Risk Communication after Nuclear Accidents: Learning from the Chernobyl Case

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Abstract

By the 30th anniversary of Chernobyl disaster, there are still many undiscovered issues awaiting attention of researchers. Chernobyl consequences remain on the political and media agenda. However, agenda-setting and framing of Chernobyl issues have been changing. Some reasons behind these changes include: Japan tragedy at the Fukushima Daiichi plant; a tight connection with the security issues after September 11 and in the recent military conflict in Ukraine.

This paper integrates emergency management and risk communications perspectives. Misinformation and incomplete information can bias decision-making and political actions. When risk communication is inadequate, the public reacts with fear, mistrust, panic and stress. The measures taken by the USSR lacked consistency and clarity. The government also demonstrated a lack of attention to social justice in its dealings with people who moved back to the contaminated area, ignoring government policy that they should stay out. The evacuation of affected people aimed at reducing exposure to radiation and did not consider psychological and physical health impacts of moving. The paper’s findings may benefit experts looking to address risk communication issues, as well as emergency managers and top-level executives who must focus on the broader picture of policy analysis and evaluation of the effectiveness of emergency responses. This research may also influence academicians analyzing emergency management practices after the Fukushima disaster.

Introduction

This paper shows how risk communication issues significantly impact the management of nuclear disasters, some of which can have global environmental repercussions. Only the Chernobyl and Fukushima Daiichi nuclear power plants accidents have been rated 7, the highest level on the International Nuclear and Radiological Event Scale. At the same time, “the consequences of the Chernobyl accident clearly exceeded those of the Fukushima accident” (Steinhauser et al. 2014, 800).

Two issues deserve special consideration. The first involves communication to the general public. The Japanese officials reaction was close to the one in USSR despite cultural differences in perceptions of nuclear operations. Scientists cite that the “formal commission reports at Fukushima suggest that information was withheld from the public to prevent panic in the populous” (Koerner 2014, 246).

The potential for cognitive dissonance—the stress that arises when one’s behaviors do not match his beliefs—is high after a nuclear disaster. In general, people tend to ignore or deny disaster data that contradicts their existing beliefs. If, for example, someone believes that radiation is much more dangerous than authorities claim, then that person may be reluctant about following authorities’ recommendations for how to behave around it.

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A second issue relates to how scientists adopt decisions and reach conclusions. If experts present uncertain statistics as final scientific findings, this action may ultimately affect the pollution prevention and cleanup decisions of the governments (Moore 2003). This paper explores these two topics - misinformation and incomplete information - that directly affect decision-making processes in all areas of political expertise.

Evidence from environmental policy, communications studies, emergency management is examined, emphasizing the following two questions:

1) How do nuclear disasters affect risk communication?

2) In such disasters, how does communication impact or alter governments’ emergency management responses?

The main objectives are to examine how nuclear disaster in Chernobyl affected risk communication and how the experience of having lived through it prompted governments to develop improved plans to deal with future nuclear disasters.

The methodology for the research includes a literature review, policy analysis, personal insights following on-site fieldwork at the Chernobyl exclusion zone in Ukraine and Belarus during the period 1993-2011, and content analysis of media publications in Ukraine. I conducted the most recent field trips to the affected areas in Belarus with the help of the International Chernobyl Research and Information Network, supported by UNDP, IAEA, UNICEF, and WHO. The analysis is limited to Ukraine. The author did interviews with 25 state officials in Ukraine during face-to-face meetings in 1993-2011 and 12 officials during face-to-face meetings in Belarus in 2011. Two scientists from Japan were interviewed in Toronto in 2013-2014 and one by e-mail.

Nuclear disasters are complex. Policy-making in response to nuclear issues has always been difficult. Development of new policies requires the active involvement of - and a clear understanding among - a wide array of stakeholders. This similarity in government responses is alarming. Chernobyl happened in an authoritarian USSR in 1986, while Fukushima happened in a capitalist country, a democracy with a free press in 2011. Despite the fact that some Japanese media were reluctant to take an anti-government stance, the Asahi newspaper, one of the biggest dailies, was critical of the government. Moreover, social media were active in 2011, which enabled immediate information distribution on the internet.

**Literature review**

The Chernobyl disaster on April 26, 1986 is one of the most famous and controversial tragedies of our time. It happened at the Lenin Chernobyl Nuclear Power Plant (which consisted of four reactors) in the Soviet Union. The Chernobyl plant is located only 93 km from Ukraine’s capital Kyiv. A one-off test of whether the turbine-generator could continue providing electricity after the reactor scrambled caused the tragedy. The resulting explosion and fire at the Chernobyl plant sent a radioactive cloud over a large part of Europe. Emergency staff reported traces of pollution in Asia and North America, including Canada (Parliament of Canada 1986; Kerr et al. 1992). In the Soviet Union, the accident affected mostly Ukraine and neighboring Belarus and Russia. “Application of remediation on a limited scale will remain necessary for at least several decades (up to 2045–2050)” (Fesenko et al. 2006, 357).
There are some studies about coverage of the political response to this disaster in the USSR and other countries. The researchers investigated the role of the Soviet media and politicians in covering this catastrophe (Hoffman 1986), (Mickiewicz 1988), (Ellen and Woodbury 1986), (Marples 1986, 1989), (Medvedev 1990), etc. The international media coverage was studied by Friedman, Gorney, and Egold (1987).

Furthermore, there is an analysis of Chernobyl and other disasters. Chernobyl case motivated scientists (Allan, Adam, and Carter 2000; Gamson and Modigliani 1989; Welsh 2000) to extend their research to other nuclear accidents studying media and political response to them: Canadian one on Chalk River in 1952, Soviet one in Kyshtym in 1957, British one in Windscale in 1957, as well as those in the US in Idaho in 1961, and near Detroit in 1966. One of the especially valuable cases for comparison is a situation on Three Mile Island in the US in 1979, as there were many technical similarities with Chernobyl (Gamson and Modigliani 1989).

Gould studied the relationship between the European countries dependence on nuclear energy and degree of information manipulation or suppression about Chernobyl in these countries (in %). The Gould findings show that Denmark, Portugal, Norway, Austria and Eire do not have the described relationship, while Soviet Union comes with 10.3%, Belgium - 59.8% and France - 64.8% (Gould, 1990, 115). Such high percentage raises the question how authorities and press of some countries would react to the Chernobyl-like crisis if it had happened not in the USSR, but at home. The information about a similar fire in graphite reactor at the Windscale (UK) in 1957 was suppressed and made public only after three days – the situation similar to the Chernobyl case (Gould, 1990, 17). Furthermore, after the British data about „high levels of cesium were found in the pastures around the nuclear reprocessing plant, the government claimed that it was due to Chernobyl fallout”(Gould, 1990, 17).

The Chernobyl coverage is sensitive and depends on the political discussion in the context of some recent events (Japan, war, terrorism, energy crisis, etc). Based on the analysis of the studies mentioned above, there are some general tendencies and main characteristics of Chernobyl coverage, public response to it, and their dependence on political climate and interests of different groups:

- Communication about Chernobyl is misinterpreted and manipulated by industry representatives, journalists, authorities and surprisingly, scientists world-wide;
- Chernobyl coverage challenged the Soviet system that resulted, to some extent, in its collapse;
  - Chernobyl had played a significant role in politics of some countries (Ukraine, Germany, Sweden, Austria, etc.);
  - Ways, in which the data is presented to the public are important for future studies of manipulations with statistics;
  - The tragedy contributed to the development of risk communication and its interpretation by political science (as well as further detailed research in other disciplines);
  - Politicians, some parties, and governments used the tragedy for propaganda and to influence the public opinion on the selected issues;
  - Bureaucrats across Europe developed different tactics to avoid public access to any information about an environmental crisis;
  - Journalists actively misused a variety of nuclear terminology and metaphors according to their particular needs;
  - Nuclear lobby was defending its investments through financing large-scale PR actions to promote nuclear energy development and influence politicians;
  - The truth about the tragedy may remain undiscovered in the coming decades.
Media coverage and political response are influenced by an ongoing discussion about the following issues:

- Nuclear disaster in Japan;
- Controversy of scientific findings;
- The role of international organizations such as the UN and the WHO;
- World energy crisis and increase in natural fuel prices;
- Terrorism, in the context of September 11th;
- Military target, in the context of the recent conflict in Ukraine;
- Climate change;
- Environmental and social consequences of the tragedy;
- Financial costs for the recovery of the contaminated regions and construction of the Sarcophagus around the destroyed reactor;
- National responses during countries’ elections;
- Lack of knowledge about nuclear power among the media and the public.

What was done in Ukraine after the Chernobyl disaster?

Edward Geist has reconstructed the events following the Chernobyl accident. He praised the culture of mass mobilization, as well as individual heroism. He concluded: “in some respects, the Soviet response to Chernobyl” compares favorably to the Japanese government’s handling of the Fukushima Daiichi accident a quarter-century later.” (Geist 2015, 126).

Officials ordered nearly one million people to move out of areas with contaminated soil to avoid exposure to low levels of radiation. The Soviet authorities established the 30-km zone of mandatory resettlement. There is a difference from the agencies’ recommendations about “two sizes of zones in anticipation of qualitatively different radiation hazards: one with a radius of 10 miles (16.1 kilometers) to address whole-body radiation exposure, and another with a radius of 50 miles (80.5 kilometers) aimed at preventing ingestion of radioactivity in food and water” (Geist 2014).

Photo 1. A duty officer at the Chernobyl fire department. Photo by the author.
Soviet authorities failed to take some very simple preventive actions. One of the biggest threats from the disaster was radioiodine carried long distances by clouds. Potassium iodide tablets should block radioiodine uptake by the thyroid. But authorities did not give them even to residents of Pripyat, a town near the Chernobyl nuclear plant. Face masks are also an inexpensive tool that can prevent inhalation of radioactive dust, but authorities did not distribute them. Officials even failed to warn people to stay inside.

One of the major differences between nuclear and other types of disasters is that radiation is invisible and confusing. Thus, officials must warn people when high radiation levels exist. Soviet leaders did not. Twenty years later, Gorbachev (2006) disingenuously denied claims that the Soviet leaders from the governmental commission were engaged in concealment of information about the tragedy: “Its members all had dinner with regular food and water, and they walked around without respirators, like everybody else who worked there. If the local administration or the scientists knew the real impact of the disaster, they would not have risked doing this.” Such statements might alternatively mean that some authorities had a clear understanding that short-term exposure to external radiation sources during their brief visits to Chernobyl would not cause drastic health effects.

Officials needlessly overpaid some people, but underpaid the majority and failed to provide support to displaced people who illegally returned to the affected zone. Residents in a few distant areas received regular benefits even though radiation levels there were low (e.g. Boyarka). Some experts claim that people sometimes were falsely or intentionally (due to corrupt practices) identified as major victims of the disaster (Davies, Polese 2015). Later, the Ukrainian state harmed quality of life of the affected people by unofficially deciding “not to assert its role. For many marginalised individuals, despite a belief that Chernobyl has caused widespread sickness, the risk from invisible radiation is considered less of a health threat than the tangible reality of leaving behind social support networks after moving, and the ability to employ local informal economic tactics.” (Davies, Polese 2015, 42).

**Risk communication after the Chernobyl disaster**

Limited data on high contamination of dairy products, mushrooms and wild berries appeared in the local media about a month after the Chernobyl disaster. The government’s failure to develop well-grounded educational programs to address the divergence of behaviors and beliefs as well to answer all public questions created anxiety and distrust among people. This failure is also due to cognitive dissonance inherent in government messages. While officials were not truthful about the radioactivity doses and acted as if nothing serious had happened during the first weeks after the disaster, the appearance of military personnel in protective clothing tended to alarm local residents. Individuals strive to have consistency in their lives. If beliefs and behaviors start to contradict each other, it causes discomfort or even serious stress. Governments can exacerbate this situation by prioritizing other disaster-related issues, thus neglecting communication with the affected people.

In the Chernobyl case, the Soviet mass media in some instances erroneously reported about mutations in humans and cattle, increasing public fears and mistrust of both government and the mass media. For example, the newspaper “MIG” in Zaporizhya in 1991 published a report about mutations in humans and cattle. The agricultural workers refused to go to work and farmers tried selling their land and houses until journalists officially recognized their mistakes (Belyakov, 2003, 69).

The population’s perceptions about safety issues are critical in emergency response. The most affected groups after the Chernobyl disaster were:
- People who were first resettled from the 30 km zone of mandatory resettlement but who later returned, even though this was not officially allowed in the early stages after the disaster;
- Professional fishermen;
- Local residents whose diet depends on fish, wild berries/mushrooms or local dairy products and meat;
- Farmers dealing with irrigated agricultural products (or dairy) and consuming them themselves;
- Clean-up workers.

Although most of the affected population was evacuated and resettled elsewhere within Ukraine, some residents remained or illegally returned to the exclusion zone, ignoring health risks. Most of these people were elderly. Illegal residents of the 30-kilometer zone who were protecting their right to return to their homes in the area faced severe problems. These people--variously called self-settlers, returned displaced people, or samosely--faced difficulties securing access to food and safe shelter.

Why did they come back? Eudokiya and Peter Degtyarenko, from the village Kupovate in the exclusion zone explain: “There is no life. But in Markivsky District, where we were resettled, there was no life either. There were two, three families together in one house. Rats, mice gave us no life. And also people…” (Belyakov 1994).

The government failed to support these illegal residents. Only in 1993 did the government and local authorities informally recognize samosely in this zone. Once the government became aware of disruption of residents’ food supplies, the meals-on-wheels delivery started to bring bread and some other limited food items to their area once a week. When local authorities recognized, in the mid-1990s, that samosely were starving, police began to provide hot meals for elderly people in the police cafeterias in these remote areas.

Residents grow and process most of the food locally, collecting and consuming wild berries and mushrooms. Critics have pointed to the small state pensions and inadequate support: “The post-Chernobyl Ukrainian state offers only a ‘Potemkin village’ of welfare support - a complex web of de jure
entitlements but a lived reality of de facto state abandonment” (Davies, Polese 2015, 36). Police ordered self-settlers’ evacuations after a fire affected 400 hectares of woodland in the 30-km zone in April 2015. The fire came as close as 5 km from the Chernobyl nuclear waste repository.

People’s risk perceptions were quite varied – ranging from ignorance and dismissal to panic. In turn, people’s responses to the disaster ranged widely--from ignorance to avoiding meat/dairy/berries/mushrooms to fleeing the affected area. Immediately after the disaster, rumors spread that drinking red wine helps decrease the absorbed radiation dose. This is true to a degree, but only if the wine is consumed in small doses with the alcohol removed (Greenrod et al. 2005). As a consequence of misinformation about the beneficial effects of wine, there were cases where paramedics took children to hospitals drunk or even poisoned after parents had given them wine.

The ways in which scientists communicate numerical risks are also crucial. In the case of Chernobyl, the same cancer risk could have been conveyed in the following ways: 131 additional cases of cancer expected in the lifetimes of the 24,000 people within 15 kilometers of the plant; a 2.6 percent increase in the cancer rate of exposed people; or an increase in cancer of only .0047 percent of the population among 75 million people exposed in Ukraine and Belarus (Wilson and Crouch 1987; Susskind and Field 1996).

Photo 2. Residents of the exclusion zone. Photo by the author.

One of the pre-conditions of effective and transparent risk communication is availability of extensive research, monitoring programs and access for researchers to relevant information. In the USSR, no large-scale government-supported research on safety issues was conducted immediately after the
Chernobyl disaster. Ukrainian scientists working in state-owned research institutions report that research on radiological protection had not been supported by state funding. Authorities restricted access of some Ukrainian scientists, including the world-known radiobiologist Dmytro Grodzinsky, to their own laboratory equipment. The Communist Party did not approve any independent investigation. For about two years, officials treated people as criminals if they possessed their own dosimeters (Medvedev 1990). Even the regularly collected data regarding contamination was neither properly analyzed within a large-scale spatial or broad temporal frame nor communicated or even classified.

Contemporary issues in the mass media about the Chernobyl nuclear disaster

In 1986, soviet crews sealed the most radioactive areas of the destroyed block No. 4 with a concrete shelter known as the Sarcophagus. However the shelter – built in a hasty and poorly organized cleanup – has developed numerous cracks that have been studied by many scientists. After many years since the tragedy, the safety and security of the shelter and the plant are especially important. To prevent further radiation leakage, the creation of a new construction base on the shelter begun in 2012. Another Sarcophagus should be built around the existing one, transforming the shelter into an environmental friendly system by the end of 2017.


Somebody who is interested in the destabilization of the situation in the Ukrainian capital could cause critical damage. Because of the lack of security, a possible terrorist attack rupturing the Sarcophagus or other human factors could also spew high levels of radiation across Europe. The shelter project was developed before both the September 11 attacks and the recent military conflict in Eastern Ukraine. We have no way of knowing if the new construction would provide protection from a plane crash and other potential terrorists’ attacks.

Scientists rarely compare Chernobyl and September 11 tragedies. Most academics are deeply involved in the discussion whether the attacks as September 11 can lead to the tragedy like a nuclear explosion or any Chernobyl similar damage.
Public response to the post-Chernobyl discussion and nuclear security evokes links to terrorism issues. At the same time, “the industry’s response is shocking. Rather than conceding the vulnerability of its facilities and the need to upgrade security, at a press conference on September 25 a spokesman for the Nuclear Energy Institute took the extraordinary stand that greater security isn’t required because Chernobyl wasn’t that bad.” (Hirsh, 2002, 7). However, 21 nuclear reactors are located very close to the airports in the USA.

The US tragedy also has an opposite effect on the Chernobyl plant itself. An additional security was introduced everywhere. As reported, all flights over the Chernobyl plant zone after September 11 were prohibited. If “any planes appear in the sky above the Chernobyl area without warning it will be regarded as a terrorist act,” and shot down (RFL/Tl 2001). There is believe “the air-defense forces will have sufficient time to see to it that this plane is downed... The closed airspace has now been extended far beyond the 30-kilometer zone around the Chernobyl plant, but whether this step would be enough to prevent another disaster is still questionable.” (RFL/Tl 2001).

The security of Chernobyl nuclear plant became an exceptional issue in the military conflict in Eastern Ukraine in 2014-2015. The mass media became especially concerned after the Hague Nuclear Security Summit in 2014 where Andrii Deshchytsia, Minister for Foreign Affairs of Ukraine, addressed the potential threat to nuclear plants. Bennett Ramberg, the US policy analyst, warned: “In Ukraine, nuclear emissions could exceed both Chernobyl and Fukushima. Wartime conditions would prevent emergency crews from getting to an affected plant to contain radiological releases should reactor containments fail. And, with government services shut down in the midst of fighting, civilians attempting to escape radioactive contamination would not know what to do or where to go to protect themselves.” (Ramberg 2014). The military risks are mainly growing after a worst forest fire since 1992 in April 2015. Officials reported that arson was a probable cause of the fire about 20 kilometers from the Chernobyl site.

Lessons for Japan from the Chernobyl disaster

On March, 11, 2011, a tsunami, triggered by the Tohoku earthquake, hit the Fukushima Daiichi nuclear plant. It caused a meltdown of three of the plant’s six nuclear reactors. As with Chernobyl, there was much secrecy around the Fukushima disaster—likely an attempt on the part of the plant’s owner and operator, TEPCO (Tokyo Electric Power Company) and state officials to prevent local hysteria and negative media coverage nationally and internationally. If Japanese authorities had done that differently and more transparent, they could have prevented much of the miscommunication issues (especially about evacuation). The Japanese government failed to provide clear boundaries for a monitoring zone and evacuation zone. Iida Tetsunari, in analyzing the lack of basic information regarding the Fukushima disaster in comparison with the Chernobyl tragedy, found that the requirements for a forced evacuation zone were very different in the two cases (Tetsunari 2013). Table 1 (Tetsunari 2013).

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<td>Right to evacuate</td>
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<td>Monitoring zone</td>
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Effective communication is important in all disasters, but even more so in nuclear disasters, which are characterized by a high dread-risk ratio (Socolow, 2011). There were dangers of unprepared evacuation of the vulnerable people: "more than 50 patients died either during or soon after evacuation, probably owing to hypothermia, dehydration, and deterioration of underlying medical problems." (Tanigawa et al. 2012, 890). Canadian scientist Victor G. Snell observes that "One area which is starting (slowly) to change is the recognition of a trade-off between minimizing radiation dose and the real damage caused by unnecessary evacuation" (personal communication).

Furthermore, activists’ and consumers’ concerns are connected to a recent state secrecy law that potentially could permit greater concealment of information regarding nuclear contamination, among other things (The Act on the Protection of State Designated Secrets, No. 108 of December 13, 2013). Amnesty International issued a statement criticizing that “State Designated Secrets are vaguely defined in the Act, which could enable authorities to hide legitimate information about environmental hazards, including ongoing nuclear clean-up and containment efforts, human rights violations and corruption. Furthermore, it states that persons may be prosecuted for releasing or even requesting information that they did not realize is protected by the act” (Amnesty International 2014, 16-17).

Nuclear safety issues are already causing fear or even worse reactions from Japanese bureaucrats. Japanese corporations have made considerable efforts to cover up the information about the disaster and its impacts. Some Japanese scientists had already addressed the “falsification of inspection records regarding cracks at three nuclear power plants by Tokyo Electric Power Co. (TEPCO)” (Tsuchiya 2003) long before the disaster in 2011. Shigeo Nishimura, deputy general manager of the general affairs department of the Power Reactor and Nuclear Fuel Development Corporation, was appointed to investigate a one-hour delay in notifying authorities about the massive coolant leak in 1995 at the Monju reactor, in Tsuruga, and the video evidence which was edited and concealed from the mass media and government. Shigeo Nishimura committed suicide the day after attending a news conference explaining the cover-up (WISE 1996). More transparency and further research are needed. Otherwise, government decisions regarding safety and related concerns may be ineffective in protecting the public and possibly unreliable in future emergencies.

Communication after the Fukushima disaster

Some Japanese mass media outlets that have traditionally taken an accommodationist approach toward government agencies sought to convince the public that everything is under control and even eating radioactive food is good for health. They employed an entire spectrum of arguments, ranging from general statements about the overall health benefits of food to appeals to national values. For example, the country’s largest circulation daily newspaper, The Daily Yomiuri, compared risks of not eating vegetables to risks of eating radioactive vegetables, where both risks were expressed in millisieverts, even though calculating the risk of not eating vegetables in millisieverts is methodologically rather questionable. The newspaper’s editors were trying to convince the public that eating radioactively contaminated food is better for health than avoiding such foods altogether.

The Yomiuri was also making the case to breastfeeding mothers that traces of radiation in breast milk are expected and should be ignored, given the general benefits of breast milk, and that in any case human bodies are expected to have traces of radiation. One more argument aimed at convincing the public of the relative safety of radioactive food involved the obligatory school lunch program. When some parents wanted to opt their children out of the program due to fear that the food was radioactively contaminated, they were characterized as egoists acting against the national "sense of bonds and solidarity" which the lunch program was building (Tollefson 2014, 306-310).
One of the lessons learned in disaster communications is about trust: “Transparency is vital, but having a singular message is paramount to maintaining trust” (Spencer 2013, 78). Lack of trust affects the speed and rhythm of responses in many areas. Trust affects all involved parties: emergency workers as well as people who rely on their support and information. Anthropologically speaking: “In Japanese, the word for safety is anzen, but when describing food safety, it is often used together with anshin (peace of mind). Anzen connotes measurable and technical ways of assessing risk, while anshin refers to emotionality and to individual perception. The ideal is that foods will be safe (anzen), and therefore people will eat them with confidence and peace of mind (anshin). The relationship between anzen and anshin is not easy to sustain in the post-Fukushima world” (Cisterna 2014, 74-75).

Many Japanese investigators mentioned serious communication issues related to health safety. According to scientist Jun Shigemura: “a combination of poor public communication by the authorities and TEPCO over radiation levels and the dangers they present to health, coupled with widespread uncertainty over the future, had created a ‘mental health crisis’ among Fukushima residents” (McCurry 2013, 791). Experts stress that two-way communications are critical in such situations. Trust is also essential. It has implications for subjective well-being; in Hommerich’s (2012, 58) words, “The fear of health implications of radioactive contamination of food strongly reduces happiness and – thereby – individual resilience.”

There are disparities between real, measured levels of radioactive contamination and perceptions of contamination by the population. Canadian scientist Victor G. Snell indicates two major issues: “how one translates science-based risk to public policy; and how one maintains public credibility while doing so” (personal communication). If the governments of the affected countries predominantly rely on nuclear industry experts who failed to communicate effectively with affected people, then damage to communication may occur not because of the increased radioactivity levels, but mostly due to miscommunication and panic.

The American geographer Peter Gould made interesting observations following the Chernobyl disaster. After governments heeded the advice of the nuclear industry, Gould found, manipulation and suppression of information usually took place. The tactics deployed include the following: "suppression or covering up; defining the problem away; authoritative belittling; arithmetic obfuscation; public relations; creative deception; and information reduction" (Gould 1990, 113). Gould believes that the inadequate "reactions are not confined to the Soviet bureaucracy; they are the natural reaction of any bureaucracy to smother ‘unfortunate news.’ The suppression of information is the arrogant and endemic curse of all modern bureaucracies, a curse that is constituted of what they are" (Gould 1990, 22).

According to Robert Mason (2014, 55), “Japan’s “nuclear village,” a formidable force over the years, has been weakened, but not vanquished by the 3.11 disaster”. It made considerable efforts to cover up information about the disaster and its impacts. A critical difference in the population’s literacy regarding nuclear radiation is evident between the USSR and Japan. USSR people often denied that there was a tragedy at all, ignoring the real threat of radioactive contamination of their dwellings. Unfortunately, this devaluation was supported by the Soviet government, which tried to downplay the catastrophe by characterizing it as merely a fire.

People in the affected areas of Japan had better opportunities to access portable equipment and measure radiation on their own than was the post-Chernobyl case. In the USSR, many restrictions had been introduced; these limited the ability of citizens to understand and monitor the situation. Western scientists had even less access to the Chernobyl zone for many years, and only the USSR collapse
opened borders. Despite the greater ability to gather data in Japan, it is clear that extensive efforts to recover and communicate additional data are still needed.

Japan was also slow to ask for external help. Prime Minister Shinzo Abe confirmed only in October 2013 that his country is very much in need of global aid in dealing with Fukushima-related issues: "We are wide open to receive the most advanced knowledge from overseas to contain the problem (...) My country needs your knowledge and expertise" (Smith, 2013). It is better that this acknowledgement comes late than never, but international experts need more access to the data. Research findings to date from Japan make it clear that extensive efforts to recover and communicate additional data are still needed. And some topics, including food security, remain under-researched by scientists.

**Challenges for policymakers**

According to Geist (2014), policymakers in all major cases - at the Fukushima Daiichi, Chernobyl and Three Mile Island Plants – have done guesswork due to “uncertainty about source terms—the quantities and characteristics of the radioactive isotopes released in a nuclear event”. What governments can do to overcome this obstacle to emergency planning? A good example is joint radiation emergency management plan of the international organizations (EPR-JPLAN 2013). The United States has programs for pre- and post-incident distribution. In 2013, the United States government rewrote its plans for responding to radiation contamination, focusing more on long-term cleanup than emergency response.

Despite the fact that the industry is promoting itself as safe, some researchers have concluded that the likelihood of having a minimum of one major nuclear accident is 66.6 % in 5 years. The tendency in a 30-year period is for about a minimum of one major accident (63.2 % likelihood), with a 25.8 % likelihood of having two (Ha-Duong and Journé 2014). In some cases, high density of nuclear reactors can increase possible risks. The 435 operable nuclear reactors worldwide, together with 71 under construction (World Nuclear Association 2015), are relatively close to many cities. But how close is close enough to compromise their safety?

120 million US residents live within 50 miles of a nuclear reactor, whereas the primary concern "is the contamination of water supplies, food crops and livestock where evacuation is at the discretion of local authorities (...) Following the nuclear disaster at Japan’s Fukushima power plant in March 2011, the United States urged Americans to evacuate the area within 50 miles of the power plant, suggesting a disconnect between domestic emergency planning procedures and practice in the event of an accident." (UCS 2011).

In general, potentially affected populations are not properly prepared to cope with the major effects of complex mega-disasters. Marsden et al. (2010, 257) argue that “in modernity, risks are incalculable and uncontrollable. If this is the case, then the structures adopted cannot ensure in the face of uncertainty that the risk assessment has addressed the appropriate risks and has generated an effective precautionary response” (Marsden et al. 2010, 257).

**Conclusion**

The USSR government downplayed the consequences of the nuclear disaster, encouraging people to ignore much of the international mass media coverage, while at the same time failing to promote such emergency measures as the distribution of potassium iodide immediately after the accident. The disaster contributed to failure of the USSR President Gorbachev’s *perestroika*. 

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General public literacy regarding emergency preparedness, and nuclear disasters in particular, needs to be improved. Experts from different fields should be properly trained in responding to nuclear emergencies. This training should include explanations of how radionuclides behave in environment and how human factors affect all processes. These actions will help in dealing with the difficulties of communicating complex scientific ideas. Developing dose models based not only on soil contamination, but on other sources of exposure (food, water) as well, will benefit all parties. Methodological approaches require unification and transparency.

Adequate, transparent and timely risk communication is critical to restoring safety after nuclear disaster. The stigma of nuclear disasters influences consumers’ choices. Lack of proper information may lead to such extremes in behavior as total avoidance of dairy products, providing wine to children, and consumption of untested foods that may in fact have high levels of radioactivity. Comparing the Fukushima and Chernobyl nuclear disasters, we see that the Japanese authorities mostly succeeded in enforcing their restrictions on consumption of contaminated foods, while the Soviet administration failed to react immediately, resulting in negative health effects for the population that could have been avoided.

In the case of the Chernobyl disaster, policies and management steps taken by the USSR government were not very efficient for affected people. These steps lacked consistency and clarity. The mass relocation of people was expensive and at the same time partially ineffective in reducing the overall radiation doses and risk factors. Lack of social justice was mostly demonstrated in governmental dealings with self-settlers in Ukraine, who still suffer from nickel-and-dime benefits. All affected groups need detailed evacuation plans and radiation detectors. Fukushima’s more recent lessons on risk communication are still under-researched. Nevertheless, governmental responses were similar to those of the Soviet bureaucracy.

Another prerequisite of effective risk communication policies after nuclear disasters is availability of short-term, quick response plan and longer-term monitoring programs, as well as access to research data for scientists, public health experts, and other decision makers. In both the Chernobyl and
Fukushima cases, access to research data was limited. These limitations created distrust that will impede future research, given the lingering mistrust between citizens and governments.

![Photo 5. The dead town Pripyat. Photo by the author.](image)

It is hardly possible to separate out risk communication issues from other disaster response issues, given the current highly generalized approach that emergency management demands. Some countries do not appoint special multi-disciplinary teams to deal with nuclear disasters. Practitioners also need to develop separate communication strategies for nuclear disasters with special attention to all high-risk groups.

Are reported consequences of the tragedy in 1986 “not bad” after all? So far, scientists disagree about this sensitive issue. Nuclear disasters have challenged many assumptions and caught some states by surprise in the past. It is time to learn from these experiences and use that knowledge to help prevent further humanitarian catastrophes.

References


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_This paper is a work in progress – please excuse some minor issues._