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## Effects on human body

### A Early deaths and injuries in the immediate aftermath

#### Summary

Early deaths following the bombings are defined as those occurring by the end of December 1945, a period that was marked by a high rate of mortality. Observed in the first two weeks after the dropping of the atomic bombs were 88.7% of the early deaths, with 11.3% of such deaths occurring in weeks three through eight. In a survey of 2,500 households (comprising 7,600 A-bomb survivors), the 50% lethal dose measure LD50 was estimated to be between 2.7 and 3.1 Gy of bone marrow dose. Numbers of early deaths in Hiroshima and Nagasaki were estimated to be around 114,000 and 73,000, respectively.

Early health effects are divided into three periods: the first (immediately following the atomic bombings through the end of the second week) ranges from instantaneous deaths to deaths caused within several days of the bombings by physical weakness brought about by fever, hematemesis (bloody vomiting), and hemorrhagic stool, among other causes. The first half of the second period (weeks three through five) was mainly characterized by such symptoms as epilation (loss of hair), purpura (purple spots) and other hemorrhaging, oropharyngeal lesions, and decreased white blood cell count, and the symptoms grew more severe with increasing radiation dose. The latter half of the second period (weeks six through eight) was marked by the disappearance of symptoms of inflammation and hemorrhagic causes, but some survivors in this period experienced pneumonia or serious bouts of colitis, resulting in relapses of poor health. The third period (months three through four) was characterized in the survivors by a trend of recovery from injuries, burns, and functional impairment of blood and organs caused by radiation.

Table 1 Numbers of deaths in Hiroshima (not including military deaths: as of Aug. 10, 1946)

Distance from hypocenter(km)	Deaths	Critically wounded	Slightly wounded	Missing	Without injury	Total
Less than 0.5	19,329	478	338	593	924	21,662
0.5~1.0	42,271	3,046	1,919	1,366	4,434	53,036
1.0~1.5	37,689	7,732	9,522	1,188	9,140	65,271
1.5~2.0	13,422	7,627	11,516	227	11,698	44,490
2.0~2.5	4,513	7,830	14,149	98	26,096	52,686
2.5~3.0	1,139	2,923	6,795	32	19,907	30,796
3.0~3.5	117	474	1,934	2	10,250	12,777
3.5~4.0	100	295	1,768	3	13,513	15,679
4.0~4.5	8	64	373		4,260	4,705
4.5~5.0	31	36	156	1	6,593	6,817
At least 5.0	42	19	136	167	11,798	12,162
Total	118,661	30,524	48,606	3,677	118,613	320,081

(1961, the City of Hiroshima)

Table 2 Numbers of deaths in Nagasaki (according to the City of Nagasaki)

Deaths	73,884
Wounded	76,796
Other victims	120,820
Total	271,500

Unclear whether or not the above figures include fluid populations such as military members or other volunteer fighting corps (1979, The Committee for the Compilation of Materials on Damage Caused by the Atomic Bombs in Hiroshima and Nagasaki)