoliberal subject, free to choose how she lives her life, she nevertheless lives in a world of social relations, gendered care and domestic economy expectations (Lock 1993; Cwiertka 2006), local ways of becoming and being part of her natal and married families (Ueno 1987a, 1987b), and national ways of becoming and being a Japanese citizen and Japanese mother (Borovoy 2005).

Making radiation protection in areas beyond the officially declared evacuation zones into domains of "self-responsibility" (*jiko sekinin*) comes both from the government seeking to evade responsibility for contamination, on the one hand, and from people acting to protect themselves against a government and industry that they do not trust, on the other. These are both new and old forms of governmental and citizen concerns in Japan. Industrial pollution incidents and food scandals of the past influenced some citizens' agentive self-protection in matters of industrial food, environmental safety, and health consciousness (Walker 2010; Sternsdorff-Cisterna 2015). At the same time, there are undeniable dimensions of neoliberalism in corporations' and governments' externalizing the responsibility for dealing with contamination onto the individuals whose life spaces have been contaminated (Nixon 2011; Love 2007; Kimura 2018).

While empowered self-responsibility should theoretically allow for individuals to make their own decisions and act as they see fit, economic and social constraints make this empowered truth only attainable for a subsection of the population (Kimura 2016, 12–13, 132–33). Furthermore, someone, especially a mother, who showed too much concern about radiation ran the risk of being chastised by others for being overly "nervous" (*shinkeishitsu*), "hysterical" (*hisuterii)*, unscientific, and even unpatriotic (Slater, Morioka, and Danzuka 2014; Kimura 2016).

In Motion

Movement in cars, trains, buses, and planes was an important part of my fieldwork. Movement and the vehicles themselves were also an important part of my interlocutors' lives. Personal cars allowed voluntary evacuees to self-evacuate, make periodic visits back to Fukushima, and have their husbands visit them and their children in evacuation. Yamagata civil society supporters commuted to and from central Fukushima, as did some voluntary evacuees. Those who evacuated to Yonezawa, in southeastern Yamagata prefecture, did so with an eye on commuting to and from work in central Fukushima. Voluntary evacuee families in Yonezawa would sometimes not even tell their employers in Fukushima that they had moved. Cars were also like personal radiation protection vessels. Concerned mothers in Fukushima would drive their children to and from school in their minivans to shield them from the dusty walk or bike ride to and from school. All around Fukushima, there were trucks transporting decontamination waste materials and microbuses of decontamination workers. Tractors and cranes were visible in urban and rural areas, moving mounds of black bags full of decontamination waste materials. People and radioactive materials were in motion.

Food and the Layering of Multiple Values

As with evacuation, food decisions are rarely just about one value. Food practices in mass consumption, mass production societies like Japan are a mosaic patchwork of state and non-state, kin and non-kin, local and global things, knowledge, and practices. Navigating trust and risk in food exchanges is not only navigating state-assured technoscientific safety and risk, but also keeping in mind social relations with the grandpa down the street, the economic feasibility of health consciousness for a family based on their income, and ideological associations with food practices. I follow the sensibilities about food and food consumption that American anthropologist of the United States Heather Paxson (2013) illustrates in her work on cheese making in America that I think create complex, middle-of-the-way interpretations about food that also apply to food and everyday nuclearity in post-Fukushima Japan.[24]

Paxson argues that safety and danger in food is not only material. It is also ideological, personal, moral, nationalistic, and implicates gender and class (Paxson 2013, 4–6). As she so aptly writes:

> Food's goodness may … be evaluated in terms of bodily and social well-being, purity, status, emotional impact, ease of preparation, cost, and, not least,

[24] Though I am hesitant to apply analytics and conclusions derived from Euro-American or postsocialist contexts to Japan, there is sufficient interconnection and historical-political reasons that analytics developed in one complex, mass production-mass consumption-mass waste society can be productively borrowed and extended to contexts that are part of similar global production, consumption, and circulation processes. Furthermore, Eiko Maruko Siniawer, historian of waste in postwar Japan, notes that the material and ideological concerns and anxieties that "mainstream" middle-class Japanese faced through the postwar decades resonate with the concerns of those living in other mass production, mass consumption societies (Siniawer 2018). Siniawer argues that despite the exoticism and self-exoticism about Japanese and their relations to waste, "waste consciousness in postwar Japan was forged largely and primarily by the logics of phenomena that assumed certain forms but were not unique to Japan" (6). These phenomena include mass production, mass consumption, economic growth, affluence, material abundance, and growing environmentalism. As with the layering of multiple values in waste, the layering of multiple values in and through food is not unique to Japan.

> deliciousness. The *layering of multiple values* that constitute food's goodness can make fraught the politics of eating: how we enact the adage 'We are what we eat,' or pose the accusatory challenge 'You are what you eat.' Ethical trade-offs and inconsistency in food choices are hardly surprising, since what makes food culturally and culinarily desirable is not always the same as what is understood to make food nutritionally or socially beneficial (2013, 5, emphasis added).

What I want to emphasize is that the food decisions about which I write take place in a complex global-local market system, personal histories, and personal decisions. The reason why these discussions matter is because the vast majority of Japanese people, as most people in mass production and mass consumption societies, procure the things that constitute their everyday and life-trajectory lives, social relations, sense of self, and conscious and unconscious, discursive and pre/non-discursive meaning through global commodity chains (Miller 1987, 1998; Graeber 2011; Bird-David and Darr 2009; Rupp 2003). The questions that arise are endless. The most important point for me is that everyday food decisions are, as Paxson says, a "layering of multiple values."

Food is a central material, social, personal and interpersonal site of everyday nuclearity. Materially safe (*anzen na*) food about which one can feel reassured (*anshin*) is a branding catch phrase on almost any food sold in Japan these days (Sternsdorff-Cisterna 2015). As Yamakawa and Yamamoto (2017) and Sternsdorff-Cisterna (2015) point out, following the nuclear accident, state-sanctioned technoscientific material safety of food (*anzensei*) no longer made consumers, especially the Fukushima mothers with whom I spoke, feel reassured about foods on the market. Food that is chemically poisonous does not simply transcend the time and space of ingestion. The harmful chemicals within it can lodge themselves thus that they cannot be excreted or gotten rid of. They might manifest in illness that cannot be gotten rid of, illnesses that end lives and

persons. In Japan, there is living memory of mercury poisoning through fish consumption in Minamata (Ishimure and Monnet 2003; Walker 2010); the babies who could not become persons in the way that their parents and society desired because they had been given milk formula laced with arsenic in 1955 (Dakeishi, Murata, and Grandjean 2006; Volunteers in support of the complete implementation of a permanent control strategy, n.d.). It took half a century to begin to reconcile Minamata court cases, and many of these legal contests are still in progress and unresolved.

The ethnography that follows is full of moments when my interlocutors, trying however they could to lower their children's likelihood of possibly getting thyroid cancers or other radiation diseases, did what they could to avoid risky produce and other foods. They took micro political action (Slater, Morioka, and Danzuka 2014, 486), sometimes not even "speaking up," but communicating to their children with nods and shakes of the head about this dish and that dish on grandma and grandpa's table; quietly snatching milk processed in northeast Japan from their child's school lunch on a class visit day, and then quietly throwing it out; teaching their preschool-aged and elementary school-aged children what they cynically called "mushroom education," so that their children knew to pick out mushrooms from their soup, which are known to accumulate radioactive materials. Such moments of micro political action contradict safety proclamations and school-based socialization meant to have children take pride in local produce and become part of the moral Japanese community—things that voluntary evacuees also valued.

With prolonged fieldwork, I also came to understand that the social bonds surrounding food in family relationships often outweighed the material possibility of contamination in food in the minds of evacuees, as when Satoko accepted Aunt Natsuko's peaches and Chinatsu accepted her neighbor's gift of radishes, even if she later threw it out. I often heard voluntary evacuee

mothers speak of choosing to preserve social respectability in their relations with their husbands and in-laws, even if it meant possibly ingesting dangerous substances and allowing their children to eat Fukushima produce they would not otherwise let them eat. Even as voluntary evacuees and my interlocutors in Fukushima continued to question the technoscientific safety of government-sanctioned food on the market, they also began to eventually resign themselves to the knowledge that quantities of radioactive materials would be low enough, even though not zero, in this state-sanctioned foods. Mrs. Sasaki and Mrs. Sasebo's stories, both returnee voluntary evacuees about whom I write in Chapter 5, demonstrate this eventual move towards knowledge, ambivalence, and what Benson and Kirsch (2010) might call "resignation."

But even before the nuclear accident at Fukushima No. 1, the logics of trust and safety in the complex Japanese food system were in flux. Yamaguchi (2014) analyzes how, in the wake of food scares and scandals of the early 2000s, the Japanese government communicated contradictory messages of the simultaneous safety of food in Japan (n.b.. not just Japanese food) and scientific thinking on risk, which asserts that "there's no such thing as zero risk with food" (Yamaguchi 2014, 167). Consumers brought up on an ideology of zero risk nonetheless demand zero risk. But the state disagrees and withdraws from full control and guarantee of safety of all food. Consumers need to accept that there can be no such thing as zero risk, but that the risk is low enough to be of little to no concern. Environmental risks and radiation risks are communicated in strikingly similar risk communication modalities.

Food and the Absence of the State

The material and social reconfiguration of the post-contamination world had a strong influence from the Japanese state. But there were lands, air, and produce for which the

government abdicated radiological responsibility. My thinking on spaces, objects, and relations into which the state *does not* enter, especially through food, is influenced by anthropological studies on postsocialist societies (e.g. Dunn 2008).

Elizabeth Dunn's (2008) work on botulism and tomatoes in postsocialist Georgia has inspired my thinking about mosaics and patchworks of food practices. Dunn writes about an outbreak of botulism in postsocialist Georgia. The safety of bottled tomatoes during the Soviet period was assured by high-modernist food canning factories, which materialized Soviet science and state legitimacy into each batch of canned tomatoes. Postsocialist Georgia was a context where material and social control by high-modernist states collapsed, leaving spaces, objects, and relations into which the scientific industrial food safety protocols of the high-modernist state had formerly entered through each factory-bottled jar of tomatoes to become "self-responsibilitized." As people bottled their own tomatoes in their own kitchens out of nostalgia for nearly one hundred years of pickled tomatoes being a centerpiece on the kitchen table and out of nutritional need, an epidemic of botulism broke out because they did not can them properly. A food whose safety was once accounted for by the state through technological infrastructures that materialized science into safe bottled tomatoes was now no longer infused with the state's science and industrial food safety standards. A space (the kitchen table) that once had the state in it was now without state interventions and responsibility through the collapse of the state and the reconfiguration of the state through neoliberal policies.

Kaneko (2017) notes a similar production of "Self-resposibilitized" food spaces in his discussion of "nature's bounty" following Fukushima. Kaneko (2017) writes about the importance of forest/mountain commons as a source of mushrooms and "nature's bounty" for the elderly local people in officially-contaminated Kawauchi village. The forest commons are not

acknowledged by the central government as a target for decontamination, despite the integral role they play in local people's sense of self, connection to nature, and a seasonal food economy. Decontamination procedures focus on houses, twenty meters around houses, and economically productive lands, such as farms. Kaneko makes the case that even though the forests are contaminated and beyond the purview of the commercialist logics of decontamination, it is imperative to not only understand the importance of connections to the mountain forests for the locals of Kawauchi village, but also to support the locals' revitalization of their meaningful connections to the forest through the continued use of the forest for this purpose, rather than making the forests entirely off-limits (Kaneko 2017, 152). We are dealing with differentially configured foods, spaces, exposures, and health, in which "self-responsibility" means also "self-restraint" (*jisshuku*).

There is mixing of Fukushima produce surreptitiously in with non-Fukushima foods nationwide and locally. One example of this that was often remarked upon was rice. Fukushima *koshihikari* rice is delicious. It is top-notch, classified as "grade-A" rice in Japan. However, due to the nuclear accident, the national government and local farmers claim that mean, uneducated consumer are viciously spreading "harmful rumors" against Fukushima produce, and, as a result of this "(economic) damage from harmful rumors," Fukushima rice, as well as other produce, does not sell as well. Consumers are the problem, and they're being mean to Fukushima farmers. The flip side of this, from the point of view of concerned consumers, is that you can't tell us that there are absolutely no radioactive materials in the food from Fukushima, northern Kanto, and the northeast. It's been shown that there is contamination, even if it's minor. In other words, any "damage" to farmers is "actual damage" (meaning physical, material presence of radionuclides).

I have field notes from a meeting between evacuees to Yamagata and the national Reconstruction Agency, when the evacuees, over a meal, were telling the Reconstruction Agency representative about recent news headlines of contaminated rice being found on a farm in an area that is not a compulsory evacuation zone. The Reconstruction Agency representative countered right away that in that particular case, the fields had not yet been decontaminated, so it was not their fault that the contaminated rice was grown and harvested. First, this moment shows that food grey zones were real, even with monitoring procedures in place. Second, it shows that the national government would take on responsibility for post-Fukushima food safety only in tandem with decontamination. In other words, they were not taking responsibility for contaminated food if the contaminated food was produced prior to decontamination—even though the original contamination is the national government's and TEPCO's fault.

I take all this to mean that contaminated foods may well enter people's homes through local officially unmonitored food sharing. My interlocutors thought and knew so, too. When Chinatsu, about whose views of everyday nuclearity I write in chapter 6, quietly threw away daikon from her Kawamata neighbors, it was because she could not know the local geography of contamination in the patchily contaminated fields, with water running down to them from the hillier compulsory evacuation area. Satoko would only let Mari eat one slice of a well-intentioned gift of large, plump, fresh, delicious peaches from Aunt Natsuko's orchard in nearby Date City.

Contamination deposition was patchy, but not unknowable. The material and social results of responses to contamination were varied, but deliberate and informed. As I show in my discussion on nuclear toxic uncertainty in chapter 1, knowledge about nuclear risk and danger is patchy and varied, but was also actively being banalized. State-supported decontamination and

food monitoring were effective but patchy and did not incorporate all forms of food production, circulation, and exchange—even as food sharing and food gift-giving might. Personal radioprotection measures that were not supported by the state, such as voluntary evacuation, changing where one's food came from, and avoiding areas and foods could also never be absolute assurances of safety. These habitation and food decisions interfaced with family-based and school-based socialization, complex food systems, localism, and gift-exchange, making them additionally patchy not only through individual choice, but also through social life.

I take it to be my job as an ethnographer to both account for the layering of multiple values (Paxson 2013) and, more importantly, to present and analyze how people themselves—in various subject positions, in various relations, at various moments—account for their food, family, care, and life decisions and the meanings of those decisions and actions.

Fieldwork Methods

The ethnographic data presented in this dissertation is based mainly on 20 months of ethnographic fieldwork conducted between September 2014 and May 2016. Fourteen months, from October 2014 through November 2015, I conducted participant observation in urban and rural areas of Yamagata and Fukushima. I also conducted three follow-up visits in 2016 and a two-week follow-up visit in July 2018. Two and a half months of preliminary fieldwork in summer 2012 also inform part of the discussions in chapters 1 and 2.

Continual and recurring interactions with voluntary evacuees, their children, civil society supporters (*shiensha*), families continuing to live in Fukushima, and conversations with other users of various event and non-profit organization (NPO) spaces inform the ethnography. Throughout this participant observation, I took field notes and photographs; audio-recorded

public events; collected flyers, pamphlets, other ephemera; and read the most recent Japanese language publications on nuclear evacuees, nuclear disaster, and post-nuclear contamination life available at that time.

From January 2015 onward, I made regular trips back and forth to urban and rural central Fukushima with supporters, voluntary evacuees, and on my own, to visit families in Fukushima. From January through May 2016, I lived in Tokyo and conducted short-term comparative research with voluntary evacuees and civil society supporters in far-Western and far-northern Japan, as well as three follow-up trips to central Fukushima and Yamagata.

I began my fieldwork mostly working with voluntary evacuee mothers' groups and civil society supporters in Yamagata City. This remained constant as my fieldwork activities expanded into central Fukushima, where I volunteered at events hosted by the "Accept-and-Welcome Nationwide Association" (AWNA). At these events, I met civil society supporters from all corners of Japan and Fukushima mothers who were concerned about radiation, but who had never evacuated long-term from central Fukushima. Through the introductions of supporters and my on-going volunteering with AWNA. Most of the mothers with whom I spoke were voluntary evacuees from Fukushima prefecture to neighboring Yamagata prefecture. However, given the proximity of Fukushima City and Yamagata City and my methodology of volunteering with civil society support networks, my fieldwork straddled central Fukushima and southeastern Yamagata.

In Yamagata, I volunteered at five "rest and recuperation" camps, five cooking classrooms for voluntary evacuees, and over twenty seasonal events organized by evacuee supporters, such as rice planting, rice harvesting, potato stew events, and winter play in the snow. I also spent time on a regular basis at local evacuee support NPO offices and spaces, participated

in a weekly evacuee mothers' embroidery group, and volunteered at five official information sessions for voluntary evacuees held by Fukushima Prefecture and the national Reconstruction Agency.

In Fukushima, I volunteered at three all-day "rest and recuperation" information sessions and four small-scale grassroots events. I spoke at length with eight families about post-nuclear disaster life with whom I stayed on several occasions and these families' groups of local friends and kin, who shared their views and their family's experiences. I visited indoor play areas, local shrines and stores, and citizen science radiation monitoring groups with these families. I also asked key interlocutors to show me around their everyday "decontamination in progress" environments, attended a "decontamination tour," and accompanied two visits to compulsory evacuation areas with international audiences.

I went to the "green" compulsory evacuation areas three times: once with a "Decontamination tour" and twice with one of my key interlocutors, Chinatsu Yamata, showing me and a friend and colleague around. I went to the "yellow" areas two times: once as part of an organized informational tour for visitors from international NGO's and independent journalists, and once as a Japanese-English interpreter as part of a smaller trip organized for a visiting former representative from the Marshall Islands. I entered into the "red" areas once, as part of the same international NGO and journalist tour. I had one invitation to visit the crippled plant itself, but that was beyond was I was willing to risk for this research.

To supplement the participant observation and qualitative data collection, I audio-recorded in-depth interviews with 25 voluntary evacuees in Yamagata (20 of whom were voluntary evacuee mothers); 15 supporters; and 12 compulsory evacuees. In almost all cases, I audio-recorded two or more follow-up interviews with these same participants over the course of

the 20 months of fieldwork. These and the participant observation and multimodal qualitative data collection inform the overall ethnography.

The voluntary evacuees whose experiences and perspectives I share in this dissertation regularly took part in some form of local and evacuee-specific social activities, evacuee support groups, or knew local civil society support workers. These mothers did not report that they or their children faced discrimination due to their evacuee status in Yamagata society. Indeed, they clearly said that such was not the case when I asked. In some cases, they did experience difficulties making connections with locals, but they did not attribute this to their being evacuees, but rather, to the social dynamics of living in apartment buildings typically used for housing government employees. Their most pressing concerns were in normalizing the arena of daily life, managing family tensions, and navigating the uncertainty of continued economic and interpersonal support for continued evacuation.

The people in and out of Fukushima whom I came to know through my fieldwork are not activists. My inquiries were about personal and familial matters. Radiation and the nuclear power plant disaster are crucially central and interfused with non-nuclear hometowns, landscapes, identities, roles, values, relations; in some cases they destroyed bonds and people reconfigured those bonds and fabrics of life. I was studying how people live with and within their nuclear environments and what happens to families in such circumstances and situations.

Part 4: Overview of Chapters

This dissertation makes numerous contributions to risk studies, the anthropology of Japan, disaster and environmental anthropology, science and technology studies, among other fields. Chapter 1 builds on this Introduction. In it, I narrate structural shifts that occurred following the nuclear accident through hybrid analytical concepts derived from STS and

environmental anthropology. These concepts include nuclearity, toxic uncertainty, and social science scientific literacy. I hybridize these into my concepts of emergency and residual nuclear toxic uncertainty and my central analytic of "everyday nuclearity." Rather than just an imposition of etic analytics onto the Fukushima case, I also see this intellectual work as a contribution that translates the case of Fukushima into the language of English-language environmental anthropology and STS.

In the remaining chapters, I show through ethnography how voluntary evacuation, remaining in grey zones Fukushima, and return out of voluntary evacuation were not single-issue ("radiation only") decisions. Chapter 2 presents three of my key interlocutors' stories as they told them to audiences in far-western Yamaguchi prefecture in February 2016. I situate these stories as testimonials in the broader context of the stories that get circulated about Fukushima and in debates in anthropology about the effects of testimonials. In Chapter 3, I examine the rich everyday material knowledge and practical implications of the dust-like materialities of nuclear contaminants in people's everyday lives and spaces to argue that radiation moves in and out of visibility not only through technical means, but also through common-sense means and patterns. Radiation is not imperceptible and invisible always and it does not always require technological means to be a felt presence.

In chapter 4, I follow the close attention Slater, Morioka, and Danzuka (2014) pay to the micro-tactics taken by Fukushima mothers as they reluctantly made on-going compromises between radiation protection, on the one side, and the kinship and socialization expectations that are normatively placed on young mothers and the mother-child unit, on the other. The articulation of the mother-child unit with expectations and obligations to the extended family (*ie*), the nuclear family (*kazoku*), and the regional and national moral community (through

education) became double-binds (Fortun 2001) that middle-range evacuees navigated through locally-specific values and social roles. In chapter 5, I recount three mothers' stories of navigating everyday nuclearity around and through food to demonstrate how the layering of multiple values in food (Paxson 2013) means that questioning food safety is not only questioning material and emotional safety, but also many other dimensions of being that get instantiated through food. Chapter 6 tells various parts of my Fukushima mom's, Chinatsu Yamata's, story in greater detail in order to ethnographically show patchy grey zones of visible and invisible radiation, negotiations of everyday nuclearity, and Chinatsu's going about normal, everyday life.

I conclude with a discussion of how living in grey zones Fukushima was taking a form of what Benson and Kirsch (2010) call a "politics of resignation." I argue that this broader politics of resignation articulates with the kinds of mainstream, middle-class ambivalences towards mass waste in a mass consumption society that Siniawer (2018) describes in postwar Japan. These kinds of dispositions and navigations of contamination and normalcy are part of what the middle classes of risk society are faced with and learn to navigate. It is the new normal.

Chapter 1 Nuclear Toxic Uncertainty: "We Don't Know What's Right"

This chapter is a conceptual discussion of nuclear toxic uncertainty as it emerged and took hold in the lives of the people of Fukushima and Japan more broadly. As the nuclear disaster unfolded and official designations and directives were criticized, changed, and changed again, the people of Fukushima and Japan more broadly had to navigate contested material and social adjustments to what is normal and what is abnormal. From the get-go, this requires understanding that permissibility of radioactive exposures is a politico-historic set of decisions, not one of an absolute, objectivist science. The very same level of radiation can be considered dangerous under certain regimes of perceptibility (Murphy 2006) and perfectly acceptable under others. Such an understanding of science and regulation is common in science and technology studies (STS) (Franklin 1995) and in this chapter, I draw on two prominent STS scholars (Gabrielle Hecht and Takuya Tsujiuchi) to help narrate and analyze the unfolding of the nuclear disaster in ways that resonate with global nuclear knowledge contestations. I also draw on environmental anthropologists Auyero and Swistun's (2009) concept of "toxic uncertainty" to narrate this unfolding in terms of an initial emergency phase and a residual phase, in which the rest of the ethnography takes place.

I begin the chapter with science and technology historian Gabrielle Hecht's concepts of nuclearity, nuclear banality, and nuclear exceptionality as a basis for techno-politico-historical social constructionism of what is exceptional and what is banal when it comes to nuclear things. I then draw on environmental anthropologists Auyero and Swistun's (2009) concept of "toxic

uncertainty" to narrate the Fukushima No. 1 nuclear disaster in broad strokes. Third, I turn back to Hecht to narrate the ever-shifting zoning and thresholds of official nuclearity in the Fukushima case. Fourth, I draw on critical medical anthropologist Takuya Tsujiuchi to further conceptualize the specifically post-Fukushima Japanese context, in which disagreements between the "safety" and the "anti-safety" group continue through residual toxic uncertainty.

After conducting fieldwork in Yamagata and Fukushima three to seven years after the nuclear accident, I find Tsujiuchi's depiction of "we don't know what's right" as accurately capturing the creation of the various grey zones with which people had to contend. However, being handed uncertainty is not reassuring. Even as uncertainty should ideally allow for various responses to be equally valued, in actuality, economic, social, and political pressure to fall in line was placed on those who try to leave or dissent. In such a sociopolitical-economic environment, it cannot be said that all choices were equally valued and supported. My interlocutors nevertheless carved out their own patchwork methods of dealing with risk and uncertainty. To conclude the chapter, I develop my central analytic of everyday nuclearity, which intertwines the disagreements over nuclear knowledge and the acceptability of nuclear risks with the everyday practices and family decisions that my interlocutors faced. These everyday nuclear disagreements course throughout the rest of the dissertation.

Nuclearity

From the very start of our discussion, I want to make clear that this dissertation is not about nuclear apocalyptic exceptionalism. Some, if not most, American readers will likely approach "Fukushima" with the psychosocial disposition of what Joseph Masco (2006) calls "the nuclear uncanny." Masco is an ethnographer of everyday life in sites of the United States'

nationwide plutonium economy. In addition to everyday life in these nuclearly environments, Masco also examines Cold War and post-Cold War nuclear imaginaries in American culture. Broadly, for all Americans and many in our shared world full of nuclear weapons, the nuclear uncanny comes through as "the dislocation and anxiety produced by … moments of tense recognition" that we are living everyday life in a national context of being thirty minutes from complete world annihilation (2006, 27-28). [25] Masco envisions the nuclear uncanny "not simply as a figurative device, but as an ethnographic category, a subject eminently worthy of cross-cultural research" (2006, 34). Local manifestations of the nuclear uncanny result from the constellation of specific nuclear technologies, knowledges, and histories. To an extent, this dissertation offers such a cross-cultural perspective. However, I take issue with Masco's strongly exceptional formulation of disorientation in nuclear contexts. Nuclear things can just as much be banal, as Hecht (2012) argues.

In order to make preliminary conceptual sense of radiation debates throughout the accident and in "grey zones" of radiation contamination, I borrow the concepts of nuclear exceptionality, nuclear banality, and nuclearity from Gabrielle Hecht's work entitled *Being Nuclear: Africans and the Global Uranium Trade* (2012).[26] Nuclear exceptionality refers to

[25] The nuclear uncanny captures American disjointedness and unease between the unimaginably unthinkable timescales and effects of nuclear things on thinkability, bodily orientation, and human perception in nuclear worlds. Masco explains:

> The nuclear uncanny exists in the material effects, psychic tension, and sensory confusion produced by nuclear weapons and radioactive materials. It is a perceptual space caught between apocalyptic expectation and sensory fulfillment, a psychic effect produced, on the one hand, by living within the temporal ellipsis separating a nuclear attack and the actual end of the world, and on the other, by inhabiting an environmental space threatened by military-industrial radiation. [2006, 28]

[26] Hecht is an historian of science and technology who works on uranium mining in several different countries on the African continent. Through her far-reaching study, Hecht shows how constellations of politics and technologies allowed or disallowed varying practices and meanings around nuclear things in Gabon, Madagascar, the Congo, and South Africa. She also interweaves these African histories with colonial and postcolonial histories of Europe and North America. Geopolitical Cold War interests, mining and nuclear industry interests, and postcolonial nation-state politics incentivized and allowed for differing practices of radiation detection, conceptualization of bodies and

nuclear things when they are problematized, dangerous, and exceptional, whether in their potential for harm, or their miracle-like potential for glory. Hecht offers examples of nuclearly exceptional things that include uranium as a dangerous substance with the potential to obliterate the world, particular traces of yellow cake becoming evidence of rogue nations' nuclear weapons programs, and feared chromosomal aberrations that could destabilize the very biological nature of human and non-human being (2012, 6-8). In contrast, nuclear banality refers to nuclear technologies and practices that have been configured in such a way as to make them unexceptional (Hecht 2012, 8-13). Hecht gives many examples of nuclearly banal things, among them medical uses of radioactive isotopes and uranium traded on the world market for "peaceful purposes." It is easy to see "Fukushima" as an example of nuclear exceptionalism, even solely on the basis of it being one of the only two Level 7 nuclear accidents in history on the seven-tier International Nuclear and Radiological Events Scale (INES) (International Atomic Energy Agency 2017). However, are the resultant distributions of radioactive materials from Fukushima and Chernobyl (the only other Level 7 INES accident in history) also nuclearly exceptional? The answer depends on context, politics, and positionality.

At the core of her social constructionist ontological argument, Hecht conceptualizes *nuclearity* as, "a technopolitical phenomenon that emerges from political and cultural configurations of technical and scientific things, from the social relations where knowledge is produced" (2012, 15). Nuclearity is not synonymous with radioactivity or radiation. The mere

workplaces, and health records creation in different parts of the world, at different times. The translatability of the observations and the records that were produced into meaning—namely, possible health effects, permissible labor conditions, and what kind of trades in materials and technology were possibly dangerous or banal—shifted depending on many interlinked factors. A uranium mine could be an ordinary (nuclearly banal, but ordinarily dangerous) work place one day, and a nuclearly exceptionally dangerous health hazard the next. Uranium ore could be a nuclearly exceptionally dangerous substance to trade one year (because it could be enriched into weapons-grade material), and nuclearly banal the next (because it would be used in "peaceful" nuclear reactors). Hecht calls this relative nuclear banality or exceptionality of places, practices, and things their "nuclearity."

presence of radiation or ionizing radiation does not make a situation nuclear. As particular constellations of nuclear things, knowledge about those things, and politics and morality around those things are made more or less banal or exceptional, their "nuclearity" can also oscillate between the nuclearly exceptional and the nuclearly banal (2012, 15). Crucially, Hecht argues that, "Agreements and disagreements about *degrees* of nuclearity have significant consequences" (2012, 16, emphasis in original). This is certainly the case in Japan post-Fukushima. On the one hand, the government deems background radiation, yearly air dose measurements below a certain threshold, and decontaminated areas—indeed, any areas beyond the official evacuation zones—to be nuclearly banal. On the other hand, those same places, ranges of exposure, and procedures are deemed nuclearly exceptional by voluntary evacuees, concerned citizens, citizen scientists, and national and international environmentalist organizations.

Now that we are primed to expect, rather than be surprised by, disagreements and shifts in what is nuclearly exceptional and what is banal, I turn the early days of the nuclear disaster, as the people of Fukushima, the national government, and world governments disagreed about what would be acceptable and unacceptable nuclearity.

Emergency Toxic Uncertainty and Residual Toxic Uncertainty

"Toxic uncertainty" refers to a situation where disagreements among experts and structurally powerful organizations result in confusion and contrasting views about the safety and/or danger of the environment, environmental and medical risks, and health effects among people who live in those debatably toxic environments (Auyero and Swistun 2009; Singer 2011). Auyero and Swistun (2009) work in a context where toxic uncertainty has been ingrained for decades. Crucially, "toxic uncertainty" does not blame people's lack of understanding or

education for the epistemological confusion and lack of unified understandings of environmental risks. Auyero and Swistun clearly implicate the larger contexts in which people find themselves for creating the confusion and contrasting understandings. I would argue there were two stages of toxic uncertainty following the Fukushima nuclear disaster: the emergency phase and the residual phase. These do not align with nuclear exceptionality and nuclear banality. The nuclearity of the emergency situation and the nuclearity of the residual situation were constantly contested. This dual temporal categorization parallels less the nuclear fallout itself and more the most jarring moments of transition in the government's response to the accident.

First, there was the emergency phase of heightened confusion amid cascading disasters. As heightened radiation levels in certain municipalities were ascertained, communities and homes were wrenched away from their inhabitants and into governmental jurisdiction. People of those municipalities were forcibly expelled from their homes and communities for five or more years. Beyond the government designations, fear of the biological damage that invisible radiation exposure in the present could cause for their children in the future compelled people out of their homes and away from their hometowns. By Saturday, March 19, 2011, eight days after the unprecedented 9.0 magnitude earthquake and the start of the nuclear disaster, heightened levels of radioactive iodine were found in milk and water across central Fukushima prefecture. The circulation of milk and produce from the northern Kanto prefectures of Ibaraki, Chiba, and Tochigi was temporarily stopped, as radiation levels were assessed. Tokyo tap water, over 250 km away from the crippled nuclear plant, was found to have heightened levels of radioactive iodine and was not recommended for infants to drink.[27] Radiation detector sirens blared, cell

[27] There are several isotopes of radioactive iodine that are emitted in nuclear fission. The most commonly noted one is iodine-131, which has a half-life of 8.02 days. It decays quickly and no trace amounts remain after one year, but is a major public health concern that requires quick action (EDP Sciences n.d.). Iodine-131 can be absorbed by the thyroid instead of stable iodine and cause thyroid cancer, especially in children (World Health Organization 2006).

phone messages and emails flew from friends and online blogs, and there were endless media reports on the nuclear plant and the tsunami destruction.

Yamakawa and Yamamoto argue that 3-11 also resulted in a disaster of public mistrust in government, experts, media, and science resulting from the government's handling of the nuclear disaster (Yamakawa and Yamamoto 2017a; Yamakawa, Nakai, and Yamamoto 2017). Four days into the disaster, on March 15, the government extended the official evacuation zone to 20 km around the crippled power plant. People living 20-30 km from the plant were told to stay indoors. Everyone else beyond the 20 km zone was told not to worry, even as fallout undeniably fell on them, their homes, and their world. One medical doctor's remarks provide a notorious example of how Fukushima residents' anxiety, fear, and bids for knowledge were met with condescension and clearly out of touch explanations from what came to be called "government-beholden scientists" (*goyō gakusha*). On Friday, March 25, 2011, at the Terusa Fukushima Building, Dr. Shin'ichi Yamashita explained to those present and those watching, listening, and reading the rebroadcasts of his statements that, "The effects of radiation do not come to people that are happy and laughing. They come to people that are weak-spirited, that brood and fret" (Blogger "Northeast-Kanto Great Earthquake Press Conference Summaries Pig's Room" 2011; Radio Fukushima 2011; Hixson 2011).[28] Dr. Yamashita's remarks garnered him the derogatory nickname "Damashita," which means "He fooled us." Government reassurances of safety flew in

[28] 放射線の影響は、実はニコニコ笑っている人にはきません。くよくよしている人にきます。これは明確な動物実験でわかっています。酒飲みの方が幸か不幸か放射線の影響が少ないんですね。けっして飲めということではありませんよ。笑いが皆様方の放射線恐怖症を取り除きます。でも、その笑いを学問的に科学的に説明しうるだけの情報の提供が、今、非常に少ないんです。
[AS translation: "The effects of radiation do not come to people that are happy and laughing. They come to people that are weak-spirited, that brood and fret. We know this from clear animal experiments. Whether it's something to be happy about or not, we also know that the effects of radiation are low in people who drink alcohol. Now, of course I'm not telling you to go drink. Laughter will do away with your radiophobia. However, the information we have about laughter is extremely limited, much less than what we would need to be able to fully scientifically and academically explain these [effects] of laughter."]

the face of even the government's own countermeasures and messages of risk. Even as nuclear power plants exploded, heightened levels of radiation were observed far and wide, tens of thousands of people were forcibly evacuated, and restrictions on produce were imposed, people across the country were told not to panic. Even as major Japanese news companies forbade their own correspondents and employees to enter into Fukushima (Geilhorn and Iwata-Weickgenannt 2017; McNeill 2014), local residents beyond the 20 km zone were told to stay put and not to panic.

The government and news media embarked on a wide-ranging and concerted effort of risk communication, which was met with a social media storm of tit-for-tat counter-arguments.[29] This tit-for-tat dynamic continues to this day. An infamous headline that circulated far and wide came from then-Chief Cabinet Secretary Yukio Edano, who exemplified failed risk communication with the statement, "there will be no immediate health effects." This led mothers of young children all across eastern and northeastern Japan and many others to ask, "What does 'immediate' mean?" The Chief Cabinet Secretary and others used risk communication that compared the increased chance of cancer from the then-current levels of exposure to only about the increase in chance of cancer from smoking one pack of cigarettes. This led mothers to counter, "I wouldn't let my child smoke one pack of cigarettes, and here I have no choice!" (fieldnotes July 2012). Mistrust of the Japanese government also grew when the government raised permissible external radiation exposure limits for the general public from 1 to 20 milliSievert per year (mSv/yr). Twenty mSv/yr is the permissible yearly radiation dose for nuclear power plant workers in non-emergency conditions; it was now to be applicable to infants

29 Geilhorn and Iwata-Weickgenannt (2017) use the hyperbolic metaphor of a tsunami when referring to the inundation of information, critique, arguments, and counterarguments. I am conflicted about unreflexively perpetuating this metaphor.

and children. Meanwhile, the government left accurate predictions about the possible spread of radioactive materials from the System for Prediction of Environment Dose Information (SPEEDI) undisclosed for over one month. This led tens of thousands of compulsory evacuees to evacuate northwest, in the direction of heightened fallout. There, they were reassured that the heightened levels of radiation were acceptable, only to be told six weeks later that this was actually not the case, and made to evacuate a second time (Gill, Steger, and Slater 2014, 13). In the months and years since, requests by investigative journalists and activists for the release of radiation-related information by the government and industry have been met at times with literal non-transparency in the form of blacked-out records (Hino 2013, 2015).

Throughout, non-government sources of information emphasized the dangers of radiation, encouraged self-evacuation, and offered people methods for self-protection. Evacuation orders from American, French, and other world governments contradicted those given by the Japanese government to their own people. The American consulate encouraged American citizens up to 80 km from the plants to evacuate. The French consulate extended their evacuation orders to include the greater Tokyo area, 250 km from the plants (Gill, Steger, and Slater 2014, 12). Even as two of the most knowledgeable nations when it comes to nuclear energy and nuclear health risks (the United States and France) ordered evacuations based on the radiological situation, the Japanese government sought to keep its citizens beyond the official 20-30 km evacuation zone in place and argued that this was scientifically rational and legally acceptable to do so. [30]

[30] Despite the differences in American and French histories and practices of acquiring nuclear health knowledge (Hecht 1998, 2012), the United States and France are leaders of the Western Euro-American-Japanese post-World War II global capitalist nuclear order. Whereas Soviet and post-Soviet Eastern European scientific knowledge about health effects from Chernobyl could be discredited simply on the basis of anti-Soviet prejudice among Euro-American radiation population geneticists (Goldstein and Stawkowski 2015), it is not as easy to so categorically dismiss the basis of scientific validity behind evacuation orders when they come from these very governments.

These are but some examples of growing toxic uncertainty during the emergency phase. As noted earlier, "toxic uncertainty" refers to a situation where disagreements among experts and structurally powerful organizations result in confusion and contrasting views about the safety or danger of the environment, environmental and medical risks, and health effects among people who live in these contexts (Auyero and Swistun 2009; Singer 2011). The twenty-fold spike in permissible yearly exposure levels in order to legitimize a policy of continued habitation makes sense from the International Commission on Radiological Protection's (ICRP's) justification and optimisation perspective. It was and is accepted practice to increase permissible doses during a radiological emergency to between 20 and 100 mSv/yr according to recommendations by the International Commission on Radiological Protection (2008, 5, Basic principle (b); 18, para. 26). As the radiological emergency and short-lived isotopes stabilize, the Commission recommends that national governments aim for between 1 and 20 mSv/yr of exposure during the residual exposure period (International Commission on Radiological Protection 2008, 10, Basic principle (z); 50, para. 141). The Japanese government duly followed these recommendations.

These principles themselves contradict the ICRP's own Linear Non-Threshold (LNT) hypothesis, which states that the possibility for health effects from any radiation exposure is linearly cumulative and that there is no threshold below which radiation exposures do not add to the cumulative effect. but it turns out that the LNT itself is now outdated, having been supplanted by a what is *de facto* a 100 mSv threshold and a broader move in the nuclear industry from regulating exposures in terms of thresholds to communicating in terms of risk (Boudia 2013). But the best models for deterministic and stochastic effects of low-dose exposed all remain debated, even in the field of radiobiology. See, for example, Tubiana et al. (2009) who argue

against the Linear Non-threshold hypothesis, whereas Little et al. (2009) argue that the LNT may still be the best approach available.

Furthermore, this does not mean that people on the ground took these to be the proper actions in protecting their well-being. For Mrs. Honda, whose story I tell in greater detail in chapter 4, and others, the spike to 20 mSv/yr was a sign of the government's intentional exposure of only part of its populace to the possible negative health effects of radiation exposure. Mrs. Honda is a pharmacist. She had studied about the health effects of radiation exposure in medical school. The textbooks hadn't changed. Understandings of what radiation does hadn't changed. And yet, somehow now it was acceptable to be exposed to twenty times more than before the accident. She had to do something to protect the health of her two daughters. She voluntarily evacuated to neighboring Yamagata.

For Sayori, who was in ninth grade at the time of the disasters in 2011 and a junior in college when I interviewed her in 2015, the people of Fukushima were being used as guinea pigs (*morumotto*) in a human subjects research program, where the result will be a better population-wide understanding of the effects of low dose radiation exposure on human populations, at the scale of hundreds of thousands of people. Sayori is plugged into critiques of nuclear knowledge and the nuclear establishment on social media. But in her own family, she has had to navigate her parents' disagreements about evacuation, whether to return to central Fukushima, and where to buy food.

In picking up the critique of Fukushima residents being used a guinea pigs, Sayori echoes a critique that has traveled far and wide throughout the world of scholars, citizen scientists, and independent journalists, who also point to a similar interpretation of the Fukushima Health Management Survey (Wataru 2012; Hino 2013). Participants may choose whether they become

part of the data, but, unfortunately, they cannot choose to avoid exposure, since radionuclides are in the air they breathe, food they eat, soil, and water. Participants will receive lifelong health screenings and free medical care, with encouraging messages that it is a very small minority who might develop health effects—even as the need to conduct the "experiment" itself attests to the fact that such pronouncements of safety are not absolutely known. Sayori and some Fukushima mothers with whom I spoke pointed out: If the almost absolute safety of these levels of radiation exposure were already known, why would the study be necessary? If the study is necessary, how can seeming conclusions about "most likely" safety be promoted?

In time, emergency toxic uncertainty became what I call residual toxic uncertainty: an unresolved, debated state of environmental pollution with complex temporalities and materialities, social and economic responses, and competing timelines, multiple expertise, and a cacophony of voices each with different social power supporting them. What is crucial to note here is that not feeling reassured about the danger, safety, risk, or acceptability of radiation comes from mistrust in the state, *not* as a result of the invisibilities of radiation and radiation's being beyond human perceptibility, as Beck (1992), Adam (1998), Masco (2006), and so many others writing about nuclear things regularly assert. As Tateno and Yokoyama (2013, 1) note in the case of Fukushima, "[Mothers'] anxiety derived from distrust of the government and uncertainty about scientific information, rather than lack of knowledge although risk communication emphasized learning the scientific mechanism." Trust and mistrust in experts and the understandings of risk, danger, safety, and acceptability they peddle are crucially important in navigating toxic disasters, toxic environments, and toxic everydays.

Deposition

The most bureaucratically consequential divisions of official exceptional and banal nuclearity of the post-contamination world in Japan are the official evacuation zone designations, which have shifted considerably over the past eight years. Understanding these shifts gives a good sense of the instability of even official nuclearity. I describe key changes in official evacuation zone designations and some salient debates about the validity of the criteria used to make these zone designations. Disagreements about the validity of these designations are a case in point of how nuclearity was debated following the nuclear accident at Fukushima No. 1.

The official evacuation zones following the nuclear accident did not align with the presence or absence of radioactive materials. Fallout deposition from a nuclear power plant accident is a complex set of physical, atmospheric, and geological processes. Generally, all concerned parties in Fukushima prefecture have a good sense of where radioactive materials fell as a result of the nuclear disaster (Kawatsu, Ohse, and Kitayama 2017). These shared understandings of deposition are the result of both official fly-over government air dose measurements and independent citizens scientist measurements. What have been hotly debated are risk and safety logics, the acceptability for different forms of human habitation in environments with various levels of radioactive materials in them, and the logics and practices of the health management of exposed populations.

The global and local reaches of aerial dispersion of radioactive materials is common sense to those who know about Chernobyl deposition patterns, "down-winders" around the Hanford site, and stories of black rain following the atomic bombings of Hiroshima and Nagasaki (Brown 2013; Petryna 2013; Ibuse 1969). Fallout is carried by “the wind” and deposited with precipitation. It also goes farther if taken high enough up into the atmosphere.

Deposition of radionuclides all across the northern hemisphere from above-ground nuclear weapons testing from the 1940s up through the Limited Test Ban Treaty of 1963, is widely recorded (Beck and Bennett 2002; Prăvălie 2014; Phillips 2013, 6). The fallout we talk about in Fukushima, Chernobyl, the Marshall Islands, Semipalatinsk (the Soviet nuclear test site in Kazakhstan), Hanford, Nevada, Hiroshima, Nagasaki, and beyond is more localized than the globally spread fallout from above-ground nuclear testing. Perhaps it may be useful to think of atmospheric fallout of the "down-winder" and "precipitation deposition" variety as a kind of medium-range fallout. It is more highly concentrated than that which gets picked up and spread around the globe, but less concentrated than the runoff and soil closest to radiation contamination sources, not to mention nuclear fuel or fissile materials themselves.

There are constantly new fallout maps being produced and circulated. Any map of the distribution of radioactive materials and evacuation zones opens itself up to questions surrounding the understandings of radiation that it reflects, the process of its creation, the appropriateness and legitimacy of these measurements, and the affects and conclusions to which it drives or is meant to drive those who access and interact with it (Kuchinskaya 2014). As Crampton (2001) aptly argues, maps are social constructions that are technologies of power-knowledge. The meanings accrued to these representations and the processes of their creation influence the validity of the use of particular maps by various actors in various arenas. Citizens create maps of hot spots that challenge official maps. Concentric circles and diameters are a bureaucratically expedient way for the state to create maps, representations, and devise actions. I do not seek to provide the most recent or most accurate maps here, nor do I wish to engage in a discussion about what version of moral outrage it ought to incite. I use the following maps as a

starting reference point to help orient my readers as we focus in on radioactive grey zones following the Fukushima No. 1 nuclear accident.

As we look at some maps, there are two fundamental points:

1. Radioactive fallout does not deposit in concentric circles around its source. It is carried by wind and precipitation and deposited where the wind blows and the precipitation falls (Figures 1.1 and 1.2).[31]
2. Official evacuation zone designations *do not* align with the presence or absence of radioactive materials. Fallout does not stop at town or prefectural borders, even if compensation payments, food monitoring procedures, and decontamination procedures do.

The maps below do not capture the complex materialities of fallout deposition and circulation. I engage further with the materialities of radioactive materials in chapter 3.

[31] This was an oft-repeated point on a "Global Citizens Conference on Fukushima" tour that I went on. Going further, Davis and Hayes-Conroy in their theorization of risk distribution and the movement of people and materials in terms of "wet ontologies" and micro-geographies of risk. A photograph from Davis and Hayes-Conroy's work is demonstrative of risk micro-geographies (2017, 5).

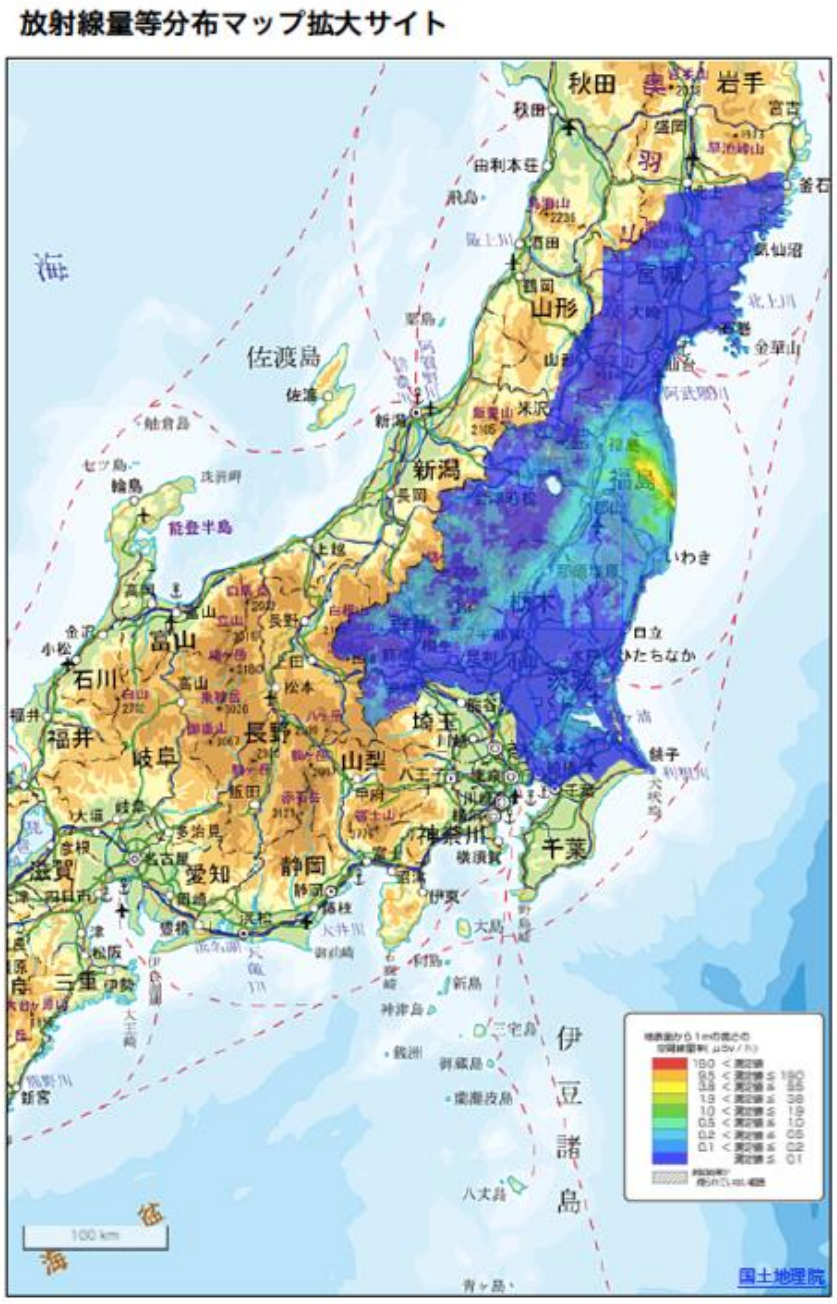


Figure 1.1 Contamination map of northeast and east Japan.

Aircraft monitoring for Cesium 134 and Cesium 137 contamination conducted in summer 2011.
Source: Extension Site of Distribution Map of Radiation Dose, etc./GSI Maps (2017).

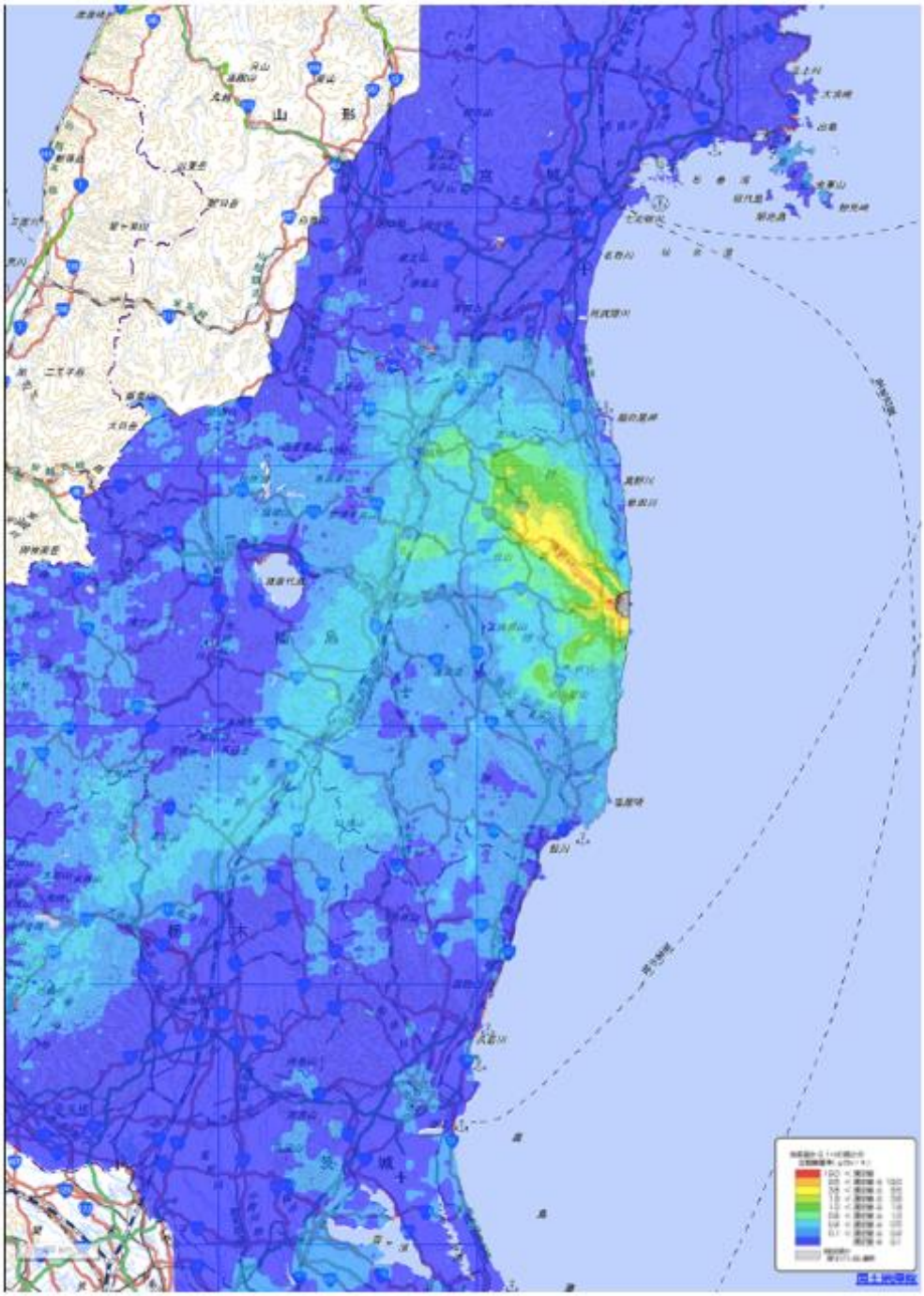


Figure 1.2 Contamination map, zoomed onto northeast and east Japan.

Aircraft monitoring for Cesium 134 and Cesium 137 contamination conducted in summer 2011. Source: Extension Site of Distribution Map of Radiation Dose, etc./GSI Maps (2017).

Circulation

Though not an ethnographically-derived concept, Davis and Hayes-Conroy's (2017, 5) use of Steinberg and Peters' (2015) oceanic metaphor of "wet ontologies" to understand flows and circulations of radioactive materials is a helpful starting point for imagining already-known ways that radioactive materials move and flow (2017, 5). Geographers Davis and Hayes-Conroy employ the combined perspectives of "wet ontologies" and "absencing/presencing risk" to discuss "the complex geographies of radiation and the associated geographies of risk" (2017, 4). Here, I will focus on the affordances and limitations of the concept of "wet ontologies" as a metaphorical way to make sense of radioactive materialities beyond the official evacuation zones.[32]

[32] Davis and Hayes-Conroy's use of "ontology" differs from the sustained "ontological debates" that have raged on in sociocultural anthropology since the early 2000's (Bessire and Bond 2014; Mol 2002; Povinelli 2016). Some have critiqued "ontological anthropology" for seeking to substitute "ontology" for "culture." I think of "ontology" as the assemblage of cosmological forces and things that spatiotemorally, materially, ideologically, discursively, and bodily orient people in their world/s. "Ontology" is a shorthand way of signaling "expected functioning of existence" or "reality." A thorough review of the rich literature on existence and ontology, singular or plural, is beyond the purview of this essay, but it is important to note that "ontologies" may change as the assemblages of epistemologies, practices, the regularity of experienced material worlds, and everyday life change.

In their original article on wet ontologies, Steinberg and Peters (2015) emphasize oceanic materiality more literally than Davis and Hayes-Conroy do in their article on Fukushima. As I considered Steinberg and Peters' methodology of literally and metaphorically engaging the materiality of oceanic ontologies and Davis and Hayes-Conroy's application of the notion of "wet ontologies" to the Fukushima case, I thought of even more radical ways of extending the metaphor. Metaphorically, to extend the materiality of the ocean into our understandings of the circulation of radioactive materials from a scale of everyday human interaction might mean thinking of "going for a swim" in a "lake" of radioactive materials, getting out of the lake, wiping off the [radioactive] water, and using domestic bathing with hygienically modern water and chemicals to wash away the [radioactive] dirtiness that sticks to the body after a swim in the [radioactive-materials-containing] lake or ocean. [32]

A wet oceanic metaphor is evocative also if one thinks of the initial accident and deposition as a set of nuclear tsunamis that swept through terrestrial Japan originating from oceanic tidal waves that devastated the nuclear plant. The tsunamis of radioactive materials ravaged—but did not kill—bodies, towns, homes, produce in their path. Once they had swept through, they did not pull back as quickly as the oceanic tsunamis. They became embroiled with the materialities of terrestrial soil-air-water systems. Indeed, as the debris from the oceanic tsunamis needed to be cleared, decontamination workers have been attempting to clear the cataclysmically widespread nuclear debris deposited by the nuclear tsunamis. The materiality of the nuclear tsunami debris changes over time, as do the effects from one-time or continued exposure.

First, with regards to geographies of deposition and circulation, a starting point for understanding the deposition of radioactive materials can be relatively accurately gleaned from a two-dimensional Euclidean representation like the above maps. From this static snapshot, we then need to think of currents and flows. For Davis and Hayes-Conroy, using wet ontologies to think of radioactive materials deposited terrestrially allows them to articulate "geophysical and social processes [that are] always in motion and in a constant state of becoming" (2017, 5). Davis and Hayes-Conroy emphasize how radioactive materials churn through layers of soil; can be picked up into the air; move through the leaves, branches, and roots of trees at different rates, leading to different concentrations in different times; move through and deposit in human and nonhuman biologies in ways that shift and change over time (2017, 5). In short, the radioactive materials-containing world is ever-becoming and ever-changing. Metaphorically thinking about this material becoming and change in terms of oceanic metaphors of flow and mobility helps to conceptualize its scope and scale.

Ever-shifting, Porous Official Evacuation Zones

Even official nuclear exclusion zones and the rationale for them have been continually in flux. The scientific and moral basis for these designations and the validity of the numerical thresholds upon which these designations were established continue to be points of debate. Radiation was also dealt with in terms of place, but what places were considered acceptable for

Evocative as such a metaphor may be for thinking about radioactive materialities at large scales, it runs the danger of Orientalizing a cataclysmic Japanese nuclear accident in terms of quintessentially Japanese cataclysmic oceanic materialities. At the same time, I find the colossal yet contained spatializing allowed for when thinking of a radioactive event in a tsunami-metaphor to be helpful when thinking of the mid-range scale at which we need to think about impacted areas in this dissertation. Furthermore, it helps to keep in mind the ever-churning three-dimensional imagination of biomatter as if it were masses of ocean water moved by currents that contain radioactive materials moving through landscapes, organisms, and biologies.

habitation, passage, and other activities was always changing even in official designations and constantly open to official and personal reclassification. Radiation was a concern in terms of circulating produce, things, vehicles, and people—all of which had various official and unofficial logics of control and organization. This, of course, included neutral and positive associations, where places and things were interacted with normally, as anywhere else. I analyze the ways my interlocutors dealt with radioactive materials, food, circulating objects, vehicles, people, produce, place, and more in later chapters. Here, I examine how levels, zones, and thresholds of official nuclearity have shifted over the years. Iitate village and Kawamata Town are good examples of constantly shifting bureaucratic zone designations. They are the closest radiation "grey zones," adjacent to and shifting into and out of being compulsory evacuation areas.

Iitate was originally outside of the "deliberate evacuation areas" (the 20-kilometer zone) and even the "evacuation prepared areas in case of emergency" (the 30-kilometer zone; "In-house evacuation" zone) (Figure 1.3, below). Roads from within these original evacuation zones lead to the northwest—to Iitate. Evacuees from Namie, Futaba, and Minami Soma thus headed northwest, to Iitate, as they evacuated according to the government's orders. Once they arrived, they were assured by government officials for over one month that it was safe and acceptable to remain in Iitate, despite heightened radiation levels. Then, on April 22, 2011, six weeks after the start of the disaster, evacuees and Iitate village residents were suddenly told that the levels were in fact too high to allow further habitation until decontamination was conducted. The former 20 km evacuation zone became the "Restricted Areas." The entirety of Iitate village was designated a "Deliberate evacuation zone" and that the locals and the people who had evacuated there needed to evacuate (Figure 1.4, below). The Yamakiya district of Kawamata Town was also designated a "Deliberate evacuation zone" at this time.

For those from the initial evacuation zones, this meant a double-evacuation after six weeks of living in a heightened radiation environment that the national government had assured people was fine. Dr. Yamashita also made a visit. For those from Iitate and Yamakiya, this also meant that they had lived for six weeks in an area of heightened radiation, which was now deemed dangerous to continue living within, even as those six weeks were said to pose no immediate danger to people's health. In other words, the added exposures due to government incompetence and change in the government's perspectives on nuclear acceptability were to be seen as nuclearly banal. With the rezoning of April 22, 2011, the 20 km radius for evacuation thus extended up to a 40 km radius into the northwest. At the same time, to the south, the 30 km radius started to shrink and take the shape of municipal boundaries.

Evacuation zones were reconfigured yet again in March 2012, one year after the start of the nuclear disaster. This time, the existing evacuation areas were to be separated into three gradations based on their air dose radiation measures. This created three distinct, but interlinked and neighboring, gradients of evacuation zones: the "red," "yellow," and "green" zones (Figures 1.5 and 2.6, below). These three gradients were preliminarily applied based on measurements of air dose in these regions taken from aircraft fly-over measurements in summer and fall 2011. In April 2012, each zone and its now scattered residents were thus assigned differing fates and temporalities for remediation. As I will go into later, they were also well-compensated as compulsory evacuees.

Official on-the-ground measurements (actually, one meter *above* the ground) and the affixing of one of these three designations was carried out through summer 2014. To finish the remediation narrative, the government continued its charge towards the lifting of as many evacuation orders as possible on March 30, 2017 (Figure 1.7, below).

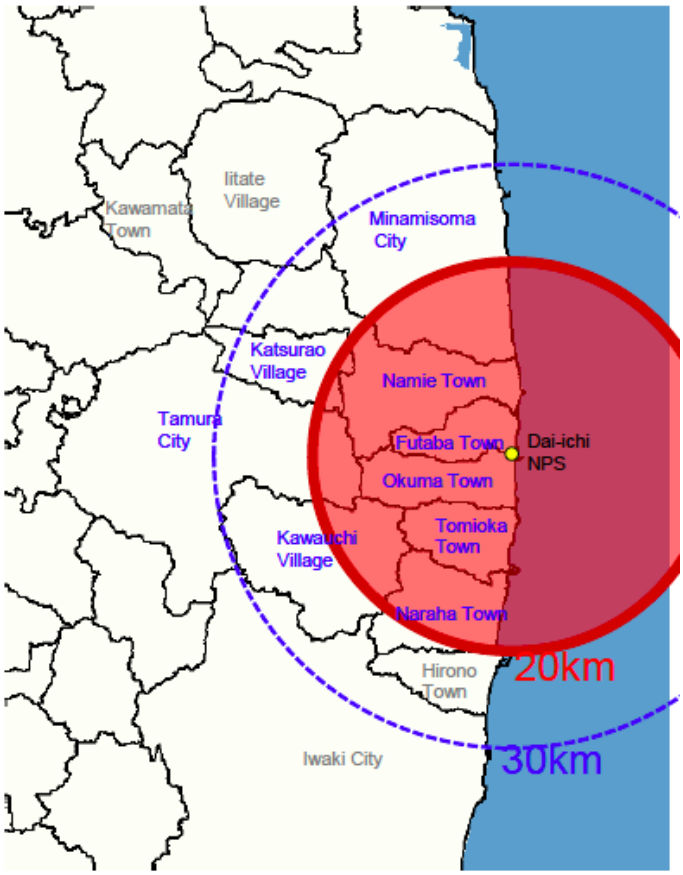


Figure 1.3 "Deliberate evacuation area," in red. "In-house evacuation area," between red and blue circles. Effective March 12, 2011, through April 22, 2011.

Source: Cabinet Office, Japan and Support Team for Residents Affected by Nuclear Incidents (2012).

Figure 1.4 Reconfiguration of evacuation zones on April 22, 2011.

Source: Cabinet Office, Japan and Support Team for Residents Affected by Nuclear Incidents (2012).

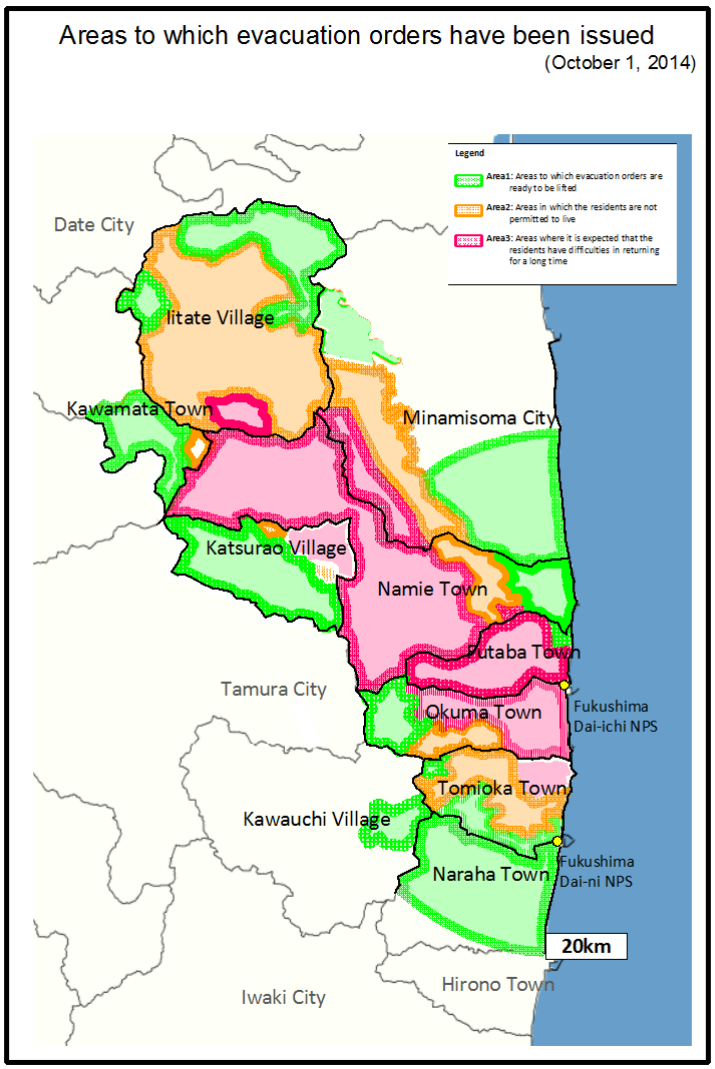


Figure 1.5 Green, yellow, and red compulsory evacuation designations effective starting March 29, 2012.

Evacuation orders to yellow and green areas have been lifted piecemeal from summer 2012 onward. Evacuation orders to most green areas have been lifted as of March 30, 2017.
Source: Ministry of Economy, Trade, and Industry (2014).

Practical operations for designating areas to which evacuation orders have been issued as newly designated areas		
	Basic Definition of the Areas	**Details of Practical Operations**
Area 1 [“Green”] Areas to which evacuation orders are ready to be lifted	Areas where it is confirmed that the annual integral dose of radiation will definitely be 20mSv or less	1. People concerned can pass through the areas along main roads, return home temporarily (staying overnight is prohibited), and enter the areas for the purpose of public benefit. 2. People concerned can : [a] resume businesses such as manufacturing, but regarding such businesses for the residents in the areas such as hospitals, welfare facilities, or shops, work is limited to that for preparation for resuming their businesses; [b] resuming farming,* and [c] start other work involving [a] and [b], such as conducting maintenance, repair, or transport related activities. 3. People are not required in principle to take or carry out protection measures, such as screening or measures to control the radiation dose when they enter the areas temporarily. * This depends on the degree of limitation on rice planting and the extent to which radiation has been removed from the ground.
Area 2 [“Yellow”] Areas in which residents are not permitted to live	Areas where the annual integral dose of radiation is expected to be 20mSv or more and where residents are ordered to remain evacuated in order to reduce the risk of radiation exposure.	1. The operations applied to the deliberate evacuation areas are also basically applied to these areas. 2. People can temporarily return home in the areas (but staying overnight is prohibited), pass through the areas along main roads, and enter the areas for the purpose of public benefit, such as for repairing the infrastructure or conducting disaster prevention-related work.
Area 3 [“Red”] Areas where it is expected that residents will face difficulties in returning for a long time	Areas where the annual integral dose of radiation is expected to be 20mSv or more within five years and the current integral dose of radiation per year is 50mSv or more.	1. People are legally required to evacuate from the areas, for which physical barriers to entry such as barricades are placed at the boundaries of the area. 2. People may temporarily return home to meet domestic needs and requirements as far as possible, while those who are in charge thoroughly screen people for radiation, control individual doses of radiation, and require the people entering the zone to wear protective gear.

Figure 1.6 Practical operations for designating areas to which evacuation orders have been issued as newly designated areas.

Recreated based on: Ministry of Economy, Trade, and Industry. March 30, 2012.
Source: Ministry of Economy, Trade, and Industry (2012).

Note: “Green,” “yellow,” and “red” are additions by the author.

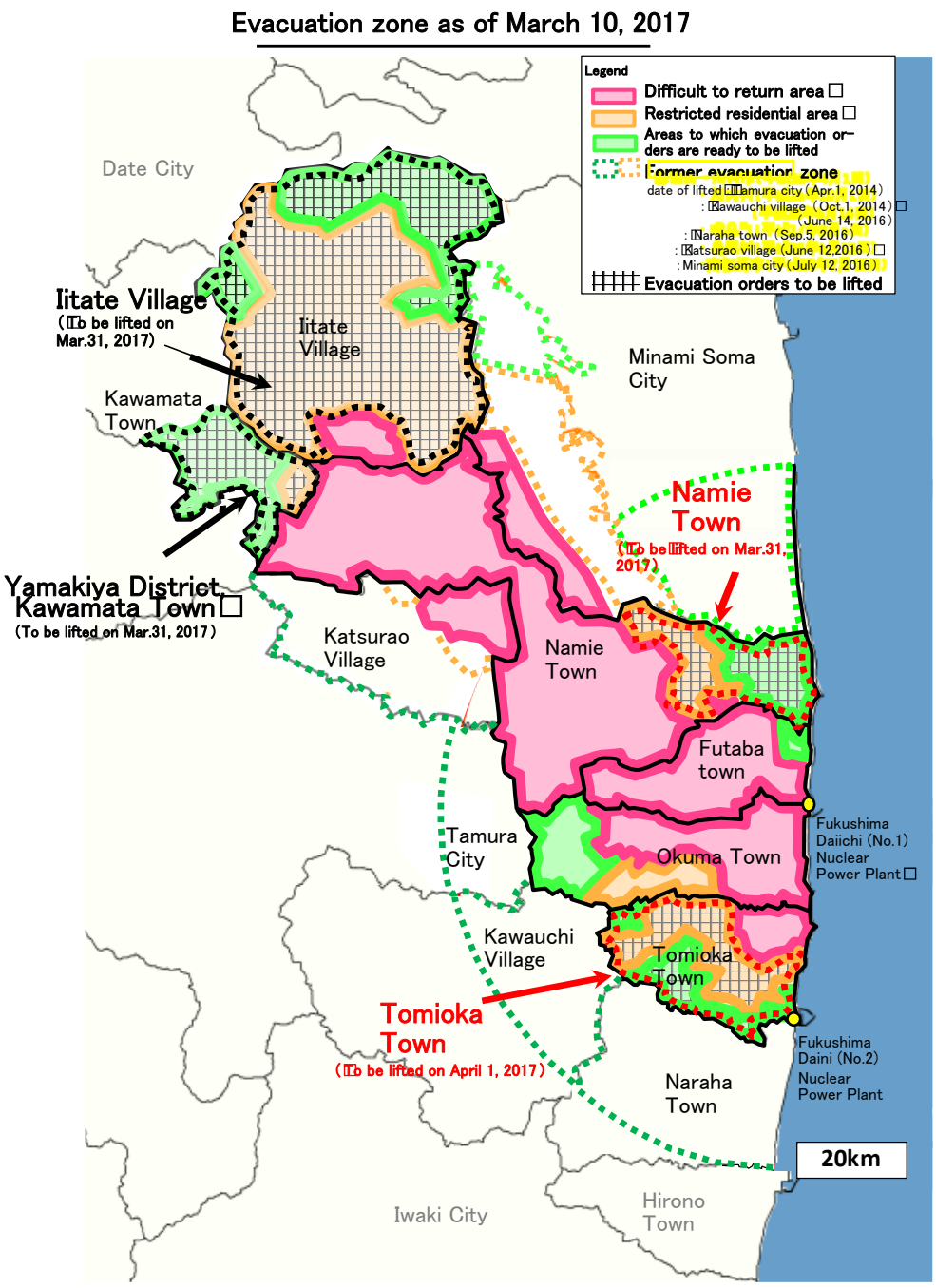


Figure 1.7 Evacuation zones leading up to the lifting of most green and yellow evacuation orders on March 30, 2017.

Source: Fukushima On the Globe 2018, citing Ministry of Economy, Trade, and Industry.

Citizen groups, scientists, scholars, and activists have criticized the Japanese government's criteria for evacuation as insufficient from the start. Contamination spread much farther than the limited areas that the government deemed as worthy of compensation. Misalignment between the presence of contamination and the social and financial recognition of damages will necessarily occur when municipal borders are used to designate remunerative measures. It is even worse when the same town gets split in half, like in the case of Kawamata Town, which was split between a "green" compulsory evacuation area and a "business as normal" area. The above maps of evacuation zones are thus best understood as representing the distribution of human experiences in response to the government compensation schemes, rather than contamination distribution.

Evacuation zones were not only ever-shifting and ever-contested. They were also materially, legally, and socially porous. During the course of my fieldwork from September 2014 through May 2016, anyone could drive and go into the "Areas to which evacuation orders are ready to be lifted" ("green" compulsory evacuation areas) and the "Areas in which residents are not permitted to live" ("yellow" compulsory evacuation areas). Only the "Areas difficult to return to for a long time" ("red" compulsory evacuation areas) were barricaded, and even these were not absolutely impassable. Indeed, the national government opened national highway number 6 to four-or-more-wheel traffic in March 2015, which runs directly through the "red" zones (Hirano 2016, 7). The Ministry of Environment, in collaboration with Prime Minister Shinzo Abe's (childless) wife, then organized a communal environmental clean-up day for junior high students from Minami-Soma to clean up trash alongside national highway number 6. As the government moved to lift as many restrictions as possible, mobility between the zones and the rest of Fukushima and Japan became ever more widespread.

What should be clear by now is that even as radioactive fallout fell far and wide, the mere presence of radioactive materials somewhere or in or on something did not translate into making those things and places officially dangerous/nuclearly exceptional in the eyes of the Japanese state and all of society. The danger or safety, exceptionality or banality, of radiation and radioactive materials and their concentrations were constantly debated.

Internationally and Domestically Contested

Internationally and in Japan, there has been a constant contestation over which levels of exposure (additional yearly exposure) should justify evacuation. Following Chernobyl, acceptable yearly exposure was a heavily debated set of questions (Kuchinskaya 2014) and has been a bedrock of labor safety in the nuclear industry for as long as the nuclear industry has existed (Boudia 2007, 2013; Lindee 1994). In the Chernobyl case, debates about acceptable levels of low-dose radiation exposure continued for several years and shifted through contestations between the governments, experts, and civil society (Kuchinskaya 2014; Kansei Gakuin Daigaku et al. 2015). In the case of Chernobyl, ultimately, the "Safe Living Paradigm" was arrived at, which allowed up to 75 rem (75 milliSieverts) of exposure over the course of an individual's predicted lifetime of 75 years (Kuchinskaya 2014). In other words, this anticipated 1 mSv per year of additional exposure in addition to background over a lifetime of 75 years. The "Safe Living Paradigm" informed the logics of the Chernobyl Laws of 1991 in the Russian Federation, Belarus, and Ukraine. According to "zone approach" of the Chernobyl Laws of 1991 (Zgersky 1998), anyone living in areas where they would have 5 mSv of additional exposure was within a "zone of forced resettlement"—a compulsory evacuation zone. People living in areas of

between 1mSv and 5 mSv of additional radiation had the state-supported option of evacuating/relocating/resettlement – "volitional relocation." Areas of up to 1 mSv of extra exposure would be designated "heightened radiation monitoring zones," but people would stay put (Toda 2018, 160–61; Zgersky 1998). Therefore, anyone who left ("self-evacuated"/"voluntarily evacuated") from areas between 1 and 20 mSv/yr of added exposure in post-Fukushima Japan left from areas that would fall within evacuation zone levels if the 1991 Chernobyl Laws were the standards used in post-Fukushima Japan (Kamanaka 2015).

Figure 1.8 Map of Fukushima with Post-1991 Belarusian Evacuation Standards Applied.

Source: Long (2018, 11). Image originally from Kamanaka (2015).

< According to Belarusian Contamination Designations >

Japanese reads: Soil Contamination by Cesium 137, based on data by the Ministry of Education, Culture, Sports, Science and Technology

Original Caption in Long (2018, 11): Map of Fukushima with Post-1991 Belarusian Evacuation Standards Applied. Areas in red represent what Belarus would consider "mandatory evacuation" zones. Areas in pink show actual mandatory evacuation zones as determined by Japanese standards.

Additional Caption: Under the Belarusian 1991 Chernobyl Laws, red areas would be “zone of forced resettlement,” orange areas would be “areas of state-supported optional self-evacuation,” and yellow areas would be “heightened radiation monitoring zones.” In the Fukushima case, only the magenta-pink areas were ever state-sanctioned compulsory evacuation areas.

Critics invoke the precedent of the Chernobyl Laws as evidence for the immorality of the Japanese state's 20 mSv/yr law (Hino 2015; Kamanaka 2015).[33] In the case of Fukushima, the post-nuclear accident permissible yearly added dose of exposure was set at 20 mSv/yr, where it remains. **As I note on page 80**, the validity of the 20 mSv threshold comes from the International Commission on Radiological Protection (2008, 5, Basic principle (b); 18, para. 26). However, these principles themselves contradict the ICRP's own Linear Non-Threshold hypothesis and did not align with people's sense of safety, danger, and morality. 20 mSv/year is the lowest level of exposure in times of emergency, but the highest recommended level for the general public under non-emergency conditions (Hino 2015; International Commission on Radiological Protection 2008). Critics also do not forgive the actual levels of exposure that people were exposed to in the early weeks and months after the accident. However, even the 20 mSv/yr model is far below levels necessary for concern if the 100 mSv threshold model is used.[34] But the 100 mSv has been criticized, as has any threshold model.

[33] Even though Japanese critics' emphasis tends to end at the 1 mSv mark, set in 1991, scholars who work in and on post-Chernobyl Belarus, like Kuchinskaya (2014) and Topçu (2013), give more of the story. It turns out the Chernobyl Laws were difficult to implement in a way that would have led to the ideal-type evacuation that Japanese critics suggest. In Belarus, though the Laws looked good on paper, little came in the form of actual evacuations from areas between 1 and 5 mSv/yr. Evacuation apartments were built in areas where it was discovered that the radiation levels were actually higher than from where people would be evacuating. Bureaucratic procedures were difficult, funding dried up, and people did not want to leave their property. Therefore, they continued living in contaminated areas. As United Nations and international nuclear industry teams visited these areas and spoke with these residents, the residents' difficulties in everyday life were consigned not to radiation, but to fatalism. These international experts claimed that it wasn't the radiation that was the problem, but the local rural population's mindset and lack of education in interacting with the contaminated environments. Pardon the sarcasm, but what they needed was help from French social psychologists and the international nuclear industry in learning how to be proper practitioners of participatory citizen science and self-regulation—but only *after* their lives had been contaminated through technological processes in which they did *not* have any say. In came the Ethos program.

[34] The 100 mSv threshold model is based on the Life Cohort Study conducted by the Atomic Bombing Casualty Commission (Radiation Effects Research Foundation) (Cullings 2014; Ozasa, Grant, and Kodama 2018).

Socially and Monetarily Divided

Even as radioactive materials continued to circulate in environments beyond official evacuation zones, evacuation zone designations and compensation divided people and communities (Gill n.d.). [35] Compulsory evacuation zone designations and associated compensation payments created a group of deserving nuclear disaster victims: "compulsory evacuees," who were forced to leave their homes and communities through no choice of their own (Gill n.d.). It was broadly understood that wide chasms had formed between compulsory evacuees and the rest of society due to these hefty compensation payments (Gill n.d.).[36]

Compulsory evacuation aligned with heightened immediate exposure and loss of property, but also resulted in significant accrual of compensation money over the years following. By the fourth and fifth years after the disaster, when I was in Tohoku conducting fieldwork, the over 100,000 compulsory evacuees had received substantial compensation payments. In some cases, a family of four compulsory evacuees received up to 130 – 160 million yen ($1,190,000 – 1,648,000) in compensation (*baishōkin*) for their lost property and "consolation payments" (*isharyō*) for mental suffering (Gill n.d.). Gill characterizes the experience of compulsory evacuees as one that went from "sudden exile to sudden wealth,"

35 In his post-disaster ethnographic work, anthropologist Tom Gill (2014, n.d.) chronicles the post-disaster trajectory of Nagadoro hamlet of Iitate village. Gill relays the human damages and local and family processes of bearing through the initial disaster, then having homeland abruptly ripped away, and irreconcilable interpersonal and local schisms. Political schisms surrounding evacuation designations and their present and future meanings within Iitate were severe. As is to be expected, many of the schisms had direct or indirect involvement of money and pressure from the national government and other pro-nuclear factions. There were also differing opinions between the mayor and the people, different factions among the residents, and differences resulting from the difference between evacuation zone designations. Gill has followed the residents of Nagadoro out of their hometown, through evacuation, and on to opulently reconstructed homes. Nagadoro is the only one of Iitate village's seven hamlets to receive the "Difficult to return to for a long time" evacuation designation. The lands and houses of Nagadoro thus fall into the "red" evacuation zone. Most of the rest of Iitate's hamlets were designated "yellow" evacuation zones: "Areas in which residents are not permitted to live."

36 For a legal and policy overview of compensation, see Feldman (2015).

followed by envy discrimination (*netami sabetsu*) from their Fukushima peers because of the extreme gap in monetary compensation.

Residents of Fukushima prefecture who did not become compulsory evacuees received a meager one-time consolation payment for the nuisance and mental distress the accident had caused them. Those who were older than 18 years old and not a pregnant woman received a one-time payment of 80,000 yen (about $750), and those under 18 years old and for pregnant women received between 120,000 and 400,000 yen (about $1,100 – 3,660) (Ōtomo 2016, 176, referenced in Gill n.d.). The difference in these one-time payments depended on the municipality. Voluntary evacuees from Fukushima could also pursue "Alternative Dispute Resolution" (ADR), but the process was onerous and required meticulous records of expenses and receipts for expenses incurred due to voluntary evacuation. In any case, if a family of four (two children under 18, a mother, and a father) who were Fukushima residents or voluntary evacuees who did not follow through with ADR received only the one-time payment, and with two children below age 18, they would receive between 400,000 and 960,000 yen total (about $3,660 – 8,800).

One might think that property values would deteriorate in Fukushima and that houses in central Fukushima would become more difficult to sell. On the contrary, housing was at times hard to find in Fukushima, where rentals were almost at full capacity, and prices were not falling. This was because of several factors: (1) the sizeable number of the decontamination workers, engineers, and other specialist and non-specialist workers who had descended on Fukushima all needed to be housed; (2) evacuees from compulsory evacuation areas needed to be housed. Compulsory evacuees were building new (mansion-like) houses for themselves in central Fukushima and had glitzy new cars in their driveways, which contributed to jealousy and envy

from non-compulsory-evacuee residents of central Fukushima. The construction of these new houses by the compulsory evacuees was contributing to a housing boom in Fukushima.

First there is the chasm between compulsory evacuees and everyone else. This chasm is mainly over compensation, but also over loss and actual acute exposure. Second, there are the gaps between voluntary and compulsory evacuees and between voluntary evacuees and people who stayed in place, in Fukushima. Third, there are differences about decontamination demands between Fukushima residents, on one side, and local municipalities and the national government, on the other side (Edgington 2017, 99–102). Fourth, there are chasms between long-range and short-range voluntary evacuees. When speaking with Fukushima families, it is not uncommon to find a mix of such perspectives in one family. For example, one voluntary evacuee from Date City with whom I spoke in Yamagata was married to a city office bureaucrat for Date City. Even as he urged her to evacuate with their son at least for a few years, he and other municipal employees worked to convince the people of Date that interim decontamination plans were an acceptable response to the radiological situation. Many voluntary evacuee's parents were from one of the compulsory evacuation areas. They were evacuated to central Fukushima, even as their daughters left with their grandchildren from those same areas.

Residual Toxic Uncertainty: "We Don't Know What's Right"

People in the "grey zones" of contamination beyond the official 20-30 km evacuation zones were denied official contaminated and official nuclear exceptional status in terms of compensation and evacuation orders. In the immediate aftermath of the accident and ever since, people have wanted to know if the situation was safe. First there was too little information, then there was too much (Slater, Morioka, and Danzuka 2014, 491). A cacophony of voices

adamantly disagreed: the government, experts, citizen scientists, netizens, Tweeters, friends, and family. As Slater, Morioka, and Danzuka (2014) chronicle, "When a real scientist came, the situation was often worse," because they would be unable or unwilling to answer people's most pressing question: "is it safe?" (491). Equally as bad, if not worse, was to be told the situation was safe, only to find out otherwise later or from another source.

Critical medical anthropologist Takuya Tsujiuchi (2016, 2018b) argues that those who asserted that there should be—there *must* be — one sole correct answer to how much, of what kind of ionizing radiation exposure in/to humans is safe or dangerous fall into what he calls a "hard science/scientific perspective" (*katai kagakukan*). Readers will be familiar with the "hard science perspective" as a stereotyped, but nevertheless real and aspirational ideology of an objectivist science, in which any observers, if only they observe matters (matter) properly, will arrive at the same verifiable and falsifiable results (Tsujiuchi 2016, 16). It creates an either-or stance in a stereotypical natural sciences onto-epistemology that would necessitate a single – and only one either-or—answer to the question "are these levels of radiation exposure dangerous? Or are they safe?" Tsujiuchi sees those employing a "hard scientific perspective" as falling into associated binary either-or political groupings. The "safety group" (*anzensetsu*) asserts that radiation exposure, at least at the levels that the government has decided following the nuclear accident, is safe. The "anti-safety group" (*hi-anzensetsu*) asserts that even the smallest of doses, or at least even the smallest increases in doses beyond what was prior to the accident, are dangerous. The Japanese government, the international nuclear industry, and government-beholden scientists fall into the former, "safety" group. Anti-nuclear activists, critical documentary directors such as Kamanaka Hitomi, and Greenpeace fall into the latter, "anti-safety" group.

Following the nuclear accident, the "anti-safety" group cried for the evacuation of all from areas where air dose is above 1 mSv/yr, or where there are any manmade radionuclides, or other similar criteria. In contrast, the "safety" group can be caricatured by Dr. Yamashita's assertions (see page 69) in March 2011 that anywhere below 100 mSv/yr was just fine to live in, so long as you smiled and laughed. The 100 mSv/yr discussion is both long past and still present.[37] It repeatedly creeps up in government risk communication materials, such as the 2018 booklet titled "The Truth About Radiation," which was distributed nationwide as part of the "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication" (see Appendix C for translation). The government has changed acceptable thresholds and their social and economic justification over the intervening years. By 2014, the discussions were about the grey zones of between 1 and 20 mSv/yr, 100 Becquerels per kilogram of cesium 134 and 137 in food on the market, and soil versus air dose measurements.

In the case of the over-200 cases of childhood thyroid cancers that have been found and treated among Fukushima children, the "safety" group of the Japanese government, government-beholden scientists, and international scientists march together to the tune of the "screening effect" drum. They claim that the rise in childhood cancers is not due to the radiation exposure, but due to the "screening effect" of highly sensitive ultrasound technology in combination with the thoroughness of the Fukushima Health Management Survey, which together have resulted in an increase in cases being detected that would have otherwise gone unnoticed (Yamashita and Saenko 2017; Yamashita et al. 2017). These are countered by "anti-safety" critiques that the Fukushima Health Management Survey was designed "in the service of the state" and its

37 The ABCC studies stand by the 100 mSv/yr mark as the first point at which health effects start to be noticed, even as the ICRP espouses the "linear non-threshold" hypothesis and a recommendation of 1 mSv/yr of additional exposure for the general public.

conclusions were over-determined to result in something that will lower citizens' anxieties from the start (Wataru 2012; Hino 2013).

Tsujiuchi carves out a space between these two opposing sides for what he calls the "social studies of radiation."

> If we are to say [only] "one of the two approaches (safety or anti-safety) is correct," then the opposition between the two grows ever deeper. If we were to try and say, "both are correct," this would be rationally untenable. May we not see the most appropriate stance as one that acknowledges that, "given the state of past and present data, we cannot accurately predict future health effects," in other words, "we don't know what is right?" [Tsujiuchi 2016, 17][38]

A "we don't know what is right" disposition is one way of attempting to maneuver out of the binaries of safety-or-danger, black-or-white, right-or-wrong, moral-or-immoral dichotomies. Drawing on Onai and Hondō (2013), Tsujiuchi reminds us that the social conditions that permeate all aspects of scientific knowledge and ways of knowing necessarily mean that science is not something that exists beyond the people who take part in creating it. Such insights have been part of the social studies of science since the 1980s (Franklin 1995). Science has inherent inaccuracy (*fukakujitsusei*) and ambiguity/polysemy (*tagisei*) (Tsujiuchi 2016, 16). Moreover, knowledge about radiation health effects in humans is the epitome of debated and patchy scientific knowledge not only because of inaccuracy and polysemy, but also because of its global political, military, and secret histories.

38 過去のデータからも現在のデータからも、将来の健康影響を正確に予測することは出来ない」、つまり「正しいところはわからない」というのが最も妥当なスタンスだと言えるのではないだろうか。

Tsujiuchi calls the "we don't know what is right" disposition as representative of a "humanities and social sciences" scientific literacy (2016, 14–18, 2018b, 14–15). Indeed, Tsujiuchi's "humanities and social science" scientific literacy of radiation is of a kind with Hecht's concept of "nuclearity," as well as the contributions of other Anglophone scholars of science, technology, and society studies who study uncertainty, low-dose chemical exposures, and environmental pollution. Nuclearity, like discussions about the acceptability of risks (Douglas and Wildavsky 1982; Beck 1992; Bickerstaff and Simmons 2009), is debated, historically and politically contingent, and not universal. Uncertainty about industrial risks comes about through politics, economics, and histories of knowledge production, regulatory regimes, and logics—all of which make some problems visible and perceptible, while making others imperceptible (Murphy 2006). Understanding the specific political histories behind perceptibility, science, and regulation is important in each case, though some broad trends can be seen.

Historical studies repeatedly show that the experiences of humankind with nuclear things have ranged from fascination to terror, from glorification to Holocaust, and many grey areas of ambivalence and banality in-between. Nuclear knowledge has always been politically produced and politically influenced knowledge, inflected through Cold War politics and the global influence of the nuclear industry. Tsujiuchi makes his historically-specific point by briefly reviewing the political and economic history of atomic energy and nuclear science in Japan and in the post-World War 2 capitalist world. The creation of nuclear non-knowledge has a global history (Petryna 2013; Caufield 1989). For the sake of space and to continue my post-Fukushima focused argument without too much diversion into global nuclear history, I discuss further dimensions of the muddled histories of nuclear knowledge in Appendix A. In Japan, the pre- and

post-disaster "safety myths" are paradigmatic examples of the "safety" group's cultural and political products. Tsujiuchi unequivocally calls these safety myths irrational (2016, 2018). The pre-disaster safety myth convinced the general public and municipality leaders that nuclear power was absolutely safe and Japanese engineering superior enough that no large accidents could be imaginable (Mori 2013, p. 593; Bricker and Nihon Saiken 2014). Thanks in great part to the pre-disaster safety myth, public opinion among the Japanese of nuclear energy in Japan was high and widespread information campaigns to rationalize Japan's need for nuclear energy were successful.[39] The post-disaster safety myth asserts that the government has done everything necessary to protect the citizenry's health, despite having set the compulsory evacuation threshold at the highly debated 20 mSv/yr and despite sustained critiques from activists, citizen organizations, doctors, and scientists.

It is important to note that in creating and arguing the "we don't know what's right" stance, Tsujiuchi also explicitly does not align himself with anti-nuclear activists. These days, activism has a bad rap in Japan due to the violence of left-wing extremists in the 1960s and 1970s. However, local and national opposition movements date back to the first nuclear power plants and continue to this day (Liscutin 2011; Ogawa 2013a; Ogawa 2013b; Wöhr 2014; Brown

[39] This is not to say that everyone was convinced of the safety of nuclear power pre-Fukushima. Activists, academics, and public intellectuals have long implicated the Japanese nuclear energy industry as being part of the United States-Japan nuclear military complex. Even as the "peaceful atom" took hold under Eisenhower's "Atoms for Peace" program in Japan (Tanaka and Kuznick 2011; Zwigenberg 2012; Kingston 2012a, 2012b, 2012a; Takekawa 2012; Penney 2012; Onitsuka 2012; Penney 2012), the nuclear science that formed its core was for the making of hydrogen bombs, an unquestionably military technology. In 1967, Japan publicly proclaimed the "Three Non-nuclear Principles" to not possess, not produce, and not permit the introduction of nuclear weapons into Japan, which are supposed to be in line with the postwar peace constitution (Ministry of Foreign Affairs of Japan 2014). Almost as soon as the non-nuclear principles were espoused, they were broken. The United States regularly brought military nukes into Okinawan ports, even after Okinawa's being returned to Japan in 1971 (Pulvers 2011).

Aldrich argues coastal municipalities with weak "civil society" were targeted by LDP politicians as the sites to place these "public bads" (Aldrich 2008). Out of the metropolis's sights, out of the urban dwellers' minds, and far enough away that neither Tokyo nor Osaka would be irreparably devastated in case of a meltdown or three. More broadly, the government and industry's success in circumventing local opposition to state projects attests to a history of hierarchal state power in Japan (Apter and Sawa 1984; Kainuma 2011). Resistance to state projects becomes a lifelong commitment.

2018). Whistle-blowers, protestors, fishermen and women, farmers, and many others have led lifelong battles fighting and opposing the pro-nuclear postwar Liberal Democratic Party-led developmentalist state's plans (Aldrich 2008; Dusinberre and Aldrich 2011). Nevertheless, despite resistance over the years, with the help of the safety myth, the LDP and private energy utilities were able to legally create an energy infrastructure that included 54 nuclear power plants along the tsunami-prone coasts of one of the most seismically-active areas of the globe.

A stance of "we don't know what's right" seems more aligned with the "anti-safety" group and fundamentally takes issue with the positivist and over-confident logics and affects of "safety" peddled by the "safety" group. However, the "safety" group has also used the ambiguity of a "we don't know what's right" stance to undermine support for people living in grey zones. Tsujiuchi notes that the lack of scientific knowledge about the effects of radioactive materials on human health is inscribed into the logic and justification of the purpose of the Nuclear Accident Child Victims' Support Law (Umeda 2012; Citizen-Scientist International Symposium on Radiation Protection 2014; Fukushima On The Globe n.d.).[40] According to the law, given the history of the Japanese states' promotion of nuclear energy, ethically and legally, it is the responsibility of the Japanese state to devise and implement necessary support measures for the physical and mental health of all people living in or who used to live in "areas that exceed a certain threshold." The law seeks to support three kinds of choices for the people of Fukushima living in such areas: (1) to evacuate; (2) to stay put; (3) to return. The "certain threshold" of the

40 The official title of the law is the "Act concerning the promotion of measures to provide living support to the Victims, including the children who were affected by the TEPCO Nuclear Accident in order to protect and support their everyday lives (Act Number 48 of the 27th of June 2012)."
「当該放射性物質による放射線が人の健康に及ぼす危険について科学的に十分に解明されていないこと等のため、」
"because the risk of radiation from the said radioactive materials on human health is not fully understood scientifically."

Child Victims' Support Law, however, was left undefined—precisely because, ostensibly, "we don't know what's right," and because to define it would be politically and legally binding. The undefined "certain threshold" has been the Achilles heel of the law, leaving it generally an unimplemented, watered down (*honenuki*) "idea" law (*rinenhō*) with no bite (Hikita 2018, 124). The impotence of the Nuclear Accident Child Victims' law demonstrates the weakness of the "we don't know what's right" scientific literacy stance, which even Tsujiuchi fortifies further with a structural violence perspective (Galtung 1969).

The "safety," "anti-safety," and "we don't know what's right" stances towards scientific literacy are more than just perspectives on science. Each one also entails social and political dispositions. Tsujiuchi makes this argument when writing about voluntary evacuees in a publication titled "Salient Characteristics of Voluntary Evacuees as Seen from a Large-Scale Survey: Not 'Excessive Anxiety,' but 'Legitimate Concern'" (2016). Tsujiuchi is refuting vile critiques lobbed against voluntary evacuees that they are "too anxious," "hysterical," or, in the worst cases, are pejoratively bullied for having "radiation brain" (*houshanō,* which is a homonym with the word for "radiation," but with the last Japanese character changed from "power" to "brain") (see also Kimura 2016). Writing against the widespread, state-sanctioned social bashing of voluntary evacuees as "overly anxious" and "hysterical," Tsujiuchi argues that it is not voluntary evacuees who are irrational, but the new manifestation of the state-sanctioned safety myth that is irrational. However, there is nothing to stop Tsujiuchi's stance itself from being criticized as irrational. If one is in the "safety" camp, then it is those who think of radiation as dangerous who are irrational. If one is in the "anti-safety" camp, then those who would seek to normalize life with radioactive materials are irrational.

The arguable middle ground of "we don't know what is right" allows for the valuing of two otherwise contradictory moral-ethical approaches to living with and through contamination. The first is staying in grey zones where health effects are yet unknown. The second is evacuating from those unknown grey zones. The post-colonic and dedication in Hikita's 2018 publication *Rest and Recuperation Support for Children Following the Nuclear Accident: Together with "Evacuation" and "Reconstruction"* (emphasis added), also attempts an in-between stance that respects people's differing decisions, opinions, and political leanings. "Reconstruction" is aligned with the national government's "safety" stance. Going through with voluntary evacuation means that a person does not think it is safe and therefore aligns with the "anti-safety" stance. Even as the "safety" group asserts that the radiological situation in areas with air dose less than 20 mSv/yr is acceptable (and therefore "safe") for human habitation, the "we don't know what's right" group allows for people to make their own decisions of acceptability based on personal thresholds, personal attention to nuclear materialities (focus on the Becquerel count of radiation in soil, rather than the Sievert count of dose in air, for example), and personal scientific literacy. It also allows for middle-of-the-road civil society support, like rest and recuperation camps, without condemning those who continue to live in nuclear grey zones. This stance acknowledges that people may have reasons other than radiation for why and how they make their post-disaster habitation decisions. It allows for the possibility of living in uncertainty and unknowing, especially when the economic costs would be too high to evacuate; or if you do not know somewhere you can go; or if others in your family oppose your evacuating.

In the territory of a "we don't know what's right" stance towards low-dose radiation exposure, lots of possibilities become possible. The same situation can be understood and experienced as radiologically dangerous, with lies and mistrust fueling the sense of danger.

There are those who try to avoid the uncertainty as much as they economically and personally can, but will never be able to escape the fact that they were exposed in the initial days of the accident. They may also return to areas and interact with questionably nuclear things from time to time and for good. People can live as if nothing has changed. They can accept the safety group's logics in some areas, but not others. It also allows for making do with less-than-desirable circumstances, as with Ethos Belarus (Topçu 2013).[41]

Even though a "we don't know what's right" stance seeks to be accepting of plurality, it cannot be said that all choices are equally valued and supported. Living within less-than-desirable circumstances became nearly compulsory and economic, social, and political pressure to fall in line was placed on those who try to leave. It would seem that public acceptance of uncertainty and "we don't know what's right" was a deliberate part of the disaster response in accordance with international nuclear organizations (such as the International Commission on Radiological Protection and the International Atomic Energy Agency). This works in the government's and TEPCO's favor, since they then do not have to pay for the damages and mental health suffering of the broader public and can restart nuclear power plants. But living in the meantime with a "we don't know what's right" disposition does not offer solace or certainty. As Slater, Morioka, and Danzuka (2014) note, to have a scientist arrive into a situation of extreme uncertainty and not be able to offer a theory or prescription for proper comportment

41 Writing about Belarus, Topçu (2013) writes of how a representative for the French Network for Phasing Out Nuclear tried to tell Belarusian NGOs that they were being used as a laboratory. In turn, a former resident of Pripyat in one of the Belarusian NGOs reportedly told them, "We know we have become a laboratory, an open laboratory. So what? You should also come and work with us" (Topçu 2013, 156). Rather than chastise the nuclear-industry-supported ETHOS representatives who were teaching locals how to understand the contaminated environment in ways that each individual would be responsible for their own dose and would strive to live within their dose, this nuclear evacuee criticized the French environmentalists who were othering them and their environment. There is an aspect of Western Europeans othering Eastern Europeans here. There is also an insinuation that people living in a contaminated environment do not know well enough what the powers at be are doing to them and their lives—a kind of "we know better" Western European view. Though I cannot offer a "way to do things better," I am resistant to the latest rendition of "we know better" theorizing for an academic audience's sake and sensibilities.

within that uncertainty was just as problematic for grey zone residents who came to hear them speak as being told not to worry or not to panic. Furthermore, given its financial and political backing of the Japanese state, the "safety" group tends to win out.

"We don't know what's right" allowed for the goodwill attempt at the 3-11 support law at the same time that it killed that law. It allowed for evacuation, even as it likewise allowed for evacuation to be criticized. Most of all, it made for lots of decisions for people in their own lives. It allowed for stalling. It allowed for partial attention, to only food, for example, and not as much to air and soil. This says nothing as to what is happening to people's cells and biologies. "We don't know what's right" is not an assurance of safety. It allows for latency (Murphy 2013), slow violence (Nixon 2011), and the health monitoring programs that can be seen as making people into lab rats (Wataru 2012). But it is also not an assurance of illness. It all allows for uncertainty and life in the meantime. Life in the meantime is full of contingencies, everyday logics, and interpersonal relations.

After conducting fieldwork in Yamagata and Fukushima, I find Tsujiuchi's depiction of "we don't know what's right" as accurately capturing the creation of the various grey zones with which people had to contend. Many people ended up in the "we don't know what's right" group, whether it was of their choosing or not, and so behaved in ways and adopted strategies that made some kind of sense for them, hedging their bets/risks/costs with radioactive materials, family relationships, uncertainties about the future, and economic difficulties in the present. People navigating these uncertainties were my interlocutors. The rest of the chapters tell their stories.

Everyday Nuclearity

In grey zones, the presence of radioactive materials could not be denied, but the implications and responsibility for dealing with radioactive materials and radiation—and the contestations and disagreements over nuclearity—were externalized onto people, their worlds, and their social relations. Other scholars call this the "externalization" and "privatization" of risk (Nadesan 2013). My interlocutors spoke about the process of learning about nuclear things as they went through disaster and life. Though there was a period of confusion and lack of knowledge, people did eventually make the decisions they made within the constrained choices they had. They learned things about Japanese society, changed their food habits, met similarly-minded others, and made decisions and formed transitory communities in response to what they learned. Nuclear disaster and nuclear health effects were not solely in the realm of the uncanny. They also became banal in the everyday.

In speaking of disjointed unease in interacting with nuclear things, Masco's concept of the "nuclear uncanny" again comes to mind (Masco 2006). As I noted earlier, Masco envisions the nuclear uncanny "not simply as a figurative device, but as an ethnographic category, a subject eminently worthy of cross-cultural research" (2006, 34). Local manifestations of the nuclear uncanny—just like local manifestations of nuclearity (Hecht 2012) and a "social science scientific literacy of radiation" (Tsujiuchi 2016)—result from the constellation of specific nuclear technologies, knowledges, and histories. To an extent, the notion of "everyday nuclearity" that I am about to propose could be seen as developing Masco's notion of nuclear uncanny into and through the Fukushima case. The important addition to his theory is that nuclear things can just as much be banal, as Hecht shows. An addition to both of their studies is

that when nuclear things enter the realms of the everyday, then the ethics, moralities, and logics of the everyday and family come to bear on the nuclear.

In the grey zones and middles of residual toxic uncertainty, my interlocutors interacted with people, objects, food, and environments in ways not solely informed by nuclear fear and nuclear exceptionalism. By three to seven years after the initial fallout (2014 to 2018), on the one hand, everyday logics of habitation, cleanliness, and the procurement of clean food helped the Fukushima mothers with whom I spoke control nuclear risks for their children. On the other hand, they faced economic constraints and encountered limits to what they could control as they continued to live everyday life in a mass consumption society, did their best to value kinship and community relations, and sought to support their children's proper socialization through schooling and family. They were tied to mortgages and lands, as well as to their families, whose views on the radiological situation differed. As I noted in the Introduction, these pulls and multiple obligations are of a kind with what Kim Fortun refers to with the concept of double binds, "[a] situation in which individuals are confronted with dual or multiple obligations that are related and equally valued, but incongruent" (2001, 13). Throughout, my interlocutors found themselves double-bound to property, family, mortgages, and gender-based expectations and having to navigate these contradictions and pulls—simply put: they lived everyday life.

Sometimes, there would be moments when mistrust in the state would surface; when emotional and legal scars from a radiation divorce (Weston 2017) would arise; when the jurisdictions for decontamination would not extend far enough to actually do away with the material contamination. There was a base-load possibility that things might be contaminated, even if slightly, but everyday life went on.

Recall that Hecht conceptualizes *nuclearity* as, "a technopolitical phenomenon that

emerges from political and cultural configurations of technical and scientific things, from the social relations where knowledge is produced" (2012, 15). Such a social constructionist argument is amenable to qualitative elaboration through insights from semiotic anthropology. No one denies that radioactive materials fell onto areas that contestably became officially nuclearly banal grey zones. I argue that in these areas the "social relations where knowledge [about nuclear things] [was] produced" became the social relations of people's homes, families, communities, and economic and non-economic forms of exchange, including everyday life, kinship, gifts, and produce.

Hecht argues that the nuclearity of a place, practice, object, concept, or other assemblage is its relatively exceptional or banal meaning in a historically and geo-techno-politically specific network of material and social meanings. This is akin to how sociocultural anthropologists discuss the historically and politically specific meanings that objects, spaces, and relations take on within shifting semiotic ideologies that selectively emphasize only certain parts of inherently overabundant material, social, political, and other meanings in things (Keane 2003; Fehérváry 2011, 2012; Harkness 2015; Hankins 2013). Nuclearity—or possible dangerous nuclear exceptionality—can be seen as a characteristic of objects, spaces, foods, and so on. In fundamental tension with nuclear knowledges and the analytic of nuclear banality and exceptionality is the fact that homes, houses, food, gifts, commodities, air, water, and so on do not function and mean in the same ways that radioactive materials, nuclear knowledge, and nuclear communications function and mean. These objects, spaces, and exchanges also retain meanings, functionalities, materialities, values, and practices beyond radiation. A quick example of the home/house can illustrate my point.

In the emergency situation of March 2011, people within the 20-30 km zone from Fukushima No. 1 were told to shelter in place, seal air ducts, and not go outside. At the height of the fallout, the walls of houses became shields against the depositing radioactive materials. However, this was a temporary measure and could only be a temporary adaptation. At the very least, people still needed to procure food and water outside of the sealed material structure. Lest a home become a grave, objects and people, air and water need to flow in and out. With these flows, not all nuclear things can be altogether stopped from entering the home. In order for a house to sustain human life, it needs to have flows of things in and out, whereas using the house as a material shell predominantly for radiation protection would require its impermeability.

There is a rich conversation in anthropology surrounding the materiality of everyday life and the home (Fehérváry 2013; McAllister and West 2013; Miller 1987; Miller 1998). There are also works on everyday life and the home in Japan, in particular (Daniels 2009; McVeigh 1996; Tobin 1992). What such anthropological writings on the permeability of homes demonstrate is that the crossings of objects, people, and information into and out of the home require vigilance in order to stabilize and protect against possible undesirable entrance, passage, and escape of materialities and the meanings associated with the objects and people that may pass in, out, and through the home (Buch 2015; Dickey 2000; Weiss 1996). There are also desirable everyday passages in and out, such as hanging one's futon and laundry out to dry. The intersections of passages in, out, and through; and localized practice within and around the home also have temporal dimensions in addition to the material and social dimensions just described. The cyclical regularity and normalization of home practices make them continuous, though fluctuating, vectors for the passage of materials and meanings into and onto their inhabitants.

Furthermore, "normal" everyday life does not take place just around the house/home/apartment. It extends through the community. Examples of this extension through local communities include walking to and from school, driving to and from the grocery store and doing your grocery shopping, going to and from work—the everyday cycles of reconstituting the world that happen within a relatively confined expanse of everyday life (de Certeau 1988; Lefebvre 1991). Many of these everyday cycles do center around the home, but not all. That is how passage of objects and people into and out of the home becomes important. Affects and meanings also cross in and out of the home with objects, invisible materials (such as air, bacteria, microbes, and radioactive materials), people, and information.

I detail all of these dimensions of homes and houses as part of an argument that to understand the felt process of contamination and readjustment (or liminality), we need to think about the implications of the instability of everyday nuclearity on people's bodies, lives, relations, and affects. Voluntary evacuees from grey zones told me how houses and areas that were not officially deemed to be contaminated enough were subject to personal nuclearity assessment and decisions. The nuclearly banal or exceptional status of particular rooms, particular foods, particular readings, particular strands of rice, particular radionuclides, particular animals, particular people, this book, this pair of pants, this futon, the air in this room, the windowsill as opposed to the center of the room, and so on and so forth—everything became subject to personal designations, as Slater, Morioka, and Danzuka (2014) also note. The instability and unshared assumptions of these meanings had profound consequences for social and material relations. People disagreed. They fought. They cut off relations.

These consequential contestations of nuclear banality or nuclear exceptionality are what I call "everyday nuclearity." Everyday nuclearity acknowledges, on the one hand, that citizens are

empowered to make decisions about safety and danger, banality and exceptionality of nuclear things. On the other hand, it also underscores the displacement of these decisions into fundamental dimensions of everydayness and family life. Such a displacement creates strain within those dimensions of everydayness into which nuclear meanings permeate.

Everyday nuclearity refers to the decisions and contestations that were pushed into the realm of family and the everyday in the immediate moment of nuclear disaster; the continued contestations and disagreements that were worked out and experienced within families, communities, and individuals as no single answer about safety and danger reigned; and the residual personal, familial, and community effects and meanings of those disagreements and navigating those disagreements. Everyday nuclearity includes the shifts in the materialities of everyday life, social relations, and sense of morality within one's role and identity that accompanied the deployment of nuclear knowledge by ordinary citizens within their own lives. Everyday nuclearity requires the navigation of the micro-politics of radiation (Slater, Morioka, and Danzuka 2014) in spaces and relations onto which nuclear materialities were externalized by the post-nuclear disaster privatization of risk (Nadesan 2013).

Conclusion

In this chapter, I used environmental anthropologists Auyero and Swistun's notion of "toxic uncertainty" to narrate an emergency and a residual phase. I also drew on Hecht's notion of "nuclearity" to destabilize expectations that dealing with the radiological results of the nuclear accident at Fukushima No. 1 will focus on apocalyptic nuclear exceptionalism. Instead, the responsibility for determining what is radiologically acceptable and unacceptable is imposed on individuals and families. I then introduced Tsujiuchi's work to narrate political-scientific-moral

binary oppositions that are prevalent in the residual toxic uncertainty in the post-Fukushima Japanese context. A "we don't know what's right" stance is accurate and allows for many stances and positions, none of which are particularly reassuring. I finished the chapter by merging these discussions of nuclear toxic uncertainty with anthropological examinations of the values and micropolitics of everyday life, food, space, kinship, and everyday materialities, which I will use to narrate and analyze my interlocutors' experiences of interpersonal and personal disagreements the nuclear and seemingly non-nuclear. As if the uncertainties of radiation effects in humans weren't enough, nuclear things are constantly and always-already political (Hecht 2012), just like health, life itself, and the health of variously politically, economically, racially, and otherwise differentiated populations (Foucault 1978; Rose 2007), all of which are in turn subjected to further moral and ethical evaluations.

These discussions are useful because they organize nuclear cacophony in ways that are readily accessible and broadly narratable.[42] However, the scaffolds of "nuclearity," "toxic uncertainty," and "scientific literacy" offer little in terms of the emotional and messy work that I intend for the rest of the dissertation to do. They do not capture the disjointed unease [*fuan*] in the world, seemingly banal everyday lives, and intimate lives of my interlocutors. This is why I develop my concept of "everyday nuclearity."

I now turn to three women's stories of everyday nuclearity that will take us into the messiness of navigating life through nuclear disaster.

42 Similar to how Bourdieu (1977) writes of the difference between practice and a *theory of* practice, Mazzarella (2017) examines a long tradition in anthropology of grappling with social life and knowledge *about* social life as ever-oscillating between immanence and form. I am uncomfortable with the writing of form into what was experienced as imminent. Yet, I nevertheless see immanence as having form. I endeavor to show people's practice and offer middle-range theories of their practices (Jones 2017).

Chapter 2 Three Stories of Navigating Nuclear Disaster and Everyday Nuclearity

The focus of this chapter is a storytelling trip by three mothers in their late-thirties and early forties from Fukushima to far-western Yamaguchi in February 2016.[43] These mothers' stories begin with their experiences of the initial days and moments of the disaster in different parts of central Fukushima Prefecture. The stories then expand into various issues that arose in the years since, as each mother navigated her own contexts of residual toxic uncertainty, "we don't know what's right" grey zones, and everyday nuclearity. I offer these three semi-public narratives in full as a pivot and counterpoint to the theoretical first chapter. Personal stories such as these inform the rest of the dissertation.

The Japanese *katharibe* refers to storytellers in an oral nonfictional storytelling tradition in Japan that relays important historical events to people who did not personally witness the events, which often, though not always, means younger generations. Mrs. A, Mrs. B, and Ms. C referred to themselves as "Katariinas." The term *Katariina* is a neologism that their self-proclaimed manager Ms. H created to feminize the non-gendered Japanese word "*katharibe*," or story-teller. Incidentally, Ms. H and the Katariinas also liked that *Katariina* sounded like the regal Russian name Katrina. By calling themselves "Katariinas," they emphasized their positionality as women and mothers in the stories that they shared. By labelling their storytelling activities as *katharibe*

43 As a note for geographic orientation, YamaGUCHI prefecture is *not* YamaGATA prefecture, where much of my ethnography takes place. Yamaguchi is in far-Western Japan, 1,300 kilometers (slightly over 800 miles), away from Fukushima. "Yama" in Japanese means "mountain." In a country where over 70% of its lands are mountains (and many of those are active volcanoes), it is not surprising that places over 1,000 kilometers apart share "mountain" as part of their name. Yamaguchi means "mountain-mouth," whereas Yamagata means "mountain-shape." This chapter takes place in Mountain-Mouth prefecture.

activities, Ms. H and the Katariinas infused their stories with a kind of gravitas and a sense of mission.

I begin this chapter with a brief introduction to who the storytellers were and then I give written voice to them through my English translations of one version of their presentations in full. I include only brief commentary in this part of the chapter. I then situate these stories within the context of dominant narratives that circulate in Japan and globally about Fukushima, the people of Fukushima, and aid from civil society. Lastly, I situate the Katariinas' work within a broader discussion of the testimonial genre and NGOs in anthropology. Recently, anthropologists have begun to look at the effects on marginalized internationally-traveling activists when they partner with nongovernmental organizations that operate multinationally to present testimonials to new audiences and institutions (Tate 2013). The Katariinas' work differs from such international initiatives because they are not making claims on the state, they do not see themselves as activists and nor do they wish to be considered activists, and their activities are Japan-internal. The Katariinas' trip mattered not because it was radical in any way, but because of its intention to counteract the weathering and forgetting of everyday lives in Fukushima.

The *Katariinas*

The three Katariinas are representative of subject positions and human and non-human movement that run throughout the dissertation. Mrs. A was a voluntary evacuee who evacuated with her young children for one year and eight months to Yamagata and then returned to live everyday life in the rural city of Nihonmatsu in Fukushima. Mrs. B evacuated briefly with her middle-school-aged son to western Fukushima prefecture, but returned for the schoolyear in April 2011; she then found a way to have just her son evacuate from Fukushima, while she and

her family stayed behind in Koriyama. Ms. C lives in a rural Fukushima town split between a compulsory evacuation zone and "business as normal" decontamination-in-progress environments. I write more extensively about Ms. C's everyday nuclearity in chapter 6. She never evacuated but was concerned about radiation and was one of a hyper minority in her town to try and do something about it, but without rocking the boat and without criticizing those who were not concerned.

All three storytellers were active on the Fukushima side of nationwide grassroots support efforts with the Accept-and-Welcome Association (AWNA) and other small-scale food shipment, rest and recuperation, and civil society initiatives. Mrs. A and Ms. C formed their own non-profit, non-governmental organizations in their respective towns and Mrs. B ran a café that became a hub for national and international Fukushima civil society supporters and sympathetic researchers, myself among them. During this four-day storytelling trip in February 2016, they interfaced with civil society supporters from across Japan who wished to support the people of Fukushima more so than engage in anti-nuclear politics, necessarily.

Mrs. A: "We decided to go back to Fukushima before my child's heart would be forever broken"

I had met Mrs. A several times before this trip. In particular, I attended a public talk she gave in Yamagata right around 3-11 in 2015, at a community center in West-Central Yamagata City. She presented a Power Point that showed photos of her home she took with a gamma ray camera and large plastic bottles full of water that she had lined up all along the windows in her house because it was said the water had a shielding effect. I also learned about Mrs. A's story

during a Fulbright Symposium I co-organized with the Northeast Japan Fulbright Alumni Association at the end of August 2015. Over the course of the Yamaguchi trip, I would get to know more about her and her family, as well. She smoked thin cigarettes, often one after the other. I could tell that she was very stressed. I also learned that she works as a home-visitor for the elderly, giving them massages and just chatting with them.

Figure 2.1 Mrs. A's Story

Good evening, everyone. I'm Mrs. A, from Nihonmatsu-shi in Fukushima. Thank you for coming tonight.

I am from Hiroshima. I was born and raised in Hiroshima. I moved to Fukushima when I got married. I learned a lot about the atomic bomb when I was growing up, to be honest, when I had to face nukes again in Fukushima starting from five years ago, I felt dejected and down-trodden.

At the time, I took my older son, who was a first-year in nursery school (3 years old; *nenshō*), and my younger son, who was one year old, and evacuated with them to Yamagata. We evacuated to Yamagata City in Yamagata Prefecture and I continued to commute to work by car between Nihonmatsu City in Fukushima and Yamagata City. But I did whatever I could to leave my children in a Yamagata nursery school or kindergarden (*hoikuen ka youchien*), so I searched for a place that could take them. That's kind of how I evacuated to Yamagata City, trying to do both things, to commute to work in Fukushima and put my kids in a Yamagata nursery school/kindergarten.

I hoped that by going to Yamagata, I could let them live a normal everyday life (*futsū no seikatsu o sasete yaritai*). Well, by normal, I mean—when it's summer, to be able to wear

short sleeves—that's the kind of life I was hoping to let them lead in Yamagata. The things that we couldn't do in Fukushima. I felt extremely strange having to do things the way we were doing them in Fukushima. With all kinds of conflicting information all around, living in Fukushima became extremely uncomfortable and restrictive. I didn't know what was right.

Maybe it's because I grew up in peacetime, but I just couldn't understand why the government would want to throw us away. But, well, in times like these, my parents were also telling me, "don't you think it's best you get as far away as you can?" So I followed their advice and went to Yamagata.

So, next, about one year and eight months later – I'm sorry, I'm skipping over a bunch of things, given that time is short – so we lived our everyday lives for one year and eight months in Yamagata and my children and I made lots of friends. But then, my younger son started learning to speak when he was about two and a half – it was about autumn of the second year – and he started saying, "Why is daddy not here?" (Mrs. A begins to cry.)

I couldn't answer my child's simple question. (Crying.)

When he started saying, "Daddy's not here because daddy hates me," that's when he began to be gloomy and depressed. He was about two and a half. When his father would come to visit, maybe once, max twice, a month, my younger son started turning his back to his father (Mrs. A's voice quivers as she cries), that's the reason why, well, why I returned to Fukushima from Yamagata (Mrs. A's audible crying).

Well, so that we could live positively, looking forward to the future, we decided to go back to Fukushima before my child's heart would be forever broken. I had done all sorts of paperwork to get them into school and kindergarten/nursery school in Yamagata City, but we just flipped all that on its head and decided to return to Nihonmatsu City. I did all the

paperwork right before they would be entering school, so in mid-February or so. And we just kind of up and left Yamagata. Through all that, I was thinking, "I guess I can't just keep looking back, thinking about what I could have done," so I thought, "I'm going to do what I can, going forward, to protect my children."

But the reality of the situation is extremely difficult. There's all kinds of problems—school lunches, what to do about paths to and from school, outdoor activities that take place at school—all of these problems come at you, one after the other. It really hit home for me just how powerless I was in all of that. I felt so full of regret (crying), so upset and disappointed.

And then, well, say you want your child to be excused from gym class. Well, there's a column where you can fill in if they are sick or have some sort of pre-existing condition, but there's no column to write about anything other than those reasons. Well, there is a very thin column for "Other reasons." So I thought about what I could do to request of the school, "I want you to make public the radiation levels at 50 centimeters above the ground in the places through where the schoolchildren are likely to run. Please publicly announce these radiation levels to all of the students." So I thought, why don't I go out and buy a pen that will work for that thin line, so I went out and got one – with a 0.38 millimeter tip (everyone laughs) – and oh I wrote in that column like no other. It's a small elementary school so I think I was the only one who wrote something like that.

But when they made the numbers public, they said they would be running through areas that were between 0.23 and 0.76 microSieverts per hour. They included a letter that explained, "But since it's just one moment, this will not negatively affect your child's health."

But, when other mothers were shown the numbers, they also reacted, "Isn't 0.76 microSieverts a little too high!?" But, yea, we couldn't say anything to the school. But when

you think of your own child, how are you supposed to take those numbers? My son would go to practice, training for long-distance running. To be honest, I wanted to stop him, but to respect what my child wanted to do (*kodomo no ishi o sonchō shite*), I let him run. I told him, "Just don't fall, ok?" Hmm… "Maybe try to breathe less?" (Mrs. A and everyone laugh) "maybe just don't breathe too deeply?" (laughs) Stuff like that. So I had to tell my children difficult things like that. "Make absolutely sure you don't fall, ok?" Like that. "If you fall, wash your legs right away, ok?" We've kept living that kind of everyday life this whole time. In the end, my husband and I, as husband and wife, we let our children take part in whatever school activities they want to, so that we don't dampen their desires.

Because our return from Yamagata to Fukushima was so sudden, I thought to establish the organization Earth Angels. The "angels" in "Earth Angels" are children. When we thought of going back to Fukushima, two years had already passed since the accident. In those first two years, there was a lot of momentum and there were actually a lot of small groups that were started. Mothers were really doing anything and everything they could. But after two years, so many of those groups had disbanded. So I thought for myself, what happened? Why did these other groups fall apart? What if we made some rules? Would that help? So when I decided on the rules for Earth Angels, one thing that I felt very obviously caused friction in other groups was when people would criticize each other. So I made the rule, "Don't criticize others." "Respect." "Accept." I made a group where you had to promise to abide by these rules if you became a member.

There were two pillars to Earth Angels. Just because you evacuated to this or that place –there are the so-called "winners" because they evacuated and those who didn't evacuate think, "we're the losers" – there really are so many of these kinds of little divisions between

people all over the place. And so, what I emphasized was, "wherever you might have gone or been, the feeling that you as a parent have that you want your child to be happy doesn't change." And that was the pillar—that we all are the same in feeling that "we as parents want our children to be happy," no matter where we are. That was the first pillar.

After that, I asked members to all hold onto their own image of what that "happiness" or whatever it is looks like – what you have in mind when you think, "if things were like this, life would be easier, life would be good to live" – to keep that in mind was the second pillar. And then, like I said, I decided to make the ground rules that we don't criticize each other to prevent from the divisions that happen when you don't accept others. So every year, I confirm with each member if they are willing to abide by these rules and that's how they become members.

Now, among the members – well, among the people of Fukushima – it's a strange thing to say, but there are lots of people who have become used to just getting stuff (from civil society aid groups) – there really are! So that's why in our group, if we receive some sort of support goods or anything, we have our members pay something for it, whether it's just one yen or ten yen. That way, we do our best to have our members clearly realize, never forget, that they get this support because of where they are living.

Because all members are directly affected people (*tōjisha*), the idea isn't to "have someone do things for me" – what I ask them to do is to be clear about "what was it that I wanted to get from joining this group?" For example, maybe it's something like, "I wanted information." Or something like, "I've heard about rest and recuperation programs, and my family makeup is such and such, so I would like information for families like mine." Earth Angels then becomes the reception box for these requests. That's the group we are making,

one into which everyone's feelings enter. I founded the group in 2013, so it's been three years. And even after three years, there's close to thirty members, coming to it of their own will.

Also, like Ms. H said, I'm part of the "sending group" of the Accept-and-Welcome Nationwide Association. When there are "Rest and recuperation Information Sessions" in Fukushima, I will sometimes help out guiding visitors around the event.

I also think that, going forward, Earth Angels is necessary as a place for communication. I've always thought that if parents and children who go to rest and recuperation camps end up isolated after coming home to Fukushima – I always thought that really defeats the purpose. So rather than ending up like isolated points, let's try to make lines of connection, faces we know. If people who go to R & R camps become isolated from each other after they come back to Fukushima, they end up feeling like they need R & R camps forever or else they won't have a place to go. I want to make a place for community in Fukushima, too. I think that would be a good thing.

That's all for my presentation.

There continues to be an unresolved tension within Mrs. A between seeking to keep the family together for the psychological well-being of her sons, on the one hand, and her knowing that by returning to Fukushima and allowing her children to participate in these school activities, she is exposing them to radiation. The question is not the appropriate level of risk is, as some might try to spin it. The point of the matter for Mrs. A is that any level of exposure is something that already weighs heavily on her heart and conscience. Receiving fresh vegetables from Yamaguchi and sending her children to her parents' place in Hiroshima for the summer vacation

are ways she tries to mitigate some of the continued radiation risks and concerns. However, she cannot make peace with the situation, no matter how much she continues to compromise.

To put this in context the school's acknowledgment that elementary school students would be running through areas where the air dose is 0.76 microSieverts per hour, it is helpful to know that Fukushima City, next door to Nihonmatsu City, seeks to lower external exposure to 0.23 microSieverts per hour wherever they conduct decontamination procedures. Anything above 0.23 microSeiverts per hour is a contested grey zone of exposure, which has never been categorically proven to be unilaterally safe or damaging to all human bodies. The disproportionate distribution of contaminants following the accident creates hot spots where external exposure can spike if there is a higher concentration of radioisotopes in a given area. The school was effectively acknowledging that the schoolchildren would be running through hot spots but telling parents not to worry or think too much about this.

My side conversations with Mrs. A really stand out to me. Walking up and down the pier on Iwai-shima island in the dark, she told me about how her husband won't listen anymore and gets angry at her and the children when the topic of possibly leaving Fukushima comes up. He yells at her that she is brainwashing the children. But how can he accuse her of brainwashing them when the children are just talking about how much fun they had with their grandparents in Hiroshima, which is where A-san and her side of the family are from? The children are just saying that they enjoyed baseball in Hiroshima, and A-san's husband gets angry that A-san is brainwashing them to want to leave Fukushima. What can she do in such a situation?

Mrs. B: "My son said, 'That's the end of my escape from reality'"

I had met Mrs. B several times over the course of the year and a half that I had lived in the northeast. In the years after the accident, Mrs. B's café became a central hub for AWNA members from across Japan who have come to Fukushima over the years to plan "rest and recuperation" camps, food shipments, and other grassroots activities that connect Fukushima children and families with civil society supporters throughout Japan. Mrs. B's café also became a stop on many international researchers' paths into and out of Fukushima. In addition to myself and an American colleague whom I introduced to Mrs. B's café, researchers from a French social science research group make yearly inquiries for long-form qualitative interviews with Mrs. B. There are also plans in the works to make Mrs. B's son's story into a French-language manga (graphic novel).

Despite having visited Mrs. B's café with Ms. C several times and having sat in on AWNA meetings that took place at her café, I had mostly refrained from engaging Mrs. B too directly about her 3-11 story. She has a strong, somewhat abrasive personality that was difficult for me to sync with, especially because she is such a (seeming) comedian, quick-tongued, and has the strongest dialect of the three women. My fear and hesitancy subsided as I learned more about Mrs. B over the course of the Yamaguchi trip. When we got to the Hotel from the first storytelling event in Yamaguchi, Mrs. B was packing up her bag and about to bring it to her room. I commented that I was surprised by the very pink flowery design on a white background on her bag—that I thought it was uncharacteristic of her. The other storytellers and their manager Ms. H laughed, as did she, and said that I clearly didn't know how girly Mrs. B truly is—how much she loves all that stuff. She thinks of herself as Tinker-bell, whereas I had thought of her as the Big Bad Wolf from Little Red Riding Hood.

Figure 2.2 Mrs. B's Story

I'm B from Koriyama. Thank you for coming tonight.

I will tell you about my past five years.

In 2011, my son – I only have one son – was part of the student council at his middle school and he had just come home from his graduation ceremony. I work, so I also had just gotten home. We were eating the lunch I had made ahead of time when the earthquake struck. So on 3-11 – I think wherever anyone was they spent the day like this – but we just watched the TV, the footage of the tsunamis, and that's just kind of how the day went. The next day, we didn't know anything so we the people of Fukushima started clearing away the debris and climbing onto roofs to put tarps over the broken parts, and before you knew it, it was evening.

At the time, I was running my own business and my store was on the third floor. Glass had fallen down onto the street from the shaking everywhere, so I went back to the store to avoid that. When I was coming home from that, on the radio, they were saying, "This is an emergency announcement. The nuclear reactor… has… exploded." It was broadcast on Fukushima, on Radio Fukushima. At the time, there was an expert who was explaining the situation and that expert kept asking the announcer over and over, "It's an explosion?" And "Are you sure it wasn't a hydrogen explosion?" And the announcer would answer, "It says 'explosion' here in the announcement script."

And then that expert said, "If it's an explosion, then 150 to 200 kilometers is out [*auto desu*]." At that word "out," I was thinking to myself, "This is it. We're done for. [*aa, mō, dame da.*]" I went home right away to speak with my son. He had just studied about nuclear power and knew more than I did and he said, "Let's evacuate right now!"

We were living with my younger brother's family – because my husband is deployed elsewhere for his job, we live with my younger brother's family – so we also had to convince my brother. My niece was three years old at the time, a first-year in nursery school, so I was saying, "I'll take her and we'll evacuate together." But my brother works at a school and the graduation ceremony was the day of the earthquake and he had come home without cleaning anything up. So he said he couldn't go anywhere until everything was cleaned up and put away at the school. So we couldn't get going until March 14.

So we went on the morning of the 14th and evacuated to my aunt's place in Minami-Aizu (western part of Fukushima Prefecture). When we were there in evacuation, my middle school-aged seventh-grader son was the most knowledgeable of all of us. (laughs) He was saying all along, "We won't be able to go back." But as a parent, when I'm told, "School starts tomorrow," somehow I couldn't let him miss school, as strange as that sounds. So the day before school was supposed to start, we ended up going back to Koriyama.

After that, my son started missing school more and more, little by little. And when he would go to school, he would put on full protection. Honestly, strangers probably thought he was some kind of pervert [*henshitsusha*] the way he was dressed. He was in touch with this person named Yamaguchi who told him to put on goggles. So he would wear those goggles and long sleeves even when it was hot out, and would say to me, "Drive me to school so I can avoid external radiation exposure." And he'd come home dressed like that. Everyone treated him like some kind of twisted pervert or something.

In September 2011, it was announced that they would be using local Koriyama-grown Asaka rice in the school lunches, so he stopped eating the school lunches. He was the only one in the whole school to do that.

After that, at that time, because he wasn't eating rice from Fukushima prefecture, he was called "unpatriotic." Well, and so then my son finally started realizing that he was a little different from others around him (laughs), and so he kind of no longer felt like he could go to school, so that's the situation we found ourselves in. So around the end of March, beginning of April 2012, we started looking for a way to evacuate/send my son away (*sokai saseyō*). We started looking online. For a way to send/evacuate just my son, on his own. So we were looking online and it wasn't easy. They were accepting people if they came as "mother-and-child" or "with parents present" at quite a few places in like Aichi prefecture and like Higashikawa in Hokkaido, but because I couldn't go with him, I guess I made him have to refrain… made him have to suffer for that time (*gaman saseta*).

So I tweeted that I really wanted to send him somewhere during a long break from school. And that's when a café owner in Sapporo replied to my tweet and asked, "What's wrong? Is there anything I can do?" So I explained to him, "Well, this is the situation we're in." And I was able to send my son to Hokkaido for the long-term, one-month summer vacation.

So he went for one month and then when he got back, what he said was, "That's the end of my escape from reality." He said, "From tomorrow, it's back to reality." That's what he said. It was so sad and painful for me to know I was the one who made him say that – who had put him in a place where he had to say something like that. I thought to myself, "I really have to get him out of here." So I looked for the right timing and evacuated my son, just by himself.

I definitely wanted to send him as he graduated middle school and was advancing into high school, but there were all sorts of problems, like him not having gone to enough days of school. He didn't get into the Fukushima prefectural public high school and had a whole year

before he could take the high school entrance exams again. That's when I let him go to Sapporo. Now, he's up in Sapporo at a private high school with a dorm, still on his own.

When it comes to evacuation or moving, the timing is extremely important. Every family has their own circumstances and I think a lot of families do want to do something when the timing is right. But even if you want to evacuate or move or something, unless there's someone, somewhere who can accept and welcome you, you can't go. I think that rest and recuperation, evacuation, and relocation are going to be increasingly important in the years to come.

That's all for me.

In the case of Mrs. B, radiation led her son to make his decision to leave home and family. When her son proclaimed upon his return home from the one month in Hokkaido that "[his] escape from reality [was] over" (*genjitsu tōhi ga owatta*), Mrs. B felt herself to blame for putting him through these radiation-related difficulties and she took it upon herself to find a path out of Fukushima for her son, amid hopelessness and despair. Radiation meant not only ionizing radiation exposure, but also the overall social atmosphere that arose with school, government, and community response(s) to the contamination and government-decided living and compensation plans – which included widespread debates about everyday nuclearity. Reality in Fukushima was that Mrs. B's son was the crazy person for being concerned about radiation. Reality in Fukushima was that radiation was still everywhere and he would need to continue practicing radiation protection. In the first two tellings of her story, Mrs. B expressed that she was very saddened to hear her son say this, and that this was the moment when she realized she had to find a way to get him out of Fukushima. At the third retelling, in front of a group of forty

young mothers, fathers, and toddlers, she began to cry. Hearing her son proclaim that reality meant being treated as a crazy person for trying to protect himself, she knew she had to get him out of Fukushima.

After concluding her retelling by emphasizing the importance of the evacuation timing for each family, Mrs. B passes around a handout with the results of her individual dose monitoring data from 2013-2014. She points out that her external exposure on the days she spent visiting her son in Hokkaido was half of what she is regularly exposed to in Koriyama. This data and her story are meant to show that living in Koriyama means being exposed to twice as much external radiation as compared with living in Hokkaido. For Mrs. B, the other storytellers, and the audience members, this means twice as much danger. But I can also predict several official counterarguments that could be brought to critique and confound this data. One central question would be whether or not the levels Mrs. B recorded in Koriyama are indeed something to be concerned about—whether or not those levels are dangerous to human health, and, if so, to what degree; in other words, what do we know about the meaning of these observed levels when it comes to humans? What is the risk calculus, if the measurement was conducted properly? A second central question is whether Mrs. B conducted her measurements correctly. These would all be ways of discrediting Mrs. B's claims, concerns, and story flat-out. Anticipating and knowing such critiques and knowing also that they are irresolvable is part of the experience of living in grey zones of residual toxic uncertainty. But the critiques do not matter in the same way with this audience. They also do not matter in the same way within the frame of "choice and self-determination" that Japanese citizens are supposed to have.

Mrs. B now has to find a second home, so that her son can have a home to come back to. He hasn't been back to Koriyama since leaving. As a result, she, her husband, and her son have

not been able to have a meal together for the past four years. In the grand scheme of children growing up and going on their own way, this is not that strange of a story. But the radiation and social dimensions of living in everyday nuclearity make it strange. Mrs. B seemed to be especially concerned with finding a new home before her son finishes high school and enters college. It's this strange concern with *making* or *finding* a *new* home for her son to be able to go back to that is difficult to understand. In our side conversations, she kept using the verb "to go home" (*kaeru*). It feels strange to have the home and community to which one *goes back* (*kaeru*) become something that you need to actively choose anew. The home, community, and family that one *goes home* to are supposed to pre-exist you, in some way. It's this inversion of pre-existence and intentional choice that seems strange.

Ms. C: "It's as if people have completely forgotten about all this"

The third storyteller was my Fukushima mom. I write more about Ms. C in chapter 6, "Chinatsu's Everyday Nuclearity," at which point, I give her the pseudonym "Chinatsu Yamata" and refer to her as "Chinatsu" throughout my writing. In Japanese, I call her *okāsan,* which means "mom." This was a relationship through which I came to know ways in which affect and caring can keep one going back to contaminated lands. For the sake of this chapter, Chinatsu is "Ms. C," a divorced, single mother of two boys from Kawamata. At the time of this writing in 2019, her sons are 23 and 27. At the time of the disasters, her younger son had just completed junior high school and her older son had completed high school and just started working a steady job.

Ms. C lives in a town whose people and geography have been split by evacuation orders and compensation payments. Half of her town has been designated a compulsory evacuation

zone. The residents from that part of town had to evacuate and were living in temporary housing on a hill nearby. These compulsory evacuees were being paid lucrative compensation payments and "consolation payments for mental suffering." The other half of the town, where Ms. C lives, is a "business as usual" zone. There are no evacuation orders and no compensation. But there is contamination. The roads in and out of the evacuation zone are completely open to any vehicle that goes there, and this town is one of the main roads to the crippled plant. Houses built right next to each other are labeled evacuation and not; compensation and not. Contaminated water flows down to houses at the bottom of the hill that was designated the evacuation zone. When the wind blows, contaminants are carried into the "business as usual zones."

Figure 2.3 Ms. C's Story

Good evening. I'm from a place called Kawamata. My name is C. Thank you for coming tonight.

Our local organization is not large like Earth Angels. At the moment, we only have three members. But you can't be a proper incorporated nonprofit without at least four people – you need an Accounting Auditor. I have a friend who evacuated from Tsushima (a hamlet of Futaba Town, which is a red "Difficult to Return to for a Long Time" zone) and built a house. I asked them if they would do the accounting audit and that's when we were finally able to become an organization.

Our group started in January 2013. Until then, I would go to the supermarket without consulting anyone and would look for things from far away and decide what vegetables it was ok to buy – I would do the shopping within that feeling of worry and anxiety (*fuan no naka de kaimono o shite*). I think women will understand this, but you know how there's the time when

you are thinking of what to make and there are really good ingredients and then there are those times when you're like "what even is this?" What you make changes depending on all of those feelings.

I wanted to feed my kids something I could say, "this is alright/safe [*kore daijōbu da yo*]," so I linked up with a group in Ehime prefecture (in Shikoku, 1,100km to the southwest from Fukushima) and went through the trouble to get vegetables sent from them and stuff like that. But after five years, money got tighter and tighter (laughs), and something came up in my life that made things more difficult. So that's when we started to do group buying with our organization "Hand to Hand."

And in Saga Prefecture (1,400 km to the southwest, on the island of Kyushu), there is a "we'll do the shopping for you" (*kaimono daikō*) thing that we use for sea products, like wakame seaweed. I know the Sanriku Coast (in Iwate prefecture, also heavily damaged by the 3-11 tsunamis, very close to Fukushima, and part of the same cultural area of Tohoku) is extremely famous for its wakame and sea products and the like, but we don't want the things from there, so we go through the trouble of getting stuff from places like Saga, nori seaweed from the Ariake Sea – we have people in Saga buy those things for us and send them to us. And we pay for it. Yea. So we've scraped by doing small things like that, like having them do our shopping for us.

Why don't I move away? Why wasn't I able to evacuate? At that time, my younger son had just had his middle school graduation ceremony and the results for high schools had been posted. If he hadn't made it into the high school he wanted to get into, we might have evacuated, but he made it into the high school he wanted to go to, so I let him advance to school there. As for my older son, I think it was right about one year since he had started

working. So, he had found a job and was finally getting settled. And, well, say I was like, "That's it! We're going!" and took him with me to evacuate somewhere because of the nuclear accident. Well, it would be great if he was fortunate enough to find a proper job there, but what if we made it there and everything fell apart, what then? As a parent, I was extremely worried about that, and, well, that's how we kind of ended up continuing in the situation we're in now.

So that's why I tell my younger child that when he starts applying to jobs, it's ok if he doesn't choose Fukushima – he can go anywhere he wants. And to his older brother, too, I tell him that if he quits his current job and an opportunity presents itself, he can go on ahead to wherever he wants. And in time, I, too, want to go wherever I'll be able to go and if we could all move somewhere together, I'd like to do that, too. That's why… I guess… if the time comes when we're at a crossroads and we can move, I still think I want to go, even now. I think I will actually keep thinking this on and on. I don't think there will be an end to our everyday worries.

Oh, I always wear my dosimeter and I brought the data with me, so you're all welcome to take a look later.

Hmm… They decontaminated and the levels did go down, but large numbers continue to pop up here and there, in places you wouldn't even expect. And all of the stuff from the decontamination is all over the place. As for soil measurement – it has to be a proper organization if you are to do it right – but when I had the (radiation in) soil measured at 15 centimeters deep two years after the accident, there was a huge amount of Cesium there. So I think it fell to those deeper places, too.

And now, it's as if people have completely forgotten about all this (*fūka ga hontō ni hageshī*). You'd probably be surprised if you went and saw it for yourselves, but people just go about their normal everyday lives, no different from here. As if nothing whatsoever happened – that's what daily life is like. But then, there comes the day when they try to build a new house or something. You dig down to place the foundation, but it was only the top 2-3 centimeters of the topsoil that had been taken away for decontamination. Even if you let people forget, this stuff that is hidden deep will come up at some point somewhere and I think it will have a negative effect on people. That's why I want to work hard so that it's not forgotten, so that we don't let it be forgotten. But those in the local community who don't want this to be forgotten like me barely raise their voices. I want to keep building connections with the mothers who come to rest and recuperation destinations, like Mrs. A was saying. I want us to share information so that we can protect our children. That's why I take part in these activities.

If you have any questions, I'd be glad to answer them afterwards. That's all for me.

The procurement of safe food for her family from far away enabled Ms. C to provide life-stage stability within social organizations for her sons (school and job), even in the middle of extreme contamination that is literally in her back yard. Ms. C has since told me of her friends developing thyroid irregularities, other friends' health deteriorating, and repeated deaths of people in their twenties and thirties due to heart problems—all in just the past year. Yet, everyone goes about their normal everyday lives as if nothing happened. She's not blind to this, but she can't leave.

Kataribe Story-telling in Context

In Japan, in recent years, kataribe narratives tend to privilege the victim and suffering narratives of elderly who were women and children during the Second World War and survived American air raids. Emblematic of these sufferers are the atomic bombing survivor-victims of Hiroshima and Nagasaki (*hibakusha*) and the survivors of the most destructive air raid in history, the Tokyo Air Raid of March 9-10, 1945. These kataribe tell their stories as a way to relay the devastation of war to the postwar generations, who have become "blinded by peace" (*heiwa boke*) from living their whole lives in peacetime. Those with first-hand experience of great disasters, such as the 1995 Kobe Earthquake or the March 11, 2011, triple-disaster, tell their disaster experience stories as kataribe at yearly anniversary and memorial events, as part of local post-disaster sightseeing tours, or at international disaster prevention and memorial events. 3-11 kataribe activities tend to privilege victims of tsunami devastation and compulsory nuclear evacuees.

Common to wartime kataribe and disaster kataribe is the goal of heightening consciousness among the "peace-blinded" public, who has not experienced living through such great cataclysms first-hand. If this leads to personal, political, or grassroots action, so much the better, but a move to action is not necessary. There are other Japan-internal practices of public testimony linked with legal action or demands for legal action by victims of industrial pollution and medical malpractice (Koga 2013; Cullinane 2005).[44] In contrast, the disaster experiences of people from central Fukushima and voluntary evacuees are delegitimized. People from grey

[44] There are also types of public testimony in East Asia that go alongside heavily nationalistic wrongs. These include testimonials by Korean "comfort women," who are women who were forced into sex slavery by the Japanese army while Korea was a Japanese colony from 1910 through 1945; and Chinese survivors of Japanese war atrocities. There are also testimonials of the surviving family of persons who were abducted from their hometowns in Japan by North Korean operatives.

zones in central Fukushima and at the borders of the compulsory evacuation zones also tend to minimize their own claim to victimhood.

The Katariinas' storytelling trip, therefore, is both within and outside of these general patterns of storytelling and advocacy. They are speaking up, but to relatively like-minded and receptive audiences. They are not making overtures in front of the Prime Minister's residence, as other more activist groups do. The Katariinas, their manager, and those who came to hear them speak were middle-of-the-road in their grassroots efforts, certainly not trusting the "safety" group's messages that the radiological situation in Fukushima was acceptable and safe, but also not swinging into any kind of radical leftist politics or even making of direct claims on the state. The Katariinas' small-scale public retellings of living through spaces and relations of everyday nuclearity were intended for establishing continued grassroots connections between the people of Fukushima and grassroots supporters throughout Japan. Their storytelling and grassroots activities were Japan-internal, even if by interfacing with international researchers such as me, their stories travel abroad.

In anthropology, the genre of the testimonial has received analytical attention particularly in contexts of war and violence (Tate 2013; Fassin 2008; Rapport and Hartill 2010). Chief among these contexts have been analysis of Holocaust survivors' trauma and testimonials (Rapport and Hartill 2010; Douglass and Vogler 2003) and the global political activism of Latin American women who lost family members to state and paramilitary violence in the 1970s, 80s, and 90s (Menchú and Burgos-Debray 1984; Tate 2013). Zimmerman (2004) defines the Latin American genre of *testimonio* as a, "first-person narration of socially significant experiences in which the narrative voice is that of a typical or extraordinary witness or protagonist who metonymically represents others who have lived through similar situations and who have rarely

given written expression to them." Testimonio came to prominence in the 1970s and 80s as a way for illiterate or semiliterate indigenous subalterns and guerilla leaders to tell their lived experiences orally to a sympathetic member of a global literate intelligentsia, who would then write down and translate the story to have it reach a broader, non-Spanish-speaking audience (Zimmerman 2004).[45]

More recently, analysis has shifted to interrogating the political possibilities of testimonio in the context of non-traditional notions and practices of citizenship that interrogate the role of NGOs in enabling and cultivating notions of citizenship beyond those based in the nation-state. Tate (2013) writes of the power of transnational NGO networks to affect individuals' access to, embodiment of, and personal practice of what she calls "proxy citizenship" through the international sharing of their testimonios. For Tate, "proxy citizenship" refers to how "some of the rights of citizenship – the ability to make claims for redress to the state on the basis of experience of governance – are conferred and enacted through relationships and affiliations with networks of human rights NGOs" (2013, 56). Through the opportunity to travel and share their *testimonios* with U.S. lawmakers, Colombian women who lost family members due to U.S.-funded military violence were able to speak directly to U.S. lawmakers and make claims against

45 The Rigoberta Menchú controversy solidified that testimonials need not be absolutely true about the individual speaking in order to be understood as deeply representing and reflecting experienced truth for them, their community, and those who have gone through similar experiences. *I, Rigoberta Menchú* tells from the first person the family and personal story of Rigoberta Menchú, a Guatemalan Quiche woman, as she lives through violence, economic exploitation, poverty, and eventually accesses a global stage. This work is credited with helping to bring international awareness about the conditions and violence experiences by indigenous Guatemalans. Testimonio was also embroiled in controversy in the late 1990s and early 2000s. In 1999, David Stoll challenged the accuracy of some parts of Rigoberta's testimonio, sparking a widespread controversy as to whether every detail of a testimonial has to be completely accurate or whether the truth of such public accounts stems not from their absolute accuracy, but broader social and political experience shared by many individuals. Detractors argue that storytellers are not trustworthy narrators because they exaggerate, misrepresent, and are too emotional, especially because they tend to be women. These detractors argue that those who seek to represent speakers' stories as truth are at best duped, at worst, insufficiently independent thinkers and irresponsible critical scholars. Proponents and defenders of testimonios argue that testimonio has become a kind of expertise (Tate 2013).

For further reading on the Rigoberta Menchú controversy, see Menchú and Burgos-Debray (1984), Arias and Stoll (2001), Canby (1999), Rogachevsky (2001), Stanford (1999), and Stoll (1999; 2008).

the U.S. state through their lived experience, which Tate argues became a new form of legal expertise. Along the way, they were preselected and coached by NGO representatives about how best to engage in these encounters. After the encounters, Tate also reports that the Colombian activists experienced personal changes that allowed them to change their sense of citizenship to a more global register.

If we employ the English and Latin American context as the starting point for a discussion of the testimonial genre, then oral testimonials and testimonial literature by Japanese atomic bombing survivors from Hiroshima and Nagasaki are a global and local Japanese variant of testimonio (Treat 1995).[46] In a theoretical, abstracted, genre-focused sense, the Katariinas, like the Colombian activists whom Tate followed, "used personal experiences to confront and contest the official policy narratives that circulated about their region" (Tate 2013, 55). These were Japan-internal narratives circulating about Fukushima and globally-circulating images of nuclear apocalypse. The Katariinas' storytelling trip worked against the tremendous power of the media, the political establishment, time, and sheer distance to obfuscate the experiences of these women and others in their lives. Their stories complicated the government's – "safety" group's – proclamations of everything in Fukushima being under control. At the same time, their stories counterbalanced stereotypical portrayals of the people of Fukushima that get circulated by the

46 For example, Douglass and Vogler (2003, 40-41, 294 n. 38) argue explicitly that analytical descriptions given by American and Japanese-American scholars of atomic bombing survivors' testimonials fit almost perfectly the Latin American genre of testimonio. Douglass and Vogler also go farther to claim the therapeutic and empowering effects of testimonials to shift speakers' subjective experience of one from victims to survivors. The connections between the testimonials of U.S.-supported paramilitary violence in Latin America and the atomic bombings of Japan gain an added layer of historical appropriateness if both are understood as American military atrocities.

In recent years, American analysts have argued that victim's telling their narratives is therapeutic for the victim. However, victims' experiences of the atrocities and life thereafter differ widely, as do victims' experiences of retelling their experiences. Even among the five-person delegation from Colombia about whom Tate writes, depending on the audience and the storyteller-activist, the speaker's experience of retelling her story could make the trauma worse, rather than better or therapeutic. Neither does the positionality of victim need not be presupposed to be juxtaposed with or necessarily seen as leading to being a "survivor," as Douglass and Vogler, among others, suggest. Atomic bombing victim-survivors can be both victims and survivors at the same time.

"anti-safety" group, which collapse depictions of Fukushima into apocalyptic images of deformed babies and sickly children, similar to those from the contaminated Chernobyl zones. On a national, critical documentarian, and structural-academic critique level, "anti-safety" film makers and activists depict those who could not or did not evacuate as disempowered victims of corporate-government collusion, paternalism, and patriarchy. Such depictions, commonly peddled by well-wishing outsiders, strip people's agency in the choices that they each made and the circumstances that they each faced in their families. The Katariinas' stories were thus contestations of both "official policy narratives" and stereotypical activist narratives and images about and of Fukushima and its people, as NGO and activist narratives also gain an official quality to them.

In both the case of Colombian activists about whom Tate writes and the Katariinas, nongovernmental organizations (NGOs) mediated the creation of the "space of encounter." In the case Tate analyzes, the "space[s] of encounter" were the meetings to which the activists could travel and in which they could make claims based on their experience of governance by the U.S. state (2013, 56). In the case of the Katariinas, the spaces accessed were conversations with other Japanese parents. The Katariinas told their stories at five different venues to different groups of people up and down Yamaguchi Prefecture. The audience members were culturally, linguistically, and nationally the life-stage contemporaries, juniors, or seniors of the Katariinas. The main distance in experience between the storytellers and their audiences was physical, geographical distance, and the difference of going through the nuclear accident. It was not time or a generational gap. Young mothers and fathers comprised part of the audience at all five venues where the Katariinas spoke. Another key group of audience members were individuals who were active in civil society NGOs and NPOs, and who were thus interested in learning more

about the difficulties faced by people continuing to live in Fukushima and how they could help. Some audience members were even themselves evacuees from Fukushima. The Katariinas alternated who they considered to be the particular spokesperson for each venue based on whose story they thought would connect most with the particular audience.

The comparison of genre between testimonio and the Katariinas' storytelling falls apart when we pay attention to the content of these testimonials. This is especially important to do because focusing on process rather than content often results in the complete opposite of the intended message.[47] On the level of content, there are salient differences between the Latin American testimonios, which overwhelmingly focuses on war and violence, and the Katariinas' seemingly milder focus on family decisions in the contexts of radioactive contamination in and of everyday life. The stories shared by the Katariinas tell us about why and how people remain or remained in Fukushima, returned to Fukushima out of evacuation, or were able to leave Fukushima. They also tell us about the Katariinas' experiences with everyday nuclearities. The Katariinas pay targeted attention to:

- changes in family and community relations as a result of evacuation and post-contamination compensation;

47 Tate (2013) notes how the content of Colombian activists' testimonios was not paid attention to by politicians and staffers in Washington D.C. Even if the content of their testimonio was not addressed in any way, "participation" in conversations with U.S. political staffers in D.C. got spun as participation in the democratic process. This way of twisting and subordinating content into a process that it does not support is similar to Li's (2009) argument that the international mining industry uses the form and process of "Environmental Impact Assessments" to create documents that take precedence over their content. In other words, even if a local group is highly critical, distrustful, and rejective of a proposed mining project due to the irreversible environmental impacts it would have, if they take part in a mining industry-sponsored conversation about the EIA, the mining industry can then say they heard this critique, have factored it into their EIA, and still go ahead with their plans anyway. This is similar to committing to denuclearization, while never denuclearizing.

- changes in how they and their families interacted with the new physically radioactive outdoors environments following the accident, including how they and others interact with the continued presence of contamination literally in their back yards;
- the physical, psychological, and social health of their families through evacuation and post-nuclear accident Fukushima society;
- stories of how one hears and learns about questionable school food practices related to radiation monitoring;
- procurement of clean and trustworthy food;
- the ways that evacuation zones and compensation divide people within a town, despite the continued presence of contamination in the "business as normal" zones;
- and the importance of the creation and continuation of connections with the greater Japanese community following 3-11, including how these connections facilitated changes in their family habitation patterns following the nuclear accident.

Conveying this information to their audiences was the primary goal of the trip.

Tate traces a progression from "solidarity to advocacy" in translational campaigns in Latin American contexts (2013, 57). The Katariinas' storytelling was Japan-internal. In this respect, the Katariinas' work remains more in lines with asking for solidarity than advocacy. The stories of the Katariinas and the goals of the mission on which they embarked had to do with the connections and movement of people, groups, objects, and stories into, out of, and within Fukushima. In terms of the kind of support and help they and others in Fukushima needed, their range of actionable suggestions was limited. They were able to suggest continuing food shipments of vegetables from Yamaguchi to Fukushima. Secondly, they hoped that their stories would be enough to motivate local "rest and recuperation" camp organizers to continue

organizing these camps and hosting children from Fukushima. On several occasions, audience participants expressed that they had been frustrated with and less than understanding of Fukushima children who had come to Yamaguchi as part of the "rest and recuperation" camps. The hosts felt the children expected everything to be done for them, from meals to lodging to organizing group activities. Furthermore, given the continued broadcasting by the mass media that any negative consequences of the nuclear power plant accident were being more and more mitigated, and that everything was under control, the hosts were also confused as to why Fukushima children in particular needed any further special treatment or "rest and recuperation" opportunities. The Katariinas' sharing of their on-going experiences in contemporary Fukushima helped win over these audience members' continued support and understanding of the need for Fukushima children and adults to be able to get out of Fukushima, even if only temporarily.

In the realm of grassroots aid, the Katariinas' stories dispelled misunderstandings of *all* people of Fukushima as receivers of government aid and industry compensation. This is not the case, and the Katariinas themselves only received small one-time payments from TEPCO, since they were not from compulsory evacuation areas, even if people from the same town may be continuing to get substantial monthly payments given to compulsory evacuees. Another stereotype that the tellings worked to dispel was one of the people of Fukushima as ungrateful receivers of grassroots aid—as if they had come to expect aid, free things, and free vacation trips without the due gratitude, work, and humility that receivers of such aid should exhibit. The *Katariinas* told their stories not for the evocation of sympathy or empathy (though they certainly received sympathy and empathy from their sympathetic listeners), but for the purpose of sharing the facts and truth of a recent historical and current state of affairs.

Conclusion

The Katariinas and Ms. H, their "manager," recognize that due to the contamination resulting from the nuclear power plant catastrophe, they have been put into a position where support and help are desirable. Securing that support and help was an important part of the mission on which they embarked. Yet, part of the point of the storytelling is to share the everyday struggles that they face, without necessarily seeking help or support in those struggles. The network of food, information, and trust resultant from these efforts is not absolute; but it does have potential to support future sending of people out of and sending of goods into Fukushima.

In order to realize "rest and recuperation" or other forms of sociomaterial grassroots support, the Katariinas had to come and tell their stories of living in Fukushima. Physically traveling to Yamaguchi and telling their stories in person allowed the Katariinas to counterbalance media and government portrayals of their lives. They were also able to counterbalance stereotypes that depict the people of Fukushima as selfishly benefitting from the aid of others. Theirs were not stories of victimhood and only victimhood. Indeed, the Katariinas pushed back strongly against such an uneducated, caricaturized representation of them and fellow residents of Fukushima. The measured-ness of self-determination, victimhood, *and* choice; as well as reciprocity, imaginability, linkability, and knowledge were all important parts to how successful sociomaterial links could be formed from both sides—or at least, how an understanding could be achieved. But just because the Katariinas did not abuse the goodwill of others did not mean that there weren't those who did. They counterbalanced this stereotype and reality by sharing much-sought-for information, expressing gratitude for the aid they have thus far received, and explaining the kind of continued support that they do desire.

The *Katarinas* understood this story-telling voyage as a chance for creating new connections and deepening old ones. The exchange of information was part of continued and new movement of food and goods into Fukushima and people and stories out of Fukushima. The support that they are able to organize and continue receiving through these grassroots connections pales to the scope of environmental concerns in their everyday lives that they and their families continue to face as they live in Fukushima. And yet, this exchange of information, continuing grassroots food shipments, and continued movement of people between Fukushima and the outside can translate into hope, health, and new possible futures somewhere that then becomes not altogether unknown. It also means continued futures living in Fukushima with material and moral/emotional (*seishinteki*) support from people living 1,300 kilometers away. These are sociomaterial pathways in and out of not only the physical space of Fukushima, but also in and out of the sedimenting relations of community, food, children's bodies, health, and contamination. This chapter thus examined how deliberate acts of personal storytelling can lead to material and social practices of connection that can change the course of people's lives.

The Katariinas' stories demonstrate the kinds of pressures that the nuclear power plant catastrophe at Fukushima Daiichi has created within Fukushima families. These were not problems that the Katariinas sought for the people of Yamaguchi to fix. They were human experiences that could be shared, and through the sharing, meaningful connections could be created and affirmed. Some of those connections were material, as when Yamaguchi farmers continued to send produce to the Katariinas and their NPOs in Fukushima. The continuation of rest and recuperation camps in Yamaguchi may possibly connect to relocation, as it had for Mrs. B's son to Hokkaido. These kinds of grassroots initiatives can never be a panacea for the complexities of experience arising from manmade and natural disaster; but they are an important

part for some who continue to live between the competing pulls of family, information, and concern.

Chapter 3 Radioactive Materials: Like Dust and Beyond

> The situation in which we now find ourselves is something that has been decided for us by the Japanese government [by Japan]. … It played out just like [the two Russian doctors] said it would: dragging on and on after the accident, nothing resolved, things left unsettled and indefinite, and that's the end. It's scary how we get used to things. On top of that, it seems like all of Japan has gotten used to it, doesn't it? What is there for us to do?
>
> Chinatsu (Ms. C)

> On the TV they were saying stuff like, "Radiation is like pollen," that kind of stuff, and, um, "If you have something shell-like, slippery (*tsuru-tsuru*), you can dust it off, like as if you were dusting off pollen (she gestures dusting off pollen from her clothes), so if you go out, you should wear something like that," that's what they were saying.
>
> Mrs. Matsuda

This chapter is an ethnographic examination of *visible* manifestations of radioactive materials in Fukushima society and the informed coping with the invisibility of radiation and radioactive materials that my interlocutors undertook. As the Katariinas' stories showed, the responses to radioactive materials and radiation by people living within grey zones were varied. They incorporated multiple material and immaterial orienting logics and considerations, and took into account considerations of people's varied feelings and perspectives, even if one's own perspectives on radiation differed from others'. Reconstituting the world in the wake of nuclear disaster was a process full of overlaps and disjunctures between the seemingly nuclear and non-nuclear, visible and invisible, exceptional and banal, material and immaterial. Amid the

contradictions, non-nuclear systems of order and meaning helped my interlocutors to cope through and with the contamination, while surreptitiously banalizing living with contamination.

My argument is as a set of counterarguments against, on the one hand, social science literature that posits apocalyptic anxieties about an irreversibly toxic world, and, on the other, government propaganda that muddles contamination from manmade radionuclides with representations that entreat their viewers to think and feel that "it's all fine" and that lifestyle diseases greatly overshadow any foreseeable radiation-induced risks of carcinogenesis. Both extremes claim to offer ontological truth-models of inhabiting nuclear everyday life without attention to the practicalities involved. In the introduction, I outlined my stance towards the social science literature on risk and invisibility. My goal in this chapter is to present government and non-government representations of radioactive materials in the Fukushima context beyond the zoning, thresholds, and exposures discussed in chapter 1. I then present the implications of such understandings in my interlocutors' everyday lives through an ethnographical account of my interlocutors' understandings and practices of avoidance and removal of radioactive materials.

As I noted in the introduction, I write in tension with studies that dramatically overemphasize the invisibility of radiation (Adam 1998; Beck 1992; Weston 2017). Radioactive materials and radiation are very visible when there are mounds of decontamination waste material all over: next to your child's playground, outside your living room window, and on display at the edge of farm fields in view of the major highway, for all to see.

There were broadly shared material understandings of what radioactive materials are, how they move, and *that* they *can* be moved, even if the implications of radiation and radioactive materials remained and remain contested, negotiated, and uncertain. Government risk

communication materials include a number of representations that explain and banalize radiation and radioactive materials into everyday life through their dust-like materialities. Concerned citizens likewise depict radioactive materials in this dust-like way even as they exceptionalize them. Radiation was being made abundantly visible and people were dealing with it in common sense ways, as part of common sense, everyday life concerns. News reports, government communiques, and media produced by concerned citizens articulated the qualities of radiation and radioactive materials in the everyday in a myriad of different ways, including through the materialities of rainwater, dust, soil, germs, and light. Interacting with radioactive materials in these ways, as an additional kind of everyday "normal" waste associated with outdoor environments, like germs and dirt that can stick to your hands, an environmental toxin, or a new undesirable food additive allowed my interlocutors access to vigilance and agency in various everyday practices of avoidance and removal of these kinds of materials, even as it banalized the contamination.

Practically, it was not impossible to reconstitute everyday life in a way that incorporated the avoidance and removal of radioactive materials, since dust and dirt avoidance and removal practices are, after all, a regular part of everyday life (Daniels and Andrews 2010; Douglas 2002). At the same time, the practical implications of trying to avoid dirt and the outside, especially with young, energetic children, could be overwhelming and quite impossible to uphold. This led voluntary evacuees to remove themselves from the radioactive-material-containing environments (rather than trying to remove radioactive materials from their environments). When my interlocutors sought to avoid radioactive materials, their actions were therefore informed by physical, material understandings of removal and avoidance in line with

government depictions and actions, rather than metaphysical notions of "purification" or malicious discrimination. But materially-inflected discrimination also occurred.

Even as everyday materialities helped make common sense of living and coping with radioactive materials, there were also national media and academic studies (e.g. Tsujiuchi 2016) that reported incidences of discrimination against evacuees and the people of Fukushima, with evacuee children being called "germs" or "radiation" in schools. The government came out strongly and repeatedly to emphasize that radiation *is not* like germs or viruses and chastised any such insinuations as unscientific. But such counterarguments collapse what are understood to be material analogies with pejorative bullying. Civil society supporters noted that voluntary evacuees were among the most stringent and well-aware of contamination and contamination avoidance, so it was actually more likely that voluntary evacuees might discriminate against others, who, for example, might buy something from Fukushima to support recovery. Therefore, while anti-discrimination overtures were seemingly made with the well-being of evacuees and the people of Fukushima in mind, it often felt like voluntary evacuees (themselves from Fukushima) were the targets of such injunctions.

Part 1: Depictions of Radioactive Materials

On the morning of Saturday, November 8, 2014, I got a phone call from Yuta. He was wondering if I had any plans for the day. I did not. He told me that the Fukushima Prefectural government and national government were having an Information Session for voluntary evacuees at the Yamagata Terusa Building. There would be individual consultation booths for voluntary evacuees to be able to speak with officials, official presentations for all, and various civil society organizations would be present, too. This seemed like the chance! Already I had

been going around to events in Yamagata and volunteering at rest and recuperation camps for one month. I could finally attend an official presentation, collect pamphlets, maybe meet new civil society supporters or voluntary evacuees, I thought. That mini dream of being the all-information-collecting fieldworker popped quickly. Could I help them out by manning the cotton candy machine and playing with the children, Yuta asked. Spirits slightly dampened at being slotted into the childcare volunteer slot, I somewhat begrudgingly went to volunteer and help out. I hopped on my bicycle and made my way down to the station, through the underground pedestrian tunnel, and to the Terusa building.

The day of fieldwork was very productive. As I was manning the cotton candy machine, Mrs. Sasaki came over in her dark purple coat. I had met Mrs. Sasaki at a potato stew event in mid-October, then again when I was volunteering at a cooking lesson for voluntary evacuees. She then invited me to become a regular member of a Wednesday morning embroidery circle for some six to ten voluntary evacuee mothers, which I had been attending with her for several weeks. Mrs. Sasaki came over with her fourth-grader daughter Hana-chan and ninth-grader son Sui, waving. "Oh! Look at you! What are you doing here?" she said smiling and laughing.

"Would you like some cotton candy?" I likewise, laughingly, returned the greeting. We chatted briefly and Mrs. Sasaki told Hana and Sui to stay with Alex, while she went to get some information about high school advancement for Sui. She also went to other one-on-one "consultation windows" (*sōdan madoguchi*) with government and civil society representatives from Fukushima and Yamagata. Reluctantly, Mrs. Sasaki was planning return to Fukushima in March 2015. Sui would be advancing to high school and she wanted to make sure he did his best to get into the agricultural-focused high school he had his sights on.

Mrs. Sasaki came back in about half an hour. She had just smoked a cigarette—I could smell the tobacco on her clothes. She shared with me that one thing that was getting on her nerves was that in all the explanations (*setsumei*) and consultations (*sōdan*) that she was going to that were organized by Fukushima Prefecture just kept on saying that everything is alright. "It's fine, it's fine! (*Daijōbu daijōbu*.)" They want people to come back, she said, annoyed. They want to keep people from leaving. They will only ever say that everything is ok, she said. I could see the pain and tiredness in her eyes and body. She said she spoke frankly about radiation to her children, Sui, in particular. She had collected information on rest and recuperation camps, in preparation for when they decided to return to Fukushima. I write more about Mrs. Sasaki later in this chapter and in Chapter 5. For now, she, Hana, and Sui then made their way home, with a goodie bag provided by Yamagata civil society supporters to Information Session participants.

I ventured away from the cotton candy stand a little later, once another volunteer came by to take over. I made the rounds through the open areas, where there were pamphlets, booklets, flyers, and other informational materials by government and non-government sources. I was especially interested in the Decontamination Information Plaza's public displays.[48] As I approached, I could see Mr. Eggplant (*Nasubi*) playing on the TV. "Mr. Eggplant's Questions" is a series of videos, picture books (manga), pamphlets, and safety appeals sponsored by the Ministry of the Environment and put out by the Decontamination Information Plaza (Ministry of the Environment 2019b). Mr. Eggplant answers all sorts of questions about living, radiation dose, radiation in food, the reuse of soil removed through decontamination procedures, and many other topics. Each step of the way, Mr. Eggplant assures you that all necessary countermeasures are being taken and that all government-supported work is safe for the decontamination workers

48 Later renamed the "Environment Revitalization/Restoration Plaza" (*Kankyō Saisei Puraza*) on July 14, 2017, to get rid of the negative connotation and association with "[de]contamination."

and residents. In short, Mr. Eggplant is one cartoon and real-life person's face of the "safety" group (Tsujiuchi 2016), telling for all to hear what was irking Mrs. Sasaki: that everything is fine, all fine (*daijōbu, daijōbu*).

As I approached the Decontamination Plaza display, I met Technical Advisor Aoki, who was the representative of the Decontamination Information Plaza at the Information Session. I exchanged business cards with him and later followed up by email for any English-language materials he had on decontamination. Technical Advisor Aoki emailed me an English-language Power Point titled "Fukushima Daiichi NPS Accident, Its Health Effects, and Progress of Countermeasures," dated in October 2014. I also saw him give a Japanese version of this presentation as part of the Accept-and-Welcome National Association's "Decontamination Tour" to central Fukushima on February 21, 2015. This Decontamination Plaza's Power Point presentation is geared towards the general public, including civil society supporter nonprofit organizations from across Japan.[49] I take these two sources as representative of the government's depictions of radioactive materials for the general public.

Government representations of radiation and radioactive materials often begin with a comparison between ionizing radiation and the light emitted from a lightbulb or some other version of a power-emitting analogy. In "The Truth About Radiation," it is a lightbulb, which is compared to a radionuclide (Figure 3.1). The light it emits is the radiation. The brightness of the light is the radioactivity—the power—of the radiation. Therefore, it is important to know the "light" source, the power of the "light" it is emitting, and how far the "light" will penetrate through different materials. Differentially penetrable materials include human skin, the walls of

[49] I include the Power Point in Appendix B, along with an English-language translation of the Reconstruction Agency's March 2018 "The Truth About Radiation" booklet in Appendix C (translation by myself and Tomoki Birkett 2018), which I engage later in this chapter.

houses, cinderblocks, and lead vests. The Decontamination Information Plaza's materials employed a series of boxing metaphors (Figure 3.2).

The following figures (3.1 through 3.7) are Power Point slides from the Decontamination Information Plaza that depict the dust-like materiality of radioactive materials. Radioactive pollutants ("RP" for short) are depicted as dust-like particles with animate facial expressions that were emitted into the environment and can enter the thyroid and food (Aoki 2014, slides 1, 3-5, 10, 14-15, 27). RPs can be rounded up, sequestered, and, so long as people keep away from them, the people will be safe. Four countermeasures to decrease external exposure doses include securing distance, shortening exposure time, providing shielding against the RPs, and removing RPs with soil (Figure 3.3). Through decontamination procedures, RPs are ideally collected and removed, contained, covered with soil, and kept safe (Figure 3.4). Beyond what is sequestered through decontamination, Cesium in the environment is shown having washed away with rain water and foliage (Figure 3.5), and is now understood to collect on soil surfaces under trees, depressions in ground surfaces, road-side ditches, and drain spouts and eaves troughs (Figure 3.6). Decontamination procedures are depicted as duly addressing these high-concentration areas (Figure 3.7).

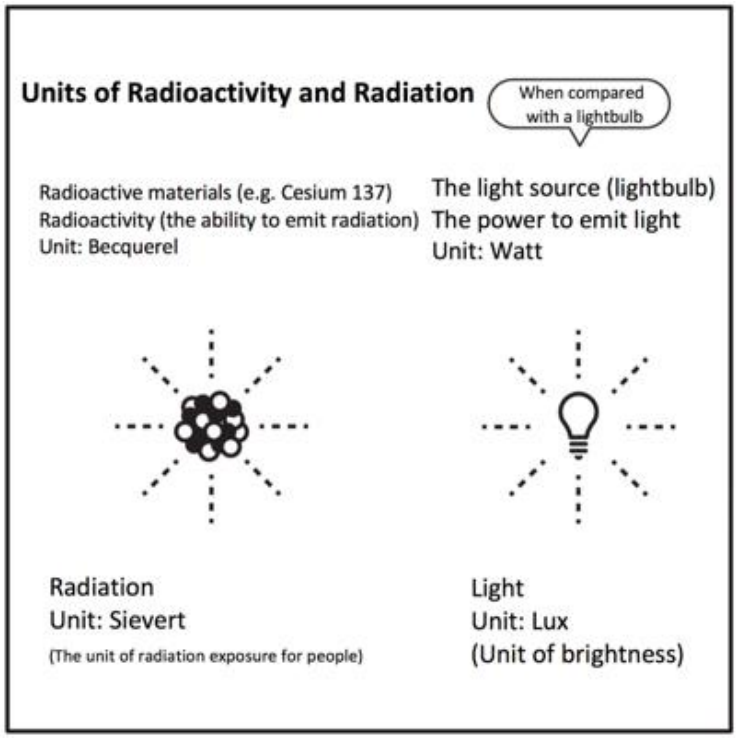


Figure 3.1 Radiation explained through a light and lightbulb analogy.

Source: Reconstruction Agency (2018, 4). "The Truth About Radiation."

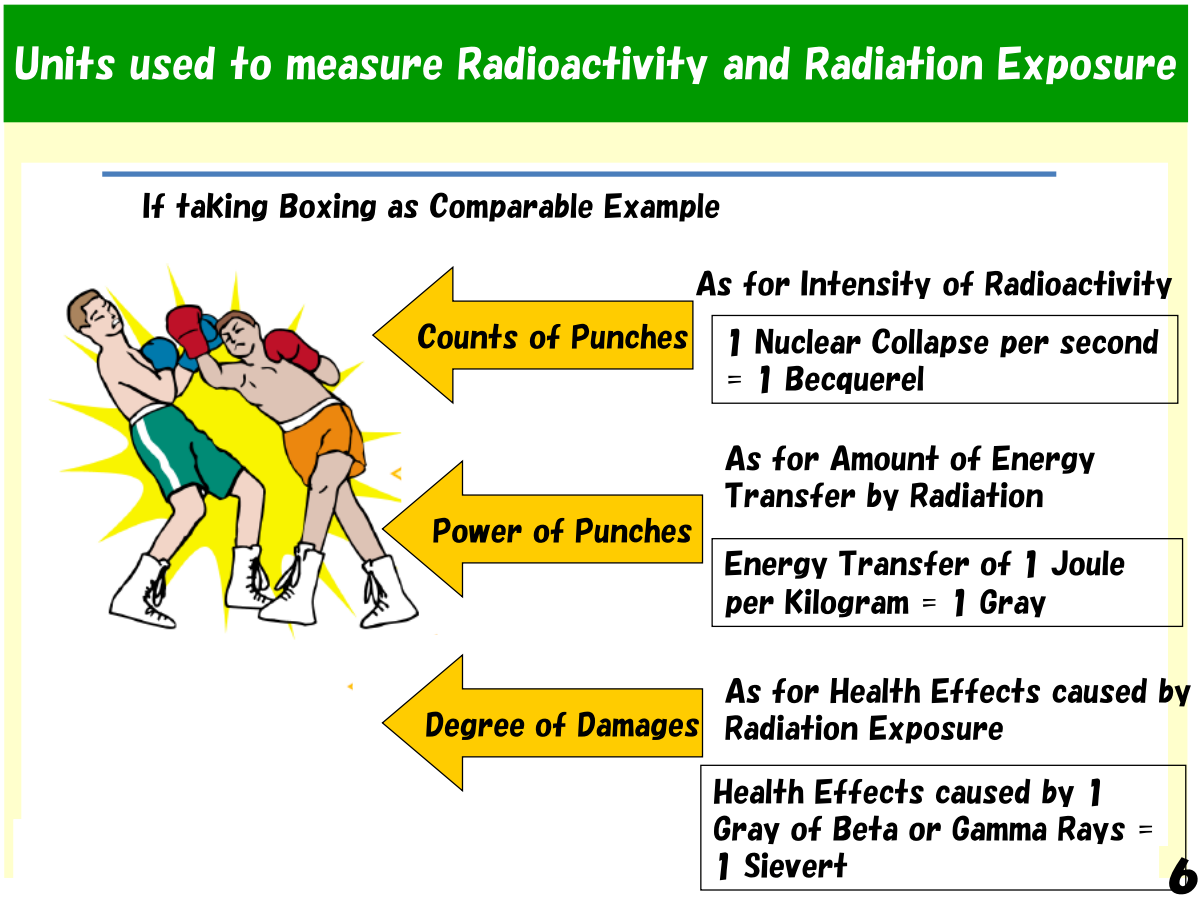


Figure 3.2 Radiation explained through a boxing analogy.

Source: Decontamination Information Plaza (Aoki 2014, slide 6).

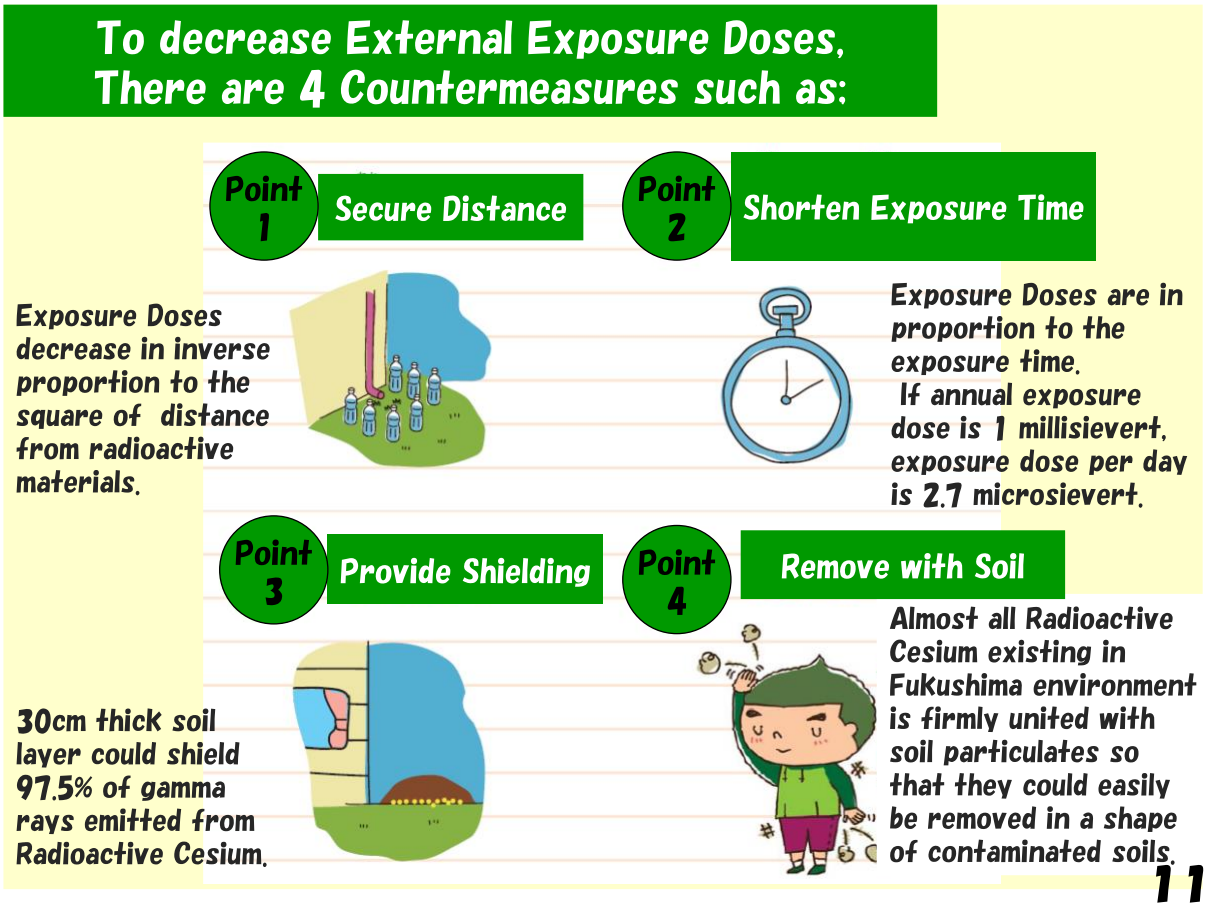


Figure 3.3 Four countermeasures to decrease external exposure doses.

Source: Decontamination Information Plaza (Aoki 2014, slide 11).

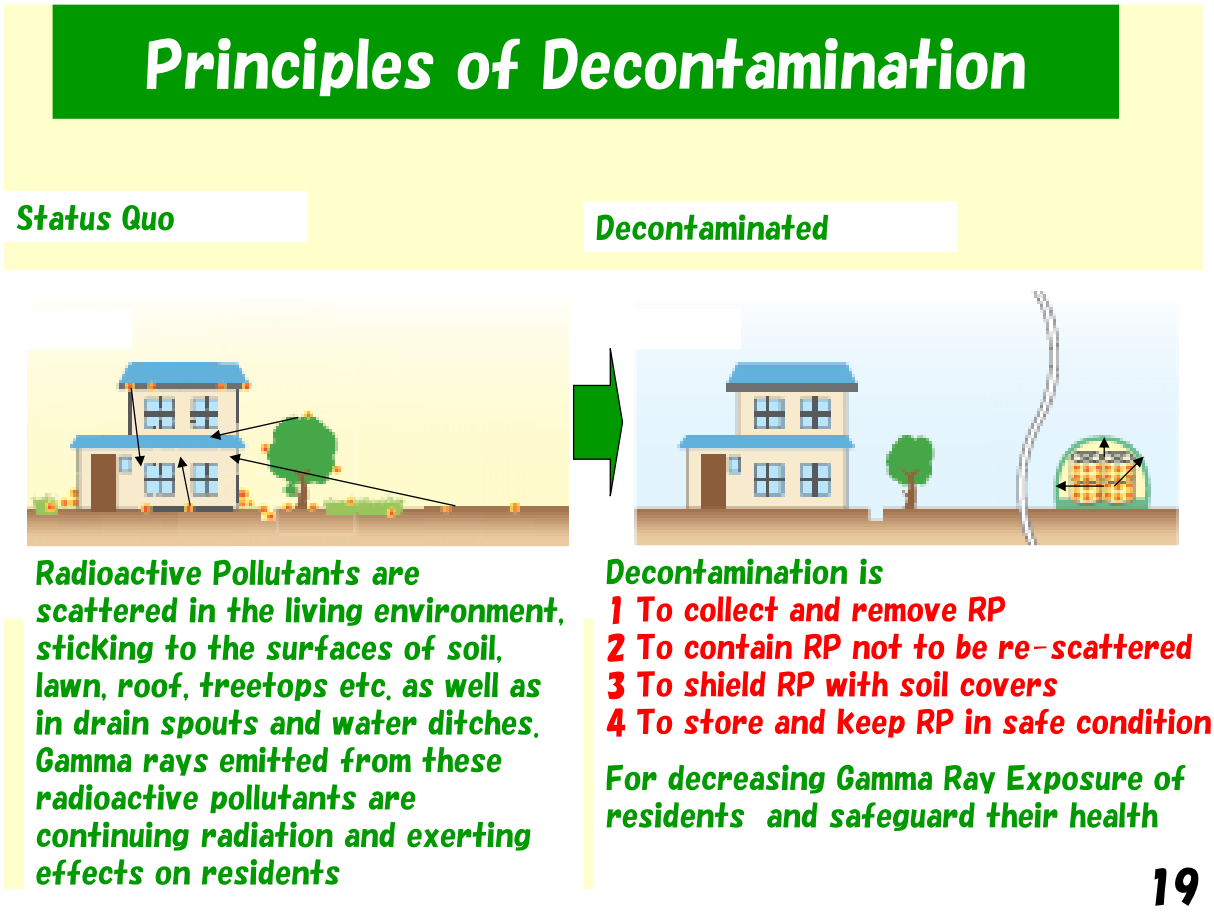


Figure 3.4 Principles of Decontamination.

Source: Decontamination Information Plaza (Aoki 2014, slide 19).

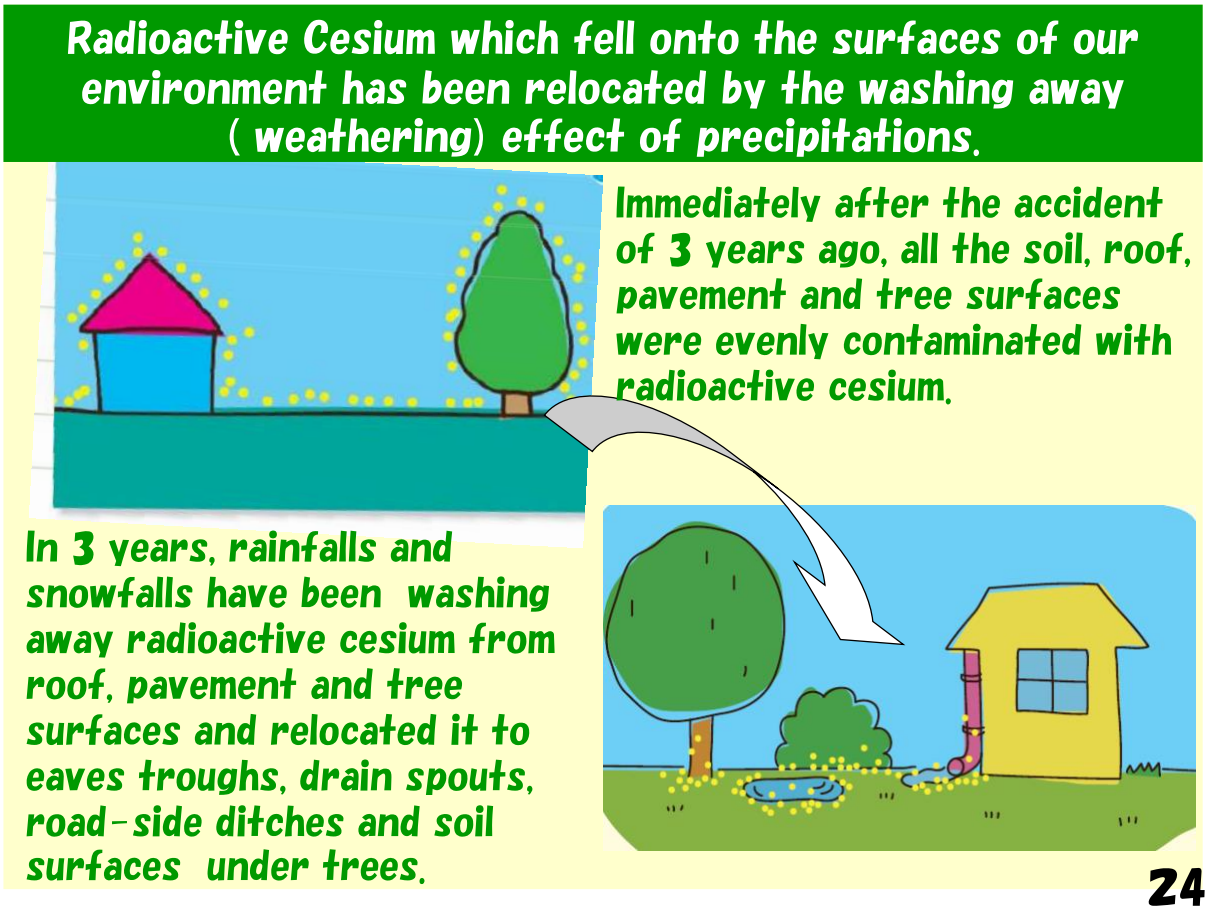


Figure 3.5 Weathering effects on Cesium washing away in the environment.

Source: Decontamination Information Plaza (Aoki 2014, slide 24).

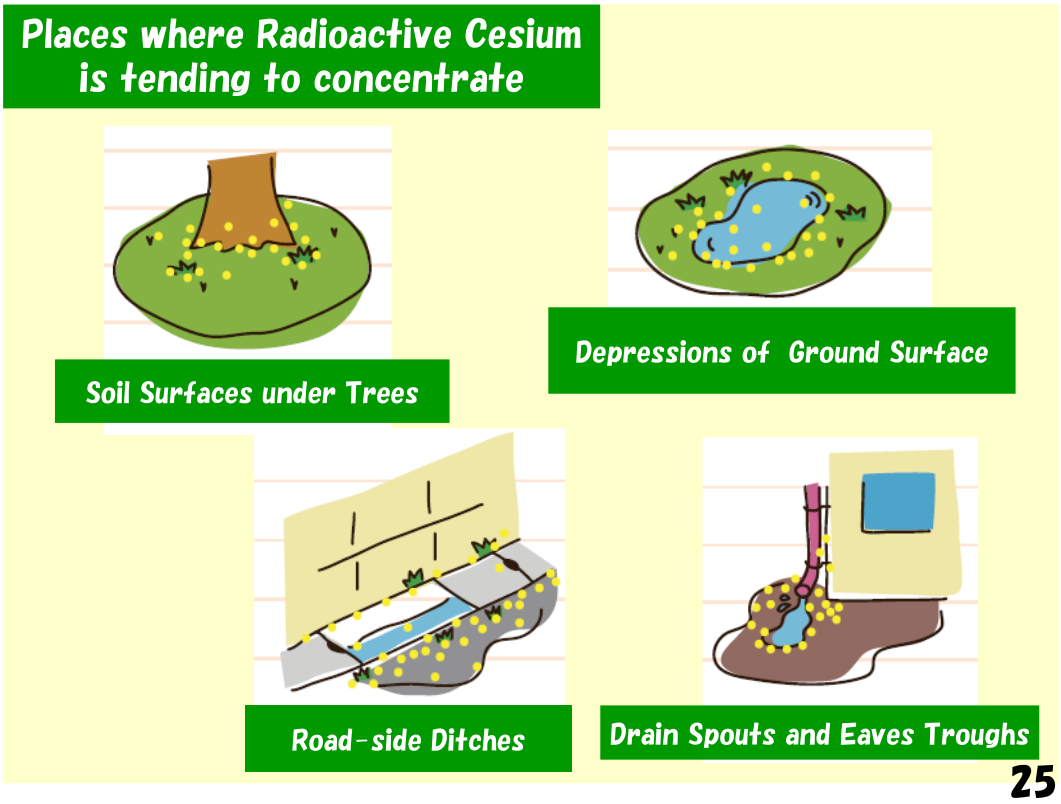


Figure 3.6 Places where radioactive Cesium tends to concentrate.

Source: Decontamination Information Plaza (Aoki 2014, slide 25).

Figure 3.7 Methods of Decontamination.

Source: Decontamination Information Plaza (Aoki 2014, slide 26).

Figure 3.8 Decontamination Information Plaza's Radioactive Doll House.

Source: Photograph by author.

A Decontamination Information Plaza model of a house and yard used to demonstrate the principles of decontamination. Yellow pebbles represent soil that contains Cesium 134 and/or Cesium 137. White pebbles are soil without radioactive pollutants. Lights on the roof and in the tree also represent radioactive contaminants. Those who walk by can use the oversized out-of-scale shovel, scoop the dirt, and place it into the protective canister. Notice the female doll in the yard, presumably a housewife and mother. Saturday, November 8, 2014. Terusa Building, Yamagata City. Information Session.

Figure 3.9 Familiarizing yourself with radiation already all around you.

Source: Photograph by author.
Part of the Decontamination Information Plaza display at the Information Session. Blue “Beta-chan” (bottom left) is a Beta rays deterctor. It (she?) lies next to a slab of granite and fertilizer from phosphoric acid and potassium. Pink “Alpha-chan” (upper right) is an Alpha rays detector. It (she?) lies next to dried *konbu* seaweed and mineral encrustations left by hot springs (*yu no*

hana). "Chan" is a diminuitive suffix added after girl's names. Saturday, November 8, 2014. Terusa Building, Yamagata City. Information Session.

Figure 3.10 A display board titled "How can you avoid exposure?"

Source: Photograph by author.

Part of the Decontamination Information Plaza display at the Information Session. "How can you avoid exposure?" is written in an informal tone, like a child might ask the question. Saturday, November 8, 2014. Terusa Building, Yamagata City. Information Session.

Amid these various visibilities and invisibilities, my interlocutors and concerned citizens devised various common-sense ways to understand the properties of radioactive materials. Prominent among the material understandings of radiation danger were the dust-like properties of radioactive materials. There is a dust-like *spreadability* of radioactive materials through the

environment, a dust-like *stickability* of radioactive materials to clothing, shoes, cars, trucks, trains, skin, hair, and other objects, a dust-like *inhalability* of radiation from the surrounding atmosphere, and a nutrient-like *absorbability* of radioactive materials into organic tissue, organisms, and bodies.[50] Depending on the material properties of the objects on which radioactive materials are deposited, they may be absorbed or transferred further.

In 2011, artist and concerned citizen Misato Yugi created a series of "red dots" depictions of radioactive materials in child-centered vignettes, which she featured on her "One Picture a Day Blog" (Figure 3.11).[51] I first came across these images at anti-nuclear protests in the summer 2012. Yugi depicts radiation and radioactive materials as red dots amassed on the ground, kicked up by wind and outdoor play, and packed into lunch boxes. The writing is in simple hiragana script, like the ABC's in English. Hiragana evokes children's voices, as Yugi entreats adults and caretakers to protect children's health and lives from radiation, and to consider the genetic impact of radiation exposure on the fetus of pregnant mothers. These "red dot" images became symbols of the anti-nuclear movement early following the nuclear accident, and circulated on posters, tweets, Facebook posts, t-shirts, badges, among other material depictions (Sekiguchi 2011).

50 My articulation of these qualities of radioactive materials is inspired by Anne Meneley's (2008) approach to writing about and analyzing the material qualities of olive oil. Meneley's work analyzes the "luminosity, liquidity, spreadability, durability, capacity to cleanse, capacity to act as a sealant or preservative, capacity to insulate, and notably, a lack of miscibility in water" of olive oil (2008, 306). I by no means suggest that radioactive materials and olive oil are similar in their qualities! The point of this footnote is to acknowledge not only argument-level inspirations in my writing, but also stylistic inspirations for ethnographic and anthropological writing.

51 As of [April 16, 2018], the blog website (http://www.mikanblog.com/?p=2367) has been taken down, though the illustrations continue to circulate. Conspiratorial thinking would suggest that this blog's being taken down might be part of internet and information censorship in the wake of Fukushima, perhaps targeted by the government's Secrets Law. But I cannot confirm that such was the reason for the blog's discontinuation without further research. It may also be due to the author's wanting to take down the blog; not paying for the domain name; or any number of other reasons.

Figure 3.11 Red Dots Posters. Google Images Search for "Akai tsubu tsubu houshanō" [red dots radiation].

Accessed April 16, 2018. The writing in four-panel-image at the bottom of this picture reads, "This, this, this, this." "This [is what we're talking about]." "This [is what it is]." "This [is the situation]." The writing on the image of two small children underneath two large hands reads, "Protect [them]."

In Yugi's depictions, the red dots—the radiation and radioactive materials—did not fall simply on the land, water, and abstracted houses. They are in the dust inhaled by children playing soccer, presumably as part of their school club activities. They are in the bowls of food that the children are being served by their grandparents. They are on the milk carton, which suggests school lunches. They are on the t-shirt that the mother will wash in the laundry. They are on the playground where a little girl sits in a raincoat, evoking the summer rainy season. Whether or not these depictions made radiation visible, they certainly made radiation tangible and the object of perception.

Part 2: The Visibility of Radioactive Materials in Decontamination-in-Progress Environments

The national government is concerned with optics when it comes to Fukushima and the nuclear accident. Edgington (2017) notes that Fukushima residents and environmental NGOs criticized the government decontamination campaign as a public relations front**.** These actors claimed that while the government claimed to be reducing levels of radiation, the most substantial decrease in levels came about not as a result of the decontamination, but as a result of the natural decay of radionuclides, notably the 2.06-year half-life of Cesium 134 (even as Cesium 137 will persist in the environment for much longer, with a half-life of 30.17 years) (Edgington 2017, 100). My interlocutors echoed this sentiment and noted the optics of decontamination. When I spoke with Ms. Tanaka and Mrs. Yamatera in summer 2018, they noted how large bags of soil removed through decontamination procedures was being piled up in plain view of the Tohoku expressway, as if to flaunt how successful the state and the Fukushima City have been at decontamination. They laughed uncomfortably at how ludicrous it would seem

to flaunt radioactive materials in plain sight of anyone driving through Fukushima. On a tour for international audiences by "Fukushima On the Globe" on March 12, 2015, the optics that were emphasized by tour organizers for international tour participants were different. They pointed out instead the white walls at the far edge of farm fields that were supposed to hide the bags of decontamination waste from view.

Between these extremes of flaunting mounds of dirt from decontamination procedures by the highway and walling it out of sight, there was no lack of further visible and physical signs of life spaces contaminated with radioactive materials in those parts of Fukushima deemed inhabitable and "business as normal" by the government. In the immediately visible environment of people's everyday lives, large black bags full of the dirt, leaves, tree branches, and other such materials that are removed through decontamination procedures. In Japanese, the dirt, leaves, tree branches, and so on are called *josendo* or *josen haikibutsu* – "decontamination soil" or "decontamination waste materials." The blacks bags are called "flexible containers" (*furekon pakku*). They cannot shield against radiation emissions. They are meant to bundle up the decontamination waste materials for spatial containment and transport.

The flexible bags of decontamination waste materials were covered with green or blue tarps and placed in the corner of people's lawns, parking lots, and repurposed government lands (Figure 3.12).Decontamination materials from school grounds were collected and buried underneath those same schoolyard grounds (Figure 3.13). In urban areas, "temporary-temporary" decontamination waste storage sites were located next to government offices, people's homes, schools, and nursery schools (Figure 3.14). In rural areas closer to the compulsory evacuation areas, these decontamination materials became hills and mountains of black containers (Figure 3.15). Physical mountains of black container-bags full of decontamination materials,

"Decontamination in Progress" signs (Figure 3.16), frequent risk communication seminars, pamphlets, school hand-outs, glass badges, monitoring posts, and the physical presence of decontamination workers were all exceedingly visible signs of the continued presence of radioactive materials in people's immediate lived environments in Fukushima.

Figure 3.12 Decontamination waste materials covered by a green tarp in a residential neighborhood in Fukushima City.

Source: Photograph by author, 17 January 2015.

Figure 3.13 Decontamination procedures at a school in Fukushima City on a Saturday.

Source: Photograph by author, 17 January 2015.

Figure 3.14 "Temporary-temporary" decontamination waste materials storage site in the middle of Fukushima City.

Source: Photograph by author, 21 February 2015.

Figure 3.15 Decontamination waste materials in Kawamata Town, Fukushima.

Source: Photograph by author, 21 February 2015.

Figure 3.16 "Decontamination in progress'" signs on sidewalk in Fukushima City.

Sign reads: "We are sorry for the inconvenience. We are transporting removed soil, etc. Until March 30, 2015."
Source: Photograph by author, 29 January 2015.

In addition to these highly visible mountains of decontamination waste material and the people and signs associated with decontamination work, people also inferred radiological danger and safety through more commonly-noted mediated modes of judgment and perception. Readings from personal radiation detectors supplemented those from official governmental radiation detectors and monitoring posts, and sometimes called into question the officially announced radiation levels. Furthermore, television, radio, and newspaper weather forecasts in Fukushima prefecture typically included current atmospheric radiation levels, as measured by government monitoring posts, alongside current temperatures, forecasts of rain, wind, etc. In sum, in central Fukushima during 2014-2016 these environments and practices made radiation highly present, and, indeed, visible.

As with the criteria for compulsory evacuation zone designations, the appropriate scope and reach of decontamination were contested, as were the measurement practices by which the efficacy of decontamination ought to be measured. According to the government, decontamination is one interim, but acceptable, state of the world and being. It will eventually lead to a resolution: lower air dose levels in the areas that undergo decontamination. In envisioning and carrying out decontamination procedures, the government is explicitly concerned with air dose radiation measurements (measured in Sieverts) and focus their decontamination efforts on spaces within twenty meters of inhabited homes; they do not focus on the contamination quantities within soil (measured in Becquerels; Edgington, 2017). Concerned citizens want to know soil contamination level, the exposure that farmers and others processing food may be subjected to during the growing and processing of food, and the levels of radiation in plants and animals prior to their becoming foods. Contestation about the safety or danger of air dose radiation exposure occurs along the lines of "how safe is safe enough?" (Edgington,

2017)—what levels of observable, measurable air dose are "safe enough" for human habitation, passage, and visits to given areas. Writing in 2017, Edgington furthermore reports that there were plans at the Ministry of the Environment to switch from air dose measurement targets to individual exposures as monitored by individual glass badge dosimeters (100-101). What was already a patchy decontamination landscape was to be individualized. This would allow for pushing further responsibility for one's own exposure onto the individual, while in aggregate claiming that environments were "safe enough" and in reality lowering costs for continued decontamination.

Mothers' need to make radiation visible were often in tension with the government's desire to minimize the optics of the implications of the nuclear accident. Personal glass badge dosimeters for schoolchildren and monitoring posts for environmental monitoring were two sets of technologies that were meant to mediate public knowledge of exposure levels. Neither of these technologies are fully trusted by citizen scientists and concerned citizens.

For example, the non-transparency of glass badge personal dosimeters that were given out to Fukushima schoolchildren is widely known. The devices hang on children's schoolbags and record doses of exposure. However, they do not provide readings or have an alarm in the event that levels get too high. It can be argued that the levels of radiation where these schoolchildren go should be low enough that no such high-level alarm is necessary. But the post-facto presentation of *post-exposure* results differs from real-time warnings. To citizen scientists and concerned mothers, the glass badge dosimeters were seen as meant mainly to accumulate and statistically dilute population-wide data, much like the Fukushima Health Management Survey (Wataru 2012). I heard citizen scientists explain that the results are generally understood to be underestimates, given that the children's bodies act as a water-and-biomaterial shield that

reduces by 20 to 40 % the measurable exposure from at least one side of the surroundings that the dosimeter measures (fieldnotes 2/13/15). Families were not provided with the exposure data for their children unless they asked and signed several forms. The information would then be mailed to them several months later. This meant having to devise various shortcuts for interacting with everyday environments, part of which took on very similar strategies to managing dust and dirt.

Second, official monitoring post sensors were nearly two meters above the ground. Furthermore, when the monitoring posts were erected, the soil from several square meters around their base was scraped away and the plot was filled in with cement. In other words, the official white monitoring posts did not give readings that would accurately reflect radiation levels at 1 meter or 50 centimeters above the ground or ten meters away from them. They were meant to monitor any future possible radiation leaks from the plants, not necessarily be the most accurate reflections of current conditions. Readings from the monitoring posts were nevertheless used like weather stations: they provided the radiation levels at any given time, and it was generally interacted with as if those levels generally reflect levels in a wider area than that sole point. Of course, such was not the case given the hyper-locality of how radioactive materials deposited and circulate in the environment and given human interventions to move those radioactive materials through processes like decontamination. In short, they gave readings for that which they measure: air dose at two meters above a decontaminated plot of land that had since been filled in with clean concrete. Nevertheless, while they were operational between 2011 and summer 2018, they were visible, general reference points of environmental exposures.

Starting in 2018, of the 3,000 monitoring posts that were originally deployed to Fukushima, 2,400 were slated to be turned off and removed from municipalities outside of the

compulsory evacuation zones and immediate vicinities around them as part of the Reconstruction Agency's "Sweeping Away Rumor Damage" campaign (Manhattan Project for a Nuclear-Free World 2019). With a mix of belief and disbelief in their voices, my interlocutors in Koriyama told me in summer 2018 that in anticipation of the 2020 Tokyo Olympics, to have radiation monitoring posts throughout Fukushima would look bad to the international visitors. It is an appeal (*apiiru*) to stop thinking about radiation—an official proclamation that all areas in central Fukushima are radiologically acceptable ("safe"). At each step of the way, the material and the symbolic intertwined.

Part 3: Micro Actions Informed by the Dust-Like Materiality of Radioactive Materials

The dust-like properties of radioactive materials allowed people who were concerned about radiation to justify their physical and material protection measures against contaminated places and the people and objects passing through them or living (continuing to live) there and to justify continued evacuation. Measuring of exposure is but an assessment of exposure; an assessment of radiation power at a given time and place. Bearing in mind the dust-like materiality of radioactive materials helps us see the (socio)material expanse of actual exposure and concerns about exposure.

Dust-like representations of radioactive materials made conceptual understandings of the radioactive-material-containing world that informed micro-actions. The story of Mrs. Sasaki, whom we met at the cotton candy machine, demonstrates how aspects of the dust-like materiality of radioactive materials guided her to bring herself, Hana, and Sui into voluntary evacuation. Mrs. Sasaki is from Fukushima City. After a brief two-week evacuation to north-western

Yamagata prefecture in late March 2011, she returned to Fukushima for Hana's elementary school entrance ceremony in April 2011, when school restarted as normal. Few changes were made to account for radioactive materials that had been deposited on the schoolyard grounds, and school lunches were prepared with Fukushima produce. For three months, Mrs. Sasaki brought Hana to and from school in her car and prepared her children's lunches at home with ingredients grown and processed outside of Fukushima, as best she could. Mrs. Sasaki watched in horror as the schoolchildren at Hana's elementary school were told to line up outside and sit down on the contaminated ground. The first-grade children would put their hands into their mouths and touch their faces with their hands, which had just been on the ground. This was a time when air dose radiation levels in Fukushima City were between 0.26 and up to 6.65 μSv/hr, as compared to the current decontamination goals of 0.23 μSv/hr or less (Edgington 2017, 92). It was terrifying for Mrs. Sasaki to see Hana and other schoolchildren being told to interact with the contaminated environment in such a way. Wanting to protect her children, Mrs. Sasaki applied for an apartment in Yamagata City at the beginning of June 2011. Once summer vacation came in late July, Mrs. Sasaki and her children returned to north-western Yamagata for the summer months. They then moved into their Yamagata City evacuation apartment in mid-August 2011, where they lived for nearly four years, until they returned to their Fukushima City condo in late March 2015.

Mrs. Matsuda, whom I interviewed alongside Mrs. Yamatsuki on May 22, 2015, explained how in the early days after the accident, there was much talk and many depiction that compared radioactive materials to pollen. With this pollen-like materiality of radioactive materials in mind, Mrs. Matsuda said the following about the early days in March and April 2011.

> On the TV they were saying stuff like, "Radiation is like pollen," that kind of stuff, and, um, "If you have something shell-like, slippery (*tsuru-tsuru*), you can dust it off, like as if you were dusting off pollen (she gestures dusting off pollen from her clothes), so if you go out, you should wear something like that," that's what they were saying. I really stuck to that, and I wore those nylon-like clothes (*shaka shaka shita mono*), and when I came to the [maternity] ward, I'd take those nylon clothes off, change my clothes, and then I'd be allowed to enter and hold the babies and such. I think the [nurses at the maternity ward] really were being careful and considerate (*ki o tsukattemashita*).

Here are some other examples of dust-like shorthands people used to express their understanding of radiation risk. Mrs. Honda asked readers to imagine their children playing in a sandbox on the playground. When the sun shines through the sand-dust that has been blow up into the air, she knows there is Cesium 137 mingled with it, and she can imagine her daughter in that dust cloud. In actuality, Mrs. Honda never let her daughters play outside in Fukushima after the accident. When I asked Mrs. Kojimoto, a voluntary evacuee how she explained the situation in Fukushima to her four-year-old daughter, she told me that she told her daughter that the air in Fukushima was dirty. Mrs. Yamatsuki told her daughters that radiation was like germs.

This imagination of radioactive materials as being stickable, spreadable, inhalable, and absorbable, like dust, sand, germs, pollens, or other particles in the air that deposit onto and transfer between objects and can enter into bodies, allowed voluntary evacuees to put in place radiation protection measures that were very similar to dust control measures focused on shoes, clothes, and cars. This is in addition to physically removing themselves and their children from the environments they viewed as dangerous. For the first few years after the disaster, Mrs. Honda regularly washed her car and also had separate shoes that she wore in Fukushima and Yamagata.

Another voluntary evacuee, Mrs. A (a Katariina whom we met in the previous chapter, who evacuated to Yamagata for one year and eight months before returning to live in Nihonmatsu City in Fukushima prefecture), had hard plastic shoe trays instead of foot mats in her family car. That way, it would be easier to wash away any radioactive materials deposited there from her family's shoes and the radioactive materials would not get into the carpet-like floor mats. She also turned the car's air-conditioning onto internal ventilation mode when she was in Fukushima. Mrs. Sasaki told me in February 2015, on the eve of her return to Fukushima in March, that she washes her car and hits the seats of her car to have the dust fly out of them. She also makes sure to wash the foot mats because they are the most disgusting, from all the dust and dirt and radioactive materials that will get on your shoes and be trailed into the car. She does the laundry, but she does not wash her coat/outer wear.

These forms of everyday cleaning or using internal ventilation in your car could just as much be about everyday cleaning as about radioactive materials. But other actions, like hanging laundry inside even on a sunny summer day or amassing piles of plastic bottles from cooking from bottled water, also became signs for a household's views on the safety or danger of radiation conditions. One day at a sewing circle for voluntary evacuee mothers that Mrs. Sasaki let me join regularly, Mrs. Sasaki spoke about how when she went to Fukushima on a short visit, she visited a friend of hers, who had evacuated for two years before returning to Fukushima. Her friend had been back in Fukushima for about a year by that point. The futon hanging outside on the balcony told Mrs. Sasaki everything she needed to know: within a few years of returning, everyday life in Fukushima would become normalized. When we spoke before her return to Fukushima, Mrs. Sasaki was adamant that she would not hang her futon or laundry outside because she was concerned that dust containing radioactive materials would be kicked up on

windy days and would stick into the futon. Her friend's futon, hanging outside, told her what she could and couldn't say. Everyday life in Fukushima had normalized for her friend and Mrs. Sasaki did not want to criticize her friend for her own decisions, even as she felt reluctant to return, since she knew everyday life would grow into everyday ways of doing things.

Practically, it is Hard to Keep Up Avoidance

Recent arguments about materiality tend to emphasize the power of the material world to encroach on human-made order (Reno 2016) or emphasize the agency of non-human actors (Latour 2005). I do not contest these claims, but what I want to focus our attention on is less so how the material continuously reverts to disorder, and more the implications of practical difficulties of avoidance and removal. Avoidance of radioactive materials involved hanging the laundry to dry indoors, rather than on the balcony; buying food from far away; avoiding playing outdoors. Removal involved everyday seemingly non-nuclear practices of cleaning, like washing the balcony, doing the laundry, washing the car, wearing outer clothes from which dust can more easily be removed. There were also techno-solutions, including expensive water filters. These practices of avoidance and removal accommodated articulations and practices of cleanliness/relative safety and risk reduction posed by radioactive materials. They also allowed for informed thinking about invisible risks and informed countermeasures, but they eventually became too burdensome to uphold stringently.[52]

[52] Through this agentive formulation of my argument, I am implicitly counterarguing top-down, deficiency model arguments that paint the "lay public" as ill-informed. As Bickerstaff (2004) and Bickerstaff and Simmons (2009) aptly argue, such "experts-versus-lay people" models of risk communication and perception are long outdated in the field of risk studies, even as governments continue to employ a deficiency model of risk communication.

Official, public decontamination procedures took time, so mother's groups took it upon themselves to clean along children's paths to school, around the yard, in the neighborhood, and between fields (Love 2013; Kamanaka 2015). At times, this caused disagreements between neighbors and social pressures to conform. A three-generation carpenter family whom I visited once with Nishimura in Fukushima City told me about how a mother with a young child was ostracized (*mura hachibu ni sareta*) from a neighborhood association for her objections to having the decontamination waste material from their neighborhood piled up in the corner next to her yard, and not elsewhere, near houses where older people lived without children. When I spoke with Mrs. Hanasaka, a voluntary evacuee in Yamagata, in 2015 and 2016, she emphasized how she did not want to return to the town in central Fukushima from where she evacuated because there was a "temporary-temporary storage site" (*kari-kari okiba*) for decontamination waste materials right next to the neighborhood playground. In other words, this was a physically visible mound of radioactive materials—of radiation. I return to Mrs. Hanasaka's story in the next chapter.

Needless to say, self-evacuation was one form of avoidance through which voluntary evacuees sought to distance themselves and their children from the overwhelming practical issues that vigilance in avoidance and removal posed. Mrs. Saue was one of many voluntary evacuee mothers who told me about their young children's temper tantrums and how difficult it was to keep their children cooped up. Mrs. Saue worked part-time for a voluntary evacuee support NPO and part-time at a chain fast food restaurant to help make ends meet. She has three daughters, the youngest of whom was in preschool at the time of the disaster, the middle daughter in middle/junior high school, and the oldest daughter advancing from junior to senior high school. They lived in Watari, a district of Fukushima City that received national and

international attention because of high radiation there. Had spot-based compulsory evacuation been allowed in Fukushima City the way it was allowed in more rural areas of the prefecture, most of the houses in Watari and Nankodai would have been able to be compensated.[53] But since those special measures were not allowed in the urban areas of the prefecture, they would have to adjust their everyday lives to accommodate the radiation until decontamination procedures reached their neighborhoods. Mrs. Saue found out about the heightened levels of radiation through a school informational pamphlet in her mailbox. She then tried to keep her youngest daughter indoors, to prevent her from playing outside in the radioactively dangerous environment. But after a few days, her daughter started throwing temper tantrums (*kanshaku o okoshiteita*) from being cooped up. Mrs. Saue evacuated with her youngest daughter and her middle daughter to Yamagata. Her oldest daughter stayed with her father in Watari because she did not want to leave her friends from school. The family was therefore practically split between self-driven avoidance (voluntary evacuation) and coping while waiting for the government to decontaminate (removal).

The impracticality of avoiding dust and dirt when raising small children was made especially clear to me at a cherry blossom viewing event at which I volunteered in Yamagata with a local voluntary evacuee support NPO in spring 2015. This is a point that anyone who has raised a child will know intimately, but was novel to me, then a 27-year-old bachelor, in its practical enormity. Have you ever had to try to convince a four-year-old not to eat dirt? When I volunteered at these kinds of group outings, it was my job to play with the children. We always played a variety of games, including Japanese versions of tag, color tag, and hide and seek. Sometimes there would be a playground, sometimes a field, sometimes a creek or a rice field

53 See discussion of *Tokutei hinan kanshō chiten* in Kansei Gakuin Daigaku et al. (2015, 22-23).

nearby. This time around, it was an urban park on the grounds of the old Yamagata castle (Kajō Kōen). Surrounded by sakura (cherry blossom) trees, there was a playground, a field, and the crowning glory: a water fountain on which you could adjust the water pressure so that it could shoot water several meters up into the air. The four-year-old son of one of the NPO workers was mesmerized by the water fountain and an impromptu succession of games among the group of children quickly ensued. There was "let's see how high it can shoot up," "I just want a drink—by covering the whole spigot with my mouth," and "let's see if we can avoid getting wet with the water at full blast." Successful at limiting the four-year-old's full mouth-on-spigot venture to only once, I had but a moment before the other children swooped in to turn the spigot on full-force and run in all directions, from the water and from Alex, who was de facto "it" (*oni*) in what felt like an endless game of tag. One tripped, laughing as they hit the ground, got up again, and ran away from the water and from Alex. Play: good for the soul and energy, but you get covered in, ingest, and inhale dirt and water.

Dirt, play, and contact with nature are all desirable and valued materialities and activities for children. Fukushima parents went out of their way to bring their children to rest and recuperation camps in Yamagata and across the country precisely for this contact with soil, rice fields, and for opportunities to play outside without worrying about radioactive materials or exposure.

From among the voluntary evacuees with whom I spoke in Yamagata, Mrs. Kubota was one of the most clear and unambiguous in her stance towards radiation as a dire, dangerous pollutant. Like many other voluntary evacuees, Mrs. Kubota's parents lived on the coast, near the nuclear plants, and were compulsory evacuees. When they evacuated, it would have made sense to her if they left everything and sought to get rid of their clothes, if they could, but no, to the

contrary, she crescendoed in her voice and body, as she recounted their unbelievable action: "They brought their plants with them! They brought their plants! With everything on them!" Clearly, she saw radioactive materials as dust-like, transportable, and movable with people and things.

Mrs. Kubota's view of Fukushima and things and people coming from Fukushima was that they were irreparably dirty. Mrs. Kubota was annoyed if her husband came to visit. The best amount and type of contact with her husband was his continuing to pay for her evacuation and visiting as little as possible. She said she was ready to evacuate again, even from Yamagata if any further problems were reported at the plant, any further radiation leaks occurred, or another great earthquake struck. In the meantime, she followed many of the more extreme and critical anti-nuclear voices on Facebook and Twitter (the "anti-safety" group (Tsujiuchi 2016)). These positions tended to advocate that there is no such thing as safe or acceptable radiation levels. When it came to radiation, nothing short of zero Bequerels would do; even then, a carefully executed macrobiotic diet (*makurobi*) was the only path to possibly having good health, with the added help of naturopathic remedies and negative ions (*mainasu eon*). Though Mrs. Kubota did repeatedly remark and laugh in irony at her cell phone habits. She liked playing games on it and checking Facebook. But she would note that at least she did have a small rock salt crystal charm dangling from her cell phone. "Not like it does much," she laughed when we spoke in April 2016, "But it's there. I should really keep the phone farther from where I sleep," she said, laughing.

Part 4: Social Discrimination

Keeping spaces, people, and objects separate between Fukushima and Yamagata was a

point of difficulty and the way evacuees dealt with this changed over time. Some voluntary evacuees were very strict about their physical separation from the spaces and places of Fukushima and had only gone back to Fukushima once or twice in the five-year period between 2011 and 2016. Some continued to feel that their husbands' coming to visit from Fukushima contaminated their living spaces. They worried that radioactive dust may be stuck to their husband's clothes and shoes, and disliked his regularly being somewhere they considered to pose transferable material dangers. In some families, there were clothes and shoes they wore only in Yamagata, and other clothes and shoes they only wore in Fukushima. The wives would make their husbands bathe upon arrival and wash their Fukushima clothes in a Fukushima clothes-only laundry load. Some continued this practice at the time of my fieldwork, but most had given up on it, saying that they got tired after five years and that they had resorted to hoping that there aren't too many radioactive materials on their husbands' clothes or their cars.

In the early months and years, rest and recuperation camp organizers in Hokkaido and far-Western Japan made families who came to their camps from Fukushima and eastern Japan wash their cars, take a bath, and sequester the clothing they were wearing when they arrived. To try and separate the material—clothing, radioactive materials – from the people on whom they are is a desired move. Unfortunately, this does not correspond to the way that prejudice and concern actually play out. At a meeting of rest and recuperation camp organizers from across Japan in Fukushima City in November 2014, a representative of Fukushima users of rest and recuperation camps, who herself sent her children to R & R camps in western Japan, spoke as part of the open comment session. Through tears, she asked R & R camp organizers not to subject future participants to being forced to wash their cars, being made to take a bath, and being made to sequester their clothes.

To say something along the lines of, “I’m not saying *you’re* dirty; I’m just concerned about the invisible materials that might be sticking to you, your clothes, and your car,” doesn’t make a person feel less dirty. One voluntary evacuee chastised me in these terms when I met with her for coffee on March 14, 2015. On March 11-12, I had gone on a tour for international audiences that brought us into the “red” exclusion zone. When having coffee with Sayori, she turned the note-taking on me and began to interrogate me as to why I had not used separate clothes for when I went to Fukushima and when I was in Yamagata. She in no uncertain terms told me that by not changing my shoes and coat—by not throwing them out or at the least washing them—I was causing annoyance and danger not only to myself, but to those with whom I interacted and especially my housemates.

Figure 3.17 Text message email exchange. March 14, 2015.

From: Sayori
To: Alex

Alex,

Thanks for today.
We really did talk about some severe things… I'm glad we were able to talk.

But, I do hope you throw away the clothes and shoes you wore when you went and when you go to Fukushima… Or, even if you don't throw them away, wash them or something, and use them the next time you have to go to Fukushima. Maybe you're fine with it, but I myself, my body is not strong against radioactive materials. It makes me worried.

I'm not trying to criticize [deny/reject/contradict] you. I just want you to understand that you aren't the only one who may be negatively affected by your actions… You yourself may be exposed to radiation by what you bring back; other people can also be exposed by it.

You're right, it's endless if you think about it. But, somehow, I want you to reflect on it…

Best,
Sayori

From: Alex
To: Sayori

Thank you, Sayori-san. Our conversation today made me realize a lot of things. It's as you say. [What I do/what might be on my clothes when I come back] It doesn't only affect me.

I will get rid of or wash what needs to be gotten rid of or washed. Also, the next time you and I meet, I will wear, to the best of my knowledge, clean clothes and shoes.

I'm really sorry for causing you to worry. I'm really sorry. By trying not to think too much [not to overthink things], things got all jumbled up—how to be considerate of whose feelings, what feelings [when it comes to radiation]. I'm grateful that you helped me regain my senses and realize this.

Alex

From: Sayori
To: Alex

Not at all…
I also think it was wrong of me not to confirm these things [before meeting with you]…
Based on our previous conversation, I was certain that when you go to Fukushima, you take the proper measures to protect yourself by what you wear. You had told me the last time we spoke that you threw away the clothes you wore in Fukushima, so I was certain that you would also throw away the clothes you wore on your observation trip to Fukushima this time, too… That's what I thought you'd do…

To be honest, it's a little too bad… Maybe it can't be helped that your senses have become numb, too. I don't like thinking it, but I think it might be your trying to feel what the [nuclear power plant/earthquake] victims feel that is making you also become numb…
That's why when we met today we took the time for you to reflect on you and your actions. I wanted you to realize the discrepancies in your actions and your thoughts.

From here on out, please pay proper attention to your clothes and how you dress, ok?… (ｴ ; ω ; `)

Let's talk again sometime.
Good night.

This interaction upset me very much because I felt I had betrayed Sayori's trust. In reality, my material and interpersonal interactions with Fukushima had changed since my first post-disaster trip to Iwaki in summer 2012. Then, upon my return from a two-day trip to Iwaki, I did take the clothes and shoes I had worn in Fukushima, put them in plastic bags, and threw them out. By mid-March 2015, I had been going back and forth between Fukushima and Yamagata for several months and getting deeper and deeper into the situation.

When I told Mrs. A, whom I went to hear speak at a 3-11-related event the following day, what Sayori had told and messaged me, Mrs. A was not surprised to hear it, but was not so absolutist. "With a coat like that, you can just brush it off, go pat pat and it will come out," she told me. When I shared this text message exchange with my housemates in preparation for a

presentation in August 2015, they were more stunned at Sayori's discriminatory remarks than my going back and forth to Fukushima. They were stunned that she would say it so openly, not the stance.

By the end of fieldwork, I had become more brazen in asking the uncomfortable questions, such as these, which had to do with contamination sticking to your clothes. Three of my key interlocutors, who were voluntary evacuees and NPO workers, laughed at the implication of what it would look like to change clothes every time you went back and forth between Fukushima and Yamagata. They mockingly said, with uncomfortable laughter at how ludicrous it sounds, "Oh, I know we're supposed to meet for coffee, but hold on while I go home and change." No, they had stopped separating their clothes and shoes a year or two into their evacuation. One even bought Fukushima produce.

Government Anti-Discrimination Campaigns

Highlighting this understanding of stickable, transferable radioactive materials is discouraged by the government and the media because it connects to social discrimination. It is also a painful topic for people from Fukushima and voluntary evacuees. In these official publications, as with "damage from harmful rumors," seeing radioactive materials as dust-like, stickable, and transferable is equated to a scientifically uninformed perspective that contributes to vicious dynamics of social discrimination. Though I did not hear about such incidents from my interlocutors, it made national headlines when voluntary evacuee children were bullied at school, called "germs" or "radiation." Perhaps perceptions of radiation as contagious or stickable to clothing and bodies formed a part of the basis for such bullying. However, discrimination against irradiated people is not new in Japan. Atomic bombing survivors faced marriage

discrimination (Lindee 1994; Ōe 1985; Ibuse 1969). However, calling children "germs" is not a new form of bullying among schoolchildren, as Mihasi (1987) analyzes in his 1987 article "The Symbolism of Social Discrimination: A Decoding of Discriminatory Language."

It is difficult to say whether overtures by the government against the bullying of evacuees come from a genuine concern for the evacuees' and Fukushima people's wellbeing. While overtures to not bully Fukushima evacuees might come off as considerate of the feelings of evacuees, it might also be an opportunistic use of affect by the government to further its own goals of propagating the new "safety myth" that the radiation levels in Fukushima are safe (Tsujiuchi 2018b). Rather than directly chastise "unscientific" and hysterical voluntary evacuees, this safety appeal is folded in alongside propagandistic risk communication that depicts life in all non-compulsory evacuation areas as completely normal, that there have been no health effects as a result of the accident, and that an increase in thyroid cancers among children is the effect of the screening power of advanced technology (Yamashita and Saenko 2017; Yamashita et al. 2017). In short, the government puts out anti-bullying messages as part of its "safety" stance towards radiation.

We can see this in the Reconstruction Agency's "Sweeping Away Damage from Harmful Rumors" initiative of 2018, of which "The Truth About Radiation" booklet is but a recent manifestation. The Reconstruction Agency's "The Truth About Radiation" is geared towards schoolchildren in lower grades and their guardians, as well as expectant and nursing mothers (Reconstruction Agency 2017, 3). It was distributed across Fukushima Prefecture and far and wide across Japan as part of the "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication." As of November 2018, the Citizens' Nuclear Information Center reported that 22,000 of these booklets were handed out across the country, including at

related government agencies, Parent-Teacher Associations in Saga and Niigata prefectures, and events inside and outside Fukushima (Citizens' Nuclear Information Center 2019). I came across these pamphlets at Yuta and Reina's house during follow-up fieldwork in July 2018. Yuta had just come back from Date City with a box of glowing, yellow booklets.

This booklet demonstrates how the Reconstruction Agency, a powerful representative of the central government, wants schoolchildren, expectant mothers, and Japanese citizens in the broadest sense, within and beyond Fukushima, to think about radiation. The entire English translation is available in Appendix C, and I encourage you to take a look and see how the dust-like materiality of radioactive materials has disappeared from the depictions. Readers are told that radiation is not like germs, radiation health effects do not get passed down, Japan has the strictest radiation standards for food and water in the world, and life for the people of Fukushima has returned back to normal. Most striking of all is the risk comparison chart in the centerfold of the booklet (Figure 3.18).

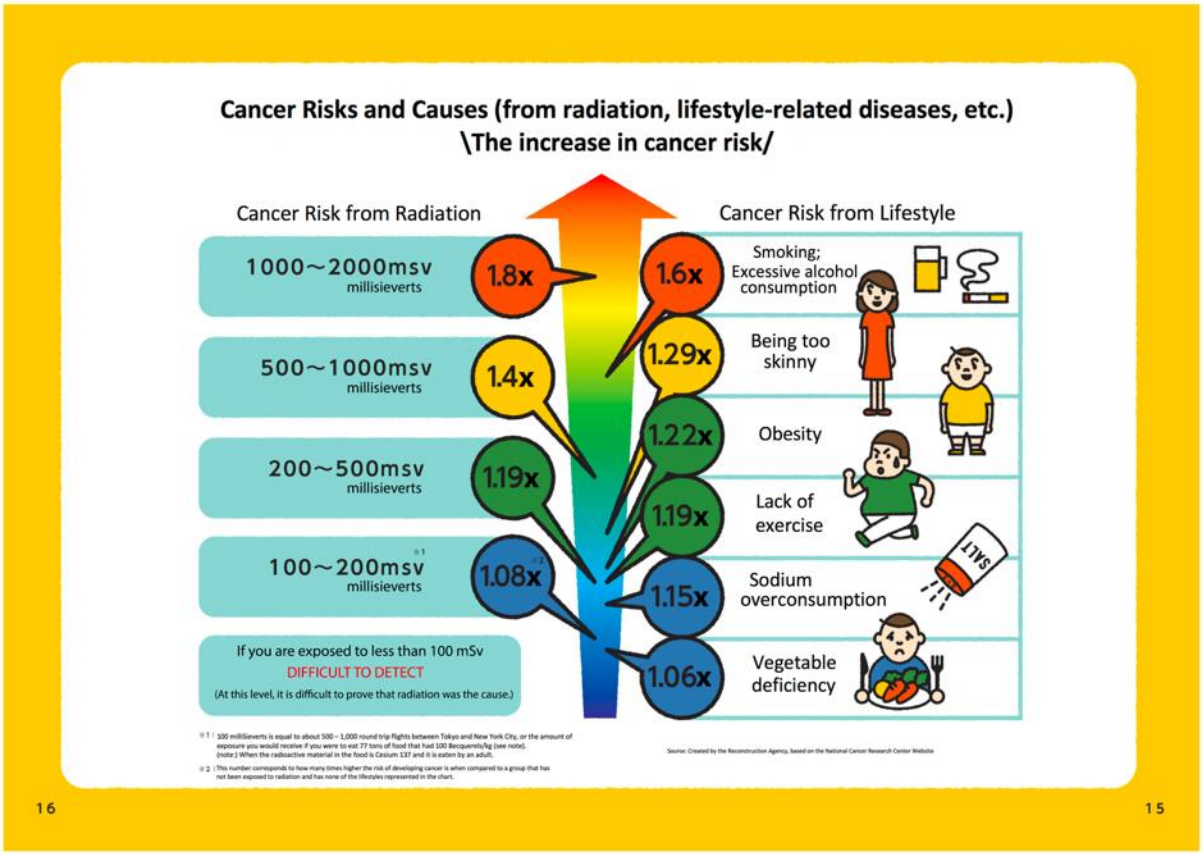


Figure 3.18 Cancer Risks and Causes (from radiation, lifestyle-related diseases, etc..) from "The Truth About Radiation" booklet.

Source: Reconstruction Agency (2018, 15-16).

Conclusion

In the years 2014-2018, far from being invisible, imperceptible, and unmanageable, low-level nuclear waste in grey zones Fukushima was being enfolded into middle class waste aversion and removal dispositions and practices, which included vigilance, ambivalence, and, to some extent, resignation (Benson and Kirsch 2010) to the fact that "radiation can't be made to zero." Writing about "mainstream class" attitudes towards waste in postwar Japan, Siniawer argues, "Desires to achieve and defend privileges of middle-class lifestyles made possible by affluence have existed right alongside discomfort and dissatisfaction with the logics, costs, and

consequences of that very prosperity. That tension has long endured in postwar Japan" (2018, 15). Though Siniawer brackets nuclear and industrial waste out of the purview of her study, I suggest that any study of waste now has to contend with radioactive materials as a category of everyday waste towards which mainstream Japanese are ambivalent, but which has been brought on by half a century of nuclear prosperity. Of course, the nuclear prosperity was not directly for the people of Fukushima, since the electricity from Fukushima Daiichi was sent to Tokyo and the spread of contamination is vastly greater than the few local municipalities that received nuclear subsidies for the siting of the plants (Aldrich 2008). Nevertheless, the insights about ambivalence towards waste seem to apply to the banalization of radioactive contamination into people's everydays.

Radioactive materials are a case study in anomalous, shape-and-meaning-shifting sociomaterialities par excellence. Not only is there tremendous variation in the chemical properties (what anthropologists might term the "materialities") of different radioactive materials, the environments where they circulate, and the areas, items, and beings in which they collect; there are also lots of them (the materials and the places they collect) and they are widespread (spatiotemporally proximally to a nuclear event and more expansively, given nuclear history), assuring that there will be no one way that everyone will deal with, interact with, or think about them. A person's or a group's knowledge and politics, which anthropologists might term "symbolic systems," will lead them to understand and interact with radioactive materials differently. There are representational and classificatory struggles, mired through and through with politics and money.

When my interlocutors spoke of using germs or viruses as a shorthand to explain to their children to wash their hands, to wash off possible radioactive materials, this was material

practice fully in line with government risk communication about radioactive pollutants. When they compared the public health-informed school-based influenza countermeasures to the lack of radiation countermeasures, it was a systemic critique not about the materialities of viruses, but about group-based procedural creation and recreation of sociomaterial reality and the protection of populations (Foucault 1978). For example, Mrs. Matsuta noted how when a child has the flu, they are asked to stay home, effectively quarantined from school. There would be days in the winter when entire grade cohorts would be dismissed for several days in order to prevent the spread of the flu. Why, then, was exposing children to radiation supposed to be acceptable? Here, she is not saying that someone who has been exposed to radiation is a germ or saying that radioactive materials increase in number like bacteria and germs do. She is saying that the group-based countermeasures for protecting children's health just don't add up, when you compare group-based health interventions around germs and radiation.

Nuclear risks, though not actively chosen or consented to by the people onto whose homes nuclear contaminants fell or whose lungs they affected, became part of people's lives. Government risk communication initiatives encouraged society to understand that "radiation can't be made to be zero," but that the levels in non-evacuation areas of Fukushima were normal and acceptable—despite the need for officially-recognized and government-funded decontamination. My interlocutors mistrusted the government and were nonplussed by such messages of "it's alright." They tried to bring themselves, their everyday lives, and their environments to a mode of cohabitating in ambivalence (Siniawer 2018) with low-level nuclear waste (mainly Cesium 134 and 137) as another kind of waste, dirt-like in its materiality.

Chapter 4 Value Conflict Among Voluntary Evacuee Mothers: Protecting Children from Radiation, Respecting Family and Society

Yamagata City, Yamagata Prefecture, Japan.

(70 miles/112 kilometers as the crow flies from Fukushima No. 1 nuclear power plant)

Saturday, October 11, 2014.

Three days after I first arrived in Yamagata, I went with the Hondas, a relocated family of three from Fukushima City, to an autumnal potato stew event (*imonikai*) for evacuees. We drove through the autumnal fields with Mrs. Honda at the wheel, her two daughters in the back, and myself in the passenger seat. Mihoshi-chan was in second grade and her older sister, Minako-chan, was in fifth grade. About half an hour into the drive, Minako-chan started asking her mother if the potato stew event location was closer or farther away from Fukushima. She wanted it to be closer, so that they could go home to their Fukushima home faster after the event. They were going to visit their father for the weekend.

"When are we going to go back to Fukushima?" Minako-chan asked, with Disney's *Let It Go* playing in the background.

"After the *imonikai* event," her mother reluctantly told her.

Having arrived in Yamagata just three days before, I could not imagine that people, especially voluntary evacuees who had deliberately, often at great personal financial and social cost, distanced themselves from Fukushima, would want to return. Yet, as Mrs. Honda took her daughters to take part in this regional tradition, where they would eat Yamagata stew free of radioactive materials and play carefree outdoors in a radiation-free environment, it was clear that

they would be heading to Fukushima after the event. Even as Mrs. Honda was uncompromising that the food she fed her children not be made or processed in Fukushima or indeed, anywhere in the Pacific side of northeastern Japan; even as she refused to return with her daughters to live their daily lives in Fukushima again; she nevertheless continued to make these trips back and forth for her family. Powerful affective forces pulled her daughters to see their father in Fukushima. Out of caring for her daughters' feelings and in order to fulfill her promise to her husband that he would continue to see his daughters, Mrs. Honda and her daughters went back to Fukushima for the weekend. In time, I learned that for this family and many other voluntary evacuee families in Yamagata, these were constant orientations and returns to and from Fukushima and Yamagata.

Chapter Overview

In this chapter, I follow the close attention Slater, Morioka, and Danzuka (2014) pay to the micro-tactics taken by Fukushima mothers as they reluctantly made on-going compromises between radiation protection, on the one side, and the kinship and socialization expectations that are normatively placed on young mothers and the mother-child unit, on the other. The articulation of the mother-child unit with expectations and obligations to the extended family (*ie*), the nuclear family (*kazoku*), and the regional and national moral community (through education) became double-binds (Fortun 2001) that middle-range evacuees navigated through locally-specific values and social roles.

I begin this chapter with a broad overview of voluntary evacuation to Yamagata and a discussion of why I see voluntary evacuees as what I call "middle-range" evacuees. Then, I turn to close analyses of how voluntary evacuees navigated the difficulties brought on by the

compromises (*dakyō*) they made between a series of less-than-perfect choices. First, choosing Yamagata was a compromise in itself between bringing their children to live in Yamagata's lower radiation levels and being close enough for fathers, who typically remained in Fukushima with their jobs, to visit their children on weekends. Second, valuing group-based socialization at nursery and elementary schools meant that mothers faced limitations as to what food and drink they could control when their children were at school, even in evacuation. Third, valuing kinship ties with husbands/fathers and extended family who remained in Fukushima meant welcoming husbands who continued to live their everyday lives in supposedly dirty Fukushima into their supposedly clean Yamagata evacuation homes and making periodic visits to Fukushima for family functions. I call short-term return visits to Fukushima "micro returns" to differentiate them from the "final" return (*kikan*) out of evacuation. I mean to emphasize the abnormality of having to consider possible exposure to radiation when visiting one's family. Such were the material and social tensions—the pulls into and away from Fukushima, into and out of certain social and material relations—that were at the forefront of the experience of voluntary evacuation to a city just one hour away. I conclude with a discussion of how middle-range voluntary evacuation might be analyzed in tandem with conservative ideologies and expectations of fulfilling the dual roles of mother and wife.

The voluntary evacuees introduced in this chapter regularly took part in some form of local evacuee-specific social activities, joined evacuee support groups, or knew local civil society support workers in Yamagata. Though incidents of bullying against voluntary evacuee children and families made national headlines and appear in survey-based research on Fukushima evacuees (Tsujiuchi 2018a), the mothers with whom I spoke did not report discrimination towards themselves or their children. Indeed, they clearly said that such was not

the case when asked. In some cases, they did experience difficulties making connections with locals, but they attributed this not to discrimination, but rather to the social dynamics of living in public apartment buildings typically used for housing government employees. Some of the evacuee mothers gave up jobs in Fukushima in order to evacuate, whereas others were stay-at-home housewives prior to evacuation. In Yamagata, most sought part-time employment in non-profit organizations, care work, cleaning services or school lunch preparation, or earned a minimal income from take-home sewing work. Under the pressure of waning economic and social support for people who evacuated voluntarily, they struggled to balance their concerns about contamination and exposure against the difficulties of normalizing daily life, ensuring group-based socialization for their children, and negotiating fluctuating family support for continued displacement.

Voluntary Evacuees to Yamagata: The Place and the Numbers

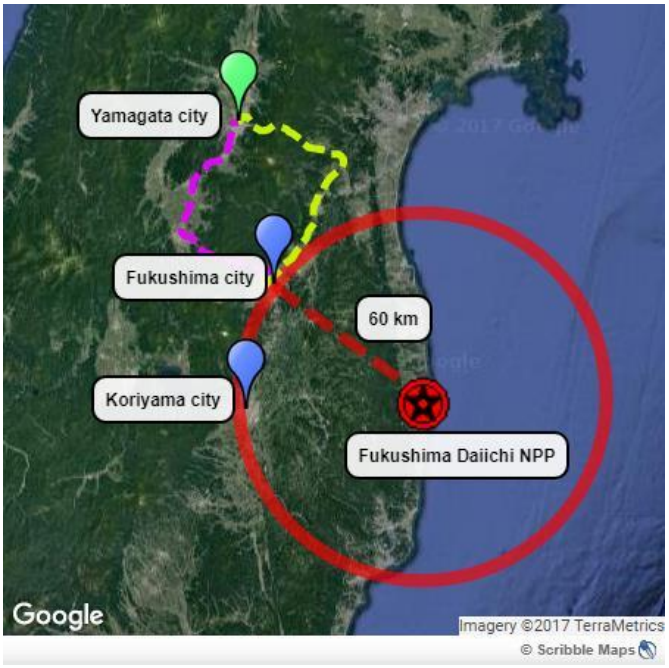


Figure 4.1 Map of distance from Fukushima No. 1 NPP to Fukushima City and Koriyama city and two main routes from Fukushima City to Yamagata City.

Source: Map created with ScribbleMaps and Google Maps. Available online: [https://www.scribblemaps.com/maps/view/Routes_from_Fukushima_city_to_Yamagata_city/CDOIrDPEie].

It takes slightly over one hour to go from central Fukushima to south-eastern Yamagata prefecture by car or train (see Figure 4.1). The mountain ranges between the two prefectures greatly reduced the spread of the radioactive plume. This is evidenced by the results of radiation monitoring conducted by government aircraft, which show radiation levels at one meter above the ground on August 15, 2011, in all parts of Yamagata to be no more than 0.2 microSieverts per hour (μSv/hr), with most regions below 0.1 μSv/hr (MEXT 8 Sept 2011). This compares with 0.5~1.9 μSv/hr for most areas of central Fukushima prefecture (ibid.). Cesium 134 and cesium 137 levels in soil show a similar pattern, with most regions of Yamagata prefecture registering less than 30,000 Becquerel per square meter (Bq/m_2) of combined cesium 134 and 137 content,

against 60,000~600,000 Bq/m2 for Fukushima (ibid.). Note that these monitoring techniques do not account for localized hot spots, circulating produce, or cars, trains, and other vehicles that travel between areas with fallout and the rest of Japan. Nevertheless, radiation levels in Yamagata were generally far lower than those in Fukushima.

The combination of Yamagata prefecture's proximity to Fukushima, the lower radiation levels, and the availability of free apartment housing from June 2011 through March 30, 2017, contributed to making Yamagata the destination with the most "out of prefecture evacuees" from Fukushima for the first two years into the disaster. According to statistics gathered by Yamagata prefecture, at the peak of the exodus from Fukushima to Yamagata in January 2012, 94% of all registered evacuees in Yamagata were from Fukushima (13, 033 out of 13,797; Yamagata Prefectural Government 2011-2017).[54] This number also amounted to over 20% of all "out of prefecture evacuees" from Fukushima to locations nationwide at that time (13,033 in Yamagata out of 62,808 nationwide) (Fukushima Prefecture Evacuees Support Division 2018). [55] Unfortunately, these statistics for "out of prefecture evacuees" do not differentiate between tsunami evacuees, compulsory nuclear evacuees, and voluntary nuclear evacuees. Indeed, I met several elderly families from compulsory evacuation areas in Yamagata, there because they had relatives or friends in the area. I also met Fukushima evacuees who had fled to Yamagata from tsunami-stricken areas, who are most likely included in these numbers.

[54] All statistics are for evacuees registered with Yamagata prefecture. Not all evacuees would have officially registered. Yamagata Prefectural Government reports are available for download at: http://www.pref.yamagata.jp/ou/kankyoenergy/020072/fukkou/hinansha-suu/23hinansya-suu.html [Accessed 23 May 2018].

[55] These numbers are based on data from the Reconstruction Agency, which relies on prefectures' self-reporting of evacuee numbers based on self-decided collection methods and varying definitions of who counts as an evacuee. A change in who counts as an evacuee can suddenly increase the number of evacuees in a given prefecture by several thousand, as was the case in Saitama from July to August 2014 (Hino in Kansei Gakuin Daigaku et al. 2015, 32-33).

The sudden swell of Fukushima evacuees to Yamagata during the summer and fall of 2011 coincided with voluntary evacuees becoming eligible for "temporary housing" public apartment subsidies (*minashi kasetsu; kariage jūtaku*) under the Disaster Relief Act (*Shinsai Kyūjohō*) (Value Management Institute, Inc. 2012, Kansei Gakuin Daigaku *et al.* 2015, Hino 2015, Hiromoto 2016). Voluntary evacuees from Fukushima were eligible to receive free public or private housing, with local authorities paying the rent up to 60,000 yen (about $550) per month. The vast majority of the registered evacuees to Yamagata were voluntary mother-child evacuees (*boshi hinansha*) from central Fukushima prefecture. Employment prospects in Yamagata looked slim, even if voluntary evacuees could have the rent for an evacuation apartment be paid for by the government. This is part of how families ended up split, with the father staying behind in central Fukushima to continue working. Steady income was necessary to continue paying mortgages and daily expenses for both the mother and child in evacuation and the father/husband who remained in Fukushima. Yamagata's proximity allowed fathers who remained in central Fukushima to visit their evacuated wives and children on weekends. It also allowed the mothers and children to return to central Fukushima for family functions and holidays.

Most mother and child voluntary evacuees evacuated in summer or fall 2011, once they had secured an apartment that would be paid for by the government. A civil society supporter who organized rest and recuperation camps for over five years in Yamagata and regularly hosted cooking classes and organized meals for voluntary evacuee mothers noted the following: many young mothers evacuated for a year or two because of the general fervor around the contamination and the ready-made nearby evacuation destination and logistics. This civil society supporter explained her view that those who came as part of this fervor, scared, concerned, and

uncertain didn't necessarily intend to hold out for too long and weren't necessarily too knowledgeable about radiation. Some packed whatever they could take with them into their cars, while others only took a basic set of clothes, for fear of carrying radioactive contamination on their futons, furniture, and so on. Upon arrival in Yamagata, many received the Japanese Red Cross's six-piece set of new household appliances: washing machine, refrigerator, rice cooker, microwave oven, television and electric kettle (Japanese Red Cross Society 2011). These appliances helped them to establish daily life in Yamagata, as they enrolled their children in nursery schools, kindergartens, and elementary schools.

Six years into the nuclear disaster, 2,026 evacuees from Fukushima remained on the official evacuee lists of Yamagata prefecture: an 84% drop from the initial influx of 13,033 (Yamagata Prefectural Government 3 August 2017). The vast majority of this group went back to Fukushima. Continuing voluntary evacuation became difficult as limited economic support combined with marriages on the brink of collapse and the evacuee mothers' getting pushed to their emotional, mental, and physical limits in trying to make evacuation work (Kansei Gakuin Daigaku et al. 2015, 135). That said, I also met evacuees who ceased to be counted as evacuees for reasons other than returning to Fukushima: some, like Sayori (who was a voluntary evacuee, but still a college student and not a "mother-and-child" evacuee) from the previous chapter, evacuated farther away, feeling that Yamagata itself was too contaminated; others, like Mrs. Kubota from the previous chapter, became Yamagata citizens, thus also ceasing to be counted as evacuees. Official statistics do not record these distinctions. The vast majority of Fukushima prefecture's two million residents, of course, never left in the first place.

Evacuees from non-compulsory areas had to continue paying mortgages for houses that they had had built right before the disaster. Since the government never designated these houses

as requiring evacuation, then business and economic life went on as usual, and everyone who owned a house or a condominium in areas that were not designated as evacuation zones had to continue paying their mortgages, without exception. This in turn meant that families needed to have a steady income, obliging the breadwinners, typically the husbands and fathers of a family, could not leave their jobs, if they were to continue paying their mortgages. Most of the time, their husbands were still living in these houses, but it was not uncommon for the husband to have been deployed elsewhere in the country or prefecture by his company. In these cases, the family would continue paying the mortgage even if no one even lived in the house anymore. For example, I knew families where the husband's company would deploy him to different towns or cities within Fukushima for several years at a time. His rent in the new town would be paid for by the company, but this meant that the house that the marital family had had built would now be sitting empty, since the husband/father was working elsewhere while the wife/mother and child/ren were in evacuation. They nevertheless would have to keep paying the mortgage on that house. A marital family of three (husband, wife, and a child) could thus have three households: the evacuation apartment, the father's current work apartment, and the empty house for which they had to continue paying the mortgage.

People had the option of selling their houses and transferring the loan to the new owner. Some evacuees whom I came to know, like Mrs. Kubota, did just this. But the trade-off amounted to breaking even on their two-story, modern homes that were usually less than ten years old in Fukushima, while committing themselves to a one or two-bedroom apartment built twenty or more years ago in Yamagata. They would then have to start paying monthly rent on the Yamagata apartment because government support for the rent would be discontinued as soon as they were no longer residents of Fukushima. Selling their Fukushima home would make

voluntary evacuees no longer evacuees from a bureaucratic perspective. They would become regular citizens of Yamagata Prefecture. Selling the Fukushima house might result in the reunification of the family in Yamagata, but since job prospects in Yamagata were few and far between, the husband would tend to remain in Fukushima, either moving back in with his parents or renting an apartment that was cheaper than the mortgage payments.

It was also fairly common to sell the house that the family lived in at the time of the disaster and have a new house built or find another house in an area with lower radiation levels and where the house itself had lower levels. In at least two cases I heard where the husband had a new house built in Fukushima, doing so worked in part to convince their wives to return with the child out of evacuation, as Mrs. Kojimoto's story shows, below.

Yamagata Evacuees as "Middle-range" Evacuees

In this section, I provide an overview of voluntary evacuation to Yamagata in context with other post-Fukushima evacuations, demonstrating salient ways in which Yamagata voluntary evacuees were what I call "middle-range" evacuees. When I say "middle-range," I simply mean a middle that is in-between a series of possible extremes.[56]

At the broadest level, a "voluntary evacuee" (*jishu hinansha*) is anyone who evacuated from areas other than state-decreed compulsory evacuation areas due to concerns about radiation from the nuclear accident. Voluntary evacuees moved somewhere they deemed to be

56 I was originally going to refer to these evacuees as "in-between" evacuees, but given the confusion such a nomenclature might cause, I have used the term "middle-range" instead. What I mean by "middle-range" here is much simpler than famed sociologist Robert K. Merton's notion of "middle-range theory" in which micro observations and macro theories iteratively inform each other (Hedström and Udehn 2011; Jones 2017, 125–31), though I do intend for my ethnography to result in such "middle-range theory." My use of "middle-range" also differs from Catherine Lutz's (1995) feminist critique of how academic writing produced by women is made to be "middlebrow" due to a virulent masculinization of grand theory.

radiologically safer, but, just as there were on-going debates about the acceptability and safety of everyday living in grey zones beyond the official evacuation zones, there was also no single way to decide on a proper evacuation destination. Different people's personal criteria for safety and danger meant that there were those who self-evacuated from different parts of Japan, not only Fukushima. Voluntary evacuee experiences and perspectives diverged significantly depending on the levels and types of economic support they were able to receive from the central government, Fukushima prefecture, the welcoming prefecture, and the local municipalities to which they evacuated. Voluntary evacuee experiences and perspectives also diverged significantly based on the location of their pre-evacuation homes, their evacuation destinations, and whether their self-evacuation was seen by the people and municipalities with whom they interacted as justified. Voluntary evacuees from central Fukushima to south-eastern Yamagata, whom I will call "Yamagata evacuees," were "middle-range" evacuees with respect to distance of evacuation, origin, destination, economic support, and whether their evacuations and related radiation concerns were socially legitimated.

Distance from central Fukushima can be a simple starting measure in a typology of voluntary evacuees on which Yamagata evacuees were "middle-range" between greater extremes. Central Fukushima was an evacuation destination for compulsory evacuees. With the on-going lifting of compulsory evacuation orders, compulsory evacuees who chose not to "return home" after the government's declaration of a former evacuation zone as eligible for return were reclassified as voluntary evacuees. In other words, with the shrinking of official evacuation areas, areas that are closer to the crippled plant and that had fallout of up to 20 mSv/yr become officially deemed as habitable. There were people who relocated within non-compulsory areas to other areas in the same city in Fukushima, where radiation levels were lower. These were not

evacuees per se, since they remained local to central Fukushima, but they nevertheless moved due to concerns about levels of radiation.

The 13,000 evacuees to Yamagata did not relocate as far away from Fukushima as others from the same places did. As the crow flies, it is 56 kilometers (35 miles) from Fukushima City to Yamagata City. Yamagata City itself is just barely outside the 100-kilometer range from the crippled plant. In comparative fieldwork, I interviewed voluntary evacuees who left from central Fukushima to far-northern Hokkaido (580 km from Fukushima City), far-western Okayama (680 km) and Yamaguchi (900 km), other destinations throughout the country (Fukui 422 km, Mie 490 km), and, ironically, including Hiroshima (810 km).[57] Even in these simple calculations, Yamagata evacuees remained close to central Fukushima, were able to go back to their Fukushima homes in their own cars if they had to rather easily, and did go back much more often than those who evacuated farther away.

Yamagata evacuees did not occupy positions that can be seen as the possible extremes of economic support. At one extreme of economic support are the "nuclear aristocracy" (Gill n.d.) of state-sanctioned compulsory evacuees from the compulsory evacuation zones. At the other are completely unsupported voluntary evacuees from areas outside Fukushima, who received absolutely no social or economic support for their evacuation. "Middle-range" evacuees to Yamagata were on the more supported end of voluntary evacuees, since they received housing support until March 2017 and normative kinship households with children also received free highway access between their evacuation and pre-evacuation homes (will receive it, as of now, until 2020). I discuss the free highway access measures in the context of "micro returns" in greater detail below. Even if the economic support paled in comparison to compulsory evacuees,

[57] Distances were calculated by using the "How Far Is It Between" tool available at https://www.freemaptools.com/how-far-is-it-between.htm, accessed April 2, 2019.

it is notably more than what evacuees from the greater Tokyo area and other parts of Japan received.

In terms of official recognition of the presence of radioactive materials, Yamagata evacuees and residents of central Fukushima were "middle-range" in-between extremes. Yamagata evacuees' hometowns and neighborhoods in central Fukushima were unequivocally, officially acknowledged as having had radioactive materials deposited there and became the target of decontamination procedures. This radiological situation, alongside associations with the word and place of "Fukushima," gave evacuees from central Fukushima some legitimacy in the eyes of the broader public and in the eyes of the state, wherever their evacuation destination might have been—mid-distance or farther. In contrast, voluntary evacuees from areas of the northern Kanto region (such as Gunma, Tochigi, Ibaraki, and Chiba prefectures) and the greater Tokyo area (Tokyo, Yokohama, Saitama, and other areas around Tokyo Bay) were left with little official ground to stand on for their evacuations. This lack of official ground is despite the fact that radioactive iodine was officially noted in these areas in the weeks following the start of the accident and hotspots were abundantly noted by citizens in the months and years after. Nevertheless, no official decontamination policies or reasons for any changes in daily life were announced. Civil society throughout Japan recognized these citizens' radiation concerns and created evacuation and rest and recuperation opportunities for them, as well, but these were all grassroots efforts.

There were also voluntary evacuees who evacuated from areas not associated with distance or direct fallout, but with the nationwide push to accept and burn disaster debris. When conducting comparative fieldwork in far-Western Japan, I met two self-evacuee mothers with children who evacuated from their homes near garbage incinerators in cities that had announced

they would accept disaster debris as part of a national push to help deal with disaster clean-up. Most "wide area" (*kōiki*) burning in prefectures beyond the three disaster-hit prefectures of Iwate, Miyagi, and Fukushima took place mainly in the northeast, eastern, and rural prefectures on the Japan Sea side of Japan, but Fukuoka prefecture and Osaka also accepted debris (Ministry of the Environment N.D.). Doubts about the radiological safety of the debris that would be burned, the significantly higher level of radiation that would be concentrated in ashes of the burnt debris, and what might leak into the air from the burning made debris even from Miyagi and Iwate questionable. The two women who evacuated with their children from near Fukuoka and Osaka incinerators could not claim any kind of official voluntary evacuee support and they were viewed as overly sensitive even by voluntary evacuee grassroots supporters. One found shelter for herself and her son with a Christian church in the rural countryside in Okayama, but even that location was not absolutely free of the vestiges of the nuclear age in Japan. Just several kilometers down the road was the Ningyo Toge uranium mine, the only uranium mine in Japan, which was only operational for a brief period in the 1960s and 70s, and now remained an open pit. The other woman worked at her own coffee stand in town in Okayama city.

These women, who self-evacuated with their children from nearby incinerators in Osaka or Fukuoka, would be considered outliers, even among voluntary evacuees. Even so, their concerns demonstrate how material concerns about the state-sanctioned circulation of radioactive materials from the nuclear accident could impact family habitation decisions even in areas outside where direct fallout fell. As nuclear power plants had been sited unevenly throughout the country through national and local state development projects (Aldrich 2008), so was the burden of burning disaster debris to be distributed unevenly. Mayors, citizen groups, and mothers'

groups across Japan were able to stop most such debris acceptance and burning plans, but not in all places.

Middle-range evacuees to Yamagata were faced with on-going navigation of pollution and safety, family relationships, and pulls back to Fukushima in ways that evacuees who went further afield did not have to negotiate as directly at an everyday level. However, as the most far afield examples above demonstrate, to live "normally" in mainstream Japanese society meant accepting or at least not thinking too much about small amounts of contamination that might be circulating here and there.

Mothers and Wives: Gendered Kinship Expectations

The ideologies, state apparatuses, and institutions of socialization that inform gender norms in Japan connect into nation-building projects from the past 150 years (Frühstück 2003; Lock 1993; Ueno 1987a, 1987b). Scholarship on Japanese families in the late 1990s and early 2000s was contending with the tenacious hold of cultural paradigms in stereotypical gender roles in the face of undeniable demographic and economic shifts that were projected to become even more pronounced. Broadly, sociologists of family in East Asia note that family practices have been changing radically in Japan, South Korea, and China with the second demographic transition. These radical changes include later age at the time of first marriage, increasing divorce rates, low fertility rates, and a rapidly aging society. One can also note the rise of alternative and new forms of kinship in Japan, including queer kinship, never-married singles, premarital cohabitation, and binational families (Ronald and Alexy 2011). All the while, Raymo et al. (2015) argue that expectations and obligations of married women with children (cisgender, ethnically Japanese, generally normative mothers) have remained constant in East Asia more

broadly. In Japan, these expectations of married women with children include domestic work, childcare, food preparation, and managing the family finances; proper socialization of children into the national community; nurturance not only of the child but also the husband; and continuation of the husband's stem family (*ie*) (Borovoy 2005).

Slater, Morioka, and Danzuka point out that women marrying into farming families in areas of rural Japan like Fukushima understand well the conservative expectations placed on the *yome* ("bride" of the house—the daughter-in-law) (2014, 495). The *yome* is not only to care for her husband, but also his parents and is expected to support and reproduce the economic unit of the stem family. These older, more conservative expectations around the *ie* (stem family) mix with what are now equally conservative expectations of childcare and domestic nurturance placed on the urban housewives of postwar, "corporate kinship," "Japan, Inc." decades of the 1950s through the 1980s (Ueno 1987b; Allison 2013; Borovoy 2005).

It is widely known in the literature on the post-war Japanese family that, "the responsibility for childcare has rested almost entirely on the shoulders of mothers… [and] fathers have often been expected to show their primary loyalty to their company rather than their family" (Goodman 2002a, 20). The stereotype goes like this: during the post-war rapid economic growth period, there was a strict and pronounced gender division between the woman-wife-mother in the home providing childcare and doing all of the domestic work and the man-husband-salaried worker-mostly absent father committed to a large company that offered him lifetime employment and a "family wage" (Borovoy 2005, 172–73). Upon becoming wives, "middle-class" women held the purse strings of the nuclear family household, while the husband breadwinner would be coddled (*amae*) when at home. This system is commonly referred to as the "family-corporate system," "my-home-ism," and "Japan, Inc."

These days, any study that begins with this breath about the domestic housewife and the company-tethered salaryman husband then begins to qualify this stereotype further. Goodman argues that the "Japanese values" that were lauded from the 1960s through the 1980s were blamed for economic stagnation, child abuse, and the disintegration of the family in the 1990s and early 2000s (Goodman 2002a, 21). In the 1980s, Japan was touted from the outside and touted itself for being somehow exemplary in this labor market composition. However, as study after study have shown and argued, "while the *ideology* of lifetime employment has been given much greater prominence in Japan than in many of its OECD competitors, the *reality* has been that the make-up of the Japanese workforce in this regard has not in the post-war period been nearly as different as much of the rhetoric might have suggested" (Goodman 2002a, 20; see also Chiavacci 2008; Slater 2010; Ishida and Slater 2011; Siniawer 2018).

In her recent highly influential and controversial work, renown American anthropologist of Japan Anne Allison penned a sensationalist polemic titled *Precarious Japan* (2013), which sought to portray Japan of the 2000s and early 2010s as being ripped apart at its seams, with the stability of labor and family from the period of "Japan, Inc." disintegrating towards a worldwide trend of precarity – precarious employment, precarious existence, human dis-connections (Hinkson 2017). Allison is interested in, "the biopolitics of life in [the] period following the collapse of Japan, Inc." (128), as if "Japan, Inc." was ever a homogenous material reality in the first place. To do this study, Allison identifies prescient social problems, but also seems to run full-speed with the most tabloid renditions of disintegrating social relations. For example, she recognizes the broader problem of elderly dying alone, while also taking an incident of a mummified mother who was found in her elderly son's bathtub—an elderly son who continued to benefit from his deceased mother's pension payments—as if it shows widespread Japanese

pathologies. Historian of postwar Japan Eiko Maruko Siniawer cautions against seeing the moral panic of precarity as decidedly new and overwhelming as Allison and her tabloid sources make it out to be. I am partial to Siniawer's characterization of the post-bubble 1990s and 2000s as, "A time of economic anemia and material plenty" (2018, 275). Slater (2010) also notes that moral panics about precarity are arising not because there has never been a precariat in Japan prior to the burst of the Bubble, stagflation, and neoliberal restructuring of the economy in the late 1990s, but because by the early 2000s, the wrong class of people was being faced with precarious labor and life courses.[58] Rather than try to keep up with Allison's sensationalist analyses, I follow Siniawer, Slater, and others who are more subdued in their assessment of economy, kinship, and middle-classness in post-bubble Japan.

As noted above, deep-seated affects around kinship and economy are slow to change. Glenda Roberts writes about Japan, "Work is incompatible with family life due to corporations' demands on employees' time" (2002, 87). She furthermore shows that gender role and family paradigms do not shift in accordance with economic shifts and especially not in step with policy shifts. Liberalizing policy shifts, such as campaigns and changes meant to support more mothers' participation in the labor force and to encourage fathers to do more housework and childcare, are even more difficult to actualize in practice due to entrenched gender norms in labor and broader social norms (Roberts 2002). The ever-declining birthrate prompted various initiatives meant to support women who were raising children, while attempting to expand social perception of

58 Schooling connects to labor, marriage, and kinship patterns. Commenting on kinship necessarily means commenting on the labor economy. Slater argues that the moral panic about freeters in the early 2000s came from class mismatch. The sk. "wrong" need to explain people—cram school-educated, high school and college-graduating middle-class people who have properly invested in their costly education and have acquired the interpersonal "wet" social skills that are supposed to lead to success in long-term employment tracks—are being faced with employment and socio-economic forms that are below them (Slater 2010, 27). Slater argues that the economy is what creates the conditions for labor liberalization—less stable employment, more "fluidity," lower pay, in short, a labor "reserve army"—even as socialization through schooling makes it seem like a choice to those who end up in such jobs.

increased participation by fathers in childcare and childrearing. These initiatives were undermined by entrenched obstacles to gender equality laws: no enforcement against corporations that broke laws meant to support workers' gender equality and childcare equality, and entrenched conservative values, especially among conservative politicians and men forty years old and older.

Though acknowledging that the normative employment/labor patterns, gender roles, and family values of "Japan, Inc.," my-home-ism, also known as the *ichioku chūryū shakai* "one hundred million middle class society," only partially extended into the working classes, Siniawer (2018) nevertheless sees the "mainstream" "middle-class" (*chūryū*) as hegemonically and ideologically real and influential, even today. As with any hegemonic ideology, "Japan, Inc." had real social ramifications and reverberated as true for many, especially when its sense of realness was heightened through media hype and consistent attention. But, also like most hegemonic ideologies, it captured the dominant social class's aspirational normal and state-sanctioned normativities (Bourdieu 1984). In Siniawer's view, the recent rise in a widespread moral panic about an "income gap society" (*kakusa shakai*) as having replaced the more egalitarian "one hundred million middle class society," is itself one of the recent moral panics of the mainstream. A mainstream of "Japan, Inc." that, even if labor patterns never fully aligned with the middle-class housewife-salaried worker ideal, nevertheless brought material affluence, consumer products, and consumerist desires and realities to many.

So, how does voluntary evacuation articulate with these broader gendered expectations of married women and men in consumerist middle-class society? The dominant middle-class gender ideology of the postwar period, though never an actual reality for the vast majority of Japanese, nevertheless perpetuated a stark, stereotyped, normative gendered division of labor.

Thinking in stereotypes about absent Japanese fathers, one might wonder, "If Japanese fathers are so devoted to their work and notorious for being absent from parenting and domestic duties, what difference does it make if the father isn't around anyway?" Thinking in abstract family models that critique the postwar gendered division of labor, in which the father worked through overtime and even at times died from overwork (*karōshi*) at the firm, while the mother did all childcare and domestic economy duties, I thought, "Doesn't voluntary evacuation basically result in the same family configuration as when a man/father is deployed for months and even years at a time on business for his job without his wife and children (*tanshin funin*)?" I knew these were naïve views to take, but, on the one hand, the critical gender literature has an unabating critique of fathers' domestic inadequacy, and, on the other, it is established that childcare in Japan falls overwhelmingly on the mother.

When I asked voluntary evacuees these abstracted questions, here are crucial differences they articulated between the absent father stereotypes and voluntary evacuation: when men are deployed elsewhere for their jobs, relocation expenses and accommodations are paid for; they are only responsible for feeding, clothing, and caring for themselves; the mothers/wives remain in home communities where they know where to buy groceries, which doctors to visit if their child becomes ill, and have access to informal childcare from relatives. Those were all things that voluntary evacuees had to figure out in evacuation. Furthermore, even though voluntary evacuees were clearly continuing to provide nurturance and care for their children, they weren't providing care for their husbands. Whereas a husband's working for their firm, even if deployed, would still align with the breadwinner role, by evacuating, voluntary evacuees were also leaving behind their ability to be "good wives" for their husbands because they were no longer

physically present to provide care for their husbands and to contribute to their marital families' domestic economy.

Even as Borovoy (2005) demonstrates how in postwar mainstream values, motherhood became much more emphasized than wifehood or daughter-in-law obligations, the case of voluntary evacuees brings into sharp relief that the roles and expectations of the mother, wife, and daughter-in-law (*yome*) are collapsed into one. Slater, Morioka, and Danzuka also argue that for Fukushima mothers who sought to protect their young children from radiation, the roles of ["good"] wife and ["wise"] mother diverged (2014, 494-497). Their interlocutors discursively and morally prioritized the role of mother, meaning that protecting one's children from radiation was of greater importance than fulfilling duties as a wife and daughter-in-law. However, the authors note that this discursive and moral acknowledgment of the primacy of the "mother" role did not necessarily translate into the kinds of action we might expect, from the outside looking in. Voluntary evacuation and concern over radiation caused conflict with corporate membership in the kinship group (the stem family) and community. They note young mothers' struggle with tensions between the "good wife" and "wise mother" halves of the conservative "good wife, wise mother" ideal. The mothers with whom Slater, Morioka, and Danzuka spoke valued their children growing up among the Fukushima-based family—the evacuee mothers to Yamagata with whom I spoke also shared this value.

Voluntary evacuation was sometimes seen by the voluntary evacuee herself, her neighbors, and/or other family members as her turning her back on her responsibilities and obligations to her husband, his family, and their neighborhood community. Some of the women with whom I spoke suffered greatly from the incongruencies of this bifurcation. The vast majority of voluntary evacuees to Yamagata tried their best to keep their marriages intact

throughout the evacuation and eventually returned to their pre-evacuation Fukushima homes or new homes in Fukushima. Some eventually saw their evacuation lead to divorce. Voluntary evacuees who were working single mothers found part-time employment, but felt familial obligations to their own parents, whom they left behind in Fukushima.

I am by no means suggesting that these normative kinship structures define contemporary Japanese families across the board, that all rural families and individuals espouse these values, or that all Fukushima families even aspire to the same kind of kinship practices and moralities. But I do acknowledge that these normative kinship and normative values informed the criticisms that voluntary evacuees faced, sometimes from their husband, in-laws, and their own natal families; sometimes from the grandfather down the street in their Fukushima community; sometimes from their own mothers; and oftentimes in themselves during our interviews and conversations and when they went back and forth. If it weren't for the nuclear contamination, some would have been able to live out their lives in Fukushima with their kin group around them, with childcare provided in part by grandparents and other relatives, and sharing a home with their husbands and being able to care for them. For others, it was better that they left Fukushima; a divorce that was long in the making could finally be actualized.

I review this literature at length because the tensions between the role of mother, wife, and, at times, daughter-in-law and daughter were important tensions that middle-range voluntary evacuees were navigating when they chose to evacuate to Yamagata, when they valued on-going school-based socialization for their children, and when they went back and forth between evacuation and their Fukushima homes and family. I now turn to Mrs. Hanasaka's story as an example of how navigating these double binds between family and protecting her child's health, between "good wife" and "wise mother," informed her middle-range evacuation to Yamagata.

Mrs. Hanasaka

Mrs. Hanasaka's story is similar to many other voluntary evacuees with whom I spoke. Following an initial evacuation elsewhere, she went back to Fukushima in the spring or summer of 2011, evacuated again, and eventually decided on Yamagata because of its lower radiation levels and closer proximity to Fukushima. Mrs. Hanasaka's experience most starkly showed the double-bind of trying to fulfill the contradicting obligations involved in being a "good wife" and "wise mother." As Mrs. Hanasaka expressed to me, protecting her child's health (taking him into evacuation, away from radioactively contaminated areas) had resulted in her sabotaging the happiness of the family (everyone living happily, patrilocally with her husband's extended family in Fukushima). April 2015. Saturday afternoon at a cafe in Yamagata City. I arrived a couple of minutes before Mrs. Hanasaka. Everything is made of wood and a there are things from India or Nepal. Fumbling with my pens and notebook, I'm worried about what to ask during the interview. I am the only man in the packed restaurant. Of course, men can come, but chic cafes with a natural wood aesthetic where pasta or gratin is served tend to be almost entirely women's spaces around lunchtime. Mrs. Hanasaka arrives. She has a simple, somewhat elegant fashion and appearance. She is wearing a long blue sweater and black pants; her hair, which was dyed light brown and slightly shorter than shoulder-length, was set nicely. She also has small earrings, a watch or bracelet, and a simple necklace. This is one of the rare times when Mrs. Hanasaka would be able to make time to meet with me to speak one-on-one like this. It was spring break at the elementary school before the start of the new school year. Her son, Mrs. Honda's daughters, and Ms. Tanaka's daughter were all at a "rest and recuperation" camp on an island in the Japan Sea with Nishimura.

Mrs. Hanasaka prompts me: "So what is it that you would like to ask me?"

I fumble a little with my speech. Since this is the first interview I am having with an evacuee in a public space, I am not entirely sure how comfortable she will be talking openly about her evacuation experience. Prompted, I fumble into it, "Yes, right. Um. So what do you do about food and things like that? Also, I want to ask about your decision when you first came. How did you decide on Yamagata?" Trusting that four months of interacting with the evacuee community and spending time with Mrs. Hanasaka, her son, and three other evacuee families at three pot sticker parties at Yuta and Reina's is enough of a background for trust in our conversation, I listen. Hanasaka-san dives in:

> H: My parents' home is in Saitama (222 km from the crippled plant). When it [Fukushima No. 1] exploded, right away, on the 19th, I evacuated. We stayed in Fukushima for one week. One week after the explosion, I took my child and ran away [*nigeta*]. It's because I got a text from a friend. I didn't know whether it would be ok to evacuate on my own, or whether to stay. So I texted a few of my friends, asking them what they were doing. The friend who I trusted the most replied, saying, "You should get out!" She had already evacuated with her family to a town in Yamagata. But I didn't know anyone in Yamagata. I had no relatives. I didn't think I could just go to Yamagata all of a sudden, alone. So, for the time being, I ran away [*nigeta*] with my son to my parents' home, in Saitama.
>
> Had it not been for that friend, I wouldn't have been able to evacuate. I couldn't decide all by myself. I didn't know anything then. That friend said very forcefully, "You absolutely have to get out!" She texted me, "Run away, right now!" That's why I thought, "Oh ok" and I packed my bags right away, but, um. Well, there's my husband. My husband, he was saying, "Huh? What? Why are you evacuating? They're saying it's

fine." We lived with his mother and father, so I couldn't get them to understand me. "Here is fine." "It's fine here, there's not need to evacuate," they told me. So I couldn't leave right away. But, well, in the end, I, I explained this and that to my husband and he, well, he allowed me… I got him to allow me to go? (laughs wryly)

AS: So that was your first evacuation?

H: Yes, on March 19th, [2011], we went to Saitama.

AS: Did your parents tell you, "come, come!"?

H: No, no. They were more like, "Oh? Oh? Really? Well then." My parents really didn't know anything, either. It's like that with my parents' generation. They only look to the television and newspapers. "The government says it's fine, so it's fine. What are you worried about?" That kind of attitude. "There's no real need to evacuate, don't you think? You guys live far enough away anyway."

Hanasaka-san's natal family lives in Saitama, which is 222 kilometers from the nuclear plants. Her marital family lives in a town in central Fukushima Prefecture, about 60 kilometers from the power plants. "That's quite close," I say. Hanasaka-san laughs and agrees.

H: It *is* quite close! And on top of that, the wind—the wind was blowing our way. We're right after Iitate village. (she laughs) It's in the same direction. That's how the radiation came. But they wouldn't listen to me. They couldn't see what I was saying. My in-laws, my parents—they couldn't see it. "The government says it's fine. The national government. Besides, you're 60 kilometers away. (laughs) It's not like you're in Futaba or somewhere like that. You don't have to evacuate." Like that. My parents, too. (laughs)

Yea. They couldn't understand. But I said to them, "Whatever the case, I'm still coming with my child." "Well, if you're going to come, alright then," they said. (laughs) They really didn't get it. Yea.

Hanasaka-san and I continued our conversation for another hour that day. She stayed with her parents in Saitama for four months in 2011, from March 19 until July. Her son had been looking forward to entering kindergarten in Fukushima, but given the circumstances, she ended up putting him in a kindergarten in Saitama when the school year started in April. They went back to Fukushima in July and evacuated to Yamagata City in August. If they had stayed in Saitama, her husband would not have been able to come visit his son very often. It takes between four and five hours by car from their home in Fukushima to her parents' home in Saitama. If this were to continue, her son would only be able to see his father maximum once a month, and sometimes not at all. He loves his dad, playing with him and spending time with him.

In summer 2011, there was an electronic mailing list that was created by mothers in Fukushima called "Kodomo Fukushima" (Children Fukushima). Mrs. Hanasaka found information there that apartments in Yamagata would be available for rent to voluntary evacuees. If they were in Yamagata, then her husband could come visit them more often. Yamagata is only one hour by car from central Fukushima. However, she still felt uneasy going somewhere where she knew no one, so she made her own post in that mailing list and other mothers responded, saying that they were also going from Fukushima, and that they could meet in Yamagata. From there, she got the courage to come to Yamagata. She and other evacuee mothers then made another electronic mailing list for mothers from Fukushima who had evacuated to Yamagata.

Mrs. Hanasaka is grateful for these mailing lists, especially Kodomo Fukushima. They are what gave her the courage and non-kin-based social support to be able to go into evacuation.

When we spoke in April 2015, Mrs. Hanasaka had not yet made up her mind as to whether she was going to go back with her son to live in her husband's family home. She was torn. As she saw it, protecting her child's health by taking him into evacuation resulted in her sabotaging the happiness of the family, a happiness based on everyone living together, patrilocally with her husband's extended family in Fukushima. Indeed, it was not only about living happily together. It was also about obligation to the family and fulfilment of the promises which she made when entering into marriage. These promises included helping her husband to inherit the family business and taking care of her husband's ailing parents. Though she felt this obligation and responsibility strongly and wanted to be able to fulfil these roles, Mrs. Hanasaka was not ready to bring her third-grade son back indefinitely to the air, food, and piles of large black bag-like containers full of contaminated waste materials that were piled up next to the playground in her neighbourhood in Fukushima. She was not ready to do this, especially because her son was very energetic and loved to play outdoors. She nevertheless returned regularly with her son for days at a time to spend time with her husband's immediate and extended family.

By the end of the interview, Hanasaka-san had a spacey look on her face. Her eyes were out of focus. I don't think she was in shock, but she definitely talked about things that she had not spoken with others about. I asked her if she speaks with anyone else about these things. "Who is there to speak with?" she said. When could she or they make time? She said it's rare to be able to share these concerns, especially when the children are around. Listening back on the recording now, I can hear the bitter laughter from the very start of the story. I wonder what that kind of bitter laughter means or does or is...

I spoke with Mrs. Hanasaka again in summer 2018. Apartment subsidies for voluntary evacuees had been discontinued over a year beforehand, in March 2017. She still lived with her son in Yamagata. She emphasized just how little had changed since we last spoke in April 2016. Her son still played baseball at school, they were living in Yamagata, her husband came to visit on the weekends, and they made return visits to Fukushima for family functions. She wasn't planning on making the final return yet and doubted that she would ever be able to. Surprisingly, though she emphasized that little had changed, one thing stood out to me as we were winding up our conversation: radiation had not come up as a topic of discussion or a main reason stopping her from returning when we spoke in 2018. Instead, she was afraid of how she would be treated by other women in her neighborhood. She feared the social repercussions and passive-aggression she would face if she tried to reintegrate into the neighborhood after seven years of having evacuated and abandoned them. She hadn't yet broached the conversation with her husband of possible divorce.

Mrs. Yamatsuki

I spoke with Mrs. Yamatsuki alongside Mrs. Matsuta in a three-person interview in April 2015. Mrs. Yamatsuki was born and raised in Namie, one of the towns that became a complete no-go zone after the accident. Her cousin and her father benefitted from employment at the nuclear plant before the accident. At the time of the accident, she lived in Fukushima City with her husband, had a three-year-old daughter, and was pregnant with her second daughter. Mrs. Yamatsuki's not speaking up against TEPCO did not stop her from acting to protect herself and her daughters from radiation. Her concerns were different than what anti-nuclear activists might want to see and hear. As her family fled in dire straits from Namie, she was torn between

wanting to let them into her home and wanting to protect herself, her daughter, and the child with whom she was pregnant from radiation exposure from the radioactive materials that her relatives might be carrying on their clothes and car. As she told me the story of these early days, she broke into tears and accused herself of taking what she now saw as discriminatory action against her relatives.

Once her second daughter was born, she evacuated to her mother-in-law's place in Sendai, but there, too, she had a painful disagreement. She was doing her best not to eat produce from the Fukushima area because she was breastfeeding her newborn and she also did not want to feed her three-year-old daughter possibly contaminated food. Her mother-in-law, however, scolded her harshly for wanting to drink bottled water and avoid milk from the Northeast. All of the other children were eating this food and drinking this water and milk, she said. "Who do you think you are to protect just yourself and your children?" As she told the story, Mrs. Yamatsuki broke out into tears again. She felt horrible. The next day, Mrs. Yamatsuki quietly packed up her things and went with her daughters into voluntary evacuation to Yamagata. She and her mother-in-law never spoke about the altercation again.

The Case of Milk

Evacuating and navigating the double binds that arose through evacuation involved what Slater, Morioka, and Danzuka (2014, 446) call micro political action: speaking up "in small rural communities, within families, and among friends." Voluntary evacuees also told me of situations where they did not speak up, but (micro-politically) acted quietly, communicating to their children with nods and shakes of the head about this dish and that dish on grandma and grandpa's table; quietly snatching milk processed in northeast Japan from their child's school

lunch on a class visit day, and then quietly throwing it out; teaching their preschool-aged and elementary school-aged children what they cynically called "mushroom education," so that their children knew to pick out mushrooms from their soup, which are known to accumulate radioactive materials. Such moments of micro political action contradict safety proclamations and school-based socialization meant to have children take pride in local produce and become part of the moral Japanese community.

Many of the Fukushima mothers with whom I spoke in Yamagata had figured out various strategies to have their children avoid having to drink milk in nursery school and elementary school. Milk is widely touted to be a rich source of calcium that growing children should drink to develop strong bones and a healthy future. At the same time, milk is also known to be the medium through which many children ingested radioactive Iodine following the Chernobyl disaster, which in turn resulted in a dramatic rise in childhood thyroid cancers among the affected populations in Ukraine and Belarus (World Health Organization 2006). Mistrust in the Japanese government's pronouncements of safety, delayed communications about the direction and levels of the radioactive plume in March 2011, and the possibility of on-going leaks of radioactive materials from the plants contributed to evacuees' concerns about the safety of milk processed in Fukushima and northeast Japan generally. Possible on-going circulation of radioactive materials into cows' feed and into the air at milk processing plants contributed to evacuees' continued resistance to letting their children consume milk from northeast Japan.

These physical/material concerns over milk turn into social concerns the moment one considers the contexts in which milk is consumed. Particularly salient for the evacuee mothers was the milk their children drank in nursery and elementary school. One evacuee mother with whom I spoke first in February 2015, Mrs. Hamada, told her son's preschool (*hoikuen*) that her

son was allergic to milk, as a way to prevent him from having to drink it. Several months later, one of the teachers confronted Mrs. Hamada and told her that she should really let her son try milk. This was on the teacher's mind because Mrs. Hamada's son had caused a small hubbub that day when he tried to wrest the straw attached to another child's milk box from him and tried to insert the straw into that child's milk box himself. He wasn't trying to drink the milk—he just wanted to insert the straw into the box. The teacher explained to Mrs. Hamada that it would be nutritiously important for her son to drink milk, and that if he didn't start drinking it now, he might not like it for the rest of his life. The teacher also emphasized that the mother should not be stopping her son from drinking milk just because of her own preferences. If her son was truly allergic, she would need to provide a doctor's diagnosis. When confronted like this, Mrs. Hamada had to explain about her son's having been exposed to radiation in the first days of the accident, and that she did not want him drinking milk because she did not know what might happen to him in the future because of the initial exposure and how this might interact with the milk. The teacher was very understanding and apologized for his lack of information. This negotiation is an example of everyday nuclearity in middle-range evacuation.

Another evacuee mother noticed that the milk at the lunch served to parents and students when she was visiting her son's school was processed in Fukushima. She took it home with her in her hand-bag when no one was looking, telling her son that they would drink it once they were home. She then proceeded to throw it out in her own trash at home when her children were not looking. She did not refuse the milk and could not throw it out then and there at the school. But she nevertheless made sure her children did not drink it.

From the point of view of nursery school and elementary school teachers, to not allow your child to drink this fortifying, healthy substance is to deny your child a strong future; it is

also to deny your child shared milk socialization with his or her peers at lunchtime. Besides, one can imagine nursery school and elementary school teachers arguing that any milk that is coming to the market should be safe enough to drink, since it must have met government radiation standards. The mothers who asked for their children to be excused from drinking school milk also understood these perspectives and practices. Yet, since trust in the government about radiation contamination issues was lost, these official pronouncements were ineffectual. They therefore sought to alter what their children consume, while minimizing disturbance in the school community and avoiding conflict with other parents' views of the matter and the school's overall policies. In doing so, they also thought about their children's group-based socialization and how difficult self-exclusion from food-based group socialization could be for their children. Ms. Tanaka, a single mother, and her daughter Hanako's story is a powerful example of such considerations.

I came to know Ms. Tanaka and her daughter Hanako through Yuta and Reina, when they hosted *gyōza* (pot stickers) parties for a group of four mothers in evacuation, with their children. I became well-acquainted with all these mothers and children over many months, playing together and sharing meals. Eventually, I distributed an open-ended survey to the mothers and asked to do follow-up open-ended, semi-structured interviews with them about their survey answers and their general experiences of the nuclear disaster and evacuation. I spoke at length with Ms. Tanaka in late March 2015, again in April 2016, and a follow-up in July 2018. The vignette below comes from our interview in April 2016.

There are things that Hanako has never eaten and groups of people with whom she has not been able to share in food moments. For example, just the day before we spoke in late April 2016, Hanako told her mother that everyone in her class toasted a classmate's birthday with

milk, but she couldn't because her mother doesn't let her drink the school lunch milk. Ms. Tanaka once again had to tell Hanako why: it is to protect her health because the milk might be dangerous. But she could see that she was forcing her daughter to refrain from doing something she wanted to do. Though perhaps Hanako did not entirely understand why she had to exclude herself from these class rituals, she had had to cope with the pain of self-exclusion at her mother's bequest. Ms. Tanaka wonders, "When will this period of child self-restraint (*gaman*) for the sake of me, her mother, shift into self-assertion and rebellion?"

There is a negotiation here between the physical, bodily danger that certain foods, milk in this particular case, may pose and the social, societal meanings of belonging created by sharing food and drink in classroom rituals. Hanako had yet to partake in these sharing rituals due to the dietary restrictions imposed by her mother. Nor did Hanako know when she would be able to. It pained Ms. Tanaka to have to make her daughter practice self-restraint in these circumstances. In not drinking milk, she was different from those around her—from the group. She was not sure whether her daughter herself understood why she had to bear with this. Of course, she had told her and they had had many conversations about this.

As we spoke, I commented that *gaman* (self-restraint) is hard. Yet, Ms. Tanaka does not think that *gaman* is altogether bad. Self-restraint is something that all children have to learn. They can't just have anything they want whenever they want it. Being able to restrain yourself is a crucial basic skill needed in order to function well in society. But this kind of *gaman* is different, since it differentiates Hanako from her friends and threatens to leave her in isolation, perhaps too a target for bullying.

One can say that the meaning of milk changed after the Fukushima disaster. Yet, there is more to this than just the shift in a definition. From a semiotic materiality standpoint, any object

will always have more qualities and properties than those which are selectively emphasized or deemed the most important in a given social, cultural, or linguistic context (Keane 2003; Fehérváry 2012). Healthy bodies, healthy futures, possible thyroid abnormalities, possible surgeries, possible medical futures, and how you will then judge yourself as a mother and caregiver – all were now implicated in the milk. At the same time, these mothers want to be good citizens, to not cause too much trouble at the school in the community hosting them as evacuees, and to avoid tiring out their child from having to worry about these things. These kinds of negotiations between actions in the present and future reverberations permeate many food, life, and parenting decisions faced by evacuees.

Micro Returns

Voluntary evacuees to Yamagata continued living their everyday and family lives in motion between Fukushima and Yamagata, amid the constant possibility of material contamination. In addition to protecting their children from radiation, voluntary evacuee mothers also had to figure out how to continue upholding family and economic ties with relatives and property, such as homes, that remained in ambiguously contaminated grey zones inside Fukushima. This was especially true for married evacuees, many of whom had left their husbands behind in Fukushima. Much like the Hondas, with whom I opened this chapter, most of the evacuees I came to know during fieldwork made frequent trips back and forth between Yamagata and Fukushima in part as a response to these tensions. To go back and live in Fukushima forevermore is called the "final return" out of evacuation, towards which voluntary evacuees were explicitly and implicitly guided by the government, bureaucracy, media,

neighbors, friends, and family. What I call a "micro return" was anything short of "the" final return (*kikan*).

Some micro returns would otherwise be "normal" family visits (*kisei*) out of consideration family members' desires to see their children and grandchildren. Another seemingly "normal" category that some micro returns took was that of a work commute, as Mrs. Honda's example below demonstrates. The Obon Buddhist holidays and family New Years' celebration were also important times to make a micro return. A somewhat "abnormal" category of micro returns were ones when the evacuees went to bring their children to see their fathers. I consider this abnormal because were it not for the evacuation, they would not be living separately. Even in writing this, I come against an everyday nuclearity negotiation for myself as a narrator: Which is more appropriate to write: "were it not for the contamination" or "were it not for the evacuation?" To write, "were it not for the contamination" is to take the side that the radiological situation remained abnormal. To write, "were it not for the evacuation" is implicitly to suggested that the evacuation was an overreaction and that living normally in Fukushima was normally possible. For this chapter and this dissertation, I take the side of the voluntary evacuees with whom I spoke, who were themselves navigating these slippages and negotiations of everyday nuclearity.

Even if a voluntary evacuee went back and forth (*ikiki shiteita*) to Fukushima on micro returns from time to time, this did not mean she thought Fukushima (the spaces and places in Fukushima; and her going back and forth) was safe and clean. As I discussed in chapter 3, when voluntary evacuees made micro returns, they had to consider how they would deal with the material, emotional, and psychological concerns related to the possibility that their children might breathe radioactive materials present in the air, eat food that possibly contained radioactive

materials, and then possibly transport radioactive materials in their cars, clothing, and other objects as they travelled back to their supposedly clean evacuation homes. Just because someone made micro returns also did not mean that she desired to go back for "the" final return (*kikan*). Furthermore, even if a voluntary evacuee went through with *kikan*, this did not mean that she thought the situation in Fukushima was all fixed or safe, as Mrs. Kojimoto's example below demonstrates. The abnormality of having to be concerned about possible radiation exposure persisted across micro returns and often into the final return (*kikan*).

Were micro returns/return visits supported financially and socially?

State support for voluntary evacuee back-and-forth mobility had to respond to broader society's response to a logic of heightened radiation risk for children, even as the state never acknowledged that basic premise for voluntary evacuation as necessary.

All highways/expessways in Japan are toll roads. It costs 2,750 yen (about $25) to go one-way from Yamagata (Zaō Interchange) and Fukushima (Nishi Interchange). For compulsory evacuees, free highway access between evacuation homes and Fukushima homes in the compulsory evacuation areas began on April 1, 2012 (Ministry of Land, Infrastructure, Transport and Tourism 2019b). Voluntary evacuees were granted free highway access between the closest highway entrance to their evacuation home and the closest highway exit near their Fukushima home through the "Measures for Free Expressway Access for Mother-Child and Other Evacuees due to the Nuclear Accident" starting on April 26, 2013 (Ministry of Land, Infrastructure, Transport and Tourism 2019a). At the time of this writing in March 2019, the Ministry of Land, Infrastructure, Transport and Tourism has approved the extension of these free highway measures for evacuees from restricted areas and for voluntary evacuees until March 31, 2020

(Ministry of Land, Infrastructure, Transport and Tourism 2019a, 2019b). For most voluntary evacuees, micro returns were therefore financially supported by the central government.

The name of the card for evacuees from compulsory areas and the brief explanation of the purpose of the back and forth travel demonstrate the government's ideology of a highspeed march towards reconstruction (*fukkō*), repatriation/"final" return (*kikan*), and the lifting of evacuation orders (*kaijo*). The card is called the "Hometown Repatriation Back-and-Forth Travel Card" (*Furusato kikan tsūkō kādo*) and temporary return visits (*ichijiteki kitaku*) for compulsory evacuees are ideologically articulated as, "travel by evacuees, such as temporary visits to their homes, meant to rebuild daily life" (Ministry of Land, Infrastructure, Transport and Tourism 2017).[59] Despite the clearly imprinted ideology that temporary visits are meant to lay the groundwork necessary to restart daily life after the "final" return, not all compulsory evacuees who use this free highway access to make visits to their pre-evacuation homes necessarily wish to return to these homes for a "final" return (*kikan*). There are a myriad of reasons why many compulsory evacuees do not wish to repatriate (*kikan*), including "disbelief in decontamination, distrust of government safety declarations, low expectations for accident resolution, concerns over daily life and finance, opposition from other family members, [and because they] found new employment" (Yamakawa 2017, 54–55).

In the case of voluntary evacuees, the free highway measures were put in place to let people who lived in the same household prior to evacuating visit with each other. They were not strictly for mother-child evacuees to be able to visit fathers back in Fukushima; fathers could also come to visit their wives and children in evacuation with the government paying highway access fees. Father-child evacuees and child-only evacuees were also eligible for free highway

59 避難者の一時帰宅等の生活再建に向けた移動を支援する目的で実施しているところです。

access, so long as the members who were registered as living together in the pre-evacuation household were divided due to evacuation. For example, if a single mother and her child were *registered* as living (regardless of whether they actually did live there or not) in a three-generation home with the mother's parents, and then the mother and child evacuated, but the grandparents remained in Fukushima, then highway access would be free for the grandmother when she went to visit the evacuee mother and child and vice-versa. However, such cases were exceedingly rare. Single mother households tend to be registered as their own household. Therefore, even if they left due to radiation concerns and the mother left behind her parents (the child's grandparents), free highway access did not extend to them.

However, when we critically consider what kind of visits, by whom, to where, and to whom were supported, we begin to see that free highway "support" (not compensation) measures were (and are) child-centric and skewed towards normative and heteronormative, reproductive nuclear families. Single mother households didn't get free highway access; families with children who were 18 years old become ineligible; this is not to mention any adults who might have decided to evacuate. This is not surprising, as much writing on social support for families in Japan points out that it is normative kinship practices that get state support (Goodman 2000, 2002b). Free highway access is discontinued on April 1 of the year following the year when the family's youngest child turns 18.[60] This acknowledges that families with children under 18 years old are more likely to self-evacuate (due to the widely shared understanding that health risks of radiation are greater for children), but not all families with children are supported, and

60 April 1 is the start of the fiscal year for the local and national governments in Japan and the schoolyear also begins in April, unlike the autumn start dates for schoolyears in most of Europe and North America or the various start and end dates for fiscal years in different companies, governments, and institutions throughout the world.

alternative/additional understandings of radiation risks that extend to adults or young adults are undermined.

Actual practices of micro returns (short-term return visits) exceeded the ideologies baked into the logics and reasons of the state-supported return visits. Travel back and forth and official support for this travel were not only matters of contamination and ideology, but economic and personal matters. Though voluntary evacuees did use free highway access to prepare for a final return once they decided to make the final return, micro returns did not necessarily predict a final return or suggest that the mothers who made return visits or the final return thought the radiation situation in central Fukushima was acceptable. My fieldwork revealed how people made micro returns for family obligations and sentiments, even when they were not financially supported by the government. It also showed economic considerations that go beyond contamination.

Mrs. Honda: daily back-and-forths

At the moment of deciding to go into voluntary evacuation, Mrs. Honda sought to protect her daughters from radiation exposure by moving them to a location where they could lead everyday life in a radiation-free environment, with minimal inhalation and ingestion of radioactive materials. At first, Mrs. Honda had considered evacuating several hundred kilometres away from Fukushima. However, her parents still needed her to work at their family pharmacy in Fukushima City. As a result, she and her daughters were only able to evacuate to Yamagata City, which would be close enough to allow Mrs. Honda to make the one-hour each-way commute to Fukushima City. Her daughters return to Fukushima to see their father on weekends and almost every school holiday.

From the very start, negotiations with her own parents and her husband strongly influenced the enactment and practice of voluntary evacuation by Mrs. Honda and her daughters. Concern for her daughters' lifelong biological wellbeing in the face of unprecedented and enduring widespread radioactive contamination prompted Mrs. Honda to pull her daughters into evacuation in the summer of 2011, away from their family hometown of Fukushima City. At the same time, Mrs. Honda compromised part of her own everyday physical presence to continue being day-in, day-out in Fukushima for the sake of the economic viability of her Fukushima-based family and out of dedication to her parents. However, even if she does go back, Mrs. Honda continues to see the state of affairs in Fukushima as abnormal. I therefore consider Mrs. Honda's daily commute to and from Fukushima and certainly the times when she takes her daughters to see their father to be micro returns.

Mrs. Kojimoto: eating "normally" in Fukushima

I met Mrs. Kojimoto at a cooking salon for evacuee mothers in Yamagata in January 2015. She had been back in Fukushima City the weekend before because there was a Shinto ground-breaking ceremony (*jichinsai*) blessing the new house that her husband was having built. Her husband was having the new house built so that Mrs. Kojimoto and her daughter would go back to Fukushima City for their final return in July 2015.

Mrs. Kojimoto had evacuated to Yamagata in July 2011 with her daughter, who was only a few months old at the time. By January 2015, Mrs. Kojimoto had spent more time separated from her husband in Yamagata than living with him in Fukushima and her daughter had lived almost all her life in Yamagata. Mrs. Kojimoto did not want to go back for the final return and was worried about things such as contaminated places her daughter might pass on her way to

school and where her daughter and other children might wander when not under adult supervision. She was also worried about what her daughter might do as she grew older, and the radiation in places aside from the decontaminated schools and the city hall establishments. As she pointed out, by being somewhere, you are breathing the air there. The air in Fukushima is likely to have radioactive materials in it, even in small quantities. These particles will certainly increase when dust is kicked up and circulated – or if you play in non-decontaminated fields or walk through un-decontaminated back alleyways or sit outside under the trees.

During her time in evacuation, Mrs. Kojimoto had periodic micro returns. She would go back with her daughter around the mid-summer festival of Obon and the New Year holidays to Fukushima to visit her in-laws and her own natal family. Towards the end of our forty-minute-long interview, I asked Mrs. Kojimoto to tell me about how she had explained the evacuation and radiation to her daughter. She said she always stressed the need to be careful with air, saying that "the air was dirty" in Fukushima.

It was somewhat strange to me that Mrs. Kojimoto would emphasize air, rather than water, soil, or food, so I asked to confirm, "'The air,' you said? Not the soil or the water or the food, but the air?"

> K: The air. I told her, "the air." With food, well, [that's taken care of because] I am careful about what I feed her. And then, when we go back [to Fukushima] and we go to my [natal] family's house, I tell my parents to be careful and to not feed her anything from around there [Fukushima]. Besides, even if I told her [my daughter] about that [food], I don't think she would understand.
>
> AS: And your parents are understanding?

K: I can tell them [my own parents] directly, and they just say, “Oh, if that’s the case, OK then.” But when we’re at my husband’s parents’ house, well, from the get-go, they don’t think it’s dangerous. And then, if I go and say something, well, I don’t think it will be pleasant for anyone. So, when we go to my husband’s parents’ house I try my best to… well, I let them feed [my daughter], but [in my heart], I think [to myself], “ugh...” But I can’t just flat-out say, “Stop that, please!” (Mrs. Kojimoto laughs), so, it’s like there’s nothing that can be done about it, really.

AS: That’s hard…

K: The neighbours will bring over some freshly-picked—since it’s the Fukushima countryside—there are apple farmers nearby, and they take the freshly-picked apples and just peel them right then and there, without taking them to be screened [for radiation], and just [serve them] there. Just like that.

AS: What? Really? Wow. Is that how it is?

K: Yeah. They take the apples that they cannot sell on the market and come over with them. Then they’re peeled and served right then and there. Ugh! I really hate it! But, well, I can’t really let that show. And then, once I go back to live in Fukushima, I don’t know what I should do… whether I should say something or what… ahh… these are my worries these days.

[…]

AS: Have you spoken with your husband or someone about this?

K: Ahhhh, really, there’s no point in even trying to say anything to him.

AS: Oh really? Is that so?

K: He'd be more like, "My parents just went through all that trouble to peel it and give it to her, and you won't let her eat it?" Yeah. It's like that. He's remained in Fukushima for a long time. And, well, while, on the one hand, you have people like me who are worried about it [food, radiation, etc.], on the other hand, you also have parents who think, "Oh [it's been long enough]; it's fine by now," and who are letting their children eat normally.

AS: Wow…

K: And, um, my husband's older brother's children are also eating normally. It seems that the parents don't worry about it anymore. And so, that's why he [my husband] says, "Well, since their children are eating everything just fine, I'm sure it's fine, don't you think?"

AS: Is that what he says…?

K: Something like that. But, I mean, even if you eat it, it's not like something's going to happen to you right away. If anything happens, it'll be decades later, and that's when you'll be in trouble. So that's why I don't want to let my daughter eat it. They all say, "It's fine to eat it," and I just go on thinking to myself, "I don't think so…" (Kojimoto-san laughs)

Note all of the negotiations of everyday nuclearity that Mrs. Kojimoto explains: not only who is fed what and how that makes her feel, but also who is likely to take her nuclear-related comments in what ways. With prolonged fieldwork, I came to understand that the social bonds surrounding food in family relationships often outweighed the material possibility of contamination in food in the minds of evacuees. As in Mrs. Kojimoto's case, I often heard voluntary evacuee mothers speak of choosing to preserve social respectability in their relations

with their husbands and in-laws, even if it meant possibly ingesting dangerous substances and allowing their children to eat Fukushima produce they would not otherwise let them eat. Stating that one has to force oneself to live and eat "normally" underscores the fact that one does not, in fact, think that that way of life is normal.

Mrs. Kojimoto was not the only one to underscore the way things are "normally" done in Fukushima on micro returns and in anticipation of the final return. The term "*futsū ni*" ("normally") became prevalent in the narratives of evacuees anticipating their return to Fukushima. A final return meant accepting the air, streets, and dust from which they evacuated in the first place. It also meant accepting hefty doses of Fukushima-love broadcast on television alongside the daily forecast of radiation levels throughout the prefecture. They would have to force themselves to behave "normally," despite their numerous concerns about handling radiation in relation to food supply and preparation, drinking water, children, school, births, breathing, hanging out laundry, neighbourhood relations etc. Ms. Tanaka, for example, anticipated a kind of necessary emotional and mental numbness (*mahi*) to it all, if she were to go back to live in "normal" Fukushima every day.

Conclusion: Five Years Into it All: Driven to Return Amid Sedimenting Everyday Nuclearity

I have shown how voluntary evacuee mothers from central Fukushima to south-eastern Yamagata sought to simultaneously protect their children from radiation exposure, while facing social limits to their radiation protection efforts. Overall, voluntary evacuees' actions were tempered by their own valuing of continued group-based socialization at school and with their families, who remained in Fukushima. This meant social and material compromises,

ambivalence, and changes in attitudes over time, as material and interpersonal circumstances in Fukushima and in evacuation changed.

As voluntary evacuees were explicitly and implicitly guided by the government, "repatriation" (*kikan*) policies and subsidies, bureaucracy, media, neighbors, friends, and family to just "come home" and return to Fukushima, making the "final" return tended to get collapsed with an acceptance of the radiological situation. Few of the voluntary evacuees with whom I spoke considered the radiological situation to be absolutely safe, and it was family obligations, economic pressures, and the likely eventual discontinuation of housing subsidies, which indeed were discontinued in March 2017, that guided them to make the "final" return to "decontamination in progress" Fukushima. By seven years into the disaster, some voluntary evacuees were afraid to return to Fukushima less so because of the radiation and more so because they were concerned about how they and their children might be socially chastised for having left Fukushima in the first place (children bullied and mothers criticized by other women who had stayed). Overall, among the social pressures and considerations, radiation was becoming a relative concern, rather than an absolute concern, that intersected with social roles as mothers, wives, and in other family and social positionalities.

By the fifth year in evacuation, Mrs. Honda had loosened up her strict dust (read: radioactive material) control measures. She stopped washing her car as frequently. She didn't change her shoes because of radioactive materials anymore. She even started buying produce grown in southeastern Yamagata, which she had avoided until then. This did not stop her, however, from assessing objects and practices in terms of how radioactively dangerous they may be. Five years of vigilance leads to fatigue or simply tiredness, which is doubly acted upon by the pressures and desires of social obligations and desire for social belonging. Fukushima

normalcy remains abnormal for Mrs. Honda and other evacuee mothers, and it is the visible material manifestations of radiological contamination (decontamination waste, decontamination procedures) that signify this abnormality. Nevertheless, they continue to travel back and forth for their families.

Socially, once children are given over to an institution of socialization such as a kindergarten or school, the mother can no longer control all her children's practices in the institution. Morioka (2014b) presents one example of how "activist mothers" in southern Miyagi prefecture succeeded in acquiring radiation detectors from their local governments in order to conduct radiation monitoring at their local nursery schools and kindergartens in the months immediately following the 3/11 disasters in 2011. Morioka argues that these "activist mothers" were successful in pressuring the immobilized authorities into action in large part due to their appeals from the moral, socially conservative, and state-sanctioned stance of protective motherhood (2014b, 196-199). Morioka also comments that, "No counter-ideology challenges the legitimacy of maternal protection in contemporary Japan" (2014b, 198).

Feminist sociologist of science and technology Aya Hirata Kimura (2016) paints a slightly different picture of the extent to which emphasizing one's role as a mother in the wake of the nuclear disaster can affect change at the local and societal levels. Kimura focuses especially on food policing and citizen radiation monitoring organizations in predominantly urban locales in Japan between 2011 and 2014. Whereas the mothers about whom Morioka writes were heard, "precisely because they hold the subordinate status of housewives and mothers whose realm of influence is confined to domestic matters" (2014b, 198), the mothers with whom Kimura spoke were repeatedly bashed by society as "radiation-brain moms," who were overly worried, confused, and unscientific (2016, 35). Though Kimura demonstrates that

"maternal identity helped women highlight the need for a different kind of logic in thinking about contamination's impact" (94), her analysis overwhelmingly emphasizes how, even in the wake of contamination, the virulent, inescapable strictures of postfeminism, neoliberalism, and scientism force women into docility, demobilization, and depoliticization (2016, 19, 21). Even in Kimura's recounting of the "school lunches movement," mothers seeking to gain legitimacy through their positionality as women and mothers were thwarted, bashed, or otherwise constrained. Kimura ends her account by suggesting that though epistemic and procedural justice in the face of invisible contamination may be arrived at through citizen science, such justice-oriented engagements would still take place within a neoliberal regime that will not listen to women's concerns unless they are expressed in a technoscientific, depoliticized, "happy" way (156-157). The moral stance of motherhood, therefore, does not exonerate women from the apolitical demands of neoliberalism, the postfeminist gender contract, and scientism.

The experiences I presented in this chapter fall between Kimura's and Morioka's findings. Though the mothers with whom I spoke did not seek to change institutional practices or become citizen scientists, they nevertheless succeeded in removing their children from harm's way for several years after the nuclear disaster. In the realm of family, the proximity of Yamagata to Fukushima allowed for visits from husbands and micro returns, but evacuee mothers' control over material practices during the micro returns was often limited whenever other family members were present. In the case presented by Morioka, the mothers who deployed their conservative position of mother and caretaker remained in their hometowns, homes, and corporate kin groups. They did not abdicate their equally important conservative status as homemakers. Even as they struggled with an immobilized bureaucracy and local power politics, they did not face critiques for insufficiently caring for their husbands.

As I already suggested, some might argue that the constraints and pressures these mothers faced in such family relations arise from the conservative values of respecting the husband and the husband's family, embedded in the "good wife" half of the "good wife, wise mother" (*ryōsai kenbo*) ideology (Ueno 1987, Borovoy 2005). By this interpretation, being a "wise mother" by protecting one's child from radiation was in direct conflict with being a "good wife" and daughter-in-law, which would require a married woman living in the same place as her husband and his family, contributing to the family's domestic economy, and socializing her child into her husband's kin network through material practices such as sharing in food. If Fukushima places and food are absolutely "dangerous," then the irreconcilable contradictions between being a "good wife" and "wise mother" are obvious. That said, the glimpses of evacuees' marital relationships that I offer in this chapter are insufficient to cast a "good wife, wise mother" interpretive lens on all voluntary evacuees. Furthermore, Fukushima destigmatization and economic recovery campaigns, these evacuees' relations with their own parents, their own attachment to their hometowns, and other societal and interpersonal pressures beyond deference for the husband and his family also bore down on these Fukushima women.

The expectation of eventual return to their pre-evacuation homes loomed over voluntary evacuees throughout. The anticipation and eventual announcement that government support for evacuation housing was going to end on March 30, 2017, also dented their determination to stay away. In spite of these developments, some voluntary evacuees will never return for good, even if they no longer count as evacuees in the official numbers. For many others, as time wore on and prolonged evacuation created economic and personal tensions within families; as official air dose radiation measurements in Fukushima decreased (even if soil contamination measurements did not); as mothers and children tired of the constant dietary restrictions; and as the lure of everyday

stability “if only” they were to return to Fukushima grew, one might say that radiation was becoming a relative, rather than an absolute danger.

Yet, even if these voluntary evacuees did return to Fukushima, they did so not because they saw the radiological situation as resolved, but rather *in spite of* their on-going worries. Going into evacuation could not alleviate concerns about initial exposure or when or how related health effects might surface. As with Chernobyl survivors and other victims of slow violence, these are questions that will dog the disaster victims for the rest of their lives, even if symptoms never surface (Adam 1998; Nixon 2011). Living and coping with that is a permanent fact of life.

Chapter 5 Food and Final Returns into Everyday Nuclearity

As with evacuation, food decisions are rarely just about one value. Food practices in mass consumption, mass production societies like Japan are a mosaic patchwork of state and non-state, kin and non-kin, local and global things, knowledge, and practices. Navigating trust and risk in food exchanges is not only navigating state-assured technoscientific safety and risk, but also keeping in mind the social relations with the grandpa down the street, the economic feasibility of health consciousness for a family based on their income, and ideological associations with food practices.

In this chapter, I recount three mothers' stories that demonstrate the layering of multiple values, material considerations, scientific knowledge, ideology, politics, and interpersonal relations in their everyday nuclearities. I tell the story of two voluntary evacuees' stories in greater detail than the shorter vignettes I have provided in other chapters. Both Mrs. Sasaki and Mrs. Sasebo returned out of voluntary evacuation for the "final" return to Fukushima in spring 2015. Mrs. Sasaki returned to her condominium in Fukushima City. Mrs. Sasebo returned to Date City and lived with her husband, son, and daughter in a temporary apartment paid for by the government while they had a new house built. I show how these women navigated everyday nuclearity and how their sense of everyday nuclearity changed over time. Nuclear normalization and banalization occur over time, with information, through trust and mistrust, and social relations. I then also recount the scene of a gift of peaches to Satoko Haraguchi and share a brief vignette of compulsory evacuees whom I came to know well in Yamagata, who claimed that they

avoided Fukushima produce, but when we went on a micro return to Fukushima together, they proceeded to buy Fukushima peaches and pears. An analysis of gift-giving or quasi-gift-giving food exchanges is an important original contribution to post-Fukushima studies of food, which overwhelmingly focus on technoscientific risk, citizen radiation monitoring efforts, and trust and mistrust of food commodities, whose provenance may be obscure (Sternsdorff-Cisterna 2015; Kimura 2016; Reiher 2017).

Though the chapter deals with many things in addition to food, including family relations and habitation, a critical discussion of food is central to the chapter. As I noted in the introduction, food is a central material, social, personal and interpersonal site of everyday nuclearity. Food exchange and consumption are personal micro-geographies and micro-practices that create and sustain relationships, bodies, health, and well-being. Here, I am not talking about concerned Tokyo mothers (like Sternsdorff-Cisterna 2015) or consumers in western Japan (like Reiher 2017).

Any anthropological discussion of food in contemporary Japan begins with three to four pages of authors enumerating tremendous variety of ingredients and culinary practices; the hyper oversaturation of food and images of food not only in the built environment but also in all forms of media, especially visual media on the television and in travel magazines; and the obligatory passage point of recounting the global histories of modern and contemporary Japanese foodways, on the one hand, and how Japanese cuisine plays an important role in global economic and gastronomic processes (which, of course, also strongly influence Japanese cuisine), on the other (Cwiertka 2005, 2006; Assmann and Rath 2010; Bestor 2004; Solt 2014). I will briefly reproduce this genre, since the micro considerations of meal preparation and consumption mattered

tremendously to my interlocutors, especially in their roles as mothers, and these micro-macro considerations matter to elaborating my argument of everyday nuclearity.

A Japanese meal is a hybrid. A standard Japanese meal consists of rice, soup, and side dishes, which include an at-times eclectic and always multicultural assortment of vegetables, fish, and meat prepared in myriad ways (Cwiertka 2005).[61] The preparation of a nutritious home meal, these days often supplemented with processed and prepackaged foods, is the domain of mothers, building on close to a century of the cult of "good wife, wise mother" domesticity, which I addressed in chapter 4 (Bestor 2004, 157–60; Cwiertka 2005, 415–16; Sand 2003). In addition to the composition of a meal as rice, soup, and side dishes, there is also a focus on visual appearance, including shape and color (Bestor 2004, 157–60).[62] There are also single-dish meals, such as rāmen, hot pot, and pasta dishes.[63]

All parts of a typical Japanese meal are alterable, with each change and choice being meaningful and often commented upon. For example, even as polished white rice is a

[61] Cwiertka argues that everyday modern Japanese "national cuisine" became democratized and homogenized around the rice, soup, and side dishes structure that readily incorporates multicultural ingredients and dishes through the modernizing and international history of the modern Japanese state from the mid-19th century onwards (2005, 423). The prominent role that polished medium-grain white rice and multicultural side dishes of non-Japanese origin play in contemporary everyday Japanese cuisine came about as a result of state formation, modernization, empire, and war in the second half of the 19th century and first half of the 20th century (Cwiertka 2006). Cwiertka argues:

> The seven most important processes in the dietary transformation of modern Japan [were]: the embrace of the West as the model for political and economic development, the rise of the new urban mass gastronomy, the modernization of military catering and home cooking, wartime food management, the dietary effects of Japanese imperialism, and the impact of the rapid economic growth in post-war Japan. [2006, 11]

[62] Cwiertka argues that the two primary characteristics of Japanese food culture are the esthetic influence of premodern haute couture *kaiseki* cuisine, in which there is an "emphasis on esthetic qualities in food preparation and presentation, together with a stress on the quality and freshness of the ingredients and harmony between the food, the vessel, the setting, and the season in which food is served," and a multicultural character of "embracing of foreign ingredients and dishes, along with an impulse to domesticate them" (2005, 417).

[63] Each such dish has its own hybrid international history, and it is beyond the scope of this dissertation to explore any one of them in detail. Other works already do this. For example, Solt shows how the spread of fast food meals of Chinese noodle soup (*rāmen*) were catalyzed by imports of American wheat during the Occupation, sustained the labor force in the reconstruction and economic ascendance of Japan in the postwar period, and working class meals became "national cuisines" in the late 20th century (Solt 2014).

symbolically potent staple of a Japanese meal (Ohnuki-Tierney 1993), it is not quantitatively the most consumed item. Medium-grained white rice can just as easily be switched out with brown rice for health consciousness, as Mrs. Sasebo notes, below. Auspicious red rice (*sekihan*) made with red beans and sticky *mochi* rice is usually made for festive occasions but can also be made for its nutrition. Whether the rice comes from the few remaining rice farmer families, what prefecture it is from, if it is imported or domestic—all of these factors carry different meanings. It is also completely common to eat Western-style meals of pasta and bread throughout the day, especially for breakfast and lunch.

Amid the side dishes at a meal can be vegetables from the garden, including smashed cucumbers with miso bean paste and pickled eggplants; boiled spinach lightly pickled in a sour vinegar, citrus, soy sauce, and fish flakes-based sauce (*ponzu*); a pork, potatoes, and gelatinous rice noodles dish flavored with soy sauce, *mirin*, and sugar (*niku jaga*); tofu and shrimp pan-fried with garlic and olive oil *al ajillo*; and various other side salads or pickled vegetable dishes. The evening meal is either accompanied with a bowl of white rice throughout or at the end of the meal and some kind of soup, usually miso soup, with various ingredients and broth bases. When hosting a guest, beer or some kind of dessert is also commonly served.

When it comes to school lunches as part of state-sponsored education, a standard lunch at an elementary or middle school consists of "rice or bread, main dish(es), and milk" (Kimura 2017, 446).[64] Just like wearing school uniforms is "wearing ideology" (McVeigh 2000), anthropologists and sociologists of food argue that consuming the material (the food itself), knowledge, and affects arduously and explicitly attributed to and discussed about a standard school lunch (*kyūshoku*) is consuming state ideology (Yotova 2016; Reiher 2012). The Food

64 The standard school lunch came about as a result of the American Occupation of Japan from 1945-1952 (Solt 2010; K. Cwiertka 2005, 423; Dower 1999).

Basic Law of 2005 is a school-based tool of political subjectification that materially and socially teaches Japanese schoolchildren that domestically-grown and produced Japanese foods are unequivocally materially safe and that consuming domestic Japanese ingredients is the morally and economically righteous thing to do, even if domestic products might be more expensive (Yotova 2016; Reiher 2012). By extension, consuming domestic Japanese fare is the ideologically safe and proper thing to do not only because of its material and moral superiority, but also because not falling in line with these principles of daily school-based "food education" (*shokuiku*) presents the social risk of being dubbed "unpatriotic," as Mrs. B and others shared that they had been dubbed when they even asked about non-Fukushima foods for school lunches (see especially Kimura 2017). Overtures about the material, nutritious, and moral superiority of Japanese ingredients has been in tension with concerns among consumers about the material safety of foods, industrial or otherwise, in the second half of the 20th century, and especially in the 21st century. In the 1970s and 80s, concerns focused especially on food raised through industrial agriculture that overemploys chemical pesticides were on the rise and more broadly, recurring incidences of material pollution of food by polluting industries, such as those that release methyl mercury and radionuclides into the environment, have been a mainstay in Japanese food safety problems since the mid-20th century (Cwiertka 2005, 424–26; Jussaume, Shûji, and Yoshimitsu 2001; Yotova 2016; Reiher 2012).

In Fukushima, Yamagata, and other agricultural areas of Japan that engage in local vegetable, fruit, and rice cultivation, alongside the raising of livestock and fishing, the side dishes, rice, and ingredients for the soup are all bundled in not only with gastronationalism, but also localism. Bridget Love (2010), writing about Akita prefecture, which borders Yamagata to the north, refers to this in English as "the politics of local flavor." In this rural, northern politics

of flavor, the ageing rural population (women especially) actively partakes in, encourages, and is encouraged to (re)vitalize disappearing local foodways and take pride in counteracting their disappearance (Love 2010). Stephanie Assman (2010), writing prior to the 3-11 disasters, also writes about slow food and traditional vegetables in northern Japan, specifically in Miyagi prefecture, which borders both Fukushima and Yamagata. Assman shows how "buy local" and consume local movements are at the intersection of global and local economy, tourism, and reinvented tradition. Kimura (2016, 2017) writes about contestations over the use of Fukushima ingredients in school lunches across Japan broadly, not only in Fukushima, but also as part of gastronational consumption of Japan-made food and the "support through eating" post-3-11 state-sponsored Fukushima promotion initiative. Gastronationalism and *shokuiku* (nationalistic "food education" through school lunches and other promotions of Japanese food as supremely right for Japanese people and bodies) are sites of everyday nuclearity precisely because not only is the nuclearity of the foods debated, but so are the multiple non-nuclear values that are layered into them in micro and macro ways.

Each side dish on the dinner table, the leftovers from which then get carried over into breakfast or as a side dish in the child's lunch box (*obentō*) the next day, was a site of contested everyday nuclearity. Mrs. Tsutani told me about how her father-in-law, whom she referred to as "grandpa" (*jīchan*), as is common in Japanese, would put out pickled daikon radish side dishes for his granddaughter (her daughter) on the table and say, "eat up! I grew these myself!" When Mrs. Tsutani asked where he grew them, he replied "in the field." She married into a farming family that has been local to that town for generations. They were therefore invested in seeing the situation as normal and in supporting Fukushima recovery. For grandpa, any questioning of Fukushima produce was equated to "damage from harmful rumors" and the daughter-in-law

(*yome*) in voluntary evacuation was a blemish to their family. To grandpa, everything with the daikon grown in the back yard was fine—they didn't have to worry about radioactive materials anymore and to do so would be unpatriotic. To Mrs. Tsutani, everything was not fine, but she could not argue against him and quietly bore through it (*gaman*). At night, she took her personal Geiger counter and brought it close to the wood stove, where grandpa and grandma burned local wood from the forest. She took a video of the Geiger counter as she approached the stove and showed it to me and the others at the sewing circle in Yamagata. The numbers rose. The burning of local wood, continued production of food for the home even on non-decontaminated fields, and an expectation that the daughter-in-law will know her place and keep quiet were all things that Mrs. Tsutani commented on, uncomfortable and unpleasant, sorely against what she valued and her concerns for her daughter's already frail health. When we spoke again in April 2016, this time with Mrs. Kubota also present, Mrs. Tsutani announced that she would be returning for good to live with and care for her in-laws, while putting her daughter through school in Fukushima, despite tremendous reluctance to do so. Mrs. Tsutani's stalwart self-sacrifice (*gaman*) made no sense to Mrs. Kubota, who listened to this with wide eyes and nervous laughter.

Notably, many of the food exchanges about which I write in this chapter are between locals, where the farmer's face isn't just a picture on a plastic bag of tomatoes, but actually your aunt who has a peach orchard in the next town over, your neighbor down the street who brought you a large box of delicious strawberries, your father-in-law (your child's grandfather) who raised the radishes that he pickled and put out on the table for his grandson, or the elderly grandmother serving volunteers (of whom I was one) a meal on the border of the exclusion zone.

Mrs. Sasaki

Recall Mrs. Sasaki from Chapter 3. I met Mrs. Sasaki during an *imonikai* (potato stew event) that happened my second weekend in Yamagata in October 2014. Mr. and Mrs. I had volunteered with local rest and recuperation camp organizers who also often cooked with voluntary evacuee mothers. Mrs. Sasaki was sitting with others on a blue tarp, eating the potato stew. I joined them and made small talk. I saw Mrs. Sasaki again at a cooking class run by the same supporters over the following few weeks. As I continued to explain my research and continued to show up to voluntary evacuee spaces, Mrs. Sasaki and I exchanged phone numbers and she invited me to a weekly Wednesday morning sewing circle that she loosely organized with other voluntary evacuees. She would come pick me up on Wednesday mornings and I would join the group. Outside of group events, my meetings and interviews with Mrs. Sasaki took place at family restaurants. Half of the time, we just had a meal with her children and their friends. The other half of the time, she and I would meet in the same place and talk at length about what evacuation and the nuclear power plant accident has been like for her. Meeting at family restaurants like this, during the daytime on weekdays, was a socially acceptable way of interacting that did not overly attract the eyes and ears of those around. In addition to many group interactions and spending time with her and her children, I also spoke one on one with Mrs. Sasaki on several occasions both in Yamagata, while she was in evacuation, and in Fukushima City, after she had returned from evacuation.

Like Mrs. Hanasaka from Chapter 4, Mrs. Sasaki's first evacuation was on March 19, 2011, eight days after the earthquake and several days into the nuclear power plant catastrophe. She went with her sixth-grade son and first-grade daughter to Tsuruoka, a city on the Japan Sea coast of Yamagata Prefecture. Her husband knew a work acquaintance who lived there. The

acquaintance found an apartment for Mrs. Sasaki and her children and prepared the bedding and space heater. They stayed there for about two weeks, until her daughter's elementary school entrance ceremony at the start of April.

In chapter 3, I introduced Mrs. Sasaki's story to demonstrate how aspects of the dust-like materiality of radioactive materials guided her to bring herself and her children into voluntary evacuation. Recall that after this brief two-week evacuation, Mrs. Sasaki returned to Fukushima for her daughter's elementary school entrance ceremony in April 2011, when school restarted as normal. Few changes were made to account for radioactive materials that had been deposited on the schoolyard grounds, and school lunches were prepared with Fukushima produce. For three months, Mrs. Sasaki brought her daughter to and from school in her car and prepared her children's lunches at home with ingredients grown and processed outside of Fukushima, as best she could. Mrs. Sasaki watched in horror as the schoolchildren at her daughter's elementary school were told to line up outside and sit down on the contaminated ground. The first-grade children would put their hands into their mouths and touch their faces with their hands, which had just been on the ground. This was a time when air dose radiation levels in Fukushima City were between 0.26 and up to 6.65 μSv/hr, as compared to the current decontamination goals of 0.23 μSv/hr or less (Edgington 2017, 92). It was terrifying for Mrs. Sasaki to see her first-grade daughter and other schoolchildren being told to interact with the contaminated environment in such a way. When I spoke with Mrs. Sasaki in March 2015, while she was still in evacuation in Yamagata, she was conflicted about how she feels about having returned to Fukushima then. Wanting to protect her children, Mrs. Sasaki applied for an apartment in Yamagata City at the beginning of June 2011.

Once summer vacation came in late July, Mrs. Sasaki and her children returned to

Tsuruoka in north-western Yamagata for the summer months. They were not scheduled to move into their Yamagata *kasetsu jūtaku* evacuation apartment, the rent for which would be paid by the government, until August 1. They also had to wait until about August 10 for the six-piece household electric appliance set from the Japanese Red Cross to be ready. In the meantime, Mrs. Sasaki and her children returned to Tsuruoka for the summer months. With the help of the Tsuruoka city office, they were able to find a room attached to someone else's house, with whom they shared the bathroom. They then moved into their Yamagata City evacuation apartment in mid-August 2011, where they lived for nearly four years, until they returned to their Fukushima City condo in late March 2015.

As February 2015 rolled around, the decision-making period was upon the voluntary evacuees. Mrs. Sasaki made regular micro returns to Fukushima. Her micro returns as she prepared for the final return were ideologically in line with the government's way of supporting return visits that are meant to connect to the final return, even as she did not agree that everything was acceptable and safe in Fukushima. The fiscal year and the school year in Japan start on April 1. If voluntary evacuees are to move back to Fukushima in alignment with their children's progress through school, they need to move back in March, so that their children can start school on time in early April. Test-taking season for high school entrance exams takes place in February and March each year, with students preparing all school year for the test. Different schools have different tests. The tests also vary if the school is a prefectural or local municipal school. Voluntary evacuee children who are entering high school and whose families are preparing to return to Fukushima in March/April of a given year need to prepare for and take the entrance exams for their intended Fukushima school, while keeping up with Yamagata classes.

Mrs. Sasaki's son Sui found himself in just such a situation. Mrs. Sasaki was going to align their final return out of evacuation with Sui's entrance into high school.

Mrs. Sasaki returned to Fukushima with her two children on March 19, 2014. She no longer used "kaeru" 帰る (to go home) when she spoke about going to Fukushima. She has lived in Yamagata Prefecture with her two children for the past three and a half years. Even in her email messages to me, she uses the particle "へ" (*e*) when referring to Fukushima. It is a distant place that she does not want to go to, but she has done everything to make sure that her children' transition back into Fukushima life will be smooth. Her son, who is going into high school, took the necessary high school exams for Fukushima Prefecture and got into the senior high school he wanted to go to in Fukushima City, with a hard science bend. Her daughter will enter the fifth grade in Fukushima. In the summer of 2011, she brought her children, crying, into evacuation. Her daughter was in first grade. Her son was in sixth grade. They are now in fifth and tenth grade, respectively. Now, almost four years later, they were heading back.

Mrs. Sasaki was clear that her returning for the final return to Fukushima was a compromise. She did not want to go but would do everything she could to make the transition back to Fukushima smooth.

March 18, 2015
23:45 JST
We're going to Fukushima tomorrow afternoon. 🚙
But I really don't want to go back 😣 I was born and raised in Fukushima and married a person from Fukushima, so that's why 😠
It can't be helped… I keep telling myself. Everyday life in Fukushima 😤
I bet it's going to be extremely stressful 😱
We're going to be in Fukushima, and I'm going to lead everyday life, protecting my children!!
I'll keep at it, keep at it, keep at it… *(ganbatte ganbatte ganbatte…)*

I guess this must be the true feelings of people going back to Fukushima

Let me know when you're coming to Fukushima. Let's together again!

Figure 5.1 Text message from Mrs. Sasaki, on the eve of her return to Fukushima.

We met again on April 22, 2015. Mrs. Sasaki met me at Fukushima Station, wearing a surgical mask, as is common in Japan when one is sick, wishes to avoid getting sick from others, or suffers from seasonal allergies. It is also one way that people who are concerned about inhaling radioactive materials and then suffering from internal radiation exposure try to protect themselves. By then, I rarely wore a mask myself. We drove the few blocks from Fukushima Station to the chain store family restaurant Gasto, Fukushima Station, West Store. Mrs. Sasaki laughed as she said she no longer knows or remembers the roads in Fukushima-shi. It's been four years.

As we sit down, Mrs. Sasaki says, suppressing tears, that Hana-chan, her eleven-year-old daughter, said that she wishes she had not been born in Fukushima. Hana-chan is probably not eating much at school, Mrs. Sasaki says. Because she comes home very hungry. It may just be that she's growing. Or, Mrs. Sasaki thinks, it's because Hana-chan is being careful about not eating too much Fukushima food. So maybe she doesn't eat much at school. Mrs. Sasaki let Hana-chan decide whether she would eat the school lunches (made with all-Fukushima, all the time ingredients) when they returned from evacuation in Yamagata. Hana-chan said that she wanted to eat the lunches. If she didn't, she was concerned that she may be ostracized or bullied. But she does not drink the milk; she, herself, chooses not to drink the milk.

As we continue to talk, Mrs. Sasaki tells me about how her son Sui had to write about *fūhyō higai* –"damage from harmful rumors"—for an essay for school. Despite the drastic

difference of opinions between his own parents and whatever his own personal views may be, he could not write about any of this. There is a formula—a "right answer"—that he has to write on the lines of the essay sheet. He has, after all, chosen to go to an agricultural high school in Fukushima. He cannot be critical of what is happening in the prefecture. He needs to answer that "damage by harmful rumors" is bad; that we need to work together to have everyone accept scientific proof of the safety of Fukushima products; and that he will and wants to contribute to improving the situation. The contamination—the accident—is something that happened, now in the past tense; this was an unfortunate happening that has led to the current reality, but now we need to work and figure out how to deal with the situation and move forward. No discussion of any opinion that is not this one.

Mrs. Sasaki's husband works for a local supermarket, as a buyer, buying directly from farmers. He would know what and how the local producers are hurting and the difficulties they are facing. He himself eats Fukushima produce and products. He buys them at the store and drinks the Fukushima milk that Hana brings home after not drinking it at school.

In his essay, Sui cannot include his own mother's everyday choices of not buying Fukushima products, because her doing so makes her that evil consumer causing damage by harmful rumors. It seems that the focus needs to be on the level of the farm field. A field and the producers—not the agricultural business, not larger agriculture or industry or the history, politics, and economics of nuclear power.

Mrs. Sasaki said her opinions. Her husband said his. Sui adjusted himself to say what he has to in different situations, not just for this essay, but overall. And this worries Mrs. Sasaki. She is afraid that he will be precisely the kind of person to get swept and carried away by the flows of society and those that surround him. He will not be the one to look left when the other

one hundred people are looking right. She sees herself as the one who looks left if she wants to, even if all others are looking right.

Since coming back to Fukushima, the amount of plastic bottles they have to throw out is a mountain. They do not collect plastic bottles every week, like in Yamagata; it's only every two or three weeks. By that point, you end up with a huge amount of bottles, even if you flatten them down before putting them into the trash bag. Mrs. Sasaki says that she is very diligent and responsible about garbage. She even used to return the plastic trays from under meat back to the supermarket after washing them (which is common in Japan). She would do the same with the paper cartons. The amount of plastic bottles is becoming embarrassing for her husband. Isn't the purifier/filter that they had installed on the kitchen sink enough? Can't she just use that water? No. She will not bend. She has her levels. She has her lines. And she would not back down on them or loosen them.

Mrs. Sasaki separated the water she uses for different tasks related to cooking. For example, they almost don't eat noodles anymore because the noodles would take up a considerable amount of water when they are boiled. This would mean she would have to use even more bottled water than she already uses. She would also have to use water in the dipping sauce. Despite the safety campaigns and what everyone is saying and her own mother now calling her "shinkei shitsu" ("too [neurotically] worrying"), she will not bend. Though she has already bent. She is already back in Fukushima. That was one "compromise" she made.

Summer 2015, April 2016, July 2018. I visited Mrs. Sasaki on several further occasions in the years after her return. With each visit, she was becoming more and more accustomed to normal everyday life in Fukushima. After return in March 2015, Mrs. Sasaki hung her laundry indoors, used bottled water to cook with, and did her best to keep buying produce from far away.

She continued to disagree with her husband, her own mother, and her mother-in-law as to if all this was necessary, but when we spoke in April 2015, one month after her return, she was defiant and determined. When I went to see her again in August 2015, I introduced Mrs. Sasaki to Mrs. Haraguchi, who had never evacuated, but ordered organic vegetables and meat from farther away through various grassroots connections. The produce and meat shipments would arrive depending on what was in season at the various farms and producers in western Japan and what the fishermen on the Japan Sea might catch, when they might catch it. Mrs. Sasaki was grateful for the offer, but she said she was not sure she would be able to use up the different vegetables when they would arrive in the shipments. I understood this to be a polite way of not committing herself to an added financial burden. She would stick with buying produce from the supermarket, instead.

I asked Mrs. Sasaki to take me to a supermarket where she did her shopping. She pointed out how produce from farther away was more expensive and would be right next to Fukushima produce anyway. If there was anything on the Fukushima produce, it was already touching the other vegetables of the same kind, laid out right next to it. She got a water filter, even though she wasn't entirely sure it did enough to filter radioactive materials out of the water. (I also wondered if these filters themselves would become hot spots, if they are filtering and keeping the radioactive materials in their filters.)

In April 2015, Mrs. Sasaki was defiant and navigating everyday nuclearity within her family. One year later, in April 2016, she no longer wore a mask when she met with me. She took me along on a visit to *Minna no Ie*, "Everyone's Home,"[65] where we spent several hours with several other mothers of young children. "Everyone's Home" is meant as a space for young

65 You can access the homepage of Everyone's Home here: https://ameblo.jp/f-minnanoie/

mothers in Fukushima to feel welcomed, supported, and part of the community. It is a childcare support NPO that especially seeks to support (maybe some would say "targets") returning evacuees and young mothers raising children for the first time, so that they do not feel alone and have a place to talk with other more experienced mothers and childcare professionals, gather, chat, have events, and so on. Among those critical of normalizing the radiation situation, Minna no Ie is criticized as being part of ETHOS Fukushima; some of my informants in 2016 were very clear about this critique. There were murmurs among the "anti-safety" group that "Everyone's Home" was associated with Ethos Fukushima.

Kimura (2018) has written about ETHOS Fukushima. ETHOS Belarus was a brainchild of French social psychologists for normalizing life in post-nuclear disaster, contamination-containing environments (see also Topçu 2013). The main premise is that people living in contaminated environments should be educated and informed of risk, so that they can manage their own doses themselves. This is empowering and especially powerful in tandem with a neoliberal subjectivity, even as it shifts the focus away from the root cause of the contamination and political action against the government and industry who were the polluters. Topçu and some of the people in Belarus about whom she writes do argue, though, that, yes, there are root causes and injustices, and yes, to cooperate with ETHOS is to make their everyday worlds into laboratories—but they're still going to have to live in those contaminated environments, so maybe rather than only criticizing and critiquing the project, environmentalist groups should also try contributing to participatory governance by affected populations. Similar dynamics play out in Japan, but with added dimensions of what Kimura (2016) calls scientism, a post-feminist gender contract, and neoliberalization. I would add family obligations, mortgages, economic

constraints, family roots, and jobs as other compelling reasons for why people continue to live in places with contamination.

In July 2018, Mrs. Sasaki told me how Minna no Ie partnered with the 30 Years Project to have a few standard meals tested for radioactive materials—one made entirely from all-Fukushima ingredients, another from all-Yamagata ingredients, and a third from northern-Kanto ingredients. The 30 Year Project is a citizen-led food and environmental radiation monitoring organization. They get their name from the half-life of Cesium 137, which is 30 years. They have one device that is basically a radiation monitor strapped to a stroller, so that it's at about 50 cm from the ground, and they can measure people's lawns, public parks (provided there are no jurisdictional injunctions in the way), and other areas, if someone asks. They also have a Germanium semi-conductor for measuring food and do some experiments based on daily life contexts. For example, in one such experiment that they told me about in 2016, they hung up towels on the second-floor balcony of an apartment building on a windy day, then took that towel, cut it up, and put it in the semi-conductor to see if there were any radioactive materials on it. There were; but the amount was very little. The 30 Years Project also holds study sessions, social events where folks can just talk with each other, and other small events.

The results from the food test that Minna no Ie asked the 30 Year Project to conduct showed that the meal with all-Fukushima ingredients had the lowest amount of radioactive materials, thus supposedly attesting to the effectiveness of food monitoring in Fukushima prefecture, as opposed to the risk of hot spots beyond Fukushima Prefecture's borders. Of course, such demonstration effect science has been critiqued (see especially Kirsch 2014, chapter 4 on "Corporate Science"), but it still is important and had an affective effect of calming Mrs. Sasaki. Mrs. Sasaki told me in July 2018 that she's taken the dirt and dust from her vacuum cleaner and

given it to the 30 Years Project to measure on several occasions. Yes, the results do show minute levels of Cesium, but they are very minor. This data has helped her to feel more calm living everyday life in Fukushima (City), especially compared with when she first returned from evacuation in 2015.

Mrs. Sasebo

I first met Mrs. Sasebo in October 2014, on my second day in Yamagata. She came into the office of an evacuee support NPO, with her newborn daughter strapped to her front and her then-three-year-old son, Matsu, holding her hand. She was preparing to return out of evacuation and came to talk with the NPO workers, three of whom were themselves voluntary evacuees, about the process of returning and to just chat. She had had the radiation levels measured at the site where she and her husband were going to build their new house, and they were good enough for her. I saw her at three or four other seasonal events with this NPO and my NPO friends helped to arrange an interview with her husband in September 2015. Here, I present information form my conversation with Mrs. Sasebo from April 11, 2016, when I visited her, her husband, and their two children in their temporary rental apartment in Date City, in rural central Fukushima. Mrs. Sasebo was 31 years old at the time of our conversation in April 2016, making her 26 years old at the time of the 3-11 disasters.

Mrs. Sasebo had been through three large moves since March 2011. First, her immediate evacuation period began when she evacuated with her then two-year-old Matsu on March 12, 2011, to Tokyo. Second, around April 25, 2011, she moved with her son from Tokyo to Yamagata. She lived for close to four years in a rental apartment in Yamagata for which the government paid the rent, first with her mother-in-law also there, and then alone with Matsu,

while she was pregnant with her daughter, and, eventually, with her newborn daughter, also. In the meantime, she and her husband sold their house in Fukushima because an elderly couple whom they knew was interested in buying it despite the heightened radiation levels. The third move was the final return out of evacuation in spring 2015. Mrs. Sasebo, her newborn daughter, and now five-year-old Matsu moved in together with Mr. Sasebo, into a 2-bedroom, Dining-Kitchen rental apartment where I visited them in Date City in April 2016. A fourth and hopefully final move was imminent in the near future: they were having a new house constructed in a new housing development in their hometown of Date City, which borders the exclusion zones. Construction of this new house began in March 2016 and was scheduled to be completed by August of the same year. This speed of constructing new houses is typical in Japan.

In April 2016, the Sasebos were living in a *kariage* rental home near Hobara Station in Date City, which is twenty minutes away from Fukushima Station on the local Abukuma Express train line. A central point of contention between voluntary evacuees from Date City and the Date City municipal government were decontamination procedures. Date is to the northwest of the nuclear power plants and at the tail end of the fallout that deposited northwest, before it turned southward through central Fukushima. Fukushima City was conducting blanket decontamination on all parts of the city with a goal of lowering an air dose to 0.23 microSieverts per hour (μSv/hr) and to cut in half any other levels, even if they are already below the 0.23 μSv/hr target. Date City, which borders Fukushima City to the northeast, had a different approach to decontamination. Since anything below 20 milliSieverts per year was the national legal criteria for acceptable habitation, all municipalities did not seek to decontaminate to the same stringency as Fukushima City. It was decided by the Date City government that "blanket" decontamination would not be done like it was being done in the central-Fukushima cities of Fukushima City and

Koriyama. Date was designated a "C Area" for decontamination, which meant that only spot-based decontamination would be conducted on particularly high areas.

April 11, 2016 was a sunny, but very windy day, which meant that radioactive materials were being picked up and blown around along with the dust. The monitoring post in front of Hobara Station read 0.26 microSieverts per hour. I was not outside long. Yuta, a civil society supporter friend from Yamagata, was in Date that day and met me at the station. We had lunch and he then took me to the Sasebos' home.

Towards the end of our conversation, Mrs. Sasebo expressed feeling great relief at finally being back. She laughed with her characteristic slightly nervous laugh as she told me, "Just thinking about the fact that we're building a house, I thought, 'it's finally over.' (she laughs) I guess I felt we could finally start over." Mrs. Sasebo explained at several points during our conversation that it was better for the family overall that she be happy, not overburdened, and not over-stressed. This was a theme that rang true about electric appliances, food preparation, childcare, and, ultimately, her decision to return to Fukushima, out of voluntary evacuation.

In their current 2DK apartment, electric appliances were all around: rice cooker, television, TV recording device, microwave oven, wall-mounted air conditioner, an electric kettle, and a family-sized refrigerator. When I asked Mrs. Sasebo further about what other electric appliances they use in their everyday lives, she also talked about the washing machine, dehumidifier, futon dehumidifier, and air purifier. They bought a sewing machine when she came back with the children, to sew school bags and make some clothing alterations. All of these household electronic appliances made daily life easier for Mrs. Sasebo. "It's so convenient!" she repeated several times, laughing, as the list went on. When I asked if there were any other words she associated with everyday life among all of these household electronics, she called out, "Solar

energy! We're going to put solar panels on our new house! When I realized that we would be making our own energy, I was really relieved. We won't be selling electricity or anything like that, but there should be enough to cover our own electricity consumption."

"Could you imagine a life without electric appliances?" I ask.

"No way. It would be impossible," she answers, laughing slightly uncomfortably.

"Impossible?" I ask.

"Impossible. I'm one to even want a dishwasher! (laughs) If I have to exert myself on household chores, there will be bad influence for my children, and that's not good. (laughs) If I can live in convenience and smile and be happy, that will absolutely be a good influence for the children and it will be better. That's why I do what I can to make things easy."

As we talked about electric household appliances, Mrs. Sasebo established a baseline that she was concerned about and sought to avoid negative emotional states resulting from overexerting herself by doing household chores or exerting too much effort in food preparation. This awareness and aversion were based on her experience in her natal family surrounding her mother's mood swings around food preparation. It was totally normal for them to eat frozen and instant foods in their family. The worst thing that could happen was if her mother felt her effort was not appreciated and then got angry. That was the home environment she grew up in, so it was important for Mrs. Sasebo to keep herself happy and not overexerted, and in doing so, she did not have qualms using frozen and instant foods and what might be considered unhealthy snacks. In contrast, her in-laws were very health conscious. They did not allow their children to eat much sugar and didn't use chemical soaps, in large part because their son, Mr. Sasebo, had eczema. So their use of chemicals in household chores, their food practices, and their health concerns were exactly opposite from Mrs. Sasebo's and her natal family. Mr. Sasebo himself,

however, was one to use chemical products if he wanted to, even while knowing they were bad. The convenience outweighed the moral and physical badness. He also found his mother's health consciousness to be suffocating, which Mrs. Sasebo narrated through the example of rice: "He couldn't stand always having to eat brown rice (laughs). Apparently he hated it. Apparently he wanted white rice."

Mrs. Sasebo's understanding of her food choices is strongly informed by the risks she saw of her own over-exertion on her emotional state and the possible negative effects that might have on her children and the family environment. When I asked about how she differentiates between risk and danger, if at all, this explanatory theme came back. She saw continued evacuation itself as posing a greater risk for her and her children's health and safety. It was exhausting and overwhelming for her to be endlessly with her young children for twenty four hours a day everyday. She was at her limits (*ippai ippai*). "I feel like I came close to child abuse." It is healthiest for everyone involved if parents can get away from their children, even for a little while.

In this narrative, health consciousness is opposed to convenience. Health consciousness is aligned with no sugar, no chemical soaps, and brown rice; convenience is aligned with frozen and instant foods, the use of chemical products in household chores, and white rice. It is commonly understood that health consciousness is morally superior to convenience. However, Mrs. Sasebo's experience and point of view make it clear that the mother's happiness—her own happiness as a mother of young children and her mother's happiness in her natal family—were of paramount importance, lest undue repercussions fall upon the children due to the mother's anger. Convenience in home-making thanks to convenient electric household appliances and

convenient, even if unhealthy, food practices, thus make convenience also morally important. The mother remains emotionally healthy and the children are, by extension, safer and happier.

References to Mr. Sasebo's health-conscious mother appeared three more times in Mrs. Sasebo's conversation with me. Most notably, it was Mrs. Sasebo Senior who secured a house for Mrs. Sasebo and her son in Yamagata in April 2011. She quit her job at a hospital in Fukushima to do this. She then lived with Mrs. Sasebo and Matsu for a while in evacuation, helping Mrs. Sasebo with the newborn. She was mentioned again when Mrs. Sasebo told me of another appliance they currently had: a 100,000 yen (about $950 - $1,000) water purifier that her mother-in-law purchased for them. Mrs. Sasebo explained, "Apparently it has a filter that's supposed to remove radioactive materials. I don't really get it, though." Lastly, she came up again towards the end of Mrs. Sasebo's and my long conversation on radioactive materials and food gifts, to which I return below. Mrs. Sasebo explained that her in-laws do not eat Fukushima produce, whereas she could foresee herself having to have the talk to remind her own parents not to give them dangerous foods. This was the inverse of most narratives I heard, where evacuee mothers shared with me how they could not raise their voices against in-laws who fed their children Fukushima produce. In a way, this was yet another aspect of reverting back to normal for the Sasebos: Mr. Sasebo's parents were the more health conscious and thus averse to Fukushima produce; Mrs. Sasebo's parents cared less about whether produce was from Fukushima. However, what was different and more fine-grained was Mrs. Sasebo's own navigation of Fukushima produce and radiation concerns.

Turning back to the water filter, referring to the radiation levels in water, I asked Mrs. Sasebo, "Do you measure it yourself?"

She answered, “No, I don’t measure the water. Test results are available from the Water Department. Hmm… I don’t think I’ve ever measured food, either,” she says.

Provided the opening in conversation, I ask, “What do you do about food?”

Mrs. Sasebo was clear and adamant that she does not worry about radiation too much anymore—especially not in food, really. She just started ordering produce through a delivery service from a consumers’ cooperative, but, she explains, “it’s less of a strategy to counter radioactive materials and more to counter processed foods and additives.” She did want to get food, “that’s as [materially] safe (*anzen na*) as possible,” but the reason why connected back to convenience:

> S: When I make my children’ lunch boxes, I always use things like ham, wiener sausages, meatballs. (laughs) Frozen foods—I use them all no problem. But, yea, since I’m a little concerned about what gets sold out and about, I’m trying this coop. It has more brands that, I guess, I feel safe (*anshin na*) (laughs) about. They have delivery, so I’m using them now.

She used the premade meat products, such as wiener mini hot dogs, in her children’s lunches for daycare or served them for breakfast at home. Using meat from the coop would be healthier—would be made from safer meat. She then laughs as she pointedly says, “but if it’s going to be expensive, I’m going to stop.” Consumer cooperatives that sell and deliver under the banner of “materially safe food you can feel calm about” (*anzen anshin*) can get expensive from the costs involved in measurement, she explains.

Materially safe (*anzen na*) food about which she can feel safe (*anshin*) is a branding catch phrase on almost any food sold in Japan these days. This is especially true of food sold through consumer cooperatives, which brand themselves as safe because their farmers do not overuse

pesticides or use no pesticides at all, their produce is organic, and their members and the cooperative headquarters themselves engage in other earth-friendly and human-friendly practices. This is all meant to distinguish their safety as above and beyond the safety of goods commonly available in supermarkets, which are associated with a corporate Japanese and international food scape that is ecologically unfriendly, overemploys pesticides and chemicals, and overly modifies foods through practices such as genetic modification. Consumer cooperatives thus align with the values and material concerns of health-conscious consumers, such as Mr. Sasebo's natal family, while defining themselves against the ills of the ecologically and biophysically evil, consumerist products and practices of mainstream Japanese society, accurately symbolized by convenience stores on most corners of every city and town. Once again we see the tension between ethical health and unethical convenience, which preexisted the nuclear disaster.

Anthropologist Nicolas Sternsdorff-Cisterna (2015) traces the history and post-Fukushima meanings of "anzen-anshin" for concerned "scientific citizens" in the greater Tokyo area. Sternsdorff-Cisterna writes, "food safety is both a question of science and of affective networks of trust. Food must be safe (anzen) and feel safe (anshin). However, many people's trust in the government expertise after the Fukushima nuclear accident was eroded" (2015, 456). His concept of "scientific citizen" refers to citizens, primarily mothers, who mistrusted the government's safety standards and scientific risk communication and instead, developed their own more stringent ways of gauging the safety of foods, though the main criteria for safety was predominantly the location of origin. The farther from Fukushima, the safer. But those of Sternsdorff-Cisterna's interlocutors who had lived through the cooperative movement of the

1970s and 80s, though critical and scientifically informed about chemical dangers, also knew that upholding stringent personal standards would be difficult.

"Scientific citizens" are an extension of the consumer cooperatives movement, which came as a response by concerned citizens in the 1970s and 80s to repeated food contamination incidents, some of which were local and some of which were national. In a move common to the way corporate science responds to its critics in the capitalist world (Benson and Kirsch 2010), the same companies that caused food contamination and the Japanese state began adopting the language of their critics in order to appeal to the material and emotional safety (anzen-anshin) of their products. State-led food safety campaigns that also seek to promote the continued economic viability of certain enterprises also seek to prove the safety of any given products, emphasizing the anzen-anshin of farmers' products.

What is of interest here beyond the *anzen-anshin* branding is that for Mrs. Sasebo, price will win out over material and emotional safety (anzen anshin) considerations. Furthermore, the reason why she uses foods that might be questionable on the general market is because of their convenience. If she can have affordable convenience that will be materially and emotionally safe, then why not do it? But if it gets too expensive, she doesn't need it. Mrs. Sasebo's use of the cooperative, therefore, is not because of radiation concerns or a commitment to health consciousness at whatever cost.

Mrs. Sasebo was clear and adamant that she is not particularly concerned about radioactive materials in produce:

> S: To be honest, I truly think it's impossible to remove them. Whether it's Cesium or Potassium, if it's there, it's there. I think it's totally impossible to get it down to zero Becquerels. The things they're finding these days are really only a couple

> Becquerels, sometimes a little above ten Bq. I think it depends on the thing. With vegetables, if it's vegetables that are a large part water, then they almost never detect anything, almost never.

She does avoid foods that she knows to have had higher concentrations detected in them, when economically possible. These include potatoes from Ibaraki, lotus root (*renkon*), burdocks (*gobou*), shiitake mushrooms, and the like. "If I'm just careful about stuff like that, then that should be good enough, I think. But if they're only selling Ibaraki potatoes, I'll buy them and we'll eat 'em. Hmm. Maybe I don't really care, to be honest." The same is not true with lotus root and Fukushima-grown shiitake mushrooms.

> S: If there's something where it's like, "It's been detected in this!" (*Kore deru!*), then I don't buy that thing, but, I mean, we eat vegetables from Fukushima normally (*futsuu ni*). But if it's like shiitake from Fukushima, then I don't buy them. (laughs) Because I know it's been detected in them (*deru to wakatteiru kara*). And if they are labeled that they were grown on trees out in the open (*genboku*), then I absolutely won't buy them! (laughs) Even if it's mushrooms grown through substrate cultivation (*kinshou*), I'm still weary, so I kind of avoid the ones grown in Fukushima. That's how I go about buying things, more or less. They've detected it in lotus roots, so I guess I don't buy those.

She avoids lotus roots, shiitake mushrooms, and mountain vegetables if she can. She knows that potatoes and pumpkins might have some radioactive materials in them, but she buys them anyway. Carrots, potatoes, onions—those kinds of things, she buys normally and doesn't worry about them, even if they're from Fuksuhima. She knows that it's not detected (*denai*) in green vegetables, so she buys the Fukushima ones.

"Things like leafy vegetables—spinach, Napa cabbage (*hakusai*), cabbage. Well, there's barely ever cabbage from Fukushima. (laughs) Right. Spinach, *komatsuna*, Napa cabbage—they sell a lot from Fukushima. And long leeks, I know it's not detected in them, so I buy them and we eat them. There was a book…" Mrs. Sasebo gets up from the table and rummages through a book shelf to take out a book titled *Will You Eat It?* from 2013.

> S: There was this book. It's a bit old, from 2013. The levels are (There's) less now. This is how I learned that it really depends on the thing. Alright, so something like this you should be a little careful about. The results from lotus root are maxed out, for example. (laughs) I think this is really crazy (*yabai*). Tens upon tens of Becquerels, even now, they're detecting that much. Yea. So I'm careful even now, I guess. So I get stuff from Western Japan.

Trustworthy information about radioactive materials in food changes rapidly. It matters when a book was published and when the data was collected. However, general patterns can also be discerned. Some of the general patterns that Mrs. Sasebo discerned included an expectation that the amounts of radioactive materials showing up in food overall have gone down, as have air dose measurements.

Publishing and sharing food-related data on social media was part of the moral landscape surrounding food, radiation, and political stances. Mrs. Sasebo no longer cared for the author of this book. "This guy has gotten a little all over the place with his comments recently, so I don't really trust him too much anymore. But as far as the data goes, it's really useful to have someone like this doing really detailed research," she said**.** He had gone too far in the "anti-safety" direction and thought everything was a conspiracy theory against him. Some of his tweets were too unkind to those who didn't agree with his views. However, for Mrs. Sasebo, these views did

not undermine the trustworthiness of data he collected, though it was now a few years old. Data seems to be different from the trustworthiness of people's relative stances and opinions on radiation. She also defines her food and non-food radiation stances in relation to a field of different groups of people, with different opinions. Mrs. Haraguchi, whom I introduce below, and others do the same, often offering reconciliatory comments in terms of "winners" and "losers"—that there is no winning side and no losing side; but that different people—different families—made different choices based on their own circumstances and values.

From there, we got on to the topic of things that she may still be concerned about, even having done all of the checks she has done. That is when she told me about the dried *shiitake* mushrooms that a Fukushima promotion agency/group was handing out at Fukushima station. She was just walking by. They greeted her joyfully; she greeted them back, as she was trying to pass by, and before she knew it, they had shoved a bag of dried mushroom tea into her hands. She had no choice but to take the bag, slightly shocked at how quickly it all happened. The bag was not labeled as to where the shiitake mushrooms were from, whether they were grown on trees in the wild or in greenhouse cultivation, or where the trees had originally come from. Mrs. Sasebo spoke about this as a moment when she felt she had been a voluntary evacuee, because her emotional response to getting this bag of mushroom tea shoved into her hands was not one of "let's go Fukushima!" but one of danger and suspicion, informed by her knowledge that radiation collects in mushrooms and that the origins of foods are not always accurately labeled, especially when the foods are processed, or when the tree that the mushrooms were raised on might come from a different prefecture than the prefecture where they are raised.

Mushrooms and wild vegetables from the forest are known to amass astounding quantities of radiation/radioactive materials within them, and Mrs. Sasebo knows that very well.

She nevertheless could not give back the bag that was shoved into her hands and had to smile, with a heavy dose of, "let's eat Fukushima!" Once Mrs. Sasebo was out of eyesight of the people distributing the mushrooms, she threw them away. She did not trust the mushrooms, and to have this kind of non-negotiated, non-negotiable, inconsideration of what her or her family's food or thought practices may be was highly aggravating for her. She hadn't been given a choice *not* to take the bag or to ask questions about it. She explained:

> S: Maybe, if I had chosen it for myself, I could've drank it then. "This is shitake tea from somewhere or other." "Ah, ok," If they could make me think that it would be ok to drink, then, maybe, I could've drank it, but it wasn't… it wasn't anything like that. Honestly, it went straight into the trash. (laughs). Yuuuuccckk! Gross! Like that. And like, you can't just throw it away near them, so I went and found a trash can farther away. The moment I found one, I chucked it. (laughs) There's probably going to be stuff like this from here on out, I thought then. Yea.

It's slimy how locally picked and branded dried mushrooms are shoved into the hands of those passing through Fukushima station – to be cooked in the home and fed to the children in tow.

To a certain extent, Mrs. Sasebo's embodied response to having shiitake mushrooms of unknown origin shoved into her hands by some guy at a pro-Fukushima revitalization event can be seen as a local manifestation of what Masco calls the nuclear uncanny. It was, after all, "dislocation and anxiety produced by … moments of tense recognition" about radioactive materials (Masco 2006, 28). But Masco's use of the nuclear uncanny is more nuclearly exceptional and intense than the scene that Mrs. Sasebo describes. The tea was political, with the material and geographic origins of the mushroom tea obfuscated through a lack of a label or a way to track where it came from. The affect of supporting Fukushima recovery and revitalization

was supposed to be the main focus of the package of food. The tea was an affective battleground over the banality or exceptionality of radiation and nuclearity. Mrs. Sasebo disagreed with the unspoken banalization of this particular kind of politically-inflected radiomateriality into her hands and her everyday. At the same time, the shiitake tea was banal, in the everyday, and Mrs. Sasebo disposed of it as normal trash. Mrs. Sasebo explicitly said that this was a moment when she felt she had been a voluntary evacuee. She understood her reaction as part of her political subject position.

I asked if she received *osusowake* from her neighbors or relatives. *Osusowake* literally means "sharing from the sleeve." It is a kind of local food sharing of in-season foods or some of the extra pickles a neighbor might have made too much of. A grape farmer might have too many grapes, or at least claim she or he has too many grapes, as she gives you delicious, market-quality grapes from her vineyard. I was offered *osusowake* of fresh cucumbers, eggplants in August, fried rice, and various pickled vegetables throughout the year when I would visit families in Yamagata and Fukushima. *Osusowake* can be simply seen as "something to take home," but sometimes neighbors will drop off *osusowake* in people's foyers or doorsteps, even when they are not home.

Even though the emphasis in Japanese culture is precisely that *osusowake* is too lowly of an offering to be considered a gift, in anthropology, we would analytically call this a kind of food "gift" because receiving *osusowake* necessitates a return in time, in an appropriate way, and creates non-economic social relations. The return can be an offering of *osusowake* in kind, or at the very least a thank-you note, a greeting, or simply hosting the person who gave the food to you for informal and impromptu tea if they come by again. *Osusowake* creates the conditions for

low-stakes social relations, including the small talk when dropping off a bag of eggplants, a box of strawberries, or several bags of leafy vegetables.

> S: Yea. We do get Fukushima produce from our neighbors. But we are grateful to get it and eat it. Yea. So, we're happy to get that, that stuff. And it's like, it's people we don't know at all, from Hobara. There's an old man who lives nearby who's really good to us. Just today, he brought us a bunch of strawberries. (laugh) They're really impressive strawberries! We got a whole pack of them from him. And just a little while ago, we got this one strange-looking, interesting pumpkin. Yea. We ate it. It was delicious. (laughs) And then there were the Chinese chives (*nira*)—five whole bags of them came and we took them! (laughs) Well then, time for a pot stickers party? haha (laughs) (pot sticker meat filling has Chinese chives in it.)
>
> AS: I see. So we're talking about gifts. About receiving food gifts.
>
> S: Yes, yes.
>
> AS: You're not buying them.
>
> S: Well, but if I got lotus root, then I would throw it away. (laughs)

These are also local economies of food exchange. For example, the grandfather down the street had just brought them strawberries. "He is really good to us, and we're happy to eat the food he gives us," Mrs. Sasebo says. Social relations of closeness matter in the post-nuclear world.

Wanting to be a good mother becomes a patchwork of food and habitation decisions for Mrs. Sasebo. Her concerns about being a good mother are articulated through seeking to heighten the convenience of domestic duties and doing what she can to avoid the psychologies of her own natal family experiences. Easy-to-cook, microwavable food made through the mass-

production, mass-consumption, and mass-waste economies of convenience in postwar Japan are fine with Mrs. Sasebo, so long as they keep her happy and not overburdened. Self-evacuation was becoming too much of a familial risk for her to continue it. Her husband's family's navigation of mainstream economies of health consciousness countered the economies and moralities of convenience. For Mrs. Sasebo, so long as convenience and economic feasibility can be maintained as she employs food shipments from food cooperatives, she is willing to use economies of health consciousness.

Mrs. Sasebo's interaction with the cooperative is directly in conversation with everydayness. The everyday food connects into a mixed food economy between commodities, self-grown foods, intra-familial gifts, seasonal gifts from relatives, and *osusowake* "sharing" from neighbors. This is nothing out of the ordinary. Food practices in mass consumption, mass production societies are a mosaic patchwork of state and non-state, kin and non-kin, local and global things, knowledge, and practices. Navigating trust and risk in food exchanges is not only navigating state-assured technoscientific safety and risk, but also keeping in mind the social relations with the grandpa down the street, the economic feasibility of health consciousness through the coop home delivery, and ideological reconstruction support activities on the street.

Where everyday nuclearity comes into play is around which parts of the patchwork of food, environment, and social relations Mrs. Sasebo runs up against viscerally felt disagreements and danger. Despite being adamant about not thinking too much about radiation in the produce she buys, she nevertheless laid out quite a thorough understanding of more and less risky produce geographies and the social relations of food exchange she trusts. Most untrustworthy are the random men handing out most likely very dangerous and uncertain shiitake tea. More trustworthy is the grandfather down the street who's "been very good to us." In the case with the

shiitake mushroom tea, were she to have denied the tea flat-out, she would have been a bad supporter of reconstruction. Since she got rid of the tea privately, she nevertheless navigated the radiological and practical foodscape.

Mrs. Haraguchi: Peaches

We return now to the Haraguchi family home, where we met Satoko and her daughter Mari through Nishimura in the Introduction. Nishimura first took me along with him to the Haraguchi's home in early February 2015, again two weeks later, and on other occasions. I also went to visit them on my own twice in August 2015, once in October 2015, in April 2016, and again in July 2018.

During my second visit in August 2015, I was going to head home to Yamagata with Nishimura, but I arrived on my own after a visit to Kawamata and a day out to Koriyama. A gift of large, plump, fresh, delicious peaches arrived from aunt Natsuko, whom I met by chance a couple of weeks earlier during a prior visit. Aunt Natsuko has an orchard in Date City, where she invited me to come by and help pick the peaches if I wanted to during the peach season. I never did take up the invitation, but Satoko let me know that she and Aunt Natsuko still sometimes chatted about that time when she visited and I, a random tall white foreigner was there at the table, making jokes in Japanese. The peaches were a mid-year gift as part of the *Ochūgen* gift-giving season.

As Satoko was preparing dinner, with the box of peaches from Aunt Natsuko on the floor in the dining area, I transgressed a social boundary of not technoscientifically or otherwise morally questioning the foods people ate or that I was offered. But by now, I knew the Haraguchis well and I trusted I could risk making such a transgression. Far from being

prescriptive about the meaning of what I was about to do, I embarrassedly admitted that I had a newly-purchased radiation detector with me that was also a surface contamination monitor. This radiation detector can detect radioactive materials if they are present on the peaches or in the box. I asked Mrs. Haraguchi if it would be alright if I tried using it on the peaches, to see if they had anything detectable on them. I felt uncomfortable even suggesting this. If something showed up, then that meant there might have to be an uncomfortable conversation with or unpleasant emotions towards Aunt Natsuko. If nothing showed up, then I was concerned that Mrs. Haraguchi might feel obligated to let her daughter eat the peaches, even though she did not feel they were safe in the way that she needed them to be safe. I prefaced and followed up my asking permission to use the detector in their home, on their sociomaterial relations, with my own inequities and limited knowledge when it comes to radiation and radioactive materials; that I certainly didn't mean for whatever the result would be to mean any particular thing. Mrs. Haraguchi was slightly apprehensive, questioning if the device could really detect anything that easily, but invited me to go ahead and use the detector.

As I was measuring, Nishimura, who was also there that evening, was more concrete in his critique: is that the right way to measure this? Shouldn't it take much longer? What signals—what kinds of radiation—from which radioactive materials would this detector pick up? Can it measure Becquerel content? Shouldn't they be put into a Germanium semi-conductor? My detector did not detect anything on the peaches, in, or on the box. Mrs. Haraguchi said that this made her more comfortable allowing her daughter to eat the one slice of a peach she let her eat. Satoko, her husband, her father, Nishimura, another friend of mine, and I all ate the peaches.

By the time the peaches evening happened in August 2015, I had stayed with the Haraguchis over five times. As I briefly mentioned in the prelude of this dissertation, the

Haraguchi family had been regulars at Nishimura's "rest and recuperation" camps in western Japan from immediately after the nuclear power plant accident in summer 2011 until summer 2014. They also took their daughter Mari to "weekend rest and recuperation" (*shuumatsu hoyō*) programs in Yamagata and take advantage of other opportunities through the "Accept-and-Welcome Nationwide Association" (AWNA) network.

Radiation levels in their neighborhood are low, Satoko explained to me during my first visit in February 2015.[66] Satoko ran her family clothing store, which was attached to their newly renovated house. The store primarily sold school uniforms and clothing for middle-aged men and women. The store made the most money when it was time for all of the families in the neighborhood to buy school uniforms. Some of the orders would always come to the Haraguchi shop. The Haraguchis were not wanting in domestic comforts.

Satoko spoke of the change in food practices since the start of the nuclear disaster as substantial. Before the disaster, she said she would often take her daughter Mari to McDonald's to get the Happy Meals with toys. In her retelling, McDonald's is emblematic of unhealthy food, ravaging capitalism, and immoral consumption. She now has organic, non-GMO, locally-grown foods shipped right to her doorstep from a store in western Japan that sources directly from farmers there. A fisherman from the Japan Sea coast ships her his freshest catches every so often. The fish and shellfish, shipped in the morning, arrive on ice by evening the same day.

[66] Nevertheless, I also knew voluntary evacuees who had left from this same neighborhood. This kind of multiple geography is common.

Figure 5.2 Fresh shrimp from Toyama delivered to the Haraguchi home. February 16, 2015.

Source: Photography by author.

Figure 5.3 Fresh meat from Gifu delivered to the Haraguchi home. February 17, 2015. Source: Photography by author.

This is a way of participating in locality through established infrastructure and shipping networks. It is based on personal efforts to establish connections with producers. Social relations of trust in food production solidified by "feeling of safety from relations in which you are able to see the faces of producers" (*seisansha kao ga mieru kankei*) preexists the nuclear accident (Sternsdorff-Cisterna 2015; Love 2013). With the nationwide networks, these relations of locality are still in place, but the locality is shipped. Shipments are then made through well-established individual-based shipping methods, such as *takkyūbin* and *takuhai*. When the producers or naturally-minded stores in western Japan can ship small groupings of produce all at

once, this made the shipments more cost-effective and required sociality among the small group of Fukushima families/mothers who wanted these items.

Satoko also mentions how they have changed from using chemical dish and bathroom soaps to soaps from natural, ethically-sourced ingredients. Satoko also had her husband get a water filter that should be able to remove radioactive materials from the water they use in the kitchen. She showed it to me on my first visit. They go about life normally in Fukushima, having made these shifts in food and consumption practices.

During our late-night conversations over beer or tea, Satoko and her husband often emphasized the importance of knowing when what they have is enough (*taru o shiru*). They faulted avaricious consumption for many wrongs in the world more broadly and in Japan, in particular, including the nuclear disaster. They spoke positively of a man who wrote a book about how he ran his own café in Shinjuku just enough to make ends meet. He did not keep the café open just for the sake of trying to make as much money as possible. Working for the sake of working was not an ideal.

In contrast to Satoko and her husband's views on ethical consumption, Mr. Haraguchi Senior was a staunch supporter of the Liberal Democratic Party (LDP) and especially their continued measures to revitalize and sustain an ever-growing, ever-expanding economy. Satoko and her father disagreed and often fought over what proper consumption and economics practices should be for the family and for the nation. As many in their 70s, Mr. Haraguchi Senior grew up in the postwar period of Rapid Economic Growth and the Economic Miracle. It was the collective goal of his generation to bring the Japanese economy forward, often at the sacrifice of family lives and the environment. Growing up in the postwar years, he had experienced living in a world before it was brimming with consumer products.

Satoko and her husband saw the LDP's economic and social policies as being driven by an attitude of growth for the sake of growth. Such a culture created values (*kachikan*)—and the values then fed into the culture—of work for the sake of work; consumer citizens who want more, more, more (*motto, motto, motto!*) to consume, consume, consume; a system full of people, establishments, projects, and consumerist objects for whom electricity is made at nuclear power plants. Satoko and her husband grew up in such a world, brimming with consumer goods, in the 1970s and 80s.

Mr. and Mrs. Sakamoto

I visited Fukushima with a compulsory evacuee couple in their early sixties. Mr. and Mrs. Sakamoto evacuated to Yamagata in the early days of the disaster, along with their daughter and cat. They have now bought a house in Yamagata and were even planning to move their family grave to Yamagata in 2015, though when I saw them again in July 2018, they said they had given up on the idea to move their family grave. The Sakamotos took me around to many places in Yamagata and one time, in early September 2015, we went together to Fukushima City to visit the Sora Animal Shelter for pets who had to be abandoned by their owners when the owners evacuated. They were not thinking of adopting a pet but wanted to help the shelter out and wanted to take me to see it. Mr. Sakamoto also missed his deceased dog and there was one that reminded him of it at the shelter.

In the supermarkets in Yamagata, Mrs. Sakamoto impressed on me how she does not eat Fukushima produce, and especially not fish caught in the Pacific Ocean. As we drove through the orchards of Japanese pears in the western part of Fukushima City, there were unmanned roadside fruit stands, where the pears were for sale for 150 yen per bag of three (with payment

by honor-system). As the Tsubasa Shinkansen passed quietly by the fields in the distance, Mr. Sakamoto pulled the car over, the three of us stepped out of the car, and we walked over to the fruit stand. There were slices of pears in a bowl, with toothpicks, for tasting. The Sakamotos bought two bags, leaving the money in the cash box. When we got back in the car, I debated whether or not to ask why or how it could be that they just bought the pears. I thought that they avoided Fukushima produce. Why did they unquestioningly buy the pears? I asked.

They laughed quite a lot, but somewhat uncomfortably. Mr. Sakamoto repeated several times "*hontou wa—HONTOU wa—*, " trying to express that if they had acted truthfully or that the truth of the situation was that they did not buy the pears—that they did not want to buy the pears—that they should not have bought the pears. I knew about the "Fukushima flip" by this point. I had even become relatively accustomed to not thinking too much when in Fukushima.

That same day we stopped in *Shiki no Sato*, a playground, park, craft glass store, and open-air market. Mrs. Sakamoto had packed us all a sizable lunch. As we ate our lunch outside on the picnic tables, next to the radiation monitoring post, we also noticed that some TEPCO employees were walking in and out of a building nearby. We talked about home and pollution, but also enjoyed the beautiful weather. They told me that the small open-air market was once bustling, but now, there was one lonely old grandmother, sitting alone, trying to sell even a few of the peaches in her crates.

When we walked by her the first time, on the way from the parking lot to the picnic area and the glass shop, I could tell that Mrs. Sakamoto felt bad for the grandmother sitting there with her peaches. She felt the weight both that she should avoid buying peaches because they were from Fukushima, but also felt bad for the lonely grandmother, trying to sell her goods. When Mrs. Sakamoto was obviously hinting at something, she had this kind of side-eye look that she

would sometimes do, with a pursed smile, glancing around here and there, both deliberately making eye contact with you and then looking elsewhere, with the feel a chuckle just below the surface. She did a variant of that look at me as we walked by the grandmother with the peaches, so as to say, "I know we just talked about the pears and we didn't give you any answer, and now we're walking by this grandmother here, and she has peaches, and you know what's coming, just as much as I know what you're thinking." On the way back to the car after lunch, she could no longer refrain and gave in to buying a bag of these peaches. They then gave these peaches to an evacuee in Yonezawa, the next town over from Fukushima City, but on the Yamagata Prefecture side of the Kuriko Mountain Pass. They let that other evacuee know where and from whom they got them, and that is the last they saw of the peaches. What that evacuee did after graciously receiving the gift, I do not know; but since he himself was a compulsory evacuee in his early fifties, I assume he ate the peaches without much fear for his health.

Conclusion

I see these micro-tactics around food as an important dimension of navigating residual everyday nuclearity, even as simple everyday logics begin to win out. It seems that as radioactive materials became part of everyday spaces and therefore a variety of everyday "normal" waste, ambivalences about everyday waste helped Mrs. Sasaki and Mrs. Sasebo to cope with these undesired materials, as well. These stories show starkly how their views and practices changed over time from exceptional to banal, but those changes meant neither a sense of positive "acceptance" of the situation, nor an on-going active resistance. One might say that their everyday nuclearities took the form of what Benson and Kirsch (2010) call a "politics of resignation." But, as noted, Mrs. Sasaki and Mrs. Sasebo and the people around them, as with

Mrs. Sasebo's mother-in-law, still tried to do something. They were not completely resigned, even if Mrs. Sasebo repeatedly tried to say she was fine with the situation.

Satoko and the Sakamotos had varied relationships with Fukushima produce, through food gifts, rather than commodities. They exchanged and consumed this produce within fields of power in which they understood the personal and economic suffering that Fukushima producers were facing due to the nuclear accident, though they did not ascribe all of this economic effect to "damage from harmful rumors," as the government sought to do. Gift exchange and the sharing of food are at the heart of upholding social relations. These exchanges are moments, sites, emotions, thoughts, and social and material relations into which everyday nuclearity unpleasantly permeates. A sense of everyday nuclearity is heightened in the gift-giving exchange precisely because of the sociality, consideration, and affects involved in gift exchange and around food.

Mrs. Sasebo's example of weiner sausages from the cooperative and Mrs. Sasaki's examples of bottles of water and milk are more "everyday" than Satoko's and the Sakamotos' examples of the gifts of peaches and pears. But Mrs. Sasebo also encountered a not-so-everyday moment full of navigating nuclearity with the shiitake tea. "Everyday" food involves cyclicity and recurrence. Commodity, gift, and *osusowake* sharing from farmers and fishermen throughout Japan comes to the Haraguchis' home through nationwide grassroots support networks. Mrs. Sasebo's interaction with the cooperative is directly in conversation with everydayness. The everyday food connects into a mixed food economy between commodities, self-grown foods, intra-familial gifts, seasonal gifts from relatives, and *osusowake* "sharing" from neighbors.

Chapter 6 Chinatsu's Everyday Nuclearity, My Nuclear Uncanny

This chapter tells various parts of Chinatsu Yamata's story. Chinatsu is Ms. C of the Katariinas from Chapter 2. She was also my "Fukushima mom." I tell this story in order to ethnographically show patchy grey zones of visible and invisible radiation, negotiations of everyday nuclearity, and Chinatsu's going about normal, everyday life. It is an ethnographic depiction of Chinatsu's everyday nuclearity, almost always in conversation with me in various media—in person, over text message, and over email. We begin with my visit to Chinatsu's home in Kawamata Town in July 2015 and then piece together different parts of the story from there.

Since Chinatsu was divorced and had two grown sons when we met in 2014, one in college and the other in the workforce, she had considerably more freedom to take me around Fukushima or come visit me in Yamagata, compared to my voluntary evacuee interlocutors in Yamagata who were mothers with school-aged or younger children or the families with school-aged children whom I came to know in Fukushima. On one outing, we went to a shrine and winery in Takahata in Yamagata. On another, she came by train to Yamagata City and we cooked borscht and other Russian food together with my housemates. Some weekends, we would meet up in Fukushima and go visit Mrs. B's café in Koriyama. Toward the end of my fieldwork, we spent a day out in Aizu. Born and raised in the Fukushima countryside, Chinatsu lived briefly in Tokyo when she was in her twenties, before coming back to her hometown of Kawamata, where she continues to live.

There is no doubt that Chinatsu's identity as a mother is central to her sense of self, but she has never felt herself to be particularly feminine. On several occasions, she expressed how maybe she feels herself to be more X-gender than female/woman. X-gender is a social, though not legally-recognized, identity category in Japan (Dale 2012) that is akin to gender queer or nonbinary but does not necessarily carry the politicized implications that "queer" and "nonbinary" carry in the United States. Chinatsu has had various jobs usually done by men, including gutting fish and her job inspecting septic tanks at the time we interacted. She always wore button down shirts and jeans or dark-toned khakis when we met.

The setting is central Fukushima prefecture, Friday, July 24, 2015. That muggy evening, Chinatsu and I greeted each other smiling, cracked a few jokes, and headed out on the 30-minute drive from Fukushima Station to Chinatsu's hometown of Kawamata. Like always, Chinatsu came to pick me up in her black Subaru Exiga. When I texted Chinatsu to double-check the make of her car as I wrote this ethnography, she texted back, "Make sure to tell them it's a good car! Lol." To me, an Exiga looks like a Subaru Outback or Forester, though I am sure there are important differences. Apparently, "Exiga" is a neologism made of the English words "exciting" and "active."[67] Dear readers, Chinatsu's black Subaru Exiga is a good, "exciting," and "active" car, for a similarly good, exciting, and active owner.

We took national route 114, lush green summer vegetation hugging either side of the narrow road, one lane in each direction. Narrow though it is, route 114 is an important thoroughfare. It connects Fukushima City to Kawamata Town, and then connects to prefectural route 12, which leads to the coastal region of the prefecture. On a different occasion when I was traveling this stretch of road, a local independent journalist explained that the radioactive

67 For those interested in learning more about the Exiga, you can visit the Wikipedia page: https://en.wikipedia.org/wiki/Subaru_Exiga

deposition from the plume followed the mountains and geographic crevices of route 114. Route 114 also has a silk museum commemorating Kawamata's history of silk production and, oddly enough, a UFO museum.

Attesting to the importance of this road, though our path to Kawamata was clear, there was a sizable traffic jam in the opposite direction, heading to Fukushima City. Midway through making light banter about Chinatsu's late grandfather's psychic abilities, I remarked on the traffic jam going in the opposite direction and the license plates from all over. Chinatsu explained that the cars from far-away (Aomori, Fukuoka, Hokkaido, Yamanashi, and so on) and the micro buses and mini vans with plates from closer areas, such as Sendai and Aizu, were all full of decontamination workers (*josen sagyōin*). Having finished their workday, they were heading back to Fukushima City, where they were most likely living. There were also large trucks carrying loads or empty from having carried their cargo to the coast. Decontamination work and workers, banners and signs, and public communications about the progress of decontamination were all around urban and rural central Fukushima throughout the time of my fieldwork. As I noted in Chapter 3, I find it exceedingly difficult to maintain that radiation is invisible when tons upon tons of soil were being moved and communication about radiation, decontamination, and radioactive materials abounded.

As we pulled into a grocery store to pick up snacks for the evening and breakfast for the next day, Chinatsu told me under her breath that the decontamination workers do group shopping at the local grocery store, too. I knew from scholarly (Jobin 2012; Hecht 2013) and popular press articles, as well as from general conversations with people from Fukushima, that some of the decontamination workers from outside the prefecture live in barracks housing and are not thought of positively by locals. The inundation of decontamination workers had created a

housing bubble in Fukushima. It had also brought in many outsiders, sometimes of the less desirable sorts. Lured by relatively high wage labor for physical tasks, in some cases, rounded up by yakuza mobsters in Tokyo, Yokohama, and other cities. Mrs. Sasaki told me, "It's in the papers," she drew a small square, the size of what an advertisement would be. One of the women from the Volunteer Support Plaza in Yamagata also told me how there are cases where decontamination workers are people from Fukushima and even entire families work as part of the decontamination boom. The pay is good and it can help them to capitalize on the moment.

Chinatsu seemed to have taken the presence of decontamination workers all around in stride. She was not particularly thrilled with the decontamination worker types, but also not actively antagonistic. Chinatsu says she sees them every day, as she drives and walks around for her job inspecting and replacing septic tanks and does her groceries. At some point in our drive that weekend, Chinatsu shared her impression that some of the decontamination workers are just bodies meant to take up space. Who knows if they can even do any of the work they are meant to be doing, Chinatsu told me and my colleague in the car the next day. They walk funny, as if they were alcoholics, which some might well be, Chinatsu said in passing. I wondered to myself if their walking funny might be from radiation exposure, but I doubt it. She had talked to *sagyōin* at bars and local Kawamata joints—and drank them under the table. They can't hold their sake like she can, she said, laughing.

As we left the grocery store parking lot, a bus with the words *Showa Kankō* drove by. I asked if the people on that bus were also decontamination workers, and Chinatsu said no. That was an inter-city bus that people, predominantly men, use to commute to and from work. Those were people who do municipal work (*oyakusho shigoto*) in villages/towns in Eastern Fukushima prefecture, but who lived in Fukushima City. You can see them at six in the morning, all asleep

on the bus, being carried to their post, she explained. On the way back in the evening, their white collared shirts (*wai-shatsu*), lanyards around their necks, middle-aged-ness (40's-50s), the kinds of glasses they wear, and their slightly fattened bodies (fattened probably because of the comfort food lunches they eat with rice, curry, and fried foods) suggest their bureaucratic-ness. They are properly uniformed for bureaucratic work. This contrasts with the decontamination workers (*sagyōin*), who look dirtier. The *sagyōin* might have construction clothes (*sagyō-fuku*). Their skin is tanned from outdoor work. There is a sense of different kind of loneliness... or something... in the "air/atmosphere" (*fun'iki*) about them...

As we drove into Kawamata that night, Chinatsu pointed to a nondescript four-way intersection just one block away from her natal home and two blocks away from her current home. By now, she was asking me the questions. "This is the intersection that had the highest radiation readings in our town after the disaster. Why do you think that was?" she asked me, with a wry smile. I looked around. There were houses here and there and small hills. "This is where all the evacuation routes intersected," she went on. "Everyone evacuating from Iitate; everyone evacuating from Namie and Futaba—they all had to come through this intersection." It's where routes 114 and 12 intersect. As tens of thousands of people from the areas with the highest fallout in the hours, days, and months after the disaster fled, they drove through the intersection just two blocks from where Chinatsu now lives. Radioactive materials must have been carried on their cars. They probably deposited like dust, transferred from tires onto the cement, and were washed off with rains into the soil next to the road. But how did Chinatsu know? It turns out she and other "ordinary mothers" in town had a few batches of soil tested for its Cesium content in 2014. I return to that process later in this chapter. I take Chinatsu's knowing about this local hot

spot as an example of her knowing at least a little more about contamination than the average person in Kawamata.

I had been to Kawamata twice already and passed through it three times. It always struck me just how close in distance and time, and yet how far in radiation experience Kawamata was from the other cities and towns around it. On the one side of a tunnel, densely urban and peri-urban Fukushima City, itself contending with uneven fallout, was engaged in city-wide, blanket decontamination efforts to reduce air dose rates to 0.23 microSieverts/hour (μSv/hr). On the other side of the tunnel, decontamination in rural Kawamata was centered around schools, public parks, houses, and farmers' fields, but even after decontamination, air dose levels ranged anywhere from 0.23 to 1.0, and sometimes even 3.8 μSv/hr (Ministry of the Environment 2019a). However, other radiation and evacuation privileges flipped between Kawamata and Fukushima City. Though households in more rural Kawamata Town and Date City with school-aged children or where pregnant women were living could seek to have their house and yard recognized as a "Special Evacuation Recommendation Point"[68] on a house-specific basis, no one in Fukushima City could make such a claim. If air dose levels at the porch and ten meters into the yard on the specific day when municipal employees with the municipality's Geiger counters came to your house showed that cumulative yearly dose would exceed 20 *milli*Sieverts, then that household could claim to have just their house and property be treated and compensated the same as a compulsory evacuation area.

On the more rural sides of Kawamata, fully-evacuated Iitate village was just 15 minutes down the road one way, Yamakiya (compulsory evacuation area of Kawamata) was up the hill, and just beyond Yamakiya was Namie, a "Difficult to Return to for a Long Time" barricaded

68 *Tokutei hinan kanshō chiten*.

red-zone exclusion zone. Kawamata itself, as I mentioned in the previous chapter, was split in half between Yamakiya, which was a “green” compulsory evacuation area, and the rest of town, which was a “business as normal-decontamination in progress” area. Chinatsu lived in the business as normal half of town.

Chinatsu and I turned right at the intersection and went down a little hill before turning left onto the narrow road with Chinatsu’s natal family home. As we turned, less than a kilometer away, I saw half-wooded hills that were being broken by heavy machinery. Chinatsu noticed my looking into the distance. "What do you think they're doing there?" she asked me in her playful quiz-like style of show and tell.

I hazarded a guess, “Does it have something to do with decontamination?” By this point in my fieldwork, I knew that just a few kilometers up the road from Chinatsu’s home in all directions, there were fields and fields of “temporary-temporary storage sites” (*kari-kari okiba*) with black bags full of decontamination waste materials. These were sites common across central and coastal Fukushima, always peopled by decontamination workers. But forested hills like the one in the distance were usually outside the purview of decontamination procedures, which were focused on the twenty meters around homes and public spaces (Kaneko 2017).

Chinatsu goes on to explain, "It *is* part of decontamination. They're taking the soil from that hill and using it to cover up fields that they decontaminate." Once contaminated topsoil was scraped off and put into bags, different kinds of (hopefully less radioactive) soil were being used to cover up those fields. On the other end of the soil flows, the Ministry of the Environment was experimenting with the safe “reuse of soil removed through decontamination procedures” (*jokyo dojō no saisei riyō*) in the construction of public works such as roads, tsunami walls, and coastal disaster prevention forests (Ministry of the Environment 2018). I had heard about these plans for

years. Regular citizens, voluntary evacuees, critical scholars, and activists often criticize them as further spreading the contamination. But what is there to be done with the colossal amounts of soil that were removed through decontamination procedures? The neighboring prefectures won't accept it. Not to worry, Mr. Eggplant assures children and the general public alike, not only are the air doses and exposures of decontamination workers on the "soil reuse experimental site" in Minami-Soma City monitored, they are also completely safe. [69]

Chinatsu backed up into the driveway outside her natal home. We dropped off our things for the night and got ready to head to dinner and drinks with Chinatsu's friend at a local *izakaya* (a Japanese-style pub). On the way to the pub, we stopped briefly at Chinatsu's current house, just a couple of blocks away and near that intersection. She went inside to get something. I stepped out of the car and looked around. I had brought my handheld surface contamination monitor with me on this visit. I had just bought it from a European company (it was a Rados RDS-80)[70] a few weeks beforehand. When I used it a few times here and there in Yamagata or in central Fukushima, it hadn't yet registered anything remarkable. I decided to try it on somewhere I knew should be high, thinking, "Well, let's see." So I brought it close to the rainwater drain pipe. Radioactive materials collect in gutters, water ducts, where there is foliage, or other deposits of water. "It can't be that bad," I thought to myself. I don't remember whether the Rados-80 was set on Becquerels per square centimeter (Bq/cm_2) or Counts per Second (cps). The numbers on the detector began to skyrocket by the thousands. Before the radiation detector could stabilize its reading, I retreated back into the car. Cars and houses provide physical, material

69 Mr. Eggplant (*Nasubi*) is the character spokesperson for the newly renamed "Environmental Restoration Plaza." The Decontamination Information Plaza changed its official name on July 14, 2017, in order to get rid of the negative associations of the word "decontamination" (Environmental Restoration Plaza, Fukushima Prefecture Environmental Agency 2019). The URLs nevertheless retain the old "josen.env.go.jp" domain.

70 https://www.mirion.com/products/rds-80-contamination-survey-meter

protection from radiation being emitted by radioactive materials that are outside them. I'm not entirely clear on which emissions of which particles are stopped to what degree by what kind of walls and car materials, but if you are inside a car or a house, the levels go down, the exposure is reduced, and you are shielded. Call it an "interactional model of the environment" (Weston 2017, 81), if you must, but in radiation environments, physical barriers matter, and they matter more than just symbolically.

What was I expecting? What was I hoping not to find?

I hesitated about telling Chinatsu about the reading. Not only was I afraid it would be rude that I measured without her permission, but I wasn't entirely sure what the numbers meant and I didn't want it to come off as me criticizing her habitation decisions. In the end, I did tell her, later that evening. She wasn't one bit surprised or upset at me having measured, though she was upset about the situation she found herself in. What my detector registered as skyrocketing numbers from the rainwater runoff pipe was just another small part of Chinatsu's visible and invisible, perceptible and imperceptible everyday nuclearity.

Chinatsu knew very well that she was living in an environment together with radioactive materials. In February (2015), she had shown me a personal dosimeter the size of a USB thumb drive that she wears on a black lanyard around her neck. She got it from a German citizen science group, with whom she shares the results. The dosimeter was not only *the size* of a USB thumb drive—it *was* a USB thumb drive. Chinatsu could plug it into a USB port and access her own daily and cumulative exposures with the proper software, unlike with the glass badges that were doled out to Fukushima schoolchildren and pregnant mothers. With those glass badges, results were collected *en masse* but not communicated to each individual without bureaucratic paperwork, by which point the exposure would have already happened several months in the past

and made into general population-wide statistics to give overwhelming numbers in support of safety. Population-wide numbers and averages are the bane of specific cases; specific cases cannot be extrapolated into population-wide numbers.

Figure 6.1 Chinatsu's personal USB dosimeter, which she wears on a black lanyard around her neck. February 22, 2015.

Source: Photograph by author.

In the months prior, she had mentioned many other parts of the mosaic of contamination in the everyday, how she came to know of it, and what she now did differently. To put it bluntly, it seemed she didn't do much differently at all, other than avoid the outdoors sometimes, avoid

local foods, and seek out nationwide grassroots food shipments and connections for herself and others in town. But she also lived her everyday life normally. She didn't make a show of these practices of avoidance. She didn't want to pressure anyone to be concerned about radiation or change what they ate or how they went about their business. But as for her sons and herself, she did her best to get clean food from elsewhere. She also monitored her own exposures. Her knowledge of radiation exposure prevention measures tended to be left unspoken, whereas grabbing a drink and having dinner together were more shared, without really inquiring where the local pork or quail came from. Of course, when I asked or noticed this or that about radiation, Chinatsu had a slew of experiences that informed her understandings and practices. She had a personal USB dosimeter, she had had soil measured, she knew which streams were too contaminated to ever be fished in again. She had heard Japanese and international officials' and citizen scientists' explanations and recommendations. She herself was also a Katariina or storyteller, after all, so her perspective on the everyday was one that noticed just how weathered (*fūka*), which is to say not in any way critically conscious, many others' interactions had become.

Piecing Together Chinatsu's Everyday Nuclearity

I first met Chinatsu in Koriyama, the largest city in central Fukushima prefecture, at an event for the "Accept-and-Welcome Nationwide Association" in November 2014. At one point in the afternoon, I joined Chinatsu and several other women from Fukushima to pack potatoes and carrots from Hokkaido into individual family-sized "gift bags" (*omiyage*) for the families coming to the event. At such events, it was common for a cast of civil society "supporters" and volunteers from across Japan and "directly-affected persons" (*tōjisha*) from within Fukushima to come together to co-organize and co-host other local Fukushima residents. It wasn't until I

volunteered again, this time at a two-day series of events in Kawamata Town in February 2015, that Chinatsu and I exchanged phone numbers. Two weeks later, I returned to Kawamata on a Decontamination Tour of urban and rural Fukushima for AWNA members from across Japan. On this occasion, several Kawamata mothers became our local guides to the painful social schisms induced by compensation and decontamination schemes throughout Kawamata.

As I outlined in chapter 1, the people of Kawamata were split not by the contamination, but by the compensation payments and evacuation zone designations. Radioactive materials from Fukushima No. 1 fell indiscriminately on Kawamata. However, one and a half months after the start of the nuclear disaster, part of Chinatsu's town was designated a compulsory evacuation zone, while the majority of the town was left to be a “business as normal” zone. On April 22, 2011, the Yamakiya district of Kawamata was deemed to be an area "where annual cumulative dose of radiation was expected to reach 20 mSv after the accident" (Cabinet Office and Support Team for Residents Affected by Nuclear Incidents 2012, 7).

The Chinese characters for "Yamakiya" read "mountain" "tree" "house" 山木屋. Yamakiya is the mountainous district of Kawamata Town. The rest of Kawamata Town is downhill from Yamakiya. Water that feeds many farmers' fields in the lower "business as usual" Kawamata flows down from the officially contaminated Yamakiya district. Chinatsu also regularly went into Yamakiya for her work inspecting and replacing septic tanks. This local knowledge informed Chinatsu's hesitancy to eat and cook with local produce, especially what local farmers grew and gave to her. She nevertheless accepted these food gifts, if she was given them, only to dispose of them in a way so that the farmer who gave them to her did not know.

Chinatsu had to make compromises with the reality, social perceptions, and actionable dimensions of radiological contamination early on. After the disaster, Chinatsu stayed in her

house with her sons, close to her own mother and her natal home. Even as her house and property were officially in a post-disaster "business as normal" zone, she nevertheless had radioactive materials in her yard and all around her community. She and her sons never benefited from the compensation payments that compulsory evacuees from the other half of the town received. At the same time, it is also true that they were never forcibly made to leave their home.

At the time of the disasters in 2011, Chinatsu's younger son had just completed junior high school and was admitted into a good high school in Fukushima City that he wanted to go. He graduated college in April 2018. Her older son had just started working a steady job at a manufacturing plant in town in 2011. The procurement of safe food for her family from far away enabled Chinatsu to provide life-stage stability within social organizations for her sons (school and job), even in the middle of contamination that is literally in her back yard. It should be noted that Chinatsu's sons are older than many of the children of the families about whom I write in the rest of this dissertation. Even so, Chinatsu still cooked for her older son, who still lived at home, every day and often spoke about the extents to which she would go to procure food from western or northern Japan and avoid locally grown produce.

Chinatsu's food safety concerns in particular and mistrust of the government's pronouncements of safety guided her to join together with a like-minded hyper minority in her town after the start of the disaster. Together, they formed a five-person incorporated nonprofit group, which then helped them to link up with regional groups of concerned citizens and with grassroots networks of supporters all across Japan. This local civil society organization could organize local Kawamata events for other civil society groups from across Japan to join. Chinatsu and the other members would join regional and national civil society events, and

individuals from the regional and national civil society groups would come to volunteer at Kawamata-local events.

Until the founding of this group 2013, Chinatsu would go to the supermarket and try to buy produce from far away. She had no one to discuss this with at the time. When she made meals for her sons, she wanted to be able to give them something that she could say with certainty was safe. When she founded the small NPO, their main focus was to get produce from far away. It's not that there isn't enough local produce from Northeast Japan; it's that they did not want to eat it. So they asked people in southwestern Japan to shop for ingredients local to those areas and ship them to Fukushima for them, paying the price of the produce and the shipping costs.

In mid-March 2015, on the fourth anniversary of the 3-11 disasters, I was passing through Kawamata Town for a third time. This time, my destination was beyond Kawamata: first to Iitate village, then into the tsunami-destroyed corridor of Minami-Soma, Okuma, and Namie. I was not going to volunteer; I was being shown the "now" of Fukushima as part of the "Global Citizens' Conference on Fukushima," which was organized by the NGO Fukushima Beacon for Global Citizens Network (FUKUDEN) in collaboration with Peace Boat and other NGOs. As our tour bus full of foreigners passed the center of Kawamata, I texted Chinatsu that I was on my way to Iitate, which neighbors Kawamata.

She texted back:

From: Chinatsu To: Alex Iitate has sadly become a village that is close yet so far. What is it like, I wonder?

Figure 6.2 Text message from Chinatsu. March 12, 2015.

Chinatsu's question was already a meta-commentary that the tour for us, the international audience, was about to take us to places where people who live their daily lives as ordinary citizens day-in, day-out on the ground do not regularly go. We were entering lands distinct from the arena of daily life, despite their proximity.

We, the international audience of FUKUDEN's tour, could not see or understand the drawn out local experiences from the tour bus we were on. What we saw in Iitate were endless fields turned into "temporary-temporary storage sites" for decontamination waste materials, though new plans have been made since. Our tour guides explained how there were no plans, as of yet, for final disposal or storage of the materials. Our attention was directed out from the bus, from the road, towards the fields of decontamination materials in black "flexible container" plastic bags and the workers putting the bags into place.

Iitate was only a passage point for us that day. Our destination for the next few hours was beyond the barricades: the local office of Namie Town. We drove along the coast. The road ran through what were now fields, but were villages four years prior, before they were decimated by the relentless tsunamis of 3-11. There was some remaining wreckage. The bus and the group had special permission to pass through the gates into the Namie Town local office. The satellite office for Namie Town is in Nihonmatsu-shi, near the temporary barracks housing for Namie evacuees. The irony, it turns out, is that radiation levels at the local Namie Town Office, situated only three kilometers from the crippled plant, were consistently lower than at the satellite Namie Town Office in Nihonmatsu-shi, close to 60 kilometers from the plant.

Ghost Town and Tsunami Decimation

On our way back to Fukushima City, we drove through the abandoned ghost town of Namie and disembarked briefly from the bus to walk through a four-story school left in shambles, where children and teachers lost their lives as the tsunami waves washed over the roof. The Russian participant uses his radiation detector on the wreckage of a mangled car near the school entrance. He jumped away in shock when he saw how high the readings were. The rest of us walked through the decimated shell of the school and went on the roof. *Let's hope no large aftershock happens. Let's hope no new tsunami comes barreling in. How much radiation are we exposing ourselves to? What is getting into our lungs? But this is only brief.* From the rooftop, you could see the ocean, not even half a kilometer away. On the other side of the school, about one kilometer inland, you could see an incinerator under construction. In the distance, over the hills, about three kilometers away, we could see the towers of Fukushima Daiichi. This was the closest I came to the crippled power plant.

This "now" of Fukushima was a spectacle for a well-informed and critical international audience. Fukushima Beacon gave these international NGO representatives what they [we] wanted to see: dark tourism. The worst of the worst. The abandoned ghost towns. The remaining landscapes of tsunami destruction. Victims' curated voices of anger towards and mistreatment by the state. A mangled, contaminated car. Even views of the crippled plant itself.

In the end, I was left more numb than shocked. I had seen several different "nows" of Fukushima prior to this March 2015 study tour. Though this was my first and only time into the "red" exclusion zone, it wasn't my first time into the "yellow" and "green" evacuation areas.

The next day, an anti-incinerator activist would provide us with further details and guidance on how to feel outraged about these incinerators. The daily burning capacity of this incinerator and others like it was registered at one ton less than the level that would legally

require environmental assessment, thus making it twice concealed: hidden in the exclusion zone, where people no longer lived, and on the brink of legal environmental visibility, but deliberately below the threshold necessary for monitoring. These incinerators were quickly constructed and only scheduled to run for about one year, further temporally enabling their just under-the-surface operations. Temporary sparks in history and on the landscape that were using fire to process radioactively-contaminated tsunami debris into more compact and consequently more radioactive ash. Contained contaminated infernos that will ignite, burn briefly, and quickly extinguish themselves, hopefully only barely rising to the threshold of public awareness. But we the tour participants now knew of the existence of these "out of sight, out of mind" semi-clandestine incinerators. All we could do was be outraged.

The tour and the conference were thoroughly packed with local Fukushima voices. However, as to be expected, there was a strong slant to the overall tour and conference, as well as the speakers whose voices were given the microphone and stage: thoroughly anti-nuclear throughout, speakers belabored in anger and outrage the human rights abuses, suffering, political abuse, and other "suffering slot" narratives (Robbins 2013). I had seen many of these same speakers and activists on the national stage, in street demonstrations in Tokyo, and in audiences with representatives to the national Diet in the summer of 2012. I had met others, like Ms. Ruiko Muto, in Chicago in May 2012, where she spoke at the "Nuclear Age 2" conference at the University of Chicago (Yamaguchi and Muto 2012). I would continue seeing these same speakers at subsequent events, especially those surrounding criminal court cases being waged against TEPCO. In short, the speakers whose stories the international audience heard were part of a well-rehearsed, one-sided, chorus of the anti-safety group.

This one-sided chorus of absolute wrongs seemed dissonant with the more fraught and mixed negotiations I had been witnessing as to what was or was not, should or should not, be acceptable and unacceptable in non-evacuation radiation grey zones. Chinatsu's experiences of living through contamination in Kawamata Town is a point in case.

Back in conversation with Chinatsu

Chinatsu's text message asking about Iitate underscores that the FUKUDEN tour was taking us into areas where even the people living in neighboring towns don't go. I was finally able to reply to Chinatsu's text later that night.

From: Alex

To: Chinatsu

Thank you for your response. Our close to 13-hour-long field visit is over and I have finally made it to the hotel.

If I am to be quite honest, I feel that I've become numb to the landscape of furikon pakku ("flexible container packs"). Furthermore, I want to think that ordinary citizens shouldn't be able to enter into contaminated areas, but it looks like that kind of logic is completely absent in Fukushima today. For example, as I see more and more the lifting of evacuation orders and decontamination procedures being carried out in the spaces of everyday life, I feel like the shock I felt when I first saw these things has become dull [obtuse; dulled donkan ni natta kanji ga suru]. It's not only the fact that something that is supposed to be extremely dangerous has become the run of the mill scenery in these towns and cities; it's that anyone who has a car can go see this and if they wanted to reach out and touch it, they probably could. Too much has been left up to self-control, and, frankly, I think that this kind of stance signals the eschewing of responsibility by the organizations that should properly be managing this.

At the same time, if I make a blanket judgment that all contaminated areas are dangerous, I worry that it might sound like I am criticizing the people who continue to live there [denying/critiquing/scorning; hitei shiteiru ni kikoeru no dewa nai ka to ki ni narimasu]. There are so many circumstances that I know nothing about. People have all sorts of different values, and, on top of that, I only partially know how things have come to be the way they are now. Furthermore, the ways that different people make sense of [sort out/organize; seiri suru] this kind of overwhelming societal and personal material and psychological confusion are different for different people, and, depending on the conclusion that one wants to see, the interpretations and logic used change.

Maybe there's just too much that I don't [can't] understand. But I do think that there is numbness and [emotional/mind] dullness.

Figure 6.3 Text message to Chinatsu. March 13, 2015.

Chinatsu responded the next day:

From: Chinatsu
To: Alex
Subject: Numbness... You're right in that.

When I read your message last night, it gave me a shock [I was shocked; *zotto shita*]. When I reread it just now, I feel really disappointed in [I regret] my own environment and our current situation. Then, I remembered what two medical doctors from Russia said at a public lecture in Kawamata the year after the accident. Dr. Mariko said, "Given the radiation levels in Kawamata Village, relocation should be approved and if you are to decontaminate houses, it would probably be a good idea to chisel away several centimeters from the roofs and walls of the houses, but I guess that's quite impossible. But hey, since Japan is just so superior at everything, I'm guessing you'll just come up with some sort of ground-breaking new decontamination method, right?" Was she being sarcastic? Such was the opinion she shared with us. The other medical doctor said that his homeland was also just as contaminated as Kawamata, but that everyone goes about their daily lives normally. And with those contrasting comments, they concluded that it's something for each country/nation to decide for itself.

The situation in which we now find ourselves is something that has been decided for us by the Japanese government [by Japan]. But your message made me realize that we must all continue to be alert about it, not letting ourselves become numb. Thank you for that.

It played out just like they said it would: dragging on and on after the accident, nothing resolved, things left unsettled and indefinite, and that's the end.
It's scary how we get used to things.

On top of that, it seems like all of Japan has gotten used to it, doesn't it? What is there for us to do?

Figure 6.4 Text message from Chinatsu. March 13, 2015.

There is resignation in Chinatsu's response, but not proactive acceptance or a lack of knowledge. Chinatsu drove in her good, exciting, and active black Subaru Exiga through all but the barricaded zones almost every day as part of her job inspecting septic tanks. Given Kawamata Town's status as half-evacuated, half-business-as-normal, Chinatsu was well-aware of the hyper-local, hyper specific, decimally-thin ways in which even adjacent houses and fields were designated in a variety of ways:

- "business as normal" districts not requiring decontamination;
- "business as normal" districts with optional decontamination;
- compensated evacuation zones to which residents could return during the daytime;
- compensated evacuation zones to which residents could not return without special permission even in daytime;
- barricaded no-go zones;
- houses and yards outside evacuation zones that appealed to be recognized as contaminated enough to be designated "Special Evacuation Recommendation Point"[71] on a house-specific basis.

Each of the above categories recognizes official recognition of differentially distributed contamination.

Saturday, July 25, 2015

71 *Tokutei hinan kanshō chiten*.

This is a sudden jump from March 2015 back to July 2015. After the evening at the pub with Chinatsu and her friends, the following day, she and I drove on rural roads to get to Koriyama the back way, she would share further local knowledge about contaminated streams and evacuated communities. We drove through the "green" and "yellow" compulsory evacuation areas on our way to Koriyama, to visit Mrs. B's cafe.

They even recently completed a new road heading towards Namie, a fully "red zone" compulsory evacuation town. The old, narrow, windy road leading up to the Yamakiya half of Kawamata Town runs generally within view of the new, wide, relatively non-winding road. In her quiz-show style of questioning, Chinatsu asks me about the brand-new road, "So why do you think they finished this road, even though no one lives over there anymore?"

"Was it one of those roads that they had planned for a while and had to finish it anyway?" I ventured. I had learned about one form of corruption in postwar Japan connected with nationwide construction contracts that benefited Tokyo- and Osaka-based construction conglomerates, while siting unnecessary construction projects throughout more rural areas of the country (McCormack 1996).[72]

Not quite, it turns out. Chinatsu explains, "It's for direct access to the nuclear plants. The new road can handle firetrucks or other heavy machinery and they can get there faster that way."

72 Ostensibly as a way to counterbalance urban centralism in Tokyo, road, infrastructure, and industrial projects extended throughout the archipelago throughout the postwar period under central state-led economic and industrial developmentalism (Saito 2012; Fujita and Hill 2012). Pejoratively called the "construction state" (*doken kokka*), McCormack (1996) describes a cycle of corruption that began with the Japanese Ministry of Construction issuing contracts for public works to officially-recognized cartels of construction companies, called the *dangō*. All members of the cartels were guaranteed continued contracts, so there was no competition.1-3 percent of the contract amount went back to the (LDP) politicians and bureaucrats who issued the contracts. The politicians and bureaucrats thus had an incentive to inflate the price of construction contracts so that they would also reap greater kickbacks. The loop of reciprocity would be closed off when the politicians and bureaucrats "descended from heaven" (*amakudari*) into lucrative positions with the construction companies (33).

“Ah, I see.” A sustained critique of the postwar political economy wasn’t what Chinatsu saw in the newly built road. It was a road with direct connection to the nuclear plant, a part of her everyday. Now, everyday, busloads of workers going to and from the crippled power plant, heavy machinery, and decontamination workers from within and outside compulsory evacuation areas drive through the village day and night.

As we drove from "business as normal Kawamata" towards the Mount Kuchiguto tunnel, on the other side of which is Yamakiya, we talked about food and contamination. Chinatsu nonchalantly said, "Oh it happened just the other day. Someone gave me some produce, saying that they eat it in their home, but they don't have it measured. And when I took it to be measured, it was over [the limit]."

I asked, "Wow. By 'over,' you mean over 100 Bequerels?"

"Yea. Over." Chinatsu answered. Chinatsu means over the national limit. I heard voluntary evacuees all across Japan say that certain foods or areas are, "extremely high" or "high" or "it's being detected" (*deteru!*), but those are all relative expressions that also reflect individual, personal risk perceptions and limits. These personal risk assessment can become blanket statements about where/what "is being detected." But here, Chinatsu is literally talking about produce that, when screened, was over the national limit.

Chinatsu often gets food gifts of produce as she makes the rounds with her work. "Wait! Wait! Here, take these!" her clients, who are also her neighbors and fellow village residents, say as she is finishing up her job on their property. Chinatsu's family has been local to her village for over three generations. They grew up with the overflows of neighbors' and relatives' harvests showing up inside their vestibule (*genkan*) announced or unannounced. But despite radiation

concerns fading from the minds of most everyone else in her hometown, Chinatsu knows too much.

I process this, "But yea, it must happen. I mean, look at where we are. There was quite a lot of fallout here."

That day, we took the long way, on the back roads to get from Kawamata to Koriyama, going through Nihonmatsu-shi. We drove through Yamakiya and right up to the barricades at the edge of Namie. As we drove through the “green” compulsory evacuation zone in Yamakiya, Chinatsu commented, “It's extremely high. This monitoring post is probably at 0.2 something.”

I looked at the monitoring post as we pass by, “Oh, it says 0.23,” I remarked.

As Chinatsu and I drove around through the "Areas to which evacuation orders are ready to be lifted," the official white monitoring posts on the side of the road read 0.23 to 0.431 microSieverts of radiation per hour. Official monitoring post sensors are nearly two meters above the ground, as I explained in chapter 3.

C: The levels here won't go down. Oh, and, the fish they fished here, in that river, was so high! They screened (*kensa shite*) it and it was extremely high, but they only did it once. After that, no one fishes in this river. I bet they are continuing to screen it, but they don't publish the results.

AS: Huh? What?

C: Huh? Hmm... what fish was it...

AS: Oh, no, not that. So when they found the heightened levels that one time, they?

C: Right right right. That one time, it was so extremely high, the numbers! It was higher than anything anywhere else, I tell you!

AS: Wow. In this river...

C: Well, um, so over there, that's Mount Kuchiguto. That's Yamakiya, in other words. And so because it comes running down from there, what you get here is extremely high. And after that happened, they stopped testing it. Or maybe they just stopped putting out the numbers, stopped making them public.

AS: Hmmm. So, is that more or less how it's done?

C: They probably don't release the numbers because it's so high.

AS: Ohh. That's like, um, so it's like they've erased it? That river no longer exists? Is it like it no longer exists as a source of food? That kind of thing?

C: Hmm. Yea. Cuz probably no one will use it for food (chuckles). Yea. It's not something you can know if you don't use it for food.

AS: Is that so? I see. But, yea, I really think about it. Um, in a place like this... Well, I mean, look, there's someone cutting their grass. That person there. And I think to myself, "what must it be like..."[what's going on there]

C: (Laughs) Yea. What *is* going on there? [*Dou natteirun darou ne.*]

AS: Hmm. That river.

When we entered Yamakiya, I noticed that people's cars are in their driveways and we regularly came across oncoming cars, even on a Saturday. Chinatsu explained, "For people who live up here in Yamakiya, it's too hot down in the temporary housing during the summer days. So they come up here during the day, where the elevation is higher, and go back in the evening, once it starts to cool off." Anyone was allowed to pass through these areas in their cars, but people required special permission if they are to stay overnight. There were no barricades to block or check car traffic. Other days of the week, I would expect the decontamination workers to be here on the fields and around people's homes, but that Saturday, there were just the flags

professing decontamination slogans and the physical piles of black bags all across the fields, around homes, and around the now unused elementary and middle schools.

My colleague asked about the "flow" (*nagare*) by which decontamination workers end up here, doing this job. Chinatsu explained that first, there are the large companies, who were themselves also the makers of the nuclear power plants, or the construction conglomerates (*zene-komu*; Gene-Com). Then there are subcontractors, who subcontract further down, who then recruit the workers. Majority of the reconstruction funds set aside by the national government for these decontamination activities ends up being taken by the large conglomerates and intermediates. The people actually doing the work do get some of the cut, but not as much as the intermediaries. They work year-round. Work continues on during the Obon Buddhist holidays in August and the New Year's Holidays—times when almost everyone in Japan goes home. “Do they not have a home to go back to?” I asked.

Some probably don't, Chinatsu answered.

My colleague asked if there are any under-aged decontamination workers, or illegal workers hired to do these jobs. In particular, have there been high schoolers doing this? Yes—it was actually in the newspapers several times, Chinatsu said. The local Fukushima newspapers—Fukushima Minyu and Minpou—continued to cover the more mundane aspects of the nuclear power plant accident and cleanup.

Tested Soil—Dangerous Materials are Regular Dirt, Regular Weeds

Chinatsu had told me on numerous occasions about how she and a few other mothers in Kawamata gathered dirt from their yards and sent it to a radiation measurement organization to be analyzed in 2014. The measurements revealed that soil from one private garden in town had

952 Becquerels per kilogram (Bq/kg) of Cesium 137 and 134. Another private garden had 2,233 Bq/kg. Soil from a flowerbed next to a road had an astounding 10,477 Bq/kg; another roadside soil sample was at 1,244 Bq/kg. A vegetable field had 496 Bq/kg. Soil from Chinatsu's garden was at 704 Bq/kg. But what do all these numbers mean? Chinatsu's friend reached out to a citizen scientist to help gain at least some sort of understanding of the results. "There's no denying that I've become numb and my senses are all strange, so please just tell me like it is," Chinatsu's friend wrote.

The citizen scientist responded putting the numbers into context. First came a series of important preambles. They (the citizen scientist) didn't know at what depths the soil was gathered or the soil's density, so anything they said would be approximations and just meant to give a general sense of what these things mean. First, Becquerels per kilogram would have to be converted to Becquerels per square meter (Bq/m^2). To do this conversion, you multiply the number of Bq/kg by anywhere from 65 to 195, depending on the depth of the soil and soil density. For the sake of argument, the citizen scientist used a round 100 to make the conversions.[73] The resulting numbers ranged from 49,600 Bq/m^2 in a vegetable field to a whopping 1,047,000 Bq/m^2 in the flowerbed next to road. The rough estimate for the soil from Chinatsu's yard was 70,400 Bq/m^2.

[73] When I tried to understand these conversions poking around the internet, I came across this blog: http://ex-skf-jp.blogspot.com/2012/05/blog-post_15.html. The author (EXSKF-JP) tries to arrive at how Bq/kg are converted to Bq/m^2. They manage to do the conversions that show if soil depth is 5cm, then one would multiply the Bq/kg by 65 to get Bq/m^2. If soil depth is 15cm, then one would multiple Bq/kg by 150 to get Bq/m^2. This conversion allows for comparisons with Chernobyl soil levels, which are given in Bq/m^2.

EXSKF-JP explains that at the time of their writing (May 15, 2012), the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) would use soil to 5cm depth and multiply the Bq/kg by 65 to get a Bq/m^2 number. The Ministry of Agriculture, Forestry, and Fisheries would use soil from a depth of 15cm and multiply it by 195 to get the Bq/m^2. The 15cm depth was used because fields would be tilled to that depth. These conversions are also used by the Japan Health Physics Society (http://www.jhps.or.jp/).

To put these numbers in context, the citizen scientist compared them to national laws for Radiation Control Areas. They wrote:

You've probably heard this a bunch of times already, but here are the standards for Radiation Control Areas. You're not allowed to take anything that exceeds 40,000 Becquerels per square meter out of Radiation Control Areas. When I went on a tour of the experimental nuclear reactor at Kyoto University, they did a body surface screening when we were going out from Radiation Control Areas. The automatic door that leads out of the room would not open without confirming that you do not have radioactive materials that exceed 40,000 Bq/m^2 (4 Bq/cm^2) stuck to you. If the radioactive materials didn't come off with water and soap, you still would not be able to get out, even if it meant you would have to burn off some of your skin with acid or something like that. As you know, it is forbidden to drink, eat, or sleep in Radiation Control Areas, and you're not allowed to work there as a nuclear technician unless you're at least 18 years old.

And if we just base it on these standards, the data you sent me on the soil from Kawamata, basically all of it is above this specified control level/standard.
Maybe the reason the dirt from the farm fields is lower because it's being tilled? [and thus the soil concentrations are being mixed] I wonder, is the soil from the roadside from a depression that's lower than the ground around it? It's quite high.
I'm shocked at the dirt from near the flowerbed that's over 1,000,000 Bq/square meter.

In terms of effects on the body, mainly with regards to external exposure, since I don't know where exactly the dirt from the garden came from (whether it's a hot spot or an average, flat area, etc.), I will refrain from calculating anything of the sort.
However, even if it wasn't this kind of situation of general spread of pollution, to have this kind of contamination near you is something legally unimaginable; if the nuclear accident hadn't happened, you would never find yourself in this kind of a situation.

Also, there's the danger of internal exposure if you breathe in the soil-dust when it's blown up into the air. Of course, it all depends on a person's food habits, but my understanding is that generally speaking, the exposure is greater if you breathe in the stuff floating in the air than what you would be exposed to from food. Is this information helpful?

Figure 6.5 Email from Citizen Scientist. March 2014.

For the citizen scientist, these measurements were without a doubt nuclearly exceptional. They emphasized that this is just an estimate and meant to give a general sense of what the numbers sent back from the lab meant. Chinatsu's friend forwarded her the correspondence, Chinatsu followed up with the citizen scientist, explained that she understood this was just an approximation and thanked them for the interpretation. But here I was with Chinatsu in July 2015 and she still lived in the same place. She knew full well about the contamination. It is not uncommon to find people living near toxic waste dumps.

In February 2018, I followed up with Chinatsu by email to ask her a little more about the soil sampling from 2014. Where had the soil she sent in come from? What did she do once she found out the levels? Did she change anything about her everyday activities as a result of this knowledge? Below is her email response.

From: Chinatsu

To: Alex

First of all, please understand that when I made the request that this (soil) be measured, it was when everything was unclear and everything was a reason for worry and anxiety. People from all over wanted to help and do something for us and extended their helping hands to us from the kindness of their hearts. We were desperate for any help we could get.

First, where was the soil from?

The dirt was from the garden behind our house that is closest to the road. The data that is labeled "Garden B" is the data from our house. I personally never got an explanation of what the data meant.

What did I do when I saw the results of the measurement?
One month after (the measurement), there was decontamination by the local municipality. … but the soil that we sent to get measured was dirt from 15 cm under the surface, whereas when they decontaminated it, they just scraped off the top 2-3 cm of soil and covered it up with dirt from the mountains. So I don't think there is any change to the measurement results. I have not used this data to appeal to the local authorities to do a more thorough job of decontaminating or anything like that.

Did you change anything about your everyday activities (as a result)?
I stopped volunteering when our town gets together to weed the roadside and the like. I can't avoid weeding my own yard, so I do weed that a little.
I can't view the cherry blossoms from outside, can I…

Also, I think I've told this to you before, but even though it's obvious that dangerous materials have sunk deep into the ground, any dirt that comes up or that you bring up that doesn't come out through official decontamination procedures is treated as regular dirt and therefore outside jurisdiction/official control. The reality is that I/we don't know where or how it's circulating.

In the end, what it means is that you can't control every little thing in every corner where people live. Because if you admit/say that it's dangerous, then the people living there will start to grumble and get all up in arms. If you ask me, I think they're pretending like they're clueless as they spread the contaminated dirt all over the place.

I pray that something like this will never happen again, but as someone who's gone through it, if it were to happen again, even if it meant throwing away my job and pushing myself to the breaking point, I would do everything I could to prioritize evacuating together with my children.

And as for data, I think I want to see them gather data that can be publicly disclosed, collected by proper methods.

This data was measured by a proper inspection organization, but since the dirt that we dug up and had transported to them was so highly contaminated, and we had it transported without the proper control measures in place, I don't think I can disclose which organization it was that we had it sent to.

Besides ourselves with worry, this is as much as we amateur mothers were able to do.

Figure 6.6 Email from Chinatsu. February 2018.

What strikes me most from Chinatsu's response is that the soil she digs up and the weeds she pulls up are just considered normal soil and weeds. But if the exact same soil and weeds were pulled up as part of decontamination procedures, they would be considered and treated as decontamination waste materials. The very fact that they had to send the dirt to be analyzed by a specialty organization in the first place shows that they did not have the means to know even the basic data about radiation levels in their back yards. But even after receiving the results, they did not have the means to understand and interpret them.

"Amateur mother" (*shirōto no okāsan tachi*) is an important subject position from which Chinatsu was speaking. She means amateurs in these radiation, science, politics, and government-related matters. "Amateur mother" is a variant of "ordinary mothers" (*futsū no okāsan tachi*), which is juxtaposed to activist mothers, citizen scientists, or scientist-mothers (Slater, Morioka, and Danzuka 2014; Bestor 2002; LeBlanc 1999). Activist mothers will also often refer to themselves as "ordinary mothers," since that subject position carries less stigma. Anti-nuclear activists, activist mothers, and women in the anti-nuclear movement in Japan and internationally often employ maternalist rhetoric and imagery (Wöhr 2014; Weston 2017).

Though Chinatsu's continuing to live among contamination might suggest a degree of resignation to her everyday nuclearity, she knew plenty and did many things to learn about the risks that surrounded her. Perhaps her resignation took the form of what Benson and Kirsch (2010) call a "politics of resignation." Benson and Kirsch note, "The everyday politics of resignation implies recognition not only that things have gone awry but also that one is practically unable to do anything about it" (2010, 468). Chinatsu would agree with that there is a sense of powerlessness and discontent in living in her everyday nuclearity. What was there for her and her friends to do? This was a situation that had been decided for them by the Japanese government. Contamination and the social relations associated with it had become part of their everyday.

Epilogue

As I was writing the final draft of this Chapter in June 2019, Chinatsu and I seemed to have a moment of thought transference (*ishin desnhin*). We hadn't been in touch since I last went to see her and the others in July 2018. I was frantically writing about our trip that one day in July 2015, trying to remember the make of her car, and all of a sudden, there was an email from Chinatsu in my inbox. How am I doing, she wondered? She didn't want to disturb me or be a nuisance, but she always thinks about me all the time, she wrote. I was delighted to hear from her. (I could confirm the make of her car—the Subaru Exiga—and also catch up a little bit.) Her older son had gotten married and her younger son had just gone to western Japan for the Golden Week holidays with his friends from college (which he graduated last year).Whereas in March 2015, I was the one who was going to Iitate, which was so close, and yet so far, now, the evacuation orders had been lifted to all but one hamlet in Iitate. Chinatsu announced to me that

she was now working another job on the side at a national chain convenience store in Iitate. For a middle-aged woman to work at a convenience store as a second (maybe a third) job suggests that she is having difficulties making ends meet. It is minimum wage, unskilled employment. But Chinatsu assured me that this was not the case. She wrote that she enjoys working at the convenience store very much, actually. There's always something new to do and she's never bored.

I shared with her some of my arguments for this chapter—mainly, how continuing to live everyday life amid the contamination did not necessarily mean that she had "accepted" the risk. She agreed with that sentiment. As she put it in an email to me, "'Accepting the risk' is to not think, to swallow hook, line, and sinker what they say about it being okay. We live daily life, suppressing worry into the depths of our hearts" (Personal communication 6/3/19).

Conclusion

Which of the following is the most accurate statement?

1. Voluntary evacuees removed themselves and their children from harm's way.
2. Voluntary evacuees sought to remove themselves and their children from harm's way.
3. Voluntary evacuees sought to remove themselves and their children from perceived harm's way.

Statement #1 implies that voluntary evacuees were successful in removing themselves and their children from harm's way. It also unequivocally states that harm was present. Statement #2 likewise states that harm was present, but casts doubt on whether the actors were successful or if they or we can know they were successful. Statement #3 calls into question not only whether the action was necessary, but whether there was "real" harm in the first place, or whether it was only "perceived" harm. Perhaps we are in a moment where "risk perception" no longer carries the strong undertow of "perception is not reality" (Bickerstaff 2009), but given the readiness with which terms like "radiation brain moms" (*houshanō mama*; see Kimura 2016) reared their heads against women who tried to voluntarily evacuate with their children or asked questions about radiation, and given that Tsujiuchi (2016) among others have had to argue that evacuating from grey zones was "Not 'Excessive Anxiety,' but 'Legitimate Concern'," it would seem that risk perception continues to differ from risk, which in turn differs from danger. Whether an increase in risk is in itself necessarily harm also continues to be an open debate.

What constitutes harm? Is any amount of risk synonymous with harm, or is zero risk an unattainable and unacceptable demand? As I introduced in chapter 3, Reconstruction Agency risk communication materials collapse into the same frame the increase in the risk of carcinogenesis from additional radiation exposure from a nuclear accident with the increase in risk of carcinogenesis that comes as a result of not eating enough vegetables, being too skinny, eating too much sodium, or not exercising enough – so-called "lifestyle diseases." Is this fair to do? If low-dose radiation is just another environmental risk, brought into and out of visibility through assemblages of material, knowledge, and the visceral reactions that are then felt when interacting with possibly nuclear things and places – how is that different from saying that "radiation is all in people's heads?" Why is it that such a formulation still sounds like radiation, and especially harm from radiation, lack reality unless that reality is socially recognized?

In this dissertation, I have tried to show how people moved through precisely these kinds of baffling questions in the wake of Fukushima in their family lives. My interlocutors represent middle-of-the-road, informed citizens faced with nuclear risk in their environments, food, air, and bodies. Because they lived in grey zones of contamination, I termed them the "middle classes of risk society." I have argued that living through emergency and residual nuclear toxic uncertainty involved navigating double binds through toxic uncertainty. Navigating the social and practical implications of these disagreements about the acceptability of nuclear things is what I have termed "everyday nuclearity."

I developed my concept of "everyday nuclearity" by thinking closely about the food-related stories that feature throughout the dissertation. Food, air, and bodies, children's bodies in particular, were especially important focal points for debates about acceptable and unacceptable radiation exposure. We can say this statement without needing the conceptual apparatus of

everyday nuclearity. But what everyday nuclearity adds is a sense that these were not just, only, or mainly medical, scientific, or regulatory debates; neither were they just run-of-the-mill debates about freshness or culturally appropriate ways of eating like a Japanese person or a Fukushima farmer's granddaughter. They could be both and the disagreements about which wins mattered. "Everyday nuclearity" acknowledges, on the one hand, that citizens are empowered to make decisions about safety and danger, banality and exceptionality of nuclear things. On the other hand, it also underscores how the displacement of these decisions into everydayness and family life created strain within those social relations.

For example, in chapter 5, Mrs. Kojimoto's story tells of an apple freshly-picked and peeled by grandpa and fed to his four-year-old granddaughter. That apple could be felt to be the substance of commensality by him at the same time that his daughter-in-law, Mrs. Kojimoto, could feel the apple to be a risk of cancer for her daughter several decades down the line. But Mrs. Kojimoto kept quiet because she knew her saying anything would only sour the mood in the family and with the neighbors who brought over the apples. She also anticipated that even her husband would turn on her if she said anything. These social considerations competed with nuclear considerations. In chapter 6, Mrs. Sasebo adamantly asserts that she is fine with almost any Fukushima produce and that she's resigned herself to the fact that radiation can't be made to zero. After four years in voluntary evacuation, she was relieved to be back with her husband in Date City, with her family and kind and generous Fukushima neighbors nearby. She explained that the main reasons that inform her use of a local food cooperative are economic considerations and considerations about food additives, preservatives, and processed foods—and she adamantly emphasized that her use of the coop was not about radiation. But despite the adamant assertions that she had chosen what she had chosen—to return to Fukushima, to live happily and normally,

to construct the house she and her husband wanted—despite all of these assertions, she was not blind to radiation and still sometimes felt like she was a voluntary evacuee. This feeling of once having been a voluntary evacuee came through especially on the occasion when a bag of shiitake mushroom tea was suddenly pushed into her hands by some guy at a "support Fukushima!" event outside of Hobara station. This felt slimy and gross and she chucked the bag of tea in a trash can just far enough away so that it was out of view from the event. Even here, there was a social consideration of how to unoffensively get rid of a nuclearly questionable object. These are all moments of everyday nuclearity, in which the things Mrs. Kojimoto and Mrs. Sasebo refuse *are* normal and banal for others. Everyone has their own normals.

Everyday nuclearities can stay with a person even when they are not in nuclear environments. In chapter 2, I noted that the audience members were culturally, linguistically, and nationally the life-stage contemporaries or seniors of the Katariinas. There were also similarities of environment between Fukushima and Yamaguchi. At times, these geographical similarities even scared me and the Katariinas. We all experienced what I call "phantom Fukushima moments" when we were driving through the Yamaguchi countryside. These slippages between a nuclear, non-nuclear, and questionably nuclear everyday are part of what I have sought to bring forward as a sense of everyday nuclearity. For example, when there were rolls of hay wound up in white or black vinyl plastic sheets in tub-like batches, Mrs. A did a few double-takes to remember that those cannot be decontamination waste materials, like they would be in Fukushima.

On the five-day trip, we also experienced contrastive moments of self-reflexive normal eating. When we were eating breakfast one morning, Mrs. A commented that the previous day, when we had a local soup that contained *shiitake* mushrooms, that was the first time in the past

five years that she has had mushrooms. Water in Yamaguchi could be trusted to be free of radioactive materials. The local fish, seaweed, and mushrooms could be safely eaten and enjoyed. It was nice to be able to eat and acknowledge the almost certain absence of radiation from what we were ingesting; though, in so doing, this only underscores the continued presence of radiation at the forefront of our minds and in the environments and everyday lives to which the Katariinas would return after the five-day trip.

Though the stories that the Katariinas were telling were foremost stories of what had happened and was happening in Fukushima, they were also stories that could happen in the backyards and communities of Yamaguchi. The phantom Fukushima moments are projections of the Fukushima everyday onto the Yamaguchi environment. Similarly, the Katariinas would point out of the window of the venues where they spoke and use the countryside right before them to make a point about the physical and social place of low-level radioactive waste materials in Fukushima people's everyday lives. When they spoke of how radiation measurements of school lunches in Fukushima were deliberately distorted, their audiences knew what a school lunch in a Japanese public school is. When they spoke of their children having nosebleeds and suffering from psychological stress, or the limited power that parents have on school policies, their audiences could imagine themselves facing similar situations.

For some of my interlocutors, like Mrs. Sasebo and Chinatsu, their everyday nuclearities eventually took the form of what Benson and Kirsch (2010) call a "politics of resignation." Benson and Kirsch (2010) argue that widespread discontent, which they term the "politics of resignation," is a status quo affect for people living in a late capitalist world where corporations inflict tremendous harm to humans and the environment without ever making substantive remediations for the inflicted harm. Drawing on Dumm (1998, 74), Benson and Kirsch (2010,

468) note two crucially different dispositions of resignation. The first is "a passive state of being resigned to fate." The second is "a form of defiance that registers feelings of discontent." It is the second disposition that they emphasize. They note that though "the everyday politics of resignation implies recognition not only that things have gone awry but also that one is practically unable to do anything about it" (2010, 468), this recognition does not mean acceptance or consent. Being resigned to living in a contaminated world and doing what one can within that does not mean "accepting" a world that is being destroyed by various vestiges of capitalism. As Benson and Kirsch note, "Deliberate acts of resignation are 'as far from the terms of consent as possible'" (Benson and Kirsch 2010, 468, quoting Dumm 1998, 74). A politics of resignation builds on a cynicism in which people readily understand that the world is getting ever more toxic and inequality is rising. For Benson and Kirsch, "resignation is a mass feeling that provides evidence of widespread discontent with capital" (2010, 468). They leave open the question of what such a sense of resignation-as-defiant-discontent might bring about or how it might be channeled by people and movements in the future, calling for an "anthropology of no guarantees" (2010, 474).

My ethnography shows abundant recognition within the everyday of how things have gone awry due to nuclear energy and nuclear contamination. My interlocutors spoke of various dimensions of powerlessness and discontent in living through their everyday nuclearities, while also being proactive and agentive in choosing how they moved through these environments and disagreements. The Katariinas give three prime examples of doing what one can on the micro-level without having to incite political upheaval. For the mothers about whom I write in chapter 4, perhaps evacuating with one's children for a few years to an area with lower radiation levels, cleaning car floormats, switching to internal ventilation mode when driving in Fukushima, and

snatching milk processed in Fukushima from their child's school lunch are forms of resignation as acts of "defiance that register feelings of discontent" with capital, since they were proactive actions that could be taken in the face of contamination, even if not directly against the corporation or the government. However, the actions were taken and informed mainly by these mother's attention to their children's health. Voluntary evacuee mothers were certainly defiant when they self-evacuated and defiant when they continued to stay away.

For those who remained, recognition of the undesirability of the situation is not giving up. As Chinatsu put it, "'Accepting the risk' is to not think, to swallow hook, line, and sinker what they say about it being okay. We live daily life, suppressing worry into the depths of our hearts" (Personal communication 6/3/19). Chinatsu also wrote, "What is there for us to do? It seems like everyone has forgotten about it," further evidencing a kind of resignation with a sense of powerlessness, even as she continued to take part in AWNA activities, organize food shipments, and tell her story as a Katariina. Mrs. Sasaki's text message to me on the eve of her return in March 2015 also captures both a sense of having no choice and therefore being resigned to return to Fukushima and a determination to do whatever would be in her power – that she will "keep at it, keep at it, keep at it" (see Figure 5.1 for full text message). For Sayori, who evacuated from Yamagata even farther to Hokkaido, the discontent was thoroughly palpable, but so was resignation to the wider workings of capital. When I visited her in Hokkaido in April 2016, she was working as a cashier at a supermarket and knew she could not say anything to the customers, even as she watched them buy fish from the northeastern coast and the Pacific. In a way, moving farther away from her family necessitated that she work to be able to sustain herself, which saw her move more deeply into capital and food.

Living through nuclear disaster is living through and navigating arguments about materiality, reality, knowledge, and truth. As I argued in my conclusion to chapter 3, in the years 2014-2018, far from being invisible, imperceptible, and unmanageable, low-level nuclear waste in grey zones Fukushima was being enfolded into middle class waste aversion and removal dispositions and practices, which included vigilance, ambivalence, and, to some extent, resignation (Benson and Kirsch 2010) to the fact that "radiation can't be made to zero." Radiation, the political and knowledge structures behind it, and even the mountains of contaminated soil come in and out of visibility, in and out of perceptibility. Even when visible and perceptible, the acceptability of exposures gets contested, as experts shift the goal posts in how they administer the situation and what will be made the new normal, the interim exceptional, or the new exceptional. Knowing that radioactive materials are there, knowing that the government is not to be trusted, knowing that they and their children had been exposed, my interlocutors went about their everyday lives in a mainstream middle-class Japanese mass-consumption, mass-waste society, in which consumerist waste has always been dealt with stringently but ambivalently.

In a way, perhaps being able to live within ambivalence (Siniawer 2018) and resignation were the goalposts towards which the situation was being normalized. Banality did not mean non-recognition of the problem. It meant knowing that things continued to be wrong, taking practical measures to cope with it, and continuing to live everyday life.

Appendix A: The Muddled History of Nuclear Technology, Risk, and Knowledge

Radiation exposure at low doses has been associated with cancer, heritable effects, non-cancer diseases (particularly circulatory disease), and cataracts (UNSCEAR 2012, 1). However, cancer and heritable effects have a privileged position in official Western nuclear epistemology, and are the two aspects of low-dose health effects "currently considered important" in "establishing nominal radiation risk estimates for low dose exposures" by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), the International Commission on Radiological Protection (ICRP), and the National Council on Radiation Protection and Measurements (NCRP) in the United States (UNSCEAR 2012, 1). Given all this, the most accurate way to characterize the current state of public and scientific knowledge about radiation exposure in humans would be to say that it is patchy.

Anyone seeking to speak, write, or conduct research about radiation health effects in humans in the United States or Japan has to contend with the Life Cohort Study of the postwar United States-Japanese Atomic Bombing Casualty Commission (ABCC), which later became the Radiation Effects Research Foundation (RERF) (Lindee 1994; Cullings 2014; Ozasa, Grant, and Kodama 2018). The atomic bombing survivors' data and resultant theories are treated as a kind of gold standard in American, International Atomic Energy Agency, and Japanese radiation public health principles, even as the Cohort study continues to be criticized. Chief among the critiques are the exclusion of populations who died from the bombing and radiation sickness before the study began; the patchy self-reporting by atomic bombings victims of their recollections of where they were at the time of the bombing, on which dose-effects were

estimated; the inclusion and exclusion of what counts as a mutation; and the manipulation of conclusions so as to lessen worldwide anxieties about radiation health effects in the era of above-ground Cold War nuclear weapons testing (Lindee 1995).

One hotly debated set of issues had to do with genetic versus somatic health effects resulting from exposure to ionizing radiation from the atomic bombs. To this day, health effects are debated. During the cohort studies conducted by the ABCC, the extent of *inherited* radiation health effects was a hotly debated point full of severe disagreement (Lindee 1995). Lindee (1995) argues that American scientists' research and public statements on the results of the ABCC's Genetics Study were biased because they sought to offer public statements that would subdue possible public panic over nuclear technology (weapons and energy) and encourage acceptance of these technologies. Therefore, the sociopolitical atmosphere of the start of the Cold War and the Nuclear Age encouraged the creation and spin of scientific radiological knowledge as assuring the public that nuclear technology is "safe" (Lindee 1995), even as the physical atmosphere of the planet continued to be polluted by radionuclides from above-ground nuclear tests and entire ways of life were decimated by irremediable nuclear weapons production and testing fallout (as in the Bikini Atoll and French Polynesia (Davis and Hayes-Conroy 2017) and the poisoning of groundwater and inhabited lands through nuclear production disasters like Hanford and Ozersk (Brown 2013)).

Boudia and Jas give a global history of radiation exposure permissibility logics. The 1970s in the United States saw an adaptation of a cost-benefit rationale/logic for the permissibility of exposure *in the nuclear industry* known as the "As Low As Reasonably Achievable" principle. The societal benefits of nuclear energy production, in the form of economics, electricity, global prestige, and even global "peace" efforts through trading in nuclear

technology were socially worth the costs of increased cancer rates among nuclear power plant workers. This was an industrial work health matter of social concern that required attention to the extent necessary to sufficiently subdue public outrage and mistrust. Even if there was a tangible undercurrent of mistrust and doubt, this would be tolerable, so long as no mass revolts were underway and the industry could continue to "acceptably" accrue benefits (mainly for itself, though pitched as for the public and its workers). In post-Fukushima Japan, it would seem that threshold and risk logics are deployed together. Furthermore, they have been externalized into and onto people's everyday, private lives.

As for Chernobyl-derived knowledge, associations between Fukushima and Chernobyl have been more of a liability than a resource for the Japanese government and the global nuclear establishment. If mention of Chernobyl is made by official publications in Japan, it is to point out how much worse Chernobyl was than Fukushima and to praise the Japanese government's swift and sufficient response to Fukushima (see for example the government-funded "The Truth About Radiation" pamphlet in Appendix C). The government already presents its response as having staved off any possible health effects despite it still being too soon to draw such a conclusion or make such an assertion. Such premature over-confidence is resonant with what critical medical anthropologist and ethnographer of Chernobyl Adriana Petryna calls closed off "non-knowledge," which continues to be the defining characteristic of knowledge about human health effects from Chernobyl, in post-Soviet societies, and especially in international organizations and international science. When atmospheric radiation readings exceeded levels that instruments in 1986 could register, their maximums were recorded as the observed levels. Rather than seeking to know more about how some liquidators survived, while others died, follow-up studies have been left unfunded. Petryna is not alone in showing how Cold War knowledge structures

categorically shut out Soviet or post-Soviet knowledge about human populations exposed to low-dose radiation (Goldstein and Stawkowski 2015; Kuchinskaya 2014; Petryna 2013; Brown 2013).[1] Goldstein and Stawkowski (2015) show how the clout of ABCC epidemiological radiologist James Neel influenced how Soviet and post-Soviet radiological knowledge was accepted into American knowledge. Put simply, it wasn't. Neel and others categorically shut out studies that showed conclusions that differed from what the Cohort Study showed. In an ironic twist of how theory and observations should work in the scientific method, American and Japanese "scientists beholden to the government" seem to be unwilling to accept data and explanations that contradict or complicate their existing theories.

Appendix B: Fukushima Daiichi NPS Accident, Its Health Effects & Progress of Counter Measures Government Representations of Radiation

Document Title: Fukushima Daiichi NPS Accident, Its Health Effects & Progress of Counter Measures
Acquired: Received by email from Representative Miura of the Decontamination Information Plaza on Friday, November 14, 2014.
Witnessed presentations on: In Japanese on AWNA Decontamination Tour, February 21, 2015. In Fukushima City, Fukushima.

English Translation by: Decontamination Information Plaza
Author, Publisher, and Distributor: Decontamination Information Plaza, Fukushima Office for Environmental Restoration, Ministry of Environment
Publication Date: October 2014
Target Audience: General Public

Fukushima Daiichi NPS Accident, Its Health Effects & Progress of Counter Measures

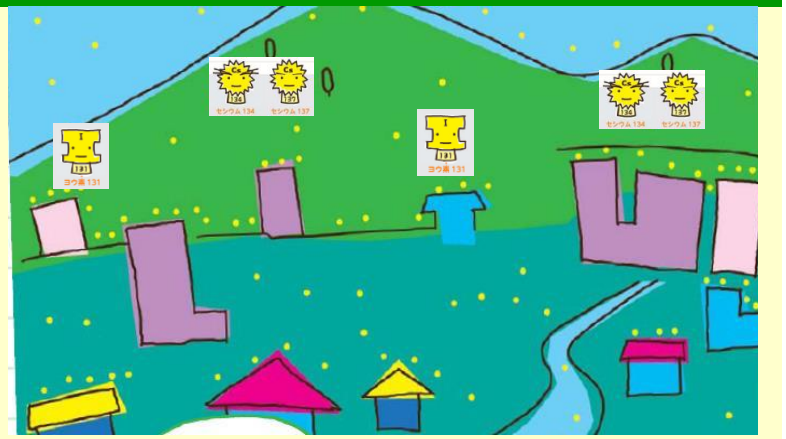
Hitoshi AOKI
Technical Advisor
Decontamination Information Plaza,
Fukushima Office for Environmental Restoration,
Ministry of Environment

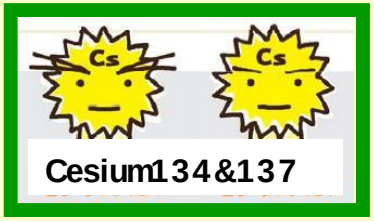
October 2014

Figure Appendix B. 2 Power Point Presentation "Fukushima Daiichi NPS Accident, Its Health Effects & Progress of Counter Measures," October 2014 (30 slides)

Primal Radionuclide Contaminating Our Living Environment

= Radioactive Cesium134&137





Cesium134&137

Iodine131

Iodine131 is no longer existing due to its short 8-day half life.

One Third of Cesium134 (medium half life of 2years) & 95% of Cesium137 (long half life of 30years) are still existing in our living environment.

ESTIMATED RELEASED AMOUNT：

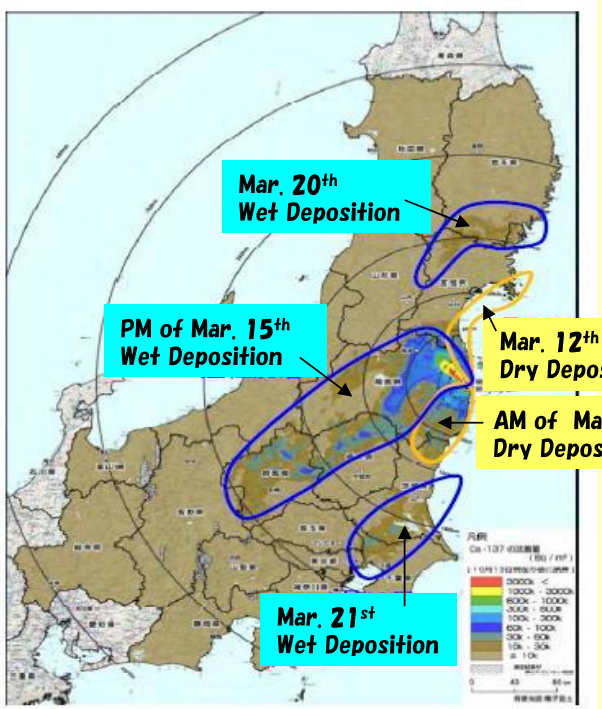
20 Peta Becquerels　　500 Peta Becquerels

(1Peta = 1000Trillion)

Plutonium239　Strontium90

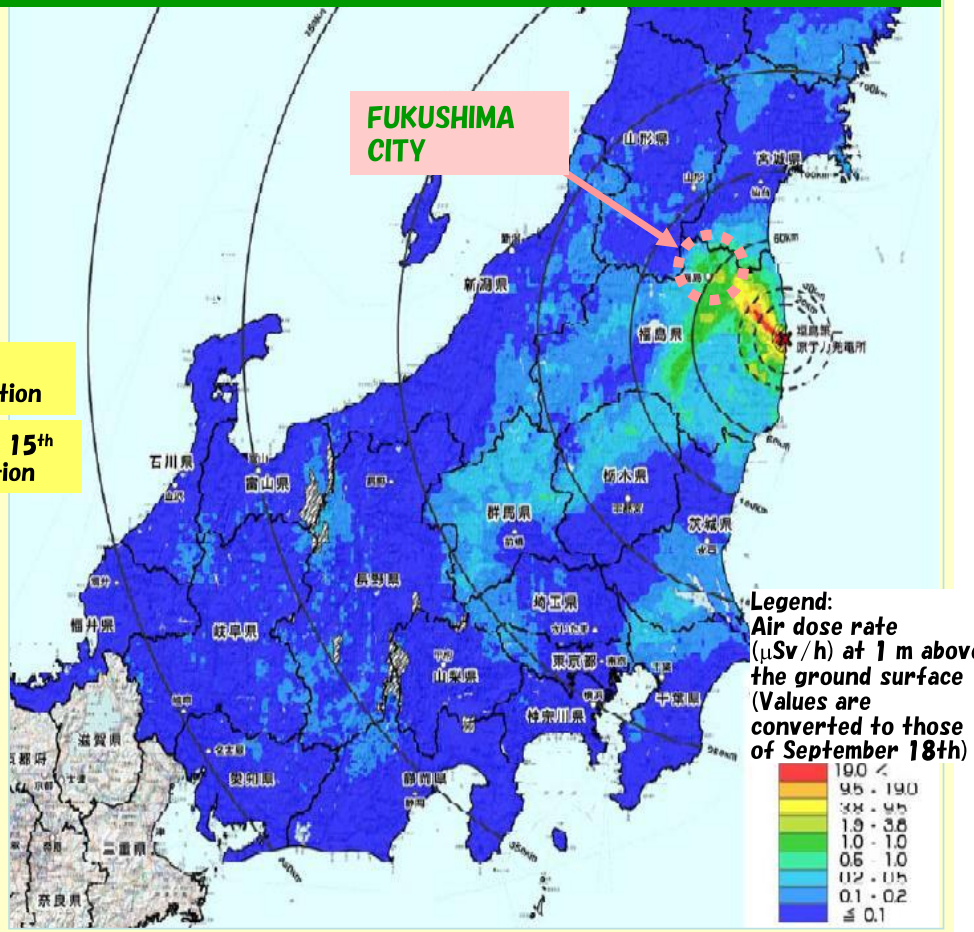
55 soil samples tested after the accident have proved all but 1❼ existing Plutonium and Strontium levels are less than the maximum levels recorded in Fukushima in 10 years prior to the accident and 1 sample exceeding the maximum level is still less than the past 50□□□❼ maximum level in Japan.

Status of the Environmental Contamination Caused by Fukushima Daiichi NPS Accident Wind Direction and Precipitation played a Critical Role.



@Mar. 6th, 2012 JAEA Open Symposium on Diffusion Process of Radioactive Materials Released from Fukushima Daiichi Nuclear Power Station

This assumption was made by Mr. Nagai of JAEA.



@20110708 Aerial Monitoring by MECSST

2

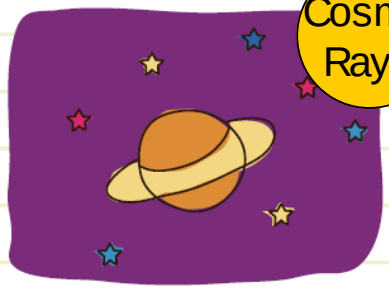
Natural Background Radiation

Annual Exposure Doses for Individuals on World Average: Total 2.4 millisievert

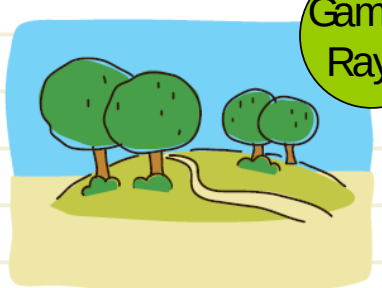
0.39 millisievert

Proton
Neutron

Derived from the Sun



From the Universe



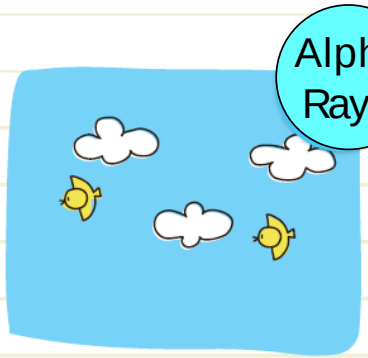
From the Earth

0.48 millisievert

Thrium232 / 234

1.26 millisievert

Radon220/ 222



From the Air

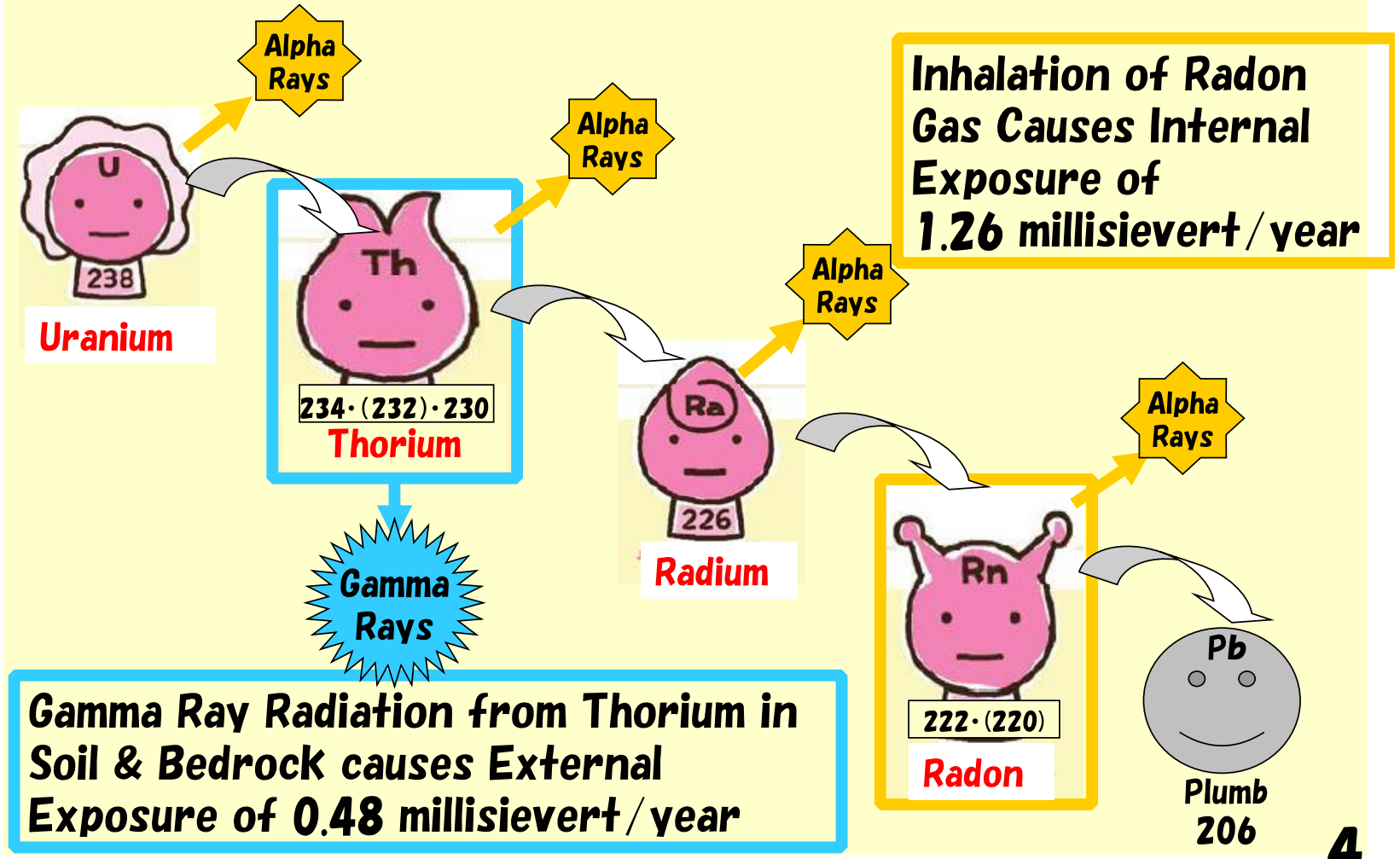
From Food

0.29 millisievert

Potassium40

3

Natural Background Radiation derived of Uranium238 & its Descendants



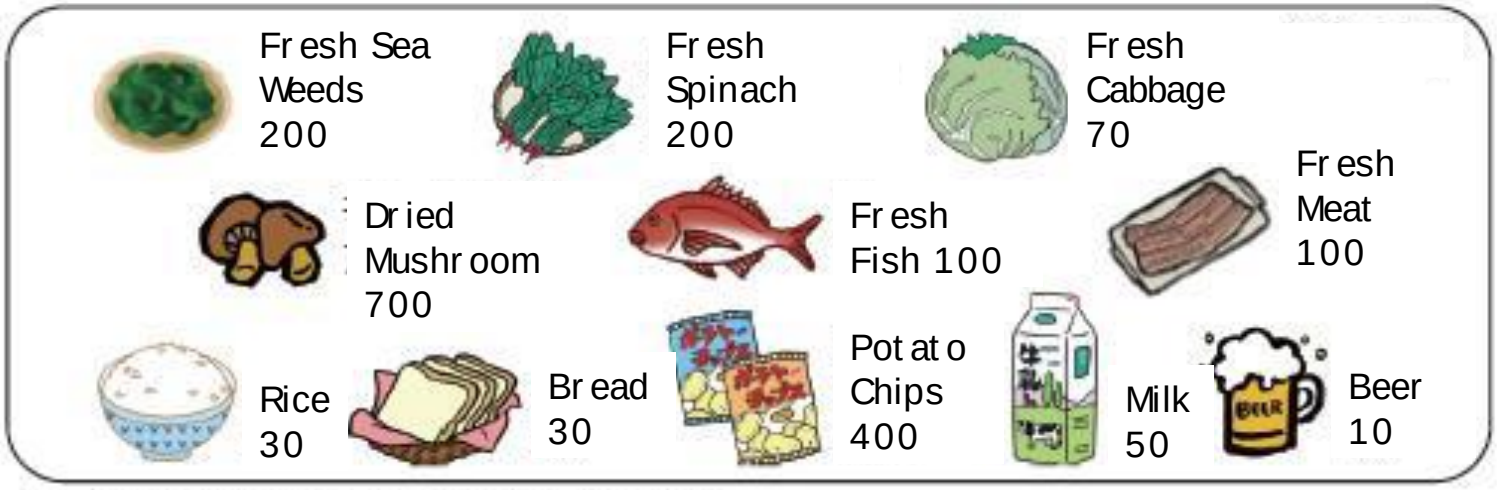
4

0.0117% of Natural Potassium Inventory is Radioactive Isotope of Potassium 40

Potassium

Potassium is one of the Indispensable Nutrients for Plants so that all the Foodstuffs include Radioactive Potassium 40 to some extent.

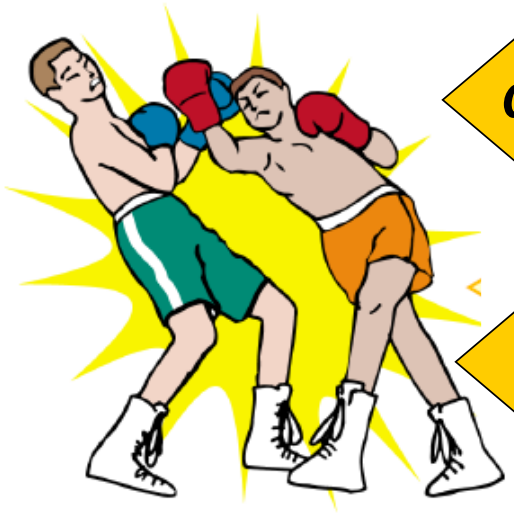
Potassium 40's Density in respective Foodstuffs In Becquerels/ Kilogram



5

Units used to measure Radioactivity and Radiation Exposure

If taking Boxing as Comparable Example



Counts of Punches

As for Intensity of Radioactivity

1 Nuclear Collapse per second = 1 Becquerel

Power of Punches

As for Amount of Energy Transfer by Radiation

Energy Transfer of 1 Joule per Kilogram = 1 Gray

Degree of Damages

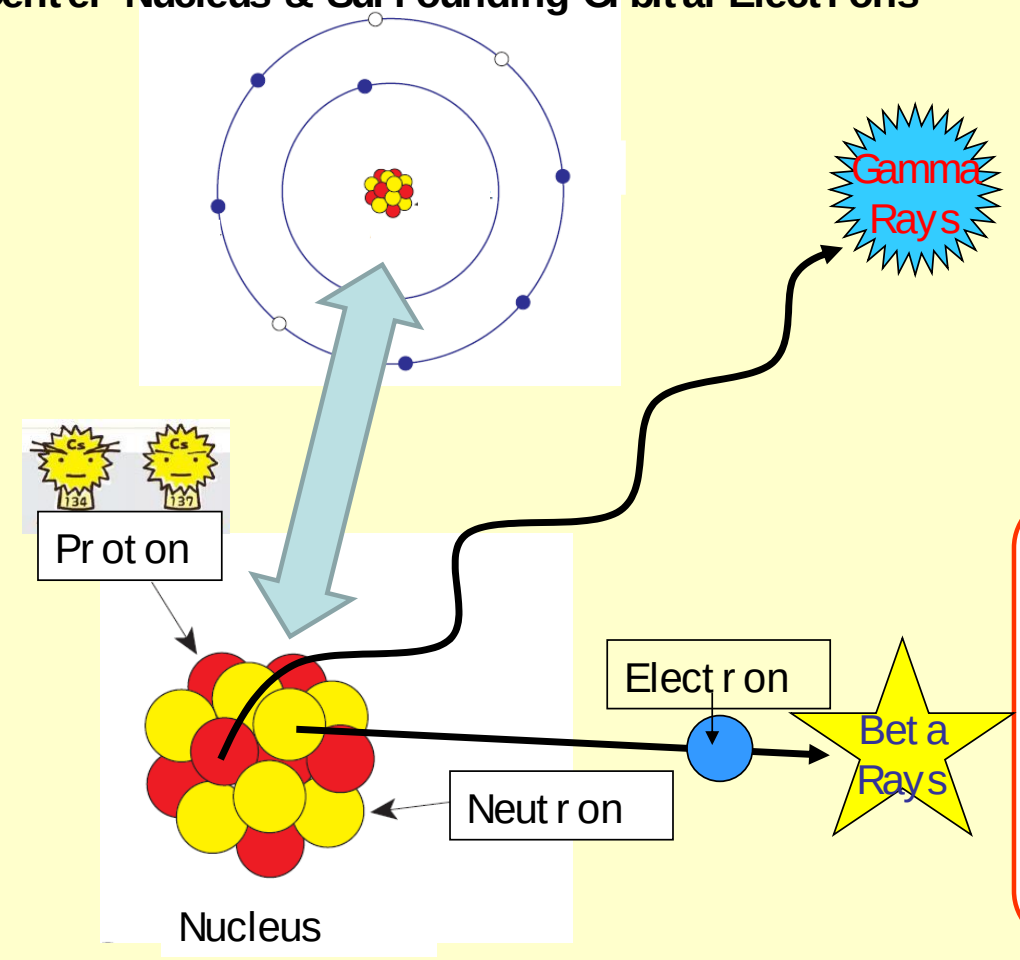
As for Health Effects caused by Radiation Exposure

Health Effects caused by 1 Gray of Beta or Gamma Rays = 1 Sievert

6

Radioactive Cesium emits Beta Rays & Gamma Rays

Atom's Structure:
Center Nucleus & Surrounding Orbital Electrons



Gamma Rays:

Flow of Photon released from nucleus (a kind of electro magnetic waves similar to X ray) traveling 100meters on average in the air, could permeate human body and causing external exposure

Beta Rays:

Flow of electron spinning off from Neutron, traveling 2m at maximum in the air and only 2mm in human body, thus not causing external exposure

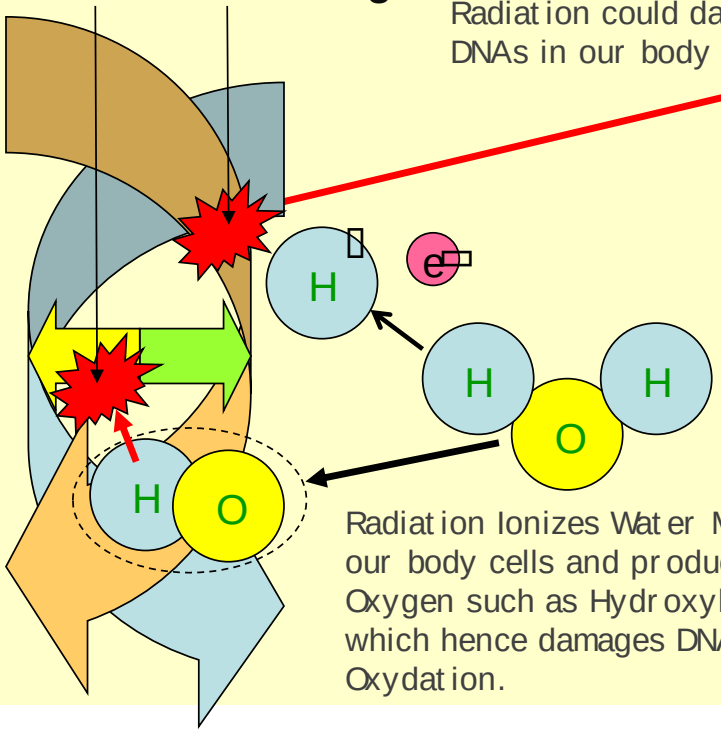
Mechanism of Health Effects by Atomic Radiation

Beta Rays and Gamma Rays could damage DNAs in our body cells and increase our Cancer Death Rates.

DNA Damage

Base & Strand Damage

Mass, Electric Charge, Kinetic and Electro-Magnetic Energy of Radiation could damage DNAs in our body cells.



Radiation Ionizes Water Molecule in our body cells and produces Reactive Oxygen such as Hydroxyl Radical which hence damages DNAs through Oxydation.

Radiation Effects

- Direct Effect
- Indirect Effect

There are many causes which produce Reactive Oxygen other than Radiation such as:

- Oxygen Respiration
- Bacteria and Viruses
- Chemical Carcinogen
- Mental Stresses
- Smoking
- Ultra-violet Rays

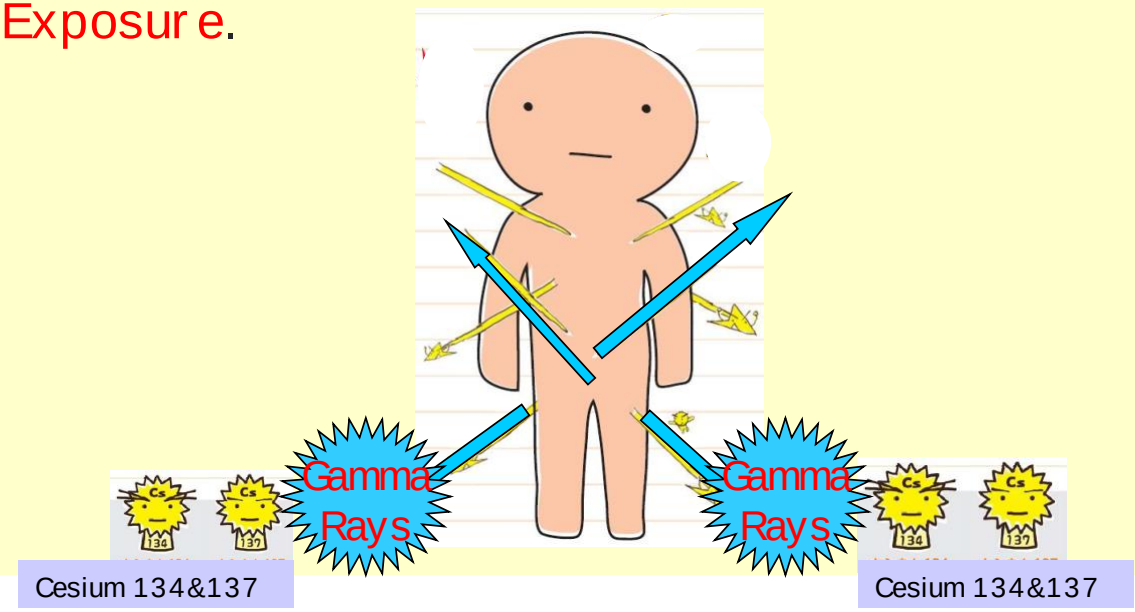
Mechanism of Health Effects by Atomic Radiation

- Our body is consisted of 60 trillion cells.
- For each cell, DNA damages are occurring tens of thousand times a day.
- Almost all the DNA damages are restored by Restoration Enzymes existing in our body cells.
- If Restoration failed, the very cell would die spontaneously.
- In case DNA damaged cell would survive, White Blood Corpuscles attack and eliminate it through Immune System.
- If Immune System failed, the DNA damaged cell would survive and propagate then become Cancer as Disease.
- In the World of Radiological Protection, there is a [illegible] Threshold Linear [illegible] which deems Chronic Exposure to Radiation increases 0.005% of Cancer Death Rates per 1 millisievert of Accumulated Doses.
- ☆ However in the reality based on the Intensive Survey on Atomic Bomb Victims in Hiroshima & Nagasaki, Victims whose Exposure Doses were 100 millisievert or less, No Cancer Death Rate Increase has been observed or reported.

External Exposure caused by Gamma Rays emitted from Radioactive Cesium deposited in our Living Environment

As Beta Rays emitted from Radioactive Cesium could travel only 2 millimeters in the water, Beta Rays coming from outside of our body would be stopped by the very surface layer of our skin and cause no external exposure.

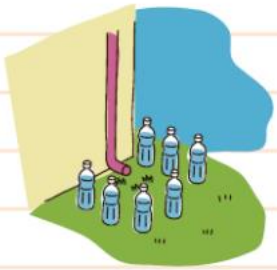
Gamma Rays emitted from Radioactive Cesium could travel 100 meters on average in the air and go through our body causing External Exposure.



To decrease External Exposure Doses, There are 4 Countermeasures such as:

Point 1 Secure Distance

Exposure Doses decrease in inverse proportion to the square of distance from radioactive materials.

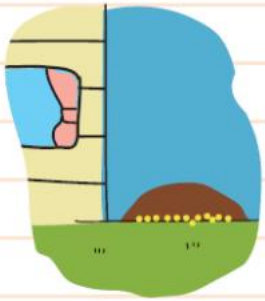


Point 2 Shorten Exposure Time

Exposure Doses are in proportion to the exposure time.
If annual exposure dose is 1 millisievert, exposure dose per day is 2.7 microsievert.

Point 3 Provide Shielding

30cm thick soil layer could shield 97.5% of gamma rays emitted from Radioactive Cesium.



Point 4 Remove with Soil

Almost all Radioactive Cesium existing in Fukushima environment is firmly united with soil particulates so that they could easily be removed in a shape of contaminated soils.

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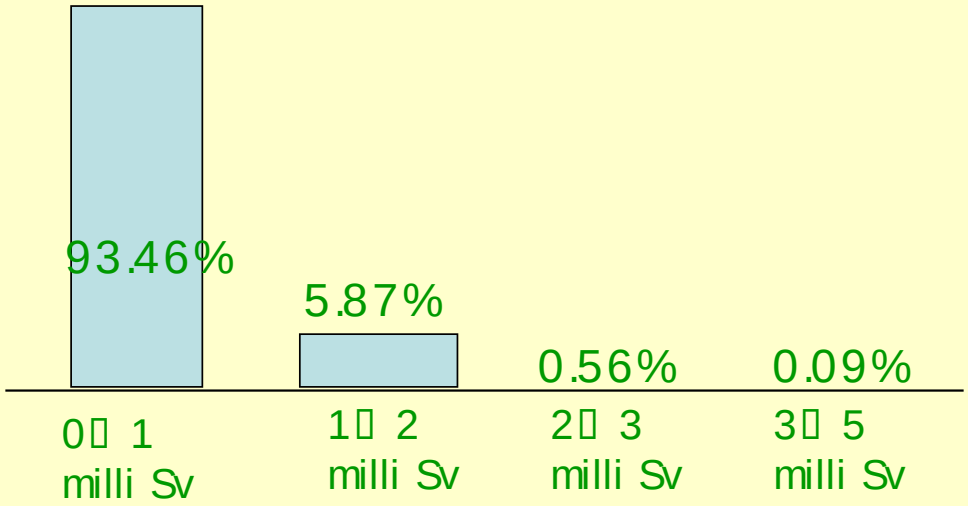
The actual Additional External Exposure Doses of Fukushima City Residents

Fukushima City Authority has been conducting Residents' External Exposure Dose Survey by providing Personal Dose-meters to residents for 3 months.

The latest survey result published in March 2014 reads for nearly 94% of residents who participated the survey, their Annual Additional External Exposure Doses are less than 1 millisievert.

This 1 millisievert of Annual Additional Dose is the Japanese Government's Final Target Level for Decontamination Efforts.



Personal Dose-meters

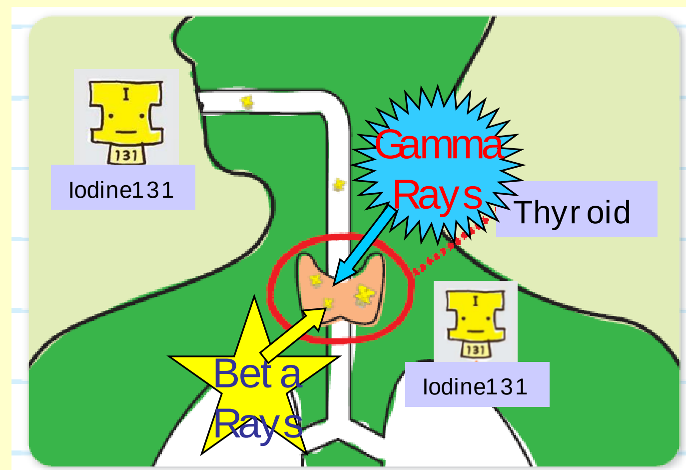
Internal Exposure in Thyroid of Children and teens by Radioactive Iodine131

Radioactive Iodine131 once taken into our body would concentrate in our Thyroid and could cause Thyroid Cancer in particular for children and teenagers.

In this context Fukushima Prefectural Government has been conducting thorough Thyroid Screening of 370,000 population of which ages were 18 or less at the time of the accident. By the end of June 2014, diagnoses for 296,000 people have been completed and 57 persons were diagnosed as thyroid cancer.

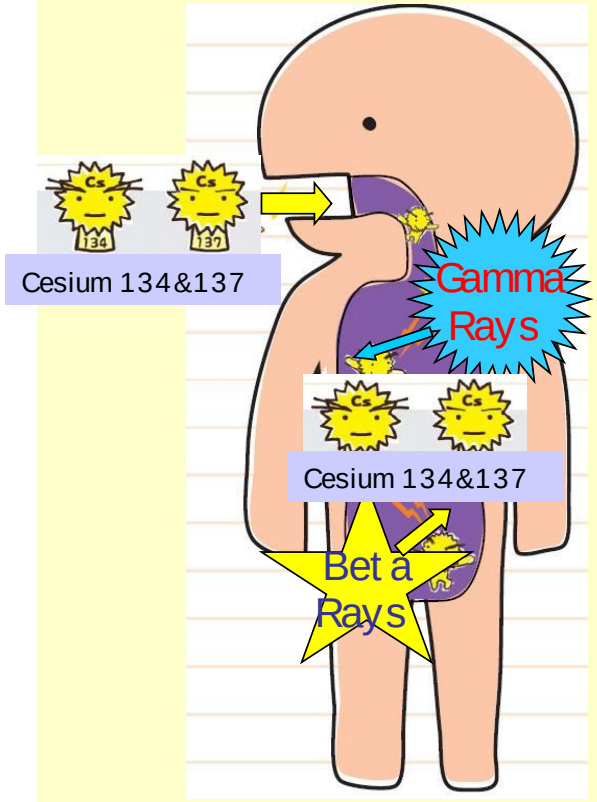
To identify the influence of the accident, comparative study has been implemented in 3 cities outside of Fukushima. By the end of March 2014, screening of 4,365 persons had been completed and 1 case of thyroid cancer was found.

Many Experts of Thyroid Cancer do not think, these 57 cases in Fukushima have been caused by the Nuclear Accident based on the facts that firstly [illegible] substantively higher if compared with the Chernobyl cases and secondly as the growth of thyroid cancer is so slow that 3 years is too short for the Accident triggered thyroid cancer to evolve into the detectable stages.



No Radioactive Iodine131 is remaining in our environment after 3 years of the Accident.

Internal Exposure caused by Beta & Gamma Rays emitted from Radioactive Cesium taken into our body with foods, drinks and air



- Radioactive Cesium taken into our body through Intake of foods and drinks as well as inhalation of air will be distributed to muscle cells and used to contract muscles.

- Therefore Radioactive Cesium will not be accumulated in our body and be discharged a half amount in 90 days for adults.

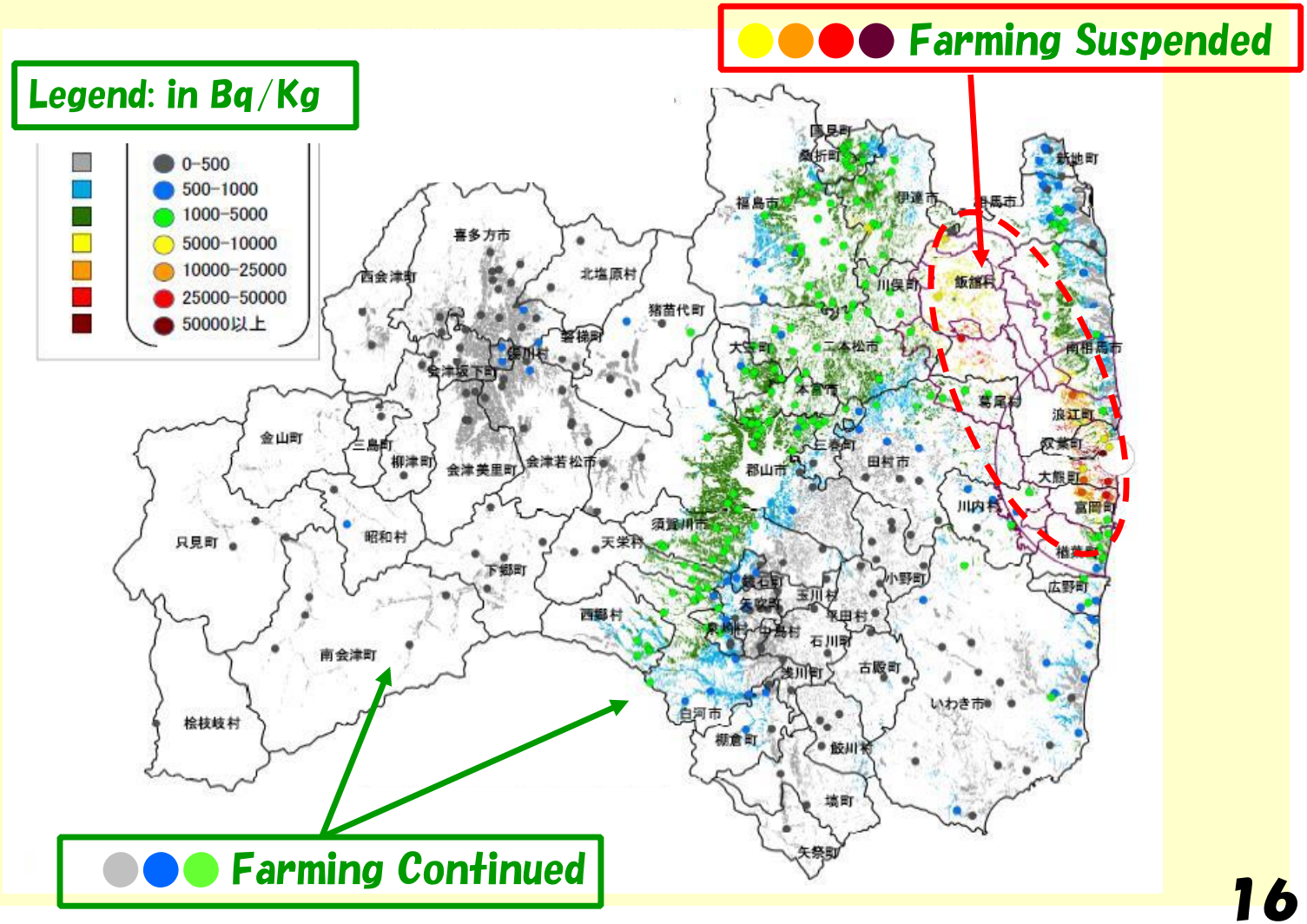
Measures in place to prevent Internal Exposure by Radioactive Cesium

- To prevent Internal exposure by intake of radioactive cesium, a strict standard for hood and water has been set forth and intensive monitoring and control are implemented.

- As for agricultural products, Cesium intake by plants is successfully restricted by keeping soluble potassium content in agricultural soil above some given level through additional use of potassium containing fertilizer.
- As to marine products, fishery off the Fukushima coast areas is basically prohibited except for relatively safer 17 species but still only on experimental basis.
- On dry and windy days soil particulates containing radioactive cesium are floating in the air and we could inhale or intake these particulates causing internal exposure. Based on the actual contamination levels, possible annual exposure doses caused by inhalation would be less than 0.1 microsievert.

Food Standard for Radioactive Cesium in Becquerel / Kg	
Category	Upper Limit
Potable Water	10
Dairy Product	50
General Food	100
Baby Food	50

Radioactive Cesium Density of Agricultural Soils in Fukushima



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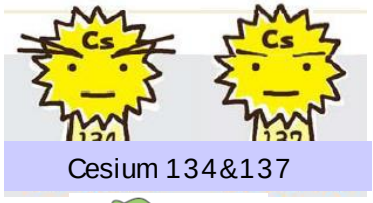
Fukushima Rice Crops of the year 2□□3

All the rice crops of year 2013 were monitored with Becqerel Monitors and test results read **99.93% of rice crops contain less than 25 Becquerels of Radioactive Cesium per Kilogram in the shape of Brown Rice.**

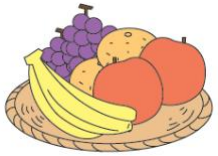
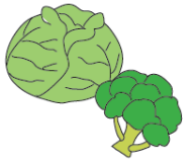
By polishing brown rice into polished rice, weight-wise Radioactive Cesium Content will be lowered down to 40%levels. Then by cooking polished rice with water, weight-wise Cesium density will further be lowered down to 10%levels.

Cooked rice contains less than 2.5 Becquerels per Kilogram.

A bowl of cooked rice contains



0.5 Becquerels of radioactive cesium at most.

I, Aoki eat  &  Without any concerns.

□□

Internal Exposure Caused by taken in Radioactive Cesium

By sliding in this void and waiting for 1 minute, we could know the amount of radioactive cesium inside of our bodies.

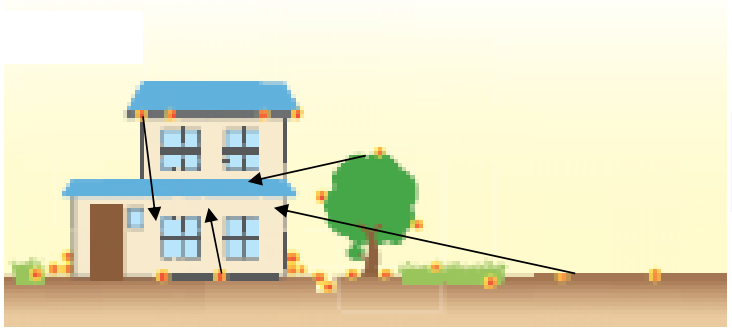
Whole Body Counter

We could know the amount of Radioactive Cesium taken inside of our bodies by using Whole Body Counter. Nearly 100% of Fukushima People's test results have been less than 300 becquerels per whole body. If 300 becquerels of Radioactive Cesium are maintained in our bodies throughout a year, Annual Internal Exposure Dose would be less than 0.01 millisievert.

As for Internal Exposure, World Target level of Radiological Protection is 1 millisievert per year. Against this target level, Fukushima people's actual exposure dose levels could be said so well controlled.

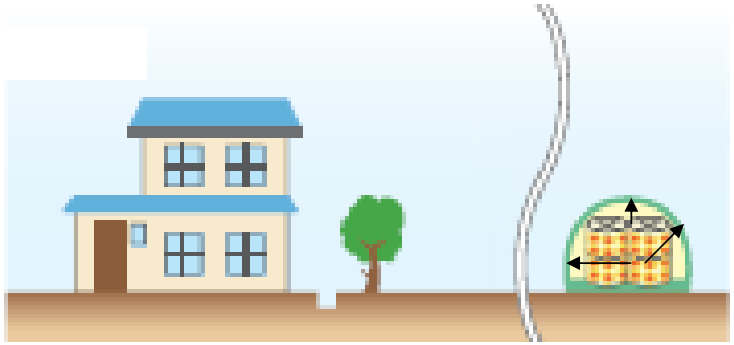
Principles of Decontamination

Status Quo



Radioactive Pollutants are scattered in the living environment, sticking to the surfaces of soil, lawn, roof, treetops etc. as well as in drain spouts and water ditches. Gamma rays emitted from these radioactive pollutants are continuing radiation and exerting effects on residents

Decontaminated



Decontamination is

1 To collect and remove RP
2 To contain RP not to be re-scattered
3 To shield RP with soil covers
4 To store and keep RP in safe condition

For decreasing Gamma Ray Exposure of residents and safeguard their health

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Target levels of Decontamination For Non-Evacuation Areas

Long-term target of Decontamination for Non-Evacuated Areas as well as Evacuated Areas is to reduce Annual Additional External Exposure Dose down to 1millisievert/year. Equivalent hourly air dose rate is 0.23 microsievert/hour.

Long-term target signifies it is not always possible to realize this target level only by Decontamination.

Interim target of Decontamination is to halve the Air Dose Rate by August 2013 if compared with that of August 2011. As for the living environments of children, this reduction target is not 50% but 60%.

Follow-up studies done in the autumn of 2013 have proved Air Dose Rate in Decontaminated places are less than 40% of Before-Decontamination levels.

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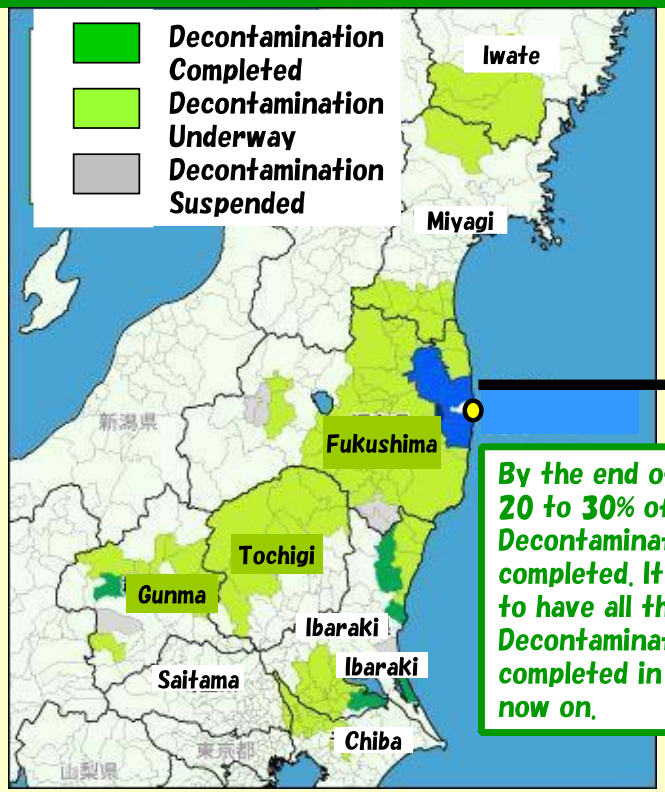
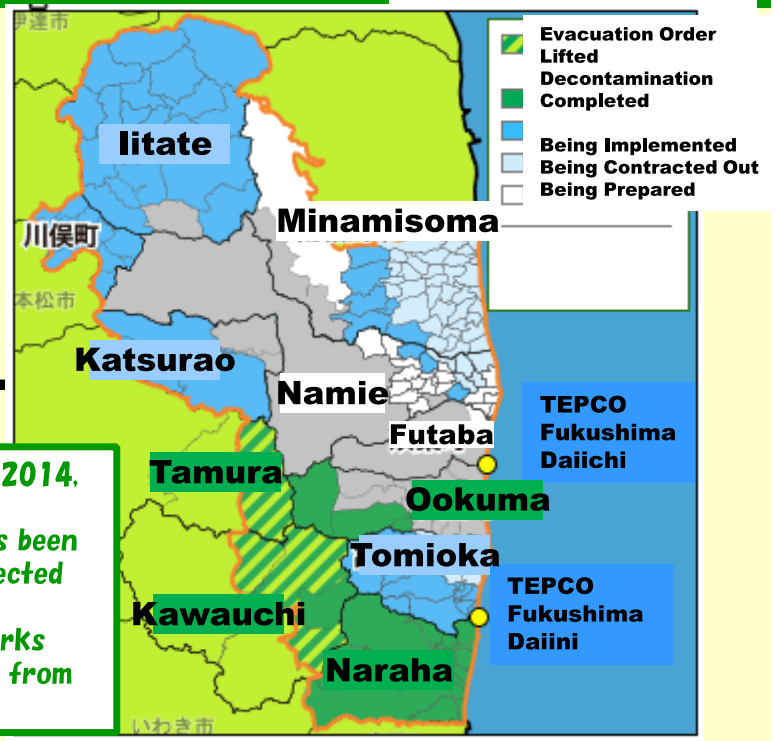
Areas Where Decontamination has been planned and implemented



By the end of Marc 2014, 20 to 30% of Decontamination has been completed. It is expected to have all the Decontamination works completed in 3 year from now on.



Dark & Light Green Areas + Grey Areas Where Air Dose Rate exceeds 0.23microsievert per hour have been designated as Intensive Survey Areas of Contamination, encompassing 100 municipalities in 8 prefectures. Total surface areas are 24000km².

Respective municipalities are implementing Decontamination.

Blue Areas are consisted of former Alert Areas (in 20km radius) and former Planned Evacuation Areas where Evacuation Order has been issued and 84000 residents have been evacuated. These areas are encompassing 11 municipalities and surface areas of 1140km²

Central Government (MOE) is implementing Decontamination.

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Target of Decontamination for the Evacuated Areas

As for the areas where mandatory evacuation order is in place, consisting of former alert areas in 20 Km radius of Fukushima Daiichi NPS and former planned evacuation areas where Air Dose Rate levels have once exceeded the threshold for issuing mandatory evacuation order (which is 20 millisievert/year or 3.8 microsievert /hour) , Decontamination targets are as follows:

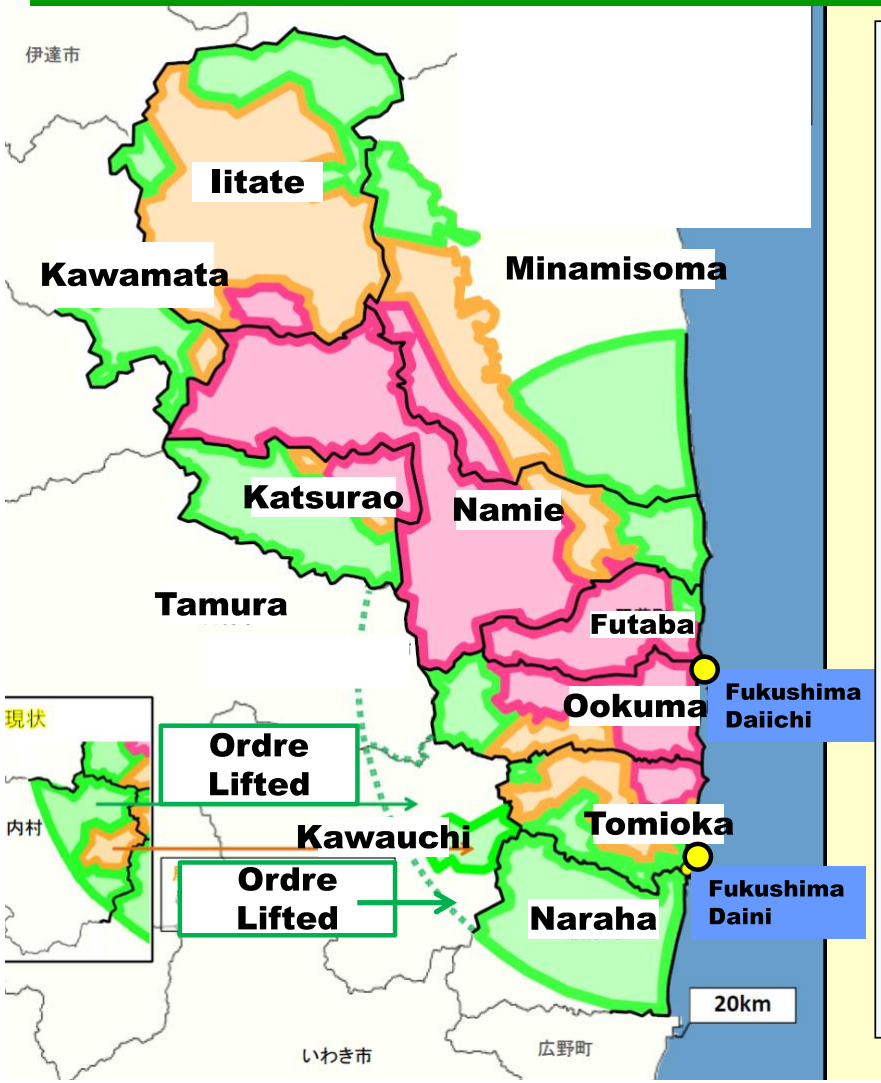
1 For the areas of which Air Dose Rate levels have already cleared 20 millisievert/year threshold, the Decontamination target is the same as that for the Non-evacuated Areas.

2 For the areas of which Air Dose levels are in between 20 millisievert/year and 50 millisievert/year, the Decontamination target is to lower them down to 20 millisievert/year or less.

3 As for the areas of which Air Dose levels are currently exceeding 50 millisievert/year and the mandatory evacuation order could not be lifted for at least 5 years, priority is given to R&D activities to develop more effective decontamination methods.

22

Evacuation Areas have been divided into 3 Areas based on Air Dose Rate levels



Areas to prepare for the lift of evacuation order
20 milliSv/year or less

	Surface Areas	Evacuated Population
	500km2 (44%)	33000persons (41%)

Areas to restrict habitation
20 to 50 milliSv/year

	300km2 (26%)	23000persons (29%)

Areas to prohibit returning
50 milli Sv/year or more

	340km2 (30%)	25000persons (31%)
Total	1140km2	81000persons

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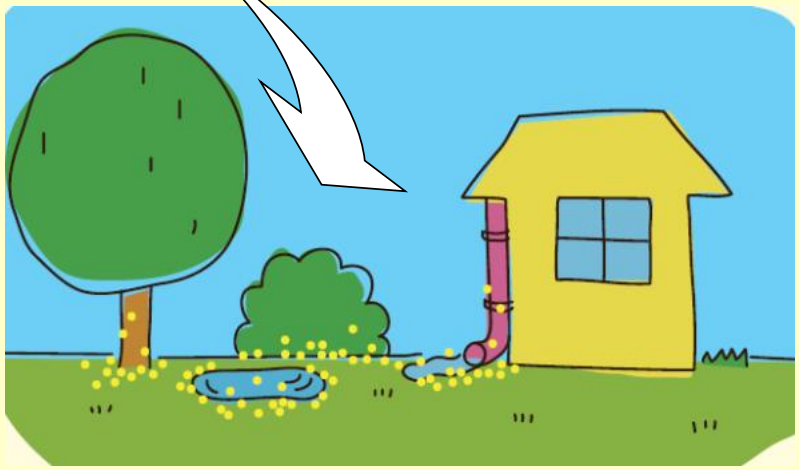
Radioactive Cesium which fell onto the surfaces of our environment has been relocated by the washing away (weathering) effect of precipitations.

Immediately after the accident of 3 years ago, all the soil, roof, pavement and tree surfaces were evenly contaminated with radioactive cesium.

In 3 years, rainfalls and snowfalls have been washing away radioactive cesium from roof, pavement and tree surfaces and relocated it to eaves troughs, drain spouts, road-side ditches and soil surfaces under trees.



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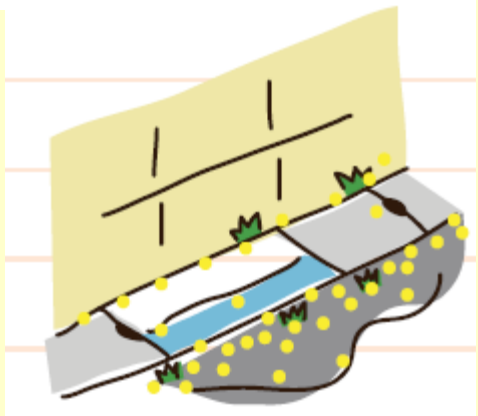
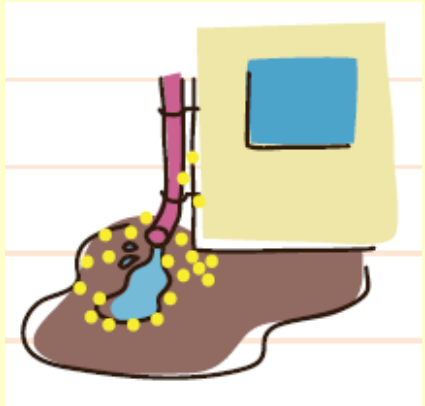
Places where Radioactive Cesium is tending to concentrate

Soil Surfaces under Trees

Depressions of Ground Surface



Road-side Ditches



Drain Spouts and Eaves Troughs

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Methods of Decontamination

Removal of sediments and washing of inner surface of eaves trough

Removal of fallen leaves and soil surfaces under trees

Removal of sediments and washing of Inner surface of road-side ditches

Removal of surface soil of school ground with heavy machine and burying in a pit bored in the ground

Brushing and wiping of rust or stain on roof surface

Removal of soil surface cm by cm with hand shovels & carrying out of removed soil to deposition site

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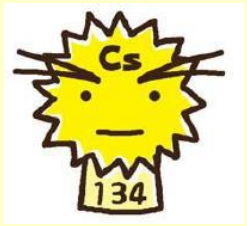
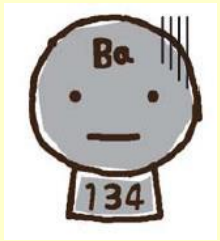
Radioactive Materials will naturally decrease thorough emitting Radiation and become Stable Materials

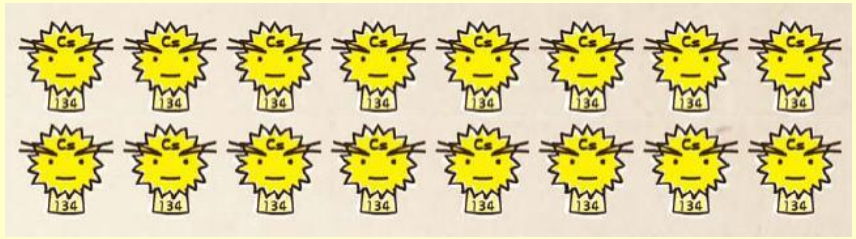


Radioactive Cesium 134

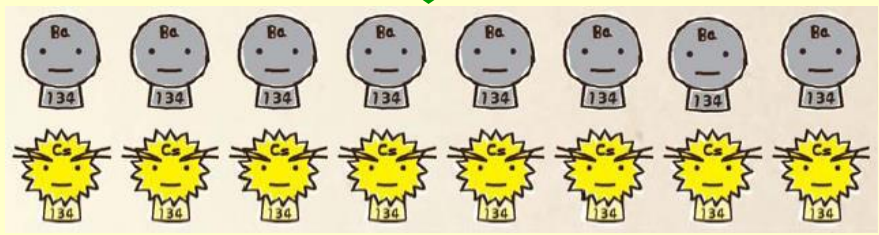


Non-radioactive Barium 134

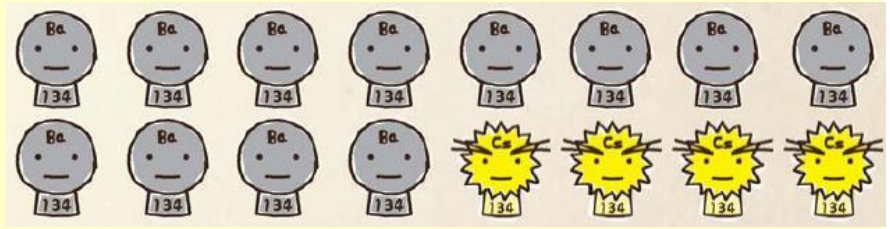
By emitting Radiation, Radio-acitive Cesium turns to Non-radioactive Stable Barium. In this way Amount of Radioactive Cesium134 halves in every 2 years.



In 2 years



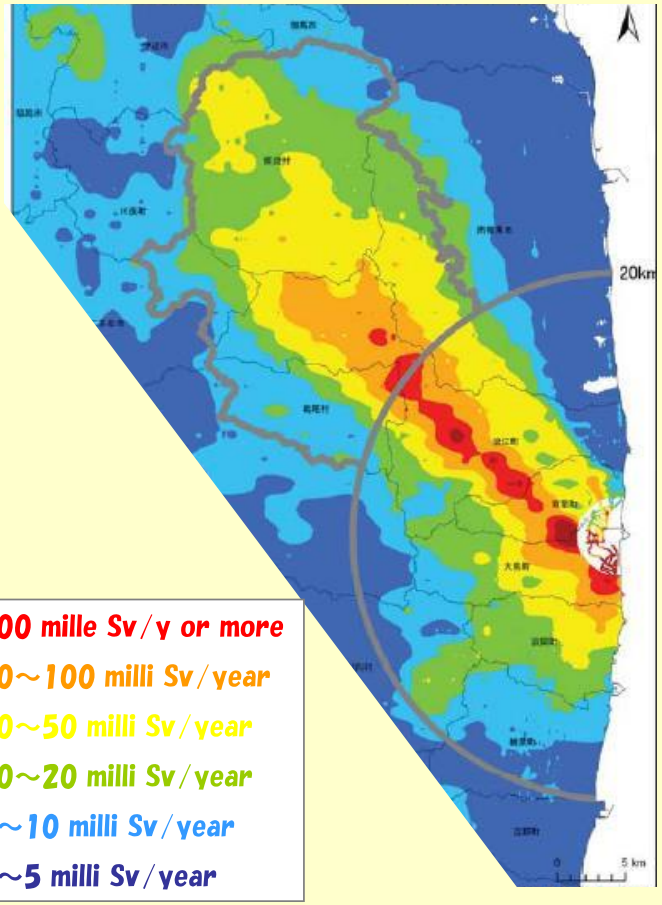
In 2 years



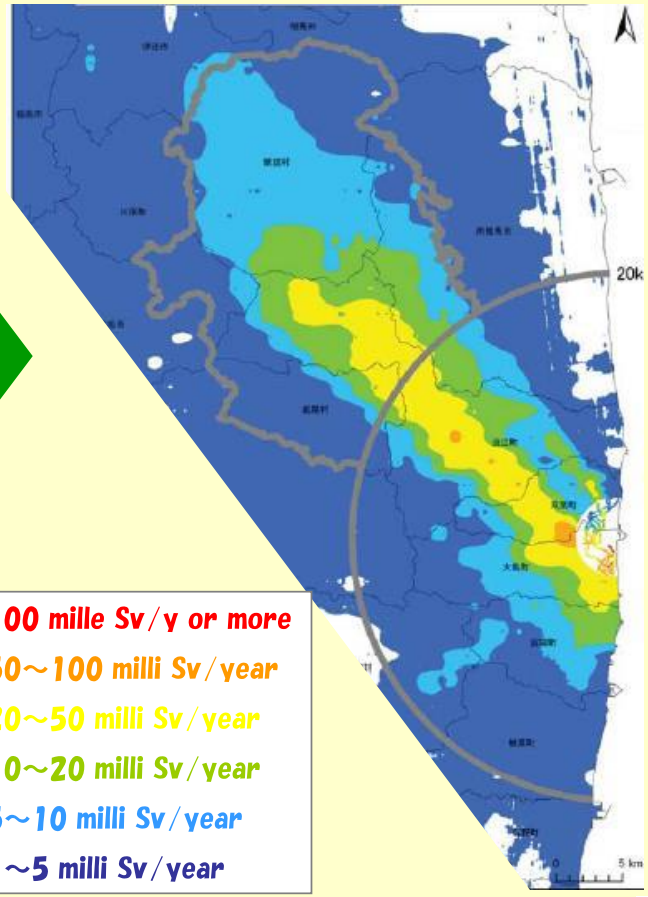
27

Future Projection of Air Dose Rate through Natural Decay and Weathering Effect

As of March, 2013



As of March, 2022



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Thank you for your audience !

If you have any questions or require any information, please feel free to contact us by phone or mail ♪

Decontamination Information Plaza
Phone: #81-024-529-5668
E-Mail: josen-plaza@env.go.jp

Appendix C: The Truth About Radiation

Document Title: The Truth About Radiation
Available for download from: http://www.fukko-pr.reconstruction.go.jp/2017/senryaku/
Acquired: In person, over dinner at Yuta and Reina's house in July 2018.

English Translation by: Aleksandr Sklyar and Tomoki Birkett, August 2018
Author, Publisher, and Distributor: Reconstruction Agency, Japan
Publication Date: March 2018
Of note: This pamphlet was made in accordance with the "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication" (p. 30). The full text of the Strategic Plan is available online here: http://www.fukko-pr.reconstruction.go.jp/2017/senryaku/.

Target Audience: According to the Reconstruction Agency's (2017) "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication [fūhyō fushoku risuku comyunikēshon kyōka senryaku]," the targets of the Strategic Plan are:

> The target audience for the Reconstruction Agency's "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication" is as follows:
>
> 1. Persons involved in education, such as elementary, middle, and high school students and educators
> 2. Expectant and nursing mothers, guardians of infants and elementary, middle, and high school students
> 3. Broadly, the Japanese citizenry [*hiroku, kokumin ippan*]
>
> Reasons for targeting these audiences:
> At the heart of unfounded prejudice and discrimination that claims the nuclear disaster as its cause, such as the problem of bullying of disaster victims, there is a lack of understanding the correct knowledge about radiation and a lack of knowledge of the current circumstances of Fukushima prefecture.
>
> Since there is the danger that misinformed perspectives stemming from this lack of knowledge might harden with the passing of time, there is a need for swift and sweeping dissemination of information to the general citizenry, including regions where residents have had limited contact with information about radiation up to now. In particular,

since it is through the education of schoolchildren that foundations of values are formed, there is a need to communicate accurate information using contents that will be easy for schoolchildren to understand. Furthermore, the dissemination of information to guardians, including expectant and nursing mothers, is also very important; there is a need to deliver absolutely correct information to pregnant and nursing mothers, who strongly seek information about health effects to children and the like.

（１）伝えるべき対象
①児童生徒及び教師等教育関係者
②妊産婦並びに乳幼児及び児童生徒の保護者
③広く国民一般
【対象とする理由】

被災児童生徒へのいじめの問題をはじめとした原子力災害に起因するいわれのない偏見や差別の背景には、放射線に関する正しい知識の理解の欠如と福島県の現状に対する認識不足がある。
こうした認識不足による誤解は、時間の経過とともに固定化していくおそれがあることから、これまで放射線に関する情報に接することが少なかった地域の住民を含め広く国民一般に対して早急に情報の発信が必要である。
特に、価値観の礎となる児童生徒への教育では、正しい知識を持った教師等が授業で使いやすく、児童生徒が分かりやすいコンテンツを基に正確な情報を伝える必要がある。
また、これから子供を持つ妊産婦を含めた保護者への情報発信も重要であり、子供の健康影響等に関する情報を強く求めている妊産婦等にも確実に正しい情報を届ける必要がある。

On-going Contestations: Numerous. Including:
(1) The numbers on the water and food page are wrong. the japan numbers are for "ordinary conditions" and the other numbers are on the lower end of "emergency conditions" for the EU, US, and Codex/WHO. I am not sure, however, if that's just an "anti-safety" group graphic.

(http://anti-hibaku.cocolog-nifty.com/blog/2018/08/post-4c13.html)
(http://anti-hibaku.cocolog-nifty.com/blog/2018/10/qa-f872.html)

(2) The inappropriate risk comparison.

(https://level7online.jp/2018/%E5%BE%A9%E8%88%88%E5%BA%81%E3%81%AE%E3%80%8C%E6%94%BE%E5%B0%84%E7%B7%9A%E3%81%AE%E3%83%9B%E3%83%B3%E3%83%88%E3%80%8D%E3%82%92%E6%A4%9C%E8%A8%BC%E3%81%99%E3%82%8B%E2%91%A0/)

(3) Even if corrections are made, the desired effect of getting everyone to read it cannot quickly be undone, now that the government-sponsored misinformation has been spread.

(http://www.ourplanet-tv.org/?q=node/2293)

Figure Appendix C. 3 "The Truth about Radiation" Pamphlet, Reconstruction Agency, English Translation by Aleksandr Sklyar and Tomoki Birkett (32 pages)

It's been 7 years.

7 years have passed since the unprecedented earthquake and nuclear disaster, and damaged areas have made steady progress towards recovery.

However, there are new forms of harm that are now on the rise. They are called prejudice, discrimination, damage from harmful rumors, and the like.

"I will catch radiation from people who evacuated from Fukushima."
It's due to this kind of ignorance that some children face bullying.

"I might not be able to bear healthy children in the future because I lived close to the TEPCO Fukushima No. 1 nuclear power plant."
There are girls who worry because of these kinds of false beliefs.

"I won't eat food from Fukushima because it's contaminated."
There are farmers who suffer because of this kind of misconception.

But what's making these people suffer isn't radiation itself, but the mistaken beliefs and misconceptions that come from people's ignorance.

Even if you cannot support recovery efforts in person,
there is a way that you can help those who are suffering.
By educating yourself.

Learn the correct information,
think about it for yourself,
and then act.

We believe
that is exactly the way to build a bright future for children.

First, please look over this pamphlet.
Then, if you have the chance, please visit Fukushima, taste the food,
and chat with the locals.

Surely you will be met with more smiles and laughter than you would have ever imagined.
Come, let's move towards our next future together.

What is radiation, anyways?

Radioactivity, Cesium, Becquerels, Sieverts…
Strange, unfamiliar words were flying all over the news.
You all must have felt anxious and fearful then.

But you have to have heard of words like
"infrared rays, ultraviolet rays, Wi-fi, and X-rays."
All of these are what we call electromagnetic waves.

Electromagnetic waves have the properties of waves,
and radiation refers to the waves that are short in length.

Also, in addition to this, small particles that fly at high speeds
(e.g. electrons) are also radiation.

Alright, now let's learn the specifics about radiation.

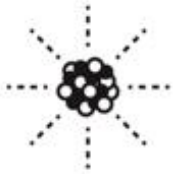
3

Units of Radioactivity and Radiation

When compared with a lightbulb

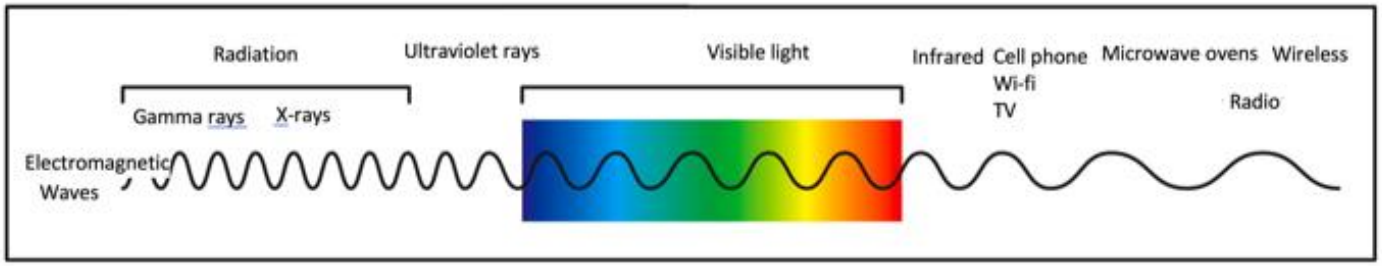
Radioactive materials (e.g. Cesium 137)
Radioactivity (the ability to emit radiation)
Unit: Becquerel

The light source (lightbulb)
The power to emit light
Unit: Watt



Radiation
Unit: Sievert
(The unit of radiation exposure for people)

Light
Unit: Lux
(Unit of brightness)



4

Can't you have zero radiation?

It's always been all around you.
It's in the air and in our bodies,
It's also used in X-ray imaging and CT scans.

By the way, the average amount of radiation that Japanese people receive per year is:
2.1 millisieverts from natural sources, and 3.9 millisieverts from medical practice.

So that's why **you can't make the radiation around you go down to zero.**

5

6

Does radiation transfer from person to person?

Radiation does not transfer.

It is not like a virus and it does not multiply like bacteria.

7

8

Do the effects of radiation
get passed down to newborn children and grandchildren?

They do not get passed down.

There have been no reports that there is any evidence demonstrating hereditary effects from radiation exposure in HUMANS.

Furthermore, there is no difference between the incidence rate of things such as congenital defects among children who were in their mother's tummy at the time of the disaster and incidence rates among children from other areas.

9

10

Is it bad for your body to be exposed to radiation?

Radiation effects on health are not a question of whether [radiation] is present or not. The "amount" is what matters.

Since there is normally very little radiation around you, there are no health effects.
You can't see radiation, but it's easy to measure.

11

12

What's the amount you have to be exposed to for there to be health effects?

It is commonly said that your risk of dying from cancer increases if you are exposed to 100 millisieverts, but

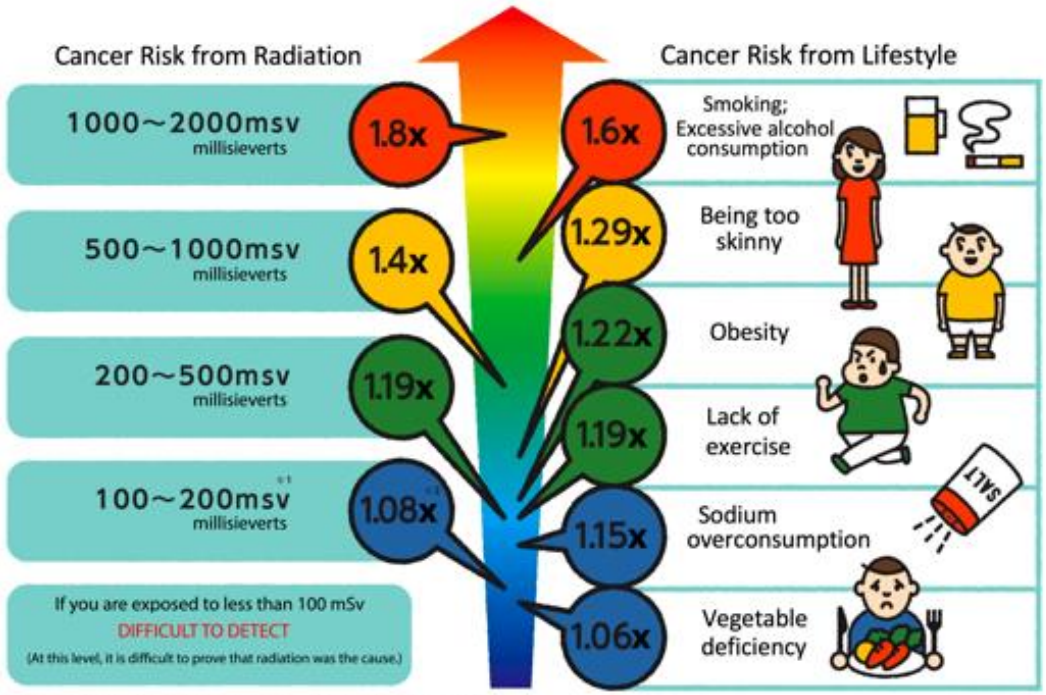
the increase in your risk of developing cancer from being exposed to 100 – 200 millisieverts
is about the same as not eating enough vegetables or eating too much sodium.

By the way, 100 millisieverts of exposure is equivalent to about 500 – 1,000 round trip flights from Tokyo to New York City.

13

14

Cancer Risks and Causes (from radiation, lifestyle-related diseases, etc.)
\The increase in cancer risk/



16

15

Weren't there any negative health impacts for people who lived close to the TEPCO Fukushima No. 1 nuclear power plant?

According to studies about the levels of radiation people in the area were exposed to,
the level of radiation exposure in Fukushima Prefecture was extremely limited, and
it has not been proven that there have been any health impacts.

17

18

Shouldn't we be concerned that people will get sick in the future from the radiation from the TEPCO Fukushima No. 1 nuclear power plant accident?

Reports on the effects of atomic radiation by the UN Scientific Commission on the Effects of Atomic Radiation have assessed that:

- **There are no people who have died, developed severe illnesses, lost their hair, or anything of the like;**
- **It is not predicted that cancers will increase;**
- **There is no need to think about a large increase in radiation-induced thyroid cancers in Fukushima Prefecture like what happened with the Chernobyl NPP accident.**

19

Was the TEPCO Fukushima No. 1 nuclear power plant accident on about the same scale as Chernobyl?

There are two main differences between the two.

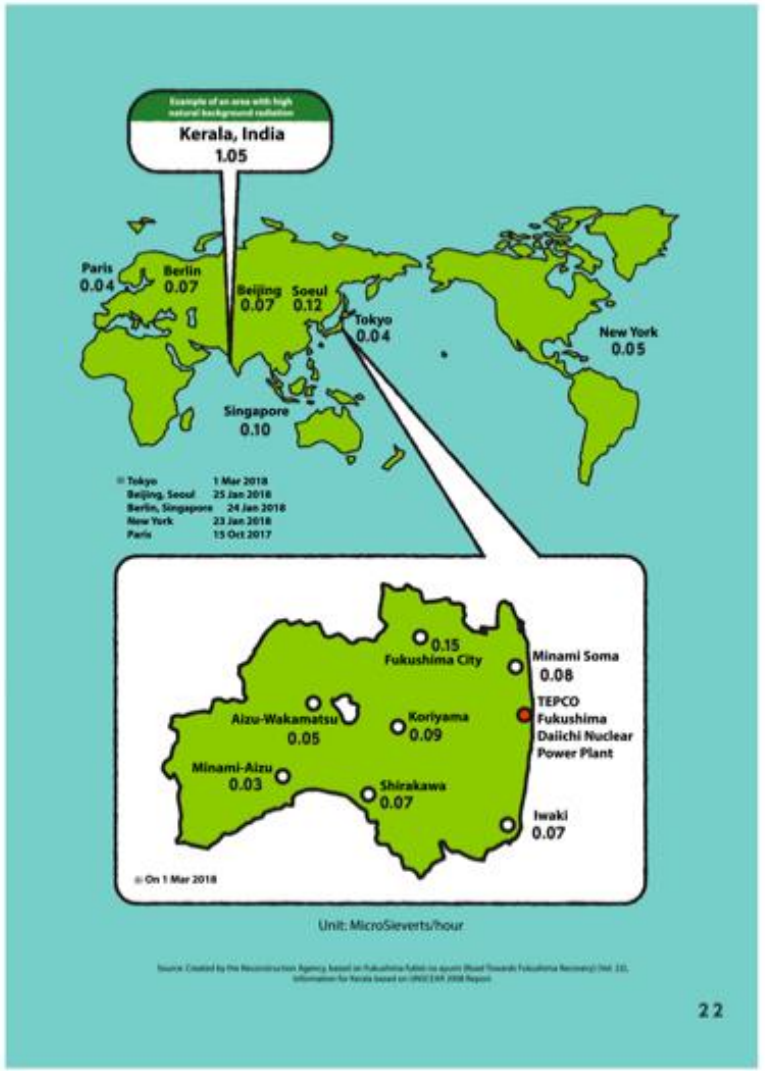
- **1/7 the amount of radioactive materials was released into the atmosphere compared to Chernobyl.**
- **Thanks to the swift response after the accident, which included evacuation orders and shipping restrictions, among other things, the amount that got into people's bodies was also much smaller.**

20

What are the radiation levels like in major cities in Fukushima Prefecture?

In the 7 years following the accident, they have gone down drastically. They are about the same as in major cities in Japan and abroad.

21



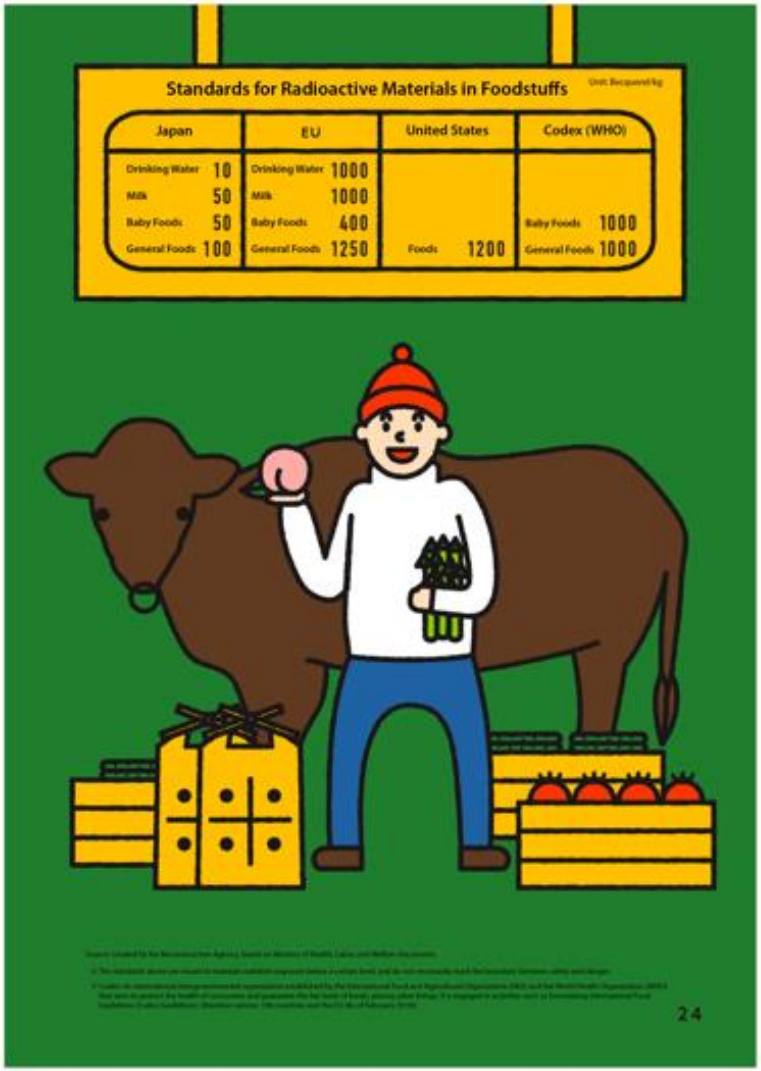
22

Can we feel reassured about the safety of the food that we eat every day?

Japan has established the strictest standards for [radiation] levels in the world and screens food and drinking water according to these standards. The system is made so that if something exceeds the standards, then it does not go to a point-of-sale.

Currently in Fukushima Prefecture, there is almost nothing that exceeds regulations.

23



24

What are people from areas around the TEPCO Fukushima No. 1 nuclear power plant doing?

In Fukushima Prefecture, roughly 1.9 million people are living their everyday lives as usual.
Furthermore, the areas for which evacuation orders have been issued have shrunk to 2.9% of the prefecture's total area and

everyday life is also returning to people who have gone home to their homes and hometowns.

25

26

What we want you to know:

10 Key Points and Important Things about Radiation

1. It's always been all around you and cannot be made to zero.

2. Radiation does not transfer.

3. The effects of radiation are not inherited.

4. Radiation's effects on health are not a question of whether [radiation] is present or not. The "amount" is what matters.

5. The increased risk of developing cancer from 100 – 200 milliSieverts of radiation exposure is about the same as not eating enough vegetables or eating too much sodium.

6. It has not been proven that there have been any health effects because of radiation from the TEPCO Fukushima No. 1 nuclear power plant accident.

7. Reports by the UN Scientific Commission on the Effects of Atomic Radiation assess that there have been no people who have died, developed severe illnesses, lost their hair, or anything of the like as a result of radiation from TEPCO Fukushima No. 1 nuclear power plant accident. It is not predicted that cancers will increase. There is no need to think about a large increase in radiation-induced thyroid cancer in Fukushima Prefecture.

8. The amount of radioactive materials released into the atmosphere by the Tokyo Electric Power Company Fukushima Daiichi Nuclear Power Plant accident was 1/7 that of Chernobyl. Thanks to the swift response after the accident, which included evacuation orders and shipping restrictions, among other things, a much smaller amount got into people's bodies.

9. In the seven years following the accident, radiation levels in major cities in Fukushima Prefecture have gone down drastically, and are now about the same as other major cities in Japan and internationally.

10. Japan has established the strictest standards for [radiation] levels in the world and screens food and drinking water according to these standards. It is made so that if something exceeds the regulations, it does not go to a point-of-sale.

In Fukushima Prefecture, roughly 1.9 million people are living their daily lives as usual. Furthermore, daily life is returning to people who have gone home to their homes and hometowns.

What did you think of this pamphlet?

Even just buying Fukushima peaches or rice at the store;
even just saying something friendly to families who have moved from Fukushima;
even just coming with your family to Fukushima to enjoy the cherry blossoms or a festival;
even just sharing the information in this pamphlet with someone;
even just that is a form of recovery support.

Our deepest hope is that
when today's children become adults,
there will no longer be any need for this pamphlet.

Let us walk together towards that future.

We consulted with the following experts to make this pamphlet:

Ryugo Hayano[i]	Professor Emeritus, National University Corporation[ii] Tokyo University
Noboru Takamura	Professor, Department of Global Health, Medicine, and Welfare,[iii] Atomic Bomb Disease Institute,[iv] National University Corporation Nagasaki University
Reiko Kanda	Center Director, Center for Radiation Protection Knowledge,[v] Radiological Science Research and Development Directorate,[vi] National Institute for Radiological Sciences (NIRS), National Institutes for Quantum and Radiological Science and Technology[vii]
Kozue Ochi	Adjunct Doctor, Soma Central Hospital[viii]
Masaki Ichinose[ix]	Professor, Graduate School of Humanities and Sociology, National University Corporation, Tokyo University
Hiroshi Kainuma[x]	Associate Professor, The Kinugasa Research Organization, Incorporated Educational Institution, Ritsumeikan University
Michihiko Yanai[xi]	Creative Director
Hitomi Kumasaka[xii]	President, SML, Co. Ltd.[xiii]
Naoko Seki	Nanakusa Farm[xiv]
Nobuyuki Ikeda	Section Chief, Sightseeing Strategy Division, Domestic Affairs Headquarters, JTB [Japan Travel Bureau] Group

This pamphlet was made in accordance with the "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication."
You can learn about this in greater detail at the following website:

http://www.fukko-pr.reconstruction.go.jp/2017/senryaku/index.html

For detailed information on radiation, please see "Basic Information about Radiation Risks":
http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-1/20140603102608.html

Please share your opinions about this pamphlet and the "Strategic Plan for Harmful Rumor Eradication and Strengthening Risk Communication" here:
Info-senryaku@cas.go.jp

Printed: Reconstruction Agency, March 2018

Walk together for the future.

The following are links to webpages that introduce the experts consulted by the Reconstruction Agency in creating "The Truth About Radiation" pamphlet. Links were researched and gathered by Aleksandr Sklyar.

i. http://office-hayano.com/
ii. As of 2009, several national universities were made into "national university corporations." https://ja.wikipedia.org/wiki/国立大学法人
iii. http://www-sdc.med.nagasaki-u.ac.jp/radepi/index_e.html
http://www-sdc.med.nagasaki-u.ac.jp/radepi/
iv. http://www-sdc.med.nagasaki-u.ac.jp/abdi/index.html
v. http://www.nirs.qst.go.jp/ENG/core/rsc/index.html
http://www.nirs.qst.go.jp/rd/rsc/index.html
vi. http://www.nirs.qst.go.jp/ENG/index.html
vii. http://www.qst.go.jp/topics/itemid047-001203.html
http://www.qst.go.jp/about/outline.html
viii. http://www.tachiya.or.jp/doctorsguide/doctors_015.html
https://www.nikkei.com/article/DGXMZO98031560U6A300C1000000/
ix. http://www.l.u-tokyo.ac.jp/philosophy/profichinose.html
x. http://kainumahiroshi.net/
http://research-db.ritsumei.ac.jp/Profiles/127/0012663/prof_e.html
xi. https://www.yanaimichihiko.jp/
https://ja.wikipedia.org/wiki/%E7%AE%AD%E5%86%85%E9%81%93%E5%BD%A6
xii. http://socialmedialabs.jp/company/profile/
xiii. http://socialmedialabs.jp/
xiv. http://www.minamitohoku.or.jp/up/news/southerncross/2010-59/top.htm

Figure Appendix C. 4 "The Truth about Radiation" Pamphlet, Reconstruction Agency, Japanese Original

あれから7年。

未曽有の大震災と原子力災害から7年の月日が経ち、
被害にあった地域も、徐々に復興が進んできました。

しかし、今なお新たな被害も発生しています。
それは、偏見・差別や風評被害です。

「福島から避難してきた人間からは放射線がうつる」
そういった知識不足からいじめにあう子がいます。

「東京電力福島第一原子力発電所の近くに住んでいたので、
将来元気な赤ちゃんが産めないのではないか」
そういった思い込みから悩んでいる女の子がいます。

「福島の食べ物は汚染されているから食べない」
そういった誤解から苦しんでいる農家の方がいます。

でも、そんな人々を苦しめているのは放射線そのものではなく、
知識不足から来る思い込みや誤解です。

復興支援に行けなくても、
苦しんでいる人たちのちからになれる方法があります。
それは知ることです。

正しい情報を知り、
自分の頭で考え、
そして行動する。

それこそが子どもたちの明るい未来を築くための方法だと、
私たちは信じています。

まずはこの冊子に目を通してみてください。
そして機会があれば福島を訪れ、食べ物を味わい、
地元の方と言葉を交わしてみてください。

きっと、想像以上の笑顔が、
みなさんを迎えてくれるはずです。
さあ、次の未来へ、ご一緒に。

そもそも放射線ってなに？

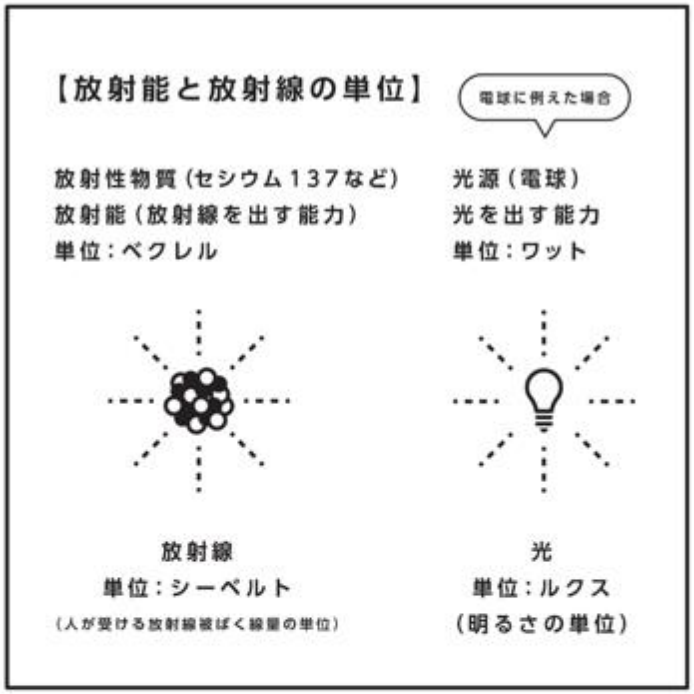
放射能、セシウム、ベクレル、シーベルト…。
なんだか聞きなれない単語がニュースを飛び交い、
みなさんも当時不安になったことでしょう。

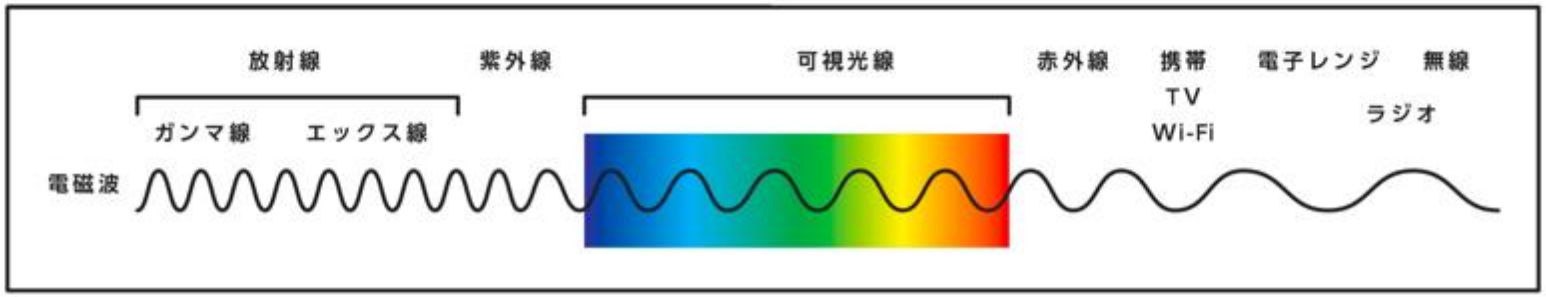
でも、赤外線、紫外線、Wi-Fi、エックス線、
このあたりの言葉ならきっと聞いたことがあるはずです。
それらは全て電磁波というものです。

電磁波は波の性質を持っており、
その波の長さが短いものが放射線です。

また、この他にも、高速に飛ぶ小さな粒子（電子など）も
放射線です。

それでは、放射線について具体的に学んでいきましょう。





4

3

放射線はゼロにできないの？

ふだんから身の回りにあります。

空気や身体の中にもありますし、
エックス線撮影やＣＴスキャンでも使われています。
ちなみに、日本人が受ける年間の放射線量は平均で、
自然界から２・１ミリシーベルト、医療行為から３・９ミリシーベルトです。
なので、**身の回りからはゼロにはできません。**

放射線は人から人にうつるの？

放射線はうつりません。

ウイルスとは違いますし、ばい菌のように増殖もしません。

放射線の影響は
生まれてくる子どもや孫に遺伝するの？

遺伝しません。

放射線を受けたことによる
ヒトの遺伝性影響を示す根拠は報告されていません。
また、事故の時、お母さんのおなかの中にいた子の
先天的障害の発生率なども、他の地域の子どもと変わりません。

放射線を受けると身体に悪いの？

放射線の健康への影響は ある・なしではなく「量」が問題です。

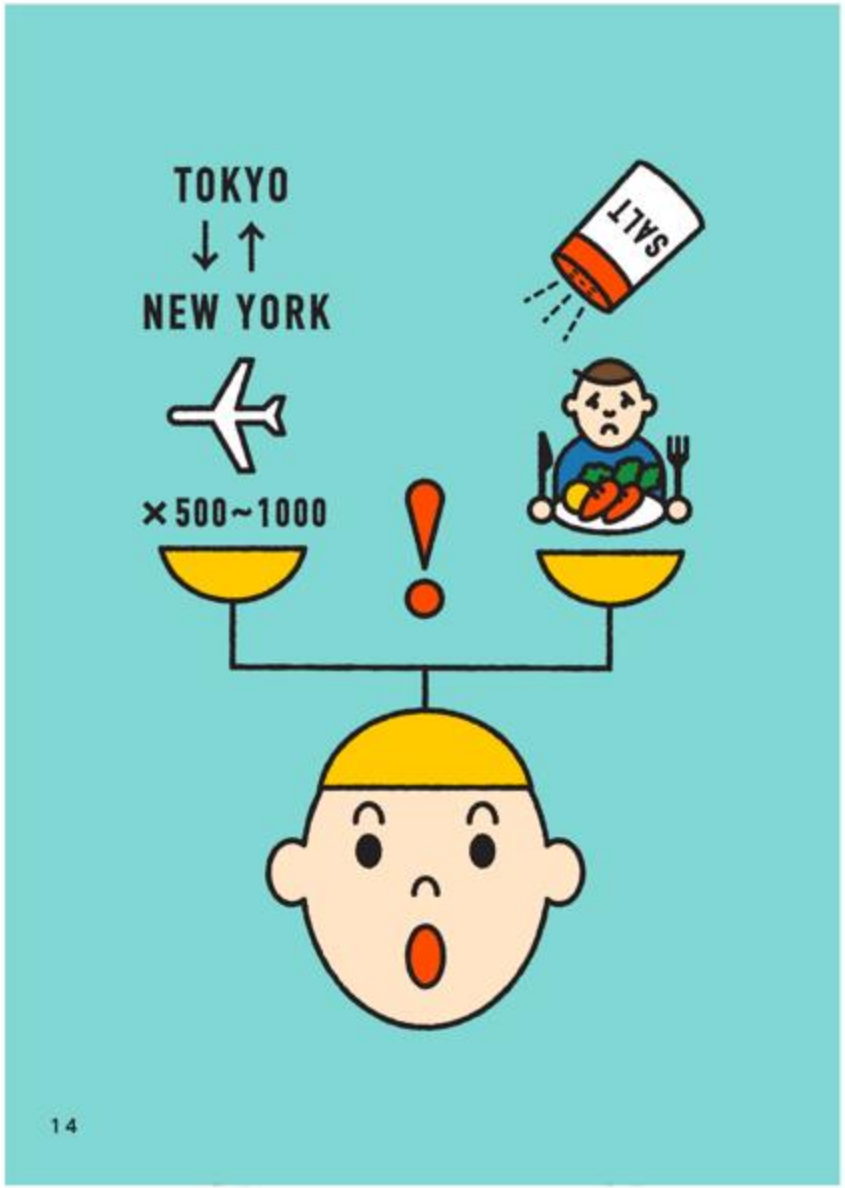
ふだんの身の回りの量はわずかなので、健康への影響はありません。
放射線は見えませんが、簡単に測ることができます。

どれくらいの量なら健康に影響があるの？

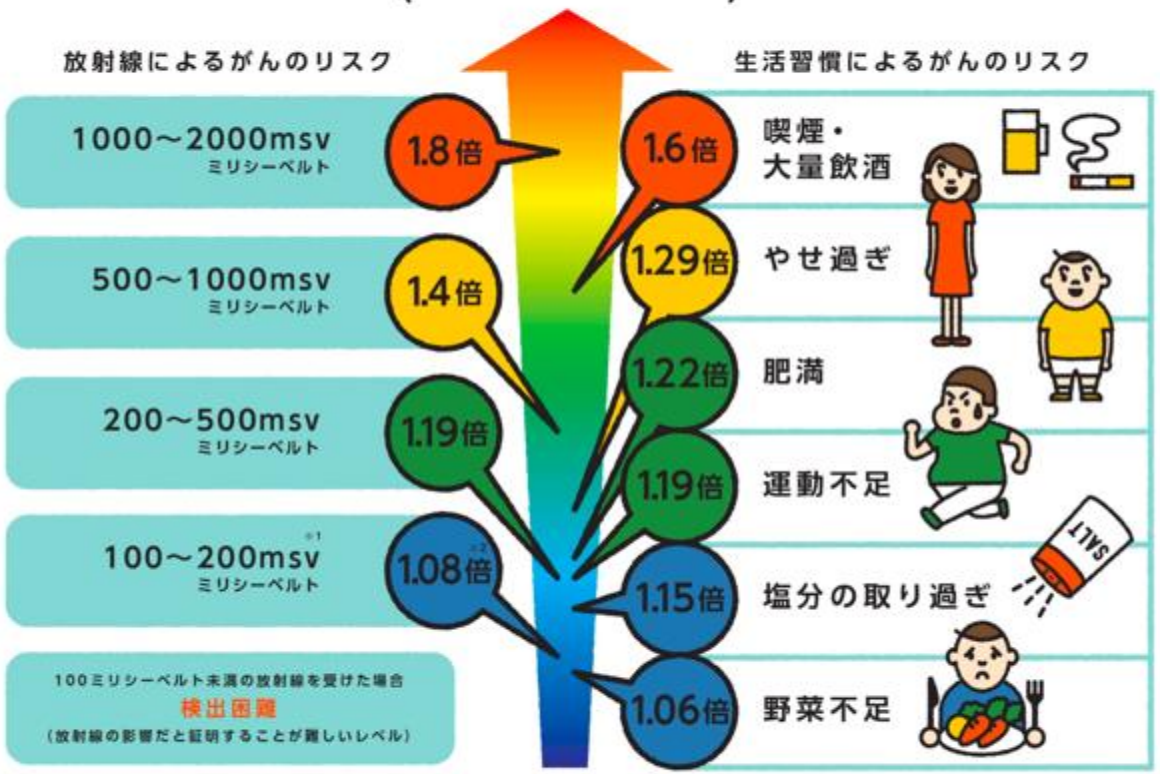
100ミリシーベルト以上被ばくすると
がんで死亡するリスクが上がると言われていますが、

100〜200ミリシーベルトの被ばくでの
発がんリスクの増加は、
野菜不足や塩分の取りすぎと
同じくらいです。

ちなみに100ミリシーベルトは、航空機で東京・ニューヨーク間を
約500〜1000往復した場合の被ばくに相当します。



【がんのリスクとその要因（放射線や生活習慣病によるもの）】



※1：100ミリシーベルトは、航空機で東京・ニューヨーク間を約500～1000往復した場合の被ばく、
または、1キログラムあたり100ベクレルの食品を約77トン摂取した場合の被ばく（注）に相当
（注）食品に含まれる放射性物質がセシウム137で成人が食べる場合
※2：放射線の被ばくがなく、喫煙などの生活習慣もない集団と比べて肺がんリスクが何倍高いかという数値

出典：国立がん研究センターウェブサイトを基に復興庁作成

東京電力福島第一原子力発電所の事故の放射線で、
周辺の人々の健康に影響はなかったの？

周辺の人々が受けた放射線量に関する調査などの結果、
福島県での被ばく線量は極めて限られており、
健康に影響が出たとは証明されていません。

東京電力福島第一原子力発電所の事故の放射線で、
将来的に病気の人が出てくる心配はないの？

原子放射線の影響に関する国連科学委員会の報告書では、

・亡くなったり、重い症状となったり、
　髪の毛が抜けたりした人はいない
・今後のがんの増加も予想されない
・チェルノブイリ原発事故のような
　放射線による多数の甲状腺がんの発生を
　福島県では考える必要はない

と評価されています。

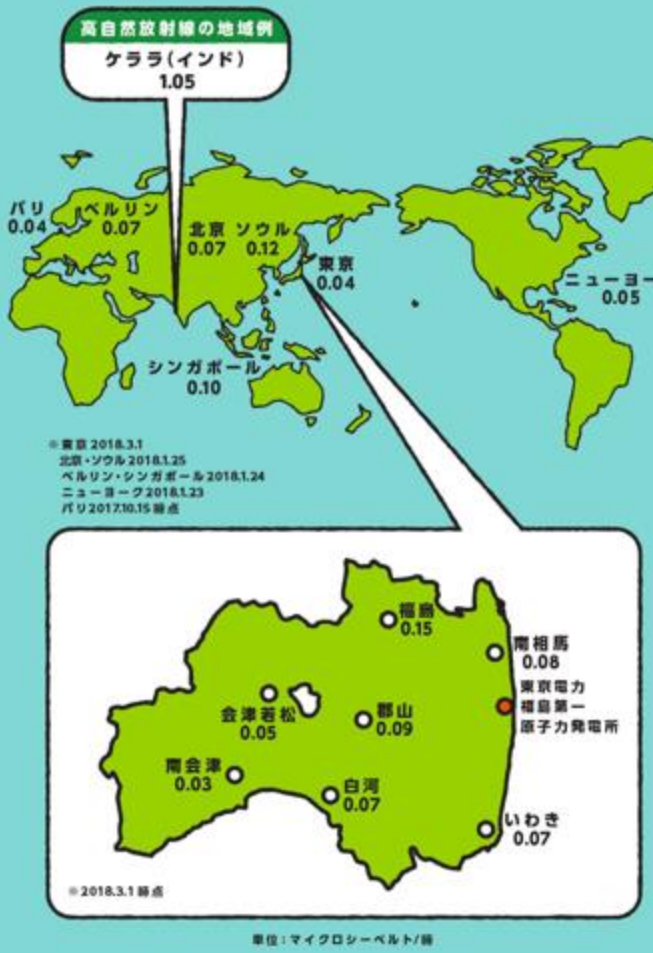
東京電力福島第一原子力発電所の事故は、
チェルノブイリと同じくらいの規模だったの？

大きく2つ違うところがあり、

・空気中に放出された放射性物質の量は
　7分の1でした。
・避難指示や出荷制限など事故後の
　速やかな対応によって、
　身体の中に取り込まれた量も
　ずっと少なかったです。

福島県内の主要都市の放射線量は
今どうなってるの？

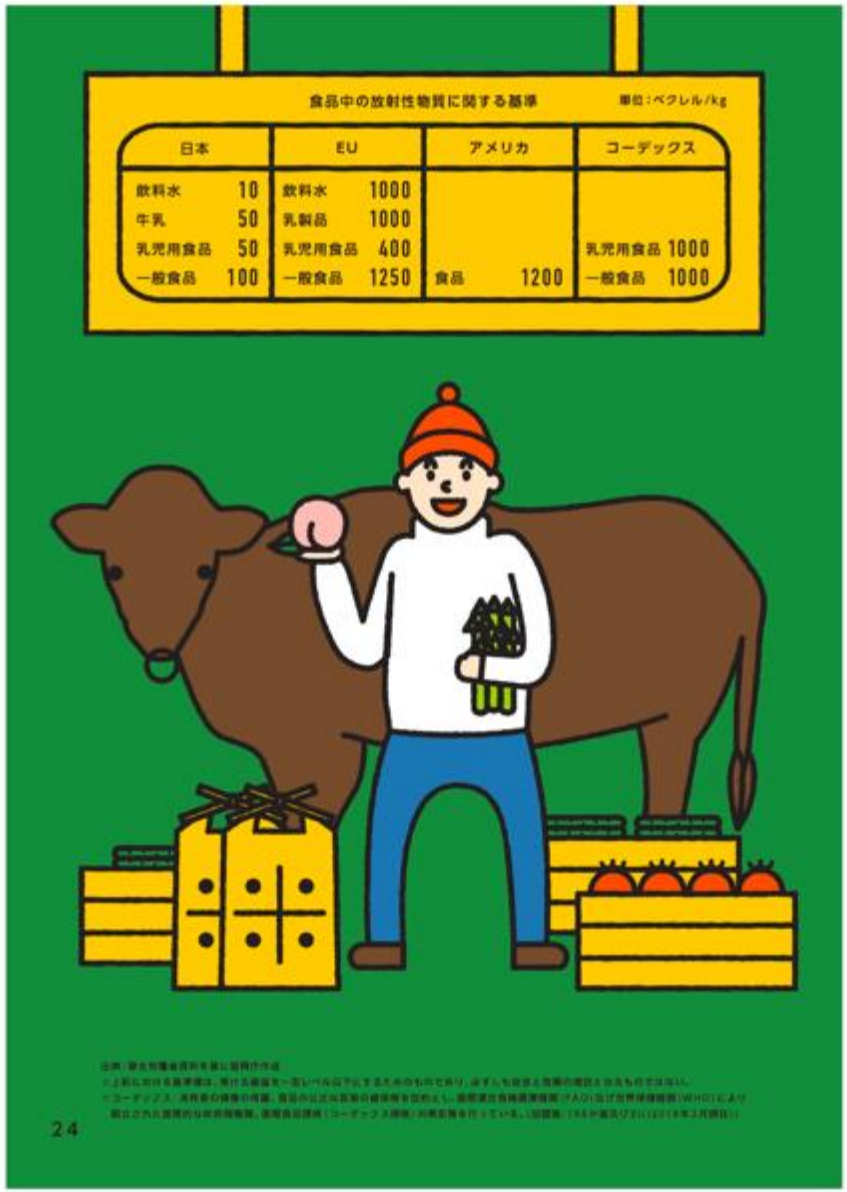
事故後７年で大幅に低下し、
国内外の主要都市と
変わらないくらいになりました。



私たちがふだん口にしている食べ物は
安心して食べていいの？

日本は世界で最も厳しいレベルの基準を設定して食品や飲料水の検査をしており、基準を超えた場合は、売り場に出ないようになっています。

福島県では現在、基準を超えているものはほとんどありません。



東京電力福島第一原子力発電所周辺地域の人々は
今どうしているの？

福島県では約１９０万人の人々が通常の生活を送っています。
また、県全体の面積の２・７％まで避難指示区域が縮小し、

ふるさとに帰った人たちにも
日常の暮らしが戻りつつあります。

知ってもらいたい

放射線10のポイントと大切なこと。

1. 放射線はふだんから身の回りにあり、ゼロにはできません。
2. 放射線はうつりません。
3. 放射線の影響は遺伝しません。
4. 放射線の健康への影響は、ある・なしではなく「量」が問題です。
5. 100~200ミリシーベルトの被ばくでの発がんリスクの増加は、野菜不足や塩分の取りすぎと同じくらいです。
6. 東京電力福島第一原子力発電所の事故の放射線で健康に影響が出たとは証明されていません。
7. 原子放射線の影響に関する国連科学委員会の報告書では、東京電力福島第一原子力発電所の事故の放射線で亡くなったり、重い症状となったり、髪の毛が抜けたりした人はおらず、今後のがんの増加も予想されず、また多数の甲状腺がんの発生を福島県では考える必要はないと評価されています。
8. 東京電力福島第一原子力発電所の事故で空気中に放出された放射性物質の量はチェルノブイリ原発事故の7分の1でした。また、避難指示や出荷制限など事故後の速やかな対応によって、身体の中に取り込まれた量もずっと少なかったです。
9. 福島県内の主要都市の放射線量は事故後7年で大幅に低下し、国内外の主要都市と変わらないくらいになりました。
10. 日本は世界で最も厳しいレベルの基準を設定して食品や飲料水の検査をしており、基準を超えた場合は売り場に出ないようになっています。

福島県では約190万人の人々が通常の生活を送っています。
また、ふるさとに帰った人たちにも日常の暮らしが戻りつつあります。

みなさんは、この冊子を読んでどう思いましたか？

福島産のモモやコメをお店で買うだけでも、
福島から引っ越して来た家族に明るく声をかけるだけでも、
福島に桜やお祭りを楽しみに家族で出かけるだけでも、
この冊子の内容を誰かに伝えるだけでも、
たったそれだけで、復興支援になるんです。

そして子どもたちが大人になった時に、
この冊子が要らなくなっていること。
それが、私たちの一番の願いです。

そんな未来へ、ともに歩んで行きましょう。

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この冊子は「風評払拭・リスクコミュニケーション強化戦略」を基に作成されています。
次のホームページで詳しくご覧になれます。
http://www.fukko-pr.reconstruction.go.jp/2017/senryaku/index.html

放射線に関する詳しい情報は、「放射線リスクに関する基礎的情報」をご覧ください。
http://www.reconstruction.go.jp/topics/main-cat1/sub-cat1-1/20140603102608.html

この冊子や「風評払拭・リスクコミュニケーション強化戦略」に関するご意見はこちらまで
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Walk together for the future.

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