

## Special Susceptibility of Children to Radiation Effects

In a nuclear war, children who survive the acute effects of radiation—the blast and intense heat—may also have to survive the loss or disability of parents who provide food, shelter, and love, so necessary for physical and emotional development. The likelihood of provision of even limited medical services following a nuclear blast is virtually nil. Finally, persons exposed to radiation as children have a substantially greater susceptibility to delayed effects than do those persons exposed as adults.

1. The peak frequency for leukemia is higher and occurs earlier among those less than 15 years of age exposed to radiation than among those who are older.

2. Breast cancer occurs excessively when females who were exposed to radiation during childhood reach the usual age for developing this malignancy. The rates for breast cancer for those who were 10 to 19 years of age at the time of the bomb are greater than those for females who were older at that time. Unexpectedly, an excessive occurrence of breast cancer has been observed among females who were 9 years old or younger at the time of the bomb, an age range when they would have had very little breast tissue. If cases continue to occur at the same rate as these women grow older, the excessive occurrence of breast cancer will be greater than among all other age groups.

3. Persons less than 30 years old at the time of

the bomb are apparently more susceptible than older persons to radiogenic thyroid cancer. Benign thyroid tumors have occurred among nearly all children exposed to radioiodine-containing fallout from a nuclear weapons test on the Marshall Islands in 1954. Two infants who were less than 1 year of age suffered ablation of the thyroid.

4. Exposure of the unborn child at 4 to 17 weeks of gestational age produced small head size, which was related in frequency and severity to the radiation dose. The lowest dose that caused an increased frequency of small head size in Hiroshima was 10 to 19 rads as measured in the air at the mother's skin. The dose was attenuated as it passed through her body en route to the embryo. At 50 rads, the head size, small because of depletion of brain cells, was associated with mental retardation, which increased in frequency with increasing dose. Few fetuses less than 4 weeks of gestational age at the time of the bomb were available for study, apparently because of miscarriages.

5. Chromosomal abnormalities in peripheral lymphocytes are still excessive among atomic bomb survivors, including persons exposed to radiation in utero.

6. The most frequent effect of exposure to the atomic bomb is fear of late effects, hereditary as well as somatic.

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