By Cindy Folkers

Hundreds of thousands of people—athletes, officials, media, and spectators—will flood into Japan for the 2020 Olympics. But radiation exposure dangers from the Fukushima nuclear catastrophe have not ended since the March 2011 disaster, and the spread of radioactive contamination over large areas reaching down to Tokyo and beyond. Soon after the start of the melts-downs in 2011, experts began warning of exposure to radioactive micro-particles or “hot particles”—a type of particle that poses a danger unaccounted for by regulatory agencies. In order to understand the special danger posed by these particles at the Olympics and beyond, we must first understand the current state of radiation exposure standards.

Hot Particles Don’t Fit Current Exposure Models

For decades, protection from radiation exposure has been based on understanding how doses are delivered to the human body. Are the doses high or low? Inside or outside the body? Is the dose internal, which organ it is impacting? Is the dose given all at one time, or over a longer period? Additional consideration should be given to who is receiving the exposure: men, women, children, fetuses—although protection based on age, gender and pregnancy falls short.

The difficulty with hot particles, which can travel great distances, is that they don’t deliver doses in the way experts expect. Current exposure assumptions hold that particles or aerosols settling in the body, i.e., through inhalation or ingestion, deliver a low dose to surrounding cells where they lodge. But these models are not truly reflecting the damage that is occurring. For instance, precise distribution of many radionuclides within the body eludes experts. And radiation doses delivered inside cells, which may seem low to an external body, may in fact, deliver a much larger dose to single cells or groupings of cells receive them. Hot particles deliver a much larger dose than what is considered “low.” And once they are inhaled or ingested, they deliver it specifically to the (often unpredictable) area of the body where they lodge.

Hot Particles Make Already Unpredictable Damage Worse

Not only can hot particle doses be unpredictable—so can the damage. Called “stochastic,” damage from radiation exposure may occur at all doses (no matter how small). The higher the dose is, the more severe the consequences. Sometimes these consequences take decades to manifest, but for times of life when fast growth is occurring—such as pregnancy or childhood—the damage may show up in a much shorter time frame.

Fukushima’s Hot Particles in Japan: Their Meaning for the Olympics and Beyond

Since all parts of the human body develop from single cells during pregnancy, the severity of a “radiation hit” during this development can be devastating for future generations, and the nuclear industry never consider these exposures as having an official radiation impact. Therefore, NO safe dose CAN exist. Stochastic risk, coupled with the additional unpredictable and unaccounted-for risk from radioactive micro-particles, can lead to impacts that are more dangerous and difficult to quantify with currently used methods.

Olympics 2020 and Beyond

Clearly, as Japan prepares to host the 2020 Olympics, the danger posed by exposure to radioactive micro-particles should be assessed, in addition to known and better understood radio-contamination. While most of the radioactive particle dust has settled, it can be easily re-suspended by activities such as digging or running, and by rain, wind, snow, and flooding. Health officials in Japan continually fail to act and stop ongoing radioactive exposures. This lack of governmental action puts all residents of Japan at risk, and also any athletes, spectators and visitors that participate in the Olympics.

Currently, the torch relay is scheduled to begin with a special display of the “Flame of Recovery,” as the torch passes through still-contaminated areas of Fukushima Prefecture, including the Grand Slam, the Japanese leg of the 2020 Olympic Torch Relay, will occur at “J. Village,” the former disas
ter response headquarters used during the initial nuclear meltdowns in 2011. It is 12.4 miles from Fukushima-1 wreckage site, and resides close to acres of radioactive topsoil and other material stored in bags. The bags and the cranes moving them are visible on satellite maps dated 2019. After starting in Fukushima, the torch will travel to all remaining prefectures of Japan. Further, there is indication that J. Village (now called National Training Center) is being retrofitted as a practice area for baseball, softball, and soccer. Games hosted in Fukushima Prefecture aren’t the only exposure concern, as radionuclides have traveled far from the ruined cores of Fukushima’s reactors. Radionuclides from the meltdowns were found in Tokyo’s metropolitan area as late as 2016 and would increase and decrease, these researchers observe. The US conducted some 67 nuclear bomb detonation experiments—a giant cement-covered radioactive waste dump site is being threatened by the rising Pacific partly threatening to spread to the rising Pacific partly because of US industry-led carbon and methane pollution. As Susan Rust reported, “Now the concrete coffin, which locals call “The Tomb,” is at risk of collapsing from rising seas and other effects of climate change. Tides are creeping up its sides, advancing higher every year as drastic glaciers melt and ocean waters rise.”

Fukushima’s Hot Particles Could Spread Abandoned Military Rad Wastes

From opposite ends of the Earth, radioactive wastes left behind by US military are colliding with climate disruption—icecap melt and sea level rise—threatening to further contaminate the oceans.

In the Greenland icecap, the US military dug 120 feet down into ice in 1959 and excavated enough ice to cover up 1.5 miles of ice tunnels and chambers into the ice for laboratories, a dining hall, a recreation area, work space, a hospital, and living quarters for up to 200 soldiers, according to news accounts. Unfortunately, Camp Century, as it was called, was lit and heated by the world’s first “mobile” nuclear reactor.

When the site was abandoned in 1967, the military reportedly packed out the reactor vessel, but left behind 9,000 tons of biological, chemical and radioactive waste. “On the assumption it would be ‘preserved for eternity’” by the island’s historically perpetual accumulation of snow and ice, Jon Henley wrote for The Guardian.

In the years since, ice and snow cover above the dump has increased to about 110 feet, but today’s rapidly accelerating heating of the climate means the waste could eventually be uncovered, and melting ice water could potentially carry the toxins into the Atlantic. A study of this unplanned eventuality, led by William Colgan from Toronto’s York University, was published in Geophysical Research Letters. Colgan told The Guardian, “Our estimate is that by 2090, the exposure will be irreversible. It could happen sooner if the magnitude of climate change accelerates.” Indeed, global temperature rise over the last four years has greatly outpaced the most severe scientific models, and last July was the hottest recorded in human history.

Meanwhile, Science Russ, reporting for Los Angeles Times, wrote recently on a flur- white spit of white coral reef in the central Pacific, a massive, aging and weathered concrete dome bobbs up and down with the tide.”

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Under the cement cover known as Runit Dome, there are over 3 million cubic feet of deadly radioactive waste left by the US military’s nuclear bomb testing authorities. Like the US waste in Greenland’s warming ice, radioactive military debris is threatening to spread to the rising Pacific partly because of US industry-led carbon and methane pollution. As Susan Rust reported, “Now the concrete coffin, which locals call “The Tomb,” is at risk of collapsing from rising seas and other effects of climate change. Tides are creeping up its sides, advancing higher every year as drastic glaciers melt and ocean waters rise.”

More than any other place, the Marshall Islands is in the path of the greatest threats facing humanity—nuclear weapons and climate change,” said Michael Gerrard, a legal scholar at Columbia University’s Law School, the LA Times article noted. The US government is entirely responsible for this nuclear waste, and its emissions have contributed more to climate change than those from any other country,” Gerrard said. —JL


— Cindy Folkers is on the staff of Beyond Nuclear where she specializes in radiation impacts on human health, government policy, climate change, and federal subsidies. She handles the group’s administrative operations, and wrote this report for the group’s website.

Winter 2019-20

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