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Chernobyl's survivors: Paralyzed by fatalism or overlooked by science?

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Abstract

The author describes the experiences of Ukrainian clean-up workers, resettled families, and parents of exposed children in the decade after the 1986 Chernobyl disaster. The period was marked by a confused state response, lethal radiation doses to clean-up workers, and fragmented research efforts. The unraveling of the Soviet system in 1989 contributed to an atmosphere of chaos and left a legacy in Ukraine of incomplete accounting of the full public health and sociological consequences of the disaster. Being accountable to those people affected, the author writes, is a key challenge of our time, and the present and future consequences of Chernobyl's health risks are not closed matters. Understanding the scope of the impact will hinge on what kinds of studies, technologies, and funds we are willing to apply, and over what time frame.

Keywords

accountability, Chernobyl, government, public health, sociological consequences, survivors, Ukraine

When the Chernobyl nuclear reactor exploded in the early hours of April 26, 1986, it blasted a radioactive plume that traveled as high as 8 kilometers into the sky. Winds carried a radioactive cloud over Belarus, Ukraine, Russia, and Europe and set off alarms at a nuclear facility in Sweden. Chernobyl is widely acknowledged as the world's worst peacetime nuclear disaster. At the time, though, it took the Soviet government 18 days to widely acknowledge what had happened. It downplayed the extent of the plume and characterized Chernobyl as a controllable biomedical crisis. Medical efforts focused on a group of 237 victims who were airlifted from the disaster site to a hospital in Moscow. Of those, 134 were diagnosed with acute radiation syndrome (ARS; International Atomic Energy Agency, 1996). Official reports set the death toll at 31 workers (IAEA, 1991; World Health Organization, 1996).

Over the years, this number has been invoked by international scientific bodies on the disaster's anniversary. And although the World Health Organization in 2005 said about 50 people—mostly highly-exposed emergency

responders—had died radiation-related deaths, and that up to 4,000 may eventually die from radiation exposure from the accident, the message remains the same: Chernobyl's public health effects "were not nearly as substantial as had at first been feared" (World Health Organization, 2005). These kinds of public statements tend to suggest that the overall medical toll is understood, even as other scientists said these casualty estimates suggested "a certainty unwarranted by the underlying studies" (Williams and Baverstock, 2006: 933). The claim that "mental health problems pose a far greater threat to local communities than does radiation exposure" (World Health Organization, 2005) must be tempered by our acknowledgement that the full biological consequences are not known yet. And there is at least a 70- to 80-year horizon—if we are to take Hiroshima as a measure—in order to know the full answer.

New reality, new vocabulary

At various points between 1992 and 2000, I carried out medical anthropological fieldwork in Ukraine, a country that inherited the unresolved Chernobyl health crisis when it declared independence from the Soviet Union in 1991. It was a convoluted world of science and bureaucracy, and I observed first-hand the disconnect between the strategies for handling the disaster's consequences and the individual and social disorder. I had extended conversations with resettled families, parents of exposed children, and Chernobyl workers. I also interviewed key scientific and political actors in Kiev and Moscow, comparing the science that shaped standards of biological risk and safety in the Soviet and post-Soviet administrations of the aftermath. How scientific knowledge about the health effects of Chernobyl evolved, and the level at which it was said to hold significance, affected the scope of state interventions and medical surveillance. Science was an instrument of state power. And, in some respects, the full human story of what it took to contain the disaster was obscured.

In the two decades following the disaster, 600,000 soldiers, firemen, and other workers were sent voluntarily and involuntarily to the disaster site to physically remove the radiation (Chernobyl Forum, 2006). They razed contaminated buildings and chopped down fallout-filled forests. They disposed of contaminated topsoil and irradiated materials. And in the most dangerous job of all, some worked in one-minute shifts on the roof of an adjacent Chernobyl unit, shoveling radioactive debris into the mouth of the ruined unit; these volunteers ironically referred to themselves as bio-robots.

In 1992, in Kiev, I met a cleanup worker who was on a two-week break from work in the Exclusion Zone (also known as the Zone of Alienation), an area 30 kilometers in diameter circumscribing the disaster site.[1] Filled with anguish, he told me: "Now I'm a sufferer," using this word (*poterpili*) to allude to a legal category for people affected by the Chernobyl disaster (but who were not recognized as such in the Soviet period); the word had been introduced the previous year by a newly independent Ukrainian state. He lifted his pant leg and revealed a patch of skin that had puckered above his ankle. "This is from radiation," he said. It was the result, he told me, of direct contact

with a radiation source, and what clinicians would call a "local skin burn" (see Petryna [2002] for details of interviews). "This happened in the Zone," he said, adding that he receives $5 each month in compensation. "We're people no one understands, in hospitals, in clinics." With scars and sicknesses, he said, he and the other clean-up workers are among the "living dead"; alive but forgotten.

In 1997, I spoke with a member of a military unit that had been charged with erecting a barbed-wire fence around the destroyed reactor site in the first weeks following the explosion. Military commanders were implementing government mandates to contain the contamination. In theory, recruits' exposure to radiation was to be closely monitored, and they were to be removed from the site to control dose exposure. However, according to this patient, who was being hospitalized for heart problems in Kiev, "The commanders told us that after being exposed to 25 rem we would be replaced by other workers. But we were not being replaced. There wasn't 25 rem, there was 125 rem, 225 rem.[2] They promised us that once we built the fence around the reactor we could get out of there. Then a general showed up and told us, 'Boys, it is better to bury one thousand than one million.'" In other words, this former recruit suggested that commanders deemed it more expedient to over-expose those already in the Zone rather than to call in more workers.

In 2000, I interviewed the director of the so-called "sarcophagus," the concrete structure enclosing the ruined reactor and its molten core. Almost a decade after Ukrainian independence, worker protections (in spite of some improvements) were still deficient and radiation protection norms were poorly enforced. That was because in the country's period of sharp economic decline, employment—even in the Zone—was valued. In comparing his country's enforcement of worker safety standards with those of Western Europe, the director told me, "No one has ever defined the value of a dose exposure here. No one has ever defined the value of a person here." Norms of worker safety were effectively being decided in terms of what local workers were willing to bear. Physical risks escalated, setting the stage for a public health disaster for which there has still not been a full accounting.

Scientific debates

In contrast to the disorder marking the cleanup efforts—and the comparably disordered political and social context—official pronouncements have tended to portray a sense of certainty about Chernobyl's health toll, while characterizing public fears as being largely irrational. While the UN Scientific Committee on the Effects of Atomic Radiation acknowledged the increase in unusually aggressive thyroid cancers among children living in affected areas, most other disorders continue to be characterized as products of "informational stress" (Sergeev, 1988; World Health Organization, 1996), "somatization of fear" (Guskova, 1995; Rumiantseva et al., 1996), a lack of proper "risk perception" (Drottz-Sjoberg, 1995; Havenaar et al., 1996), or "negative maternal health perceptions" (Bromet et al., 2009). The World Health Organization (WHO) suggests focusing health monitoring mainly on

highly exposed clean-up workers and children with thyroid cancers (World Health Organization, 2005).[3]

If the atomic bomb studies provide any measure, it is far too soon to calculate Chernobyl's full impacts. In the words of one report: "In 1965, 20 years after the atomic bombings in Japan, the Atomic Bomb Casualty Commission reported significant increases in the incidence of just two cancers—thyroid cancer and leukemia" (Baverstock and Williams 2006: 993, quoted from Shimuzu et al., 1992) among the some 80,000 Japanese bomb survivors who were monitored. It took another decade before a significant increase in other cancers was reported—and cancer and non-cancer diseases continue to be detected today. It is reported that "leukemia and thyroid cancer form only a small *fraction* of the accepted total radiation-related health detriment" (Baverstock and Williams, 2006: 1312). The message here is that what we know of the precise figures of Chernobyl's impact is far from complete.

For instance, high doses absorbed by at least 200,000 Chernobyl clean-up workers between 1986 and 1987 were poorly documented due, in part, to a lack of available functioning monitoring equipment and lax radiological scrutiny (Medvedev, 1990). In 1996, one biochemist told me that many of the workers received six to eight times the textbook definition of a lethal dose of radiation. "They are alive," he said. "The workers know that they didn't die. But they don't know how they survived."

UN-agency statements suggest that "persistent myths and misperceptions about the threat of radiation have resulted in 'paralyzing fatalism'" among those living in affected areas (World Health Organization, 2005). But this sort of characterization tends to deny affected populations the respect that their actions are due. The people I met in Kiev took all sorts of pragmatic actions in the days and months after the disaster to mitigate the consequences (sending their children by train to relatives living in unaffected areas, sealing their windows and cleaning their floors, desperately searching for iodine pills to prevent Iodine 131 induced thyroid cancers, purchasing "clean" foods for their youngest, and even, in some cases, trying to make their own dosimeters). To say that these people were paralyzed is to misstate the record of what actually happened there. Such claims echo earlier statements, which blamed mental stress on "poor understandings" of scientific principles (IAEA, 1991: 6).[4]

Such invocations can also be interpreted as an index of how far off the scientific community is from fully understanding and predicting the health consequences from Chernobyl. Yet the difficulty of independent long-term study of Chernobyl has been exacerbated by fragmented research efforts and misplaced priorities, a lack of cooperation between international organizations, inconsistent funding or inappropriate allocation and misuse of funds, and the incompleteness of information and data collection (Williams, 2001).

Because of the inconsistencies of state responses, people did not know what their own doses were, or how at-risk they were to different effects. The Soviets had established a high 35 rem, spread over an individual's lifetime (understood as a 70-year span), as the

threshold of allowable radiation dose intakes. This high threshold minimized the scale of resettlement actions. Soviet medical statistics were designated state secrets. People living in contaminated areas received little medical surveillance; claims of suffering from radiation-related disease—made by those who did not have acute radiation syndrome—were classified as "psychosomatic" realizations (Guskova, 1995).

When they took over the country, Ukrainian lawmakers lowered the Soviet threshold dose from 35 rem to 7 rem, comparable to what an average American would be exposed to in his or her lifetime. They revised the Soviet-made maps of radioactive fallout based on the significantly lowered threshold dose. Territories considered contaminated expanded, and more and more people entered into Ukraine's social welfare system as newly designated Chernobyl sufferers. The country's public health surveillance system expanded too, but without the tools needed to create truly systematic information about the actual conditions of the recipients.

One Ukrainian biophysicist who conducted retrospective dose analyses recalled the moment when the new post-Soviet policies set in: "There were long lines of resettlers waiting outside our laboratory doors. It wasn't enough that they were evacuated to 'clean' areas. These people were reclassified as sufferers, by law. They had unpredictable futures and each of them wanted to know their dose." Perhaps, not surprisingly, these populations had had enough of the uncertainty that the unknown exposure and chaotic intervention regimes had caused. They were far from scientifically illiterate. They wanted to *know their dose*. This information could secure their place in a government system, which compensated health detriments that were actual or potential.

Economic collapse

Of course, the 1990s delivered to Ukrainians a second blow: an economic one. The Soviet industrial framework fell apart. Household financial savings were wiped out by hyperinflation. Social protection systems were overburdened and inadequate to address fast-paced changes in which a core group of long-term poor emerged. The very framing of injury, I learned, was now intimately linked with the country's economic restructuring. In the Kiev clinic where I conducted fieldwork, I met Chernobyl workers who—realizing they faced fewer job prospects outside the Zone—continued working there, hiding their illnesses until they no longer could. For resettlers and those still living on contaminated territories, such compensations from a now independent Ukrainian state also served as a firewall against pervasive losses related to unemployment and hyperinflation. Those I spoke to said they wanted (and needed) a state that could defend them not only against the risks of contamination, but also against the worst effects of a brutal market transition.

Compensation (*kompensatsiia*) was no longer just payment for past disaster-related damages, but a body politic's attempt to balance or neutralize forces that gave or took life. "There are a lot of people out of work," a medical official, who ruled on Chernobyl-related claims, told me. "People don't have enough

money to eat. The state doesn't give medicines free anymore. Drug stores are commercialized." He likened his work to that of a bank and spoke of a growing political economy of claims around radiation illness. "If a person needs medicines, a person needs money. The diagnosis we write is money," he told me.

In 1997, I spent one month in this official's office, located in a major research center in Kiev, taking notes and asking questions of claimants entering the room. Around this time, amendments to compensation laws were being enacted to rein in the number of Chernobyl claims. The World Bank, promoting drastic reductions of the state's social welfare coffers, called the Chernobyl compensation system a "dead weight" on Ukraine's less-than-ideal market transition. Denials of claims were often based on poorly documented evidence of exposure or on the principal that the claimants' illnesses developed beyond the limits of acceptable timetables. But in essence, few formal rules guided the allocation of these privileges. Some individuals pleaded for them; others were given advice about informal clinical procedures to expedite their claims. The state, faced with too many people claiming to have been affected by Chernobyl, conceded that it could not afford to compensate everyone, even if they were sick.

The effects of this government approach played out almost daily in the research center where I conducted fieldwork. One woman, evacuated from her village in the Zone, told the medical official that her daughter had been pregnant at the time of the disaster. She said that her granddaughter, "now ten years old, is weak, her thinking is slow, her thyroid is swollen, her legs hurt, and her blood indicators are poor." Crying, she worked hard to elicit sympathy from the physician, who had the authority to decide whether the girl could be considered as a state-protected sufferer. The child, he said, needed to be evaluated at the Chernobyl children's hospital; he could do nothing for her.

In his mid-50s, one man had worked at the reactor site since 1978; he made a reasonably good salary there. He told the official that he kept careful records of his illnesses and that he regularly checked in at the local clinic of the Chernobyl plant for monitoring and treatment. He showed a document indicating his dose, a high 73 rem. Now, he said, "I'm sick." The official then asked him, "And what about before?" He had been sick, but, he said, "I hid it." When I asked him why, he answered, "So I could work in the Zone. I'm used to working." But he was too ill to continue working at the site, he said, and needed compensation in order to quit. Each day was the same in this administrator's office: Patient after patient told the tales of their sicknesses, and he told most of them that there was little that he could do. From widows of liquidators to former Chernobyl workers who were told that their degree of acute radiation syndrome was no longer compensated, the official had heard it all by the end of each day. After telling one man that he couldn't help him, the doctor turned to me. "He's on the border with death," he said, "We have many like that."

Conclusion

Being accountable to those affected is a key challenge of our time. The present and future consequences of Chernobyl's

health risks are not closed matters. And it is critical to recognize that these claimants showed up in the country's medical centers because of unanswered health problems. The reality of their everyday health burdens should not be excluded from analyses of the disaster's effects, including analysis of how they survived. Biomedical truths are complex, but they must be understood if we are to lay the groundwork for a better response in the future.

Notes

1. Most of the Exclusion Zone is located in Ukraine.
2. Rem, a unit of radiation dose equivalent, reflects the biological effects of radiation. A dose of below 100 rem can produce subclinical effects, detectable by blood changes. 100 to 200 rem can cause non-fatal disease. Doses ranging from 200 to 1000 rem can cause debilitating disease. A dose above 1000 rem can be lethal.
3. According to a press release from WHO, *Chernobyl: The true scale of the accident*, "In the health area, the Forum report calls for continued close monitoring of workers who recovered from Acute Radiation Syndrome (ARS) and other highly exposed emergency personnel. The report also calls for focused screening of children exposed to radioiodine for thyroid cancer and highly exposed clean-up workers for non-thyroid cancers. However, existing screening programs should be evaluated for cost-effectiveness, since the incidence of spontaneous thyroid cancers is increasing significantly as the target population ages. Moreover, high quality cancer registries need continuing government support." Available at: http://www.who.int/mediacentre/news/releases/2005/pr38/en/index.html.
4. These statements, in turn, hark back to the Soviet state's infamous battle against "radiophobia," a dubious diagnostic category that was used to filter out medical claims linked to the disaster.

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