UC SANTA BARBARA

THE Current

March 3, 2025

Keith Hamm

Girls and women disproportionately harmed by nuclear radiation

By design, the detonation of a nuclear weapon in a major city would be devastating. The explosion of intense heat and radiation would kill tens of thousands instantly — as it did during World War II in the Japanese cities of Hiroshima and Nagasaki. That pivotal moment brought an end to the war, but the damage caused by the bombings has carried on through generations, particularly in girls and women exposed to the radiation.

For researchers, the mid- and long-term health consequences from such exposure has been challenging to understand, in part because the damage manifests differently among female and male survivors, according to a recent report co-authored by Amanda Nichols, a postdoctoral researcher in the Environmental Studies Program at UC Santa Barbara. Written with evolutionary biologist Mary Olson, founder of the Gender+Radiation Impact Project, "Gender and Ionizing Radiation: Towards a New Research Agenda Addressing Disproportionate Harm" provides an overview of recent research on the correlation between harm from exposure to ionizing radiation and biological sex, and it proposes questions for a future research agenda to study gender, radiation impacts, and nuclear regulatory policy.

On March 5 at United Nations headquarters in New York, Nichols and Olson will be presenting at the Meeting of States Parties to the Treaty on the Prohibition of

Nuclear Weapons (TPNW). The session, “Gender Mainstreaming in the TPNW: Shaping a Just and Equal Future” is sponsored by the United Nations Institute for Disarmament Research (UNIDIR), which contracted the study. UNIDIR is a voluntarily funded, autonomous institute within the United Nations and one of the few policy institutes worldwide focusing on disarmament.

“The main question we were asking at the beginning of our work was whether there has been more research since the 2006 report which presents data that shows that women, especially young girls, are disproportionately impacted by radiation,” Nichols said. “What we found was an overwhelming and resounding yes.”

That 2006 report, “Biological Effects of Ionizing Radiation VII” (BEIR VII), was conducted by the National Academy of Sciences and based on 60 years of data collected by the Life Span Study of atomic bomb survivors in Hiroshima and Nagasaki.

After diving deeper into the BEIR VII data, their key findings include: clear evidence that radiation causes more cancer, heart disease and stroke in women compared to men; evidence that age at time of exposure is an important factor in assessing radiation outcomes; and that girls ages 0–5 years are the most at risk for developing cancer and non-cancer related health consequences, including compromised immune and metabolic systems, over the course of the lifetime.

The study also found that cancer and non-cancer outcomes from lower-dose radiation exposure may appear at any point during the life of the exposed individual, with some cancers taking as long as 30 years to present in the body. There’s also evidence that women whose reproductive systems were impacted by radiation — even a relatively small dose — could pass the damage genetically to their children.

Still, added Nichols, the question remains: Why are girls and women disproportionately harmed?

One answer could lie with a hypothesis put forth by the late Rosalie Bertell, a Canadian-American scientist, author and Catholic nun. She suggested that women may be more susceptible to radiation because their bodies have more radio-sensitive reproductive tissue than do men, namely breast, ovarian, and uterine tissue.

“But thinking that reproductive tissue is the *only* factor in greater incidence of harm does not explain cardiovascular impacts, for instance, where females are also harmed more than males,” Nichols said.

“Nuclear energy has been reestablished as a major energy option to help address the climate crisis, and what that means is more environmental harm and more people exposed,” she added. “To the community of scholars and people trained in environmental humanities and social sciences and in radiation research who have funding to do this kind of work — we need more people to get involved.”

Media Contact
Keith Hamm
Social Sciences, Humanities & Fine Arts Writer
(805) 893-2191
keithhamm@ucsb.edu

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.