



The legacy of nuclear testing

To increase the destructiveness and lethality of their nuclear forces, and to send warnings to their adversaries, nuclear-armed nations have carried out more than 2,000 nuclear test explosions around the world since 1945.

Releasing vast quantities of radiation into the atmosphere and oceans, these toxic experiments have caused epidemics of cancers and other chronic illnesses. Vast swathes of land remain unsafe for habitation, even decades after test sites were closed.

In the US state of New Mexico just three weeks before the nuclear bombings of Hiroshima and Nagasaki, the US government conducted the world's first nuclear test explosion, code-named "Trinity". Its giant fireball turned the sands into glass, illuminated the surrounding mountains and sent a mushroom cloud of radioactive debris 12 kilometres into the sky.

The consequences for the test site workers and nearby communities were devastating – and continue to be felt to this day.

The same has been the case for people working at or living downwind or downstream of more than 60 other nuclear test sites across the globe, from the deserts of Australia and Algeria to the steppes of Kazakhstan and the atolls of the Pacific.

Nuclear test sites

Nuclear weapons have been tested in Algeria, Australia, China, India, Kazakhstan, Kiribati, Mā'ohi Nui (French Polynesia), the Marshall Islands, North Korea, Pakistan, Russia, Turkmenistan, Ukraine, the United States and Uzbekistan.

Atmospheric nuclear test explosions – more than 500 of which were conducted, from 1945 to 1980 – had a particularly harmful effect, dispersing radioactive particles far and wide. Their combined destructive force was equal to 29,000 Hiroshima bombs.

Today, every person alive carries in their body radioactive substances from atmospheric tests, increasing their risk of disease. Physicians project that, over time, these past tests will cause at least four million premature deaths from cancers and other illnesses.

Nuclear test explosions conducted underwater and underground have also had long-term health and environmental impacts.

In the latter half of the 20th century, worldwide concern about the effects of nuclear testing gave rise to large-scale protest movements in many parts of the world, prompting leaders to negotiate a partial ban in 1963 and a comprehensive ban in 1996. Both have helped halt nuclear testing globally.

But the implications of past testing for people's lives and the Earth's fragile ecosystems will continue to be felt for generations to come. The international community has a duty not only to ensure that such destruction is never wrought again, but also to work to address the harm already done.

Few survivors of nuclear testing anywhere in the world have ever been compensated for their suffering, and efforts to clean up former nuclear test sites have been woefully inadequate. At some sites, dilapidated infrastructure poses an ongoing risk of further contamination.

Radioactive racism

Racist beliefs have often underpinned decisions concerning nuclear testing, with governments and colonial forces viewing indigenous peoples as expendable and their sacred lands as worthless and “remote”.

“Our land, our sea, our communities and our physical bodies carry the legacy of these deadly experiments with us now, and for unknown generations to come,” testified Karina Lester, a Yankunytjatjara Anangu woman from Australia, on behalf of a coalition of indigenous groups at the United Nations in 2017.

In the pursuit of “ever-deadlier weapons of mass destruction”, authorities treated indigenous peoples as “guinea pigs”, she said. Their consent was seldom sought, let alone obtained, and little or no protection was ever offered.

The toxic legacy of nuclear testing has meant that many communities have been disconnected from their traditional way of life, unable to return to ancestral sites or survive off the land and waters as they had done for centuries.



A French nuclear test explosion at Moruroa Atoll in Mā'ohi Nui in 1971.



A crater formed by a Soviet nuclear test explosion in Kazakhstan. Credit: CTBTO

Australia: Blinded by the bomb

In 1953, when Yami Lester was 10 years old, the United Kingdom began conducting nuclear tests at Emu Field near his home in the Australian outback.

He remembered radioactive debris, or “black mist”, filling the sky. It caused his eyes to sting and, within four years, he had lost all sight.

“I was just playing with the other kids. That’s when the bomb went off,” he recalled. “I remember the noise, it was a strange noise, not loud, not like anything I’d ever heard before. The earth shook at the same time; we could feel the whole place move.”

Within hours, everyone in his community fell sick. “We were all vomiting; we had diarrhoea, skin rashes and sore eyes,” he said. “Some of the older people, they died.”

Yami went on to become a leading advocate on behalf of Aboriginal communities in Australia who had suffered harm as a result of the tests. Since his death in 2017, his children have carried on the struggle for justice.

Credit: Jesse Boylan



Kazakhstan: An artist born with no arms

Karipbek Kuyukov grew up in the Kazakh village of Yegyndybulak, near Semipalatinsk – the Soviet Union’s largest nuclear test site. He recalled the furniture and crockery shaking each time a nuclear test explosion took place during his childhood.

Before his birth, his parents would climb a hill near their home to get a better view of the bright and vast mushroom clouds that rose high into the sky.

“They didn’t even know about the health threats and devastating consequences of the crimes being committed against them,” he reflected.

Karipbek was born in 1968 without arms. Despite his physical challenges, he became a renowned artist, using his feet and mouth to paint. Many of his artworks convey an anti-nuclear message.

“My main mission on this land is to do everything I can for people like me to be the last victims of nuclear tests,” he said. “I do not want a repeat of these events at any place or time, anywhere on the planet ... Let our sky be clean and our children be healthy!”

From 1949 to 1989, the Soviet Union conducted more than 450 nuclear test explosions at Semipalatinsk, almost a quarter of all tests globally.



One of Karipbek Kuyukov’s artworks, titled “Fear”.

Marshall Islands: Radioactive atolls

Nerje Joseph was seven years old in 1954 when the United States conducted its largest-ever nuclear test explosion, “Castle Bravo”, about 160 kilometres from her home on Rongelap Atoll in the Marshall Islands.

It was much larger than expected, and caused much greater contamination. The sky turned orange and pink. None of the atoll’s inhabitants knew what had happened.

Hours later, radioactive ash and coral fragments rained down on their homes, contaminating their skin, water and food. Soon they began experiencing symptoms of acute radiation sickness.

Nerje’s hair fell out and, like almost everyone else on the atoll, she suffered burns.

Days later, US authorities evacuated the Rongelapese to another atoll because of the extreme risk of nuclear fallout to their health. But after three years of displacement, the authorities encouraged them to return, as they wanted to study the health effects of residual radiation.

“Data of this type has never been available,” a US official said at the time. “While it is true that these people do not live the way that westerners do, civilised people, it is nonetheless also true that they are more like us than the mice.”

For the Rongelapese, their resettlement back home would prove catastrophic. Cancers, miscarriages, stillbirths and birth defects multiplied.

Due to the accumulation of radioactive isotopes, Nerje had to have her thyroid surgically removed. She longed for a return to the good days before nuclear testing.

From 1946 to 1958, the United States conducted 67 nuclear test explosions in the Marshall Islands. Castle Bravo alone had an explosive yield one thousand times greater than that of the Hiroshima bomb.

Still to this day, entire atolls remain unsafe for habitation, agricultural production and fishing.



Nerje Joseph’s hair loss and burns to her feet from radiation. Credit: US government

Other sources of harm

Other aspects of the development of nuclear weapons – from the mining of uranium to the disposal of radioactive waste – have also had devastating impacts on human health and the environment.

At uranium mines – where the process of making nuclear weapons begins – radioactive and chemical pollution from waste tailings has seeped into the soil and waterways, harming workers and nearby communities. No mine anywhere in the world has been fully cleaned up after mining has finished.

Radioactive contamination has also occurred at nuclear reactors involved in the production of plutonium for nuclear weapons. At the Windscale nuclear power station in the United Kingdom, for example, a fire raged for three days in 1957, sending plumes of radiation across much of Europe. All milk from farms in the vicinity had to be destroyed.

Many communities globally also face ongoing challenges related to the safe, secure storage of vast quantities of nuclear waste amassed from the production of tens of thousands of nuclear weapons since 1945. It will remain dangerous for millennia.



Anti-nuclear protesters in the US state of Arizona. Credit: Jack Cohen-Joppa



Iroji Kebenli, 13 years old, suffered radiation burns when the United States tested a nuclear weapon in the Marshall Islands in 1954. Credit: US government

The mushroom cloud from the nuclear test explosion. Credit: US government