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Topics：Risk communication for existing exposure situation after the nuclear disaster

＜Commentary＞

A new perspective on radiation risk communication in Fukushima, Japan

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Abstract

The March 11, 2011 cascading disasters of the historic earthquake, unprecedented tsunami, and subsequent radioactive substances release from the Fukushima Daiichi nuclear power plant have shocked the world. But the specter of radiation exposure has complicated the earthquake and tsunami disaster aid activities. Herein is a personal commentary on the current status of the risk communication activities within the disaster populations in Fukushima prefecture. A literature review of the current scientific literature was performed focusing on risk communication within the Fukushima region during the disaster recovery phase. I have limited my commentary to only the 5 most relevant of the publications which focus exclusively on the issue of risk communication and the problems which have generated the urgency to improve risk communication. There were several themes which were consistently identified across the articles and echo some of the personal observations of the many types of responses which victims are now demonstrating: fear, anger, distrust, denial, confusion, uncertainty, ambivalence, and hyperbole stood out regarding their varied responses to the current radiological situation and, regarding the government role in risk communication, corruption and lack of transparency. Two recommendations for helping to address these issues in risk communication are the inclusion of a community intermediary and great use of community engagement in the disaster recovery process. Improved risk communication, perhaps using established guidelines and including both community intermediaries and improved community engagement, may prove useful within the radiation affected populations of Japan.

keywords: Fukushima Daiichi nuclear power plant, risk communication, disaster recovery phase, community intermediary, community engagement

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I. Introduction

The March 11, 2011 cascading disasters of the historic earthquake, unprecedented tsunami, and subsequent radioactivity release from the Fukushima Daiichi nuclear power plant have shocked the world. These disasters are unlike any other in recorded history due to the convergence of the natural and anthropogenic contributions. As the after-shocks rattled on, the people of Japan were blanketed with a radioactive cloud that was both perplexing and terrifying to those who were in it. Disaster assistance needs were vast, beyond what any nation would have reasonably anticipated during routine disaster preparedness planning exercises. But the specter of radiation exposure has complicated the earthquake and tsunami disaster aid activities.

The responses to these cascading events from exposed populace, governments and experts from both within and outside of Japan have varied from unbridled humanitarian aid [1-16] to self-preservation [17, 18] and criticism for allowing such a catastrophic radiation failure and inability to manage it [19-29]. Countries from all over the world

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started monitoring to see if they were being poisoned by radiation from Fukushima. Dozens of papers have reported very low-level radiation exposures in the air or water across the globe, even in remote locations like Cuba [30], Monaco [31], Vietnam [32], and arctic Norway [33]. A recent model showed the global dispersion of the radioactive plume, which may be alarming to an uneducated reader [34]. In addition, many countries and disaster relief organizations jumped to help the people of Japan [1-4, 10, 15, 35-38]. But the disaster recovery needs still outweigh the resources to sufficiently mitigate them [39-43]. Furthermore, balancing the risks and responsibilities germane to this series of disasters has been proven to be enigmatic. People can easily understand that their house is unsafe after an earthquake or tsunami when they can see the damage right there in front of them. But they often struggle to understand the risks of radiation because it is something that they cannot see, something that they have little understanding of in their daily lives [16, 44, 45]. They understand that the earthquake and tsunami were outside the control of any government official. But that was not the case with the radiation release from the power-plant inundated from the tsunami, or was it [21]?

After spending time working beside my colleagues in the National Institute of Public Health during their disaster recovery efforts in Northern Japan I have learned much more than I have taught through my professional consultation assistance. There is so much that I could share about the disaster itself, the people it has affected, and those who have tirelessly put their own lives on hold so that they could help those in need within the disaster populations. But the most unique and vexing disaster recovery activity on-going within the radiation exposed populations is the effort to communicate with the public the risks of and exposures to radiation [12, 15, 46, 47]. Herein is my commentary on the current status of the risk communication activities within the disaster populations in Fukushima prefecture.

II. Methods

To lend context to this commentary, I performed a literature review of the current scientific literature focused on risk communication within the Fukushima region during the disaster recovery phase. Three internet-based academic research search engines were used to assess the published academic literature as of early May 2013: PubMed, Web of Science, and Google Scholar. The following search terms were initially used in all three search engines from anywhere in the citation for publications between 2011-2013: Fukushima, Japan, and nuclear or radiation. I then further limited my review to only those journal articles which discussed risk communication.

III. Results

There were 280 articles cited in PubMed, 347 in Web of Science, and 114 in Google Scholar resulting from the search using the terms Fukushima, Japan, and nuclear or radiation. After further limiting the review to risk communication focused articles only I found 6, 9, and 88 publications, accordingly. Most of the 88 search results identified in the Google Scholar were not from peer-reviewed publications or were general science papers which were not focused on the situation in Fukushima, rather only cited it. Over a dozen papers discussed the issues of risk communication within their broader study. But I have limited my commentary to only the 5 most relevant of the publications found within these three search tools which focus exclusively on the issue of risk communication and the problems which have generated the urgency to improve risk communication [16, 27, 48-50].

Within these journal articles there were several themes which were consistently identified across the articles and echo some of my observations of the many types of responses which victims are now demonstrating. Within the affected populations, themes like **fear, anger, distrust, denial, confusion, uncertainty, ambivalence,** and **hyperbole** stood out regarding their varied responses to the current radiological situation. Regarding the government role in risk communication, the two most profound related themes were of **corruption** and **lack of transparency,** in addition to the previously mentioned general **distrust, denial, confusion, uncertainty, and hyperbole.** Fear is now rampant within the Japanese population [45], often coupled with anger, distrust of government, confusion about risks, uncertainty of exposures and their interpretation [15]. Other common responses within the Japanese population were denial of the risks or ambivalence towards them. These responses may be driven by disaster-related stress [51-53]. The governments were often perceived as corrupt, because of their influence from the Tokyo Electric Power Company which runs the crippled nuclear power-plant, or prone to hyperbole, herein defined as exaggerating the absence of health risks [22]. Activist groups and misinformed spokesmen used hyperbole, also, but in the other direction by inflating the real health risks [50]. Non-government experts may be guilty by association due to their professional connections with either the government, the nuclear power industry, or environmental activist groups which are exploiting the Fukushima disaster to advocate for a world free of nuclear power.

IV. Recommendations

1. Community intermediaries- these are members of the disaster-affected community who are knowledgeable of the health risks, relevant science supporting the risk assessments, and are perceived as objective by the community. Such community intermediaries are needed to assist with the risk communication so that the necessary risk messages can be appropriately received by the public. We witnessed the efficacy of this approach with one such skilled community intermediary who has sacrificed countless hours of his life in the past year to teach his community about the real radiation risks (Terumi Hangai).
2. Community engagement- another approach which could help build trust within the disaster recovery activities would be the use of community engagement in the disaster recovery process [54-57]. These efforts work in concert with that of the community intermediaries, but build upon the new knowledge of the disaster community by engaging them within the disaster recovery activities and decision-making processes [46]. There is a very large literature on the science of community engagement in decision making which I will not entertain here. In brief, the integration of community engagement within the disaster recovery process is becoming increasingly recognized as vitally important to successful disaster recovery planning.

V. Discussion

Thousands of news articles have been published chronicling the Northern Japan Disaster since March 11, 2011. Millions of people have read those and viewed the plethora of social media cites which have provided the alternative views from within the disaster population. But the risk communication dialogue is surprisingly scant. The existing risk communication literature regarding the Fukushima disaster is profoundly critical of the government activities in response to the radiation release and their subsequent poor risk communication which has bred distrust, anger, fear, hyperbole, confusion, uncertainty, and denial.

1. Comments on Critiques

There are many reasons why there now is a wide-spread distrust of the Japanese government regarding the Fukushima radiological disaster. As pointed out by Figueroa [27], there is a common mis-perception that the government chose not to disclose much detail about the projected path of the radiation, the levels of radiation, and the potential prognosis of the power-plant during the immediate emergency period. That perceived lack of disclosure has been critiqued by Figueroa [27] and by countless others, even an independent commission [21]. However, such a point of view is possibly biased by exaggerated media accounts and discounts the very real risk of mass panic within a population exposed to uncertain levels of radiation [44], even more so within an island-bound population which has limited mobility. Mass panic within the Tokyo region and surrounding cities would have killed and injured thousands and caused property and environmental damage in excess of the value of the damage from the crippled power-plant itself. A hard and judicious decision was made to prevent panic. But such decisions created distrust. The government decisions were made in the best interest of the people of Japan, and the people of the world. We must remember that those decision makers who made those difficult decisions were disaster victims themselves, having lost loved ones, property, and family memories to the events that unfolded in March of 2011. Many spent countless hours for weeks working to help manage the disaster, sacrificing their own family's disaster response needs for the needs of the country and the world at large. Rather than criticizing the decision makers for the decisions that were made and stigmatizing the workers who are still risking their lives during the clean-up activities, I think those public servants should be lauded for their heroism in the face of great adversity [51]. Yet they are often lampooned in the press and criticized by the water coolers worldwide despite their best efforts. Yes, there are always lessons that can be learned from disasters or any governmental action, right or wrong. But now is the time for patience, support, and assistance not for dissecting the response and recovery efforts minute-by-minute. Would it not be more productive to focus on the current needs in the disaster population, the current crises in Japan, than on pointing fingers and attributing blame?

There is a common saying in the disaster management community that the initial data are always wrong but better than no data at all. During disasters decisions need to be made quickly and for the best interest of the population at risk. Disaster plans are made so that such decisions can be made rapidly with little debate or deliberation. Such decisions may feel right or wrong, but they are made according to the disaster plans available at that time. Sometimes there are no options for good decisions, only for less bad decisions- decisions which maximally protect the public, yet not comprehensively. Disaster managers can only do their best to mitigate the disaster circumstances and are bound by their existing disaster plans- they are not gods which can fully erase

the consequences of a disaster. Rather than pointing out the flaws in the Fukushima disaster response and recovery efforts now from offices in non-irradiated cities, in non-evacuated populations, in non-aftershock prone provinces, and non-tsunami ravaged coasts, we ought to remember the enormity of what the Japanese people face every day as they march through their disaster recovery and the gravity of the decisions which the Japanese officials needed to make when they were individually struggling with their own disaster responses and human emotional fortitude. Right now the people and government workers of Japan need our help; they need our compassion; they need our understanding. It would be much more prudent to delay such critiques until later after the full scope and context of the disaster is understood, the urgency of the public health recovery activities have dissipated, and the emotional biases implicit within the horror of disaster are abated.

2.Comments on Research

It is well known within environmental epidemiology that one of the hardest tasks in study design is finding a uniquely exposed population suitable for study. Therefore, it is understandable that many environmental epidemiologists see disasters which involve unique environmental exposures as scientific research opportunities [58-61]. But disaster populations with unique environmental exposures are still inherently susceptible to all of the public health struggles which natural disaster populations have. Therefore, such disaster populations first need aid, not observational study. As Ono rightly points out, in Fukushima the scientific opportunities for longitudinal research within the radiation-exposed disaster populations should remain secondary to the humanitarian and public health aid [62]. Despite the many challenges and failures by the Soviets after the Chernobyl disaster, at least they initially focused on the public health needs of the affected populations above any scientific observations which could be made [63]. So too were the early efforts in the Hiroshima and Nagasaki populations, which were assessed early on [63, 64] but not extensively studied until years after their disaster [65]. In our discussions with community members across Fukushima prefecture during April of 2013, some people felt that the focus on recruiting Fukushima disaster victims into studies has made them feel as if they were being treated like laboratory research animals rather than the disaster victims in need of help which they truly were. Perhaps that is why their current response rate is so low [45]. However, I am certain that such an insensitive focus was never the intention of the researchers in Japan who have been leading the Fukushima studies on-going across the country because they clearly are focused on addressing the healthcare needs of the victims first [66]. Rather, I think it is evidence of the risk communication problems within the region because the health studies being conducted in Fukushima and surrounding areas are intended to provide medical assistance to those affected by the radiation release while the researchers track their health over time to observe any changes which might be associated with their radiation exposure [61, 67]. Although some may believe these research activities to be moot [60], the simple act of longitudinal health assessment can be very reassuring to individual disaster victims and can benefit public health even if the resulting science is weak. Such studies should continue, and with their current focus on the health services for the exposed population rather than basic scientific inquiry.

VII. Conclusions

Improved risk communication efficacy in the Fukushima region should help better inform the affected populations about the rationale for the on-going studies and their sensitivity to the individual medical needs of the radiation-exposed populations. Improved risk communication, perhaps using the guidelines of Perko [68] or Slovic [47] or others and including both community intermediaries and improved community engagement, may prove useful within the radiation affected populations of Japan. But these efforts should be in concert with the other on-going disaster recovery services which are still needed to address the many medical service provision needs in the affected regions [12, 69, 70].

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＜論壇＞

福島での放射線リスクコミュニケーションの新しい視点

抄録

2011年３月11日の連動的な災害である歴史的な地震，未曾有の津波，そしてそれに引き続く福島第一原子力発電所からの放射性物質の放出は，世界に衝撃を与えた．その中でも，放射線被ばくへの恐怖は，地震と津波の災害援助活動を困難にしている．ここでは福島県内の被災集団内でのリスクコミュニケーション活動の現状を解説する．

この解説の内容として，災害復旧フェーズ中における福島県のリスクコミュニケーションに焦点を当て，現在の科学文献をレビューした．その結果，リスクコミュニケーションそのものとリスクコミュニケーションを向上させるための緊急性を要する問題を扱った５つの関連する論文に限って言及する．これらの論文では，一貫性を持って指摘できるテーマがある．それらは筆者が直接観察した，今なお，被災者から示される恐怖，怒り，不信，否定，混乱，不確実性，アンビバレンスや誇張とも整合している．これらの被災者の反応は，現在の放射線状況に対する彼らの様々な対応としてあらわれるものであり，政府機関によるリスクコミュニケーションの不調や透明性の欠如にも由来するものである．

リスクコミュニケーションにおけるこれらの問題の対処に役立てるために，地域社会での仲介者活用と災害からの回復期における地域社会巻き込みを大いに活用することの２つを推奨したい．ガイドラインとして示されると思われるが，地域社会での仲介者活用と地域社会巻き込みの両方を含むことで改善されるリスクコミュニケーションは，日本で放射線の問題に影響を受けた人々の間で有効であることが証明されるであろう．

キーワード：福島第一原子力発電所，リスクコミュニケーション，災害からの回復期，地域中間支援（コミュニティ・インターミディアリー），地域住民による取り組み

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