



Invisible Victims

Women and girls pay the biggest price when nuclear disaster strikes

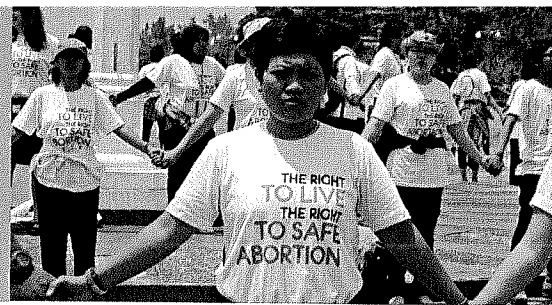
SINCE THE TRIPLE NUCLEAR DISASTER IN FUKUSHIMA, JAPAN, ON MARCH 11, 2011, there has been a great deal of speculation about the dangers to human health and the potential rise in cancer rates as a result of the three meltdowns. However, scientists have long known about the harmful effects of ionizing radiation on women and girls.

Dr. Alice Stewart was the first to sound the alarm about the dangers of radiation exposure in a 1950s study. Stewart found that pregnant women who had a single X-ray to their abdomen were almost twice as likely to have children with cancer as those who did not. She faced misogynistic opposition to her research from male scholars and the nuclear industry, yet another round of research by scientists in the 1970s proved her study absolutely correct.

We now know for certain that an important sex factor has long been ignored.

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◀ Vigil to mourn victims of the Fukushima nuclear plant disaster

Women are much more likely to get cancer from radiation exposure than their male counterparts, girls are twice as likely to get cancer as boys from the same radiation exposure, and fetuses are most vulnerable of all. (The science has not yet determined *why* women and girls are more vulnerable to the harmful effects of radiation.)

A 2006 National Academy of Sciences report found that males are more resistant to the negative effects of ionizing radiation. Females are 40 to 60 percent more likely to get cancer and die from the same radiation exposures as males.

Mary Olson of the Nuclear Information and Resource Service (NIRS) argues that this sex discrepancy is of concern, especially for women working in professions such as research and medicine where “safe dose” standards are based on a white adult male “reference man.”

Dr. Arjun Makhijani, president of the Institute for Energy and Environmental Research, suggests that the white male standard “reference man” should be retired since it doesn’t account for gender, racial, cultural and environmental variables. Such a standard consequently leaves children, women and populations of color far more vulnerable to cancer, other illnesses and death from ionizing exposures than currently recognized by industry standards. Safety regulations and environmental protections must be re-evaluated and updated accordingly.

The International Commission on Radiological Protection (ICRP), a nongovernmental body that advises on radiation safety in the United States, has been looking at age and

sex variations in radiation safety standards. It first offered a new reference model in 2002 that replaces the “reference man” with a group of male, female and age-variant subjects.

According to Olson, the ICRP has also considered a hypothetical hermaphrodite model—an adult individual with a blend of male and female reproductive organs. But the hermaphrodite standard omits consideration of biochemical or metabolic factors that differ in male and female bodies.

Additionally, safety standards for the hermaphrodite reference model are based on external, not internal, exposures. This despite the fact that

tion, make the eggs, such effects could generate the immediate negative population effects that we have observed in Fukushima.”

An interesting factor regarding radiation safety is that statistically men more so than women favor nuclear power. Research in the United States has also shown that in addition to the gender divide, there is a racial one: White men favor nuclear power more than everyone else; white men are most willing to accept nuclear disaster risk.

Historically, many anti-nuclear campaigns and actions have been led by women. In Japan, it is women who predominantly oppose nuclear pow-

Girls are twice as likely to get cancer as boys from the same radiation exposure.

with food and water contamination increasing worldwide, the impact of internal exposures must be studied, and safety standards should be adjusted accordingly. For children in particular, internal contamination from radiation must be taken into consideration. Research shows that tritium, for example, may cross the placenta and can harm developing fetuses.

Dr. Timothy Mousseau’s research on the impact of ionizing radiation on animal and insect life in contaminated areas of both Chernobyl and Fukushima shows surprisingly similar results from ionizing radiation exposures in declining bird and butterfly populations.

Mousseau states, “In our birds, we have found that in general females are more sensitive to the radioactive contaminants and have lower life spans. Given that females, by defini-

er, and a nascent feminist movement has arisen in response to the Fukushima disaster. We see such feminist anti-nuclear activism in India as well: Thousands of women led actions opposing the opening of the Kudankulam reactor in 2012, for example.

Perhaps it’s finally time to heed the Cassandras who were ignored, dismissed or trivialized, particularly Rachel Carson, best known for her work on DDT, who further warned against the dangers of bioaccumulation and ionizing radiation contamination half a century ago in *Silent Spring* and *The Sea Around Us*, as well as the epidemiologist Alice Stewart, who decades ago taught us so much about the high risk of radiation to the fetus.

What neither Carson nor Stewart knew: Women and girls pay the greatest price of all.

—HEIDI HUTNER