

Living with the Nuclear Tests: the Semipalatinsk Story

BY TOGZHAN KASSENOVA

The now-closed nuclear test site of Semipalatinsk in Kazakhstan stands as a symbol of the lasting pain of worldwide nuclear testing.

In the late 1940s, the Soviet leaders rushed to develop nuclear weapons, determined to catch up with the United States. To test them, they chose the Semipalatinsk region in the northeast part of then Soviet Kazakhstan.

For military and nuclear scientists, this was a perfect piece of land – flat steppes (grassland similar to a prairie), access to river and construction material – wood, sand, and stone. Away from major cities and far from major transportation hubs. But distance proved relative once nuclear tests began in 1949. Residents of Semipalatinsk, a relatively large city 120 kilometers away, and especially the locals in rural settlements close to the testing site, suffered firsthand the horrors of nuclear tests. What appeared as harsh and barren steppe to Soviet military planners was to Kazakhs treasured ancestral land. Kazakhs feel a deep affinity for their land and place of birth, and the Semipalatinsk region holds a special place in the Kazakh national consciousness. It was a cradle to Kazakh literature. Some of Kazakhstan's most famous writers, poets, composers, and intellectuals were born there.

Before the Soviet military arrived, Kazakh shepherds roamed the generous pastures that provided food for their cattle. Soon, the land that prided itself on raising livestock, feeding the country with the best

meat and producing fresh milk, became contaminated with radiation. For forty years, between 1949 and 1989, the Soviet military tested more than 450 nuclear bombs – in the atmosphere and underground – at the Semipalatinsk test site with devastating consequences for the land and the people.¹

TRAUMA

The impact of nuclear tests on people was both immediate with injuries and disruption during the tests and long-term when serious health issues started manifesting themselves. What it felt like to live in the vicinity of nuclear explosions? The story of the Soviet thermonuclear breakthrough and the test of Andrei Sakharov's famous "Sloika" ("layer cake") device in 1953 is a telling example.

Until the last moment, nobody gave any thought that the radioactive fallout from such a powerful explosion would spread beyond the testing site. In a rush, Sakharov and others made calculations about the fallout. They concluded that everyone within the zone where radiation could exceed 200 roentgen had to be evacuated. They also concluded that a dose of 100 roentgen would injure children and people of fragile health. There were two choices: to delay the test by months and prepare for a different method of the explosion – from a plane instead of from a tower, or evacuate the locals.²

A massive evacuation operation began. Hundreds of Army trucks drove thousands of locals away from their homes and hundreds of thousands of livestock to safer areas. One witness

Thirty years since the last nuclear test at the Semipalatinsk Nuclear Test site, there is still no clear, comprehensive picture of the total impact of nuclear tests on locals' health.

described a scene of confusion: "Why? Where? Neither the soldiers nor the shocked locals knew. Panic reigned in the steppe; bewildered people waited for something terrible to happen."³ The thermonuclear test resulted in radioactive contamination of more than 1 roentgen up to 400 kilometers away from the site; the residents in nearby villages who could not evacuate received 10-40 roentgen.⁴ Whether the massive evacuation protected the locals remained an open question with some experts saying that the fallout occurred in the zone where people waited.⁵ A follow up thermonuclear test, in 1955, brought similar disruption to the life of locals. A medical nurse from a village 100 kilometers away from the epicenter, described: "On the eve of the test, the military came to our village and gave instructions. In the morning, after breakfast [...] we walked all sick [patients staying at the hospital] outside, put them face down to the ground and covered with bed sheets."⁶ When a bomb with a yield of 1.6 megatons was dropped from a plane, in Semipalatinsk, 120 kilometers away, at the city's main meat-processing factory, industrial lights shattered

and fell into ground beef.⁷ Many locals suffered injuries, including broken bones. In a hospital, in a women's ward, half a dozen people were injured by a crashed ceiling. A three-year-old girl died when a bomb shelter where she was hiding with her parents collapsed.⁸ Five soldiers were injured during the test, and one died. They were waiting in trenches 36 kilometers away from the ground zero when the soil collapsed on them.⁹ These are just two examples from a history of 400+ tests. People were forced to live with earth shaking beneath them, and walls in their house getting cracks. Above all, they were forced to live in the state of fear of the unknown, facing the invisible danger that started ruining their health.

HEALTH CONSEQUENCES

Thirty years since the last nuclear test at the Semipalatinsk Nuclear Test site, there is still no clear, comprehensive picture of the total impact of nuclear tests on locals' health. Few documents from the past available to scholars paint a picture of conflicting narratives. Thus, for example, the Institute of Biophysics in Moscow, controlled by the Soviet military, would admit the negative impact of nuclear tests on the local population in secret reports, but in its official statements, the military would insist that locals' health problems stemmed from poor diet and living conditions.

In the late 1950s, Kazakhstan's scientists had a rare opportunity to conduct clinical studies of their own. For three years, the scientists from the Institute of Regional Pathology, part of Kazakhstan's Academy of Sciences, painstakingly examined thousands of people, going from one village to another. The clinical data they collected is the most detailed account available to scholars. The scientists from the Institute of Regional Pathology recorded that blood did not circulate properly in people's brains. Those who were exposed long-term to high

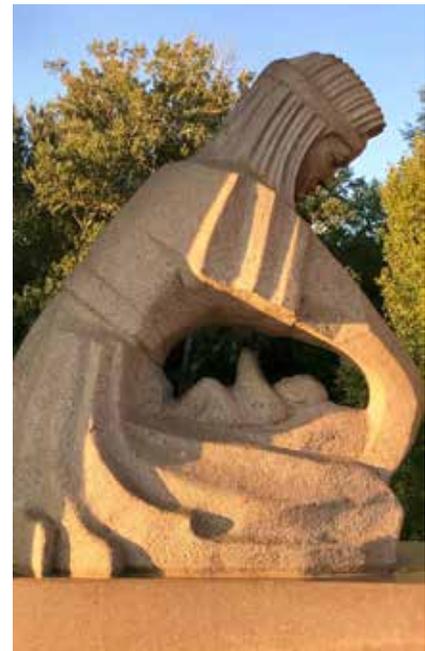
amounts of radioactivity lost the sense of smell and taste. They suffered from changes to their noses, ears, and throats. The neurological pathologies made people tired and caused headaches and dizziness. Many locals were losing their swallowing reflex – the body's essential defense mechanism against choking on food.¹⁰ After the closure of the test site and Kazakhstan gaining independence in 1991, Kazakhstan's scientists together with their international colleagues carried out studies that added new information to the picture.

In 1998, the experts from the Kazakh Scientific Research Institution for Radiation Medicine and Ecology re-examined clinical data collected by the special medical facility established in Semipalatinsk to monitor locals' health (the facility was disguised as an anti-brucellosis clinic). Their report noted that excess cancer rates were on the rise in affected areas up to 1970, and a post-1970

The best way to honor the Semipalatinsk region and its people is for the international community never to allow another nuclear tragedy to happen.

decrease was followed by a second increase in the late 1980s. The data revealed an initial peak in reports of cancer of esophagus, stomach, and liver, followed by a second peak of lung, breast, and thyroid cancers.¹¹ Several studies confirm the impact of radiation on the thyroid gland in the Semipalatinsk region. In one of them, the specialists examined 1,100 people to investigate how the combined effect of ionizing radiation and iodine deficiency contributed to pathologies of the thyroid gland.

Stronger Than Death memorial for victims of the nuclear tests. It depicts a mother covering her child from a bomb. Semey (former Semipalatinsk), Kazakhstan. Photo: Togzhan Kassenova



The specialists found that 75 percent of people examined suffered from thyroid pathology.¹² Another study conducted by a joint team of US, Kazakh, and Russian specialists found that the occurrence of thyroid nodules was linked with external and internal exposure to radiation.¹³ Kazakh and Japanese scientists studied the mental toll of nuclear testing and concluded that individuals who experienced nuclear tests at Semipalatinsk exhibited psychological symptoms similar to hibakusha—survivors of 1945 nuclear attacks on Hiroshima and Nagasaki.¹⁴

The Semipalatinsk tragedy will remain an open wound for Kazakhstan for decades to come.¹⁵ But the people in the Semipalatinsk region do not want to be seen merely as victims. They wish for their loss and pain to be acknowledged, but they do not want to be defined by the horrors of the past. The best way to honor the Semipalatinsk region and its people is for the international community never to allow another nuclear tragedy to happen.

- 1 "The Soviet Nuclear Testing Programme," CTBTO, <https://www.ctbto.org/nuclear-testing/the-effects-of-nuclear-testing/the-soviet-unions-nuclear-testing-programme/>.
- 2 Andrei Sakharov, *Memoirs*, Knopf Doubleday, 1992, p. 172.
- 3 "Musa Sharipov, Almaty," in Kairat Kabdrakhmanov, *470 Bomb v Serdtsce Kazakhstana*, Almaty, 1994, p. 97.
- 4 V. N. Mikhailov, ed., *Yadernye Ispytaniya SSSR*, Russian Federal Nuclear Center, Sarov, 1997, Volume 1, Chapter 5 "Ispytaniya pervykh termoyadernykh vzryvov RDS-6s i RDS-37," p. 221.
- 5 Boris Gusev, interview, film documentary *Where the Wind Blew* (director – Andre Singer), 2017.
- 6 Witness account by Shalaeva S. T. in Keshrim Boztayev, *29 Avgusta*, Atamura, Almaty, 1998, p. 27.
- 7 G. F. Zorin, "I Vse Zhe... Rabota i Zhizn' Byli Interesnymi [And Still... Work and Life... Were Interesting]" in *Rossiya Delaet Sama [Russia Does It Herself]*, Part 3, Sergei Davydov, ed., *Istoriya Atomnogo Proekta [History of Atomic Project]*, Issue 4, p. 216; Sakharov, *Memoirs*, 1992, p. 192.
- 8 Sakharov, *Memoirs*, p. 192; V. A. Logachev, ed., *Yadernye Ispytaniya SSSR: Sovremennoe Radioekologicheskoe Sostoyanie Poligonov [Nuclear Tests of the USSR: Current Radio-Ecological State of Polygons]*, Moscow, Izdat, 2002, p. 62.
- 9 V. A. Logachev, ed., *Yadernye Ispytaniya SSSR: Sovremennoe Radioekologicheskoe Sostoyanie Poligonov [Nuclear Tests of the USSR: Current Radio-Ecological State of Polygons]*, Moscow, Izdat, 2002, p. 62.
- 10 Khairushev E. A., Peisakh S. A., eds., *Radioaktivnost' v neshnei Sredy i Sostoyanie Zdorov'ya Naseleniya i Selskohozyaystvennykh Zhivotnykh v Tsentral'nom Kazakhstane*, Volume 3, Institute of Regional Pathology, Almaty, 1961.
- 11 B.I. Gusev, R.I. Rosenson, Z.N. Abylkassimova, "The Semipalatinsk Nuclear Test Site: A First Analysis of Solid Cancer Incidence (Selected Sites) due to Test-Related Radiation," *Radiation and Environmental Biophysics* 37, October 1998, p. 209.
- 12 L. Danyarova, "Combined effect of the environmental factors as ionizing radiation and a chronic iodine deficiency on the thyroid gland and the immune condition," *International Thyroid Conference*, September 2010, <https://inis.iaea.org/search/searchsinglerecord.aspx?recordsFor=SingleRecord&RN=43054744>.
- 13 "Thyroid Disease Near Semipalatinsk Nuclear Test Site, Kazakhstan," National Cancer Institute Division of Cancer Epidemiology and Genetics, <http://dceg.cancer.gov/research/who-we-study/cohorts/semipalatinsk-nuclear-test-site-kazakhstan>.
- 14 Noriyuki Kawano, Kyoko Hirabayashi, Masatsugu Matsuo, Yasuyuki Taooka, Takashi Hiraoka, Kazbek N. Apsalikov, Talgat Moldagaliev, Masaharu Hoshi, "Human Suffering Effects of Nuclear Tests at Semipalatinsk, Kazakhstan: Established On the Basis of Questionnaire Surveys," *Journal of Radiation Research*, Volume 47, 2006, p. A209-217.
- 15 Togzhan Kassenova, "Humans of the Polygon: Travel Notes from the Land of Abai. Karaul. Znamenka (Kokentau), Sarzhal," *Voices on Central Asia*, 2019, <https://voicesoncentralasia.org/humans-of-the-polygon-travel-notes-from-the-land-of-abai-karaul-znamenka-kokentau-sarzhah/>.



The educational expedition to visit the former Semipalatinsk nuclear testing site organized by the Center for International Security and Policy (Kazakhstan). Photo: Oleg Butenko

