Hiroshima and Nagasaki
Effects of the Atomic Bomb

1. Short Term Casualties
   a. Deaths
      i. Hiroshima 66,000\(^1\) (45,000 on the day, 19,000 by the end of 1945\(^2\))
      ii. Nagasaki 39,000
   b. Injuries
      i. Hiroshima 69,000
      ii. Nagasaki 25,000

2. Long Term Effects of Radiation
   a. Cancer
      i. It was concluded that persons exposed to the bombs at the time of detonation did show effects from ionizing radiation and that some of these patients, otherwise uninjured, died. Deaths from radiation began about a week after exposure and reached a peak in 3 to 4 weeks. They practically ceased to occur after 7 to 8 weeks.\(^3\)
      ii. The second approach to this question was to determine if any persons not in the city at the time of the explosion, but coming in immediately afterwards exhibited any symptoms or findings which might have been due to persistence induced radioactivity. By the time of the arrival of the Manhattan Engineer District group, several Japanese studies had been done on such persons. None of the persons examined in any of these studies showed any symptoms which could be attributed to radiation, and their actual blood cell counts were consistently within the normal range. Throughout the period of the Manhattan Engineer District investigation, Japanese doctors and patients were repeatedly requested to bring to them any patients who they thought might be examples of persons harmed from persistent radioactivity. No such subjects were found. It was concluded therefore as a result of these findings and lack of findings, that although a measurable quantity of induced radioactivity was found, it had not been sufficient to cause any harm to persons living in the two cities after the bombings
      iii. the total number of cancers attributable to radiation exposure through 2000 may be about 1,900 cases.\(^4\) Most due to leukemia,

   b. Birth defects
      i. No statistically significant increase in major birth defects or other untoward pregnancy outcomes was seen among children of survivors.\(^5\)
      ii. As of 2007, there has been no evidence of increased cancer incidence or increased mortality from cancer or other diseases in the children of survivors\(^6\)

\(^1\) http://avalon.law.yale.edu/20th_century/mp10.asp
\(^2\) http://www.warbirdforum.com/hirodead.htm
\(^3\) http://avalon.law.yale.edu/20th_century/mp22.asp
\(^4\) http://www.rerf.or.jp/general/qa_e/qa2.html
\(^5\) http://www.rerf.or.jp/radefx/genetics_e/birthdef.html
\(^6\) http://www.rerf.or.jp/radefx/genetics_e/mortalit.html
3. Social
   a. Huge number of persons who were killed or injured so that their services in rehabilitation were not available
   b. a panic flight of the population took place from both cities
   c. 6500 children survivors who were orphaned
   d. Hibakusha (survivors) and their children are victims of severe discrimination

4. Psychological
   a. Paralysis. No significant reconstruction or repair work was accomplished because of the slow return of the population
   b. sheer terror. Persons who had become accustomed to mass air raids had grown to pay little heed to single planes or small groups of planes, but after the atomic bombings the appearance of a single plane caused more terror and disruption of normal life than the appearance of many hundreds of planes had ever been able to cause before.

5. Environmental
   a. Hiroshima and Nagasaki are no longer radioactive? (Radiation levels are at normal background level for the area)

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7  http://avalon.law.yale.edu/20th_century/mp24.asp
8  http://atomicbombmuseum.org/4_survivors.shtml
9  http://en.wikipedia.org/wiki/Hibakusha#Discrimination
10 http://eternalflames.ucsc.edu/exhibits/show/hibakusha/gwendolyn--fong
11 http://www.commondreams.org/headline/2010/08/04-1
12 http://www.rerf.or.jp/general/qa_e/qa12.html