

OFFICE OF THE AIR SURGEON

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STATISTICAL ANALYSIS OF THE MEDICAL
EFFECTS OF THE ATOMIC BOMBS

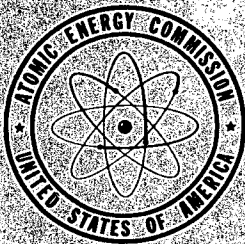
From the Report of the Joint Commission for
the Investigation of the Effects of the Atomic
Bomb in Japan.

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STATISTICAL ANALYSIS

INTRODUCTION

The Form

By the time the American physicians of the Joint Commission arrived in Japan, a great deal of information on the medical effects of the atomic bombs had already been recorded by the Japanese. For the most part, however, it consisted of scattered hospital and dispensary records of patients treated in the first few weeks after the bombing. Since this was the only source of information on the early effects of the bomb on human subjects, the immediate need was to collect and assemble these records systematically for analysis. The form illustrated in figure 1 was designed and used for this purpose in both Hiroshima and Nagasaki. In order to obtain as much consistency as possible, the form was used to record the data for patients later examined under the direction of the American physicians.

The form is largely self-explanatory. It was designed to obtain two types of information:

- (a) The location, position and shielding of the individual at the time of the bombing.
- (b) The injuries sustained, the symptoms, if any, which later developed, a general diagnosis, and the outcome of the case.

The items are described as follows, in the order in which they appear on the form:

After all the records were assembled, a case number was stamped on the top of each record, in serial order, for identification. The form illustrated in figure 1a is case number 4307, as shown at the top of the sheet.

The number H-10367-S, just to the right of the title, is a code number indicating where the examination was made and the type of patient (hospital, dispensary, outpatient or "sample").

The name, age, sex and occupation of the patient are entered in item 1. The age was recorded by the Japanese system, in which an infant is considered to be one year old at the moment of birth, and becomes a year "older" on the following New Year's Day, instead of on his birthday. Thus, a child born near the end of the year may be "two years old" within a few days, or even in a few minutes after birth. This may make a great difference in the statement of a child's age. In adults it is relatively unimportant, although there may be a maximum difference of two years in the age of an individual as expressed in the Japanese system and the commonly used American system.

The location of the individual at the time of the bombing, as recorded in item 2, is of the greatest importance in the analysis of the data. Seven concentric circles were drawn on a map of each city, with the center located directly under the point at which the bomb exploded. The radii of these seven circles were respectively, 1,000, 1,500, 2,000, 2,500, 3,000, 4,000 and 5,000 meters. Throughout this report the location of individuals will be given in terms of the rings formed by these circles. Individuals in rings 1 through 7 were located within 1,000 meters of ground center, 1,100 to 1,500, 1,600 to 2,000, 2,100 to 2,500, 2,600 to 3,000, 3,100 to 4,000 and 4,100 to 5,000 meters from ground center respectively. Individuals at a distance of over 5,000 meters are designated as being in ring 9.

It should be especially noted that these distances are recorded in terms of meters from "ground center", the point on the ground above which the bomb exploded. Since both bombs exploded several hundred meters above the ground, the actual distance from the bomb is greater than the distance from ground center. An individual 500 meters from ground center was only about one and a half times as far from the bomb as individuals directly beneath the bomb. This is the reason why the radius of the first ring was set at 1,000 meters rather than at some shorter distance. Farther away, the distance from ground center is more nearly proportional to the distance from the bomb, as may be shown by simple triangulation.

For simplicity, wherever the word distance is used hereafter in this report, it will be defined as distance from ground center, rather than distance from the bomb. The reader so desiring may make an appropriate conversion to meters from the bomb with little difficulty.

In addition to the circles described above, eight equally spaced radial lines were drawn on the map of each city to indicate the direction.

The location of the individual was recorded in item 2 of the form by a code number, indicating both the ring and the direction. The distance to the nearest 100 meters was also recorded on many of the forms, and the exact building or area was recorded, if it was of special interest.

As shown in figure 1a, school boy Tasuku Ezawa was on the Supiyoski Bridge, 1,600 meters from ground center in ring zone 3, (as indicated by the code number "8b").

In some instances, the location was recorded in terms of street address, or on an alternative system of rectangular coordinates, but these were later translated into the standard ring zone and direction system as described. For the most part, distances were probably accurate to within about 100 to 200 meters. Undoubtedly, some individuals were confused and gave erroneous information and, perhaps in a few instances, the home address might have been recorded instead of the location of the individuals at the time of the bombing. Perhaps some apparent inconsistencies, which will appear later in the discussion, are attributable to such errors.

The cause of injuries, if any were sustained, are recorded in items 3 and 4. Tasuku Ezawa, who was standing in the open on a bridge, received burns and, in the opinion of the examining physician, received radiation injuries (see words circled on the form in figure 1a). He received no injuries from "blast", "burning building", "flying debris", or "falling walls". If he had received a mechanical injury, the type of injury would have been recorded here and described more fully under "diagnosis" on the back of the form (figure 1b).

The protection of the individual by objects between himself and the point of explosion is of almost as much importance as distance in the extent of injuries received. Indeed, the protection afforded by distance is partly due to the shielding effect of air. Under item 5 are recorded:

- (a) The position of the individual (standing, sitting or prone).
- (b) If the individual was indoors, the type of building was recorded. The height of the building and the floor he was on were also written in.
- (c) If the individual was outdoors, it was recorded whether he was in the open or behind some object and, if so, what sort of object.
- (d) A description of the clothing worn and the color of the clothing.
- (e) Any other type of protection.

The patient's statement of the injuries received by other people in his near-vicinity was entered in item 6.

Item 7 is a description of burns as to degree, area, parts of body, and healing.

Under the heading "Radiation Effects", item 8, are recorded those symptoms which, at the time, were thought most likely to be produced by gamma radiation. The time of onset, and the time ceased, is recorded for each symptom. As shown in figure 1a, Tasuku Ezawa was nauseated and

vomited three times on August 6, the day of the bombing. He complained of malaise and anorexia, beginning on that day and lasting for two weeks. He had moderate epilation of the scalp, beginning on September 4 (29 days after the bombing) and lasting until September 19, with regeneration beginning on September 20. No other symptoms were recorded.

The immediate and after effects of the blast on the lungs, ears, intestines and central nervous system are recorded in item 9. Tasuku Ezawa was knocked unconscious and later had dizziness and a headache, presumably as a result of the blast.

The treatments are shown on the back of the form (figure 1b) under item 10.

If the patient died, the date, cause and autopsy findings are recorded in item 11.

Red blood cell counts, hemoglobin, hematocrit, white blood cell counts and other laboratory data are entered in item 12. A diagnosis of the case was made by the examining physician (item 13) and reviewed by the American physician in charge. Additional observations and complications are recorded in item 14, and the date and signature of the examining physician are entered at the bottom of the sheet.

Collection and Analysis of the Data

Ideally, it would have been desirable to study a random sample of the population of each city from the moment of the bombing until all the possible results were manifest. Obviously, this was impossible under the circumstances. A large percentage of the population was killed immediately, and the destruction was so great that the Japanese could not even make an accurate count of the bodies. On the other hand, some of the effects may not appear for several years, and the genetic effects, if any, will not become apparent until the next generation.

However, every attempt was made to examine as representative a sample of the population as was possible, and to obtain case histories over as long a period as time and circumstances permitted. The cases came from the following sources:

All the Japanese medical records of cases treated before the arrival of the Americans were transcribed on the standard form. Over two-thirds of the case histories of patients who were not killed outright, but who died later as a result of the bombing, were obtained from this source.

All the hospital and dispensary patients remaining after the arrival of the Americans were examined under the supervision of American physicians.

Teams of Japanese doctors, nurses, and medical assistants were formed under American supervision to examine individuals who were not receiving medical attention. An attempt was made to examine a representative sample of the remaining population in every section of each city, including a control group beyond the range of physical destruction.

Records were obtained on a total of 6,993 individuals in Hiroshima and 6,898 individuals in Nagasaki. Of these, 1,141 in Hiroshima and 2,404 in Nagasaki were hospital cases.

The nature of this sample must be carefully borne in mind in interpreting the data about to be described. Only individuals who survived the initial blast and destruction are included in these records. Since it is estimated that within a radius of 1,000 meters, approximately 87% of the individuals in Hiroshima and 88% of the individuals in Nagasaki died*, most of them within a period of 24-hours, the survivors in the inner zones

*See tables 4 and 9.

are a highly selected group. Individuals within a distance of 1,000 meters (ring 1) who survived must have been well shielded, extraordinarily resistant, or both. Individuals who were at a distance of over 3,000 meters (rings 6, 7 and 9) at the time of the bombing may approximate a random sample of the original population, since the proportion of people killed outright was relatively low.

The hospital cases are an obviously selected group, although not all the patients in the hospitals had been admitted for injuries due to the bombing. The non-hospital cases are selected to the extent that many individuals with severe injuries or symptoms had been removed to hospitals (up to hospital capacity). On the other hand, in spite of precautions taken to avoid it, it seems likely that people with complaints were more likely to have voluntarily come in for examination than people who felt perfectly well.

A preliminary analysis of the data showed that whereas the hospital cases had many more injuries and symptoms than the non-hospital group, a high percentage of injuries and symptoms were found among the latter. Furthermore, while the absolute incidence was different, the trends of incidence in respect to distance formed the same general patterns in the two groups.

In consideration of these selective factors no statistical tests have been applied to test the significance of differences as to the incidence of burns, mechanical injuries, and symptoms in individuals at various distances.

A preliminary analysis of the data showed that 6,882 cases in Hiroshima and 6,621 cases in Nagasaki were seen alive on the 20th day after the bombing or later, while 111 in Hiroshima and 277 in Nagasaki were last seen prior to the 20th day. Of the former group, 254 in Hiroshima and 174 in Nagasaki were known to have died on the 20th day or later, while of the latter group 91 in Hiroshima and 238 in Nagasaki died prior to the 20th day. Many of the cases last seen prior to the 20th day were incompletely recorded, being copied from old records. Furthermore, cases last seen a week or two after the bombing, and alive at that time, may have died or developed symptoms at a later date and were, of course, not recorded.

For these reasons, and in order to describe more homogeneous populations, the individuals last seen prior to the 20th day after the bombing have been treated as a separate group. Throughout the following discussion, the cases described are individuals known to be alive twenty days or more after the bombing, except where it is specifically stated otherwise.

Other than this, no records were eliminated, except a very few cases on which no data was recorded other than the name, and the fact that they died on the day of the bombing, and a few cases on which the location of the individual at the time of the bombing was not recorded.

In spite of the limitations mentioned, the data from these records probably give a reasonably accurate description of the medical history of individuals remaining alive a few weeks after the atomic bombing of these cities.

The People Examined

The sex and age distributions of individuals examined in the two cities who were living twenty days after the bombing are shown in table 1. In Hiroshima, slightly more males than females were examined (3,612 males; 3,270 females), while in Nagasaki the females considerably outnumbered the males (2,866 males; 3,755 females).

Age, as shown in table 1, was recorded in the Japanese system previously described. The individuals examined in Hiroshima averaged several years older than those in Nagasaki, the mean ages being 29.5 for males and 28.4 for females in Hiroshima, as compared with 25.5 for males and 22.8 for females in Nagasaki. Only a small percentage of the cases examined were children under 5 (2.9% in Hiroshima and 2.0% in Nagasaki). In Hiroshima,

about one-third (33.2%) were of school age, 5 to 9 years old; 58.6% were between 20 and 59; and 5.3% were 60 years old, or over. In Nagasaki, over half (56.7%) were 5 to 19 years old; 38.3% were between 20 and 59; and 3.0% were 60 years old, or over.

As would be expected from the age distributions, about one-third (31.0%) of the individuals examined in Hiroshima were students, as compared with nearly two-thirds (62.5%) in Nagasaki. (See table 2). In Hiroshima 11.6%, and in Nagasaki 0.7% were in military service. The percentages of individuals in other occupational groups in Hiroshima and Nagasaki respectively were "laborer" 5.7% and 18.1%; "white collar" 12.1% and 7.1%; "executive and professional" 1.4% and 0.3%; "housewife" 10.0% and 2.9%; "farmer" 3.3% and 3.0%; "unemployed" 14.9% and 4.1%; and "other occupations" 10.0% and 1.1%.

The location of the individuals at the time of the bombing in terms of distance and shielding is shown in tables 3H and 3N for Hiroshima and Nagasaki respectively. About half of the people examined in each city were in lightly constructed Japanese-type frame buildings (46.9% in Hiroshima and 50.5% in Nagasaki). In Hiroshima 6.1% of the people were in more heavily constructed brick, steel, and concrete buildings, and only 0.4% were in bomb shelters and tunnels. A much larger percentage of the people in Nagasaki were shielded by heavy construction, 19.5% being in brick, steel, and concrete buildings, and 5.8% in bomb shelters and tunnels.

A larger percentage of the people examined were in heavy buildings and bomb shelters in rings 1 and 2 (within a distance of 1,500 meters) than in more distant rings. In ring 1, 18.9% of the people examined in Hiroshima and 50.1% of the people examined in Nagasaki were in heavy type buildings and bomb shelters at the time of the bombing. Most of the people in outer rings were either in Japan type frame buildings or outdoors.

This is due, partly, to the fact that the bombs were dropped over the center of the cities where there was more heavy construction. In addition, since the casualties were lower among people protected by heavy construction most, if not all, of the survivors in rings 1 and 2 had some sort of shielding.

In Hiroshima, 42.2% of the people were outdoors, 10.1% being outdoors shielded, and 32.1% being outdoors unshielded. As compared with this, only 23.2% of the people in Nagasaki were outdoors, 8.3% being outdoors shielded, and 14.9% being outdoors unshielded.

The location of individuals outdoors or in various types of buildings is only a rough index as to the amount of protection afforded. For example, some of the people in concrete buildings were standing beside an open window facing the bomb, and were fully exposed to direct effects of the explosion, while others were in the cellar on the opposite side of the building and protected by steel girders and many feet of concrete. Likewise, some of the people outdoors were in the shadow of one or several concrete buildings, and in some instances, behind hills and had a great deal of protection. The "outdoors shielded" group is distinguished from the "outdoors unshielded" group, largely, by the individuals' own awareness of shielding or the lack of shielding. People outdoors behind a wall or a tree reported that they were shielded, although the wall may have been of flimsy construction, affording little protection from gamma radiation. Others who thought that they were in the open may have been in the shadow of a relatively distant building or hill.

For these reasons, no attempt has been made to define the extent of shielding among these various groups in precise physical terms. Nevertheless, in spite of the variation among individuals, there is a considerable difference in the average amount of shielding in these several shielding groups.

As shown in tables 3H and 3N, a much larger proportion of the people examined in Nagasaki were well shielded than were well shielded in Hiroshima, especially in rings 1 and 2. This should be borne in mind in interpreting the data which follow.

II

BURNS, MECHANICAL INJURIES, BLAST EFFECTS, AND DEATHS

The percentage of individuals with burns, and the percentage of individuals with mechanical injuries in each ring, are shown in figures 2H and 2N, and tables 4H and 4N. It will be noticed immediately that in both cities a smaller percentage of people received burns in rings 1 and 2 than in ring 3. In Hiroshima burns were sustained by 25.1% of the people examined in ring 1; 34.7% in ring 2; 47.3% in ring 3; and 42.7% in ring 4. There was a much lower incidence of burns in Nagasaki, but the same general pattern appears with 22.7% of the people burned in ring 1; 24.0% in ring 2; 34.7% in ring 3, and 23.1% in ring 4.

With increasing distance beyond ring 4, there is a sharp drop in the percentage of people burned. In Hiroshima, burns were sustained by 26.6% of the people examined in ring 5; 12.0% in ring 6; and 0.4% in ring 7. The corresponding percentages in Nagasaki are 20.3% in ring 5; 7.5% in ring 6; and 7.5% in ring 7.

The decrease in the incidence of burns beyond ring 4 may approximate the decrease in intensity of radiant heat. The inverse relationship between the incidence of burns and distance in the first three rings is most probably due to a process of selection. The individuals under discussion all survived the effects of the bombing for at least twenty days. The radiant heat in rings 1 and 2 (within a distance of 1,500 meters) was very intense and a large proportion of the population was killed outright by this and other causes. It seems likely that the great majority of the individuals in these rings who were exposed directly to the radiant heat died immediately, or within a few days, and so could not appear among these cases. Those who survived in these rings were probably partially or entirely shielded from direct radiation, whether they realized it or not. Such a selective factor could account for a lower percentage of burns among survivors in an area where burns were most likely to prove fatal.

There was a larger percentage of individuals with mechanical injuries than with burns among these survivors. The incidence of mechanical injuries declined rapidly with increasing distance, though not quite so markedly as in the case of burns. In Hiroshima, 61.8% of the people in ring 1 sustained mechanical injuries; 59.6% in ring 2; 45.7% in ring 3; 40.7% in ring 4; 39.3% in ring 5; 25.7% in ring 6; and 14.6% in ring 7. The incidence of mechanical injuries was somewhat lower in Nagasaki, being 56.4%, 62.3%, 38.2%, 26.9%, 24.4%, 27.6%, and 9.8% in rings 1, 2, 3, 4, 5, 6, and 7 respectively. The injuries recorded in these figures include all degrees of injury from minor scratches to severe lacerations and compound fractures. However, with the severe shortage in medical attention, and lowered white cell counts due to radiation, lacerations and abrasions which would ordinarily be of no consequence frequently resulted in severe infection.

The incidence of individuals with fractured bones and the incidence of individuals with lacerations, abrasions, or contusions are shown in tables 5H and 5N. Of 463 individuals with mechanical injuries in ring 1 in Hiroshima, 23 (5.7%) had fractured bones and 396 (98.0%) had lacerations, abrasions or contusions. The 23 people with fractured bones in ring 1 in Hiroshima is only 3.1% of the 749 individuals in the ring. The proportion of the individuals with any mechanical injuries who sustained fractured

bones decreases with distance, and none were reported beyond ring 6 in either city. In Nagasaki, 2.5% of the people in ring 1; 1.6% in ring 2; 1.0% in ring 3; 0.4% in ring 4; 0.8% in ring 5; and 0.4% in ring 6 sustained fractured bones. (See table 5N). Nagasaki was similar to Hiroshima, in that the proportion of individuals with fractured bones to all individuals with mechanical injuries decreased with distance, though not very consistently.

In order to obtain a general description of the severity of mechanical injuries, the injuries were classified as "moderate" or "severe". Since many cases lacked complete description of the injuries, the classification was not very precise. In general, compound fractures of any bones, a simple fracture of a long bone, and multiple lacerations, abrasions or contusions, were classified as severe injuries. Simple fractures of minor bones, and single lacerations were classified as moderate injuries.

The percentage of individuals with moderate and severe mechanical injuries in each ring is shown in table 6. Of the individuals injured in rings 1 and 2, a slightly larger percentage had severe mechanical injuries than had moderate mechanical injuries. In Hiroshima 35.4% in ring 1 and 30.9% in ring 2 had severe mechanical injuries. In Nagasaki the corresponding percentages were 30.8% and 31.0%. The percentage of severe injuries declined with distance more rapidly than the percentage of people with moderate mechanical injuries. Of the individuals with mechanical injuries in rings 3, 4, 5, 6, and 7 the greater proportion were moderate.

The direct effects of the blast on individuals (as distinguished from secondary effects from collapsing buildings and flying debris) were comparatively slight. In both cities less than 1% of the individuals in ring 1 had ruptured ear drums, and none occurred beyond 3,000 meters. (See table 4H and 4N).

In ring 1, 10.4% of the people in Hiroshima and 21.8% of the people in Nagasaki complained of vertigo, tinnitus, headaches, and related symptoms beginning immediately or a short time after the blast. The incidence declined with increasing distance, but in ring 7, 8.8% of the people in Hiroshima and 6.8% of the people in Nagasaki reported these symptoms, as did some individuals in ring 9, over 5,000 meters distant.

Loss of consciousness from the blast was not a very frequent finding among the individuals who were living twenty days after the bombing. It had a higher incidence in Hiroshima than in Nagasaki, being reported by 7.1% of the people in ring 1 in the former city, and 2.5% in the latter. Like other effects, the incidence of loss of consciousness from the blast declined with increasing distance.

Out of a total of 6,882 people in Hiroshima and 6,621 in Nagasaki who were alive on the twentieth day after the bombing, only 254, or 3.7% in the former city and 174, or 2.6% in the latter died later, apparently from injuries sustained by the bombing. In Hiroshima the percentage of deaths in rings 1, 2, 3, 4, and 5 were 25.9%, 4.1%, 0.6%, 0.1% and 0.1% respectively, and no deaths were reported among the individuals examined in rings 6, 7, and 9. The percentage of deaths in Nagasaki in rings 1, 2, 3, 4, 5, 6, and 7 were 8.1%, 3.2%, 3.2%, 0.7%, 0.8%, 0.4% and 0.4% respectively. These deaths will be discussed in more detail farther on.

The Influence of Shielding on the Incidence of Burns and Mechanical Injuries

The influence of shielding on the incidence of individuals with burns is illustrated in figures 3H and 3N from the data presented in tables 7H and 7N. The percentage of people with burns was greatest in individuals outdoors unshielded, considerably less in individuals outdoors shielded, and very much less indoors. There was little difference in the incidence of burns among people in heavy-type buildings (brick, steel and concrete) and

people in lightly constructed Japanese-type buildings.*

The incidence of burns in Hiroshima was greatest among individuals outdoors unshielded in ring 3, 89.3% of the people sustaining burns. In the same ring, burns were sustained by 42.3% of the people outdoors shielded, 16.2% of the people in Japanese-type buildings, and 16.1% of the people in heavy buildings. There were too few people in bomb shelters and tunnels to yield reliable statistics.

Approximately the same relationships were found in Nagasaki. In ring 3, 76.9%, 30.1%, 23.9%, 23.9% and 4.3% of the people sustained burns outdoors unshielded, outdoors shielded, in Japanese buildings, in heavy buildings, and in bomb shelters and tunnels respectively.

The difference in the over-all percentage of people with burns in Hiroshima and Nagasaki, as previously described, is largely accounted for by the fact that a larger proportion of the people were outdoors in Hiroshima than in Nagasaki. The incidence of burns in the two cities may be compared in ring 5, where the selective death rate is not so large as to unduly bias the results. Among people in ring 5 outdoors unshielded 64.6% in Hiroshima and 60.4% in Nagasaki sustained burns. Among people in ring 5 in Japanese-type buildings, 11.0% in Hiroshima and 6.0% in Nagasaki sustained burns.

Even taking shielding into account, a somewhat larger proportion of two individuals examined sustained burns in Hiroshima than in Nagasaki, but the difference is considerably less than appears from the over-all figures.

The incidence of mechanical injuries among survivors was influenced by shielding in exactly the reverse order from what was found in the case of burns. (See figures 4H and 4N and tables 7H and 7N).

The incidence of mechanical injuries was greatest among individuals in heavy buildings, slightly less among individuals in Japanese-type buildings, still less among individuals outdoors shielded, and least among individuals outdoors unshielded. Of the individuals in heavy buildings in ring 1 in Hiroshima, 80.5% sustained mechanical injuries, as compared with 27.6% of the individuals outdoors unshielded. Among individuals in ring 1 in Nagasaki, 78.9% of those in heavy buildings were injured, as compared with 24.7% of those outdoors in the open.

Most of the mechanical injuries were caused by falling walls and ceilings, and by flying debris, especially glass. Individuals indoors or behind walls were more apt to be injured in this way than individuals outdoors in the open.

While it is true that a smaller percentage of the survivors in lightly constructed Japanese-type buildings sustained mechanical injuries than those in heavy buildings, this does not give a complete picture of the degree of protection conferred by the two types of construction. As shown in sections 10H and 11N, the death rate was much higher in Japanese-type buildings than in heavy concrete buildings. Within a wide radius, the Japanese-type buildings collapsed completely, crushing and trapping the victims. The well constructed concrete and steel buildings remained standing for the most part, but the occupants were injured by flying glass and falling plaster ceilings. Therefore, the individuals in Japanese-type buildings were more likely to be killed and less likely to sustain non-fatal injuries than in modern concrete buildings.

Type, Degree and Location of Burns

Although it was not specifically called for on the form, the examiners were instructed to record whether burns were due to the flash, to flames

*The individuals indoors, but type of building unspecified, have been included with those in Japanese-type buildings, since the majority of individuals were in Japanese-type buildings.

from burning buildings, etc., or both. This was not always easy to determine and was omitted from many forms. The great majority of the individuals burned sustained flash burns only, a smaller proportion sustained both flash and flame burns, and only a few (36 in Hiroshima and 34 in Nagasaki) were burned by flames only. (See tables 8H and 8N). The percentage of individuals with flame burns only showed little change with distance. No flash burns were reported beyond a distance of 4,000 meters in Hiroshima, while in Nagasaki 9 out of 265, or 3.4% of the individuals in ring 6 (4,100 - 5,000 meters) were reported to have received flash burns.

An individual who received third degree burns is very likely to have some areas of first and second degree burns as well, and many of the cases were recorded as having burns of two or three different degrees. As the form did not require the details of recording the exact extent of each degree of burn, the individuals have been classified in tables 9H and 9N by the most severe degree of burn sustained. Of the people with burns examined in Hiroshima, 6.2% had first degree burns, 52.7% had second degree burns, and 41.1% had third degree burns in the most severely burned area.

In Nagasaki, 11.7% had first degree burns, 71.3% had second degree burns, and 17.0% had third degree burns. There was no marked or consistent relationship between distance and the degree of burn among these survivors.

Tables 10H and 10N show the individuals burned in each ring classified by the percent of body area burnt, and by the most severe degree of burn. The majority of the burns covered less than 10% of the body area, but a considerable number covered 10% to 19% of the body area, and a few covered over 40% of the body area. About one-quarter of the individuals burned had second degree burns covering 2% to 9% of the body area.

In order to obtain a general, summary description of the severity of burns sustained by individuals who were not immediately killed, the severity of burns in each case was classified as "moderate" or "severe" by the following criteria:

Moderate Burns:

- (1) First degree less than 20% in area.
- (2) Second degree less than 10% in area.
- (3) Third degree less than 2% in area.

Severe Burns:

Area burned greater than indicated for "moderate" burns.

In many instances the degree or the area, or both, were lacking on the form, and in such cases, the burns were classified as "moderate" or "severe" in the best judgment of the physician from reading the diagnosis, the description of the parts of the body burned, and other indications on the form. In a small proportion of cases such clues were lacking, and these were classified as "moderate" on the assumption that if the burns had been severe enough to attract attention, they would most probably have been described.

Table 11 shows the incidence of moderate and severe burns in each ring. In Hiroshima, 21.9% of the individuals in ring 1 had moderate burns, and 3.2% had severe burns, while in ring 4, 18.6% had moderate burns, and 24.1% had severe burns. The relatively small incidence of severe burns in ring 1 is probably another example of the selective factor previously mentioned. Probably most of the individuals in ring 1, sufficiently exposed to have severe burns from direct radiation, died, and so are not included among these survivors. In rings 6 and 7, there was a higher incidence of moderate burns than severe burns. There were more cases of moderate burns than severe burns in every ring in Nagasaki. In total, there were twice as many moderate burns as severe burns reported.

The majority of burns were on exposed parts of the body. (See table 12). As the weather was warm, a considerable number of people had removed their shirts, many were wearing only shorts, and some were naked. Among the individuals burned in Hiroshima, 88.4% were burned on the limbs, 77.2% were burned on the head (including face and neck), and 38.1% were burned on the trunk.

In Nagasaki, 83.6%, 64.6% and 36.2% of the individuals were burned on the limbs, head and trunk respectively. In Hiroshima, 28.3%, and in Nagasaki, 22.7% of the burned had burns on the head, the limbs and the trunk, while 38.4% in Hiroshima and 28.8% in Nagasaki had burns on the head and limbs, but not the trunk. Burns at one site only were less common. Burns of the limbs only occurred in 14.9% and 24.5% of the individuals burned in Hiroshima and Nagasaki respectively; burns of the head only occurred in 8.5% and 10.5% of the cases in Hiroshima and Nagasaki; and burns of the trunk only in 1.1% and 3.3% of the cases in the two cities.

Burns in Relation to Clothing

As is well-known, any clothing affords a considerable amount of protection from burns (especially flash burns), the degree of protection, depending upon the thickness, texture, material, and color. The factor of color was strikingly demonstrated in a number of cases in both cities. There were many examples of printed material being entirely burned away in colored areas which absorbed the heat and left unscorched in white areas which reflected the heat. The pattern of printed dresses was burned on the skin of some individuals, the skin under black or colored portions of the cloth being burned and the skin under white portions of the cloth being left unburned. This resulted in a kind of negative imprint on the skin. (See figures 55 and 56, section 5H of this report.)

Since both the part of the body burned and the clothing worn were described on the forms, an attempt was made to obtain statistical data on this phenomenon from these records. The attempt was only moderately successful, since it was frequently impossible to determine, with any degree of certainty from the form, whether or not an individual was burned under clothing, this specific question not having been asked routinely. Therefore, the data summarized in table 13 are not entirely accurate.

Of the individuals burned in Hiroshima, 34.6% were burned on uncovered areas only, 60.1% were burned, both on uncovered areas and under clothing, and only 5.4% were burned under clothing only. Thus, while a majority were burned, both on uncovered areas and under clothing, over six times as many people were burned on uncovered areas only as were burned under clothing only. Considering the fact that, in general, several times as large a proportion of the body is covered by clothing than is uncovered, this shows a considerable degree of protection from clothing. In Nagasaki, 46.5% were burned on uncovered areas only, 44.5% were burned, both on uncovered areas and under clothing, and 9.0% were burned under clothing only. Thus, in Nagasaki a total of 91.0% of the individuals with burns were burned on uncovered areas, as compared with a total of 53.5% burned under clothing.

In Hiroshima, 169 individuals were burned who were wearing white clothing only, and of these, 89 (52.6%) were burned under the white clothing. By comparison, out of 785 individuals burned who were wearing colored clothing only, 560 (71.3%) were burned under the colored clothing. There is a difference of 18.7% ($71.3 - 52.6 = 18.7$) between these two percentages; the standard deviation of the difference is 6.0%, and the critical ratio of the difference is 3.1 ($18.7 \div 6.0$). Since the odds are 516 to 1 against a difference this great or greater arising from chance alone, the difference may be considered as statistically significant. In other words, it is highly probable from this evidence that white clothing gives more protection from burns than does colored clothing. This is, of course, making the assumption that the thickness of cloth and the parts of the body covered was approximately the same for those wearing white and those wearing colored clothing. In actual fact, many individuals recorded as wearing colored clothing only were probably wearing white undergarments under colored outer clothing. This would tend to minimize the apparent difference as indicated by these figures.

There were fewer people in Nagasaki on whom to test this hypothesis. Of the individuals with burns, 86 were wearing white clothing only and 495 colored clothing only; 50% of the former group being burned under their white clothing and 56.8% of the latter group being burned under their colored clothing. The difference is 6.8% in favor of white clothing, but with the numbers involved this is not statistically significant.

Outside evidence, both from physical measurements and from the observations of individuals with flash burns from the atomic bombs, indicates far more clearly than these data that white clothing confers much more protection from flash burns than does colored clothing of the same weight and texture.

Another factor of interest in this connection is the observation made by the physicians that most of the flash burns through clothes occurred at the shoulders, elbows and other spots where the clothing was pulled tightly against the body. Burns were much rarer under loosely fit clothing where there was an air space between cloth and the skin.

III

SYMPTOMS

A few remarks are necessary concerning the definition and reliability of several of the symptoms. Very few individuals had epilation of any part of the body other than the scalp, and all but one or two of these cases had epilation of the scalp as well. Therefore, epilation of other parts of the body has been combined with epilation of the scalp. The form has spaces to indicate the presence of purpura and of petechiae, but since these are closely related and very similar manifestations, they have been combined under the general term of purpura throughout this report. Space is provided on the form to record the presence or past history of gingivitis and pharyngitis, but other oropharyngeal symptoms such as tonsillitis and sore throat were frequently written in. These have all been combined under the term of oropharyngeal lesions. Where necrotic gingivitis has been entered on the form, it has been recorded in the following tables as a separate item and included with oropharyngeal lesions as well. Likewise, where bloody diarrhea has been entered on the form, it has been recorded in these tables, both as a separate item and under the heading of diarrhea. The term "other hemorrhage" in these tables includes mainly epistaxis, bleeding gums, hematuria and a few instances of other types of hemorrhage, but does not include purpura or bloody diarrhea. Nausea was not necessarily recorded for individuals who vomited.

There was no specific requirement that the temperature should be taken in making the examinations and no space is provided for it on the form. However, the temperature taken at various lengths of time after the bombing was frequently written in as an additional observation on the back of the form. These tables show the number of cases in which a temperature of 39° or more was recorded. Since temperature was recorded in only a minority of cases, these figures indicate the minimum number of cases in which a temperature of 39° or more occurred.

Another factor should be mentioned concerning the reliability of all these observations. The standard form was used in making all the examinations done under American direction, and the physicians were instructed to check every item. As each form was reviewed by an American physician for completeness and accuracy, these records should be reliable though, occasionally, some items may have been overlooked.

On the other hand, forms copied from Japanese hospital records may not be as complete or reliable. For example: if purpura was not entered on the hospital record, there is no way of being sure that the patient did not have purpura. Not being specifically asked, the physician simply may not have recorded it, especially since there was an acute shortage of doctors and nurses to handle the thousands of casualties. Therefore, the data here presented may be considered as the minimum number of cases with each specified symptom.

The Incidence of Symptoms in Relation to Distance

The incidence of these symptoms in each ring is shown in tables 14H and 14N. The usefulness of a particular symptom from the diagnostic standpoint

depends upon two factors, its sensitivity to the causative agent and its specificity. A certain diagnosis of radiation injury, for example, could be made from a single symptom if a symptom could be found which was invariably produced by radiation and never produced by any other cause.

We may assume that all the individuals in ring 1 received a strong dosage of radiation for a very short space of time (except, perhaps, a few individuals in deep tunnels and bomb shelters). Unfortunately, no examinations were made on the same individuals just before the bombing for comparison. The best group available for comparison consists of the individuals within the city area at a distance of over 5,000 meters (ring 9). Although the intensity of radiation was comparatively slight at this distance, there is some evidence (from white cell counts as will be shown later) that some of the individuals were measurably affected by the radiation.

A symptom both sensitive to and specific for gamma radiation should have a very high incidence in ring 1, and a very low incidence in ring 9.

In figures 5H and 5N, the symptoms have been ordered from left to right, taking both of these two criteria into consideration. As shown for Hiroshima (figure 5H), epilation is both the most specific and the most sensitive symptom. Epilation had a higher incidence than any other symptom (69.4%) in ring 1, and it was the only symptom which did not appear in a single case among the 219 individuals examined in ring 9. Purpura appeared in 48.9% of the individuals in ring 1 and in only 0.5% (1 case) in ring 9. These two symptoms, epilation and purpura, may be considered as by far the best and most easily recognized diagnostic signs (aside from laboratory data) since both are rare in a normal population and have a high incidence among individuals exposed to atomic bomb intensities of gamma radiation. The epilation described here is easily distinguished from the ordinary loss of hair in males. In some instances, however, the epilation may have been produced by flame or flash burns rather than by radiation, but this was a minor factor, as will be shown later.

The incidence of these two symptoms was much lower in Nagasaki, 31.6% of the individuals having epilation and 21.3% having purpura in ring 1. But not one of the 194 individuals examined in ring 9 had either epilation or purpura.

Oropharyngeal lesions had a very high incidence in ring 1 (61.1% in Hiroshima and 34.9% in Nagasaki). By comparison, in ring 9, 7.3% of the individuals in Hiroshima and 2.6% in Nagasaki had oropharyngeal lesions. With such a difference in incidence in ring 1 as compared with ring 9, the appearance of oropharyngeal lesions in an individual anywhere near the explosion of an atomic bomb would seem to indicate a high likelihood of radiation injury. The use of this symptom as a diagnostic sign has the obvious disadvantage that it is not at all specific for radiation, i.e., the incidence may be very high in a population due to other causes.

In Hiroshima, vomiting, other hemorrhage, nausea, and fever appear to be about equal, both as to sensitivity and specificity. The incidence of these symptoms in ring 1 was vomiting 35.2%, other hemorrhage 38.1%, and fever 34.7%; in ring 9 the incidences were 0.9%, 3.7%, 2.7% and 4.6% respectively. It should be noted that vomiting and nausea are not entirely independent symptoms, the majority of cases with vomiting also being recorded under nausea. The comparison of fever in these two rings may perhaps be somewhat misleading, since the temperature was not taken in all cases and was more likely to be taken on a patient in ring 1 with injuries than on a patient in ring 9 without injuries.

The incidence of these four symptoms in Nagasaki in rings 1 and 9 respectively were vomiting 27.0% and 1.5%; other hemorrhage 13.9% and 1.0%; nausea 28.3% and 1.0%; and fever 10.4% and 0.5%.

Necrotic gingivitis and bloody diarrhea are fairly specific, since they are relatively rare in an ordinary population and had a very low incidence in ring 9; but the incidence in ring 1 was not very high as compared with other symptoms. The incidence of necrotic gingivitis in ring 1 was 10.3%

in Hiroshima and 2.5% in Nagasaki; the incidence of bloody diarrhea was 10.7% in Hiroshima and 6.8% in Nagasaki.

Anorexia had a high incidence in ring 1 (47.8% in Hiroshima and 37.0% in Nagasaki) and a relatively low incidence in ring 9 (6.8% in Hiroshima and 4.6% in Nagasaki). It, therefore, appears to be a good diagnostic sign. However, as a general subjective complaint, it may be more subject to bias than some of the findings previously mentioned. Though there is some evidence, proof is lacking that anorexia was caused specifically by gamma radiation rather than resulting from other conditions of the bombing.

Though malaise and diarrhea had a high incidence in ring 1 in Hiroshima, (47.4% and 50.1% respectively), they were common throughout the population of the city. Even in ring 9, 24.2% of the people had malaise and 37.4% had diarrhea. Therefore, though gamma radiation may have had some influence, these two symptoms probably resulted, largely, from the widespread destruction of the city, as well as general conditions incident to the defeat of Japan.

Cramps had the lowest incidence of any of these symptoms and showed little relationship to distance. In Hiroshima, cramps occurred in 3.9% of the individuals in ring 1, and in 3.2% of the individuals in ring 9; while in Nagasaki the incidence was 3.9% and 0.5% in rings 1 and 9 respectively.

Epilation and Purpura

With increasing distance, there was a very rapid decrease in the percentage of individuals with epilation and the percentage of people with purpura. (See figures 6H and 6N). The percentage of people with epilation in Hiroshima in each of the seven rings, starting with ring 1, was 69.4%, 30.3%, 8.3%, 4.8%, 2.3%, 1.2% and 0% respectively. The percentage of people with purpura in each ring was 48.9%, 21.4%, 4.3%, 1.9%, 1.2% and 1.7% respectively.

The incidence of both epilation and purpura was much greater in Hiroshima than in Nagasaki in ring 1. It will be recalled that there were more individuals in heavy buildings in ring 1 in Nagasaki than in Hiroshima, and this may partly explain the difference. In ring 3 and beyond, there was a larger percentage of both these symptoms in Nagasaki than in Hiroshima. In Nagasaki the percentage of people with epilation in each of the seven rings was 31.6%, 24.4%, 12.4%, 6.1%, 2.5%, 1.4% and 0.4% respectively. The percentage of people with purpura in each of the rings was 21.3%, 17.2%, 8.9%, 3.6%, 1.1%, 1.5% and 0.4% respectively.

Oropharyngeal Lesion, Vomiting and Other Hemorrhage

As shown by figures 7H and 7N, the percentage of cases with oropharyngeal lesions, other hemorrhage, and vomiting declined very rapidly with increasing distance, though not so rapidly as in the case of epilation and purpura. Of the three, oropharyngeal lesions had the highest total incidence, but the line does not have quite as steep a slope with distance as for vomiting and other hemorrhage.

In Hiroshima, the percentage of cases in each ring, starting with ring 1, was for oropharyngeal lesions, 61.1%, 33.9%, 15.7%, 15.9%, 15.0%, 6.8%, and 8.8%; for vomiting, 35.2%, 25.8%, 9.8%, 7.3%, 5.7%, 5.9%, and 2.1%; and for other hemorrhage, 38.1%, 17.5%, 6.1%, 6.5%, 5.9%, 3.8%, and 2.1%.

These three symptoms have a much lower incidence in ring 1 in Nagasaki than in Hiroshima. There was comparatively little difference between the two cities in rings 2 through 7. Thus, these symptoms, oropharyngeal lesions, vomiting, and other hemorrhage follow the same general pattern in the two cities as was previously shown for epilation and purpura.

The percentage of cases in each ring in Nagasaki, starting with ring 1, was for oropharyngeal lesions, 34.9%, 32.3%, 19.3%, 15.0%, 13.0%, 10.6%, and 7.2%; for vomiting, 27.0%, 27.0%, 15.8%, 9.2%, 6.8%, 4.8%, and 2.3%; and for other hemorrhage, 13.9%, 12.4%, 7.5%, 5.4%, 2.8%, 2.5% and 1.9%.

Malaise, Diarrhea and Anorexia

Of the remaining eight symptoms, malaise, diarrhea, and anorexia had the highest incidence in all rings, but showed the least change in incidence with increasing distance (except for cramps, which showed little if any change with distance in Hiroshima). (See figures 8H and 8N). These three symptoms had about the same incidence in ring 1 in Hiroshima (malaise 47.4%, diarrhea 50.1% and anorexia 47.8%), but anorexia declined in incidence with increasing distance more rapidly than the other two.

These three symptoms had about the same rate of decrease with distance in Nagasaki, malaise and diarrhea showing a somewhat more rapid decrease with distance in Nagasaki than in Hiroshima.

Nausea and Fever

As would be expected, the incidence of nausea followed the same pattern in respect to distance as vomiting in both cities. The incidence of nausea was greater than the incidence of vomiting, since some people, particularly in the outer rings, were nauseated, but did not vomit. In Hiroshima, in ring 7, 5.4% of the people were nauseated and 2.1% vomited; in Nagasaki, in ring 7, 3.8% were nauseated and 2.3% vomited. Nausea was not recorded for some individuals who vomited.

Fever, (39°C. or above), in Hiroshima, had a fairly high incidence in ring 1 (34.7% of the people) and decreased very rapidly with increasing distance down to 3.8% of the people in ring 7. In Nagasaki, the incidence of fever was very much lower, 10.4% of the people being reported as having fever in ring 1 and 2.3% in ring 7. Since there was no requirement for the temperature to be taken in the physical examination, little weight should be attached to this difference between the two cities. It may be that the temperature was taken on a smaller percentage of the cases in Nagasaki than in Hiroshima, thus resulting in a smaller proportion of the total number of cases being reported as having a fever of 39° or over.

Bloody Diarrhea, Necrotic Gingivitis and Cramps

Bloody diarrhea, necrotic gingivitis, and cramps were not very common findings even in ring 1. In ring 1, bloody diarrhea was reported for 10.7% of the people in Hiroshima and 6.8% in Nagasaki, and in ring 7 it was reported for 0.8% of the people in Hiroshima and 1.1% in Nagasaki.

In Hiroshima 150 cases of necrotic gingivitis were reported, of which 77 (10.3%) were in ring 1 and 43 (3.8%) were in ring 2. No cases of necrotic gingivitis were reported in rings 6 and 7.

The incidence of necrotic gingivitis was even lower in Nagasaki, with only 80 cases being reported in the entire sample. Only 2.5% of the people had necrotic gingivitis in ring 1, and no cases were reported in ring 7.

Cramps was the only one of these symptoms which seemed to be unrelated to distance in Hiroshima. The incidence was very low, only 3.9% of the individuals being reported with cramps in ring 1. In Nagasaki, the incidence of cramps did show a downward trend with distance, but the incidence was just 3.9% in ring 1 (the same as in Hiroshima).

Menstruation

The effect of the bombing on menstruation is difficult to evaluate from these records, since there was probably a high incidence of abnormality before the bombing in both cities and many of the records lacked a complete and accurate description of the menstrual history, both before and after the bombing. No precise or consistent criteria were used to define abnormality, some of the information coming from hospital records which merely stated that abnormality existed. But in general, if more than one period was skipped in three or four months the case was recorded as abnormal.

Nearly 17% of the women in Hiroshima, and nearly 8% in Nagasaki were reported as having abnormal menstruation, both before and after the bombing. (See section A of tables 15H and 15N.) This is probably an under-estimate of the amount of abnormality before the bombing.

Section B of tables 15H and 15N excludes those women who were known to have had abnormal menstruation before the bombing. It was reported that the bombing had no effect on menstruation in 64.5% of these women in Hiroshima and 71.7% in Nagasaki. In Hiroshima 24.0% and in Nagasaki 15.9% had normal menstruation before the bombing and abnormal menstruation after the bombing. Menstruation was abnormal after the bombing, but unknown before the bombing in 11.5% of the women in Hiroshima and 12.5% in Nagasaki.

This latter group, for whom there is no record of the menstruation before the bombing, makes it difficult to estimate accurately either the pre-bombing incidence of abnormal menstruation or the effects of the bombing on menstruation.

The bombing probably produced abnormal menstruation in between 24% and 35% of the women in Hiroshima who were normal before the bombing, and in between 16% and 29% of the women in Nagasaki who were normal before the bombing.

There is a fairly consistent change in the incidence of abnormal menstruation after the bombing with increasing distance. Taking the greater of the two alternative estimates indicated above, abnormality was produced in 40.8% of the women in ring 1 and 20.9% of the women in ring 7 in Hiroshima, and in 36.6% of the women in ring 1 and 18.0% of the women in ring 7 in Nagasaki. (See column 8 of tables 15H and 15N.)

There is no evidence in these data to indicate whether the effects on menstruation were produced primarily by gamma radiation, or whether they were produced by other conditions incident to the bombing, or both.

Pregnancy

A total of 45 women were examined in Hiroshima and 177 in Nagasaki who were pregnant at the time of the bombing (among those who were living twenty days after the bombing). (See tables 16H and 16N.) In Hiroshima, 37 (82.2%) showed no apparent effects of the bombing at the time they were examined; 6 (13.3%) had had abortions and 2 (4.4%) had had premature deliveries, with the baby born alive. Of the 177 pregnant women examined in Nagasaki, 125 (70.6%) showed no apparent effects, 39 (22.0%) had had abortions, and 13 (7.3%) had had premature deliveries with the baby born alive.

Though the numbers are small, there is some indication that the effect was related to distance. The disruption of the community following the bombing is sufficient to account for some abortions and premature deliveries. There is no evidence as to whether or not gamma radiation was wholly or partly responsible.

Days from Bombing to Onset of Symptoms

Epilation appeared in from one to four weeks after the bombing in the majority of cases and purpura usually appeared in from two to five weeks.

(See figures 9H and 9N and tables 17H and 17N.) The mean time from the bombing to onset of epilation was 19.7 days in Hiroshima and 21.1 days in Nagasaki. The mean time from the bombing to the onset of purpura was 25.1 days in Hiroshima and 24.4 days in Nagasaki. There was a very wide variation in time of appearance of both of these symptoms. A few cases of epilation (17 in Hiroshima and 21 in Nagasaki) were reported to have occurred on the day of the bombing, and a few did not appear until over sixty days later (21 in Hiroshima and 24 in Nagasaki). The records indicate that burns were the primary cause of very early loss of hair in some cases.

The intensity of radiation probably had some influence on the time of onset. (See table 18.) For Hiroshima, the mean days to onset of epilation was 17.2 days in ring 1, 20.8 days in ring 2, 28.1 days in ring 3, and 25.7 days in ring 4. The mean days to onset of epilation in these same four rings in Nagasaki was 19.4, 21.8, 21.3, and 22.6. There were too few cases beyond ring 4 to make valid comparisons.

The mean days from the bombing to onset of purpura in rings 1, 2, 3, and 4 respectively in Hiroshima were 23.2, 27.1, 26.1, and 27.9; and in Nagasaki were 24.0, 25.1, 22.8, and 27.6 respectively.

The mean days to onset of oropharyngeal lesions was 22.2 days in Hiroshima and 22.5 days in Nagasaki. A fairly large number of cases in both cities (169 cases in Hiroshima and 100 cases in Nagasaki) were reported to have begun on the day of the bombing. It seems likely that some of these cases existed prior to the bombing, but on being questioned, the patients associated the symptom with the catastrophe. Approximately the same number of cases began during each five-day period through the nineteenth day with a considerable increase occurring between the twentieth and thirty-fourth days. From the fortieth day on, the incidence of new cases in each five-day period became very much less.

As a certain number of cases of oropharyngeal lesions are expected in a normal population, especially in a community with such a high level of infection. It was thought that a large percentage of the late occurring cases of oropharyngeal lesions probably were unassociated with the direct effects of the bomb. Therefore, the cases occurring after the thirty-ninth day were omitted from all further analyses. The number and percentage of people in each ring who developed oropharyngeal lesions within thirty-nine days of the bombing, and those who developed oropharyngeal lesions after the thirty-ninth day, is shown in tables 19H and 19N. There is little indication of any relationship to distance in the late occurring cases.

Vomiting occurred on the day of the bombing in 70.9% of the cases reported with vomiting in Hiroshima, and 68.5% of the cases so reported in Nagasaki. Vomiting occurred in the first four days after the bombing in 11.5% of the cases in each city, and the remainder of the cases were scattered over a period of four months. With the filth, poor and insufficient food, and general horrible conditions in both cities following the bombing, one would expect a certain amount of vomiting to occur. The striking feature was the great number of people who vomited on the day of the bombing. For this reason it was thought that vomiting on the day of the bombing was a direct result of the bomb, and that later vomiting was, in most instances, probably an indirect result or unrelated. As shown in tables 19H and 19N, there was a marked relationship between distance and vomiting on the day of the bombing, and very much less relationship between distance and vomiting at a later date. Therefore, only vomiting occurring on the day of the bomb was considered in all further analyses.

The mean days from the bombing to the onset of diarrhea was 16.8 days in Hiroshima and 16.4 in Nagasaki. A large percentage of the cases started within the first ten days, but time of onset was distributed over a period of over four months. (See tables 17H and 17N.) As has been previously discussed, there was a high incidence of diarrhea throughout both communities, and the incidence appeared to be less related to distance than was the case with many of the other symptoms. There was a greater relationship between

distance and the incidence of diarrhea which started on the day of the bomb than between distance and incidence of diarrhea with onset at a later date, but the difference was not great enough to warrant separating these two groups for analysis. (See tables 19H and 19N.)

Duration of Symptoms

An estimate was made of the duration of each symptom by subtracting the date of onset from the date of cessation. This was a rough estimate at best, since some of the symptoms, particularly vomiting, were intermittent rather than continuous, and the figures only indicate the elapsed time between the first occurrence and the last known occurrence. There was the added difficulty that, in some cases, the symptoms were present at the time the patient was last examined, and only the time from onset up to the examination could be recorded, rather than the total duration of the symptom. For these reasons, the average duration of the symptoms, as shown in tables 20H and 20N, are only rough approximations and may be regarded as under-estimates.

While a majority of the individuals vomited only on the day of the bombing, some vomited frequently thereafter and at much later dates. The average elapsed time between the first time and last time these individuals vomited was 2.3 days in Hiroshima and 2.7 in Nagasaki. There does not appear to be any consistent relationship between distance and the average elapsed time.

The mean duration of oropharyngeal lesions (beginning within thirty-nine days of the bombing) was 16.3 days in Hiroshima and 10.7 days in Nagasaki. The symptoms may have lasted a little longer in people near the center than people more distant, but the difference is not great. As previously noted, these figures are probably under-estimates of the average duration of oropharyngeal lesions.

Diarrhea lasted an average of 16.8 days in cases observed in Hiroshima and 10.2 days in Nagasaki. The average duration does not appear to be correlated with distance.

Purpura lasted an average of 13.1 days in both cities. But a large percentage of the cases had the symptom when last seen, so this is undoubtedly an under-estimate.

Symptoms by Ring and Shielding

While very lightly constructed walls are sufficient protection from flash burns, wooden walls are transparent to gamma rays, and some inches of concrete or earth are required to diminish appreciably the intensity of gamma radiation. Therefore, individuals in Japanese buildings probably received little less gamma radiation than individuals outdoors. There was a great deal of variation in exposure among people within the same concrete building. Individuals in the upper stories on the side nearest the bomb were protected at best by a few inches of concrete and may have had no protection if they were near a window, while individuals in the basement on the far side of the building may have been protected by several feet of concrete and steel girders. Twenty-five people examined in Hiroshima, and 367 people examined in Nagasaki were in bomb shelters and tunnels. Most of them were well protected by many feet of earth or concrete, but a few were standing in the entrances and had little protection. These variations should be borne in mind in evaluating the results shown in figures 10H and 10N, and tables 21H and 21N.

Figures 10H and 10N show the percentage of individuals with each symptom in rings 1 and 2 among people outdoors or in Japanese-type buildings, as compared with people in heavy-type buildings (brick, concrete or steel). The greatest differences between the two groups appear in the incidence of epilation and purpura, the two symptoms which showed the sharpest decline

with distance, and which are probably the most specific symptoms of injury from radiation. In rings 1 and 2 in Hiroshima, 49% of the people outdoors or in Japanese buildings had epilation, as compared with 33% of the people in heavy buildings. The comparable figures in Nagasaki were 34% outdoors or in Japanese-type buildings, and 20% in heavy buildings. The incidence of purpura in rings 1 and 2 in Hiroshima was 34% outdoors, or in Japanese-type buildings and 26% in heavy buildings; in Nagasaki the incidence was 21% outdoors or in Japanese-type buildings and 16% in heavy buildings.

Oropharyngeal lesions (onset within thirty-nine days of the bombing) occurred in Hiroshima in 43% of the people outdoors or in Japanese-type buildings, as compared with 35% of the people in heavy buildings. The comparable figures in Nagasaki were 34% and 31%.

Vomiting, other hemorrhage, fever, necrotic gingivitis and bloody diarrhea all appeared in greater frequency among individuals outdoors in the open, or in Japanese-type buildings, than among individuals in heavy-type buildings in both cities. But there was relatively little difference between the two groups in the incidence of nausea, anorexia, diarrhea, and cramps.

Malaise was the only symptom which, in both cities, occurred more frequently among individuals in heavy buildings, than among individuals outdoors in the open or in Japanese-type buildings.

There were only 21 people in rings 1 and 2 in Hiroshima who were recorded as being in bomb shelters or tunnels. Of these, the numbers with each symptom were: epilation 1, purpura 3, oropharyngeal lesions 4, necrotic gingivitis 2, diarrhea 10, bloody diarrhea 0, other hemorrhage 1, vomiting on day of bombing 0, nausea 2, malaise 9, anorexia 3, cramps 0, and fever 4. Though the number of people exposed was too small to make valid comparisons, the incidence of symptoms among these individuals in bomb shelters was, in general, much smaller than the incidence of symptoms among individuals in heavy buildings.

There were 145 people in Nagasaki in bomb shelters and tunnels in rings 1 and 2, a large enough number to establish reasonably reliable rates. Only 6% of the people in bomb shelters had epilation as compared with 34% of those outdoors or in Japanese-type buildings, and 20% of those in heavy buildings. Ten percent of the people in bomb shelters had purpura, as compared with 21% of those outdoors or in Japanese-type buildings, and 16% of those in heavy buildings. The incidence of other symptoms among the 175 people in Nagasaki in rings 1 and 2 in bomb shelters and tunnels was: oropharyngeal lesions (within thirty-nine days) 14%; necrotic gingivitis 12%; diarrhea 26%; bloody diarrhea 3%; other hemorrhage 4%; vomiting on day of bomb 3%; nausea 9%; malaise 32%; anorexia 18%; cramps 2% and fever 4%. These incidences are all far lower than the incidence among individuals in heavy buildings.

There appears to be no doubt that adequate bomb shelters give a large measure of protection from radiation effects even relatively close to a bomb. It should again be noted that some individuals were standing near the entrance to the shelters and this may account for the majority of serious symptoms in this group.

Direction

In addition to distance and shielding, one other factor should be considered which might have had an influence on the incidence of injuries and symptoms. From physical evidence, there is every reason to believe that the force of the bomb was released symmetrically in all directions, although the physical destruction was not exactly symmetrical on account of hills, and because of the uneven distribution of buildings, both as to numbers and as to type of construction.

As previously described, a map of each city was divided into eight equal segments by radial lines passing through the point over which the bomb

exploded. Each individual examined was located within one of these segments. In order to examine the influence of direction alone, it is necessary to consider individuals with approximately the same amount of shielding and at approximately the same distances. Tables 22H and 22N* show the incidence of mechanical injuries, burns, and epilation among people outdoors unshielded, outdoors shielded, and in Japanese-type buildings, in each of these segments in rings 1 and 2, and in rings 3, 4, and 5. It would have been more desirable to show these figures separately for each ring and direction. Unfortunately, however, even in the broad groupings shown the number of cases in some of the ring and direction segments is so small that little weight can be attached to the variations observed.

Although there is a considerable variation in the percentages shown in these tables, there is no evidence of any real directional effect of the bombing. A much more detailed study has been made of this, but in refining the data the numbers became very small and it is hard to draw valid conclusions. Such differences as did appear could be accounted for by the location of hills and by the type of construction. Though the evidence is inconclusive, no definite indication of asymmetry was found.

Symptoms by Exposure Groups

In order to make further comparisons between the symptoms, it was desirable to divide the cases into groups, as homogeneous as possible, in respect to their probable exposure to radiation. If the exact amount of material between each individual and the bomb had been known, as well as the exact distance, it would have been theoretically possible to make precise classifications by applying known physical laws. While such an exact procedure could not be applied to the data at hand, it was practical to make reasonably homogeneous groupings from the information already described on the influence of shielding on the incidence of symptoms.

Within the same distance, individuals outdoors or in Japanese-type buildings were the most exposed to radiation, individuals in heavy-type buildings were less exposed, and individuals in bomb shelters and tunnels were the least exposed. It was observed that, roughly, the incidence of the more important symptoms among individuals in heavy buildings was about the same as the incidence of symptoms in individuals outdoors or in Japanese-type buildings one ring farther out from the center; and that the incidence of individuals in bomb shelters and tunnels approximated the incidence among individuals outdoors or in Japanese-type buildings two rings farther out from the center.

Eight exposure groups, lettered from A to H, were made up on this basis as shown below:

<u>Exposure Group</u>	<u>Individuals Outdoors or in Japanese Buildings</u>	<u>Individuals in Heavy Buildings</u>	<u>Individuals in Bomb Shelters and Tunnels</u>
A	Ring 1		
B	Ring 2	Ring 1	
C	Ring 3	Ring 2	Ring 1
D	Ring 4	Ring 3	Ring 2
E	Ring 5	Ring 4	Ring 3
F	Ring 6	Ring 5	Ring 4
G	Ring 7	Rings 6 & 7	Rings 5, 6 & 7
H	Ring 9	Ring 9	Ring 9

*People with ring or with shielding unknown are excluded from these tables. Therefore, the total number of people is less in these tables than in other similar tables.

Exposure group A consists of the most exposed cases, including only those individuals who were in ring 1 outdoors or in Japanese-type buildings. Exposure group H consists of the presumably least exposed people, including only individuals in ring 9, 5,000 meters or more distant. Since a major portion of individuals in both cities were outdoors or in Japanese-type buildings, as well as because of the adjustment made for shielding, exposure groups A through G may be considered to be approximately equivalent, in terms of exposure to gamma radiation, to rings 1 through 7 respectively for individuals outdoors or in Japanese-type buildings.

Rather than eliminate the few cases of unknown shielding, they were classified in exposure groups as though they had been in heavy buildings, their rates of incidence of symptoms being more similar to this shielding group than to any other.

The incidence of symptoms in these eight exposure groups is shown in tables 23H and 23N. Figures 11H, 11N, 12H and 12N show the percentage of cases with epilation, purpura, oropharyngeal lesions (within thirty-nine days), other hemorrhage, and vomiting (on the day of the bombing) in exposure groups A, B, C, D, E, F, and G.

Symptoms by Sex and Age

The percentage of males and the percentage of females with each symptom is shown by exposure groups in tables 24H and 24N. There was no great difference between the sexes in the incidence of symptoms. Virtually no difference appeared between males and females in either city in the incidence of epilation, oropharyngeal lesions, necrotic gingivitis, and diarrhea. The incidence of purpura was somewhat higher among females than among males in Nagasaki, but this difference, though it appeared, was trivial in Hiroshima. Bloody diarrhea and other hemorrhage had higher incidences among males than among females in Hiroshima, but not in Nagasaki. Vomiting on the day of the bombing, nausea, anorexia, and cramps were more common among females than among males in both cities. Malaise was more common in females than in males in Hiroshima, but not in Nagasaki. The incidence of fever was higher in males than in females in both cities.

The incidence of each symptom by age groups 0-4, 5-14, 15-49, and 50 and over within each exposure group is shown in tables 25H and 25N. The majority of individuals examined were between 15 and 49 years of age, and there were too few cases in the age groups 0-4 and over 50 within each exposure group to make very accurate comparisons in most instances.

Generally speaking, epilation, while it did not show much trend with age, appeared to have a lower incidence among individuals over 50. This was possibly due to the symptom failing to show in older men who were already partly bald.

Symptoms in Relation to Burns

Since most of the burns were caused by the flash, there is high presumptive evidence that most of the individuals with burns had at least a part of their bodies directly exposed even though they were in a heavy building. Conversely, individuals in the first few rings who did not receive burns were probably shielded from the flash (by the shadow of a hill or building, for example) even though they were outdoors in the open. Though this factor is minimized in the exposure group classification as previously described, by and large individuals with burns were perhaps more exposed to ionizing radiation than individuals without burns in the same exposure group. For this reason, one would not be surprised to find a higher incidence of symptoms among the people with burns. In addition, some of the symptoms may perhaps have resulted from burns.

The incidence of each symptom among individuals with and without burns in each exposure group is shown in tables 26H and 26N. In exposure group A in Hiroshima the incidence of epilation is 79.8% in people with burns as compared with 74.7% in people without burns; in exposure group B the incidence is 40.2% in people with burns and 33.4% in people without burns; and in exposure groups C and D the incidence is 9.9% in people with burns and 5.0% in people without burns. In exposure group A, in Nagasaki, a smaller percentage of people with burns had epilation than people without burns, but in all other exposure groups the reverse is true. This may be partially accounted for by the fact that the hair was burned off in some cases reported with epilation.

Anorexia and cramps appeared more commonly among people with burns than without burns in both cities.

Purpura had higher incidences among people without burns than among people with burns in both cities. In Hiroshima, oropharyngeal lesions, bloody diarrhea, and other hemorrhage were more common among people without burns than among people with burns, and this was also true in Nagasaki, though not consistently so in all exposure groups. The other symptoms showed little in the way of consistent differences in incidence as between individuals with burns and individuals without burns in the same exposure groups.

There is little reason to believe that burns played an important role in the appearance of any of these symptoms.

The Association of Each Symptom with all Other Symptoms

The number of people who had each combination of two symptoms among the 6,663 individuals in Hiroshima, and the 6,427 individuals in Nagasaki who were within a distance of 5,000 meters, is shown in tables 27H and 27N. The figures typed in the diagonal, identified by an asterisk, of the tables show the number of cases with each of the symptoms separately.

By the laws of probability, a certain number of cases would appear with each pair of symptoms even if the symptoms were entirely independent of each other. In order to determine whether or not there is a real association between the symptoms, the number which may be expected to arise by chance alone may be computed. This number may then be compared with the numbers which were observed. The critical ratios shown in tables 28H and 28N are a measure of the probability that the number of cases with each pair of symptoms (as shown in tables 27H and 27N) is greater than the number which would be expected to occur by chance alone. The greater the critical ratio, the greater is the probability that the association is real and not due to chance.* Many people consider a critical ratio of 2.0 or greater to be sufficient proof that a relationship exists, while other more conservative observers consider a critical ratio of 3.0 or greater as a minimum requirement for proof of a statistically significant relationship.

The critical ratios are 3.0 or greater for almost every pair of symptoms in both cities, and most of the critical ratios are greater than 4.0. (See tables 28H and 28N.) Therefore, there is no reasonable doubt that all the symptoms are associated with each other to a statistically significant degree, with few exceptions.

*If the critical ratio is 2.0, the odds are 21 to 1 that the association was not due to chance alone; if the critical ratio is 3.0 the odds are 360 to 1 that the association was not due to chance alone; and if the critical ratio is 4.0 the odds are 15,770 to 1 that the association was not due to chance alone.

The associations between cramps and epilation, and between cramps and purpura, is of borderline statistical significance in Hiroshima, but definitely significant in Nagasaki. There is no significant association between cramps and necrotic gingivitis in either city. The associations between cramps and other hemorrhage, and between cramps and vomiting, are of borderline significance in Nagasaki, but are statistically significant in Hiroshima. The association between necrotic gingivitis and diarrhea in Nagasaki is of borderline significance, and the association between necrotic gingivitis and bloody diarrhea in Hiroshima is not statistically significant, but in both instances the associations are significant in the other city.

Thus, of the 75 pairs of symptoms, the only pair not showing a statistically significant degree of association in one or the other, or both of the two cities, is cramps and necrotic gingivitis. Of the 13 symptoms shown, cramps has the least association with the others.

It will be noted that the association between epilation and purpura yields very high critical ratios in both cities (37.2 in Hiroshima and 29.8 in Nagasaki). Likewise, the associations of epilation and of purpura with each of the three symptoms: oropharyngeal lesions within 39 days, other hemorrhage, and vomiting on the day of the bombing, give very high critical ratios, and the probability is several millions to one against associations this high or higher arising due to chance alone.

While critical ratios are a test of the statistical significance of an association, they are not generally used as a measure of the degree of association between two items because the size of the critical ratio is dependent upon the number of cases. They are generally used only to determine whether or not any association exists. A very small, but real association may be proved to exist if the sample is sufficiently large.

The statistical constant ϕ may be used as a measure of the degree of association between the two symptoms.* The values of ϕ vary from +1.0 in the case of perfect positive association to -1.0 in the case of perfect negative association. A ϕ of 0.0 indicates that no association exists. For example, if every case with symptom A also has symptom B, and there are no cases with one symptom, but without the other symptom, then there is perfect positive association and ϕ is +1.0. If all cases have one or the other of the two symptoms, but no case has both symptoms, then there is perfect negative correlation and ϕ is -1.0. The value of ϕ for each pair of symptoms is shown in tables 29H and 29N.

Epilation and purpura are more highly associated than any other pair of symptoms in Hiroshima (ϕ being +.46), and the same is true in Nagasaki (ϕ being +.37), with one minor exception. Since these are the two most specific symptoms of radiation effects, it is of interest to note which of the other symptoms have the highest association with them. In both cities, oropharyngeal lesions within 39 days, other hemorrhage, vomiting of the day of the bombing, and nausea are more highly associated with epilation than any of the other symptoms except purpura. These same four symptoms are also most highly associated with purpura in both cities (except for fever in Nagasaki). The symptoms which have the next highest association with epilation and purpura in both cities are anorexia, fever, and necrotic gingivitis and, in Nagasaki, malaise. Cramps, bloody diarrhea, and diarrhea have less association with epilation and purpura.

Oropharyngeal lesions within 39 days has a relatively high association with other hemorrhage (ϕ being +.40 in Hiroshima and +.33 in Nagasaki), and is associated with vomiting and with nausea in both cities with ϕ 's of a little over +.20. The associations of other hemorrhage with vomiting and nausea are not as high.

* ϕ is numerically equal to the critical ratio divided by the square root of the number of cases in the sample.

Association of Epilation and Purpura with Other Symptoms

in Each Exposure Group

Tables 30H and 30N show the number and percent of cases with epilation and/or purpura in each exposure group. In Hiroshima, 44.7% of the people had both epilation and purpura in ring A, and 85.8% of the people had either one or both of these symptoms. There was a very rapid decrease in incidence with increasing distance, and in ring G no cases were reported with both symptoms, while 1.5% of the cases had purpura alone. In Nagasaki, 19.4% of the people had both epilation and purpura and 53.2% had either one or both symptoms in ring A, while 0.2% had both symptoms and 1.8% had either one or both symptoms in ring G. Although the percentage of people with both of these symptoms was much higher in Hiroshima than in Nagasaki in exposure groups A and B, the combination of the two symptoms occurred more frequently in Nagasaki than in Hiroshima in rings C, D, E, F, and G. There was a statistically significant degree of association between the two symptoms in every exposure group in both cities, with few exceptions.

The number and percentage of people in each exposure group with epilation and each of the other symptoms, and with purpura and each of the other symptoms, is shown in tables 31H and 31N.

Among people in exposure group A in Hiroshima, both epilation and oropharyngeal lesions occurred with a frequency of 52.3%, and both purpura and oropharyngeal lesions occurred with a frequency of 42.3%. In exposure group A in Nagasaki the percentages were 22.3% for epilation and oropharyngeal lesions and 21.3% for purpura and oropharyngeal lesions. The occurrence of these pairs of symptoms dropped to less than 1.0% in exposure groups E, F, and G in both cities.

In general, the decrease in incidence with decreasing exposure was more marked when two symptoms (including either epilation or purpura) were considered together than when a single symptom was considered alone, and this relationship was greatest for combinations of epilation and purpura with oropharyngeal lesions within 39 days, vomiting on the day of the bombing, nausea and (in Hiroshima) other hemorrhage.

Cramps and bloody diarrhea showed little association with epilation or with purpura within the same exposure groups. All the other symptoms were significantly associated with epilation and with purpura within the same exposure groups in both cities. Within the same exposure groups, oropharyngeal lesions within 39 days of the bombing was most associated with epilation and with purpura, and these associations were also relatively high in the case of other hemorrhage, vomiting on the day of the bombing, nausea and fever.

Tables 32N and 32H show the associations between the occurrence of epilation and/or purpura with the other symptoms. These associations were made on the tentative assumption that the appearance of either one of these two symptoms was evidence of probable radiation injury. Oropharyngeal lesions within 39 days of the bombing was more highly associated with this combination (epilation and/or purpura) than any other symptom in both cities. In Hiroshima 55.7% of the cases with epilation and/or purpura had oropharyngeal lesions. As compared with this, only 11.1% of the cases with neither epilation nor purpura had oropharyngeal lesions. The difference between these two percentages, (55.7% - 11.1% = 44.6%), is highly significant statistically, the critical ratio being 36.6. The corresponding difference in percentages was also very large in Nagasaki (difference 40.7% and critical ratio 31.9). Other hemorrhage, vomiting on the day of the bombing, and nausea were also highly associated with the occurrence of epilation and/or purpura in both cities.

Although some of the symptoms were highly associated with each other, there appears to have been a considerable amount of variation between the

individuals in their sensitivity to various effects. For example, in exposure group A in Hiroshima, 255 people had both epilation and purpura, but 179 people had epilation without purpura and 55 had purpura without epilation.

The incidence of all these symptoms was related to distance and, in general, those which were most highly related to distance were the most highly associated with each other. Since mutual cause generally produces association, this study of associations between the symptoms was made, primarily, as an additional check on whether or not their occurrence was due to a mutual causative agent. The bomb itself was the basic cause relating the symptoms to distance. But the bombing acted on the population directly and indirectly in at least four different ways, all of which were related to distance, i.e., by the blast, resulting directly or indirectly in mechanical injury; by heat, resulting in burns; by physical destruction of dwellings and community facilities; and by ionizing radiation, which presumably produced some or all of these symptoms. If one of these symptoms had been caused by burns, for example, and another by ionizing radiation, they would both have been related to distance, but would not necessarily have been related to each other in any appreciable degree. But it has been shown that burns did not have very much influence on the incidence of most of the symptoms. It is reasonably certain that radiation was responsible for the occurrence of epilation and purpura, at least in most instances. Therefore, the radiation was presumably the mutual causative agent producing the associations of other symptoms with epilation and purpura within the same exposure groups. This is not presented as proof, but only as additional evidence of the probable effects of ionizing radiation.

IV

LABORATORY FINDINGS

White Blood Cell Counts

White blood cell counts were made on 3,429 people in Hiroshima and 1,916 people in Nagasaki who were living twenty days after the bombing. The counts made during the first few weeks after the bombing were all done by the Japanese. Later, counts were made by American technicians or by Japanese under American supervision. Their accuracy probably varied considerably. Many of the Japanese were well-trained and careful workers, but because of the shortage of personnel and facilities, some counts were made by inexperienced people working under poor conditions.

Tables 33H and 33N and figures 13H and 13N show the main white cell counts and the number of subjects tested by weeks from the bombing and by exposure groups. Each count was made on a different individual. Week 1 is defined as the first seven days following the day of the bombing; week 2 the next seven days, and so on.

The lowest mean white cell counts in exposure groups A, B, C, and D in both cities occurred in the fourth week after the bombing. The mean counts in exposure group A in the fourth week were 1,790 in Hiroshima and 2,347 in Nagasaki. In Hiroshima, the mean counts were below 5,000 in weeks 2, 3, 4, 5, and 6 in exposure groups A and B. The same was true in Nagasaki, except for week 6 in exposure group A (this exception being based on only 14 cases). The mean counts increased in each successive week after the fourth week, and in weeks 9 and later, the counts averaged over 6,000 in all exposure groups in both cities.

In Hiroshima, the counts reached a high point in the tenth week, (see groups A and B and groups C and D in figure 13H), decreased in weeks 12 and 13, and rose again in weeks 14 and 15. It is uncertain whether or not any significance should be attached to these fluctuations. In a few cases in which the white cell counts were followed over a long period of time, there was a tendency for leucocytosis to appear after recovery from leucopenia before the white cell count finally returned to normal. (See section 6.) There were not enough counts made in Nagasaki in late weeks to indicate whether the same thing occurred in that city.

Figures 14H and 14N show the mean white cell counts by exposure groups for week 4, week 5, week 6, and weeks 12 and over. Exposure groups F, G, and H are not shown on these figures because of the small number of cases in the early weeks.

The frequency distributions of white cell counts in weeks 2 through 5, week 6, weeks 7 and 8, and weeks 9 and over by exposure groups are given in tables 34H and 34N. In exposure group A, weeks 2 to 5, in Hiroshima, 11% of the counts were under 500, 30% were under 1,000, 57% were under 2,000, 75% were under 3,000, and 87% were under 4,000. For the same exposure group and weeks in Nagasaki, the percentages were: 3% under 500, 20% under 1,000, 41% under 2,000, 56% under 3,000, and 72% under 4,000. These percentages are based upon counts made on 195 people in Hiroshima, but only 71 people in Nagasaki, and so are subject to a considerable sampling error in the latter city. The standard deviations of the counts were large (from 2,000 to 3,000 cells for most of the groups), but standard deviations of this size have been

reported for other populations not exposed to radiation. Cumulative percentage distribution curves plotted from these data are shown in figures 15H and 15N. For comparison, a curve is shown for 708 American truck drivers examined by the United States Public Health Service.*

Repeated white blood cell counts were made on several hundred people, but few of these were done in the first few weeks after the bombing. Tables 35H and 35N show the results of the first and second counts made on the same individuals within two to six weeks of the bombing. Of 205 people examined twice in exposure groups A and B in Hiroshima, 119 had white blood cell counts under 3,000, 151 had counts under 4,000, and 17 had counts of 4,000 or over both times they were examined. Twenty-one people had white cell counts under 4,000 on the first examination, but counts of 4,000 or over on the second examination; and sixteen had counts of 4,000 or over on the first examination, but counts under 4,000 on the second examination. In other words, of 205 people examined, 151, or 74% had counts under 4,000 both times examined, and a total of 188, or 92% had counts under 4,000 on one or both of the two examinations.

The data previously discussed on the time-trend of mean white blood cell counts by weeks from the bombing was based upon counts made of different people in each week period. Tables 36H and 36N give the mean white cell counts for individuals examined within a few weeks of the bombing, and re-examined several weeks later. These figures substantiate the previous findings, i.e., that recovery to normal levels generally occurred within two or three months. For example, white cell counts were made on forty people in exposure groups A and B in Hiroshima, two to four weeks after the bombing, and repeat counts made of the same forty people eight to ten weeks after the bombing. The mean count was 2,390 in weeks two to four and increased to 7,395 in weeks eight to ten.

The white cell counts returned to normal limits in the great majority of cases. Of 47 people in Hiroshima with counts below 4,000 in week 4, only 4 were found with counts below 4,000 when re-examined in week 9 and later. The majority of these 47 people had counts below 3,000 (11 had counts below 1,000) in week 4, and most of them had counts over 6,000 on the later examination. Only one case had a count below 3,000 in the last examination, the counts being 1,000 in week 4 and 1,350 in week 9.

Of 34 people in Nagasaki who had counts below 4,000 in week 4, only one had a count below 4,000 when examined in week 9 or later. This individual had a count of 500 in week 4 and a count of 3,100 in week 14.

White Blood Cell Counts in Relation to Burns

In exposure groups A and B in Hiroshima, and exposure group A in Nagasaki, the white cell counts made within two to six weeks of the bombing were lower among people with burns than among people without burns. That is, the mean counts were lower and there was a large percentage of people with very low counts. (See tables 37H and 37N). But this was not a consistent finding and the reverse was true in some exposure groups in both cities. In general, people with burns were probably less shielded and received a somewhat high dosage of ionizing radiation than other people within the same exposure group. The higher susceptibility to infection in cases with burns may have further complicated the results. These factors, together with sampling variation in the time when the blood counts were made, is probably sufficient to account for the differences observed.

*See "Fatigue and Hours of Service of Interstate Truck Drivers", U. S. Public Health Service Bulletin 265, Page 232, Government Printing Office, 1941.

Differential White Blood Cell Counts

Differential white blood cell counts were made on 1,690 people in Hiroshima and 1,022 people in Nagasaki who were living twenty days after the bombing. The accuracy of the data varies considerably, as some of the technicians counted 200 cells, while others counted only 50 cells or less. Only the percentages of each type of cell were recorded on the forms, and these frequently did not add up to 100%. The records were rejected from the analysis if the percentages totaled less than 95% or over 105%.

The mean of the percentages* of basophiles, eosinophiles, stab cells, polymorphonuclear leucocytes, lymphocytes, and monocytes is given in tables 38H and 38N by exposure groups and by weeks from the bombing. In exposure groups A and B from two to six weeks after the bombing, the polymorphonuclear leucocytes averaged 35.0% in Hiroshima, and 31.6% in Nagasaki. The polymorphonuclear leucocytes averaged nearer 50% (the averages ranging from 44% to 57%) in weeks 7-11 and weeks 12 and over, in all exposure groups. As compared with this, the lymphocytes averaged 46.2% in Hiroshima and 45.5 in Nagasaki in exposure groups A and B, weeks 2 to 6, but averaged nearer 33% (from 29.7% to 36.5%) during later weeks in all exposure groups. The proportion of stab cells appears to have been higher in weeks 2 to 6 than in later weeks in Hiroshima, but not in Nagasaki.

There are no consistent differences in the mean percentages of monocytes in different weeks or exposure groups. The figures are not very reliable for basophiles or eosinophiles, since no cells of these types were reported for a large proportion of the cases, and mean percentages depend upon the small number of cases for which these types were reported. However, the mean percentage of eosinophiles seems to have been less in weeks 2 to 6 than in later weeks.

The correlations between each type of cell and the total white blood cell counts are given in table 39. In weeks 2 to 6, exposure groups A, B, C, and D, the percentage of polymorphs is positively correlated with the total white cell count, (with a correlation coefficient of +.48 in Hiroshima and +.34 in Nagasaki), and the percentage of lymphocytes is negatively correlated with the total white cell count (correlation coefficient -.38 in Hiroshima and -.48 in Nagasaki). As compared with this, in group H (all weeks) the percentage of polymorphs is not appreciably correlated with the total white cell count in either city, and the percentage of lymphocytes shows a slight degree of correlation with the total white cell count in Hiroshima only. The correlations in weeks 12 and over, exposure groups A, B, C, and D are intermediate between those in exposure group H (all weeks) and those in weeks 2 to 6, exposure groups A, B, C, and D.

The percentage of stab cells is positively correlated with the total white cell count in weeks 2 to 6, exposure groups A, B, C, and D in Nagasaki (correlation coefficient +.34), but in the corresponding group in Hiroshima the correlation is negative to a very slight degree.

For a further analysis, the number of each type of cell per cu. mm. of blood was obtained for each case by multiplying the percentage of each type of cell found in the differential count by the total white blood cell count. The mean number of each type of cell, together with the standard deviation of the mean, is shown in tables 40H and 40N by weeks from the bombing and by exposure groups. The mean counts were lower in weeks 2 to 6 than in later weeks for every type of cell. Polymorphs accounted for the major portion of the decrease in total white blood cell counts. In exposure groups A and B in Hiroshima, for example, the mean number of polymorphonuclear leucocytes

*The percentages as shown on these tables do not add up to exactly 100%. This is partly due to the omission of the percentage of typical cells from this table and partly to the inaccuracies previously noted.

was 1,019 in weeks 2 to 6, as compared with 3,777 in weeks 12 and later. Lymphocytes were relatively less affected. For the same cases, the mean number of lymphocytes was 973 in weeks 2 to 6, and 2,022 in weeks 12 and later.

Frequency distributions of the number of basophiles, eosinophiles, stab cells, polymorphs, lymphocytes, and monocytes are shown in tables 41 through 46. It will be noted that in weeks 2 to 6, the majority of cases are shown on these tables as having "under 20" basophiles, eosinophiles, and stab cells. Actually, no cells of these types were found among the 50 to 200 cells examined in the differential counts in a large number of cases, but in most instances this was probably due to the counts being made on too small a number of cells rather than to the total absence of these cells in the blood.

The standard deviations* of the number of cells were very large for all types and, in general, were larger than the means, except for polymorphs and lymphocytes.

Tables 47H and 47N show the number and percent of cases in which young white cells, atypical lymphocytes, nucleated red blood cells, stippled red blood cells and reticulocytes were found. In exposure groups A and B in both cities a larger percentage of cases had young white cells and atypical lymphocytes in weeks 2 to 6 than in later weeks. Reticulocytes were found in a larger percentage of cases in exposure groups A, B, C, and D, than in exposure groups E, F, G, and H, regardless of weeks from the bombing. Relatively few cases were reported with either nucleated red blood cells or stippled red blood cells.

Platelets

Platelet counts were made on 114 people in Hiroshima and 130 people in Nagasaki. The number of cases was too small to make valid comparisons between groups. (See table 48.) The mean platelet counts were 90 (for 5 people) in Hiroshima and 95 (for 6 people) in Nagasaki in exposure groups A and B, two to five weeks after the bombing. The mean counts were considerably larger in later weeks and for less exposed groups.

Sedimentation Rates

In Hiroshima the sedimentation rates (mm. in one hour) were higher in exposure groups A and B than in exposure groups C and D, exposure groups E, F, and G, or exposure group H. (See table 49.) The mean rates were higher in weeks 2 to 5 than in later weeks. Relatively few sedimentation rates were measured in Nagasaki, and the mean rates do not show any consistent trends.

Red Blood Cell Counts

The mean red blood cell counts of people examined during each week after the bombing, and in each exposure group, are shown in tables 50H and 50N. In general, the counts were lower in weeks 2 to 5 than in later weeks, and the counts were lower in exposure groups A and B than in less exposed groups. But the trends are not nearly as apparent as for white blood cell counts.

Tables 51H and 51N show the frequency distributions, means, and standard deviations of red blood cell counts in weeks 2 to 5, weeks 6 to 8, and weeks 9 and over by exposure groups. Cumulative percentage distribution curves are shown in figures 16H and 16N. In Hiroshima, weeks 2 to 5, the mean red cell

*The means and standard deviations were computed from the original ungrouped data.

counts (in millions) were 3.10, 3.43, 3.84, and 4.43 for exposure groups A, B, C, and D, and E, F, and G respectively. The differences between these means are statistically significant. Nagasaki shows less consistent results.

There was very little difference between the mean counts in weeks 2 to 5, weeks 6 to 8, and weeks 9 and over, but too few people were examined in some of the weeks to make reliable comparisons.

Hemoglobin Determinations

Some of the hemoglobin determinations were originally recorded in grams per 100 cc. of blood, while others were recorded as percentages of normal. The percentages were later converted into grams by multiplying by the factor 14.5.

The mean grams of hemoglobin for people examined during each week in each exposure group are shown in tables 52H and 52N, and frequency distributions are shown in tables 53H and 53N, and figures 17H and 17N. In exposure groups A and B in both cities the mean grams of hemoglobin were higher in week 9, and later than in earlier weeks; but the means were slightly lower in weeks 6 to 8 than in weeks 2 to 5. The mean grams of hemoglobin for people examined six to eight weeks after the bombing in exposure group A, exposure group B, exposure groups C and D, and exposure groups E, F, and G were 8.73, 9.03, 9.83, and 11.31 respectively in Hiroshima, and 8.91, 9.52, 9.51, and 11.05 respectively in Nagasaki.

No cases were found with less than 8.0 grams of hemoglobin per 100 cc. of blood in exposure group H in Hiroshima, while 6.7% of the cases in exposure group H in Nagasaki had less than 8.0 grams of hemoglobin. As compared with this, in exposure group B, weeks 6 to 8, 30.4% of the Hiroshima cases and 29.7% of the Nagasaki cases had less than 8.0 grams of hemoglobin per 100 cc. of blood.

THE RELATION OF WHITE BLOOD CELL COUNTS TO SYMPTOMS

The number and percentage of cases with white blood cell counts under 3,000 within 2 to 6 weeks of the bombing among cases with each of the symptoms, is shown in tables 54H and 54N for each exposure group. The cases as shown here are not mutually exclusive, and most of the cases, particularly in exposure groups A and B, had more than one symptom. In exposure groups A and B, 10.6% of the Hiroshima cases with no symptoms, and 23.1% of the Nagasaki cases with no symptoms, had white cell counts under 3,000. As compared with this, in exposure group H (all weeks), regardless of symptoms, no cases in Nagasaki, and only 1.8% of the cases in Hiroshima, had counts below 3,000. (See tables 34H and 34N).

A much larger percentage of the cases with symptoms had white cell counts under 3,000. In both cities, over 50% of the cases with epilation, purpura, oropharyngeal lesions (within 39 days), necrotic gingivitis, other hemorrhage, or vomiting (on the day of the bombing) had white cell counts under 3,000 in weeks 2 to 6. (See "total" column on tables 54H and 54N). Most of these cases had more than one of the symptoms named.

Tables 55H and 55N were designed to determine if any one of the five most indicative symptoms alone is sufficient evidence on which to base a diagnosis of radiation injury. The percentage of cases with white cell counts under 3,000 is shown for people with one, and only one of the five symptoms,* epilation, purpura, oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage. Because of the high association of these symptoms with each other, relatively few of the cases had one of the symptoms alone. The percentage of cases with white cell counts under 3,000 was a great deal higher among people with epilation alone, or purpura alone, than among people with no symptoms in the same shielding groups in both cities. People with oropharyngeal lesions alone, vomiting alone, or other hemorrhage alone, also showed a much higher incidence of white cell counts under 3,000 than people with no symptoms in the same exposure groups in Hiroshima. In Nagasaki these differences were not so pronounced.

Tables 56H and 56N show the incidence of white blood cell counts under 3,000 by symptoms, among people who did not have epilation, purpura, oropharyngeal lesions, vomiting, or other hemorrhage. In general, there was a high incidence of white cell counts under 3,000 among people with these symptoms, than among people with no symptoms, though not as high an incidence as among people with epilation or purpura.

The data thus far presented indicate that epilation and purpura are the two most specific symptoms of radiation injury, aside from laboratory findings. The next three most indicative symptoms are oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage. On the basis of these findings, all of the cases living on the twentieth day following the day of the bombing were grouped, according to their symptoms, into the following six classes:

*These cases had only one of the five symptoms indicated, but most of these had some other symptoms as well.

- Class 1: Cases with both epilation and purpura;
- Class 2: Cases with either epilation or purpura, (but not both);
- Class 3: Cases with neither epilation nor purpura, but with two or more symptoms, including at least one of the three symptoms; oropharyngeal lesions (with 39 days), vomiting on the day of the bombing, or other hemorrhage;
- Class 4: Cases with neither epilation nor purpura, but with oropharyngeal lesions (within 39 days), or vomiting on the day of the bombing, or other hemorrhage, but no other symptoms;
- Class 5: Cases without epilation, purpura, oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, or other hemorrhage, but with one or more of the other symptoms; i.e., diarrhea, bloody diarrhea, nausea, malaise, anorexia, cramps and fever;
- Class 6: Cases with no symptoms.

Tables 57H and 57N show, for each of the six classes outlined above, the mean white blood cell count during weeks 2 to 6, the percentage of cases with counts under 3,000, and the percentage of cases with white cell counts under 4,000. People with both epilation and purpura (Class 1) had the lowest mean white blood cell counts in weeks 2 to 6, and the largest percentage of cases with counts under 3,000; while people with no symptoms (Class 6) had the highest mean counts and the smallest percentage of cases with counts under 3,000. In general, the six classes fall in the order shown above in respect to the mean white blood cell counts and the percentage of cases with counts under 3,000 in weeks 2 to 6.

VI

DEATHS

Individuals Who Died Twenty Days After The Bombing or Later

Of the 6,882 people examined in Hiroshima and the 6,621 examined in Nagasaki who were living twenty days or more after the bombing, 254 in Hiroshima and 174 in Nagasaki were reported to have died later. It is probable that other unreported deaths occurred in this group of people, and some may have died as a result of radiation after the end of the survey in Japan. Furthermore, there was a selective factor, in that cases with radiation symptoms were more frequently followed up than cases without such symptoms. About half of these deaths occurred between the twentieth and twenty-ninth day after the bombing, and most of the remainder occurred between the thirtieth and forty-ninth day. (See table 58.) Five deaths in Hiroshima and eight in Nagasaki were reported after the eightieth day.

In Hiroshima, 194 (76%) of the deaths occurred among people in ring 2. Two of the people who died were in ring 4, one was in ring 5, and none were in rings 6, 7, or 9. (See table 59.) In Nagasaki, most of the deaths were among people in rings 1, 2, and 3, but five were reported in ring 6 and one in ring 7. Most of the people who died on the twentieth day or later were outdoors or in Japanese-type buildings; very few were in heavy-type buildings. Two cases in Nagasaki were reported to have been in bomb shelters. One of these was in the entrance to an air raid shelter, and the other was in a cave at a distance of about 500 meters.

White blood cell counts, made within two to six weeks of the bombing, were recorded for 128 people who died on the twentieth day, or later in Hiroshima, and for forty-five in Nagasaki. (See table 60.) Eighty-eight per cent of the cases in Hiroshima, and 80% of the cases in Nagasaki had white blood cell counts under 3,000. Five cases in Hiroshima, and two in Nagasaki had counts of 6,000 or over. Only one white cell determination was made on each of these seven cases, and the counts may not have been made at the time of greatest depression.

The incidence of symptoms, burns, and mechanical injuries among the people who died on the twentieth day or later is shown in table 61. Burns were reported for 23.6% of the cases in Hiroshima and 29.3% of the cases in Nagasaki, while mechanical injuries were reported for 48.4% of the cases in Hiroshima and 46.6% of the cases in Nagasaki. Most of the burns and mechanical injuries would not have been very serious in themselves, but in many cases severe infections developed, presumably because of the low white blood cell counts.

Both epilation and purpura were observed in 145 of these cases in Hiroshima, and 55 in Nagasaki. Thus, of the total number of people with both epilation and purpura who were alive on the twentieth day after the bombing, 31% in Hiroshima and 15% in Nagasaki died during the next few weeks.

Eighty-nine percent of the Hiroshima cases and 71% of the Nagasaki cases had epilation and/or purpura. In Hiroshima, 5% and in Nagasaki, 14% of the cases had neither epilation nor purpura, but had two or more symptoms, including one or more of the following: oropharyngeal lesions, (within 39 days), vomiting on the day of the bombing, or other hemorrhage.

None of the symptoms under discussion here were reported for five of the Hiroshima cases and four of the Nagasaki cases. These nine cases may be described, briefly, as follows: Five of them died on the sixtieth day or later following the bombing. Of these five, one died from blood poisoning from a foot wound, and another, although he had multiple lacerations, probably died of paratyphoid fever. The forms were not completely filled in on the other three cases, and the causes of death are not known. They may have had symptoms which were not recorded. Of the remaining four cases, one died following a miscarriage; one died from a severely infected wound; one had multiple wounds, but the cause of death was unspecified; and one died of infected wounds not caused by the bombing.

.Autopsy findings on a number of these cases are described in section 8 of this study.

Individuals Who Died Within Nineteen Days of the Bombing

Records were made on 91 people in Hiroshima and 238 people in Nagasaki who died within 19 days of the bombing. Over half of these deaths occurred within the first nine days. (See table 62.) The data shown in tables 63, 64, and 65 are not entirely reliable, since much of it was copied from early Japanese records made at a time of great confusion, and some of the cases were never seen by a physician, the records being compiled from accounts of survivors.

Most of the cases were in rings 1 and 2, and a majority were outdoors or in Japanese-type buildings. Twenty-three of the Hiroshima cases, and 38 of the Nagasaki cases were in heavy buildings. Of the 35 cases in Hiroshima on which white blood cell determinations were made, 26 (74%) had counts under 3,000. In both cities, over half the cases had mechanical injuries, and over half had burns. Less than half of the cases were reported as having either epilation or purpura, but many of them died before the usual time of onset of these two symptoms.

VII

THE RELATIVE INCIDENCE OF RADIATION INJURIES,

BURNS AND MECHANICAL INJURIES

The number and percentage of cases with each of the six combinations of symptoms previously discussed (see page 34) is shown in tables 66H and 66N. Figures 18H and 18N show the same data in a slightly different arrangement.

It is reasonably certain that all the cases with both epilation and purpura suffered radiation injuries. The incidence of such cases was high in exposure group A, and dropped very rapidly with decreasing exposure, as illustrated by line I, figure 18H and 18N. It is also reasonably certain (with very few exceptions) that cases with either epilation or purpura (but not both) had radiation injuries. The percentage of cases with epilation and/or purpura in each exposure group is illustrated by line II in figures 18H and 18N.

The evidence indicates that a large majority of the people had radiation injury among those with neither epilation nor purpura, but with two or more symptoms, including one or more of the following: oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, or other hemorrhage. However, it is likely that radiation had little or no influence on the appearance of these symptoms in some individuals, particularly those at a considerable distance from the bomb. The percentage of cases with epilation and/or purpura, or the last named combination of symptoms in each exposure group, is shown by line III in figures 18H and 18N.

Probably few, if any, people in exposure groups A and B escaped injury from radiation, and it is safe to assume that most of the symptoms which occurred among people in these exposure groups were caused by radiation. But one or more symptoms, other than the combinations named above, undoubtedly occurred in many people from causes other than radiation. Line IV in figures 18H and 18N shows the percentage of cases with any symptoms in each exposure group. Even in exposure group G, 46% of the people in Hiroshima and 29% of the people in Nagasaki had some symptoms.

For a positive diagnosis of radiation injury, it is obviously desirable to have laboratory data as well as a description of the clinical symptoms. But laboratory studies were made on only a small proportion of the cases in the two cities, and in any repetition of such bombing, it is unlikely that laboratory work could be accomplished on the entire population of a city. Therefore, it is of interest to make a reasonable estimate of the number of cases with radiation injuries from the clinical symptoms alone.

With this in mind, epilation and purpura may be defined as specific symptoms of radiation injury. Oropharyngeal lesions (within 39 days), vomiting on the day of the bombing and other hemorrhage may be defined as suggestive symptoms of radiation injury, provided that at least one other symptom appears in addition to one of these three symptoms (or that two of these three symptoms appear in the same individual). People with specific symptoms almost certainly had radiation injuries, and people with suggestive symptoms probably had radiation injuries. It should be noted that some individuals with neither specific nor suggestive symptoms had white blood cell counts so low as to indicate that they probably had radiation injuries. Line II in figures

18H and 18N shows the percentage of cases with specific symptoms of radiation injury in each exposure group, and line III shows the percentage of cases with specific and/or suggestive symptoms.

For comparison, the original diagnoses of radiation injury made by the physicians in Japan are shown by exposure groups in table 67. Since relatively little was known about the subject at that time, no consistent set of criteria were used in making these diagnoses.

Tables 68H and 68N show the percentage of cases with specific symptoms of radiation injury, and tables 69H and 69N show the percentage of cases with specific and/or suggestive symptoms of radiation injury by distance and by shielding. There was little difference in the percentage of cases with these symptoms among people outdoors shielded, outdoors unshielded, and indoors in Japanese-type buildings. The incidence of radiation symptoms was very much less among people in heavy buildings, and few cases occurred among people in bomb shelters or tunnels.

The number and percentage of cases with each combination of the three types of injuries (radiation injuries, burns, and mechanical injuries) are shown in table 70H and 70N.* In ring 1 in Hiroshima, 96.1% of the people received some injury; 20.3% received radiation in injuries only; 1.7% received burns only; and 8.0% received mechanical injuries only. Ten percent received radiation injuries, burns, and mechanical injuries; 12.3% received radiation injury and burns only; 42.7% received radiation injuries and mechanical injuries only; and 0.9% received burns and mechanical injuries only. In ring 1 in Nagasaki, 86.1% of the people received some injury, and a smaller proportion of these were from radiation, than in Hiroshima.

Out of a total of 5,200 people in Hiroshima who received some injury 417 (8.0%) were injured by radiation only; 1,186 (22.8%) were injured by burns only; and 1,546 (29.7%) received mechanical injuries only. In Nagasaki, out of 4,117 people with some injury, 528 (12.8%) had radiation injuries only, 608 (14.8%) had burns only, and 1,248 (30.3%) had mechanical injuries only.

The figures just cited do not take into account the severity of the injuries. Many of the burns and mechanical injuries were very minor (among these individuals who were living twenty days after the bombing). As previously described, the burns and mechanical injuries were classified as "moderate" or "severe" in each case. In order to obtain an estimate of the most severe type of injury in each case, the following arbitrary criteria were used. If an individual had one type of injury only, then that was necessarily his most severe injury. Specific symptoms of radiation injury were considered to be the "most severe injury" regardless of burns or mechanical injuries. Severe burns were considered to be the "most severe injury" in the absence of specific symptoms of radiation injury regardless of mechanical injuries. Severe mechanical injuries were considered to be the "most severe injury" in the absence of severe burns and specific symptoms of radiation injury. If an individual had two or more types of injuries, but did not have specific symptoms of radiation injury or severe burns, or severe mechanical injuries, then the "most severe injury" was considered to be suggestive symptoms of radiation injury, or moderate burns, or moderate mechanical injury, priority being given in the order named.

Tables 71H and 71N show the cases classified by the most severe type of injury sustained by distance. Radiation produced the most severe type of injury in over half of the cases with injuries in rings 1 and 2 in both cities. Mechanical injuries were the most severe type in a majority of cases with injuries in rings 6 and 7. Among all cases within a distance of 5,000 meters in Hiroshima, about the same number had radiation injuries and mechanical injuries as their most severe injury, while burns were the most severe injury

*Specific and/or suggestive symptoms of radiation injury are included under the heading "radiation" in tables 70H and 70N.

in somewhat fewer cases. In Nagasaki, radiation injury was the most severe type of injury in the largest proportion of cases, mechanical injuries were the most severe type in somewhat fewer cases, and burns were the most severe type of injury in a much smaller number of cases.

In ring 1, radiation accounted for the most severe injuries in the majority of cases regardless of shielding. (See tables 72H and 72N.) Beyond ring 2, the most severe injury sustained by a majority of the people depended upon the shielding. Among people outdoors unshielded, burns were usually the most severe type of injury sustained beyond ring 2. Among people outdoors shielded, each of the three types of injuries appeared with about equal frequency as the most severe type. In Japanese-type buildings and heavy-type buildings, mechanical injuries were usually the most severe. There were too few people in bomb shelters and tunnels in Hiroshima to make valid comparisons; but in Nagasaki, radiation produced the most severe injury in a majority of the cases with any injury.

Again, it should be emphasized that the sample described here consisted entirely of people who were living at least twenty days after the bombing. Burns and mechanical injuries were probably the immediate cause of death of a very large proportion of the people who were killed instantly, or who died within a short time after the bombing. Most of the people within a distance of 500 meters died, and a large proportion of them received such severe burns, radiation injuries and mechanical injuries, that they would have died from any one of these three causes alone.

VIII

SUMMARY

1. This section describes the findings in medical examinations of 6,882 people in Hiroshima and 6,621 people in Nagasaki, who were living twenty days after the bombing.
2. In Hiroshima, 33.7% of all the people examined had burns and 43.9% had mechanical injuries. In Nagasaki, 20.9% of all the people examined had burns and 39.0% had mechanical injuries. The percentage of people with burns and the percentage of people with mechanical injuries decreased as the distance from ground center increased. (See figures 2H and 2N.) Within a distance of 3,000 meters, 38.4% had burns and 48.4% had mechanical injuries in Hiroshima, and 25.4% had burns and 46.8% had mechanical injuries in Nagasaki.
3. Shielding had a considerable influence on the incidence of burns, most of which were flash burns. The following figures indicate the effect of shielding within a distance of 3,000 meters. In Hiroshima, burns were reported for 84.3% of the people outdoors unshielded, 27.3% of the people outdoors shielded, 13.3% of the people in Japanese-type buildings, and 14.0% of the people in concrete, brick, and steel buildings. In Nagasaki, burns were reported for 69.5% of the people outdoors unshielded, 28.4% of the people outdoors shielded, 17.9% of the people in Japanese-type buildings, 17.1% of the people in concrete, brick, and steel buildings, and 7.6% of the people in bomb shelters and tunnels.
4. Mechanical injuries were caused, principally, by falling walls and flying debris. The percentage of mechanical injuries was less among people outdoors than among people in buildings.
5. Ruptured ear drums were found in only 17 of the people examined in Hiroshima and 22 in Nagasaki.
6. Abnormal menstruation, apparently resulting from the bombing, was reported for approximately 36% of the women in Hiroshima and 29% in Nagasaki, between the ages of 15 and 49, who were within a distance of 5,000 meters. A considerable proportion of the women probable had abnormal menstruation before the bombing. (See page 18.)
7. The following symptoms were studied: epilation, purpura, oropharyngeal lesions, necrotic gingivitis, diarrhea, bloody diarrhea, other hemorrhage, vomiting, nausea, malaise, anorexia, cramps, and fever. The incidence of all these symptoms was related to distance. (See figures 5H and 5N.)
8. Epilation and purpura were reported in a large number of cases near the center, but in only a very few cases beyond 4,000 meters. (See figures 6H and 6N.) These two symptoms occurred more frequently among people outdoors or in Japanese-type buildings than among people in concrete, brick, and steel buildings. (See figures 10H and 10N.) Epilation typically appeared in from one to four weeks after the bombing. (See figures 9H and 9N.)
9. Vomiting occurred on the day of the bombing in most of the cases with this symptom. Most of the cases with oropharyngeal lesions, which appears to have been related to the bombing, began within thirty-nine days.

10. The incidence of oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage, was more related to distance than was the incidence of any of the other symptoms, except epilation and purpura. (See figures 7H and 7N.)
11. Burns had little influence on the incidence of any of the symptoms listed above, (item 7).
12. Epilation and purpura were more highly associated than any other pair of symptoms. Oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage, were more highly associated with epilation and with purpura than were any of the other symptoms.
13. White cell counts of less than 3,000 cells were found in a very large percentage of cases tested from two to six weeks after the bombing among people within a distance of 3,000 meters. The percentage of people with very low white cell counts decreased with increasing distance and shielding. (See figures 15H and 15N.) The average white cell counts were lowest in the fourth week after the bombing and increased in each succeeding week, generally returning to normal levels within ten weeks. (See figures 13H and 13N.)
14. Differential white blood cell counts showed that all types of cells were affected, but a decrease in the number of polymorphonuclear leucocytes accounted for a major proportion of the decrease in total white cell counts. Among people with considerable exposure to radiation, the percentage of polymorphonuclear leucocytes was positively correlated with the total white cell count, and the percentage of lymphocytes was negatively correlated with the total white blood cell count.
15. Red blood cell counts were lower in people near the bomb than in those at a greater distance and, in general, the counts were lower in weeks 2 to 5 than in later weeks. (See figures 16H and 16N.) Hemoglobin determinations showed about the same trend with distance and shielding as red blood cell counts. (See figures 17H and 17N.)
16. Cases with epilation and purpura had much lower white blood cell counts than people without these symptoms. In general, cases with oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage, had lower white cell counts than cases without these symptoms. Some people relatively near the bombing, and with little shielding, had white cell counts under 3,000, but showed no other symptoms.
17. Of the 6,882 people examined in Hiroshima and 6,621 people examined in Nagasaki, who were living on the twentieth day after the bombing, 254 in Hiroshima and 174 in Nagasaki were reported to have died later. Most of these died within fifty days of the bombing. It is possible that other unreported deaths occurred among the people examined. Most of the deaths occurred among people within a distance of 2,000 meters who were outdoors or in Japanese-type buildings at the time of the bombing. Epilation and purpura were reported in 89% of the people who died in Hiroshima, and 71% of the people who died in Nagasaki. Almost half of the remainder, who did not have epilation or purpura, had oropharyngeal lesions (within 39 days), or vomiting on the day of the bombing, or other hemorrhage, as well as one or more of the other symptoms. The white blood cell counts were less than 3,000 in weeks 2 to 6 in over 80% of the people who died, (among those on whom counts were made).

On the basis of the findings, epilation and purpura were defined as specific symptoms of radiation injury. Oropharyngeal lesions (within 39 days), vomiting on the day of the bombing, and other hemorrhage were defined as suggestive symptoms of radiation injury, provided that at least one other symptom appeared in addition to one of these three symptoms (or that two or more of these symptoms appeared in the same individual). In Hiroshima, 1,363 cases examined had specific symptoms of radiation injury and 2,171 had specific, or suggestive symptoms of radiation injury. In Nagasaki, 1,206 of the cases examined had specific

symptoms of radiation injury and 2,101 had specific and/or suggestive symptoms of radiation injury. Within a distance of 1,000 meters in Hiroshima 91.2% of the people outdoors or in Japanese-type buildings, and 75.2% of the people in concrete, brick, and steel buildings had specific and/or suggestive symptoms of radiation injury; in Nagasaki 66.8% of the people outdoors or in Japanese-type buildings, 48.5% of the people in concrete, brick, and steel buildings, and 27.4% of the people in bomb shelters and tunnels had specific and/or suggestive symptoms of radiation injury.

Within a distance of 5,000 meters, 5,185 (77.8%) of the people examined in Hiroshima, and 4,107 (63.9%) of the people examined in Nagasaki had one or more injuries (i.e., radiation injuries, burns, or mechanical injuries). Of the people with any injury in Hiroshima, 7.8% had radiation injuries only, 22.9% had burns only, and 29.8% had mechanical injuries only; in Nagasaki, 12.8% had radiation injuries only, 14.8% had burns only, and 30.1% had mechanical injuries only.

20. Within a distance of 1,000 meters, radiation produced the most severe injuries in a majority of the cases, with any injury, regardless of shielding. At a distance of 2,500 to 5,000 meters, the most severe injuries sustained by a majority of the people depended upon the shielding. In general, burns were usually the most severe injuries among people outdoors unshielded and mechanical injuries were usually the most severe injuries among people indoors or outdoors shielded.
21. It should be emphasized that the sample described here consisted entirely of people who were living twenty days after the bombing. Most of the people within a distance of 500 meters died in less than twenty days from the bombing; and a large proportion received such severe burns, radiation injuries, and mechanical injuries, that they would have died from any one of these causes alone.

APPENDIX 1

LIST OF TABLES

Tables requiring a page or more for each city have the letter "H" or "N" suffixed to the table number, to indicate Hiroshima or Nagasaki. Except for tables 62, 63, 64, and 65, the data include only individuals who were living twenty days after the bombing.

<u>Table Number</u>	<u>Title</u>
1.	Age and sex of individuals examined in Hiroshima and Nagasaki.
2.	Occupation of individuals examined in Hiroshima and Nagasaki.
3.	Distribution of people examined by distance and shielding.
4.	Burns, mechanical injuries, blast effects and deaths by distance.
5.	Individuals with mechanical injuries by type and distance.
6.	Number and percent of people with moderate and severe mechanical injuries by distance.
7.	Burns and mechanical injuries by distance and shielding.
8.	Type of burns by distance.
9.	Most severe degree of burn by distance.
10.	Most severe degree of burn by percent of body area burnt and by distance.
11.	Number and percent of people with moderate and severe burns by distance.
12.	Parts of body burnt.
13.	Burns in relation to clothing.
14.	Symptoms by distance.
15.	Effects on menstruation.
16.	Effects on pregnancy.
17.	Days from bombing to onset of epilation, purpura, oropharyngeal lesions, diarrhea and vomiting.
18.	Mean days from bombing to onset of epilation and purpura.
19.	Vomiting, oropharyngeal lesions, and diarrhea by day of onset and by distance.
20.	Mean duration of vomiting (beginning on the day of bombing), oropharyngeal lesions (beginning within 39 days of bombing), diarrhea, and purpura, by distance.
21.	Symptoms by ring and shielding.
22.	Incidence of mechanical injuries, burns, and epilation by direction, ring, and shielding.
23.	Symptoms by exposure groups.
24.	Symptoms by sex and by exposure groups.
25.	Symptoms by age and by exposure groups.
26.	The incidence of symptoms among people with burns as compared with the incidence of symptoms in people without burns, by exposure groups.
27.	The number of individuals with each pair of symptoms.
28.	Critical ratios of the difference between the expected and observed number of individuals with each pair of symptoms.
29.	Association of symptoms (as measured by ϕ).
30.	Association of epilation and purpura by exposure groups.

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<u>Table Number</u>	<u>Title</u>
31.	Association of symptoms with epilation and purpura, by exposure groups.
32.	The incidence of other symptoms among individuals with epilation and/or purpura as compared with the incidence of other symptoms among individuals with neither epilation nor purpura.
33.	Mean white blood cell counts and number of cases by exposure groups, and by weeks from bombing.
34.	Distribution of white blood cell counts by exposure groups, and by weeks from bombing.
35.	Comparison of the first white blood cell count with the second white blood cell count made on the same individual within 2 to 6 weeks of the bombing.
36.	Mean white blood cell counts within a few weeks of the bombing, as compared with mean counts made on the same individuals several weeks later.
37.	Comparison of white blood cell counts (weeks 2 to 6) in individuals with burns and individuals without burns by exposure groups.
38.	Mean percentages of basophiles, eosinophiles, stab cells, polymorphonuclear leucocytes, lymphocytes and monocytes by exposure groups and by weeks from bombing.
39.	The correlation between total white blood cell counts and percentages of each type of cell, as measured by correlation coefficients.
40.	The mean number of basophiles, eosinophiles, stab cells, polymorphonuclear leucocytes, lymphocytes, and monocytes by exposure groups and by weeks from bombing.
41.	Distribution of number of basophiles by exposure groups and by weeks from bombing.
42.	Distribution of number of eosinophiles by exposure groups and by weeks from bombing.
43.	Distribution of number of stab cells by exposure groups and by weeks from the bombing.
44.	Distribution of number of polymorphonuclear leucocytes by exposure groups and by weeks from the bombing.
45.	Distribution of number of lymphocytes by exposure groups and by weeks from the bombing.
46.	Distribution of number of monocytes by exposure groups, and by weeks from the bombing.
47.	Number and percentage of cases in which young white blood cells, atypical lymphocytes, nucleated red blood cells, stippled red blood cells and reticulocytes were observed by exposure groups and by weeks from bombing.
48.	Mean number of platelets and number of cases with platelet counts by exposure groups and by weeks from bombing.
49.	Mean sedimentation rate and number of cases with sedimentation rates by exposure groups and by weeks from bombing.
50.	Mean red blood cell counts and number of cases with red cell counts by exposure groups and by weeks from bombing.
51.	Distribution of red blood cells by exposure groups and by weeks from bombing.
52.	Mean grams of hemoglobin per 100 cc. of blood, and number of cases with hemoglobin determinations by exposure groups and by weeks from bombing.
53.	Distribution of hemoglobin determinations by exposure groups and by weeks from bombing.

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<u>Table Number</u>	<u>Title</u>
54.	Number and percent of people with white blood cell counts under 3,000 (weeks 2 to 6) by symptoms and by exposure groups.
55.	Number and percent of people with white blood cell counts under 3,000 among mutually exclusive cases of epilation, purpura, oropharyngeal lesions with 39 days, vomiting day of bombing, and other hemorrhage by exposure groups.
56.	Number and percent of people with white blood cells counts under 3,000 (weeks 2 to 6) among cases without epilation, purpura, oropharyngeal lesions, vomiting, or hemorrhage, by other symptoms and by exposure groups.
57.	White blood cell counts by combinations of symptoms and by exposure groups.
58.	Distribution of days from bombing to death among individuals who died twenty days or more following the day of bombing.
59.	Deaths occurring twenty days or more following the day of bombing by distance and by shielding.
60.	White blood cell counts (weeks 2 to 6) among individuals who died twenty days or more following the day of the bombing.
61.	The incidence of symptoms, burns and mechanical injuries among individuals who died twenty days or more following the day of bombing.
62.	Distribution of days from bombing to death among individuals who <u>died prior to twenty days following the day of bombing.</u>
63.	Deaths occurring <u>prior to twenty days following the day of bombing,</u> by distance and by shielding.
64.	White blood cells counts of individuals who <u>died prior to twenty days following the day of bombing.</u>
65.	The incidence of symptoms, burns and mechanical injuries among individuals who died prior to twenty days <u>following the day of bombing.</u>
66.	The incidence of symptom combinations of exposure groups.
67.	Number and percent of cases originally diagnosed by the physician in Japan as having radiation injury.
68.	Individuals with specific symptoms of radiation (epilation and/or purpura) by distance and shielding.
69.	Individuals with specific symptoms of radiation (epilation and/or purpura) and/or suggestive symptoms of radiation (any combination of two or more symptoms including oropharyngeal lesions, vomiting, or other hemorrhage) by distance and shielding.
70.	Radiation, burns, and mechanical injuries by distance.
71.	Type of most severe injury by distance.
72.	Type of most severe injury by distance and shielding.

Table 1. Age and sex of individuals examined in Hiroshima and Nagasaki who were living twenty days after the bombing.

Age	Hiroshima						Nagasaki					
	Males		Females		Total		Males		Females		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 5	114	3.2	85	2.6	199	2.9	63	2.2	67	1.8	130	2.0
5-9	167	4.7	174	5.3	341	5.0	113	4.0	130	3.5	243	3.7
10-14	359	10.1	449	13.7	808	11.8	470	16.6	474	12.8	944	14.4
15-19	566	15.9	553	16.9	1119	16.4	898	31.7	1627	43.9	2525	38.6
20-24	473	13.3	412	12.6	885	13.0	260	9.2	381	10.3	641	9.8
25-29	297	8.3	237	7.3	534	7.8	138	4.9	209	5.6	347	5.3
30-34	316	8.9	232	7.1	548	8.0	153	5.4	162	4.4	315	4.8
35-39	284	8.0	262	8.0	546	8.0	126	4.5	158	4.3	284	4.3
40-44	286	8.0	245	7.5	531	7.8	150	5.3	155	4.2	305	4.7
45-49	234	6.6	197	6.0	431	6.3	142	5.0	101	2.7	243	3.7
50-54	143	4.0	148	4.5	291	4.3	119	4.2	98	2.6	217	3.3
55-59	122	3.4	113	3.5	235	3.4	89	3.1	60	1.6	149	2.3
60-64	110	3.1	73	2.2	183	2.7	53	1.9	41	1.1	94	1.4
65-69	54	1.5	55	1.7	109	1.6	39	1.4	26	0.7	65	1.0
70-74	22	0.6	24	0.7	46	0.7	15	0.5	10	0.3	25	0.4
75-79	6	0.2	7	0.2	13	0.2	2	0.1	9	0.2	11	0.2
and 80 over	5	0.1	1	-	6	0.1	1	-	1	-	2	-
Total	3558	100.0	3267	100.0	6825	100.0	2831	100.0	3709	100.0	6540	100.0
Age Unknown	54	-	03	-	57	-	35	-	46	-	81	-
Grand Total	3612	-	3270	-	6882	-	2866	-	3755	-	6621	-
Mean Age	29.5		28.4		29.0		25.5		22.8		24.0	

Table 2. Occupation of individuals examined in Hiroshima and Nagasaki who were living twenty days after the bombing.

Occupation	Hiroshima		Nagasaki	
	No.	%	No.	%
Unemployed	834	14.9	210	4.1
Student	1738	31.0	3208	62.5
Laborer	322	5.7	929	18.1
Military	650	11.6	37	0.7
White Collar	680	12.1	365	7.1
Executive and Professional	79	1.4	17	0.3
Housewife	560	10.0	151	2.9
Farmer	185	3.3	156	3.0
Other	562	10.0	57	1.1
Total	5610	100.0	5130	100.0
Occupation Unknown	1272	-	1491	-
Grand Total	6882	-	6621	-

HIROSHIMA

Table 3H. Distribution of people examined by distance and shielding
Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Indoors (by type of building)										Outdoors				Total		Shielding Unknown	Grand Total		
		Japanese Type		Brick		Steel, Factory Type		Concrete		Bomb Shelters		Type of Building Unknown		Shielded		Unshielded				No.	%
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			No.	%
1	0 - 1000	376	53.5	2	0.3	0	0	111	15.8	20	2.8	35	5.0	53	7.5	106	15.1	703	100	46	749
2	1100 - 1500	515	47.7	6	0.6	1	0.1	111	10.3	1	0.1	46	4.3	150	13.9	249	23.1	1079	100	46	1125
3	1600 - 2000	702	40.6	2	0.1	3	0.2	89	5.1	3	0.2	52	3.0	189	10.9	690	39.9	1730	100	94	1824
4	2100 - 2500	605	42.4	0	0	0	0	12	0.8	1	0.1	126	8.8	94	6.6	590	41.3	1428	100	22	1450
5	2600 - 3000	364	52.9	7	1.0	4	0.6	3	0.4	0	0	26	3.8	92	13.4	192	27.9	688	100	12	700
6	3100 - 4000	323	57.6	2	0.4	2	0.4	9	1.6	0	0	3	0.5	63	11.2	159	28.3	561	100	15	576
7	4100 - 5000	127	55.5	0	0	4	1.7	23	10.0	0	0	0	0	7	3.1	68	29.7	229	100	10	239
Total	0 - 5000	3012	46.9	19	0.3	14	0.2	358	5.6	25	0.4	288	4.5	648	10.1	2054	32.0	6418	100	245	6663
9	Over 5000	21	43.8	0	0	0	0	2	4.2	0	0	1	2.1	5	10.4	19	39.6	48	100	171	219
Grand Total	--	3033	46.9	19	0.3	14	0.2	360	5.6	25	0.4	289	4.5	653	10.1	2073	32.1	6466	100	416	6882

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Table 3W. Distribution of people examined by distance and shielding

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Indoors (by type of building)												Outdoors				Shielding Unknown	Grand Total		
		Japanese Type		Brick		Steel, Factory Type		Concrete		Bomb Shelters		Type of Building Unknown		Shielded		Unshielded				Total	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			No.	%
1	0 - 1000	245	32.6	5	0.7	11	1.5	287	38.2	73	9.7	6	0.8	52	6.9	73	9.7	752	100	37	789
2	1000 - 1500	838	46.5	20	1.1	143	7.9	442	24.5	72	4.0	23	1.3	104	5.8	160	8.9	1802	100	80	1882
3	1600 - 2000	556	55.2	7	0.7	19	1.9	62	6.2	47	4.7	5	0.5	103	10.2	208	20.7	1007	100	27	1034
4	2100 - 2500	311	47.1	4	0.6	2	0.3	29	4.4	110	16.7	7	1.1	82	12.4	115	17.4	660	100	12	672
5	2600 - 3000	360	57.7	3	0.5	5	0.8	22	3.5	25	4.0	9	1.4	61	9.8	139	22.3	624	100	20	644
6	3100 - 4000	648	58.3	14	1.3	34	3.1	104	9.4	29	2.6	6	0.5	89	8.0	188	16.9	1112	100	29	1141
7	4100 - 5000	155	61.5	4	1.6	1	0.4	12	4.8	9	3.6	2	0.8	23	9.1	46	18.3	252	100	13	265
Total	0 - 5000	3113	50.1	57	0.9	215	3.5	958	15.4	365	5.9	58	0.9	514	8.3	929	15.0	6209	100	218	6427
9	Over 5000	67	73.6	1	1.1	1	1.1	2	2.2	2	2.2	2	2.2	6	6.6	10	11.0	91	100	103	194
Grand Total	--	3180	50.5	58	0.9	216	3.4	960	15.2	367	5.8	60	1.0	520	8.3	939	14.9	6300	100	321	6621

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Table 4H. Burns, mechanical injuries, blasts effects and deaths by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Burns		Mechanical Injuries		Blast Effects						Deaths*	
							Ruptured Ear Drums		Vertigo Tinnitus Headache		Loss of Con- sciousness			
							No.	%	No.	%	No.	%		
1	0-1000	749	188	25.1	463	61.8	6	0.8	78	10.4	53	7.1	194	25.9
2	1100-1500	1125	390	34.7	671	59.6	4	0.4	192	17.1	84	7.5	46	4.1
3	1600-2000	1824	862	47.3	834	45.7	5	0.3	289	15.8	122	6.7	11	0.6
4	2100-2500	1450	619	42.7	590	40.7	1	0.1	293	20.2	92	6.3	2	0.1
5	2600-3000	700	186	26.6	275	39.3	1	0.1	64	9.1	15	2.1	1	0.1
6	3100-4000	576	69	12.0	148	25.7	0	0.0	33	5.7	3	0.5	0	0.0
7	4100-5000	239	1	0.4	35	14.6	0	0.0	21	8.8	2	0.8	0	0.0
Total	0-5000	6663	2315	34.8	3016	45.3	17	0.3	970	14.6	371	5.6	254	3.8
9	Over 5000	219	1	0.5	3	1.4	0	0.0	11	5.0	0	0.0	0	0.0
Grand Total	--	6882	2316	33.7	3019	43.9	17	0.2	981	14.3	371	5.4	254	3.7

*Deaths occurring twenty days or more after the bombing.

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Table 4N. Burns, mechanical injuries, blast effects and deaths by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of Peop- ^a	Burns		Mechanical Injuries		Blast Effects						Deaths ^a	
			No.	%	No.	%	Ruptured Ear Drums		Vertigo Tinnitus Headache		Loss of Con- sciousness		No.	%
							No.	%	No.	%	No.	%		
1	0-1000	789	179	22.7	445	56.4	4	0.5	172	21.8	20	2.5	64	8.1
2	1100-1500	1882	452	24.0	1173	62.3	11	0.6	421	22.4	46	2.4	61	3.2
3	1600-2000	1034	359	34.7	395	38.2	2	0.2	162	15.7	15	1.5	33	3.2
4	2100-2500	672	155	23.1	181	26.9	4	0.6	90	13.4	5	0.7	5	0.7
5	2600-3000	644	131	20.3	157	24.4	1	0.2	72	11.2	8	1.2	5	0.8
6	3100-4000	1141	86	7.5	201	17.6	0	0	106	9.3	6	0.5	5	0.4
7	4100-500	265	20	7.5	26	9.8	0	0	18	6.8	0	0	1	0.4
Total	0-5000	6427	1382	21.5	2578	40.1	22	0.3	1041	16.2	100	1.6	174	2.7
9	Over 5000	194	3	1.5	5	2.6	0	0	1	0.5	0	0	0	0
Grand Total	--	6621	1385	20.9	2583	39.0	22	0.3	1042	15.7	100	1.5	174	2.6

^aDeaths occurring twenty days or more after the bombing.

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Table 5H. Individuals with mechanical injuries by type and distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Individuals With Any Mechanical Injury		Type of Injury*				Individuals With Type of Injury Known		Mechanical Inj. Type Unknown No.
					Fractured Bones		Lacerations Abrasions or Contusions				
			No.	%	No.	%	No.	%	No.	%	
1	0-1000	749	463	61.8	23	5.7	396	98.0	404	100.0	59
2	1100-1500	1125	671	59.6	29	4.8	593	98.7	601	100.0	70
3	1600-2000	1824	834	45.7	36	4.7	764	98.8	773	100.0	61
4	2100-2500	1450	590	40.7	24	4.4	539	98.9	545	100.0	45
5	2600-3000	700	275	39.3	5	1.9	261	100.0	261	100.0	14
6	3100-4000	576	148	25.7	1	0.7	143	99.3	144	100.0	4
7	4100-5000	239	35	14.6	0	0	35	100.0	35	100.0	0
Total	0-5000	6663	3016	45.3	118	4.3	2731	98.8	2763	100.0	253
9	Over 5000	219	3	1.4	0	0	3	100.0	3	100.0	0
Grand Total	--	6882	3019	43.9	118	4.3	2734	98.8	2766	100.0	253

*Individuals with both fractured bones and lacerations are included in both categories.

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Table 5N. Individuals with Mechanical Injuries by Type and Distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Individuals With Any Mechanical Injury		Type of Injury *				Individuals With Type Of Injury Known		Mechanical Inj. Type Unknown
					Fractured Bones		Lacerations Abrasions or Contusions				
			No.	%	No.	%	No.	%	No.	%	
1	0-1000	789	445	56.4	20	5.9	330	97.3	339	100.0	106
2	1100-1500	1882	1173	62.3	31	3.6	847	98.6	859	100.0	314
3	1600-2000	1034	395	38.2	10	3.4	294	99.0	297	100.0	98
4	2100-2500	672	181	26.9	3	2.1	139	99.3	140	100.0	41
5	2600-3000	644	157	24.4	5	4.3	116	100.0	116	100.0	41
6	3100-4000	1141	201	17.6	4	2.5	156	98.7	158	100.0	43
7	4100-5000	265	26	9.8	0	0	20	100.0	20	100.0	6
Total	0-5000	6427	2578	40.1	73	3.8	1902	98.6	1929	100.0	649
9	Over 5000	194	5	2.6	0	0	1	100.0	1	100.0	4
Grand Total	--	6621	2583	39.0	73	3.8	1903	98.6	1930	100.0	653

* Individuals with both fractured bones and lacerations are included in both categories.

Table 6. Number and percent of people with moderate and severe mechanical injuries by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	HIROSHIMA							NAGASAKI						
		Total Number Of People	Moderate Mechanical Injuries		Severe Mechanical Injuries		Total Mechanical Injuries		Total Number Of People	Moderate Mechanical Injuries		Severe Mechanical Injuries		Total Mechanical Injuries	
			No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	0-1000	749	198	26.4	265	35.4	463	61.8	789	202	25.6	243	30.8	445	56.4
2	1100-1500	1125	323	28.7	348	30.9	671	59.6	1882	590	31.3	583	31.0	1173	62.3
3	1600-2000	1824	450	24.6	384	21.1	834	45.7	1034	234	22.6	161	15.6	395	38.2
4	2100-2500	1450	353	24.4	237	16.3	590	40.7	672	127	18.9	54	8.0	181	26.9
5	2600-3000	700	156	22.3	119	17.0	275	39.3	644	107	16.6	50	7.8	157	24.4
6	3100-4000	576	95	16.5	53	9.2	148	25.7	1141	155	13.6	46	4.0	201	17.6
7	4100-5000	239	23	9.6	12	5.0	35	14.6	265	20	7.5	6	2.3	26	9.8
Total	0-5000	6663	1598	24.0	1418	21.3	3016	45.3	6427	1435	22.3	1143	17.8	2578	40.1
9	Over 5000	219	2	0.9	1	0.5	3	1.4	194	5	2.6	0	0.0	5	2.6
Grand Total	--	6882	1600	23.3	1419	20.6	3019	43.9	6621	1440	21.7	1143	17.3	2583	39.0

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Table 7H. Burns and Mechanical Injuries by Distance and Shielding

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors Unshielded				Outdoors Shielded				Indoors Japanese Bldg.						
		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries	
			No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
1	0-1000	105	78	74.3	29	27.6	53	23	43.4	28	52.8	410	60	14.6	284	69.3
2	1100-1500	249	211	84.7	57	22.9	150	56	37.3	89	59.3	560	91	16.3	404	72.1
3	1600-2000	689	615	89.3	116	16.8	189	80	42.3	79	41.8	754	122	16.2	539	71.5
4	2100-2500	590	511	86.6	100	16.9	94	35	37.2	37	39.4	731	64	8.8	435	59.5
5	2600-3000	192	124	64.6	31	16.1	92	18	19.6	26	28.3	390	43	11.0	207	53.1
6	3100-4000	159	57	35.8	14	8.8	63	1	1.6	11	17.5	325	8	2.5	117	36.0
7	4100-5000	68	1	1.5	3	4.4	7	0	0	2	28.6	127	0	0	26	20.5
Total	0-5000	2052	1597	77.8	350	17.1	648	213	32.9	272	42.0	3297	388	11.8	2012	61.0
9	Over 5000	19	1	5.3	1	5.3	5	0	0	0	0	22	0	0	1	4.5
Grand Total	--	2071	1598	77.2	351	16.9	653	213	32.6	272	41.7	3319	388	11.7	2013	60.7

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Table 7A. Burns and Mechanical Injuries by Distance and Shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Indoors Heavy Building					Bomb Shelters & Tunnels					Shielding Unknown				
		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries	
			No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
1	0-1000	113	12	10.6	91	80.5	20	0	0	12	60.0	48	15	31.3	19	39.6
2	1100-1500	118	20	16.9	97	82.2	1	0	0	1	100.0	47	12	25.5	23	48.9
3	1600-2000	93	15	16.1	67	72.0	3	2	66.7	1	33.3	96	28	29.2	32	33.3
4	2100-2500	12	1	8.3	10	83.3	1	0	0	0	0	22	8	36.4	8	36.4
5	2600-3000	14	1	7.1	7	50.0	0	0	0	0	0	12	0	0	4	33.3
6	3100-4000	13	0	0	4	30.8	0	0	0	0	0	16	3	18.8	2	12.5
7	4100-5000	27	0	0	3	11.1	0	0	0	0	0	10	0	0	1	10.0
Total	0-5000	390	49	12.6	279	71.5	25	2	8.0	14	56.0	251	66	26.3	89	35.5
9	Over 5000	2	0	0	1	50.0	0	0	0	0	0	171	0	0	0	0
Grand Total	--	392	49	12.5	280	71.4	25	2	8.0	14	56.0	422	66	15.6	89	21.1

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Table 7N. Burns and Mechanical Injuries by Distance and Shielding

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors Unshielded					Outdoors Shielded					Indoors Jap. Building				
		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries	
			No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
1	0-1000	73	46	63.0	18	24.7	52	15	28.8	15	28.8	252	63	25.0	148	58.7
2	1100-1500	160	111	69.4	33	20.6	104	34	32.7	40	38.5	861	163	18.9	576	66.9
3	1600-2000	208	160	76.9	21	10.1	103	31	30.1	19	18.4	561	134	23.9	285	50.8
4	2100-2500	115	82	71.3	20	17.4	82	21	25.6	21	25.6	318	41	12.9	112	35.2
5	2600-3000	139	84	60.4	24	17.3	61	13	21.3	12	19.7	369	22	6.0	101	27.4
6	3100-4000	188	56	29.8	22	11.7	89	6	6.7	14	15.7	654	16	2.4	117	17.9
7	4100-5000	46	16	34.8	5	10.9	23	1	4.3	1	4.3	157	1	0.6	16	10.2
Total	0-5000	929	555	59.7	143	15.4	514	121	23.5	122	23.7	3172	440	13.9	1355	42.7
9	Over 5000	10	0	0	1	10.0	6	0	0	0	0	69	1	1.4	3	4.3
Grand Total	--	939	555	59.1	144	15.3	520	121	23.3	122	23.5	3241	441	13.6	1358	41.9

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Table 7N. Burns and Mechanical Injuries by Distance and Shielding

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Indoors Heavy Building				Bomb Shelters & Tunnels				Shielding Unknown						
		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries		Total Number of People	Individuals With Burns		Individuals With Mechanical Injuries	
			No.	%	No.	%		No.	%	No.	%		No.	%	No.	%
1	0-1000	303	39	12.9	239	78.9	73	9	12.3	11	15.1	36	7	19.4	14	38.9
2	1100-1500	604	114	18.9	480	79.5	72	8	11.1	6	8.3	81	22	27.2	38	46.9
3	1600-2000	88	21	23.9	53	60.2	47	2	4.3	4	8.5	27	11	40.7	13	48.1
4	2100-2500	35	3	8.6	11	31.4	110	4	3.6	15	13.6	12	4	33.3	2	16.7
5	2600-3000	30	4	13.3	12	40.0	25	2	8.0	3	12.0	20	6	30.0	5	25.0
6	3100-4000	152	7	4.6	37	24.3	29	1	3.4	2	6.9	29	0	0	9	31.0
7	4100-5000	17	0	0	4	23.5	9	1	11.1	0	0	13	1	7.7	0	0
Total	0-5000	1229	188	15.3	836	68.0	365	27	7.4	41	11.2	218	51	23.4	81	37.2
9	Over 5000	4	0	0	0	0	2	0	0	0	0	103	2	1.9	1	1.0
Grand Total	--	1233	188	15.2	836	67.8	367	27	7.4	41	11.2	321	53	16.5	82	25.5

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Table 8H. Type of burns by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Total With Burns		Type of Burn							
					Flash		Flame		Flesh & Flame		Type Unknown	
					No.	%	No.	%	No.	%	No.	%
1	0-1000	749	188	25.1	108	14.4	2	0.3	13	1.7	65	8.7
2	1100-1500	1125	390	34.7	258	22.9	4	0.4	47	4.2	81	7.2
3	1600-2000	1824	862	47.3	550	30.2	15	0.8	133	7.3	164	9.0
4	2100-2500	1450	619	42.7	472	32.6	10	0.7	77	5.3	60	4.1
5	2600-3000	700	186	26.6	157	22.4	5	0.7	15	2.1	9	1.3
6	3100-4000	576	69	12.0	53	9.2	0	0	2	0.3	14	2.4
7	44100-5000	239	1	0.4	0	0	0	0	0	0	1	0.4
Total	0-5000	6663	2315	34.7	1598	24.0	36	0.5	287	4.3	394	5.9
9	Over 5000	219	1	0.5	0	0	0	0	0	0	1	0.5
Grand Total	--	6882	2316	33.7	1598	23.2	36	0.5	287	4.2	395	5.7

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Table 8N. Type of Burns by Distance

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Total With Burns		Type of Burn							
					Flesh		Flame		Flash and Flame		Type Unknown	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	179	22.7	103	13.1	7	0.9	2	0.3	67	8.5
2	1100-1500	1882	452	24.0	286	15.2	9	0.5	14	0.7	143	7.6
3	1600-2000	1034	359	34.7	247	23.9	14	1.4	22	2.1	76	7.4
4	2100-2500	672	155	23.1	113	16.8	1	0.1	10	1.5	31	4.6
5	2600-3000	644	131	20.3	90	14.0	2	0.3	8	1.2	31	4.8
6	3100-4000	1141	86	7.5	65	5.7	0	0	1	0.1	20	1.8
7	4100-5000	265	20	7.5	9	3.4	1	0.4	0	0	10	3.8
Total	0-5000	6427	1382	21.5	913	14.2	34	0.5	57	0.9	378	5.9
9	Over 5000	194	3	1.5	0	0	0	0	0	0	3	1.5
Grand Island	--	6621	1385	20.9	913	13.8	34	0.5	57	0.9	381	5.8

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Table 9H. Most severe degree of burn by distance. In this table, an individual with 1st, 2nd, and 3rd degree burns is entered under 3rd degree, this being the most severe degree of burn sustained.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Total With Burns		Most Severe Degree of Burn								Degree of Burn Unknown No.
					1st		2nd		3rd		Total (Degree known)		
			No.	%	No.	%	No.	%	No.	%	No.	%	
1	0-1000	749	188	25.1	16	11.5	100	71.9	23	16.5	139	100.0	49
2	1100-1500	1125	390	34.7	26	7.8	180	53.9	128	38.3	334	100.0	56
3	1600-2000	1824	862	47.3	33	4.4	390	52.5	320	43.1	743	100.0	119
4	2100-2500	1450	619	42.7	22	4.0	249	44.9	284	51.2	555	100.0	64
5	2600-3000	700	186	26.6	15	9.4	86	53.8	59	36.9	160	100.0	26
6	3100-4000	576	69	12.0	12	18.8	45	70.3	7	10.9	64	100.0	5
7	4100-5000	239	1	0.4	0	0	0	0	0	0	0	0	1
Total	0-5000	6663	2315	34.7	124	6.2	1050	52.6	821	41.2	1995	100.0	320
9	Over 5000	219	1	0.5	0	0	1	100.0	0	0	1	100.0	0
Grand Total	--	6882	2316	33.7	124	6.2	1051	52.7	821	41.1	1996	100.0	320

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Table 9N. Most severe degree of burn by distance. In this table, an individual with 1st, 2nd, and 3rd degree burns is entered under 3rd degree; this being the most severe degree of burn sustained.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Total With Burns		Most Severe Degree of Burn								Degree Of Burn Unknown
					1st		2nd		3rd		Total (Degree Unknown)		
					No.	%	No.	%	No.	%	No.	%	
1	0-1000	789	179	22.7	12	8.7	104	75.4	22	15.9	138	100.0	41
2	1100-1500	1882	452	24.0	37	10.1	262	71.6	67	18.3	366	100.0	86
3	1600-2000	1034	359	34.7	37	11.5	223	69.0	63	19.5	323	100.0	36
4	2100-2500	672	155	23.1	18	12.9	95	68.3	26	18.7	139	100.0	16
5	2600-3000	644	131	20.3	13	11.4	86	75.4	15	13.2	114	100.0	17
6	3100-4000	1141	86	7.5	13	17.8	56	76.7	4	5.5	73	100.0	13
7	4100-5000	265	20	7.5	6	37.5	8	50.0	2	12.5	16	100.0	4
Total	0-5000	6427	1382	21.5	136	11.6	834	71.3	199	17.0	1169	100.0	213
9	Over 5000	194	3	1.5	1	50.0	1	50.0	0	0	2	100.0	1
Grand Total	--	6621	1385	20.9	137	11.7	835	71.3	199	17.0	1171	100.0	214

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Table 10H. Most Severe Degree of Burn by Percent of Body Area Burnt and by Distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Most Severe Degree of Burn	Total (With known Degree and Area of Burn)		Percent of Body Area Burnt											
					Under 2%		2% - 9%		10% - 19%		20% - 29%		30% - 39%		40% & over	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0 - 1000	1st	5	7.2	3	4.3	2	2.9	0	0	0	0	0	0	0	0
		2nd	46	66.7	18	26.1	20	29.0	7	10.1	1	1.4	0	0	0	0
		3rd	18	26.1	6	8.7	6	8.7	5	7.2	1	1.4	0	0	0	0
		Total	69	100.0	27	39.1	28	40.6	12	17.4	2	2.9	0	0	0	0
2	1100-1500	1st	17	6.5	9	3.4	7	2.7	1	0.4	0	0	0	0	0	0
		2nd	142	54.0	20	7.6	72	27.4	38	14.4	7	2.7	4	1.5	1	0.4
		3rd	104	39.5	8	3.0	49	18.6	30	11.4	13	4.9	2	0.8	2	0.8
		Total	263	100.0	37	14.1	128	48.7	69	26.2	20	7.6	6	2.3	3	1.1
3	1600-2000	1st	22	3.5	13	2.1	7	1.1	1	0.2	0	0	1	0.2	0	0
		2nd	308	49.5	50	8.0	151	24.3	76	12.2	24	3.9	6	1.0	1	0.2
		3rd	292	46.9	16	2.6	135	21.7	99	15.9	31	5.0	10	1.6	1	0.2
		Total	622	100.0	79	12.7	293	47.1	176	28.3	55	8.8	17	2.7	2	0.3

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HIROSHIMA

Table 10H. Most Severe Degree of Burn by Percent of Body Area Burnt and by Distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Most Severe Degree of Burn	Total (With known Degree and Area of Burn)		Percent of Body Area Burnt											
					Under 2%		2% - 9%		10% - 19%		20% - 29%		30% - 39%		40% & over	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
4	2100-2500	1st	10	2.0	7	1.4	2	0.4	0	0	1	0.2	0	0	0	0
		2nd	218	44.2	23	4.7	122	24.7	61	12.4	10	2.0	2	0.4	0	0
		3rd	265	53.8	13	2.6	157	31.8	77	15.6	15	3.0	3	0.6	0	0
		Total	493	100.0	43	8.7	281	57.0	138	28.0	26	5.3	5	1.0	0	0
5	2600-3000	1st	7	5.2	7	5.2	0	0	0	0	0	0	0	0	0	0
		2nd	73	54.5	16	11.9	32	23.9	19	14.2	5	3.7	1	0.7	0	0
		3rd	54	40.3	6	4.5	27	20.1	17	12.7	4	3.0	0	0	0	0
		Total	134	100.0	29	21.6	59	44.0	36	26.9	9	6.7	1	0.7	0	0
6	3100-4000	1st	11	20.4	8	14.8	3	5.6	0	0	0	0	0	0	0	0
		2nd	37	68.5	16	29.6	15	27.8	4	7.4	2	3.7	0	0	0	0
		3rd	6	11.1	2	3.7	1	1.9	2	3.7	1	1.9	0	0	0	0
		Total	54	100.0	26	48.1	19	35.2	6	11.1	3	5.6	0	0	0	0

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Table 10N. Most Severe Degree of Burn by Percent of Body Area Burnt and by Distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Most Severe Degree of Burn	Total (With known Degree and Area of Burn)		Percent of Body Area Burnt											
					Under 2 %		2% - 9%		10% - 19%		20% - 29%		30% - 39%		40% & over	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	1st	8	7.1	6	5.4	2	1.8	0	0	0	0	0	0	0	0
		2nd	88	78.6	28	25.0	29	25.9	16	14.3	9	8.0	4	3.6	2	1.8
		3rd	16	14.3	5	4.5	7	6.3	3	2.7	0	0	1	0.9	0	0
		Total	112	100.0	39	34.8	38	33.9	19	17.0	9	8.0	5	4.5	2	1.8
2	1100-1500	1st	32	9.8	23	7.0	7	2.1	1	0.3	1	0.3	0	0	0	0
		2nd	236	72.0	78	23.8	91	27.7	45	13.7	13	4.0	9	2.7	0	0
		3rd	60	18.3	9	2.7	28	8.5	12	3.7	9	2.7	2	0.6	0	0
		Total	328	100.0	110	33.5	126	38.4	58	17.7	23	7.0	11	3.4	0	0
3	1600-2000	1st	35	11.9	19	6.5	10	3.4	4	1.4	1	0.3	1	0.3	0	0
		2nd	201	68.4	45	15.3	69	23.5	49	16.7	22	7.5	12	4.1	4	1.4
		3rd	58	19.7	6	2.0	26	8.8	15	5.1	6	2.0	2	0.7	3	1.0
		Total	294	100.0	70	23.8	105	35.7	68	23.1	29	9.9	15	5.1	7	2.4

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Table 10H. Most Severe Degree of Burn by Percent of Body Area Burnt and by Distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Most Severe Degree of Burn	Total (With known Degree & Area of Burn)		Percent of Body Area Burnt											
					2%		2% - 9%		10% - 19%		20% - 29%		30% - 39%		40% & over	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
4	2100-2500	1st	17	12.8	7	5.3	6	4.5	2	1.5	0	0	0	0	2	1.5
		2nd	91	68.4	17	12.8	32	24.1	26	19.5	4	3.0	10	7.5	2	1.5
		3rd	25	18.8	0	0	16	12.0	6	4.5	3	2.3	0	0	0	0
		Total	133	100.0	24	18.0	54	40.6	34	25.6	7	5.3	10	7.5	4	3.0
5	2600-3000	1st	12	11.4	9	8.6	2	1.9	0	0	0	0	0	0	1	1.0
		2nd	79	75.2	15	14.3	35	33.3	14	13.3	11	10.5	2	1.9	2	1.9
		3rd	14	13.3	0	0	5	4.8	5	4.8	2	1.9	1	1.0	1	1.0
		Total	105	100.0	24	22.9	42	40.0	19	18.1	13	12.4	3	2.9	4	3.8
6	3100-4000	1st	13	18.8	10	14.5	2	2.9	1	1.4	0	0	0	0	0	0
		2nd	52	75.4	13	18.8	19	27.5	11	15.9	6	8.7	3	4.3	0	0
		3rd	4	5.8	1	1.4	2	2.9	1	1.4	0	0	0	0	0	0
		Total	69	100.0	24	34.8	23	33.3	13	18.8	6	8.7	3	4.3	0	0

Table 11. Number and percent of persons with moderate and severe burns by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	HIROSHIMA							NAGASAKI						
		Total Number Of People	Moderate Burns		Severe Burns		Total Burns		Total Number Of People	Moderate Burns		Severe Burns		Total Burns	
			No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	0-1000	749	164	21.9	24	3.2	188	25.1	789	129	16.4	50	6.3	179	22.7
2	1100-1500	1125	225	20.0	165	14.7	390	34.7	1882	335	17.8	117	6.2	452	24.0
3	1600-2000	1824	432	23.7	430	23.6	862	47.3	1034	211	20.4	148	14.3	359	34.7
4	2100-2500	1450	270	18.6	349	24.1	619	42.7	672	85	12.7	70	10.4	155	23.1
5	2600-3000	700	108	15.4	78	11.2	186	26.6	644	88	13.6	43	6.7	131	20.3
6	3100-4000	576	59	10.3	10	1.7	69	12.0	1141	61	5.3	25	2.2	86	7.5
7	4100-5000	239	1	0.4	0	0.0	1	0.4	265	15	5.7	5	1.8	20	7.5
Total	0-5000	6663	1259	18.9	1056	15.8	2315	34.7	6427	924	14.4	458	7.1	1382	21.5
9	Over 5000	219	1	0.5	0	0.0	1	0.5	194	3	1.5	0	0.0	3	1.5
Grand Total	--	6882	1260	18.4	1056	15.3	2316	33.7	6621	927	14.0	458	6.9	1385	20.9

Table 12. Parts of body burnt. This table includes only individuals with known location of burns.

Individuals who were living twenty days after the bombing.

Parts of Body Burnt	Hiroshima		Nagasaki	
	No.	%	No.	%
(including face Head & neck only)	193	8.5	138	10.5
Trunk only	26	1.1	43	3.3
Limbs only	340	14.9	322	24.5
Head and Limbs	875	38.4	379	28.8
Head and Trunk	44	1.9	35	2.7
Limbs and Trunk	154	6.8	100	7.6
Head, Limbs & Trunk	644	28.3	298	22.7
Total	2276	100.0	1315	100.0
Total with Head Burns	1756	77.2	850	64.6
Total with Limb Burns	2013	88.4	1099	83.6
Total with Trunk Burns	868	38.1	476	36.2

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Table 13. Burns in relation to clothing. Only cases known relationship of burns to clothing are included in this table.

Individuals who were living twenty days after the bombing.

CITY	Location Of Burns	Color of Clothing Worn									
		White Only		Colored Only		White & Colored		Color Unknown		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
HIROSHIMA	Uncovered Area Only	80	47.4	225	28.7	204	31.8	221	42.9	730	34.6
	Uncovered Area and Clothed Area	81	47.9	509	64.8	413	64.3	265	51.5	1268	60.1
	Clothed Area Only	8	4.7	51	6.5	25	3.9	29	5.6	113	5.4
	Total	169	100.0	785	100.0	642	100.0	515	100.0	2111	100.0
	Total, Uncovered Area	161	95.3	734	93.5	617	96.1	486	94.4	1998	94.7
	Total, Clothed Area	89	52.6	560	71.3	438	68.2	294	57.1	1381	65.5

NAGASAKI	Uncovered Area Only	43	50.0	214	43.2	138	43.5	201	52.3	596	46.5
	Uncovered Area and Clothed Area	28	32.6	238	48.1	145	45.7	159	41.4	570	44.5
	Clothed Area Only	15	17.4	43	8.7	34	10.7	24	6.3	116	9.0
	Total	86	100.0	495	100.0	317	100.0	384	100.0	1282	100.0
	Total, Uncovered Area	71	82.6	452	91.3	283	89.2	360	93.7	1166	91.0
	Total, Covered Area	43	50.0	281	56.8	179	56.4	183	47.7	686	53.5

HIROSHIMA

Table 14H. Symptoms by ring.

Individuals who were living twenty days after the bombing. (continued on next page)

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oro- pharyngeal Lesions *		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	749	520	69.4	366	48.9	458	61.1	77	10.3	375	50.1	80	10.7	285	38.1
2	1100-1500	1125	341	30.3	241	21.4	381	33.9	43	3.8	476	42.3	75	6.7	197	17.5
3	1600-2000	1824	151	8.3	78	4.3	286	15.7	12	0.7	666	36.5	99	5.4	112	6.1
4	2100-2500	1450	69	4.8	27	1.9	230	15.9	16	1.1	519	35.8	95	6.6	94	6.5
5	2600-3000	700	16	2.3	13	1.9	105	15.0	1	0.1	260	37.1	34	4.9	41	5.9
6	3100-4000	576	7	1.2	7	1.2	39	6.8	0	0	134	23.3	13	2.3	22	3.8
7	4100-5000	239	0	0	4	1.7	21	8.8	0	0	59	24.7	2	0.8	5	2.1
Total	0-5000	6663	1104	16.6	736	11.0	1520	22.8	149	2.2	2489	37.4	398	6.0	756	11.3
9	Over 5000	219	0	0	1	0.5	16	7.3	1	0.5	67	30.6	2	0.9	8	3.7
Grand Total	--	6882	1104	16.0	737	10.7	1536	22.3	150	2.2	2556	37.1	400	5.8	764	11.1

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

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Table 14H. (continued) HIROSHIMA

Ring	Distance (Meters)	Total Number of People	Vomiting		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	749	264	35.2	269	35.9	355	47.4	358	47.8	29	3.9	260	34.7
2	1100-1500	1125	290	25.8	321	28.5	568	50.5	462	41.1	55	4.9	164	14.6
3	1600-2000	1824	178	9.8	214	11.7	720	39.5	551	30.2	69	3.8	148	8.1
4	2100-2500	1450	106	7.3	148	10.2	689	47.5	430	29.7	86	5.9	147	10.1
5	2600-3000	700	40	5.7	53	7.6	273	39.0	145	20.7	25	3.6	29	4.1
6	3100-4000	576	34	5.9	27	4.7	120	20.8	86	14.9	31	5.4	16	2.8
7	4100-5000	239	5	2.1	13	5.4	60	25.1	26	10.9	6	2.5	9	3.8
Total	0-5000	6663	917	13.8	1045	15.7	2785	41.8	2058	30.9	301	4.5	773	11.6
9	Over 5000	219	2	0.9	6	2.7	53	24.2	15	6.8	7	3.2	10	4.6
Grand Total	--	6882	919	13.4	1051	15.3	2838	41.2	2073	30.1	308	4.5	783	11.4

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Table 14N. Symptoms by Ring.

Individuals who were living twenty days after the bombing. (continued on next page)

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oro- pharyngeal Lesions *		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	249	31.6	168	21.3	275	34.9	20	2.5	337	42.7	54	6.8	110	13.9
2	1100-1500	1882	460	24.4	324	17.2	607	32.3	33	1.8	736	39.1	86	4.6	233	12.4
3	1600-2000	1034	128	12.4	92	8.9	200	19.3	16	1.5	358	34.6	56	5.4	78	7.5
4	2100-2500	672	41	6.1	24	3.6	101	15.0	4	0.6	224	33.3	23	3.4	36	5.4
5	2600-3000	644	16	2.5	7	1.1	84	13.0	6	0.9	195	30.3	28	4.3	18	2.8
6	3100-4000	1141	16	1.4	17	1.5	121	10.6	1	0.1	268	23.5	21	1.8	28	2.5
7	4100-5000	265	1	0.4	1	0.4	19	7.2	0	0	23	8.7	3	1.1	5	1.9
Total	0-5000	6427	911	14.2	633	9.8	1407	21.9	80	1.2	2141	33.3	271	4.2	508	7.9
9	Over 5000	194	0	0	0	0	5	2.6	0	0	23	11.9	1	0.5	2	1.0
Grand Total	--	6621	911	13.8	633	9.6	1412	21.3	80	1.2	2164	32.7	272	4.1	510	7.7

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

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Table 14N. (continued) NAGASAKI

Ring	Distance (Meters)	Total Number of People	Vomiting		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	213	27.0	223	28.3	371	47.0	292	37.0	31	3.9	82	10.4
2	1100-1500	1882	508	27.0	537	28.5	791	42.0	731	38.8	47	2.5	172	9.1
3	1600-2000	1034	163	15.8	164	15.9	378	36.6	282	27.3	20	1.9	51	4.9
4	2100-2500	672	62	9.2	73	10.9	180	26.8	147	21.9	9	1.3	33	4.9
5	2600-3000	644	44	6.8	54	8.4	137	21.3	108	16.8	8	1.2	27	4.2
6	3100-4000	1141	55	4.8	58	5.1	204	17.9	154	13.5	19	1.7	26	2.3
7	4100-5000	265	6	2.3	10	3.8	23	8.7	19	7.2	2	0.8	6	2.3
Total	0-5000	6427	1051	16.4	1119	17.4	2084	32.4	1733	27.0	136	2.1	397	6.2
9	Over 5000	194	3	1.5	2	1.0	13	6.7	9	4.6	1	0.5	1	0.5
Grand Total	--	6621	1054	15.9	1121	16.9	2097	31.7	1742	26.3	137	2.1	398	6.0

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Table 15H. Effects on menstruation

A.					B.									
1 Ring	2 Distance (Meters)	3 • Total Number of Women	4 Abnormal Before and After Bombing		5 No Effect on Menstruation	6 Abnormal Menstruation After Bombing				9 Total				
			No.	%		7 Normal Before Bombing		8 Unknown Before Bombing		Total		Total		
					No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	137	7	5.1	77	59.2	32	24.6	21	16.2	53	40.8	130	100.0
2	1100-1500	327	49	15.0	159	57.2	87	31.3	32	11.5	119	42.8	278	100.0
3	1600-2000	438	83	18.9	199	56.1	102	28.7	54	15.2	156	43.9	355	100.0
4	2100-2500	424	82	19.3	252	73.7	57	16.7	33	9.6	90	26.3	342	100.0
5	2600-3000	166	32	19.3	94	70.1	29	21.6	11	8.2	40	29.9	134	100.0
6	3100-4000	53	12	22.6	30	73.2	8	19.5	3	7.3	11	26.8	41	100.0
7	4100-5000	78	11	14.1	53	79.1	12	17.9	2	3.0	14	20.9	67	100.0
Total	0-5000	1623	276	17.0	864	64.1	327	24.3	156	11.6	483	35.9	1347	100.0
9	Over 5000	15	1	6.7	14	100.0	0	0	0	0	0	0	14	100.0
Grand Total	--	1638	277	16.9	878	64.5	327	24.0	156	11.5	483	35.5	1361	100.0

*Ages 15 through 49, postmenarche and premenopause (patients statement).

Cases with incomplete information and cases of pregnancy omitted from this table.

NAGASAKI

Table 15N. Effects on Menstruation

A.

1 Ring	2 Distance (Meters)	3 *Total Number of Women	4 Abnormal Before and After Bombing	
			No.	%
1	0-1000	160	7	4.4
2	1100-1500	519	42	8.1
3	1600-2000	219	14	6.4
4	2100-2500	142	9	6.3
5	2600-3000	122	11	9.0
6	3100-4000	318	28	8.8
7	4100-5000	58	8	13.8
Total	0-5000	1538	119	7.7
9	Over 5000	43	5	11.6
Grand Total	--	1581	124	7.8

B.

5 No Effect on Menstruation		6 Abnormal Menstruation After Bombing						9 Total	
		7 Normal Before Bombing		8 Unknown Before Bombing		Total			
No.	%	No.	%	No.	%	No.	%	No.	%
97	63.4	30	19.6	26	17.0	56	36.6	153	100.0
314	65.8	90	18.9	73	15.3	163	34.2	477	100.0
139	67.8	27	13.2	39	19.0	66	32.2	205	100.0
94	70.7	23	17.3	16	12.0	39	29.3	133	100.0
84	75.7	15	13.5	12	10.8	27	24.3	111	100.0
242	83.4	33	11.4	15	5.2	48	16.6	290	100.0
41	82.0	8	16.0	1	2.0	9	18.0	50	100.0
1011	71.2	226	15.9	182	12.8	408	28.8	1419	100.0
33	86.8	5	13.2	0	0	5	13.2	38	100.0
1044	71.7	231	15.9	182	12.5	413	28.3	1457	100.0

*Ages 15 through 49, postmenarche and premenopause (patients statement).

Cases with incomplete information and cases of pregnancy omitted from this table.

HIROSHIMA

Table 16H. Effects on Pregnancy

Ring	Distance (Meters)	Total Number Preg- nant Women	No Effect Apparent		Abortion		Premature Delivery (Baby born alive)	
			No.	%	No.	%	No.	%
1	0-1000	3	2	66.7	1	33.3	0	0
2	1100-1500	8	4	50.0	3	37.5	1	12.5
3	1600-2000	12	10	83.3	1	8.3	1	8.3
4	2100-2500	12	12	100.0	0	0	0	0
5	2600-3000	8	8	100.0	0	0	0	0
6	3100-4000	2	1	50.0	1	50.0	0	0
7	4100-5000	0	-	-	-	-	-	-
Total	0-5000	45	37	82.2	6	13.3	2	4.4
9	Over 5000	0	0	0	0	0	0	0
Grand Total	--	45	37	82.2	6	13.3	2	4.4

NAGASAKI

Table 16N. Effect on Pregnancy

Ring	Distance (Meters)	Total Number Preg- nant Women	No Affect Apparent		Abortion		Premature Delivery (Baby born alive)	
			No.	%	No.	%	No.	%
1	0-1000	9	3	33.3	4	44.4	2	22.2
2	1100-1500	12	3	25.0	7	58.3	2	16.7
3	1600-2000	12	5	41.7	4	33.3	3	25.0
4	2100-2500	10	6	60.0	4	40.0	0	0
5	2600-3000	22	11	50.0	9	40.9	2	9.1
6	3100-4000	27	22	81.5	5	18.5	0	0
7	4100-5000	67	61	91.0	5	7.5	1	1.5
Total	0-5000	159	111	69.8	38	23.9	10	6.3
9	Over 5000	18	14	77.8	1	5.6	3	16.7
Grand Total	--	177	125	70.6	39	22.0	13	7.3

HIROSHIMA

Table 17H. Days from bombing to onset of epilation, purpura, oropharyngeal lesions, diarrhea, and vomiting.

Individuals who were living twenty days after the bombing.

*Days From Bombing To Onset	Epilation		Purpura		Oropharyngeal Lesions		Diarrhea		Vomiting	
	No.	%	No.	%	No.	%	No.	%	No.	%
Day of Bomb	17	1.9	5	0.9	169	12.3	473	20.6	593	70.9
1-4	31	3.4	9	1.5	119	8.7	452	19.7	96	11.5
5-9	110	12.0	17	2.9	91	6.6	258	11.3	27	3.2
10-14	235	25.7	49	8.4	94	6.9	181	7.9	16	1.9
15-19	165	18.1	65	11.1	88	6.4	101	4.4	4	0.5
20-24	113	12.4	146	24.9	191	13.9	136	5.9	10	1.2
25-29	105	11.5	147	25.1	259	18.9	188	8.2	24	2.9
30-34	40	4.4	74	12.6	141	10.3	109	4.8	16	1.9
35-39	10	1.1	35	6.0	45	3.3	72	3.1	6	0.7
40-44	30	3.3	14	2.4	40	2.9	76	3.3	7	0.8
45-49	7	0.8	3	0.5	16	1.2	30	1.3	4	0.5
50-54	6	0.7	2	0.3	10	0.7	33	1.4	2	0.2
55-59	23	2.5	9	1.5	30	2.2	59	2.6	6	0.7
60 or over	21	2.3	11	1.9	77	5.6	125	5.5	25	3.0
Total	913	100.0	586	100.0	1370	100.0	2293	100.0	836	100.0
Mean Days To Onset	20.2		25.2		22.2		16.8		5.7	
Days of Onset Unknown	191		150		150		196		81	
Total With Symptom	1104		736		1520		2489		917	
Cases Without Symptom	5559		5927		5143		4174		5746	
Grand Total	6663		6663		6663		6663		6663	

*Day of onset shown only for individuals within a distance of 5,000 meters (ring 1 - 7). 219 individuals beyond 5,000 meters (ring 9) are omitted from this table.

NAGASAKI

Table 17N. Days from bombing to onset of epilation, purpura, oropharyngeal lesions, diarrhea, and vomiting.

Individuals who were living twenty days after the bombing

*Days From Bombing To Onset	Epilation		Purpura		Oropharyngeal Lesions		Diarrhea		Vomiting	
	No.	%	No.	%	No.	%	No.	%	No.	%
Day of Bombing	21	3.1	16	3.7	100	8.3	299	15.2	670	68.5
1-4	33	4.8	16	3.7	103	8.5	411	20.9	112	11.5
5-9	75	10.9	22	5.1	96	7.9	256	13.0	36	3.7
10-14	110	16.0	24	5.6	96	7.9	210	10.7	23	2.4
15-19	110	16.0	39	9.1	71	5.9	82	4.2	17	1.7
20-24	146	21.3	90	21.0	209	17.3	176	8.9	29	3.0
25-29	41	6.0	94	21.9	185	15.3	100	5.1	18	1.8
30-34	58	8.4	71	16.6	142	11.7	134	6.8	26	2.7
35-39	31	4.5	36	8.4	80	6.6	79	4.0	15	1.5
40-44	9	1.3	1	0.2	26	2.1	48	2.4	2	0.2
45-49	9	1.3	2	0.5	14	1.2	32	1.6	4	0.4
50-54	17	2.5	6	1.4	29	2.4	49	2.5	6	0.6
55-59	3	0.4	2	0.5	9	0.7	22	1.1	5	0.5
60 or over	24	3.5	10	2.3	50	4.1	70	3.6	15	1.5
Total	687	100.0	429	100.0	1210	100.0	1968	100.0	978	100.0
Mean Days To Onset	21.2		24.6		22.5		16.4		5.5	
Days of Onset Unknown	224		204		197		173		73	
Total With Symptom	911		633		1407		2141		1051	
Cases Without Symptom	5516		5794		5020		4286		5376	
Grand Total	6427		6427		6427		6427		6427	

*The day of onset is shown only for individuals within a distance of 5000 meters. (ring 1-7) 194 individuals beyond 5000 meters (ring 9) ARE omitted from this table.

Table 18. Mean days from bombing to onset of epilation and purpura. Only cases with day of onset known are included in this table.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	HIROSHIMA				NAGASAKI			
		Epilation		Purpura		Epilation		Purpura	
		No. of Cases	Mean Days to Onset	No. of Cases	Mean Days to Onset	No. of Cases	Mean Days to Onset	No. of Cases	Mean Days to Onset
1	0-1000	446	17.2	301	23.2	192	19.4	113	24.0
2	1100-1500	292	20.8	186	27.1	352	21.8	224	25.1
3	1600-2000	103	28.1	59	26.1	92	21.3	62	22.8
4	2100-2500	53	25.7	24	27.9	30	22.6	12	27.6
5	2600-3000	12	22.3	0	43.1	11	26.5	7	31.8
6	3100-4000	7	21.0	3	7.7	9	24.2	11	22.1
7	4100-5000	0	-	4	27.8	1	39.0	0	-
Total	0-5000	913	20.2	586	25.2	687	21.2	429	24.6

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Table 19. Vomiting, oropharyngeal lesions, and diarrhea by day of onset and by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Vomiting				Oropharyngeal Lesions				Diarrhea			
			Onset Day of Bomb		Onset After Day of Bomb		Onset Within 39 Days		Onset After 39 Days		Onset Day of Bomb		Onset After Day of Bomb	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	749	200	26.7	32	4.3	394	52.6	21	2.8	67	8.9	269	35.9
2	1100-1500	1125	210	18.7	47	4.2	303	26.9	38	3.4	99	8.8	319	28.4
3	1600-2000	1824	106	5.8	65	3.6	214	11.7	44	2.4	138	7.6	474	26.0
4	2100-2500	1450	50	3.4	52	3.6	170	11.7	37	2.6	99	6.8	397	27.4
5	2600-3000	700	12	1.7	23	3.3	78	11.1	16	2.3	45	6.4	208	29.7
6	3100-4000	576	15	2.6	19	3.3	26	4.5	10	1.7	21	3.6	103	17.9
7	4100-5000	239	0	0	5	2.1	12	5.0	7	2.9	4	1.7	50	20.9
Total	0-5000	6663	593	8.9	243	3.6	1197	18.0	173	2.6	473	7.1	1820	27.3
9	Over 5000	219	0	0	2	0.9	7	3.2	3	1.4	5	2.3	51	23.3
Grand Total	--	6882	593	8.6	245	3.6	1204	17.5	176	2.6	478	6.9	1871	27.2

NAGASKI

Table 19N. Vomiting oropharyngeal lesions, and diarrhea by day of onset and by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Vomiting				Oropharyngeal Lesions				Diarrhea			
			Onset Day of Bomb		Onset After Day of Bomb		Onset With- in 39 Days		Onset After 39 Days		Onset Day of Bomb		Onset After Day of Bomb	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	149	18.9	46	5.8	205	26.0	19	2.4	61	7.7	233	29.5
2	1100-1500	1882	371	19.7	106	5.6	491	26.1	38	2.0	133	7.1	545	29.0
3	1600-2000	1034	100	9.7	51	4.9	154	14.9	18	1.7	39	3.8	296	28.6
4	2100-2500	672	25	3.7	33	4.9	79	11.8	9	1.3	23	3.4	182	27.1
5	2600-3000	644	14	2.2	26	4.0	66	10.2	10	1.6	19	3.0	166	25.8
6	3100-4000	1141	10	0.9	41	3.6	76	6.7	27	2.4	22	1.9	227	19.9
7	4100-5000	265	1	0.4	5	1.9	11	4.2	7	2.6	2	0.8	20	7.5
Total	0-5000	6427	670	10.4	308	4.8	1082	16.8	128	2.0	299	4.7	1669	26.0
9	Over 5000	194	0	0	3	1.5	4	2.1	0	0	2	1.0	14	7.2
Grand Total	--	6621	670	10.1	311	4.7	1086	16.4	128	1.9	301	4.5	1683	25.4

Table 20H. Mean duration of vomiting (beginning on day of bomb), oropharyngeal lesions (beginning within 39 days of bomb), diarrhea, and purpura by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Mean Duration (in days) *			
		Vomiting Onset Day Of Bomb	Oropharyn- geal Lesions Onset With- in 39 Days	Diarrhea	Purpura
1	0-1000	1.4	15.6	15.2	13.1
2	1100-1500	2.1	16.0	15.7	12.6
3	1600-2000	3.3	15.8	15.7	15.6
4	2100-2500	5.3	19.5	20.7	11.2
5	2600-3000	1.6	15.2	15.5	15.5
6	3100-4000	0.9	12.2	18.1	13.0
7	4100-5000	-	13.1	15.5	9.0
Total	0-5000	2.3	16.2	16.8	13.1
9	Over 5000	-	27.8	13.0	-
Grand Total	--	2.3	16.3	16.8	13.1

*Cases without the symptom or of unknown duration are omitted from this table.

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Table 20N. Mean duration of vomiting (beginning on day of the bomb), oropharyngeal lesions (beginning within 39 days of bomb), diarrhea, and purpura by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Mean Duration (in days) *			
		Vomiting Onset Day of Bomb	Oropharyn- geal Lesions Onset With- in 39 days	Diarrhea	Purpura
1	0-1000	3.4	10.2	9.3	13.6
2	1100-1500	2.4	10.9	10.4	12.3
3	1600-2000	2.2	12.3	10.7	11.8
4	2100-2500	4.2	12.6	9.5	12.4
5	2600-3000	2.8	9.1	10.9	11.4
6	3100-4000	3.6	8.6	10.3	33.1
7	4100-5000	-	6.8	6.3	-
Total	0-5000	2.7	10.7	10.2	13.1
9	Over 5000	0		13.9	-
Grand Total	--	2.7	10.7	10.2	13.1

*Cases without the symptom or of unknown duration are omitted from this table.

HIROSHIMA

Table 21H. Symptoms by ring and shielding

Individuals who were living twenty days after the bombing.

A. Outdoors or in Japanese type of building ***

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	570	434	76.1	310	54.4	356	62.5	67	11.8	301	52.8	66	11.6	240	42.1
2	1100-1500	960	315	32.8	209	21.8	305	31.8	37	3.9	405	42.2	66	6.9	179	18.6
3	1600-2000	1633	145	8.9	73	4.5	225	13.8	10	0.6	613	37.5	90	5.5	100	6.1
4	2100-2500	1415	68	4.8	26	1.8	190	13.4	16	1.1	508	35.9	93	6.6	94	6.6
5	2600-3000	674	16	2.4	12	1.8	82	12.2	1	0.1	251	37.2	32	4.7	39	5.8
6	3100-4000	548	7	1.3	7	1.3	26	4.7	0	0	124	22.6	13	2.4	22	4.0
7	4100-5000	202	0	0	3	1.5	12	5.9	0	0	50	24.8	1	0.5	4	2.0
Total	0-5000	6002	985	16.4	640	10.7	1196	19.9	131	2.2	2252	37.5	361	6.0	678	11.3
9	Over 5000	46	0	0	1	2.2	8	17.4	0	0	18	39.1	0	0	4	8.7
Grand Total	--	6048	985	16.3	641	10.6	1204	19.9	131	2.2	2270	37.5	361	6.0	682	11.3

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

***Includes people indoors, type of building unknown.

Table 21H.(continued) HIROSHIMA

A. Outdoors or in Japanese type of building.***

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	570	183	32.1	210	36.8	272	47.7	285	50.0	24	4.2	220	38.6
2	1100-1500	960	223	23.2	293	30.5	486	50.6	402	41.9	49	5.1	146	15.2
3	1600-2000	1633	108	6.6	207	12.7	659	40.4	514	31.5	66	4.0	135	8.3
4	2100-2500	1415	54	3.8	148	10.5	675	47.7	421	29.8	84	5.9	146	10.3
5	2600-3000	674	17	2.5	52	7.7	261	38.7	142	21.1	24	3.6	29	4.3
6	3100-4000	548	14	2.6	25	4.6	108	19.7	76	13.9	29	5.3	14	2.6
7	4100-5000	202	0	0	12	5.9	55	27.2	19	9.4	5	2.5	8	4.0
Total	0-5000	6002	599	10.0	947	15.8	2516	41.9	1859	31.0	281	4.7	698	11.6
9	Over 5000	46	0	0	2	4.3	14	30.4	4	8.7	0	0	2	4.3
Grand Total	--	6048	599	9.9	949	15.7	2530	41.8	1863	30.8	281	4.6	700	11.6

***Includes people indoors, type of building unknown.

Table 21H. (continued) HIROSHIMA

B. Indoors, Heavy Buildings (continued on next page)

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	113	60	53.1	38	33.6	55	48.7	5	4.4	46	40.7	8	7.1	30	26.5
2	1100-1500	118	15	12.7	21	17.8	26	22.0	3	2.5	58	49.2	8	6.8	13	11.0
3	1600-2000	94	2	2.1	3	3.2	12	12.8	1	1.1	35	37.2	5	5.3	8	8.5
4	2100-2500	12	1	8.3	1	8.3	1	8.3	0	0	7	58.3	2	16.7	0	0
5	2600-3000	14	0	0	1	7.1	3	21.4	0	0	2	14.3	1	7.1	2	14.3
6	3100-4000	13	0	0	0	0	2	15.4	0	0	5	38.5	0	0	0	0
7	4100-5000	27	0	0	1	3.7	1	3.7	0	0	7	25.9	1	3.7	1	3.7
Total	0-5000	391	78	19.9	65	16.6	100	25.6	9	2.3	160	40.9	25	6.4	54	13.8
9	Over 5000	2	0	0	0	0	0	0	0	0	1	50.0	0	0	0	0
Grand Total	--	393	78	19.8	65	16.5	100	25.4	9	2.3	161	41.0	25	6.4	54	13.7

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

Table 21H (continued) HIROSHIMA

B. Indoors, Heavy Buildings

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	113	44	38.9	47	41.6	64	56.6	54	47.8	4	3.5	20	17.7
2	1100-1500	118	17	14.4	23	19.5	64	54.2	48	40.7	6	5.1	13	11.0
3	1600-2000	94	5	5.3	7	7.4	39	41.5	31	33.0	3	3.2	7	7.4
4	2100-2500	12	0	0	0	0	8	66.7	5	41.7	2	16.7	0	0
5	2600-3000	14	0	0	0	0	7	50.0	3	21.4	1	7.1	0	0
6	3100-4000	13	1	7.7	2	15.4	6	46.2	5	38.5	2	15.4	2	15.4
7	4100-5000	27	0	0	1	3.7	4	14.8	6	22.2	1	3.7	1	3.7
Total	0-5000	391	67	17.1	80	20.5	192	49.1	152	38.9	19	4.9	43	11.0
9	Over 5000	2	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	393	67	17.0	80	20.4	192	48.9	152	38.7	19	4.8	43	10.9

Table 21H (continued) HIROSHIMA

C. Indoors - Bomb Shelter and Tunnel.

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	20	1	5.0	3	15.0	4	20.0	2	10.0	10	50.0	0	0	1	5.0
2	1100-1500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1600-2000	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2100-2500	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	2600-3000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	3100-4000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4100-5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0-5000	25	1	4.0	3	12.0	4	16.0	2	8.0	10	40.0	0	0	1	4.0
9	Over 5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	25	1	4.0	3	12.0	4	16.0	2	8.0	10	40.0	0	0	1	4.0

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

Table 21H. (continued) HIROSHIMA

C. Indoors - Bomb Shelter and Tunnel.

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	20	0	0	2	10.0	8	40.0	3	15.0	0	0	4	20.0
2	1100-1500	1	0	0	0	0	1	100.0	0	0	0	0	0	0
3	1600-2000	3	0	0	0	0	1	33.3	2	66.7	0	0	0	0
4	2100-2500	1	0	0	0	0	0	0	0	0	0	0	0	0
5	2600-3000	0	0	0	0	0	0	0	0	0	0	0	0	0
6	3100-4000	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4100-5000	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0-5000	25	0	0	2	8.0	10	40.0	5	20.0	0	0	4	16.0
9	Over 5000	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	25	0	0	2	8.0	10	40.0	5	20.0	0	0	4	16.0

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Table 21H (continued) HIROSHIMA

D. Shielding Unknown

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyngeal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	46	25	54.3	15	32.6	22	47.8	3	6.5	18	39.1	6	13.0	14	30.4
2	1100-1500	46	11	23.9	11	23.9	12	26.1	3	6.5	13	28.3	1	2.2	5	10.9
3	1600-2000	94	4	4.3	2	2.1	5	5.3	1	1.1	18	19.1	4	4.3	4	4.3
4	2100-2500	22	0	0	0	0	2	9.1	0	0	4	18.2	0	0	0	0
5	2600-3000	12	0	0	0	0	3	25.0	0	0	7	58.3	1	8.3	0	0
6	3100-4000	15	0	0	0	0	1	6.7	0	0	5	33.3	0	0	0	0
7	4100-5000	10	0	0	0	0	1	10.0	0	0	2	20.0	0	0	0	0
Total	0-5000	245	40	16.3	28	11.4	46	18.8	7	2.9	67	27.3	12	4.9	23	9.4
9	Over 5000	171	0	0	0	0	5	2.9	1	0.6	48	28.1	2	1.2	4	2.3
Grand Total	--	416	40	9.6	28	6.7	51	12.3	8	1.9	115	27.6	14	3.4	27	6.5

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

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Table 21H. (continued) HIROSHIMA

D. Shielding unknown.

Ring	Distance (Meters)	Total Number of People	Vomiting Onset day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	46	5	10.9	10	21.7	11	23.9	16	34.8	1	2.2	16	34.8
2	1100-1500	46	3	6.5	5	10.9	17	37.0	12	26.1	0	0	5	10.9
3	1600-2000	94	0	0	0	0	21	22.3	4	4.3	0	0	6	6.4
4	2100-2500	22	0	0	0	0	6	27.3	4	18.2	0	0	1	4.5
5	2600-3000	12	0	0	1	8.3	5	41.7	0	0	0	0	0	0
6	3100-4000	15	0	0	0	0	6	40.0	5	33.3	0	0	0	0
7	4100-5000	10	0	0	0	0	1	10.0	1	10.0	0	0	0	0
Total	0-5000	245	8	3.3	16	6.5	67	27.3	42	17.1	1	0.4	28	11.4
9	Over 5000	171	0	0	4	2.3	39	22.8	11	6.4	7	4.1	8	4.7
Grand Total	--	416	8	1.9	20	4.8	106	25.5	53	12.7	8	1.9	36	8.7

NAGASAKI

Table 21N. Symptoms by ring and shielding

Individuals who were living twenty days after the bombing.

A. Outdoors or in Japanese type building.***

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	376	168	44.7	105	27.9	145	38.6	15	4.0	184	48.9	30	8.0	60	16.0
2	1100-1500	1125	335	29.8	213	18.9	359	31.9	24	2.1	440	39.1	58	5.2	156	13.9
3	1600-2000	872	111	12.7	77	8.8	152	17.4	13	1.5	303	34.7	49	5.6	65	7.5
4	2100-2500	515	37	7.2	20	3.9	74	14.4	4	0.8	175	34.0	18	3.5	27	5.2
5	2600-3000	569	12	2.1	3	0.5	60	10.5	5	0.9	171	30.1	25	4.4	16	2.8
6	3100-4000	931	12	1.3	13	1.4	76	8.2	1	0.1	225	24.2	16	1.7	20	2.1
7	4100-5000	226	1	0.4	1	0.4	10	4.4	0	0	20	8.8	3	1.3	3	1.3
Total	0-5000	4614	676	14.7	432	9.4	876	19.0	62	1.3	1518	32.9	199	4.3	347	7.5
9	Over 5000	85	0	0	0	0	5	5.9	0	0	15	17.6	0	0	2	2.4
Grand Total	--	4699	676	14.4	432	9.2	881	18.7	62	1.3	1533	32.6	199	4.2	349	7.4

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

***Includes people indoors, type of building unknown.

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Table 21N (continued) NAGASAKI

A. Outdoors or in Japanese type of building.***

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	376	97	25.8	118	31.4	173	46.0	160	42.6	14	3.7	48	12.8
2	1100-1500	1125	257	22.8	338	30.0	474	42.1	444	39.5	32	2.8	110	9.8
3	1600-2000	872	97	11.1	142	16.3	313	35.9	243	27.9	14	1.6	44	5.0
4	2100-2500	515	25	4.9	60	11.7	135	26.2	112	21.7	7	1.4	24	4.7
5	2600-3000	569	16	2.8	50	8.8	122	21.4	100	17.6	8	1.4	24	4.2
6	3100-4000	931	12	1.3	46	4.9	166	17.8	123	13.2	16	1.7	24	2.6
7	4100-5000	226	0	0	7	3.1	19	8.4	16	7.1	2	0.9	5	2.2
Total	0-5000	4614	504	10.9	761	16.5	1402	30.4	1198	26.0	93	2.0	279	6.0
9	Over 5000	85	0	0	1	1.2	7	8.2	6	7.1	1	1.2	1	1.2
Grand Total	--	4699	504	10.7	762	16.2	1409	30.0	1204	25.6	94	2.0	280	6.0

***Includes people indoors, type of building unknown.

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Table 21N.(continued) NAGASAKI

B. Indoors Heavy Building.

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (Within 39 Days) *		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	303	63	20.8	44	14.5	84	27.7	3	1.0	121	39.9	17	5.6	36	11.9
2	1100-1500	605	114	18.8	100	16.5	193	31.9	8	1.3	247	40.8	19	3.1	67	11.1
3	1600-2000	88	12	13.6	10	11.4	22	25.0	2	2.3	34	38.6	3	3.4	9	10.2
4	2100-2500	35	1	2.9	2	5.7	3	8.6	0	0	13	37.1	2	5.7	3	8.6
5	2600-3000	30	3	10.0	2	6.7	7	23.3	0	0	11	36.7	2	6.7	2	6.7
6	3100-4000	152	3	2.0	2	1.3	15	9.9	0	0	33	21.7	5	3.3	6	3.9
7	4100-5000	17	0	0	0	0	0	0	0	0	2	11.8	0	0	1	5.9
Total	0-5000	1230	196	15.9	160	13.0	324	26.3	13	1.1	461	37.5	48	3.9	124	10.1
9	Over 5000	4	0	0	0	0	0	0	0	0	2	50.0	0	0	0	0
Grand Total	--	1234	196	15.9	160	13.0	324	26.3	13	1.1	463	37.5	48	3.9	124	10.0

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

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Table 21N. (continued) NAGASAKI

B. Indoors heavy building

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	303	63	20.8	97	32.0	165	54.5	109	36.0	16	5.3	26	8.6
2	1100-1500	605	137	22.6	180	29.8	280	46.3	257	42.5	12	2.0	60	9.9
3	1600-2000	88	11	12.5	18	20.5	45	51.1	28	31.8	1	1.1	6	6.8
4	2100-2500	35	3	8.6	6	17.1	7	20.0	6	17.1	0	0	2	5.7
5	2600-3000	30	1	3.3	1	3.3	9	30.0	4	13.3	0	0	1	3.3
6	3100-4000	152	2	1.3	9	5.9	32	21.1	28	18.4	3	2.0	1	0.7
7	4100-5000	17	1	5.9	2	11.8	3	17.6	1	5.9	0	0	1	5.9
Total	0-5000	1230	218	17.7	313	25.4	541	44.0	433	35.2	32	2.6	97	7.9
9	Over 5000	4	0	0	1	25.0	1	25.0	0	0	0	0	0	0
Grand Total	--	1234	218	17.7	314	25.4	542	43.9	433	35.1	32	2.6	97	7.9

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Table 21N.(continued) NAGASAKI

C. Indoors - Bomb Shelter and Tunnel

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyngeal Lesions (within 39 Days) *		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	73	7	9.6	12	16.4	16	21.9	2	2.7	16	21.9	2	2.7	5	6.8
2	1100-1500	72	2	2.8	2	2.8	5	6.9	0	0	22	30.6	3	4.2	1	1.4
3	1600-2000	47	1	2.1	1	2.1	5	10.6	1	2.1	10	21.3	1	2.1	3	6.4
4	2100-2500	110	2	1.8	1	0.9	14	12.7	0	0	33	30.0	2	1.8	5	4.5
5	2600-3000	25	0	0	0	0	1	4.0	0	0	5	20.0	1	4.0	0	0
6	3100-4000	29	0	0	1	3.4	3	10.3	0	0	5	17.2	0	0	2	6.9
7	4100-5000	9	0	0	0	0	1	11.1	0	0	0	0	0	0	0	0
Total	0-5000	365	12	3.3	17	4.7	45	12.3	3	0.8	91	24.9	9	2.5	16	4.4
9	Over 5000	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	367	12	3.3	17	4.6	45	12.3	3	0.8	91	24.8	9	2.5	16	4.4

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

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Table 21N. (continued) NAGASAKI

C. Indoors - Bomb Shelter and Tunnel

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	73	4	5.5	6	8.2	25	34.2	15	20.5	0	0	4	5.5
2	1100-1500	72	0	0	7	9.7	21	29.2	11	15.3	3	4.2	2	2.8
3	1600-2000	47	1	2.1	1	2.1	12	25.5	4	8.5	2	4.3	1	2.1
4	2100-2500	110	1	0.9	6	5.5	35	31.8	28	25.5	2	1.8	6	5.5
5	2600-3000	25	1	4.0	1	4.0	1	4.0	1	4.0	0	0	1	4.0
6	3100-4000	29	0	0	1	3.4	3	10.3	2	6.9	0	0	1	3.4
7	4100-5000	9	0	0	0	0	0	0	1	11.1	0	0	0	0
Total	0-5000	365	7	1.9	22	6.0	97	26.6	62	17.0	7	1.9	15	4.1
9	Over 5000	2	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	367	7	1.9	22	6.0	97	26.4	62	16.9	7	1.9	15	4.1

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Table 21W.(continued) NAGASAKI

D. Shielding Unknown.

Ring	Distance (Meters)	Total Number of People	Epilation		Purpura		Oropharyn- geal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	37	11	29.7	7	18.9	11	29.7	0	0	16	43.2	5	13.5	9	24.3
2	1100-1500	80	9	11.3	9	11.3	12	15.0	1	1.3	27	33.8	6	7.5	9	11.3
3	1600-2000	27	4	14.8	4	14.8	3	11.1	0	0	11	40.7	3	11.1	1	3.7
4	2100-2500	12	1	8.3	1	8.3	1	8.3	0	0	3	25.0	1	8.3	1	8.3
5	2600-3000	20	1	5.0	2	10.0	6	30.0	1	5.0	8	40.0	0	0	0	0
6	3100-4000	29	1	3.4	1	3.4	0	0	0	0	5	17.2	0	0	0	0
7	4100-5000	13	0	0	0	0	1	7.7	0	0	1	7.7	0	0	1	7.7
Total	0-5000	218	27	12.4	24	11.0	34	15.6	2	0.9	71	32.6	15	6.9	21	9.6
9	Over 5000	103	0	0	0	0	0	0	0	0	6	5.8	1	1.0	0	0
Grand Total	--	321	27	8.4	24	7.5	34	10.6	2	0.6	77	24.0	15	4.7	21	6.5

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

Table 21N.(continued) NAGASAKI

D. Shielding Unknown

Ring	Distance (Meters)	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	37	3	8.1	2	5.4	8	21.6	8	21.6	1	2.7	4	10.8
2	1100-1500	80	8	10.0	12	15.0	16	20.0	19	23.8	0	0	0	0
3	1600-2000	27	3	11.1	3	11.1	8	29.6	7	25.9	3	11.1	0	0
4	2100-2500	12	0	0	1	8.3	3	25.0	1	8.3	0	0	1	8.3
5	2600-3000	20	0	0	2	10.0	5	25.0	3	15.0	0	0	1	5.0
6	3100-4000	29	0	0	2	6.9	3	10.3	1	3.4	0	0	0	0
7	4100-5000	13	0	0	1	7.7	1	7.7	1	7.7	0	0	0	0
Total	0-5000	218	14	6.4	23	10.6	44	20.2	40	18.3	4	1.8	6	2.8
9	Over 5000	103	0	0	0	0	5	4.9	3	2.9	0	0	0	0
Grand Total	--	321	14	4.4	23	7.2	49	15.3	43	13.4	4	1.2	6	1.9

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HIROSHIMA

Table 22H. Incidence of mechanical injuries, burns, and epilation by direction, ring, and shielding.
(People in unknown direction or with unknown shielding excluded).

Individuals who were living twenty days after the bombing.

A. Outdoors unshielded.

Direction	Rings 1 and 2							Rings 3, 4, and 5.						
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	69	17	24.6	60	87.0	17	24.6	332	46	13.9	301	90.7	38	11.4
2	29	6	20.7	26	89.7	12	41.4	204	42	20.6	164	80.4	7	3.4
3	83	18	21.7	74	89.2	55	66.3	152	40	26.3	91	59.9	7	4.6
4	25	5	20.0	18	72.0	11	44.0	88	9	10.2	74	84.1	9	10.2
5	30	11	36.7	25	83.3	18	60.0	308	46	14.9	287	93.2	18	5.8
6	23	7	30.4	17	73.9	12	52.2	91	10	11.0	71	78.0	8	8.8
7	39	13	33.3	25	64.1	33	84.6	73	19	26.0	65	89.0	18	24.7
8	37	6	16.2	33	89.2	18	48.6	191	32	16.8	168	88.0	21	11.0
Total	335	83	24.8	278	83.0	176	52.5	1439	244	17.0	1221	84.9	126	8.8

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Table 22H. Incidence of mechanical injuries, burns, and epilation by direction and by ring.
(People in unknown direction or with unknown shielding excluded).

Individuals who were living twenty days after the bombing.

B. Outdoors shielded.

Direction	Rings 1 and 2							Rings 3, 4, and 5						
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	31	24	77.4	12	38.7	7	22.6	59	21	35.6	29	49.2	2	3.4
2	14	8	57.1	6	42.9	4	28.6	65	27	41.5	23	35.4	2	3.1
3	22	9	40.9	10	45.5	4	18.2	29	12	41.4	11	37.9	0	0
4	17	9	52.9	7	41.2	8	47.1	42	15	35.7	17	40.5	2	4.8
5	31	21	67.7	11	35.5	24	77.4	51	14	27.5	11	21.6	6	11.8
6	34	24	70.6	8	23.5	17	50.0	55	18	32.7	16	29.1	2	3.6
7	17	6	35.3	6	35.3	15	88.2	29	16	55.2	14	48.3	3	10.3
8	23	10	43.5	14	60.9	17	73.9	36	15	41.7	11	30.6	2	5.6
Total	189	111	58.7	74	39.2	96	50.8	366	138	37.7	132	36.1	19	5.2

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Table 22H. Incidence of mechanical injuries, burns, and epilation by direction and by ring.
(People in unknown direction or with unknown shielding excluded)

Individuals who were living twenty days after the bombing.

C. Indoors Japanese Building.

Direction	Rings 1 and 2							Rings 3, 4, and 5						
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	123	81	65.9	16	13.0	49	39.8	237	171	72.2	27	11.4	7	3.0
2	105	76	72.4	9	8.6	59	56.2	197	116	58.9	28	14.2	7	3.6
3	256	173	67.6	44	17.2	152	59.4	245	136	55.5	30	12.2	5	2.0
4	64	51	78.5	13	20.0	17	26.2	165	107	64.8	29	17.6	3	1.8
5	60	43	71.7	15	25.0	22	36.7	174	93	53.4	18	10.3	13	7.5
6	73	56	76.7	12	16.4	29	39.7	239	161	67.4	27	11.3	18	7.5
7	96	80	83.3	13	13.5	51	53.1	227	173	76.2	24	10.6	18	7.9
8	49	30	61.2	8	16.3	17	34.7	162	103	63.6	17	10.5	6	3.7
Total	826	590	71.4	130	15.7	396	47.9	1646	1060	64.4	200	12.2	77	4.7

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Table 22H. Incidence of mechanical injuries, burns, and epilation by direction and by ring.
(People in unknown direction or with unknown shielding excluded).

Individuals who were living twenty days after the bombing.

A. Outdoors unshielded

Direction	Rings 1 and 2							Rings 3, 4, and 5						
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	6	3	50.0	1	16.7	3	50.0	20	6	30.0	5	25.0	2	10.0
2	23	7	30.4	15	65.2	9	39.1	20	4	20.0	15	75.0	3	15.0
3	58	14	24.1	38	65.5	15	25.9	98	12	12.2	75	76.5	14	14.3
4	16	1	6.3	9	56.3	6	37.5	63	6	9.5	53	84.1	11	17.5
5	25	6	24.0	16	64.0	16	64.0	1	1	100.0	0	0	0	0
6	10	1	10.0	5	50.0	7	70.0	1	0	0	1	100.0	1	100.0
7	43	8	18.6	29	67.4	19	44.2	67	10	14.9	40	59.7	4	6.0
8	34	7	20.6	27	79.4	12	35.3	174	24	13.8	124	71.3	17	9.8
Total	215	47	21.9	140	65.1	87	40.5	444	63	14.2	313	70.5	52	11.7

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Table 22N. Incidence of mechanical injuries, burns, and epilation by direction and by ring.
(people in unknown direction or with unknown shielding excluded).

Individuals who were living twenty days after the bombing.

B. Outdoors shielded.

Direction	Rings 1 and 2						Rings 3, 4 and 5							
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	3	1	33.3	1	33.3	2	66.7	8	2	25.0	0	0	0	0
2	15	3	20.0	2	13.3	4	26.7	12	1	8.3	4	33.3	0	0
3	33	20	60.6	12	36.4	8	24.2	33	5	15.2	11	33.3	4	12.1
4	13	3	23.1	3	23.1	5	38.5	45	4	8.9	9	20.0	4	8.9
5	22	5	22.7	3	13.6	5	22.7	3	0	0	1	33.3	0	0
6	9	2	22.2	3	33.3	4	44.4	1	1	100.0	0	0	0	0
7	29	13	44.8	11	37.9	8	27.6	48	13	27.1	14	29.2	2	4.2
8	36	10	27.8	13	36.1	11	30.6	92	26	28.3	22	23.9	6	6.5
Total	160	57	35.6	48	30.0	47	29.4	242	52	21.5	61	25.2	16	6.6

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Table 22N. Incidence of mechanical injuries, burns, and epilation, by direction and by ring.
(People in unknown direction or with unknown shielding excluded).

Individuals who were living twenty days after the bombing.

C. Indoors Japanese building.

Direction	Rings 1 and 2							Rings 3, 4, and 5						
	Number of People	Mechanical Injuries		Burns		Epilation		Number of People	Mechanical Injuries		Burns		Epilation	
		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%
1	23	13	56.5	5	21.7	16	69.6	60	17	28.3	2	3.3	3	5.0
2	57	30	52.6	17	29.8	29	50.9	44	19	43.2	9	20.5	11	25.0
3	445	328	73.7	69	15.5	117	26.3	199	81	40.7	56	28.1	17	8.5
4	56	34	60.7	14	25.0	17	30.4	130	34	26.2	31	23.8	7	5.4
5	77	53	68.8	20	26.0	34	44.2	4	2	50.0	1	25.0	0	0
6	26	11	42.3	2	7.7	13	50.0	2	2	100.0	0	0	0	0
7	172	108	62.8	26	15.1	43	25.0	243	113	46.5	35	14.4	15	6.0
8	165	97	58.8	38	23.0	59	35.8	494	200	40.5	57	11.5	31	6.3
Total	1021	674	66.0	191	18.7	328	32.1	1176	468	39.8	191	16.2	84	7.1

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Table 23H. Symptoms by exposure groups.

Exposure Group	Total Number of People	Epilation		Purpura		Oropharyngeal Lesions (Within 39 Days) *		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	570	434	76.1	310	54.4	356	62.5	67	11.8	301	52.8	66	11.6	240	42.1
B	1119	400	35.7	262	23.4	382	34.1	45	4.0	469	41.9	80	7.1	223	19.9
C	1817	172	9.5	108	5.9	267	14.7	18	1.0	694	38.2	99	5.4	119	6.5
D	1604	74	4.6	31	1.9	207	12.9	18	1.1	561	35.0	102	6.4	106	6.6
E	711	17	2.4	13	1.8	86	12.1	1	0.1	262	36.8	34	4.8	39	5.5
F	575	7	1.2	8	1.4	32	5.6	0	0	133	23.1	15	2.6	24	4.2
G	267	0	0	4	1.5	17	6.4	0	0	69	25.8	2	0.7	5	1.9
Total	6663	1104	16.6	736	11.0	1347	20.2	149	2.2	2489	37.4	398	6.0	756	11.3
H	219	0	0	1	0.5	13	5.9	1	0.5	67	30.6	2	0.9	8	3.7
Grand Total	6882	1104	16.0	737	10.7	1360	19.8	150	2.2	2556	37.1	400	5.8	764	11.1

*See text page for definition of exposure groups. Group A consists of individuals in ring 1 outdoors or in Japanese type building. Group H consists of individuals at a distance of 5000 meters or more.

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

Table 23H. (continued) HIROSHIMA

Exposure Groups	Total Number of People	Vomiting Onset Day of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	570	183	32.1	210	36.8	272	47.7	285	50.0	24	4.2	220	38.6
B	1119	272	24.3	350	31.3	561	50.1	472	42.2	54	4.8	182	16.3
C	1817	128	7.0	237	13.0	748	41.2	577	31.8	72	4.0	157	8.6
D	1604	59	3.7	155	9.7	736	45.9	456	28.4	87	5.4	159	9.9
E	711	17	2.4	52	7.3	276	38.8	153	21.5	26	3.7	30	4.2
F	575	14	2.4	26	4.5	120	20.9	79	13.7	30	5.2	14	2.4
G	267	1	0.4	15	5.6	72	27.0	36	13.5	8	3.0	11	4.1
Total	6663	674	10.1	1045	15.7	2785	41.8	2058	30.9	301	4.5	773	11.6
H	219	0	0	6	2.7	53	24.2	15	6.8	7	3.2	10	4.6
Grand Total	6882	674	9.8	1051	15.3	2838	41.2	2073	30.1	308	4.5	783	11.4

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Table 23H. Symptoms by exposure groups

Exposure Group #	Total Number of People	Epilation		Purpura		Oropharyngeal Lesions (Within 39 Days)*		Necrotic Gingivitis		Diarrhea**		Bloody Diarrhea		Other Hemorrhage	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	376	168	44.7	105	27.9	145	38.6	15	4.0	184	48.9	30	8.0	60	16.0
B	1465	409	27.9	264	18.0	454	31.0	27	1.8	577	39.4	80	5.5	201	13.7
C	1630	241	14.8	198	12.1	373	22.9	24	1.5	593	36.4	76	4.7	146	9.0
D	702	55	7.8	36	5.1	104	14.8	6	0.9	242	34.5	27	3.8	38	5.4
E	663	15	2.3	7	1.1	69	10.4	6	0.9	197	29.7	29	4.4	23	3.5
F	1091	18	1.6	18	1.6	103	9.4	2	0.2	277	25.4	20	1.8	27	2.5
G	500	5	1.0	5	1.0	31	6.2	0	0	71	14.2	9	1.8	13	2.6
Total	6427	911	14.2	633	9.8	1279	19.9	80	1.2	2141	33.3	271	4.2	508	7.9
H	194	0	0	0	0	5	2.6	0	0	23	11.9	1	0.5	2	1.0
Grand Total	6621	911	13.8	633	9.6	1284	19.4	80	1.2	2164	32.7	272	4.1	510	7.7

*See text page for definition of exposure groups. Group A consists of individuals in ring 1 outdoors or in Japanese type building. Group H consists of individuals at a distance of 5,000 meters or more.

*Includes necrotic gingivitis.

**Includes bloody diarrhea.

Table 23N. (continued) NAGASAKI

	Total Number of People	Vomiting Onset Day Of Bomb		Nausea		Malaise		Anorexia		Cramps		Fever (39° or over)	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	376	97	25.8	118	31.4	173	46.0	160	42.6	14	3.7	48	12.8
B	1465	323	22.0	437	29.8	647	44.2	561	38.3	49	3.3	140	9.6
C	1630	246	15.1	340	20.9	634	38.9	534	32.8	26	1.6	108	6.6
D	702	39	5.6	88	12.5	209	29.8	158	22.5	14	2.0	32	4.6
E	663	20	3.0	58	8.7	144	21.7	111	16.7	10	1.5	28	4.2
F	1091	14	1.3	55	5.0	215	19.7	158	14.5	18	1.6	32	2.9
G	500	4	0.8	23	4.6	62	12.4	51	10.2	5	1.0	9	1.8
Total	6427	743	11.6	1119	17.4	2084	32.4	1733	27.0	136	2.1	397	6.2
H	194	0	0	2	1.0	13	6.7	9	4.6	1	0.5	1	0.5
Grand Total	6621	743	11.2	1121	16.9	2097	31.7	1742	26.3	137	2.1	398	6.0

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Table 24H. Symptoms by Sex and Exposure Groups
Individuals who were living twenty days after the bombing.

Symptom	Exposure Group A				Exposure Group B				Exposure Groups C & D				Exposure Groups E, F, G			
	Males		Females		Males		Females		Males		Females		Males		Females	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number Of People	414	100.0	156	100.0	560	100.0	559	100.0	1704	100.0	1717	100.0	738	100.0	815	100.0
Epilation	313	75.6	121	77.6	216	38.6	184	32.9	121	7.1	125	7.3	8	1.1	16	2.0
Purpura	224	54.1	86	55.1	129	23.0	133	23.8	67	3.9	73	4.3	14	1.9	11	1.3
Oropharyngeal Lesions*	264	63.8	92	59.0	209	37.3	173	30.9	231	13.6	243	14.2	73	9.9	62	7.6
Necrotic Gingivitis	49	11.8	18	11.5	24	4.3	21	3.8	16	0.9	20	1.2	0	0	1	0.1
Diarrhea	218	52.7	83	53.2	237	42.3	231	41.3	634	37.2	621	36.2	215	29.1	249	30.6
Bloody Diarrhea	54	13.0	12	7.7	47	8.4	33	5.9	128	7.5	73	4.3	17	2.3	34	4.2
Other Hemorrhage	187	45.2	53	34.0	118	21.1	105	18.8	121	7.1	104	6.1	32	4.3	36	4.4
Vomiting Day of Bomb	109	26.3	74	47.4	119	21.3	153	27.4	72	4.2	115	6.7	10	1.4	22	2.7
Nausea	129	31.2	81	51.9	155	27.7	195	34.9	175	10.3	217	12.6	40	5.4	53	6.5
Malaise	183	44.2	89	57.1	275	49.1	286	51.2	737	43.3	747	43.5	239	32.4	229	28.1
Anorexia	177	42.8	108	69.2	229	40.9	243	43.5	447	26.2	586	34.1	114	15.4	154	18.9
Cramps	15	3.6	9	5.8	26	4.6	28	5.0	56	3.3	97	5.6	24	3.3	40	4.9
Fever	167	40.3	53	34.0	102	18.2	80	14.3	156	9.2	160	9.3	34	4.6	21	2.6

*(Within 39 Days)

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Table 24H. Symptoms by Sex and Exposure Groups.

Individuals who were living twenty days after the bombing.

Symptom	Exposure Group A				Exposure Group B				Exposure Groups C & D				Exposure Groups E,F,G			
	Males		Females		Males		Females		Males		Females		Males		Females	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number of People	190	100.0	186	100.0	692	100.0	773	100.0	1031	100.0	1301	100.0	863	100.0	1391	100.0
Epilation	83	43.7	85	45.7	185	26.7	224	29.0	125	12.1	171	13.1	16	1.9	22	1.6
Purpura	45	23.7	60	32.3	119	17.2	145	18.8	93	9.0	141	10.8	12	1.4	18	1.3
Oropharyngeal Lesions*	73	38.4	72	38.7	190	27.5	264	34.2	193	18.7	284	21.8	65	7.5	138	9.9
Necrotic Gingivitis	9	4.7	6	3.2	12	1.7	15	1.9	12	1.2	18	1.4	2	0.2	6	0.4
Diarrhea	89	46.8	95	51.1	272	39.3	305	39.5	361	35.0	474	36.4	216	25.0	329	23.7
Bloody Diarrhea	14	7.4	16	8.6	37	5.3	43	5.6	49	4.8	54	4.2	24	2.8	34	2.4
Other Hemorrhage	27	14.2	33	17.7	97	14.0	104	13.5	87	8.4	97	7.5	28	3.2	35	2.5
Vomiting Day of Bomb	44	23.2	53	28.5	108	15.6	215	27.8	93	9.0	192	14.8	8	0.9	30	2.2
Nausea	49	25.8	69	37.1	163	23.6	274	35.4	160	15.5	268	20.6	53	6.1	83	6.0
Malaise	88	46.3	85	45.7	293	42.3	354	45.8	371	36.0	472	36.3	183	21.2	238	17.1
Anorexia	71	37.4	89	47.8	241	34.8	320	41.4	263	25.5	429	33.0	106	12.3	214	15.4
Cramps	3	1.6	11	5.9	19	2.7	30	3.9	12	1.2	28	2.2	7	0.8	26	1.9
Fever	25	13.2	23	12.4	67	9.7	73	9.4	54	5.2	86	6.6	32	3.7	37	2.7

*(Within 39 days)

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Table 25H. Symptoms by Age and Exposure Groups

Individuals who were living twenty days after the bombing

SYMPTOM	Exposure Group A											
	Age 0-4		Age 5-14		Age 15-49		Age 50 and over		Age Unknown		Total All Ages	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number of People	3	100.0	27	100.0	480	100.0	25	100.0	35	100.0	570	100.0
Epilation	2	66.7	25	92.6	368	76.7	13	52.0	26	74.3	434	76.1
Purpura	1	33.3	4	14.8	267	55.6	12	48.0	26	74.3	310	54.4
Oropharyngeal Lesions *	0	0	14	51.9	312	65.0	7	28.0	23	65.7	356	62.5
Necrotic Gingivitis	0	0	3	11.1	61	12.7	1	4.0	2	5.7	67	11.8
Diarrhea	1	33.3	12	44.4	257	53.5	8	32.0	23	65.7	301	52.8
Bloody Diarrhea	0	0	0	0	57	11.9	1	4.0	8	22.9	66	11.6
Other Hemorrhage	0	0	8	29.6	206	42.9	5	20.0	21	60.0	240	42.1
Vomiting Day of Bomb	1	33.3	11	40.7	159	33.1	7	28.0	5	14.3	183	32.1
Nausea	1	33.3	6	22.2	189	39.4	9	36.0	5	14.3	210	36.8
Malaise	1	33.3	14	51.9	238	49.6	8	32.0	11	31.4	272	47.7
Anorexia	1	33.3	18	66.7	254	52.9	6	24.0	6	17.1	285	50.0
Cramps	0	0	3	11.1	18	3.8	2	8.0	1	2.9	24	4.2
Fever	0	0	10	37.0	183	38.1	2	8.0	25	71.4	220	38.6

* Within 39 days

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Table 25H. Symptoms By Age and Exposure Groups

Individuals who were living 20 days after the bombing.

SYMPTOM	Exposure Group B											
	Age 0-4		Age 5-14		Age 15-49		Age 50 and over		Age Unknown		Total All Ages	
	No	%	No	%	No	%	No	%	No	%	No	%
Total Number of People	25	100.0	139	100.0	779	100.0	166	100.0	10	100.0	1119	100.0
Epilation	7	28.0	53	38.1	292	37.5	42	25.3	6	60.0	400	35.7
Purpura	0	0	19	13.7	201	25.8	35	21.1	7	70.0	262	23.4
Oropharyngeal Lesions*	3	12.0	41	29.5	290	37.2	43	25.9	5	50.0	382	34.1
Necrotic Gingivitis	0	0	4	2.9	35	4.5	5	3.0	1	10.0	45	4.0
Diarrhea	16	64.0	60	43.2	321	41.2	67	40.4	5	50.0	469	41.9
Bloody Diarrhea	2	8.0	8	5.8	55	7.1	14	8.4	1	10.0	80	7.1
Other Hemorrhage	0	0	23	16.5	177	22.7	20	12.0	3	30.0	223	19.9
Vomiting Day of Bomb	4	16.0	45	32.4	203	26.1	19	11.4	1	10.0	272	24.3
Nausea	5	20.0	47	33.8	268	34.4	27	16.3	3	30.0	350	31.3
Malaise	7	28.0	60	43.2	421	54.0	72	43.4	1	10.0	561	50.1
Anorexia	3	12.0	64	46.0	356	45.7	45	27.1	4	40.0	472	42.2
Cramps	1	4.0	10	7.2	37	4.7	6	3.6	0	0	54	4.8
Fever	3	12.0	22	15.8	135	17.3	16	9.6	6	60.0	182	16.3

* Within 39 days

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Table 25H. Symptoms By Age and Exposure Groups

Individuals who were living twenty days after the bombing

SYMPTOMS	Exposure Groups C & D											
	Age 0-4		Age 5-14		Age 15-49		Age 50 & over		Age Unknown		Total All Ages	
	No	%	No	%	No	%	No	%	No	%	No	%
Total People in Age Group	104	100.0	482	100.0	2331	100.0	495	100.0	9	100.0	3421	100.0
Epilation	5	4.8	24	5.0	186	8.0	30	6.1	1	11.1	246	7.2
Purpura	1	1.0	8	1.7	105	4.5	24	4.8	1	11.1	139	4.1
Oropharyngeal Lesions *	4	3.8	42	8.7	356	15.3	71	14.3	1	11.1	474	13.9
Necrotic Gingivitis	0	0	4	0.8	27	1.2	5	1.0	0	0	36	1.1
Diarrhea	49	47.1	143	29.7	876	37.6	182	36.8	5	55.6	1255	36.7
Bloody Diarrhea	9	8.7	16	3.3	143	6.1	30	6.1	3	33.3	201	5.9
Other Hemorrhage	0	0	30	6.2	167	7.2	27	5.5	1	11.1	225	6.6
Vomiting Day of Bomb	4	3.8	44	9.1	114	4.9	25	5.1	0	0	187	5.5
Nausea	7	6.7	55	11.4	280	12.0	50	10.1	0	0	392	11.5
Malaise	13	12.5	144	29.9	1112	47.7	213	43.0	2	22.2	1484	43.4
Anorexia	17	16.3	143	29.7	749	32.1	123	24.8	1	11.1	1033	30.2
Cramps	3	2.9	31	6.4	105	4.5	20	4.0	0	0	159	4.6
Fever	1	1.0	51	10.6	237	10.2	25	5.1	2	22.2	316	9.2

* Within 39 Days

Table 25H. Symptoms By Age and Exposure Groups

Individuals who were living twenty days after the bombing

SYMPTOM	Exposure Groups E, F & G											
	Age 0-4		Age 5-14		Age 15-49		Age 50 & Over		Age Unknown		Total All Ages	
	No	%	No	%	No	%	No	%	No	%	No	%
Total Number of People	67	100.0	491	100.0	807	100.0	187	100.0	1	100.0	1553	100.0
Epilation	0	0	6	1.2	14	1.7	4	2.1	0	0	24	1.5
Purpura	1	1.5	0	0	18	2.2	6	3.2	0	0	25	1.6
Oropharyngeal Lesions *	5	7.5	17	3.5	92	11.4	21	11.2	0	0	135	8.7
Necrotic Gingivitis	0	0	0	0	1	0.1	0	0	0	0	1	0.1
Diarrhea	31	46.3	76	15.5	293	36.3	64	34.2	0	0	464	29.9
Bloody Diarrhea	7	10.4	11	2.2	26	3.2	7	3.7	0	0	51	3.3
Other Hemorrhage	3	4.5	17	3.5	41	5.1	7	3.7	0	0	68	4.4
Vomiting Day of Bomb	1	1.5	13	2.6	14	1.7	4	2.1	0	0	32	2.1
Nausea	2	3.0	20	4.1	55	6.8	16	8.6	0	0	93	6.0
Malaise	9	13.4	59	12.0	321	39.8	79	42.2	0	0	468	30.1
Anorexia	14	20.9	58	11.8	154	19.1	42	22.5	0	0	268	17.3
Cramps	3	4.5	25	5.1	26	3.2	10	5.3	0	0	64	4.1
Fever	4	6.0	6	1.2	39	4.8	6	3.2	0	0	55	3.5

*(Within 39 days)

Table 253. Symptoms By Age And Exposure Groups

Individuals who were living twenty days after bombing

SYMPTOMS	Exposure Group A											
	Age 0-4		Age 5-14		Age 15-49		Age 50 & Over		Age Unknown		Total All Ages	
	No	%	No	%	No	%	No	%	No	%	No	%
Total Number of People	11	100.0	73	100.0	249	100.0	39	100.0	4	100.0	376	100.0
Epilation	5	45.5	32	43.8	119	47.8	9	23.1	3	75.0	168	44.7
Purpura	0	0	12	16.4	80	32.1	12	30.8	1	25.0	105	27.9
Oropharyngeal Lesions*	0	0	23	31.5	108	43.4	13	33.3	1	25.0	145	38.6
Necrotic Gingivitis	0	0	0	0	11	4.4	4	10.3	0	0	15	4.0
Diarrhea	6	54.5	35	47.9	122	49.0	20	51.3	1	25.0	184	48.9
Bloody Diarrhea	2	18.2	4	5.5	18	7.2	6	15.4	0	0	30	8.0
Other Hemorrhage	0	0	12	16.4	44	17.7	4	10.3	0	0	60	16.0
vomiting Day of Bomb	1	9.1	11	15.1	77	30.9	7	17.9	1	25.0	97	25.8
Nausea	2	18.2	15	20.5	90	36.1	10	25.6	1	25.0	118	31.4
Malaise	4	36.4	25	34.2	125	50.2	18	46.2	1	25.0	173	46.0
Anorexia	4	36.4	18	24.7	127	51.0	10	25.6	1	25.0	160	42.6
Cramps	0	0	1	1.4	12	4.8	1	2.6	0	0	14	3.7
Fever	1	9.1	8	11.0	35	14.1	4	10.3	0	0	48	12.8

*(Within 39 days)

Table 25M. Symptoms By Age And Exposure Groups

Individuals who were living twenty days after bombing

SYMPTOMS	Exposure Group B											
	Age 0-4		Age 5-14		Age 15-49		Age 50 & Over		Age Unknown		Total All Ages	
	No	%	No	%	No	%	No	%	No	%	No	%
Total Number of People	31	100.0	181	100.0	1131	100.0	111	100.0	11	100.0	1465	100.0
Epilation	11	35.5	61	33.7	317	28.0	19	17.1	1	9.1	409	27.9
Purpura	1	3.2	28	15.5	220	19.5	14	12.6	1	9.1	264	18.0
Oropharyngeal Lesions *	4	12.9	41	22.7	382	33.8	26	23.4	1	9.1	454	31.0
Necrotic Gingivitis	0	0	2	1.1	23	2.0	2	1.8	0	0	27	1.8
Diarrhea	15	48.4	64	35.4	460	40.7	36	32.4	2	18.2	577	39.4
Bloody Diarrhea	3	9.7	7	3.9	67	5.9	3	2.7	0	0	80	5.5
Other Hemorrhage	3	9.7	25	13.8	161	14.2	12	10.8	0	0	201	13.7
Vomiting Day of Bomb	4	12.9	31	17.1	273	24.1	13	11.7	2	18.2	323	22.0
Nausea	2	6.5	39	21.5	374	33.1	20	18.0	2	18.2	437	29.8
Malaise	11	35.5	53	29.3	543	48.0	37	33.3	3	27.3	647	44.2
Anorexia	11	35.5	61	33.7	459	40.6	29	26.1	1	9.1	561	38.3
Cramps	0	0	7	3.9	39	3.4	2	1.8	1	9.1	49	3.3
Fever	5	16.1	11	6.1	117	10.3	7	6.3	0	0	140	9.6

*(Within 39 days)

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Table 25N. Symptoms By Age And Exposure Groups

Individuals who were living twenty days after bombing

SYMPTOM	Exposure Groups C & D											
	Age 0-4		Age 5-14		Age 15-49		Age 50 & Over		Age Unknown		Total All Ages	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number of People	57	100.0	429	100.0	1606	100.0	216	100.0	24	100.0	2332	100.0
Epilation	9	15.8	32	7.5	234	14.6	20	9.3	1	4.2	296	12.7
Purpura	4	7.0	21	4.9	185	11.5	22	10.2	2	8.3	234	10.0
Oropharyngeal Lesions *	4	7.0	47	11.0	387	24.1	35	16.2	4	16.7	477	20.5
Necrotic Gingivitis	0	0	4	0.9	23	1.4	3	1.4	0	0	30	1.3
Diarrhea	20	35.1	121	28.2	623	38.8	64	29.6	7	29.2	835	35.8
Bloody Diarrhea	5	8.8	22	5.1	67	4.2	7	3.2	2	8.3	103	4.4
Other Hemorrhage	3	5.3	25	5.8	144	9.0	12	5.6	0	0	184	7.9
Vomiting Day of Bomb	6	10.5	25	5.8	232	14.4	20	9.3	2	8.3	285	12.2
Nausea	4	7.0	53	12.4	342	21.3	23	10.6	6	25.0	428	18.4
Malaise	14	24.6	91	21.2	639	39.8	92	42.6	7	29.2	843	36.1
Anorexia	12	21.1	86	20.0	532	33.1	59	27.3	3	12.5	692	29.7
Cramps	1	1.8	7	1.6	27	1.7	4	1.9	1	4.2	40	1.7
Fever	0	0	18	4.2	111	6.9	10	4.6	1	4.2	140	6.0

*(Within 39 days)

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Table 25N. Symptoms By Age And Exposure Groups

Individuals who were living twenty days after bombing

SYMPTOMS	Exposure Groups E, F, & G										Total All Ages	
	Age 0-4		Age 5-14		Age 15-49		Age 50 & Over		Age Unknown			
	No	%	No	%	No	%	No	%	No	%	No	%
Total Number of People	31	100.0	499	100.0	1496	100.0	192	100.0	36	100.0	2254	100.0
Epilation	1	3.2	3	0.6	30	2.0	4	2.1	0	0	38	1.7
Purpura	2	6.5	1	0.2	24	1.6	3	1.6	0	0	30	1.3
Oropharyngeal Lesions *	3	9.7	25	5.0	157	10.5	16	8.3	2	5.6	203	9.0
Necrotic Gingivitis	0	0	0	0	8	0.5	0	0	0	0	8	0.4
Diarrhea	12	38.7	116	23.2	362	24.2	50	26.0	5	13.9	545	24.2
Bloody Diarrhea	5	16.1	13	2.6	36	2.4	4	2.1	0	0	58	2.6
Other Hemorrhage	2	6.5	11	2.2	46	3.1	1	0.5	3	8.3	63	2.8
Vomiting Day of Bomb	2	6.5	7	1.4	24	1.6	5	2.6	0	0	38	1.7
Nausea	4	12.9	31	6.2	85	5.7	14	7.3	2	5.6	136	6.0
Malaise	5	16.1	60	12.0	289	19.3	62	32.3	5	13.9	421	18.7
Anorexia	7	22.6	71	14.2	211	14.1	27	14.1	4	11.1	320	14.2
Cramps	1	3.2	7	1.4	22	1.5	2	1.0	1	2.8	33	1.5
Fever	1	3.2	24	4.8	36	2.4	6	3.1	2	5.6	69	3.1

*(Within 39 days)

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Table 26H. The incidence of symptoms among people with burns as compared with the incidence of symptoms in people without burns by exposure groups.

Individuals who were living twenty days after the bombing.

Symptom	Exposure Group A				Exposure Group B				Exposure Groups C & D				Exposure Groups E,F,G			
	With Burns		Without Burns		With Burns		Without Burns		With Burns		Without Burns		With Burns		Without Burns	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number of People	163	100.0	407	100.0	383	100.0	736	100.0	1532	100.0	1919	100.0	267	100.0	1286	100.0
Epilation	130	79.8	304	74.7	154	40.2	246	33.4	151	9.9	95	5.0	13	4.9	11	0.9
Purpura	58	35.6	252	61.9	67	17.5	195	26.5	46	3.0	93	4.8	5	1.9	20	1.6
Oropharyngeal Lesions*	85	52.1	271	66.6	119	31.1	263	35.7	210	13.7	264	13.8	39	14.6	96	7.5
Necrotic Gingivitis	15	9.2	52	12.8	6	1.6	39	5.3	16	1.0	20	1.0	0	0	1	0.1
Diarrhea	94	57.7	207	50.9	155	40.5	313	42.5	499	32.6	756	39.4	87	32.6	377	29.3
Bloody Diarrhea	17	10.4	49	12.0	20	5.2	60	8.2	81	5.3	120	6.3	8	3.0	43	3.3
Other Hemorrhage	64	39.3	176	43.2	73	19.1	150	20.4	90	5.9	135	7.0	20	7.5	48	3.7
Vomiting Day of Bomb	47	28.8	136	33.4	96	25.1	176	23.9	101	6.6	86	4.5	12	4.5	20	1.6
Nausea	55	33.7	155	38.1	125	32.6	225	30.6	202	13.2	190	9.9	35	13.1	58	4.5
Malaise	83	50.9	189	46.4	182	47.5	379	51.5	689	45.0	795	41.4	110	41.2	358	27.8
Anorexia	92	56.4	193	47.4	185	48.3	287	39.0	551	36.0	482	25.1	73	27.3	195	15.2
Cramps	11	6.7	13	3.2	24	6.3	30	4.1	80	5.2	79	4.1	14	5.2	50	3.9
Fever	47	28.8	173	42.5	72	18.8	110	14.9	228	14.9	88	4.6	22	8.2	33	2.6

* (Within 39 days)

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Table 26N. The incidence of symptoms among people with burns as compared with the incidence of symptoms among people without burns by exposure groups.

Individuals who were living twenty days after the bombing.

Symptom	Exposure Groups A				Exposure Group B				Exposure Groups C & D				Exposure Groups E,F,G			
	With Burns		Without Burns		With Burns		Without Burns		With Burns		Without Burns		With Burns		Without Burns	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Number of People	123	100.0	253	100.0	355	100.0	1110	100.0	654	100.0	1678	100.0	250	100.0	2004	100.0
Epilation	51	41.5	117	46.2	151	42.5	258	23.2	127	19.4	169	10.1	12	4.8	26	1.3
Purpura	26	21.1	79	31.2	53	14.9	211	19.0	64	9.8	170	10.1	7	2.8	23	1.1
Oropharyngeal Lesions*	42	34.1	103	40.7	118	33.2	336	30.3	131	20.0	346	20.6	31	12.4	172	8.6
Necrotic Gingivitis	5	4.1	10	4.0	8	2.3	19	1.7	7	1.1	23	1.4	3	1.2	5	0.2
Diarrhea	55	44.7	129	51.0	147	41.4	430	38.7	219	33.5	616	36.7	74	29.6	471	23.5
Bloody Diarrhea	4	3.3	26	10.3	23	6.5	57	5.1	28	4.3	75	4.5	10	4.0	48	2.4
Other Hemorrhage	10	8.1	50	19.8	48	13.5	153	13.8	55	8.4	129	7.7	8	3.2	55	2.7
Vomiting Day of Bomb	24	19.5	73	28.9	73	20.6	250	22.5	94	14.4	191	11.4	3	1.2	35	1.7
Nausea	36	29.3	82	32.4	104	29.3	333	30.0	126	19.3	302	18.0	27	10.8	109	5.4
Malaise	57	46.3	116	45.8	156	43.9	491	44.2	267	40.8	576	34.3	88	35.2	333	16.6
Anorexia	55	44.7	105	41.5	135	38.0	426	38.4	226	34.6	466	27.8	61	24.4	259	12.9
Cramps	7	5.7	7	2.8	18	5.1	31	2.8	15	2.3	25	1.5	3	1.2	30	1.5
Fever	16	13.0	32	12.6	46	13.0	94	8.5	40	6.1	100	6.0	22	8.8	47	2.3

*(Within 39 days)

Table 27H. The number of individuals with each pair of symptoms. People within a distance of 5000 meters (6663 individuals). The red figures in the diagonal of the table are the total number of individuals with each single symptom.

Individuals who were living twenty days after the bombing.

Symptoms	Number of Individuals												
	Epilation	Purpura	Oropharyngeal Lesions ^a	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	1103	476	628	101	575	120	384	392	451	595	599	65	349
Purpura	476	736	506	75	393	84	314	234	283	409	399	14	274
Oropharyngeal Lesions ^a	628	506	1347	-	676	132	496	331	440	791	688	89	368
Necrotic Gingivitis	101	75	-	149	83	14	71	52	58	86	85	10	66
Diarrhea	575	393	676	83	2489	-	392	338	569	1352	1043	208	368
Bloody Diarrhea	120	84	132	14	-	398	90	59	92	240	200	44	84
Other Hemorrhage	384	314	496	71	392	90	756	188	259	434	387	51	233
Vomiting	392	234	331	52	338	59	188	674	541	408	443	49	173
Nausea	451	283	440	58	569	92	259	541	1045	674	645	93	236
Malaise	595	409	791	86	1352	240	434	408	674	2785	1398	194	435
Anorexia	599	399	688	85	1043	200	387	443	645	1398	2058	166	393
Cramps	65	14	89	10	208	44	51	49	93	194	166	301	59
Fever	349	274	368	66	368	84	233	173	236	435	393	59	773

^a(Within 39 days).

Table 27N. The number of individuals with each pair of symptoms. People within a distance of 5000 meters (6427 individuals). The red figures in the diagonal of the table are the total number of individuals with each single symptom.

Individuals who were living twenty days after the bombing.

Symptoms	Number of Individuals												
	Epilation	Purpura	Oropharyngeal Lesions*	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	911	338	475	49	461	68	216	293	351	492	460	45	149
Purpura	338	633	422	41	303	70	198	217	276	372	318	29	120
Oropharyngeal Lesions*	475	422	1279	-	642	99	330	319	449	723	603	53	192
Necrotic Gingivitis	49	41	-	80	36	15	30	22	27	46	36	2	14
Diarrhea	461	303	642	36	2141	-	251	374	598	1040	884	105	208
Bloody Diarrhea	68	70	99	15	-	271	56	47	95	149	130	20	38
Other Hemorrhage	216	198	330	30	251	56	508	139	191	282	244	18	106
Vomiting	293	217	319	22	374	47	139	743	536	436	421	26	101
Nausea	351	276	449	27	598	95	191	536	1119	666	634	17	147
Malaise	492	372	723	46	1040	149	282	436	666	2084	1107	74	224
Anorexia	460	318	603	36	884	130	244	421	634	1107	1733	69	216
Cramps	45	29	53	2	105	20	18	26	17	74	69	136	41
Fever	149	120	192	14	208	38	106	101	147	224	216	41	397

*(Within 39 days).

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Table 28H. Critical ratios of the difference between the expected and observed number of individuals with each pair of symptoms. People within a distance of 5000 meters (6663 individuals).

Individuals who were living twenty days after the bombing.

Symptom	Critical Ratios												
	Epilation	Purpura	Oropharyngeal Lesions*	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	-	37.2	33.2	17.0	11.1	7.5	26.9	30.7	25.4	9.0	18.4	2.4	22.7
Purpura	37.2	-	34.8	15.5	9.5	6.6	28.4	20.7	18.0	8.0	14.5	2.0	23.0
Oropharyngeal Lesions*	33.2	34.8	-	-	10.9	6.6	33.0	19.7	19.2	14.1	15.7	4.1	20.2
Necrotic Gingivitis	17.0	15.5	-	-	4.7	1.8	14.1	10.1	7.9	4.0	7.0	1.7	12.6
Diarrhea	11.1	9.5	10.9	4.7	-	-	8.4	7.2	12.4	16.0	15.0	11.7	6.3
Bloody Diarrhea	7.5	6.6	6.6	1.8	-	-	7.3	3.2	3.8	7.7	8.6	6.2	6.1
Other Hemorrhage	26.9	28.4	33.0	14.1	8.4	7.3	-	14.3	14.9	9.2	12.8	3.1	17.5
Vomiting	30.7	20.7	19.7	10.1	7.2	3.2	14.3	-	-	10.4	20.7	3.6	12.0
Nausea	25.4	18.0	19.2	7.9	12.4	3.8	14.9	-	-	16.2	23.5	7.4	12.1
Malaise	9.0	8.0	14.1	4.0	16.0	7.7	9.2	10.4	16.2	-	28.9	8.1	8.7
Anorexia	18.4	14.5	15.7	7.0	15.0	8.6	12.8	20.7	23.5	28.9	-	9.3	12.8
Cramps	2.4	2.0	4.1	1.7	11.7	6.2	3.1	3.6	7.4	8.1	9.3	-	4.4
Fever	22.7	23.0	20.2	12.6	6.3	6.1	17.5	12.0	12.1	8.7	12.8	4.4	-

*(Within 39 days)

Table 25N. Critical ratios of the difference between the expected and observed number of individuals with each pair of symptoms. People within a distance of 5000 meters (6427 individuals).

Individuals who were living twenty days after the bombing.

Symptom	Critical Ratios												
	Epilation	Purpura	Oropharyngeal Lesions*	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	-	29.8	26.3	12.1	12.0	5.3	19.1	21.0	18.2	15.2	17.2	6.4	13.8
Purpura	29.8	-	31.0	12.5	8.2	9.0	23.0	20.2	18.3	14.9	13.9	4.5	14.1
Oropharyngeal Lesions*	26.3	31.0	-	-	14.3	7.0	26.5	16.7	18.6	20.6	18.2	5.8	14.7
Necrotic Gingivitis	12.1	12.5	-	-	2.2	6.5	9.9	4.5	3.9	4.8	3.7	0.2	4.2
Diarrhea	12.0	8.2	14.3	2.2	-	-	8.0	10.5	15.7	19.5	18.3	11.0	8.3
Bloody Diarrhea	5.3	9.0	7.0	6.5	-	-	8.0	3.0	7.8	8.1	8.0	6.2	5.5
Other Hemorrhage	19.1	23.0	26.5	9.9	8.0	8.0	-	11.6	12.5	11.6	11.1	2.3	14.3
Vomiting	21.0	20.2	16.7	4.5	10.5	3.0	11.6	-	-	16.3	19.4	2.8	8.9
Nausea	18.2	18.3	18.6	3.9	15.7	7.8	12.5	-	-	21.3	24.6	3.1	10.6
Malaise	15.2	14.9	20.6	4.8	19.5	8.1	11.6	16.3	21.3	-	32.7	5.5	10.5
Anorexia	17.2	13.9	18.2	3.7	18.3	8.0	11.1	19.4	24.6	32.7	-	6.3	12.7
Cramps	6.4	4.5	5.8	0.2	11.0	6.2	2.3	2.8	3.1	5.5	6.3	-	4.0
Fever	13.8	14.1	14.7	4.2	8.3	5.5	14.3	8.9	10.6	10.5	12.7	4.0	-

* (within 39 days)

Table 29H. Association of Symptoms (As measured by ϕ) People within a distance of 5000 meters (6663 individuals)

Individuals who were living twenty days after the bombing.

Symptom	Values of ϕ												
	Epilation	Purpura	Oropharyngeal Lesions*	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	-	+ .46	+ .41	+ .21	+ .14	+ .09	+ .33	+ .38	+ .31	+ .11	+ .23	+ .03	+ .28
Purpura	+ .46	-	+ .43	+ .19	+ .12	+ .08	+ .35	+ .25	+ .22	+ .10	+ .19	+ .02	+ .28
Oropharyngeal Lesions*	+ .41	+ .43	-	-	+ .12	+ .08	+ .40	+ .21	+ .24	+ .17	+ .19	+ .05	+ .25
Necrotic Gingivitis	+ .21	+ .19	-	-	+ .06	+ .02	+ .17	+ .12	+ .10	+ .05	+ .09	+ .02	+ .15
Diarrhea	+ .14	+ .12	+ .12	+ .06	-	-	+ .10	+ .09	+ .15	+ .20	+ .18	+ .14	+ .08
Bloody Diarrhea	+ .09	+ .08	+ .08	+ .02	-	-	+ .09	+ .04	+ .05	+ .09	+ .11	+ .08	+ .07
Other Hemorrhage	+ .33	+ .35	+ .40	+ .17	+ .10	+ .09	-	+ .18	+ .18	+ .11	+ .16	+ .04	+ .21
Vomiting	+ .38	+ .25	+ .21	+ .12	+ .09	+ .04	+ .18	-	-	+ .13	+ .25	+ .05	+ .15
Nausea	+ .31	+ .22	+ .24	+ .10	+ .15	+ .05	+ .18	-	-	+ .20	+ .28	+ .09	+ .15
Malaise	+ .11	+ .10	+ .17	+ .05	+ .20	+ .09	+ .11	+ .13	+ .20	-	+ .35	+ .10	+ .11
Anorexia	+ .23	+ .19	+ .19	+ .09	+ .18	+ .11	+ .16	+ .25	+ .28	+ .35	-	+ .11	+ .16
Cramps	+ .03	+ .02	+ .05	+ .02	+ .14	+ .08	+ .04	+ .05	+ .09	+ .10	+ .11	-	+ .05
Fever	+ .28	+ .28	+ .25	+ .15	+ .08	+ .07	+ .21	+ .15	+ .15	+ .11	+ .16	+ .05	-

(within 39 days)

Table 29N. Association of Symptoms (As measures by ϕ) People within a distance of 5000 meters (6427 individuals)

Individuals who were living twenty days after the bombing.

Symptom	Values of ϕ												
	Epilation	Purpura	Oropharyngeal Lesions*	Necrotic Gingivitis	Diarrhea	Bloody Diarrhea	Other Hemorrhage	Vomiting	Nausea	Malaise	Anorexia	Cramps	Fever
Epilation	-	+ .37	+ .32	+ .15	+ .15	+ .07	+ .24	+ .26	+ .23	+ .18	+ .21	+ .08	+ .17
Purpura	+ .37	+	+ .32	+ .16	+ .10	+ .11	+ .29	+ .25	+ .23	+ .19	+ .17	+ .06	+ .18
Oropharyngeal Lesions*	+ .32	+ .32	-	-	+ .18	+ .09	+ .33	+ .21	+ .23	+ .26	+ .23	+ .07	+ .18
Necrotic Gingivitis	+ .15	+ .16	-	-	+ .03	+ .08	+ .12	+ .06	+ .05	+ .06	+ .05	+ .00	+ .05
Diarrhea	+ .15	+ .10	+ .18	+ .03	-	-	+ .10	+ .13	+ .20	+ .24	+ .23	+ .14	+ .10
Bloody Diarrhea	+ .07	+ .11	+ .09	+ .08	-	-	+ .10	+ .04	+ .10	+ .10	+ .10	+ .08	+ .07
Other Hemorrhage	+ .24	+ .29	+ .33	+ .12	+ .10	+ .10	-	+ .14	+ .16	+ .14	+ .14	+ .03	+ .18
Vomiting	+ .26	+ .25	+ .21	+ .06	+ .13	+ .04	+ .14	-	-	+ .20	+ .24	+ .03	+ .11
Nausea	+ .23	+ .23	+ .23	+ .05	+ .20	+ .10	+ .16	-	-	+ .27	+ .31	+ .16	+ .13
Malaise	+ .18	+ .19	+ .26	+ .06	+ .24	+ .10	+ .14	+ .20	+ .27	-	+ .41	+ .18	+ .13
Anorexia	+ .21	+ .17	+ .23	+ .05	+ .23	+ .10	+ .04	0.24	+ .31	+ .41	-	+ .08	+ .16
Cramps	+ .08	+ .06	+ .07	+ .00	+ .14	+ .08	+ .03	+ .03	+ .16	+ .18	+ .08	-	+ .04
Fever	+ .17	+ .18	+ .18	+ .05	+ .10	+ .07	+ .18	+ .11	+ .13	+ .13	+ .16	+ .04	- -

-(Within 39 days)

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Table 30H. Association of epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Epilation and Purpura		Epilation without Purpura		Purpura Without Epilation		Neither Epilation Nor Purpura		Total With Epilation		Total With Purpura		Total With Either Epilation or Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
A	570	255	44.7	179	31.4	55	9.6	81	14.2	434	76.1	310	54.4	489	85.8	+ .16	3.7
B	1119	170	15.2	230	20.6	92	8.2	627	56.0	400	35.8	262	23.4	492	44.0	+ .34	11.2
C	1817	38	2.1	134	7.4	70	3.9	1575	86.7	172	9.5	108	5.9	242	13.3	+ .22	9.4
D	1604	11	.7	62	3.9	20	1.3	1511	94.2	73	4.6	31	1.9	93	5.8	+ .21	8.3
E	711	1	.1	16	2.3	12	1.7	682	95.9	17	2.4	13	1.8	29	4.1	-	-
F	575	1	.2	6	1.1	7	1.2	561	97.6	7	1.2	8	1.4	14	2.4	-	-
G	267	0	0	0	0	4	1.5	263	98.5	0	0	4	1.5	4	1.5	-	-
Total	6663	476	7.1	627	9.4	260	3.9	5300	79.5	1103	16.6	736	11.0	1363	20.5	+ .46	37.2
H	219	0	0	0	0	1	.5	218	99.5	0	0	1	.5	1	.5	-	-

NAGASAKI

Table 30N. Association of epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Epilation and Purpura		Epilation Without Purpura		Purpura Without Epilation		Neither Epilation Nor Purpura		Total With Epilation		Total With Purpura		Total With Either Epilation or Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
A	376	73	19.4	95	25.3	32	8.5	176	46.8	168	44.7	105	27.9	200	53.2	+ .31	6.0
B	1465	156	10.7	253	17.3	108	7.4	948	64.7	409	27.9	264	18.0	517	35.3	+ .33	12.5
C	1630	84	5.2	157	9.6	114	7.0	1275	78.2	241	14.8	198	12.2	355	21.8	+ .29	11.7
D	702	18	2.6	37	5.3	18	2.6	629	89.6	55	7.8	36	5.1	73	10.4	+ .36	9.7
E	663	2	.3	13	2.0	5	.8	643	97.0	15	2.3	7	1.1	20	3.0	-	-
F	1091	4	.4	14	1.3	14	1.3	1059	97.1	18	1.7	18	1.7	32	2.9	-	-
G	500	1	.2	4	.8	4	.8	491	98.2	5	1.0	5	1.0	9	1.8	-	-
Total	6427	338	5.3	573	8.9	295	4.6	5221	81.2	911	14.2	633	9.8	1206	18.8	+ .37	29.8
H	194	0	0	0	0	0	0	194	100.0	0	0	0	0	0	0	-	-

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Table 31H. Association of Oropharyngeal Lesions* with epilation and purpura by exposure groups.
Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Oropharyngeal Lesions						Total With Purpura		Oropharyngeal Lesions					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	298	52.3	58	10.2	+ .23	5.5	310	54.4	241	42.3	115	20.2	+ .34	8.2
B	1119	400	35.8	238	21.3	144	12.9	+ .40	13.3	262	23.4	184	16.4	198	17.7	+ .42	14.1
C	1817	172	9.5	57	3.1	210	11.6	+ .17	7.2	108	5.9	54	3.0	213	11.7	+ .25	10.7
D	1604	73	4.6	29	1.8	178	11.1	+ .15	6.0	31	1.9	18	1.1	189	11.8	+ .19	7.6
E	711	17	2.4	5	0.7	81	11.4	+ .08	2.2	13	1.8	4	0.6	82	11.5	-	-
F	575	7	1.2	1	0.2	31	5.4	-	-	8	1.4	4	0.7	28	4.9	-	-
G	267	0	0	0	0	17	6.4	-	-	4	1.5	1	0.4	16	6.0	-	-
Total	6663	1103	16.6	628	9.4	719	10.8	+ .41	33.2	736	11.0	506	7.6	841	12.6	+ .43	34.8
H	219	0	0	0	0	13	5.9	-	-	1	.5	0	0	13	5.9	-	-

*Includes only oropharyngeal lesions occurring within 39 days of the bombing.

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Table 31H. Association of Necrotic Gingivitis with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Necrotic Gingivitis						Total With Purpura		Necrotic Gingivitis					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	59	10.4	8	1.4	+ .12	2.4	310	54.4	40	7.0	27	4.7	+ .04	0.9
B	1119	400	35.8	28	2.5	17	1.5	+ .11	3.8	262	23.4	25	2.2	20	1.8	+ .16	5.2
C	1817	172	9.5	9	0.5	9	0.5	+ .14	5.9	108	5.9	6	0.3	12	0.7	+ .12	4.9
D	1604	73	4.6	5	0.3	13	0.8	+ .12	4.8	31	1.9	4	0.2	14	0.9	+ .16	6.3
E	711	17	2.4	0	0	1	0.1	-	-	13	1.8	0	0	1	0.1	-	-
F	575	7	1.2	0	0	0	0	-	-	8	1.4	0	0	0	0	-	-
G	267	0	0	0	0	0	0	-	-	4	1.5	0	0	0	0	-	-
Total	6663	1103	16.6	101	1.5	48	0.7	+ .21	17.0	736	11.0	75	1.1	74	1.1	+ .19	15.5
H	219	0	0	0	0	1	0.5	-	-	1	.5	0	0	1	0.5	-	-

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Table 31H. Association of Diarrhea with epilation and purpura
by exposure groups
Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Diarrhea						Total With Purpura		Diarrhea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	244	42.8	57	10.0	+ .12	2.9	310	54.4	175	30.7	126	22.1	+ .08	1.9
B	1119	400	35.8	197	17.6	272	24.3	+ .11	3.7	262	23.4	126	11.3	343	30.7	+ .07	2.3
C	1817	172	9.5	78	4.3	616	33.9	+ .05	2.0	108	5.9	61	3.4	633	34.8	+ .09	4.0
D	1604	73	4.6	41	2.6	520	32.4	+ .10	3.9	31	1.9	17	1.1	544	33.9	+ .06	2.3
E	711	17	2.4	12	1.7	250	35.2	+ .11	2.9	13	1.8	8	1.1	254	35.7	+ .07	1.9
F	575	7	1.2	3	0.5	130	22.6	-	-	8	1.4	4	0.7	129	22.4	-	-
G	267	0	0	0	0	69	25.8	-	-	4	1.5	2	0.7	67	25.1	-	-
Total	6663	1103	16.6	575	8.6	1914	28.7	+ .14	11.1	736	11.0	393	5.9	2096	31.5	+ .12	9.5
H	219	0	0	0	0	67	30.6	-	-	1	.5	1	0.5	66	30.1	-	-

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Table 31H. Association of Bloody Diarrhea with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total with Epilation		Bloody Diarrhea						Total with Purpura		Bloody Diarrhea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	56	9.8	10	1.8	+ .07	1.8	310	54.4	42	7.4	24	4.2	+ .07	1.6
B	1119	400	35.8	37	3.3	43	3.8	+ .06	2.0	262	23.4	27	2.4	53	4.7	+ .07	2.3
C	1817	172	9.5	11	0.6	88	4.8	+ .06	0.6	108	5.9	6	0.3	93	5.1	+ .05	0.1
D	1604	73	4.6	14	0.9	88	5.5	+ .11	4.6	31	1.9	7	0.4	95	5.9	+ .09	3.7
E	711	17	2.4	2	0.3	32	4.5	-	-	13	1.8	1	0.1	33	4.6	-	-
F	575	7	1.2	0	0	15	2.6	-	-	8	1.4	1	0.2	14	2.4	-	-
G	267	0	0	0	0	2	0.7	-	-	4	1.5	0	0	2	0.7	-	-
Total	6663	1103	16.6	120	1.8	278	4.2	+ .09	7.5	736	11.0	84	1.3	314	4.7	+ .08	6.6
H	219	0	0	0	0	2	0.9	-	-	1	.5	0	0	2	0.9	-	-

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Table 31H. Association of Other Hemorrhage with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Other Hemorrhage						Total With Purpura		Other Hemorrhage					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	199	34.9	41	7.2	+ .14	3.2	310	54.4	171	30.0	69	12.1	+ .29	6.9
B	1119	400	35.8	137	12.2	86	7.7	+ .27	8.9	262	23.4	98	8.8	125	11.2	+ .24	8.1
C	1817	172	9.5	29	1.6	90	5.0	+ .13	5.7	108	5.9	32	1.8	87	4.8	+ .23	9.9
D	1604	73	4.6	17	1.1	89	5.5	+ .15	5.9	31	1.9	8	0.5	98	6.1	+ .11	4.3
E	711	17	2.4	1	0.1	38	5.3	-	-	13	1.8	1	0.1	38	5.3	-	-
F	575	7	1.2	1	0.2	23	4.0	-	-	8	1.4	2	0.3	22	3.8	-	-
G	267	0	0	0	0	5	1.9	-	-	4	1.5	2	0.7	3	1.1	-	-
Total	6663	1103	16.6	384	5.8	372	5.6	+ .33	26.9	736	11.0	314	4.7	442	6.6	+ .35	28.4
H	219	0	0	0	0	8	3.7	-	-	1	.5	0	0	8	3.7	-	-

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Table 31H. Association of Vomiting (on day of bombing) with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Vomiting						Total With Purpura		Vomiting					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	162	28.4	21	3.7	+ .20	4.8	310	54.4	102	17.9	81	14.2	+ .02	0.5
B	1119	400	35.8	176	15.7	96	8.6	+ .35	11.6	262	23.4	104	9.3	168	15.0	+ .20	6.6
C	1817	172	9.5	38	2.1	90	5.0	+ .19	8.1	108	5.9	22	1.2	106	5.8	+ .13	5.6
D	1604	73	4.6	11	0.7	48	3.0	+ .13	5.3	31	1.9	4	0.2	55	3.4	+ .07	2.8
E	711	17	2.4	3	0.4	14	2.0	-	-	13	1.8	1	0.1	16	2.3	-	-
F	575	7	1.2	2	0.3	12	2.1	-	-	8	1.4	1	0.2	13	2.3	-	-
G	267	0	0	0	0	1	0.4	-	-	4	1.5	0	0	1	0.4	-	-
Total	6663	1103	16.6	392	5.9	282	4.2	+ .38	30.7	736	11.0	234	3.5	440	6.6	+ .25	20.7
H	219	0	0	0	0	0	0	-	-	1	.5	0	0	0	0	-	-

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Table 31H. Association of Nausea with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Nausea						Total With Purpura		Nausea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	177	31.1	33	5.8	+ .15	3.5	310	54.4	124	21.8	86	15.1	+ .07	1.7
B	1119	400	35.8	197	17.6	153	13.7	+ .29	9.7	262	23.4	117	10.5	233	20.8	+ .16	5.3
C	1817	172	9.5	48	2.6	189	10.4	+ .14	6.1	108	5.9	31	1.7	206	11.3	+ .12	5.0
D	1604	73	4.6	21	1.3	134	8.4	+ .14	5.7	31	1.9	8	0.5	147	9.2	+ .08	3.1
E	711	17	2.4	5	0.7	47	6.6	-	-	13	1.8	2	0.3	50	7.0	-	-
F	575	7	1.2	3	0.5	23	4.0	-	-	8	1.4	1	0.2	25	4.3	-	-
G	267	0	0.	0	0	15	5.6	-	-	4	1.5	0	0	15	5.6	-	-
Total	6663	1103	16.6	451	6.8	594	8.9	+ .31	25.4	736	11.0	283	4.2	762	11.4	+ .22	18.0
H	219	0	0	0	0	6	2.7	-	-	1	.5	0	0	6	2.7	-	-

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Table 31K. Association of Malaise with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Malaise						Total With Purpura		Malaise					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	213	37.4	59	10.4	+ .05	1.2	310	54.4	148	26.0	124	21.8	+ .00	0.0
B	1119	400	35.8	229	20.5	332	29.7	+ .11	3.6	262	23.4	160	14.3	401	35.8	+ .12	4.1
C	1817	172	9.5	92	5.1	656	36.1	+ .08	3.5	108	5.9	66	3.6	682	37.5	+ .12	4.3
D	1604	73	4.6	47	2.9	689	43.0	+ .08	3.3	31	1.9	23	1.4	713	44.5	+ .08	3.2
E	711	17	2.4	12	1.7	264	37.1	+ .10	2.7	13	1.8	5	0.7	271	38.1	-	-
F	575	7	1.2	2	0.3	118	20.5	-	-	8	1.4	4	0.7	116	20.2	-	-
G	267	0	0	0	0	72	27.0	-	-	4	1.5	3	1.1	69	25.8	-	-
Total	6663	1103	16.6	595	8.9	2190	32.9	+ .11	9.0	736	11.0	409	6.1	2371	35.7	+ .10	8.0
H	219	0	0	0	0	53	24.2	-	-	1	.5	0	0	53	24.2	-	-

HIROSHIMA

Table 31H. Association of Anorexia with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Anorexia						Total With Purpura		Anorexia					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	228	40.0	57	10.0	+ .09	2.2	310	54.4	160	28.1	125	21.9	+ .04	0.8
B	1119	400	35.8	226	20.2	246	22.0	+ .22	7.2	262	23.4	149	13.3	323	28.9	+ .16	5.5
C	1817	172	9.5	91	5.0	486	26.7	+ .15	6.3	108	5.9	64	3.5	513	28.2	+ .15	6.3
D	1604	73	4.6	42	2.6	414	25.8	+ .14	5.6	31	1.9	17	1.1	439	27.4	+ .08	3.3
E	711	17	2.4	8	1.1	145	20.4	-	-	13	1.8	4	0.6	149	21.0	-	-
F	575	7	1.2	4	0.7	75	13.0	-	-	8	1.4	4	0.7	75	13.0	-	-
G	267	0	0	0	0	36	13.5	-	-	4	1.5	1	0.4	35	13.1	-	-
Total	6663	1103	16.6	599	9.0	1459	21.9	+ .23	18.4	736	11.0	399	6.0	1659	24.9	+ .19	14.5
H	219	0	0	0	0	15	6.8	-	-	1	.5	0	0	15	6.8	-	-

HIROSHIMA

Table 31H. Association of Cramps with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Cramps						Total With Purpura		Cramps					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	20	3.5	4	0.7	+ .04	0.8	310	54.4	13	2.3	11	1.9	- .00	0.0
B	1119	400	35.8	21	1.9	33	2.9	+ .01	0.5	262	23.4	13	1.2	41	3.7	- .00	0.1
C	1817	172	9.5	10	0.6	62	3.4	+ .03	1.3	108	5.9	7	0.4	65	3.6	- .03	1.4
D	1604	73	4.6	8	0.5	79	4.9	+ .05	2.1	31	1.9	8	0.5	79	4.9	+ .13	5.1
E	711	17	2.4	5	0.7	21	3.0	-	-	13	1.8	1	0.1	25	3.5	-	-
F	575	7	1.2	1	0.2	29	5.0	-	-	8	1.4	2	0.3	28	4.9	-	-
G	267	0	0	0	0	8	3.0	-	-	4	1.5	0	0	8	3.0	-	-
Total	6663	1103	16.6	65	1.0	236	3.5	+ .03	2.4	736	11.0	44	0.7	257	3.9	+ .02	2.0
H	219	0	0	0	0	7	3.2	-	-	1	.5	0	0	7	3.2	-	-

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HIROSHIMA

Table 31H. Association of Fever (39° or over) with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Fever (39° or over)						Total With Purpura		Fever (39° or over)					
				With Epilation		Without Epilation		φ	Critical Ratio			With Purpura		Without Purpura		φ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	570	434	76.1	185	32.5	35	6.1	+ .15	3.5	310	54.4	157	27.5	63	11.1	+ .27	6.5
B	1119	400	35.8	124	11.1	58	5.2	+ .30	10.0	262	23.4	82	7.3	100	8.9	+ .23	7.5
C	1817	172	9.5	25	1.4	132	7.3	+ .07	2.9	108	5.9	24	1.3	133	7.3	+ .12	5.2
D	1604	73	4.6	11	0.7	148	9.2	+ .04	1.5	31	1.9	9	0.6	150	9.4	+ .09	3.6
E	711	17	2.4	1	0.1	29	4.1	-	-	13	1.8	0	0	30	4.2	-	-
F	575	7	1.2	3	0.5	11	1.9	-	-	8	1.4	1	0.2	13	2.3	-	-
G	267	0	0	0	0	11	4.1	-	-	4	1.5	1	0.4	10	3.7	-	-
Total	6663	1103	16.6	349	5.2	424	6.4	+ .28	22.7	736	11.0	274	4.1	499	7.5	+ .28	23.0
H	219	0	0	0	0	10	4.6	-	-	1	.5	0	0	10	4.6	-	-

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Table 31N. Association of Oropharyngeal lesions* with epilation and purpura by exposure groups.
Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Oropharyngeal Lesions						Total With Purpura		Oropharyngeal Lesions					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
A	376	168	44.7	84	22.3	61	16.2	+ .21	4.1	105	27.9	80	21.3	65	17.3	+ .48	9.3
B	1465	409	27.9	225	15.4	229	15.6	+ .32	12.4	264	18.0	185	12.6	269	18.4	+ .40	15.2
C	1630	241	14.8	125	7.7	248	15.2	+ .29	11.6	198	12.1	124	7.6	249	15.3	+ .35	14.2
D	702	55	7.8	29	4.1	75	10.7	+ .31	8.2	36	5.1	22	3.1	82	11.7	+ .30	8.0
E	663	15	2.3	4	0.6	65	9.8	-	-	7	1.1	3	0.5	66	10.0	-	-
F	1091	18	1.6	7	0.6	96	8.8	-	-	18	1.6	8	0.7	95	8.7	-	-
G	500	5	1.0	1	0.2	30	6.0	-	-	5	1.0	0	0	31	6.2	-	-
Total	6427	911	14.2	475	7.4	804	12.5	+ .32	26.3	633	9.8	422	6.6	857	13.3	+ .32	31.0
H	194	0	0	0	0	5	2.6	-	-	0	0	0	0	5	2.6	-	-

*Includes only oropharyngeal lesions occurring within 39 days of the bombing.

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Table 31N. Association of Necrotic Gingivitis with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Necrotic Gingivitis						Total with Purpura		Necrotic Gingivitis					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
A	376	168	44.7	11	2.9	4	1.1	+ .12	2.3	105	27.9	9	2.4	6	1.6	+ .15	2.8
B	1465	409	27.9	19	1.3	8	0.5	+ .13	5.3	264	18.0	13	0.9	14	1.0	+ .11	4.1
C	1630	241	14.8	13	0.8	11	0.7	+ .14	5.5	198	12.1	14	0.9	10	0.6	+ .17	7.0
D	702	55	7.8	4	0.6	2	0.3	-	-	36	5.1	3	0.4	3	0.4	-	-
E	663	15	2.3	2	0.3	4	0.6	-	-	7	1.1	1	0.2	5	0.8	-	-
F	1091	18	1.6	0	0	2	0.2	-	-	18	1.6	1	0.1	1	0.1	-	-
G	500	5	1.0	0	0	0	0	-	-	5	1.0	0	0	0	0	-	-
Total	6427	911	14.2	49	0.8	31	0.5	+ .15	12.1	633	9.8	41	0.6	39	0.6	+ .16	12.5
H	194	0	0	0	0	0	0	-	-	0	0	0	0	0	0	-	-

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Table 31N. Association of Diarrhea with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Diarrhea						Total With Purpura		Diarrhea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
A	376	168	44.7	90	23.9	94	25.0	+0.08	1.6	105	27.9	51	13.6	133	35.4	-0.01	.01
B	1465	409	27.9	199	13.6	378	25.8	+0.12	4.5	264	18.0	135	9.2	442	30.2	+0.11	4.3
C	1630	241	14.8	126	7.7	467	28.7	+0.14	5.6	198	12.1	89	5.5	504	30.9	+0.07	2.7
D	702	55	7.8	28	4.0	214	30.5	+0.10	2.7	36	5.1	14	2.0	228	32.5	+0.02	0.6
E	663	15	2.3	5	0.8	192	29.0	-	-	7	1.1	3	0.5	194	29.3	-	-
F	1091	18	1.6	12	1.1	265	24.3	-	-	18	1.6	8	0.7	269	24.7	-	-
G	500	5	1.0	1	0.2	70	14.0	-	-	5	1.0	3	0.6	68	13.6	-	-
Total	6427	911	14.2	461	7.2	1680	26.1	+0.15	12.0	633	9.8	303	4.7	1838	28.6	+0.10	8.2
H	194	0	0	0	0	23	11.9	-	-	0	0	0	0	23	11.9	-	-

TIT

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NAGASAKI

Table 31N. Association of Bloody Diarrhea with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Bloody Diarrhea						Total With Purpura		Bloody Diarrhea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
A	376	168	44.7	13	3.5	17	4.5	- .00	0.2	105	27.9	10	2.7	20	5.3	+ .04	0.7
B	1465	409	27.9	35	2.4	45	3.1	+ .08	3.2	264	18.0	32	2.2	48	3.3	+ .14	5.3
C	1630	241	14.8	16	1.0	60	3.7	+ .04	1.6	198	12.1	22	1.3	54	3.3	+ .11	4.6
D	702	55	7.8	2	0.3	25	3.6	- .00	0.1	36	5.1	3	0.4	24	3.4	+ .05	1.4
E	663	15	2.3	1	0.2	28	4.2	-	-	7	1.1	1	0.2	28	4.2	-	-
F	1091	18	1.6	1	0.1	19	1.7	-	-	18	1.6	2	0.2	18	1.6	-	-
G	500	5	1.0	0	0	9	1.8	-	-	5	1.0	0	0	9	1.8	-	-
Total	6427	911	14.2	68	1.1	203	3.2	+ .07	5.3	633	9.8	70	1.1	201	3.1	+ .11	9.0
H	194	0	0	0	0	1	0.5	-	-	0	0	0	0	1	0.5	-	-

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Table 31N. Association of Hemorrhage with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Hemorrhage						Total With Purpura		Hemorrhage					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	376	168	44.7	36	9.6	24	6.4	+ .13	2.6	105	27.9	34	9.0	26	6.9	+ .28	5.5
B	1465	409	27.9	106	7.2	95	6.5	+ .22	8.4	264	18.0	93	6.3	108	7.4	+ .29	11.2
C	1630	241	14.8	52	3.2	94	5.8	+ .18	7.4	198	12.1	56	3.4	90	5.5	+ .25	10.2
D	702	55	7.8	15	2.1	23	3.3	+ .28	7.5	36	5.1	9	1.3	29	4.1	+ .20	5.3
E	663	15	2.3	3	0.5	20	3.0	-	-	7	1.1	3	0.5	20	3.0	-	-
F	1091	18	1.6	2	0.2	25	2.3	-	-	18	1.6	2	0.2	25	2.3	-	-
G	500	5	1.0	2	0.4	11	2.2	-	-	5	1.0	1	0.2	12	2.4	-	-
Total	6427	911	14.2	216	3.4	292	4.5	+ .24	19.1	633	9.8	198	3.1	310	4.8	+ .29	23.0
H	194	0	0	0	0	2	1.0	-	-	0	0	0	0	2	1.0	-	-

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Table 31N. Association of Vomiting with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total with Epilation		Vomiting						Total With Purpura		Vomiting					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%		
A	376	168	44.7	63	16.8	34	9.0	+ .24	4.7	105	27.9	43	11.4	54	14.4	+ .22	4.2
B	1465	409	27.9	136	9.3	187	12.8	+ .17	6.4	264	18.0	88	6.0	235	16.0	+ .13	4.9
C	1630	241	14.8	71	4.4	175	10.7	+ .17	6.8	198	12.1	71	4.4	175	10.7	+ .22	8.7
D	702	55	7.8	17	2.4	22	3.1	+ .32	8.6	36	5.1	11	1.6	28	4.0	+ .25	6.7
E	663	15	2.3	4	0.6	16	2.4	-	-	7	1.1	2	0.3	18	2.7	-	-
F	1091	18	1.6	2	0.2	12	1.1	-	-	18	1.6	2	0.2	12	1.1	-	-
G	500	5	1.0	0	0	4	0.8	-	-	5	1.0	0	0	4	0.8	-	-
Total	6427	911	14.2	293	4.6	450	7.0	+ .26	21.0	633	9.8	217	3.4	526	8.2	+ .25	20.2
H	194	0	0	0	0	0	0	-	-	0	0	0	0	0	0	-	-

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Table 31N. Association of Nausea with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Nausea						Total With Purpura		Nausea					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	376	168	44.7	70	18.6	48	12.8	+ .20	3.9	105	27.9	51	13.6	67	17.8	+ .23	4.5
B	1465	409	27.9	168	11.5	269	18.4	+ .15	5.9	264	18.0	124	8.5	313	21.4	+ .18	6.7
C	1630	241	14.8	85	5.2	255	15.6	+ .15	6.0	198	12.1	79	4.8	261	16.0	+ .18	7.4
D	702	55	7.8	20	2.8	68	9.7	+ .21	5.6	36	5.1	14	2.0	74	10.5	+ .19	4.9
E	663	15	2.3	4	0.6	54	8.1	-	-	7	1.1	2	0.3	56	8.4	-	-
F	1091	18	1.6	3	0.3	52	4.8	-	-	18	1.6	4	0.4	51	4.7	-	-
G	500	5	1.0	1	0.2	22	4.4	-	-	5	1.0	2	0.4	21	4.2	-	-
Total	6427	911	14.2	351	5.5	768	11.9	+ .23	18.2	633	9.8	276	4.3	843	13.1	+ .23	18.3
H	194	0	0	0	0	2	1.0	-	-	0	0	0	0	2	1.0	-	-

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Table 31N. Association of Malaise with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Malaise						Total With Purpura		Malaise					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
				No.	%	No.	%					No.	%	No.	%		
A	376	168	44.7	93	24.7	80	21.3	+ .17	3.3	105	27.9	64	17.0	109	29.0	+ .19	3.6
B	1465	409	27.9	216	14.7	431	29.4	+ .11	4.1	264	18.0	159	10.9	488	33.3	+ .15	5.8
C	1630	241	14.8	133	8.2	501	30.7	+ .14	5.6	198	12.1	111	6.8	523	32.1	+ .13	5.3
D	702	55	7.8	30	4.3	179	25.5	+ .16	4.2	36	5.1	21	3.0	188	26.8	+ .15	3.8
E	663	15	2.3	6	0.9	138	20.8	-	-	7	1.1	4	0.6	140	21.1	-	-
F	1091	18	1.6	11	1.0	204	18.7	-	-	18	1.6	11	1.0	240	18.7	-	-
G	500	5	1.0	3	0.6	59	11.8	-	-	5	1.0	2	0.4	60	12.0	-	-
Total	6427	911	14.2	492	7.7	1592	24.8	+ .19	15.2	633	9.8	372	5.8	1712	26.6	+ .19	14.9
H	194	0	0	0	0	13	6.7	-	-	0	0	0	0	13	6.7	-	-

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Table 31N. Association of Anorexia with epilation and purpura
by exposure groups.
Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		Anorexia						Total With Purpura		Anorexia					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	376	168	44.7	90	23.9	70	18.6	+ .20	3.9	105	27.9	56	14.9	104	27.7	+ .14	2.6
B	1465	409	27.9	197	13.4	364	24.8	+ .13	4.8	264	18.0	138	9.4	423	28.9	+ .13	5.2
C	1630	241	14.8	128	7.9	406	24.9	+ .18	7.9	798	12.1	96	5.9	438	26.9	+ .13	5.0
D	702	55	7.8	28	4.0	130	18.5	+ .20	5.3	36	5.1	15	2.1	143	20.4	+ .11	2.8
E	663	15	2.3	6	0.9	105	15.8	-	-	7	1.1	2	0.3	109	16.4	-	-
F	1091	18	1.6	8	0.7	150	13.7	-	-	18	1.6	10	0.9	148	13.6	-	-
G	500	5	1.0	3	0.6	48	9.6	-	-	5	1.0	1	0.2	50	10.0	-	-
Total	6427	911	14.2	460	7.2	1273	19.8	+ .21	17.2	633	9.8	318	4.9	1415	22.0	+ .17	13.9
H	194	0	0	0	0	9	4.6	-	-	0	0	0	0	9	4.6	-	-

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Table 31N. Association of Cramps with epilation and purpura by exposure groups.

Individuals who were living twenty days after bombing.

Exposure Groups	Total Number of People	Total With Epilation		Cramps						Total With Purpura		Cramps					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	376	168	44.7	8	2.1	6	1.6	+0.05	1.0	105	27.9	5	1.3	9	2.4	+0.03	0.7
B	1465	409	27.9	25	1.7	24	1.6	+0.10	3.7	264	18.0	16	1.1	33	2.3	+0.07	2.7
C	1630	241	14.8	10	0.6	16	1.0	+0.08	3.4	198	12.1	5	0.3	21	1.3	+0.03	1.1
D	702	55	7.8	0	0	14	2.0	-	-	36	5.1	1	0.1	13	1.9	-	-
E	663	15	2.3	1	0.2	9	1.4	-	-	7	1.1	0	0	10	1.5	-	-
F	1091	18	1.6	1	0.1	17	1.6	-	-	18	1.6	2	0.2	16	1.5	-	-
G	500	5	1.0	0	0	5	1.0	-	-	5	1.0	0	0	5	1.0	-	-
Total	6427	911	14.2	45	0.7	91	1.4	+0.08	6.4	633	9.8	29	0.5	107	1.7	+0.06	4.5
H	194	0	0	0	0	1	0.5	-	-	0	0	0	0	1	0.5	-	-

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Table 31N. Association of Fever (39° or over) with epilation and purpura by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Total Number of People	Total With Epilation		High Fever						Total With Purpura		High Fever					
				With Epilation		Without Epilation		ϕ	Critical Ratio			With Purpura		Without Purpura		ϕ	Critical Ratio
		No.	%	No.	%	No.	%			No.	%	No.	%				
A	376	168	44.7	29	7.7	19	5.1	+ .12	2.3	105	27.9	21	5.6	27	7.2	+ .13	2.6
B	1465	409	27.9	67	4.6	73	5.0	+ .14	5.4	264	18.0	54	3.7	86	5.9	+ .17	6.7
C	1630	241	14.8	41	2.5	67	4.1	+ .17	7.0	198	12.1	32	2.0	76	4.7	+ .14	5.8
D	702	55	7.8	7	1.0	25	3.6	+ .11	3.0	36	5.1	8	1.1	24	3.4	+ .20	5.2
E	663	15	2.3	3	0.5	25	3.8	-	-	7	1.1	3	0.5	25	3.8	-	-
F	1091	18	1.6	2	0.2	30	2.7	-	-	18	1.6	2	0.2	30	2.7	-	-
G	500	5	1.0	0	0	9	1.8	-	-	5	1.0	0	0	9	1.8	-	-
Total	6427	911	14.2	149	2.3	248	3.9	+ .17	13.8	633	9.8	120	1.9	277	4.3	+ .18	14.1
H	194	0	0	0	0	1	0.5	-	-	0	0	0	0	1	0.5	-	-

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Table 32H. The incidence of other symptoms among 1363 individuals with epilation and/or purpura as compared with the incidence of other symptoms among 5300 individuals with neither epilation nor purpura. People within a distance of 5000 meters.

Individuals who were living twenty days after the bombing.

Symptoms	Cases with epilation and/or Purpura			Cases with Neither Epilation nor Purpura			Difference in Percentage	Critical Ratio	ϕ	All Cases				
	Total	With Symptoms		Total	With Symptoms					Total	With Symptoms		Without Symptoms	
		No.	%		No.	%					No.	%	No.	%
Oropharyngeal Lesions	1363	759	55.7	5300	588	11.1	44.6	36.6	+ .45	6663	1347	20.2	5316	79.8
Necrotic Gingivitis	1363	119	8.7	5300	30	0.6	8.1	18.2	+ .22	6663	149	2.2	6514	97.8
Diarrhea	1363	699	51.3	5300	1790	33.8	17.5	11.9	+ .15	6663	2489	37.4	4174	62.6
Bloody Diarrhea	1363	140	10.3	5300	258	4.9	5.4	5.2	+ .06	6663	398	6.0	6265	94.0
Other Hemorrhage	1363	457	33.5	5300	299	5.6	27.9	29.0	+ .36	6663	756	11.3	5907	88.7
Vomiting day of Bomb	1363	428	31.4	5300	246	4.6	26.8	29.2	+ .36	6663	674	10.1	5989	89.9
Nausea	1363	512	37.6	5300	533	10.1	27.5	24.9	+ .31	6663	1045	15.7	5618	84.3
Malaise	1363	736	54.0	5300	2049	38.7	15.3	10.2	+ .13	6663	2785	41.8	3738	58.2
Anorexia	1363	721	52.9	5300	1337	25.2	27.7	19.7	+ .24	6663	2058	30.9	4605	69.1
Cramps	1363	79	5.8	5300	222	4.2	1.6	2.6	+ .03	6663	301	4.5	6362	95.5
Fever	1363	404	29.6	5300	369	7.0	22.6	23.3	+ .29	6663	773	11.6	5890	88.4

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Table 32N. The incidence of other symptoms among 1206 individuals with epilation and/or purpura as compared with the incidence of other symptoms among 5221 individuals with neither epilation nor purpura. People within a distance of 5000 meters.

Individuals who were living twenty days after the bombing.

Symptoms	Cases with Epilation and/or Purpura			Cases with Neither Epilation nor Purpura			Difference in Percentage	Critical Ratio	ϕ	All Cases				
	Total	With Symptoms		Total	With Symptoms					Total	With Symptoms		With Symptoms	
		No.	%		No.	%					No.	%	No.	%
Oropharyngeal Lesions	1206	639	53.0	5221	640	12.3	40.7	31.9	+.40	6427	1279	19.9	5148	80.1
Necrotic Gingivitis	1206	59	4.9	5221	21	0.4	4.5	12.7	+.16	6427	80	1.2	6347	98.8
Diarrhea	1206	591	49.0	5221	1550	29.7	19.3	12.8	+.16	6427	2141	33.3	4286	66.7
Bloody Diarrhea	1206	101	8.4	5221	170	3.3	5.1	8.0	+.10	6427	271	4.2	6156	95.8
Other Hemorrhage	1206	294	24.4	5221	214	4.1	20.3	23.5	+.29	6427	508	7.9	5919	92.1
Vomiting Day of bomb	1206	367	30.4	5221	376	7.2	23.2	22.7	+.28	6427	743	11.6	5684	88.4
Nausea	1206	473	39.2	5221	646	12.4	26.8	22.2	+.28	6427	1119	17.4	5308	82.6
Malaise	1206	658	54.6	5221	1426	27.3	27.3	18.2	+.23	6427	2084	32.4	4343	67.6
Anorexia	1206	598	49.6	5221	1135	21.7	27.9	19.7	+.25	6427	1733	27.0	4694	73.0
Cramps	1206	56	4.6	5221	80	1.5	3.1	6.8	+.08	6427	136	2.1	6291	97.9
Fever	1206	190	15.8	5221	207	4.0	11.8	15.3	+.19	6427	397	6.2	6030	93.8

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Table 33H. Mean white blood cell counts and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Weeks From Bombing	Exposure Groups															
	A		B		C		D		E		F		G		H	
	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC
1	1	6200	5	3260	9	6433	6	9350	2	4000	0	-	0	-	0	-
2	4	2775	5	4640	4	7100	4	7325	1	6300	0	-	0	-	0	-
3	26	2058	26	4031	25	5452	12	6400	2	4000	2	8100	0	-	0	-
4	70	1790	72	2278	34	4403	6	5483	7	7271	2	3450	3	4567	0	-
5	95	2304	108	3117	93	5023	89	5760	31	7187	12	5508	16	5681	46	5604
6	60	3743	112	4068	207	5638	312	6248	127	6023	31	5897	19	6126	15	5407
7	38	5068	33	4867	60	6313	32	5591	4	5325	20	5640	7	6814	7	7357
8	12	5092	14	5086	18	5906	8	6963	4	5925	2	7075	1	3800	2	9550
9	4	6400	14	6836	29	7928	8	8825	1	7500	1	7900	2	6150	1	6100
10	3	6867	11	7027	14	8686	9	8811	3	8767	3	6600	2	6100	1	6200
11	3	9700	40	6955	65	7518	33	8621	5	8260	3	5900	3	7233	2	9550
12 & over	71	6970	230	7085	400	7383	275	7797	99	8057	69	9007	24	7646	38	7161

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Table 33N. White blood cell counts. Means and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Week From Bombing	Exposure Group															
	A		B		C		D		E		F		G		H	
	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC	No.	Mean WBC
1	-	-	5	5020	-	-	-	-	-	-	1	3800	-	-	-	-
2	-	-	1	800	3	4300	-	-	-	-	1	9800	-	-	-	-
3	13	3523	23	3452	21	4105	12	5825	3	8233	1	900	-	-	-	-
4	32	2347	70	3154	74	3927	16	4919	5	7540	7	5314	9	7378	13	6285
5	26	4008	107	4431	106	4882	20	5550	29	7159	35	6617	16	7000	13	7008
6	14	5614	67	4288	63	4887	18	5778	9	5789	22	7727	7	7514	2	4850
7	9	5789	35	5426	22	4405	8	4538	2	9550	2	8700	4	5700	2	8750
8	10	7360	26	5035	34	6521	11	6173	7	9500	5	7180	-	-	1	7300
9	32	8500	81	7154	84	7481	24	7871	19	7663	8	6938	4	8800	-	-
10	13	8200	59	6898	60	7510	13	7908	17	6682	27	6822	12	8067	-	-
11	6	9933	65	7705	64	7392	22	8091	34	7476	35	8280	15	9227	16	9481
and 12 over	6	8017	53	7743	23	7165	12	9292	7	11671	13	7177	3	8633	47	8283

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Table 34H. Distribution of white blood cell counts by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

White Blood Cell Count	Exposure Group A								Exposure Group B							
	Weeks 2,3,4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		Weeks 2,3,4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 500	22	11.3	0	0	1	2.0	0	7.1	15	0	0	0	0	0	0	0
500- 999	37	19.0	1	1.7	1	2.0	0	10	27	12.8	2	1.8	1	2.1	0	0
1000- 1999	51	26.2	12	20.0	2	4.0	0	0	41	19.4	21	18.8	3	6.4	0	0
2000- 2999	36	18.5	11	18.3	4	8.0	3	3.7	38	18.0	16	14.3	3	6.4	4	1.4
3000- 3999	23	11.8	13	21.7	9	18.0	9	11.1	35	16.6	23	20.5	12	25.5	10	3.4
4000- 4999	16	8.2	5	8.3	8	16.0	8	9.9	22	10.4	17	15.2	11	23.4	39	13.2
5000- 5999	4	2.1	10	16.7	8	16.0	11	13.6	12	5.7	11	9.8	6	12.8	52	17.6
6000- 6999	2	1.0	4	6.7	7	14.0	15	18.5	10	4.7	9	8.0	3	6.4	57	19.3
7000- 7999	2	1.0	1	1.7	6	12.0	11	13.6	0	0	7	6.3	1	2.1	39	13.2
8000- 8999	1	0.5	1	1.7	3	6.0	7	8.6	4	1.9	2	1.8	4	8.5	40	13.6
9000- 9999	0	0	2	3.3	0	0	4	4.9	3	1.4	2	1.8	0	0	28	9.5
10000-11999	0	0	0	0	0	0	8	9.9	0	0	2	1.8	2	4.3	15	5.1
12000-13999	0	0	0	0	1	2.0	2	2.5	4	1.9	0	0	1	2.1	6	2.0
14000-15999	0	0	0	0	0	0	3	3.7	0	0	0	0	0	0	2	0.7
16000-17999	1	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18000-19999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7
20000 & over	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.3
Total	195	100.0	60	100.0	50	100.0	81	100.0	211	100.0	112	100.0	47	100.0	295	100.0
Mean	2096		3743		5074		7040		2979		4068		4932		7053	
Standard Deviation	1783		2031		2273		2804		2417		2188		2520		2503	
Standard Dev. of Mean	128		264		325		314		167		208		372		146	

Table 34H. (continued)

White Blood Cell Counts	Exposure Group C								Exposure Group D							
	Weeks 2,3,4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		Weeks 2,3,4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 500	3	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
500- 999	3	1.9	2	1.0	0	0	0	0	1	0.9	0	0	0	0	0	0
1000- 1999	13	8.3	6	2.9	2	2.6	0	0	3	2.7	2	0.6	0	0	0	0
2000- 2999	12	7.7	11	5.3	4	5.1	6	1.2	6	5.4	10	3.2	2	5.0	3	0.9
3000- 3999	23	14.7	25	12.1	8	10.3	20	3.9	11	9.9	22	7.1	2	5.0	5	1.5
4000- 4999	24	15.4	34	16.4	17	21.8	49	9.6	15	13.5	49	15.7	9	22.5	24	7.4
5000- 5999	29	18.6	37	17.9	11	14.1	84	16.5	24	21.6	68	21.8	9	22.5	49	15.1
6000- 6999	17	10.9	30	14.5	15	19.2	80	15.7	18	16.2	58	18.6	7	17.5	60	18.5
7000- 7999	16	10.3	30	14.5	4	5.1	79	15.6	17	15.3	42	13.5	5	12.5	49	15.1
8000- 8999	5	3.2	24	11.6	5	6.4	83	16.3	7	6.3	28	9.0	5	12.5	50	15.4
9000- 9999	3	1.9	6	2.9	2	2.6	48	9.4	2	1.8	22	7.1	0	0	29	8.9
10000-11999	5	3.2	1	0.5	6	7.7	33	6.5	6	5.4	8	2.6	1	2.5	30	9.2
12000-13999	3	1.9	0	0	3	3.8	14	2.8	1	0.9	1	0.3	0	0	8	2.5
14000-15999	0	0	1	0.5	0	0	6	1.2	0	0	1	0.3	0	0	10	3.1
16000-17999	0	0	0	0	1	1.3	1	0.2	0	0	1	0.3	0	0	3	0.9
18000-19999	0	0	0	0	0	0	1	0.2	0	0	0	0	0	0	5	1.5
20000 & over	0	0	0	0	0	0	4	0.8	0	0	0	0	0	0	0	0
Total	156	100.0	207	100.0	78	100.0	508	100.0	111	100.0	312	100.0	40	100.0	325	100.0
Mean	5010		5638		6219		7467		5870		6248		5865		7934	
Standard Deviation	2555		2121		2871		2969		2224		2083		1833		2935	
Standard Dev. of Mean	205		148		327		132		212		118		294		163	

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Table 34H. (continued)

White Blood Cell Count	Exposure Groups E, F & G								Exposure Group H (All weeks)	
	Weeks 2,3,4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		No.	%
	No.	%	No.	%	No.	%	No.	%		
Under 500	0	0	0	0	0	0	0	0	0	0
500- 999	0	0	0	0	0	0	0	0	0	0
1000- 1999	0	0	0	0	0	0	0	0	0	0
2000- 2999	4	5.3	10	5.6	0	0	1	0.5	2	1.8
3000- 3999	7	9.2	22	12.4	3	7.9	3	1.4	6	5.4
4000- 4999	11	14.5	32	18.1	10	26.3	17	7.9	20	17.9
5000- 5999	14	18.4	33	18.6	8	21.1	26	12.1	24	21.4
6000- 6999	12	15.8	31	17.5	8	21.1	40	18.6	26	23.2
7000- 7999	12	15.8	17	9.6	5	13.2	34	15.8	13	11.6
8000- 8999	6	7.9	11	6.2	2	5.3	28	13.0	8	7.1
9000- 9999	4	5.3	11	6.2	2	5.3	14	6.5	6	5.4
10000-11999	5	6.6	7	4.0	0	0	25	11.6	6	5.4
12000-13999	0	0	2	1.1	0	0	12	5.6	0	0
14000-15999	1	1.3	0	0	0	0	10	4.7	1	0.9
16000-17999	0	0	1	0.6	0	0	4	1.9	0	0
18000-19999	0	0	0	0	0	0	1	0.5	0	0
20000 & over	0	0	0	0	0	0	0	0	0	0
Total	76	100.0	177	100.0	38	100.0	215	100.0	112	100.0
Mean	6340		6012		5879		8229		6366	
Standard Deviation	2385		2334		1526		3063		1988	
Standard Dev of Mean	275		176		251		209		189	

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Table 34W. Distribution of white blood cell counts by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

White Blood Cell Count	Exposure Group A								Exposure Group B							
	Weeks 2,3,4, & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		Weeks 2,3,4, & 5		Week 6		Weeks 7 & 8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 500	2	2.8	0	0	0	0	0	0	7	3.5	0	0	0	0	0	0
500- 999	12	16.9	0	0	0	0	0	0	21	10.4	0	0	0	0	1	0.4
1000- 1999	15	21.1	0	0	1	5.3	0	0	28	13.9	6	9.0	0	0	0	0
2000- 2999	11	15.5	3	21.4	1	5.3	1	1.8	35	17.4	19	28.4	4	6.6	5	1.9
3000- 3999	11	15.5	3	21.4	4	21.1	2	3.5	23	11.4	6	9.0	10	16.4	11	4.3
4000- 4999	4	5.6	1	7.1	6	31.6	6	10.5	23	11.4	13	19.4	10	16.4	22	8.5
5000-55999	4	5.6	1	7.1	1	5.3	6	10.5	21	10.4	8	11.9	14	23.0	43	16.7
6000- 6999	7	9.9	2	14.3	1	5.3	9	15.8	19	9.5	7	10.4	14	23.0	59	22.9
7000- 7999	1	1.4	1	7.1	1	5.3	8	14.0	9	4.5	6	9.0	5	8.2	27	10.5
8000- 8999	2	2.8	1	7.1	0	0	5	8.8	8	4.0	0	0	3	4.9	32	12.4
9000- 9999	1	1.4	0	0	1	5.3	5	8.8	2	1.0	0	0	0	0	19	7.4
10000-11999	0	0	1	7.1	0	0	5	8.8	1	0.5	2	3.0	1	1.6	20	7.8
12000-13999	1	1.4	1	7.1	2	10.6	5	8.8	3	1.5	0	0	0	0	13	5.0
14000-15999	0	0	0	0	0	0	2	3.5	0	0	0	0	0	0	3	1.2
16000-17999	0	0	0	0	0	0	1	1.8	0	0	0	0	0	0	1	0.4
18000-19999	0	0	0	0	0	0	1	1.8	1	0.5	0	0	0	0	0	0
20000& over	0	0	0	0	1	5.3	1	1.8	0	0	0	0	0	0	2	0.8
Total	71	100.0	14	100.0	19	100.0	57	100.0	201	100.0	67	100.0	61	100.0	258	100.0
Mean	3170		5614		6616		8532		3856		4288		5259		7355	
Standard Deviation	2493		3118		5878		4001		2781		2112		1687		2873	
Standard Dev of Mean	298		865		1385		535		197		260		218		179	

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Table 34N. (continued)

White Blood Cell Count	Exposure Group C								Exposure Group D							
	Weeks 2, 3, 4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		Weeks 2, 3, 4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 500	2	1.0	0	0	0	0	0	0	2	4.2	0	0	0	0	0	0
500- 999	12	5.9	0	0	1	1.8	0	0	1	2.1	0	0	0	0	0	0
1000- 1999	26	12.7	7	11.1	0	0	0	0	6	12.5	2	11.1	0	0	0	0
2000- 2999	30	14.7	12	19.0	7	12.5	2	0.9	3	6.3	4	22.2	1	5.3	0	0
3000- 3999	21	10.3	7	11.1	10	17.9	6	2.6	5	10.4	2	11.1	2	10.5	1	1.4
4000- 4999	33	16.2	11	17.5	14	25.0	30	13.0	4	8.3	1	5.6	9	47.4	2	2.8
5000- 5999	30	14.7	6	9.5	3	5.4	23	10.0	5	10.4	2	11.1	2	10.5	10	14.1
6000- 6999	16	7.8	7	11.1	8	14.3	49	21.2	7	14.6	1	5.6	2	10.5	16	22.5
7000- 7999	15	7.4	6	9.5	3	5.4	46	19.9	5	10.4	2	11.1	0	0	12	16.9
8000- 8999	8	3.9	1	1.6	3	5.4	20	8.7	3	6.3	0	0	2	10.5	9	12.7
9000- 9999	3	1.5	3	4.8	3	5.4	22	9.5	3	6.3	2	11.1	0	0	9	12.7
10000-11999	3	1.5	2	3.2	3	5.4	20	8.7	3	6.3	0	0	0	0	8	11.3
12000-13999	4	2.0	0	0	0	0	12	5.2	0	0	0	0	0	0	0	0
14000-15999	1	0.5	1	1.6	0	0	0	0	1	2.1	2	11.1	1	5.3	2	2.8
16000-17999	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	1	1.4
18000-19999	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20000 & over	0	0	0	0	1	1.8	0	0	0	0	0	0	0	0	1	1.4
Total	204	100.0	63	100.0	56	100.0	231	100.0	48	100.0	18	100.0	19	100.0	71	100.0
Mean	4447		4887		5689		7432		5408		5778		5484		8186	
Standard Deviation	2741		2733		4337		2440		3246		4049		2690		3283	
Standard Dev of Mean	192		347		585		161		473		982		634		392	

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Table 34N. (continued)

White Blood Cell Count	Exposure Groups E, F, & G								Exposure Group H (All Weeks)	
	Weeks 2, 3, 4 & 5		Week 6		Weeks 7 & 8		Weeks 9 and over		No.	%
	No.	%	No.	%	No.	%	No.	%		
Under 500	1	0.9	0	0	0	0	0	0	0	0
500- 999	2	1.9	0	0	0	0	0	0	0	0
1000- 1999	2	1.9	3	7.9	0	0	0	0	0	0
2000- 2999	2	1.9	1	2.6	0	0	0	0	0	0
3000- 3999	6	5.7	1	2.6	1	5.0	4	2.1	1	1.1
4000- 4999	10	9.4	3	7.9	1	5.0	9	4.6	3	3.2
5000- 5999	22	20.8	5	13.2	3	15.0	30	15.5	15	16.0
6000- 6999	13	12.3	6	15.8	4	20.0	39	20.1	22	23.4
7000- 7999	16	15.1	6	15.8	5	25.0	34	17.5	15	16.0
8000- 8999	10	9.4	4	10.5	1	5.0	29	14.9	10	10.6
9000- 9999	7	6.6	3	7.9	2	10.0	21	10.8	8	8.5
10000-11999	7	6.6	2	5.3	1	5.0	18	9.3	12	12.8
12000-13999	5	4.7	2	5.3	1	5.0	3	1.5	6	6.4
14000-15999	2	1.9	1	2.6	0	0	4	2.1	1	1.1
16000-17999	1	0.9	0	0	0	0	1	0.5	0	0
18000-19999	0	0	1	2.6	0	0	1	0.5	1	1.1
20000 & over	0	0	0	0	1	5.0	1	0.5	0	0
Total	106	100.0	38	100.0	20	100.0	194	100.0	94	100.0
Mean	6867		7229		8085		7807		7961	
Standard Deviation	3034		3508		3628		2919		2517	
Standard Dev of Mean	296		577		832		210		261	

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Table 35H. Comparison of the first white blood cell count with the second white blood cell count made on the same individuals within 2 to 6 weeks of bombing.

Individuals who were living twenty days after the bombing.
Exposure Groups A and B

First W.B.C.	SECOND W.B.C.			Total
	Under 3000	3000- 3999	4000 or over	
Under 3000	119	18	16	153
3000-3999	9	5	5	19
4000 or over	9	7	17	33
Total	137	30	38	205

Exposure Groups C and D

Under 3000	12	5	5	22
3000-3999	1	4	6	11
4000 or over	4	7	46	57
Total	17	16	57	90

Exposure Group E, F, and G

Under 3000	2	0	2	4
3000-3999	0	2	1	3
4000 or over	0	0	14	14
Total	2	2	17	21

Exposure Group H

Under 3000	0	1	0	1
3000-3999	0	0	3	3
4000 or over	0	1	23	24
Total	0	2	26	28

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Table 35M.

Comparison of the first white blood cell count with the second white blood cell count made on the same individuals within 2 to 6 weeks of the bombing.

Individuals who were living twenty days after the bombing.

Exposure Groups A and B

First w.B.C.	SECOND W.B.C.			Total
	Under 3000	3000- 3999	4000 or over	
Under 3000	54	9	14	77
3000-3999	2	2	3	7
4000 or over	5	1	13	19
Total	61	12	30	103

Exposure Groups C and D

Under 3000	30	5	4	39
3000-3999	4	2	2	8
4000 or over	3	3	27	33
Total	37	10	33	80

Exposure Groups E, F, and G

Under 3000	2	0	1	3
3000-3999	1	0	1	2
4000 or over	0	0	7	7
Total	3	0	9	12

Exposure Group H

Under 3000	0	0	0	0
3000-3999	0	0	0	0
4000 or over	0	0	2	2
Total	0	0	2	2

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Table 36H. Mean white blood cell counts within a few weeks of the bomb as compared with mean counts made on the same individuals several weeks later.

Individuals who were living twenty days after the bombing.

Exposure Groups A & B					Exposure Groups C & D					Exposure Groups E, F & G				
Number of Cases	1st W.B.C.		Repeat WBC		Number of Cases	1st W.B.C.		Repeat WBC		Number of Cases	1st W.B.C.		Repeat WBC	
	Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.		Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.		Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.
29	2-4	2986	5-7	3497	26	2-4	6273	5-7	5027	3	2-4	5933	5-7	7300
40	2-4	2390	8-10	7395	14	2-4	4293	8-10	5729	3	2-4	5067	8-10	5767
32	2-4	2847	11-13	6781	10	2-4	5340	11-13	7190	1	2-4	4200	11-13	8400
3	2-4	2933	14-16	6800	3	2-4	4167	14-16	7033	1	2-4	4800	14-16	10500
104	2-4	2713	5-16	6102	53	2-4	5455	5-16	5734	8	2-4	5250	5-16	7263
56	5-6	2930	7-8	5861	22	5-6	3873	7-8	5532	3	5-6	4667	7-8	6933
29	5-6	2834	9-10	6403	13	5-6	4015	9-10	6292	5	5-6	5900	9-10	6040
53	5-6	2700	11-12	6625	15	5-6	5413	11-12	7560	2	5-6	4200	11-12	8750
11	5-6	3227	13-14	6518	11	5-6	4300	13-14	6655	0	5-6	-	13-14	-
4	5-6	2475	15-16	5000	0	5-6	-	15-16	-	0	5-6	-	15-16	-
153	5-6	2842	7-16	6253	61	5-6	4359	7-16	6395	10	5-6	5190	7-16	6750

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Table 36W. Mean white blood cell counts within a few weeks of the bomb as compared with mean counts made on the same individuals several weeks later.

Individuals who were living twenty days after the bombing.

Exposure Groups A & B					Exposure Groups C & D					Exposure Groups E, F & G				
Number of Cases	1st W.B.C.		Repeat WBC		Number of Cases	1st W.B.C.		Repeat WBC		Number of Cases	1st W.B.C.		Repeat WBC	
	Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.		Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.		Weeks From Bomb	Mean W.B.C.	Weeks From Bomb	Mean W.B.C.
16	2-4	2750	5-7	6388	12	2-4	3533	5-7	3967	2	2-4	7150	5-7	7450
22	2-4	3177	8-10	7168	18	2-4	5111	8-10	7589	0	2-4	-	8-10	-
7	2-4	4500	11-13	7057	9	2-4	3511	11-13	7867	1	2-4	9800	11-13	12000
12	2-4	2175	14-16	8317	15	2-4	3213	14-16	6513	1	2-4	900	14-16	16000
57	2-4	3009	5-16	7177	54	2-4	3967	5-16	6531	4	2-4	6250	5-16	10725
19	5-6	2889	7-8	5989	13	5-6	5208	7-8	6815	2	5-6	2750	7-8	9750
10	5-6	4300	9-10	8590	15	5-6	4553	9-10	8413	3	5-6	5067	9-10	8900
12	5-6	2275	11-12	8408	11	5-6	2791	11-12	6918	2	5-6	4200	11-12	7400
15	5-6	4740	13-14	8700	7	5-6	3371	13-14	7257	2	5-6	5500	13-14	10600
1	5-6	1000	15-16	2900	1	5-6	6800	15-16	6700	0	5-6	-	15-16	-
57	5-6	3461	7-16	7614	47	5-6	4194	7-16	7413	9	5-6	4456	7-16	9133

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Table 37N. Comparison of white blood cell counts (weeks 2-6) in individuals with and without burns by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Individuals With Burns						Individuals Without Burns					
	Number of People	W.B.C. Under 3000		W.B.C. Under 4000		Mean WBC	Number of People	W.B.C. Under 3000		W.B.C. Under 4000		Mean WBC
		No.	%	No.	%			No.	%	No.	%	
A	179	123	68.7	150	83.8	2284	76	47	61.8	56	73.7	2954
B	245	129	52.7	171	69.8	3222	78	31	39.7	47	60.3	3781
C	220	30	13.6	58	26.4	5334	143	20	14.0	40	28.0	5420
D	325	17	5.2	40	12.3	6108	98	5	5.1	15	15.3	6285
E	125	5	4.0	19	15.2	6506	43	5	11.6	10	23.3	5572
F	41	2	4.9	8	19.5	5546	6	0	0	1	16.7	7433
G	36	2	5.5	5	13.9	5808	2	0	0	0	0	5950
H	111	2	1.8	8	7.2	6356	1	0	0	0	0	7500

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Table 37N. Comparison of white blood cell counts (weeks 2-6) in individuals with burns and individuals without burns by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Individuals With Burns						Individuals Without Burns					
	Number of People	W.B.C. Under 3000		W.B.C. Under 4000		Mean W.B.C.	Number of People	W.B.C. Under 3000		W.B.C. Under 4000		Mean W.B.C.
		No.	%	No.	%			No.	%	No.	%	
A	56	33	58.9	39	69.6	3436	29	10	34.5	18	62.1	3838
B	197	83	42.1	106	53.8	3974	71	33	46.5	39	54.9	3937
C	180	60	33.3	78	43.3	4569	87	29	33.3	39	44.8	4513
D	42	11	26.2	14	33.3	5781	24	7	29.2	11	45.8	5033
E	36	3	8.3	6	16.7	6778	10	0	0	0	0	7810
F	52	4	7.7	6	11.5	6958	14	3	21.4	4	28.6	6264
G	25	0	0	1	4.0	7616	7	1	14.3	1	14.3	5800
H	112	0	0	1	0.9	8076	2	0	0	0	0	4750

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Table 38H. Mean percentages of basophiles, eosinophiles, stabs, polymorphs, lymphocytes, and monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of Cases with Differential Counts	Mean Percentages						Mean W.B.C. of these Cases
			Basophiles	Eosino- philes	Stabs	Polymorphs	Lymphocytes	Monocytes	
A & B	2 - 6	72	0.5	0.1	9.5	35.0	46.2	4.8	2438
	7 -11	128	0.3	0.7	10.2	49.1	30.2	5.9	6334
	12 and over	263	0.4	3.8	5.5	52.3	29.8	5.6	7091
C & D	2 - 6	135	0.1	0.2	4.6	54.0	34.1	4.0	5054
	7 -11	169	0.4	0.1	8.0	49.7	33.9	4.2	7564
	12 and over	587	0.6	5.2	5.4	48.6	34.6	4.8	7601
E.F. & G	2 - 6	34	0.2	2.8	6.7	50.1	36.5	3.7	5600
	7 -11	35	1.1	1.3	8.3	44.4	36.0	5.5	6400
	12 and over	180	0.6	0.5	5.6	50.6	32.9	4.6	8530
H	All Weeks	96	0.4	0.9	3.9	51.7	35.3	4.4	6438

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Table 38N. Mean percentages of basophiles, eosinophiles, stabs, polymorphs, lymphocytes, and monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of cases With Differential Counts	Mean Percentages						Mean W.B.C. of these cases
			Basophiles	Eosino- philes	Stabs	Polymorphs	Lymphocytes	Monocytes	
A & B	2 - 6	29	0.8	1.4	10.5	31.6	45.5	8.2	2569
	7 -11	319	0.5	6.5	2.8	54.6	29.7	5.6	7672
	12 and over	62	0.5	0.9	1.0	55.5	31.0	4.7	8458
C & D	2 - 6	14	0.3	2.8	17.5	30.4	44.2	2.2	4543
	7 -11	307	0.4	3.4	1.7	56.9	30.3	4.7	7789
	12 and over	35	0.3	2.6	0.9	55.9	33.0	4.5	8229
E, F, & G	2 - 6	3	0.3	4.0	13.3	23.3	49.3	6.3	4433
	7 -11	172	0.3	0.2	0.8	56.4	32.3	4.7	7728
	12 and over	14	0.4	3.6	1.4	48.2	40.8	5.9	9564
H	All Weeks	67	0.6	1.3	2.4	49.2	34.7	4.3	8530

Table 39. The correlation between total white blood cell counts and percentages of each type of cell as measured by correlation coefficients.

Individuals who were living twenty days after the bombing.

City	Exposure Groups	Weeks From Bombing	Number of Cases	Correlation Coefficients (r)					
				Percent Basophiles Vs. Total WBC	Percent Eosinophiles Vs. Total WBC	Percent Stabs Vs. Total WBC	Percent Polymorphs Vs. Total WBC	Percent Lymphocytes Vs. Total WBC	Percent Monocytes Vs. Total WBC
HIROSHIMA	A, F, C, D	2-6	207	-.13	+ .20	-.16	+ .48	-.38	-.17
	A, B, C, D	12 & over	850	.00	+ .16	+ .03	+ .10	-.19	-.08
	H	All Weeks	96	+ .16	+ .27	+ .13	-.01	-.20	+ .03
NAGASAKI	A, B, C, D	2-6	43	-.03	+ .02	+ .34	+ .34	-.48	+ .01
	A, B, C, D	12 & over	97	-.06	-.08	+ .22	+ .20	-.13	-.25
	H	All Weeks	67	-.14	+ .13	+ .04	-.08	-.04	+ .08

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Table 40H. The mean number of basophiles, eosinophiles, stab cells, polymorphs, lymphocytes, and monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of Cases	Basophiles		Eosinophiles		Stabs		Polymorphs		Lymphocytes		Monocytes	
			Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean
A & B	2 - 6	72	8	3	45	11	226	54	1019	154	973	93	98	15
	7 -11	128	23	4	266	45	633	80	3185	177	1835	93	355	29
	12 and over	263	29	3	457	40	397	35	3777	119	2022	56	394	16
C & D	2 - 6	135	6	2	160	17	218	42	2814	119	1669	79	175	16
	7 -11	169	27	4	280	32	621	60	3868	173	2425	117	332	26
	12 and over	587	43	3	479	35	416	24	3725	76	2571	54	357	11
E, F, & G	2 - 6	34	10	6	161	35	383	107	2838	248	1993	159	205	33
	7 -11	35	66	20	368	191	506	103	2801	216	2246	347	382	132
	12 and over	180	44	7	479	67	495	57	4419	180	2692	94	378	20
H	All Weeks	96	26	6	286	46	269	58	3327	140	2227	141	283	26

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Table 40N. The mean number of basophiles, eosinophiles, stab cells, polymorphs, lymphocytes, and monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of Cases	Basophiles		Eosinophiles		Stabs		Polymorphs		Lymphocytes		Monocytes	
			Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean
A & B	2 - 6	29	26	11	29	9	295	84	1059	249	877	97	244	90
	7 -11	319	34	4	569	42	252	34	4242	133	2152	64	423	21
	12 and over	62	36	8	587	81	105	41	4810	325	2565	240	359	39
C & D	2 - 6	14	8	6	127	53	1062	521	1468	345	1647	285	114	44
	7 -11	307	32	5	474	37	157	31	4485	125	2294	61	358	17
	12 and over	35	32	10	450	121	87	35	4641	530	2672	279	356	45
E, F, & G	2 - 6	3	18	-	208	-	598	-	1263	-	1835	-	340	-
	7 -11	172	21	4	405	36	80	38	4370	133	2465	106	379	33
	12 and over	14	31	18	335	91	107	57	4879	1275	3730	938	502	123
H	All Weeks	67	51	10	773	106	211	67	4176	183	2949	222	371	41

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Table 41H. Basophiles. Distribution of number of Basophiles by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Basophiles	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2,3,4,5 & 6		Weeks 7,8,9,10,11		Weeks 12 and over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 20	67	93.1	97	75.8	177	67.3	123	91.1	120	71.0	360	61.3
20-39	0	0	4	3.1	1	0.4	2	1.5	2	1.2	5	0.9
40-59	2	2.8	2	1.6	23	8.7	4	3.0	12	7.1	41	7.0
60-79	0	0	10	7.8	21	8.0	4	3.0	11	6.5	53	9.0
80-99	1	1.4	4	3.1	16	6.1	0	0	10	5.9	41	7.0
100-119	1	1.4	4	3.1	9	3.4	1	0.7	3	1.8	21	3.6
120-139	0	0	2	1.6	5	1.9	0	0	3	1.8	11	1.9
140-159	0	0	1	0.8	2	0.8	0	0	1	0.6	14	2.4
160-179	0	0	2	1.6	2	0.8	0	0	5	3.0	11	1.9
180-199	1	1.4	1	0.8	4	1.5	0	0	0	0	10	1.7
200-249	0	0	1	0.8	3	1.1	1	0.7	2	1.2	9	1.5
250-299	0	0	0	0	0	0	0	0	0	0	4	0.7
300 & over	0	0	0	0	0	0	0	0	0	0	7	1.2
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean	7.5		22.5		29.3		6.3		26.5		42.8	
Standard Deviation	28.7		46.3		49.5		25.8		49.0		71.7	
Standard Dev of Mean	3.4		4.1		3.1		2.2		3.8		3.0	

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Table 41H. Basophiles. HIROSHIMA (continued)

No. Of Basophiles	Exposure Groups E, F, & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 20	30	88.2	22	62.9	115	63.9	72	75.0
20- 39	1	2.9	0	0	1	0.6	0	0
40- 59	1	2.9	1	2.9	11	6.1	4	4.2
60- 79	1	2.9	2	5.7	13	7.2	6	6.3
80- 99	0	0	1	2.9	13	7.2	5	5.2
100-119	0	0	1	2.9	9	5.0	2	2.1
120-139	0	0	1	2.9	5	2.8	3	3.1
140-159	0	0	1	2.9	1	0.6	1	1.0
160-179	1	2.9	0	0	5	2.8	1	1.0
180-199	0	0	1	2.9	2	1.1	1	1.0
200-249	0	0	2	5.7	0	0	0	0
250-299	0	0	2	5.7	1	0.6	0	0
300 & over	0	0	1	2.9	4	2.2	1	1.0
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	9.6		65.6		43.8		26.4	
Standard Deviation	31.6		114.2		96.8		55.5	
Standard Dev of Mean	5.5		19.6		7.2		5.7	

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Table 41E. Basophiles. Distribution of number of Basophiles by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Basophiles	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 20	21	72.4	224	70.2	45	72.6	12	85.7	223	72.6	24	68.6
20- 39	3	10.3	3	0.9	0	0	1	7.1	3	1.0	0	0
40- 59	1	3.4	21	6.6	0	0	0	0	16	5.2	1	2.9
60- 79	0	0	15	4.7	6	9.7	1	7.1	23	7.5	4	11.4
80- 99	1	3.4	15	4.7	2	3.2	0	0	9	2.9	4	11.4
100-119	0	0	6	1.9	2	3.2	0	0	9	2.9	0	0
120-139	2	6.9	15	4.7	1	1.6	0	0	6	2.0	1	2.9
140-159	0	0	3	0.9	1	1.6	0	0	3	1.0	0	0
160-179	0	0	5	1.6	1	1.6	0	0	5	1.6	0	0
180-199	0	0	3	0.9	1	1.6	0	0	2	0.7	0	0
200-249	0	0	3	0.9	1	1.6	0	0	0	0	0	0
250-299	1	3.4	1	0.3	1	1.6	0	0	2	0.7	1	2.9
300 & over	0	0	5	1.6	1	1.6	0	0	6	2.0	0	0
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	25.7		34.3		36.1		7.7		32.3		31.7	
Standard Deviation	55.7		72.2		64.8		20.4		80.9		55.9	
Standard Dev of Mean	10.5		4.1		8.3		5.6		4.6		9.6	

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Table 41N, Basophiles. (continued)

No. of Basophiles	Exposure Groups E, F, & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 20	2	66.7	136	79.1	11	78.6	42	62.7
20- 39	0	0	0	0	0	0	0	0
40- 59	1	33.3	10	5.8	0	0	2	3.0
60- 79	0	0	8	4.7	0	0	5	7.5
80- 99	0	0	6	3.5	1	7.1	4	6.0
100-119	0	0	4	2.3	0	0	0	0
120-139	0	0	1	0.6	0	0	5	7.5
140-159	0	0	0	0	1	7.1	2	3.0
160-179	0	0	3	1.7	0	0	1	1.5
180-199	0	0	1	0.6	1	7.1	2	3.0
200-249	0	0	1	0.6	0	0	2	3.0
250-299	0	0	1	0.6	0	0	0	0
300 & over	0	0	1	0.6	0	0	2	3.0
Total	3	100.0	172	100.0	14	100.0	67	100.0
Mean	17.7		21.3		31.4		51.3	
Standard Deviation	-		50.6		64.0		82.1	
Standard Dev of Mean	-		3.9		17.8		10.1	

HIROSHIMA

Table 42H. Eosinophiles. Distribution of number of Eosin. by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Number of Eosinophiles	Exposure Groups A & B						Exposure C & D					
	Weeks		Weeks		Weeks		Weeks		Weeks		Weeks	
	2,3,4,5 & 6		7,8,9,10,11		12 & over		2,3,4,5 & 6		7,8,9,10,11		12 & over	
	No	%	No	%	No	%	No	%	No	%	No	%
Under 50	51	70.8	43	33.6	39	14.8	52	38.5	51	30.2	85	14.5
50-99	8	11.1	22	17.2	29	11.0	15	11.1	22	13.0	78	13.3
100-199	10	13.9	19	14.8	43	16.3	31	23.0	37	21.9	84	14.3
200-299	2	2.8	12	9.4	33	12.5	11	8.1	14	8.3	71	12.1
300-399	0	0	12	9.4	26	9.9	8	5.9	12	7.1	65	11.1
400-499	0	0	7	5.5	19	7.2	10	7.4	4	2.4	38	6.5
500-599	0	0	2	1.6	12	4.6	5	3.7	4	2.4	29	4.9
600-699	1	1.4	0	0	13	4.9	1	0.7	7	4.1	22	3.7
700-799	0	0	2	1.6	9	3.4	0	0	2	1.2	18	3.1
800-899	0	0	0	0	7	2.7	0	0	1	0.6	18	3.1
900-999	0	0	0	0	3	1.1	1	0.7	0	0	11	1.9
1000-1099	0	0	1	0.8	1	0.4	0	0	2	1.2	11	1.9
1100-1199	0	0	0	0	5	1.9	0	0	4	2.4	6	1.0
1200-1299	0	0	2	1.6	4	1.5	1	0.7	0	0	8	1.4
1300-1399	0	0	1	0.8	3	1.1	0	0	2	1.2	4	0.7
1400-1499	0	0	0	0	2	0.8	0	0	1	0.6	5	0.9
1500-1599	0	0	0	0	4	1.5	0	0	0	0	6	1.0
1600-1699	0	0	1	0.8	2	0.8	0	0	1	0.6	4	0.7
1700-1799	0	0	0	0	1	0.4	0	0	4	2.4	6	1.0
1800-1899	0	0	1	0.8	1	0.4	0	0	1	0.6	4	0.7
1900-1999	0	0	0	0	0	0	0	0	0	0	1	0.2
2000-2499	0	0	0	0	2	0.8	0	0	0	0	3	0.5
2500-2999	0	0	2	1.6	3	1.1	0	0	0	0	1	0.2
3000 & over	0	0	1	0.8	2	0.8	0	0	0	0	9	1.5
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean	45.4		266.2		456.7		160.3		279.7		478.9	
Standard Deviation	92.9		501.6		643.9		199.1		410.6		846.8	
Standard Dev of Mean	11.0		44.5		39.8		17.2		31.7		35.0	

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Table 42M. Eosinophils (continued) HIROSHIMA

Number of Eosinophils	Exposure Groups E, F, & G						Exposure Group H	
	Weeks 2, 3, 4, 5, 6		Weeks 7, 8, 9, 10, 11		Weeks 12 & over		All Weeks	
	No	%	No	%	No	%	No	%
Under 50	10	29.4	9	25.7	26	14.4	23	24.0
50-99	8	23.5	7	20.0	16	8.9	13	13.5
100-199	6	17.6	10	28.6	35	19.4	17	17.7
200-299	4	11.8	3	8.6	17	9.4	11	11.5
300-399	3	8.8	0	0	23	12.8	13	13.5
400-499	0	0	1	2.9	15	8.3	9	9.4
500-599	1	2.9	1	2.9	14	7.8	3	3.1
600-699	0	0	1	2.9	4	2.2	0	0
700-799	1	2.9	1	2.9	3	1.7	1	1.0
800-899	1	2.9	0	0	3	1.7	2	2.1
900-999	0	0	0	0	5	2.8	0	0
1000-1099	0	0	0	0	2	1.1	0	0
1100-1199	0	0	1	2.9	2	1.1	0	0
1200-1299	0	0	0	0	2	1.1	0	0
1300-1399	0	0	0	0	2	1.1	0	0
1400-1499	0	0	0	0	0	0	1	1.0
1500-1599	0	0	0	0	0	0	0	0
1600-1699	0	0	0	0	0	0	0	0
1700-1799	0	0	0	0	0	0	0	0
1800-1899	0	0	0	0	3	1.7	1	1.0
1900-1999	0	0	0	0	0	0	0	0
2000-2499	0	0	0	0	5	2.8	1	1.0
2500-2999	0	0	0	0	1	0.6	0	0
3000 & over	0	0	1	2.9	2	1.1	1	1.0
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	160.7		367.9		479.2		285.5	
Standard Deviation	200.9		1115.6		899.4		447.5	
Standard Dev of Mean	35.0		191.3		67.2		45.7	

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Table 42N. Eosinophiles. Distribution of number of Eosinophiles by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Eosinophiles	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 50	23	79.3	73	22.9	8	12.9	7	50.0	58	18.9	2	5.7
50- 99	4	13.8	31	9.7	5	8.1	1	7.1	31	10.1	6	17.1
100- 199	2	6.9	41	12.9	6	9.7	5	35.7	55	17.9	6	17.1
200- 299	0	0	31	9.7	6	9.7	0	0	29	9.4	4	11.4
300- 399	0	0	28	8.8	7	11.3	0	0	25	8.1	7	20.0
400- 499	0	0	21	6.6	7	11.3	0	0	22	7.2	1	2.9
500- 599	0	0	12	3.8	1	1.6	0	0	11	3.6	3	8.6
600- 699	0	0	9	2.8	2	3.2	0	0	13	4.2	0	0
700- 799	0	0	11	3.4	3	4.8	1	7.1	7	2.3	1	2.9
800- 899	0	0	7	2.2	2	3.2	0	0	10	3.3	1	2.9
900- 999	0	0	4	1.3	3	4.8	0	0	6	2.0	1	2.9
1000-1099	0	0	6	1.9	1	1.6	0	0	2	0.7	2	5.7
1100-1199	0	0	6	1.9	2	3.2	0	0	3	1.0	0	0
1200-1299	0	0	5	1.6	2	3.2	0	0	5	1.6	0	0
1300-1399	0	0	2	0.6	1	1.6	0	0	2	0.7	0	0
1400-1499	0	0	3	0.9	2	3.2	0	0	2	0.7	0	0
1500-1599	0	0	1	0.3	0	0	0	0	5	1.6	0	0
1600-1699	0	0	0	0	1	1.6	0	0	1	0.3	0	0
1700-1799	0	0	1	0.3	0	0	0	0	5	1.6	0	0
1800-1899	0	0	2	0.6	1	1.6	0	0	2	0.7	0	0
1900-1999	0	0	3	0.9	0	0	0	0	0	0	0	0
2000-2499	0	0	11	3.4	0	0	0	0	6	2.0	0	0
2500-2999	0	0	2	0.6	1	1.6	0	0	6	2.0	0	0
3000 & over	0	0	9	2.8	1	1.6	0	0	1	0.3	1	2.9
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	28.6		569.4		587.3		126.9		474.2		450.1	
Standard Deviation	44.9		756.7		632.0		189.2		650.9		703.8	
Standard Dev. of Mean	8.5		42.4		80.9		52.5		37.2		120.7	

Table 42N. Eosinophiles. Nagasaki. (continued)

No. of Eosinophiles	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All weeks	
	No.	%	No.	%	No.	%	No.	%
Under 50	1	33.3	24	14.0	3	21.4	3	4.5
50- 99	1	33.3	24	14.0	1	7.1	3	4.5
100- 199	0	0	24	14.0	2	14.3	8	11.9
200- 299	0	0	17	9.9	3	21.4	8	11.9
300- 399	0	0	17	9.9	1	7.1	7	10.4
400- 499	0	0	15	8.7	0	0	1	1.5
500- 599	1	33.3	16	9.3	0	0	6	9.0
600- 699	0	0	7	4.1	1	7.1	6	9.0
700- 799	0	0	9	5.2	1	7.1	4	6.0
800- 899	0	0	2	1.2	0	0	2	3.0
900- 999	0	0	1	0.6	2	14.3	3	4.5
1000-1099	0	0	3	1.7	0	0	3	4.5
1100-1199	0	0	1	0.6	0	0	1	1.5
1200-1299	0	0	3	1.7	0	0	1	1.5
1300-1399	0	0	1	0.6	0	0	2	3.0
1400-1499	0	0	1	0.6	0	0	2	3.0
1500-1599	0	0	2	1.2	0	0	0	0
1600-1699	0	0	3	1.7	0	0	1	1.5
1700-1799	0	0	0	0	0	0	0	0
1800-1899	0	0	0	0	0	0	1	1.5
1900-1999	0	0	0	0	0	0	0	0
2000-2499	0	0	1	0.6	0	0	2	3.0
2500-2999	0	0	0	0	0	0	1	1.5
3000 & over	0	0	1	0.6	0	0	2	3.0
Total	3	100.0	172	100.0	14	100.0	67	100.0
Mean	207.7		404.8		334.6		773.0	
Standard Deviation	-		476.2		327.7		861.1	
Standard Dev. of Mean			36.4		90.9		106.0	

Table 43H. Stabs. Distribution of number of stabs by exposure groups and by weeks from bombing.
 Individuals who were living twenty days after the bombing.

No. of Stabs	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 50	33	45.8	19	14.8	37	14.1	94	69.6	26	15.4	82	14.0
50- 99	6	8.3	8	6.3	31	11.8	3	2.2	10	5.9	59	10.1
100- 199	11	15.3	15	11.7	53	20.2	5	3.7	22	13.0	101	17.2
200- 299	6	8.3	12	9.4	42	16.0	5	3.7	18	10.7	88	15.0
300- 399	2	2.8	13	10.2	25	9.5	3	2.2	14	8.3	57	9.7
400- 499	3	4.2	10	7.8	15	5.7	6	4.4	17	10.1	39	6.6
500- 599	3	4.2	7	5.5	9	3.4	2	1.5	7	4.1	35	6.0
600- 699	3	4.2	9	7.0	14	5.3	3	2.2	5	3.0	32	5.5
700- 799	0	0	7	5.5	4	1.5	2	1.5	5	3.0	21	3.6
800- 899	3	4.2	3	2.3	1	0.4	0	0	3	1.8	15	2.6
900- 999	1	1.4	1	0.8	7	2.7	1	0.7	6	3.6	16	2.7
1000-1099	0	0	5	3.9	4	1.5	0	0	4	2.4	5	0.9
1100-1199	0	0	0	0	2	0.8	3	2.2	8	4.7	9	1.5
1200-1299	0	0	3	2.3	5	1.9	1	0.7	5	3.0	3	0.5
1300-1399	0	0	2	1.6	0	0	0	0	1	0.6	1	0.2
1400-1499	0	0	1	0.8	2	0.8	2	1.5	1	0.6	1	0.2
1500-1599	0	0	2	1.6	1	0.4	1	0.7	0	0	2	0.3
1600-1699	0	0	2	1.6	2	0.8	0	0	1	0.6	2	0.3
1700-1799	0	0	1	0.8	1	0.4	0	0	3	1.8	2	0.3
1800-1899	0	0	2	1.6	1	0.4	2	1.5	2	1.2	4	0.7
1900-1999	0	0	0	0	0	0	0	0	0	0	2	0.3
2000-2499	0	0	2	1.6	4	1.5	1	0.7	6	3.6	1	0.2
2500-2999	0	0	1	0.8	1	0.4	0	0	1	0.6	2	0.3
3000 & over	1	1.4	3	2.3	2	0.8	1	0.7	4	2.4	8	1.4
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean	226		633		397		218		621		416	
Standard Deviation	451		905		562		485		780		586	
Standard Dev. of Mean	54		80		35		42		60		24	

Table 43H. Stabs. HIROSHIMA (Continued)

No. of Stabs	Exposure Groups E F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 50	16	47.1	11	31.4	20	11.1	49	51.0
50- 99	1	2.9	0	0	19	10.6	4	4.2
100- 199	3	8.8	3	8.6	29	16.1	6	6.3
200- 299	2	5.9	4	11.4	29	16.1	9	9.4
300- 399	2	5.9	2	5.7	22	12.2	10	10.4
400- 499	2	5.9	4	11.4	9	5.0	4	4.2
500- 599	2	5.9	0	0	9	5.0	2	2.1
600- 699	0	0	2	5.7	4	2.2	4	4.2
700- 799	0	0	0	0	4	2.2	0	0
800- 899	1	2.9	1	2.9	6	3.3	1	1.0
900- 999	0	0	0	0	2	1.1	1	1.0
1000-1099	1	2.9	0	0	5	2.8	1	1.0
1100-1199	0	0	3	8.6	4	2.2	0	0
1200-1299	1	2.9	1	2.9	3	1.7	0	0
1300-1399	0	0	0	0	3	1.7	1	1.0
1400-1499	0	0	1	2.9	0	0	1	1.0
1500-1599	0	0	1	2.9	2	1.1	1	1.0
1600-1699	0	0	1	2.9	4	2.2	1	1.0
1700-1799	0	0	0	0	0	0	0	0
1800-1899	1	2.9	0	0	1	0.6	0	0
1900-1999	0	0	0	0	0	0	0	0
2000-2499	2	5.9	1	2.9	2	1.1	0	0
2500-2999	0	0	0	0	2	1.1	0	0
3000 & over	0	0	0	0	1	0.6	1	1.0
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	383		506		495		269	
Standard Deviation	616		600		767		512	
Standard Dev of Mean	107		103		57		58	

Table 43B. Stabs. Distribution of number of stabs by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Stabs	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2,3,4,5,& 6		Weeks 7,8,9,10,11		Weeks 12 & over		Weeks 2,3,4,5,& 6		Weeks 7,8,9,10,11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 50	15	51.7	207	64.9	46	74.2	5	35.7	235	76.5	26	74.3
50- 99	1	3.4	13	4.1	3	4.8	1	7.1	7	2.3	1	2.9
100- 199	3	10.3	16	5.0	5	8.1	0	0	9	2.9	3	8.6
200- 299	1	3.4	11	3.4	1	1.6	0	0	8	2.6	1	2.9
300- 399	0	0	8	2.5	1	1.6	0	0	9	2.9	1	2.9
400- 499	1	3.4	12	3.8	4	6.5	1	7.1	9	2.9	2	5.7
500- 599	4	13.8	4	1.3	0	0	0	0	6	2.0	0	0
600- 699	0	0	5	1.6	0	0	0	0	6	2.0	0	0
700- 799	0	0	6	1.9	0	0	1	7.1	2	0.7	0	0
800- 899	0	0	6	1.9	1	1.6	1	7.1	6	2.0	0	0
900- 999	2	6.9	2	0.6	0	0	2	14.3	2	0.7	1	2.9
1000-1099	0	0	5	1.6	0	0	0	0	0	0	0	0
1100-1199	0	0	4	1.3	0	0	0	0	2	0.7	0	0
1200-1299	0	0	4	1.3	0	0	0	0	0	0	0	0
1300-1399	0	0	3	0.9	0	0	0	0	0	0	0	0
1400-1499	0	0	4	1.3	0	0	1	7.1	0	0	0	0
1500-1599	1	3.4	0	0	0	0	0	0	1	0.3	0	0
1600-1699	1	3.4	2	0.6	0	0	0	0	0	0	0	0
1700-1799	0	0	2	0.6	0	0	0	0	0	0	0	0
1800-1899	0	0	1	0.3	0	0	0	0	0	0	0	0
1900-1999	0	0	0	0	0	0	0	0	1	0.3	0	0
2000-2499	0	0	1	0.3	1	1.6	1	7.1	2	0.7	0	0
2500-2999	0	0	0	0	0	0	0	0	0	0	0	0
3000 & over	0	0	3	0.9	0	0	1	7.1	2	0.7	0	0
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	295		252		105		1062		157		87	
Standard Deviation	447		605		320		1825		542		202	
Standard Dev. of Mean	84		34		41		521		31		35	

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Table 43N. Stabs. (Continued) NAGASAKI

Number of Stabs	Exposure Groups E, F, & G						Exposure Group H	
	Weeks 2,3,4,5,6		Weeks 7,8,9,10,11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 50	0	0	153	89.0	9	64.3	38	56.7
50- 99	0	0	2	1.2	1	7.1	9	13.4
100- 199	1	33.3	3	1.7	2	14.3	3	4.5
200- 299	0	0	3	1.7	0	0	7	10.4
300- 399	0	0	4	2.3	1	7.1	1	1.5
400- 499	0	0	1	0.6	0	0	1	1.5
500- 599	1	33.3	2	1.2	0	0	2	3.0
600- 699	0	0	0	0	0	0	2	3.0
700- 799	0	0	0	0	1	7.1	0	0
800- 899	0	0	2	1.2	0	0	0	0
900- 999	0	0	0	0	0	0	0	0
1000-1099	0	0	0	0	0	0	0	0
1100-1199	1	33.3	0	0	0	0	1	1.5
1200-1299	0	0	0	0	0	0	0	0
1300-1399	0	0	0	0	0	0	0	0
1400-1499	0	0	0	0	0	0	0	0
1500-1599	0	0	0	0	0	0	0	0
1600-1699	0	0	0	0	0	0	1	1.5
1700-1799	0	0	1	0.6	0	0	0	0
1800-1899	0	0	0	0	0	0	1	1.5
1900-1999	0	0	0	0	0	0	0	0
2000-2499	0	0	0	0	0	0	0	0
2500-2999	0	0	0	0	0	0	0	0
3000 & over	0	0	1	0.6	0	0	1	1.5
Total	3	100.0	172	100.0	14	100.0	67	100.0
Mean	598		80		107		211	
Standard Deviation	-		490		204		542	
Standard Dev. of Mean	-		38		57		67	

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HIROSHIMA

Table 44H. Polymorphs. Distribution of number of Polymorphs by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Polymorphs	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2-6		Weeks 7-11		Weeks 12 & over		Weeks 2-6		Weeks 7-11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 200	20	27.8	1	0.8	1	0.4	6	4.4	1	0.6	1	0.2
200-399	9	12.5	1	0.8	0	0	0	0	0	0	0	0
400-599	7	9.7	1	0.8	2	0.5	0	0	1	0.6	4	0.7
600-799	2	2.8	3	2.3	0	0	6	4.4	4	2.4	4	0.7
800-999	6	8.3	7	5.5	1	0.4	3	2.2	1	0.6	5	0.9
1000-1199	2	2.8	3	2.3	2	0.8	1	0.7	2	1.2	4	0.7
1200-1399	3	4.2	6	4.7	4	1.5	6	4.4	2	1.2	11	1.9
1400-1599	6	8.3	4	3.1	3	1.1	3	2.2	3	1.8	11	1.9
1600-1799	5	6.9	2	1.6	8	3.0	5	3.7	5	3.0	21	3.6
1800-1999	2	2.8	6	4.7	4	1.5	7	5.2	5	3.0	23	3.9
2000-2199	4	5.6	7	5.5	13	4.9	6	4.4	12	7.1	24	4.1
2200-2399	1	1.4	6	4.7	19	7.2	13	9.7	8	4.7	27	4.6
2400-2599	1	1.4	8	6.3	18	6.8	7	5.2	13	7.7	23	3.9
2600-2799	0	0	6	4.7	13	4.9	7	5.2	8	4.7	25	4.3
2800-2999	0	0	10	7.8	19	7.2	5	3.7	7	4.1	33	5.6
3000-3199	1	1.4	4	3.1	13	4.9	5	3.7	9	5.3	31	5.3
3200-3399	1	1.4	5	3.9	9	3.4	6	4.4	3	1.8	35	6.0
3400-3599	0	0	9	7.0	17	6.5	10	7.5	5	3.0	38	6.5
3600-3799	0	0	5	3.9	12	4.6	6	4.4	7	4.1	25	4.3
3800-3999	0	0	3	2.3	9	3.4	4	3.0	5	3.0	28	4.8
4000-4499	0	0	7	5.5	18	6.8	17	12.7	12	7.1	59	10.1
4500-4999	1	1.4	7	5.5	24	9.1	6	4.4	13	7.7	51	8.7
5000-5499	0	0	1	0.8	12	4.6	3	2.2	11	6.5	23	3.9
5500-5999	0	0	3	2.3	16	6.1	1	0.7	8	4.7	23	3.9
6000-6499	0	0	5	3.9	5	1.9	0	0	6	3.6	27	4.6
6500-6999	0	0	4	3.1	10	3.8	1	0.7	8	4.7	7	1.2
7000 & over	1	1.4	4	3.1	11	4.2	1	0.7	10	5.9	24	4.1
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean	1019		3185		3777		2814		3868		3725	
Standard Deviation	1295		1994		1926		1380		2242		1832	
Standard Dev of Mean	154		177		119		119		173		76	

Table 44H. Polymorphs. HIROSHIMA (continued)

No. of Polymorphs	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 200	0	0	0	0	0	0	2	2.1
200-399	0	0	0	0	0	0	0	0
400-599	0	0	0	0	0	0	0	0
600-799	0	0	1	2.9	0	0	1	1.0
800-999	2	5.9	0	0	3	1.7	0	0
1000-1199	2	5.9	0	0	1	0.6	1	1.0
1200-1399	0	0	1	2.9	2	1.1	1	1.0
1400-1599	2	5.9	1	2.9	3	1.7	2	2.1
1600-1799	1	2.9	4	11.4	4	2.2	2	2.1
1800-1999	1	2.9	4	11.4	5	2.8	2	2.1
2000-2199	3	8.8	3	8.6	5	2.8	6	6.3
2200-2399	2	5.9	3	8.6	8	4.4	7	7.3
2400-2599	2	5.9	3	8.6	5	2.8	8	8.3
2600-2799	5	14.7	1	2.9	7	3.9	8	8.3
2800-2999	3	8.8	2	5.7	9	5.0	8	8.3
3000-3199	2	5.9	1	2.9	11	6.1	3	3.1
3200-3399	0	0	2	5.7	6	3.3	3	3.1
3400-3599	0	0	1	2.9	7	3.9	4	4.2
3600-3799	2	5.9	2	5.7	7	3.9	5	5.2
3800-3999	1	2.9	0	0	5	2.8	3	3.1
4000-4499	2	5.9	1	2.9	23	12.8	11	11.5
4500-4999	2	5.9	3	8.6	18	10.0	7	7.3
5000-5499	0	0	1	2.9	10	5.6	5	5.2
5500-5999	1	2.9	0	0	12	6.7	3	3.1
6000-6499	0	0	1	2.9	4	2.2	1	1.0
6500-6999	1	2.9	0	0	5	2.8	3	3.1
7000 & over	0	0	0	0	20	11.1		
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	2838		2801		4419		3327	
Standard Deviation	1426		1262		2407		1376	
Standard Dev of Mean	248		216		180		140	

Table 44. Polymorphs. Distribution of number of Polymorphs by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Polymorphs	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 200	8	27.6	1	0.3	0	0	1	7.1	1	0.3	0	0
200- 399	4	13.8	0	0	0	0	3	21.4	0	0	0	0
400- 599	3	10.3	0	0	0	0	2	14.3	0	0	0	0
600- 799	2	6.9	1	0.3	0	0	0	0	1	0.3	0	0
800- 999	3	10.3	1	0.3	0	0	1	7.1	1	0.3	0	0
1000-1199	1	3.4	7	2.2	0	0	0	0	2	0.7	0	0
1200-1399	1	3.4	5	1.6	1	1.6	0	0	0	0	0	0
1400-1599	0	0	9	2.8	1	1.6	1	7.1	3	1.0	0	0
1600-1799	0	0	9	2.8	0	0	0	0	5	1.6	1	2.9
1800-1999	2	6.9	7	2.2	2	3.2	1	7.1	4	2.6	1	2.9
2000-2199	2	6.9	10	3.1	0	0	0	0	8	2.6	0	0
2200-2399	0	0	12	3.8	1	1.6	3	21.4	10	3.3	0	0
2400-2599	0	0	13	4.1	1	1.6	0	0	11	3.6	1	2.9
2600-2799	0	0	11	3.4	2	3.2	0	0	12	3.9	2	5.7
2800-2999	0	0	13	4.1	3	4.8	0	0	14	4.6	2	5.7
3000-3199	0	0	9	2.8	4	6.5	0	0	17	5.5	3	8.6
3200-3399	0	0	14	4.4	5	8.1	1	7.1	11	3.6	3	8.6
3400-3599	0	0	16	5.0	2	3.2	0	0	18	5.9	0	0
3600-3799	0	0	18	5.6	4	6.5	0	0	11	3.6	3	8.6
3800-3999	0	0	15	4.7	4	6.5	0	0	20	6.5	1	2.9
4000-4199	2	6.9	36	11.3	7	11.3	1	7.1	30	9.8	3	8.6
4500-4999	0	0	19	6.0	6	9.7	0	0	31	10.1	6	17.1
5000-5499	1	3.4	23	7.2	3	4.8	0	0	21	6.8	3	8.6
5500-5999	0	0	21	6.6	3	4.8	0	0	21	6.8	0	0
6000-6499	0	0	9	2.8	1	1.6	0	0	12	3.9	0	0
6500-6999	0	0	11	3.4	3	4.8	0	0	11	3.6	2	5.7
7000 & over	0	0	29	9.1	9	14.5	0	0	22	10.4	4	11.4
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	1059		4242		4810		1468		4485		4641	
Standard Deviation	1317		2378		2539		1244		2190		3091	
Standard Dev of Mean	249		133		325		345		125		530	

Table 44N. Polymorphs. NAGASAKI (continued)

No. of Polymorphs	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 200	1	33.3	1	0.6	0	0	0	0
200- 399	0	0	0	0	0	0	1	1.5
400- 599	0	0	0	0	0	0	0	0
600- 799	0	0	0	0	0	0	0	0
800- 999	0	0	1	0.6	0	0	0	0
1000-1199	0	0	1	0.6	1	7.1	0	0
1200-1399	0	0	2	1.2	0	0	0	0
1400-1599	1	33.3	1	0.6	0	0	0	0
1600-1799	0	0	0	0	0	0	0	0
1800-1999	0	0	0	0	0	0	0	0
2000-2199	1	33.3	4	2.3	1	7.1	1	1.5
2200-2399	0	0	5	2.9	0	0	0	0
2400-2599	0	0	5	2.9	2	14.3	6	9.0
2600-2799	0	0	3	1.7	0	0	6	9.0
2800-2999	0	0	6	3.5	0	0	3	4.5
3000-3199	0	0	13	7.6	0	0	3	4.5
3200-3399	0	0	13	7.6	2	14.3	2	3.0
3400-3599	0	0	8	4.7	0	0	2	3.0
3600-3799	0	0	11	6.4	0	0	4	6.0
3800-3999	0	0	9	5.2	1	7.1	5	7.5
4000-4499	0	0	20	11.6	3	21.4	9	13.4
4500-4999	0	0	22	12.8	2	14.3	9	13.4
5000-5499	0	0	10	5.8	0	0	4	6.0
5500-5999	0	0	10	5.8	0	0	4	6.0
6000-6499	0	0	11	6.4	1	7.1	3	4.5
6500-6999	0	0	4	2.3	0	0	4	6.0
7000 & over	0	0	12	7.0	1	7.1	1	1.5
Total	3100.0		172100.0		14100.0		67100.0	
Mean	1263		4370		4879		4176	
Standard Deviation	-		1736		4596		1489	
Standard Dev of Mean	-		133		1275		183	

Table 45H. Lymphocytes. Distribution of number of Lymphs by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Lymphocytes	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2-6		Weeks 7-11		Weeks 12 & Over		Weeks 2-6		Weeks 7-11		Weeks 12 & Over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 200	3	4.2	1	0.8	0	0	3	2.2	0	0	0	0
200-399	17	23.6	2	1.6	0	0	5	3.7	44	2.4	0	0
400-599	8	11.1	9	7.0	5	1.9	5	3.7	4	2.4	0	0
600-799	9	12.5	2	1.6	6	2.3	5	3.7	5	3.0	6	1.0
800-999	8	11.1	12	9.4	18	6.8	9	6.7	8	4.7	19	3.2
1000-1199	4	5.6	11	8.6	19	7.2	11	8.1	5	3.0	22	3.7
1200-1399	3	4.2	11	8.6	18	6.8	21	15.6	6	3.6	32	5.5
1400-1599	8	11.1	7	5.5	27	10.3	17	12.7	8	4.7	43	7.3
1600-1799	4	5.6	16	12.5	23	8.7	11	8.1	14	8.3	43	7.3
1800-1999	2	2.8	9	7.0	30	11.4	11	8.1	15	8.9	44	7.5
2000-2199	2	2.8	9	7.0	18	6.8	8	5.9	12	7.1	49	8.3
2200-2399	0	0	8	6.3	23	8.7	5	3.7	9	5.3	49	8.3
2400-2599	0	0	5	3.9	18	6.8	2	1.5	13	7.7	39	6.6
2600-2799	0	0	7	5.5	12	4.6	3	2.2	6	3.6	24	4.1
2800-2999	0	0	8	6.3	11	4.2	8	5.9	9	5.3	53	9.0
3000-3199	2	2.8	2	1.6	7	2.7	4	3.0	14	8.3	25	4.3
3200-3399	1	1.4	1	0.8	6	2.3	1	0.7	8	4.7	23	3.9
3400-3599	0	0	2	1.6	7	2.7	1	0.7	6	3.6	20	3.4
3600-3799	0	0	1	0.8	6	2.3	0	0	9	5.3	23	3.9
3800-3999	1	1.4	1	0.8	1	0.4	2	1.5	1	0.6	10	1.7
4000-4499	0	0	1	0.8	4	1.5	1	0.7	5	3.0	29	4.9
4500-4999	0	0	1	0.8	1	0.4	1	0.7	2	1.2	16	2.7
5000-5499	0	0	1	0.8	2	0.8	1	0.7	2	1.2	5	0.9
5500-5999	0	0	1	0.8	0	0	0	0	2	1.2	3	0.5
6000-6499	0	0	0	0	1	0.4	0	0	0	0	3	0.5
6500-6999	0	0	0	0	0	0	0	0	0	0	2	0.3
7000 & over	0	0	0	0	0	0	0	0	2	1.2	5	0.9
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean	973		1835		2022		1669		2425		2571	
Standard Deviation	787		1048		908		918		1511		1305	
Standard Dev of Mean	93		93		56		79		117		54	

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Table 45H. Lymphocytes. HIROSHIMA (continued)

No. of Lymphocytes	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 200	1	2.9	0	0	0	0	1	1.0
200- 399	0	0	0	0	0	0	0	0
400- 599	1	2.9	0	0	0	0	0	0
600- 799	0	0	2	5.7	2	1.1	1	1.0
800- 999	2	5.9	3	8.6	4	2.2	1	1.0
1000-1199	5	14.7	2	5.7	4	2.2	4	4.2
1200-1399	0	0	2	5.7	5	2.8	7	7.3
1400-1599	4	11.8	1	2.9	13	7.2	7	7.3
1600-1799	3	8.8	3	8.6	14	7.8	15	15.6
1800-1999	3	8.8	1	2.9	15	8.3	7	7.3
2000-2199	1	2.9	5	14.3	16	8.9	9	9.4
2200-2399	2	5.9	1	2.9	14	7.8	11	11.5
2400-2599	3	8.8	3	8.6	14	7.8	8	8.3
2600-2799	3	8.8	3	8.6	15	8.3	4	4.2
2800-2999	0	0	3	8.6	8	4.4	6	6.3
3000-3199	2	5.9	0	0	12	6.7	6	6.3
3200-3399	2	5.9	1	2.9	5	2.8	2	2.1
3400-3599	0	0	2	5.7	9	5.0	1	1.0
3600-3799	1	2.9	1	2.9	4	2.2	0	0
3800-3999	0	0	0	0	1	0.6	2	2.1
4000-4499	1	2.9	0	0	8	4.4	1	1.0
4500-4999	0	0	1	2.9	5	2.8	1	1.0
5000-5499	0	0	0	0	5	2.8	1	1.0
5500-5999	0	0	1	2.9	4	2.2	0	0
6000-6499	0	0	0	0	1	0.6	1	1.0
6500-6999	0	0	0	0	1	0.6	0	0
7000 & over	0	0	0	0	1	0.6	0	0
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	1993		2246		2692		2227	
Standard Deviation	916		2020		1252		1381	
Standard Dev of Mean	159		347		94		141	

Table 45N. Lymphocytes. Distribution of number of Lymphocytes by exposure groups and by weeks from bombing.
Individuals who were living twenty days after the bombing.

No. of Lymphocytes	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 200	1	3.4	0	0	1	1.6	0	0	1	0.3	0	0
200- 399	6	20.7	0	0	1	1.6	2	14.3	0	0	0	0
400- 599	3	10.3	5	1.6	0	0	1	7.1	5	1.6	0	0
600- 799	4	13.8	8	2.5	0	0	0	0	7	2.3	0	0
800- 999	6	20.7	12	3.8	0	0	1	7.1	10	3.3	0	0
1000-1199	1	3.4	18	5.6	3	4.8	1	7.1	12	3.9	1	2.9
1200-1399	3	10.3	31	9.7	4	6.5	2	14.3	25	8.1	2	5.7
1400-1599	1	3.4	35	11.0	4	6.5	0	0	22	7.2	2	5.7
1600-1799	2	6.9	35	11.0	2	3.2	1	7.1	34	11.1	4	11.4
1800-1999	1	3.4	31	9.7	5	8.1	1	7.1	28	9.1	5	14.3
2000-2199	1	3.4	31	9.7	8	12.9	1	7.1	18	5.9	3	8.6
2200-2399	0	0	16	5.0	5	8.1	0	0	25	8.1	4	11.4
2400-2599	0	0	19	6.0	7	11.3	3	21.4	24	7.8	2	5.7
2600-2799	0	0	14	4.4	3	4.8	0	0	13	4.2	0	0
2800-2999	0	0	11	3.4	3	4.8	0	0	9	2.9	0	0
3000-3199	0	0	8	2.5	3	4.8	0	0	22	7.2	2	5.7
3200-3399	0	0	12	3.8	2	3.2	0	0	6	2.0	2	5.7
3400-3599	0	0	5	1.6	2	3.2	0	0	8	2.6	4	11.4
3600-3799	0	0	3	0.9	2	3.2	0	0	13	4.2	2	5.7
3800-3999	0	0	5	1.6	2	3.2	0	0	3	1.0	0	0
4000-4499	0	0	7	2.2	2	3.2	1	7.1	11	3.6	0	0
4500-4999	0	0	4	1.3	0	0	0	0	5	1.6	1	2.9
5000-5499	0	0	2	0.6	0	0	0	0	2	0.7	0	0
5500-5999	0	0	2	0.6	0	0	0	0	4	1.3	0	0
6000-6499	0	0	3	0.9	1	1.6	0	0	0	0	0	0
6500-6999	0	0	1	0.3	0	0	0	0	0	0	0	0
7000-& over	0	0	1	0.3	2	3.2	0	0	0	0	1	2.9
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	877		2152		2565		1647		2294		2672	
Standard Deviation	513		1134		1872		1026		1059		1628	
Standard Dev. of Mean	97		64		240		285		61		279	

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Table 45H. Lymphocytes. NAGASAKI (continued)

No. of Lymphocytes	Exposure Groups E, F, & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 200	0	0	1	0.6	0	0	0	0
200- 399	0	0	0	0	0	0	0	0
400- 599	0	0	0	0	0	0	0	0
600- 799	0	0	0	0	0	0	0	0
800- 999	0	0	1	0.6	0	0	1	1.5
1000-1199	1	33.3	7	4.1	0	0	1	1.5
1200-1399	0	0	7	4.1	0	0	1	1.5
1400-1599	0	0	17	9.9	1	7.1	2	3.0
1600-1799	1	33.3	17	9.9	1	7.1	2	3.0
1800-1999	0	0	8	4.7	0	0	3	4.5
2000-2199	0	0	21	12.2	0	0	4	6.0
2200-2399	0	0	14	8.1	0	0	6	9.0
2400-2599	0	0	15	8.7	4	28.6	14	20.9
2600-2799	1	33.3	18	10.5	1	7.1	7	10.4
2800-2999	0	0	12	7.0	1	7.1	7	10.4
3000-3199	0	0	9	5.2	0	0	4	6.0
3200-3399	0	0	1	0.6	0	0	2	3.0
3400-3599	0	0	7	4.1	2	14.3	2	3.0
3600-3799	0	0	3	1.7	0	0	1	1.5
3800-3999	0	0	4	2.3	0	0	0	0
4000-4499	0	0	3	1.7	0	0	4	6.0
4500-4999	0	0	1	0.6	1	7.1	1	1.5
5000-5499	0	0	1	0.6	1	7.1	0	0
5500-5999	0	0	1	0.6	0	0	2	3.0
6000-6499	0	0	2	1.2	0	0	0	0
6500-6999	0	0	0	0	0	0	1	1.5
7000 & over	0	0	2	1.2	2	14.3	2	3.0
Total		3 100.0		172 100.0		14 100.0		67 100.0
Mean		1835		2465		3730		2949
Standard Deviation		-		1391		3384		1806
Standard Dev of Mean		-		106		938		222

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HIROSHIMA

Table 46H. Monocytes. Distribution of number of Monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Monocytes	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 50	35	48.6	4	3.1	3	1.1	41	30.4	18	10.7	34	5.8
50- 99	14	19.4	14	10.9	12	4.6	21	15.6	24	14.2	38	6.5
100- 199	10	13.9	27	21.1	46	17.5	22	16.3	36	21.3	95	16.2
200- 299	8	11.1	23	18.0	53	20.2	19	14.1	26	15.4	118	20.1
300- 399	2	2.8	16	12.5	49	18.6	14	10.4	18	10.7	91	15.5
400- 499	1	1.4	14	10.9	32	12.2	11	8.1	7	4.1	81	13.8
500- 599	2	2.8	10	7.8	24	9.1	4	3.0	10	5.9	49	8.3
600- 699	0	0	7	5.5	8	3.0	1	0.7	15	8.9	26	4.4
700- 799	0	0	5	3.9	14	5.3	0	0	2	1.2	22	3.7
800- 899	0	0	4	3.1	5	1.9	1	0.7	1	0.6	7	1.2
900- 999	0	0	2	1.6	7	2.7	1	0.7	2	1.2	9	1.5
1000-1099	0	0	0	0	6	2.3	0	0	2	1.2	5	0.9
1100-1199	0	0	0	0	2	0.8	0	0	1	0.6	4	0.7
1200-1299	0	0	0	0	1	0.4	0	0	3	1.8	3	0.5
1300-1399	0	0	1	0.8	0	0	0	0	1	0.6	3	0.5
1400-1499	0	0	0	0	0	0	0	0	1	0.6	2	0.3
1500-1599	0	0	0	0	0	0	0	0	0	0	0	0
1600-1699	0	0	0	0	0	0	0	0	0	0	0	0
1700-1799	0	0	0	0	0	0	0	0	0	0	0	0
1800-1899	0	0	0	0	1	0.4	0	0	1	0.6	0	0
1900-1999	0	0	0	0	0	0	0	0	0	0	0	0
2000-2499	0	0	0	0	0	0	0	0	1	0.6	0	0
2500-2999	0	0	1	0.8	0	0	0	0	0	0	0	0
3000 & Over	0	0	0	0	0	0	0	0	0	0	0	0
Total	72	100.0	128	100.0	263	100.0	135	100.0	169	100.0	587	100.0
Mean 98	98		355		394		175		332		357	
Standard Deviation	125		327		263		181		341		256	
Standard Dev. of Mean	15		29		16		16		26		11	

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HIKOSHIMA

Table 46H. Monocytes. (Continued)

No. Of Monocytes	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 -11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 50	4	11.8	2	5.7	10	5.6	11	11.5
50- 99	6	17.6	4	11.4	12	6.7	9	9.4
100- 199	11	32.4	13	37.1	27	15.0	24	25.0
200- 299	6	17.6	5	14.3	28	15.6	13	13.5
300- 399	4	11.8	3	8.6	31	17.2	15	15.6
400- 499	1	2.9	2	5.7	22	12.2	13	13.5
500- 599	0	0	3	8.6	20	11.1	4	4.2
600- 699	1	2.9	1	2.9	14	7.8	2	2.1
700- 799	0	0	1	2.9	6	3.3	1	1.0
800- 899	0	0	0	0	2	1.1	2	2.1
900- 999	1	2.9	0	0	2	1.1	1	1.0
1000-1099	0	0	0	0	1	0.6	0	0
1100-1199	0	0	0	0	0	0	0	0
1200-1299	0	0	0	0	4	2.2	0	0
1300-1399	0	0	0	0	0	0	0	0
1400-1499	0	0	0	0	0	0	0	0
1500-1599	0	0	0	0	1	0.6	0	0
1600-1699	0	0	0	0	0	0	0	0
1700-1799	0	0	0	0	0	0	0	0
1800-1899	0	0	0	0	0	0	0	0
1900-1999	0	0	0	0	0	0	0	0
2000-2499	0	0	0	0	0	0	1	1.0
2500-2999	0	0	0	0	0	0	0	0
3000 & over	0	0	1	2.9	0	0	0	0
Total	34	100.0	35	100.0	180	100.0	96	100.0
Mean	205		382		378		283	
Standard Deviation	188		771		269		268	
Standard Dev. of Mean	33		132		20		26	

Table 46N. Monocytes. Distribution of number of Monocytes by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

No. of Monocytes	Exposure Groups A & B						Exposure Groups C & D					
	Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over		Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 50	9	31.0	17	5.3	6	9.7	7	50.0	15	4.9	2	5.7
50- 99	6	20.7	27	8.5	5	8.1	1	7.1	26	8.5	2	5.7
100- 199	6	20.7	61	19.1	11	17.7	4	28.6	65	21.2	8	22.9
200- 299	3	10.3	39	12.2	10	16.1	1	7.1	55	17.9	4	11.4
300- 399	2	6.9	41	12.9	7	11.3	0	0	45	14.7	8	22.9
400- 499	0	0	36	11.3	8	12.9	0	0	32	10.4	4	11.4
500- 599	1	3.4	30	9.4	6	9.7	0	0	19	6.2	3	8.6
600- 699	0	0	18	5.6	1	1.6	1	7.1	14	4.6	0	0
700- 799	0	0	9	2.8	3	4.8	0	0	12	3.9	2	5.7
800- 899	0	0	8	2.5	1	1.6	0	0	11	3.6	0	0
900- 999	0	0	9	2.8	2	3.2	0	0	4	1.3	1	2.9
1000-1099	0	0	4	1.3	1	1.6	0	0	1	0.3	0	0
1100-1199	0	0	4	1.3	0	0	0	0	0	0	0	0
1200-1299	0	0	3	0.9	0	0	0	0	1	0.3	0	0
1300-1399	0	0	2	0.6	0	0	0	0	3	1.0	1	2.9
1400-1499	0	0	3	0.9	0	0	0	0	2	0.7	0	0
1500-1599	1	3.4	2	0.6	0	0	0	0	1	0.3	0	0
1600-1699	0	0	4	1.3	0	0	0	0	0	0	0	0
1700-1799	0	0	0	0	1	1.6	0	0	0	0	0	0
1800-1899	0	0	0	0	0	0	0	0	0	0	0	0
1900-1999	0	0	0	0	0	0	0	0	1	0.3	0	0
2000-2499	1	3.4	1	0.3	0	0	0	0	0	0	0	0
2500-2999	0	0	1	0.3	0	0	0	0	0	0	0	0
3000 & over	0	0	0	0	0	0	0	0	0	0	0	0
Total	29	100.0	319	100.0	62	100.0	14	100.0	307	100.0	35	100.0
Mean	244		423		359		114		358		356	
Standard Deviation	474		381		304		159		291		263	
Standard Dev. of Mean	90		21		39		44		17		45	

Table 46N. Monocytes. NAGASAKI (continued)

No. of Monocytes	Exposure Groups E, F & G						Exposure Group H	
	Weeks 2 - 6		Weeks 7 - 11		Weeks 12 & over		All Weeks	
	No.	%	No.	%	No.	%	No.	%
Under 50	1	33.3	4	2.3	1	7.1	6	9.0
50- 99	0	0	11	6.4	1	7.1	3	4.5
100- 199	0	0	41	23.8	1	7.1	11	16.4
200- 299	0	0	35	20.3	2	14.3	12	17.9
300- 399	0	0	28	16.3	2	14.3	11	16.4
400- 499	1	33.3	13	7.6	2	14.3	7	10.4
500- 599	1	33.3	13	7.6	1	7.1	6	9.0
600- 699	0	0	9	5.2	1	7.1	5	7.5
700- 799	0	0	6	3.5	1	7.1	2	3.0
800- 899	0	0	2	1.2	0	0	0	0
900- 999	0	0	4	2.3	1	7.1	2	3.0
1000-1099	0	0	1	0.6	0	0	0	0
1100-1199	0	0	2	1.2	0	0	1	1.5
1200-1299	0	0	1	0.6	0	0	0	0
1300-1399	0	0	0	0	0	0	0	0
1400-1499	0	0	0	0	0	0	0	0
1500-1599	0	0	0	0	0	0	0	0
1600-1699	0	0	0	0	0	0	0	0
1700-1799	0	0	1	0.6	0	0	0	0
1800-1899	0	0	0	0	1	7.1	0	0
1900-1999	0	0	0	0	0	0	0	0
2000-2499	0	0	0	0	0	0	1	1.5
2500-2599	0	0	0	0	0	0	0	0
3000 & Over	0	0	1	0.6	0	0	0	0
Total	3	100.0	172	100.0	14	100.0	67	100.0
Mean	340		379		502		371	
Standard Deviation	-		431		442		333	
Standard Dev. of Mean	-		33		123		41	

HIROSHIMA

Table 47H. Number and percentage of cases in which young white cells, atypical lymphocytes, nucleated red blood cells, stippled red blood cells and reticulocytes were observed by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of Cases Studied	Young White Cells		Atypical Lymphocytes		Nucleated RBC		Stippled RBC		Reticulocytes	
			No.	%	No.	%	No.	%	No.	%	No.	%
A & B	2 - 6	72	26	36.1	16	22.2	3	4.2	1	1.4	4	5.6
	7 - 11	128	27	21.1	17	13.3	3	2.3	0	-	9	7.0
	12 and over	263	12	4.6	9	3.4	3	1.1	0	-	6	2.3
C & D	2 - 6	135	10	7.4	5	3.7	4	3.0	0	-	29	21.5
	7 - 11	169	15	8.9	14	8.3	0	-	0	-	19	11.2
	12 and over	587	17	2.9	47	8.0	13	2.2	0	-	1	0.2
E, F, & G	2 - 6	34	6	17.6	5	14.7	0	-	0	-	1	2.9
	7 - 11	35	5	14.3	3	8.6	1	2.9	0	-	0	-
	12 and over	180	6	3.3	16	8.9	6	3.3	0	-	0	-
H	All Weeks	96	4	4.2	4	4.2	1	1.0	0	-	0	-

NAGASAKI

Table 47H. Number and percentage of cases in which young white cells, atypical lymphocytes, nucleated red blood cells, stippled red blood cells, and reticulocytes were observed by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Group	Weeks From Bombing	Number of Cases Studied	Young White Cells		Atypical Lymphocytes		Nucleated RBC		Stippled RBC		Reticulocytes	
			No.	%	No.	%	No.	%	No.	%	No.	%
A & B	2 - 6	29	13	44.8	3	10.3	0	-	0	-	0	-
	7 -11	319	10	3.1	29	9.1	7	2.2	25	7.8	12	3.8
	12 and over	62	0	-	0	-	0	-	0	-	0	-
C & D	2 - 6	14	9	64.3	0	-	0	-	0	-	0	-
	7 -11	307	4	1.3	17	5.5	3	1.0	16	5.2	3	1.0
	12 and over	35	0	-	0	-	0	-	1	2.9	2	5.7
E, F, & G	2 - 6	3	2	67.7	1	33.3	0	-	0	-	0	-
	7 -11	172	3	1.7	3	1.7	1	0.6	2	1.2	0	-
	12 and over	14	0	-	0	-	0	-	0	-	0	-
H	All Weeks	67	3	4.5	0	-	0	-	1	1.5	0	-

Table 48. Mean number of platelets (in thousands) and number of cases with platelet counts by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Groups	HIROSHIMA						NAGASAKI					
	Weeks 2 - 5		Weeks 6, 7, & 8		Weeks 9 and over		Weeks 2 - 5		Weeks 6, 7, & 8		Weeks 9 and over	
	No. of Cases	Mean Platelets	No. of Cases	Mean Platelets	No. of Cases	Mean Platelets	No. of Cases	Mean Platelets	No. of Cases	Mean Platelets	No. of Cases	Mean Platelets
A and B	5	90	26	207	11	103	6	95	9	127	58	196
C and D	7	179	31	300	4	335	3	34	10	145	36	182
E, F, & G	8	220	5	191	-	-	0	-	3	60	5	233
	All Weeks						All Weeks					
H	17	171					0	-				

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Table 49. Mean sedimentation rate (mm. in one hour) and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Exposure Groups	HIROSHIMA						NAGASAKI					
	Weeks 2 - 5		Weeks 6, 7, & 8		Weeks 9 and over		Weeks 2 - 5		Weeks 6, 7, & 8		Weeks 9 and over	
	No. of Cases	Mean Sed. Rate	No. of Cases	Mean Sed. Rate	No. of Cases	Mean Sed. Rate	No. of Cases	Mean Sed. Rate	No. of Cases	Mean Sed. Rate	No. of Cases	Mean Sed. Rate
A and B	77	82	145	66	17	50	36	73	12	112	3	34
C and D	107	30	443	27	5	12	17	96	15	95	-	-
E, F, & G	34	23	172	18	11	10	2	24	6	46	1	14
	All Weeks						All Weeks					
H	63	16					5	23				

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Table 50H. Red blood cell counts (in millions per cu. mm.) mean and number of cases by exposure groups and by weeks from bombing

Individuals who were living twenty days after the bombing.

Weeks From Bombing	Exposure Groups															
	A		B		C		D		E		F		G		H	
	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC
1	-	-	3	3.3	4	3.2	2	3.5	1	3.9	-	-	-	-	-	-
2	1	1.7	1	2.8	2	3.9	3	3.9	-	-	-	-	-	-	-	-
3	11	4.0	19	3.4	23	3.5	11	3.4	1	3.5	1	4.0	-	-	-	-
4	51	2.9	59	3.5	26	3.8	5	4.1	5	5.0	2	4.0	3	4.9	-	-
5	71	3.1	77	3.4	58	3.7	50	4.2	9	4.7	9	4.2	13	4.3	42	4.1
6	24	3.5	54	3.4	108	3.8	43	3.9	23	4.0	11	3.9	9	4.0	8	4.1
7	35	3.1	29	3.3	47	3.7	20	3.6	2	4.5	15	4.0	4	4.0	6	3.7
8	10	3.4	9	3.4	11	3.4	5	4.2	3	4.4	2	3.9	-	-	1	4.1
9	2	3.4	7	3.3	24	3.8	5	3.5	1	4.0	1	5.1	1	3.3	1	4.4
10	3	2.9	2	4.1	4	4.5	2	4.1	2	3.3	1	4.5	-	-	-	-
11	1	1.4	2	2.8	2	4.2	3	2.8	1	4.6	1	3.4	-	-	-	-
and 12 over	10	3.7	7	3.3	5	3.3	6	3.8	1	3.4	-	-	1	3.2	-	-

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Table 50N. Red blood cell counts (in millions per cu. mm.) mean and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Weeks From Bombing	Exposure Group															
	A		B		C		D		E		F		G		H	
	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC	No.	Mean RBC
1	-	-	3	3.5	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	1	4.0	-	-	-	-	-	-	1	2.7	-	-	-	-
3	10	3.0	17	2.8	14	3.7	11	3.3	3	4.1	1	2.0	-	-	-	-
4	22	3.6	46	3.5	53	3.7	14	3.7	5	4.4	5	4.1	7	4.8	11	3.9
5	18	3.6	35	3.2	53	3.2	6	2.1	5	3.9	13	3.7	3	3.7	6	4.0
6	12	3.7	35	3.3	32	3.3	15	3.5	5	4.0	14	3.7	7	3.6	1	3.7
7	4	3.7	8	2.9	5	3.1	1	2.3	-	-	2	3.7	-	-	3	4.5
8	7	2.3	14	3.2	22	3.1	7	3.5	3	2.9	2	4.1	-	-	1	5.6
9	14	3.4	30	3.4	33	3.3	9	3.5	7	3.5	2	3.7	2	3.6	-	-
10	13	3.0	55	3.3	53	3.4	13	3.7	17	3.5	27	3.8	12	3.7	-	-
11	6	2.7	39	3.5	56	3.5	20	3.8	32	3.8	30	3.9	12	3.8	3	3.9
12 & over	2	3.3	16	3.6	14	3.7	7	3.6	4	4.0	5	3.8	-	-	1	4.4

HIROSHIMA**Table 51H. Distribution of RBC's by Exposure Groups and Weeks from Bombing.**

Individuals who were living twenty days after the bombing.

RBC in Millions	Exposure Group A						Exposure Group B					
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 1	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.4	0	0	0	0.0	1	6.3	1	0.6	0	0	0	0
1.5-1.9	6	4.5	4	5.8	1	6.3	4	2.6	6	6.5	1	5.6
2.0-2.4	22	16.4	12	17.4	1	6.3	14	9.0	8	8.7	3	16.6
2.5-2.9	38	28.4	13	18.8	0	0	37	23.6	15	16.3	1	5.6
3.0-3.4	30	22.4	9	13.0	5	31.2	30	19.0	23	25.0	4	22.2
3.5-3.9	19	14.2	17	24.6	5	31.2	27	17.3	21	22.8	6	33.3
4.0-4.4	11	8.2	6	8.7	2	12.5	20	12.8	5	5.4	1	5.6
4.5-4.9	3	2.2	4	5.8	1	6.3	12	8.0	10	10.9	2	11.1
5.0-5.9	3	2.2	3	4.4	0	0	9	5.8	4	4.4	0	0
6.0-6.9	2	1.5	1	1.5	0	0	2	1.3	0	0	0	0
7.0 & over	0	0	0	0	0	0	0	0	0	0	0	0
Total	134	100.0	69	100.0	16	100.0	156	100.0	92	100.0	18	100.0
Mean	3.10		3.27		3.36		3.43		3.36		3.33	
Standard Deviation	0.86		0.99		0.93		0.96		0.90		0.75	
Standard Dev. of Mean	0.07		0.12		0.24		0.08		0.09		0.18	

HIROSHIMA

Table 51H. Distribution of RBC's by Exposure Groups and Weeks, from Bombing. (cont.)

RBC in Millions	Exposure Groups C & D						Exposure Groups E, F, & G						Exposure Group H (All Weeks)	
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Under 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.4	0	0	2	0.9	0	0	0	0	0	0	0	0	0	0
1.5-1.9	4	2.2	6	2.6	1	2.0	0	0	0	0	0	0	0	0
2.0-2.4	6	3.4	10	4.2	2	3.9	0	0	1	1.4	0	0	1	1.7
2.5-2.9	19	10.7	23	9.8	7	13.7	0	0	2	2.9	1	10.0	0	0
3.0-3.4	22	12.4	45	19.2	5	9.8	4	9.3	12	17.4	4	40.0	5	8.6
3.5-3.9	40	22.5	48	20.5	13	25.5	10	23.3	21	30.4	1	10.0	20	34.5
4.0-4.4	49	27.5	47	20.1	14	27.4	11	25.6	16	23.2	1	10.0	21	36.2
4.5-4.9	25	14.0	29	12.4	8	15.7	5	11.6	10	14.5	2	20.0	10	17.2
5.0-5.9	12	6.7	22	9.4	1	2.0	12	27.9	7	10.1	1	10.0	1	1.7
6.0-6.9	1	0.6	1	0.4	0	0	1	2.3	0	0	0	0	0	0
7.0 & over	0	0	1	0.4	0	0	0	0	0	0	0	0	0	0
Total	178	100.0	234	100.0	51	100.0	43	100.0	69	100.0	10	100.0	58	100.0
Mean	3.84		3.79		3.75		4.43		4.02		3.80		4.04	
Standard Deviation	0.84		0.97		0.74		0.82		0.71		0.69		0.51	
Standard Dev of Mean	0.06		0.06		0.10		0.13		0.09		0.23		0.07	

NAGASAKI**Table 51N.** Distribution of RBC's by Exposure Groups and Weeks from Bombing.

Individuals who were living twenty days after the bombing.

RBC in Millions	Exposure Group A						Exposure Group B					
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 1	0	0	0	0	0	0	0	0	0	0	0	0
1.0-1.4	0	0	0	0	1	2.9	6	6.1	0	0	1	0.7
1.5-1.9	1	2.0	2	8.7	0	0	5	5.0	6	10.5	2	1.4
2.0-2.4	7	14.0	5	21.7	2	5.7	11	11.1	6	10.5	4	2.9
2.5-2.9	11	22.0	3	13.0	9	25.7	15	15.1	11	19.3	20	14.3
3.0-3.4	7	14.0	2	8.7	13	37.1	16	16.2	11	19.3	46	32.9
3.5-3.9	9	18.0	3	13.0	7	20.0	23	23.2	13	22.8	43	30.7
4.0-4.4	5	10.0	6	26.1	2	5.7	12	12.1	5	8.8	20	14.3
4.5-4.9	8	16.0	0	0.0	1	2.9	5	5.0	2	3.5	3	2.1
5.0-5.9	1	2.0	2	8.7	0	0	5	5.0	3	5.3	1	0.7
6.0-6.9	1	2.0	0	0	0	0.0	1	1.0	0	0	0	0
7.0 & over	0	0	0	0	0	0	0	0	0	0	0	0
Total	50	100.0	23	100.0	35	100.0	99	100.0	57	100.0	140	100.0
Mean	3.46		3.28		3.13		3.27		3.23		3.40	
Standard Deviation	1.00		1.02		0.64		1.08		0.92		0.62	
Standard Dev. of Mean	0.14		0.22		0.11		0.11		0.12		0.05	

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NAGASAKI**Table 51N.** Distribution of RBC's by Exposure Groups and Weeks from Bombing cont.

RBC in Millions	Exposure Groups C & D						Exposure Groups E, F. & G						Exposure Group H (All Weeks)	
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 & over		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Under 1	2	1.3	1	1.2	0	0	0	0	0	0	0	0	0	0
1.0-1.4	7	4.6	2	2.4	0	0	0	0	0	0	0	0	0	0
1.5-1.9	13	8.6	3	3.7	2	1.0	0	0	0	0	0	0	0	0
2.0-2.4	11	7.3	13	15.9	8	3.9	3	7.0	2	6.1	2	1.3	0	0
2.5-2.9	12	7.9	16	19.5	15	7.3	5	11.6	8	24.2	4	2.7	1	3.9
3.0-3.4	27	17.9	15	18.3	61	29.8	2	4.7	5	15.2	24	16.0	5	19.2
3.5-3.9	32	21.2	18	22.0	78	38.0	7	16.3	5	15.2	56	37.3	6	23.1
4.0-4.4	25	16.6	3	3.7	32	15.6	13	30.2	5	15.2	61	40.7	7	26.9
4.5-4.9	7	4.6	4	4.9	9	4.4	7	16.3	5	15.2	3	2.0	3	11.5
5.0-5.9	11	7.3	6	7.3	0	0	6	14.0	3	9.1	0	0	4	15.4
6.0-6.9	2	1.3	1	1.2	0	0	0	0	0	0	0	0	0	0
7.0 & over	2	1.3	0	0	0	0	0	0	0	0	0	0	0	0
Total	151	100.0	82	100.0	205	100.0	43	100.0	33	100.0	150	100.0	26	100.0
Mean	3.43		3.27		3.51		4.01		3.66		3.76		4.04	
Standard Deviation	1.21		1.05		0.57		0.91		0.90		0.44		0.75	
Standard Dev. of Mean	0.10		0.12		0.04		0.14		0.16		0.04		0.15	

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Table 52H. Hemoglobin. Mean grams per 100cc. of blood and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Weeks From Bombing	Exposure Groups															
	A		B		C		D		E		F		G		H	
	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB
1	-	-	3	7.2	3	10.0	2	10.0	-	-	-	-	-	-	-	-
2	1	11.3	-	-	2	10.1	3	8.5	-	-	-	-	-	-	-	-
3	6	10.0	15	9.0	19	8.8	11	8.3	1	9.9	1	8.7	-	-	-	-
4	42	8.5	29	8.8	11	10.0	5	10.4	3	10.2	2	13.5	2	12.1	-	-
5	58	9.1	44	9.2	34	10.3	45	11.4	7	11.6	8	11.1	12	10.2	42	10.6
6	11	7.9	27	8.9	80	9.6	36	11.0	21	11.3	10	11.4	7	11.0	7	11.3
7	33	8.9	24	8.9	40	9.6	19	9.6	2	10.4	15	11.6	3	11.0	6	10.4
8	8	9.2	5	10.2	10	9.0	3	8.9	3	11.8	1	10.3	-	-	1	11.2
9	3	8.9	7	9.0	18	10.7	6	9.5	1	10.4	1	12.3	1	13.5	1	12.0
10	3	8.5	1	12.5	2	13.2	2	12.7	1	10.4	1	14.1	-	-	-	-
11	2	9.5	38	11.8	62	11.9	32	11.9	4	12.6	3	11.9	3	13.8	2	14.6
12 & over	53	11.9	194	12.4	327	12.7	223	12.9	90	13.1	67	12.8	23	14.2	37	13.3

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Table 52N. Hemoglobin. Mean grams 100cc of blood and number of cases by exposure groups and by weeks from bombing.

Individuals who were living twenty days after the bombing.

Weeks From Bombing	Exposure Group															
	A		B		C		D		E		F		G		H	
	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB	No.	Mean HGB
1	-	-	2	9.4	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	1	8.0	-	-	-	-	-	-	1	8.4	-	-	-	-
3	5	6.7	6	6.6	11	8.5	3	9.3	-	-	-	-	-	-	-	-
4	22	8.4	38	8.8	51	9.9	13	10.7	1	12.2	5	10.6	7	12.1	12	10.0
5	21	10.7	66	10.5	79	9.7	16	9.8	24	11.1	29	10.9	12	10.7	10	12.1
6	11	9.3	34	9.6	31	9.5	14	9.6	5	10.7	19	10.9	6	12.2	-	-
7	4	8.2	6	7.7	6	7.9	2	10.5	-	-	2	10.2	-	-	3	10.3
8	7	8.8	14	10.0	20	9.7	4	10.5	5	11.3	2	10.1	-	-	1	17.0
9	23	10.3	43	10.1	48	10.5	13	11.1	9	10.9	2	10.8	2	10.5	-	-
10	13	9.3	56	9.9	54	10.3	13	10.1	17	10.5	27	10.9	12	10.9	-	-
11	6	7.3	61	11.6	58	10.7	21	11.1	34	11.5	34	11.8	15	11.9	16	14.2
12 & over	3	11.7	38	11.8	13	11.1	11	10.5	6	12.4	6	10.8	1	14.8	47	13.3

HIROSHIMA

Table 53H. Distribution of HGB. By Exposure Groups and Weeks

HGB. in Grams	Exposure Group A						Exposure Group B.					
	Weeks 2,3,4 & 5		Weeks 6,7,& 8		Weeks 9 and over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 4	1	0.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4.0- 4.9	0	0.0	4	7.7	0	0.0	2	2.3	2	3.6	1	0.4
5.0- 5.9	5	4.7	3	5.8	0	0.0	5	5.7	3	5.4	2	0.8
6.0- 6.9	10	9.3	5	9.6	3	4.9	5	5.7	5	8.9	1	0.4
7.0- 7.9	10	9.3	7	13.5	0	0.0	10	11.4	7	12.5	6	2.5
8.0- 8.9	30	28.0	11	21.2	6	9.8	17	19.3	10	17.9	7	2.9
9.0- 9.9	21	19.6	6	11.5	7	11.5	16	18.2	11	19.6	14	5.8
10.0-10.9	17	15.9	8	15.4	6	9.8	24	27.3	11	19.6	20	8.3
11.0-11.9	7	6.5	3	5.8	9	14.8	5	5.7	1	1.8	42	17.5
12.0-12.9	2	1.9	3	5.8	11	18.0	2	2.3	4	7.1	59	24.6
13.0-13.9	4	3.7	0	0.0	13	21.3	2	2.3	1	1.8	53	22.1
14.0 & over	0	0.0	2	3.8	6	9.8	0	0.0	1	1.8	35	14.6
Total	107	100.0	52	100.0	61	100.0	88	100.0	56	100.0	240	100.0
Mean	8.93		8.73		11.47		9.04		9.03		12.21	
Standard Deviation	1.90		2.60		2.11		1.92		2.25		2.05	
Standard Dev. of Mean	0.18		0.36		0.27		0.21		0.30		0.13	

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Table 53H. (continued)

HGB. in Grams	Exposure Groups C & D						Exposure Groups E, F, G						Exposure Group H (All weeks)	
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Under 4	1	0.8	0	0.0	1	0.1	0	0.0	0	0.0	0	0.0	0	0.0
4.0-4.9	1	0.8	4	2.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5.0-5.9	1	0.8	4	2.0	3	0.4	0	0.0	0	0.0	0	0.0	0	0.0
6.0-6.9	1	0.8	10	5.3	3	0.4	0	0.0	0	0.0	1	0.5	0	0.0
7.0-7.9	16	12.3	15	8.0	6	0.9	0	0.0	1	1.6	3	1.5	0	0.0
8.0-8.9	20	15.4	32	17.0	20	3.0	3	8.3	2	3.2	1	0.5	7	7.3
9.0-9.9	20	15.4	32	17.0	25	3.7	8	22.2	7	11.3	2	1.0	12	12.5
10.0-10.9	22	16.9	41	21.8	62	9.2	9	25.0	18	29.0	7	3.6	17	17.7
11.0-11.9	14	10.8	21	11.2	111	16.5	8	22.2	11	17.7	33	16.9	16	16.7
12.0-12.9	16	12.3	12	6.4	129	19.2	4	11.1	17	27.4	41	21.0	13	13.5
13.0-13.9	15	11.5	11	5.9	170	25.3	4	11.1	3	4.8	48	24.6	15	15.6
14.0 & over	3	2.3	6	3.2	142	21.1	0	0.0	3	4.8	59	30.3	16	16.7
Total	130	100.0	188	100.0	672	100.0	36	100.0	62	100.0	195	100.0	96	100.0
Mean	10.23		9.83		12.60		10.89		11.31		13.11		11.78	
Standard Deviation	2.26		2.30		1.95		1.43		1.47		1.75		1.92	
Standard Dev. of Mean	0.20		0.17		0.08		0.24		0.19		0.13		0.20	

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Table 53N. Distribution of HGB by Exposure Groups and Weeks

Individuals who were living twenty days after the bombing.

HGB in Grams	Exposure Group A						Exposure Group B					
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Under 5	1	2.1	0	0.0	1	2.2	2	1.8	0	0.0	1	0.5
4.0- 4.9	0	0.0	1	4.5	1	2.2	3	2.7	1	1.9	1	0.5
5.0- 5.9	3	6.2	1	4.5	1	2.2	8	7.2	2	3.7	0	0.0
6.0- 6.9	6	12.5	4	18.2	0	0.0	7	6.3	2	3.7	0	0.0
7.0- 7.9	4	8.3	0	0.0	2	4.4	6	5.4	11	20.4	8	4.0
8.0- 8.9	6	12.5	3	13.6	9	20.0	14	12.6	11	20.4	19	9.6
9.0- 9.9	9	18.7	6	27.3	7	15.6	13	11.7	5	9.3	28	14.1
10.0-10.9	7	14.6	3	13.6	10	22.2	18	16.2	9	16.7	47	23.7
11.0-11.9	5	10.4	3	13.6	9	20.0	14	12.6	2	3.7	38	19.2
12.0-12.9	4	8.3	1	4.5	2	4.4	17	15.3	5	9.3	30	15.2
13.0-13.9	2	4.2	0	0.0	3	6.7	7	6.3	4	7.4	10	5.1
14.0 & over	1	2.1	0	0.0	0	0.0	2	1.8	2	3.7	16	8.1
Total	48	100.0	22	100.0	45	100.0	111	100.0	54	100.0	198	100.0
Mean	9.23		8.91		9.70		9.71		9.52		10.84	
Standard Deviation	2.47		2.04		2.10		2.58		2.50		2.02	
Standard Dev. of Mean	0.36		0.44		0.32		0.25		0.34		0.14	

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Table 53N. (continued)

HGB in Grams	Exposure Groups C & D						Exposure Groups E,F,G						Exposure Group H (All Weeks)	
	Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over		Weeks 2,3,4,5		Weeks 6,7,8		Weeks 9 and over		No.	%
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
Under 4	4	2.3	1	1.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
4.0- 4.9	3	1.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
5.0- 5.9	5	2.9	4	5.2	2	0.9	1	1.3	1	2.6	0	0.0	1	1.1
6.0- 6.9	11	6.4	1	1.3	1	0.4	0	0.0	0	0.0	0	0.0	1	1.1
7.0- 7.9	22	12.7	12	15.6	7	3.0	2	2.5	2	5.1	4	2.4	4	4.5
8.0- 8.9	21	12.1	13	16.9	10	4.3	6	7.6	3	7.7	3	1.8	2	2.2
9.0- 9.9	19	11.0	12	15.6	33	14.3	10	12.7	3	7.7	13	7.9	4	4.5
10.0-10.9	29	16.8	16	20.8	67	29.0	22	27.8	11	28.2	35	21.2	1	1.1
11.0-11.9	25	14.5	9	11.7	63	27.3	11	13.9	9	23.1	53	32.1	9	10.1
12.0-12.9	16	9.2	5	6.5	33	14.3	18	22.8	4	10.3	40	24.2	19	21.4
13.0-13.9	12	6.9	1	1.3	11	4.8	6	7.6	1	2.6	5	3.0	11	12.4
14.0 & over	6	3.5	3	3.9	4	1.7	3	3.8	5	12.8	12	7.3	37	41.6
Total	173	100.0	77	100.0	231	100.0	79	100.0	39	100.0	165	100.0	89	100.0
Mean	9.75		9.51		10.66		11.00		11.05		11.33		12.85	
Standard Deviation	2.59		2.24		1.48		1.70		1.94		1.55		2.39	
Standard Dev of Mean	0.20		0.26		0.10		0.19		0.31		0.12		0.25	

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Table 54H Number and percent of people with white blood cell counts under 3000 (weeks 2-6) by symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptoms	Exposure Groups														
	A & B			C & D			E, F, & G			H (all Weeks)			Total		
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
		No.	%		No.	%		No.	%		No.	%		No.	%
Epilation	325	232	71.4	47	19	40.4	1	0	0	0	0	-	373	251	67.3
Purpura	259	198	76.4	37	19	51.4	2	0	0	1	0	0	299	217	72.6
Oropharyngeal Lesions	295	211	71.5	106	24	22.6	36	3	8.3	11	0	0	448	238	53.1
Necrotic Gingivitis	55	42	76.4	10	7	70.0	0	0	-	1	0	0	66	49	74.2
Diarrhea	246	157	63.8	229	20	8.7	94	6	6.4	43	1	2.3	612	184	30.1
Bloody Diarrhea	46	24	52.2	23	5	21.7	5	0	0	2	0	0	76	29	38.2
Other Hemorrhage	183	132	72.1	45	13	28.9	18	1	5.6	8	0	0	254	146	57.5
Vomiting	159	100	62.9	22	10	45.5	2	0	0	0	0	-	183	110	60.1
Nausea	176	105	59.7	67	15	22.4	20	1	5.0	6	0	0	269	121	45.0
Melaise	287	186	64.8	311	34	10.9	113	9	8.0	34	0	0	745	229	30.7
Anorexia	273	183	67.0	146	21	14.4	45	2	4.4	11	0	0	475	206	43.4
Cramps	20	13	65.0	11	4	36.4	5	0	0	5	0	0	41	17	41.5
Fever	133	105	78.9	41	10	24.4	5	1	20.0	7	0	0	186	116	62.4
No Symptoms	47	5	10.6	302	18	6.0	85	3	3.5	49	1	2.0	507	39	7.7

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Table 54N. Number and percent of people with white blood cell counts under 3000 (weeks 2-6) by symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptom	Symptom Groups														
	A & B			C & D			E, F, & G			H (All Weeks)			Total		
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
		No.	%		No.	%		No.	%		No.	%		No.	%
Epilation	136	89	65.4	71	45	63.4	5	3	60.0	0	0	-	212	137	64.6
Purpura	90	68	75.6	57	38	66.7	5	2	40.0	0	0	-	152	108	71.1
Oropharyngeal Lesions	143	91	63.6	97	45	46.4	25	5	20.0	0	0	-	265	141	53.2
Necrotic Gingivitis	12	9	75.0	18	11	61.1	2	1	50.0	0	0	-	32	21	65.6
Diarrhea	142	70	49.3	117	42	35.9	38	5	13.2	10	0	0	307	117	38.1
Bloody Diarrhea	11	1	9.1	4	1	25.0	1	0	0	0	0	-	16	2	12.5
Other Hemorrhage	72	54	75.0	42	25	59.5	10	1	10.0	0	0	-	124	80	64.5
Vomiting	73	37	50.7	46	27	58.7	4	1	25.0	0	0	-	123	65	52.8
Nausea	81	41	50.6	69	36	52.2	12	2	16.7	0	0	-	162	79	48.8
Malsise	150	75	50.0	130	66	50.8	46	9	19.6	9	0	0	335	150	44.8
Anorexia	127	63	49.6	98	40	40.8	25	6	24.0	5	0	0	255	109	42.7
Cramps	11	1	9.1	4	1	25.0	1	0	0	0	0	-	16	2	12.5
Fever	36	23	63.9	21	13	61.9	3	0	0	0	0	-	60	36	60.0
No Symptoms	52	12	23.1	83	12	14.5	63	1	1.6	78	0	0	276	25	9.1

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HIROSHIMA

Table 55H. Number and percent of people with white cell counts under 3000 (weeks 2-6) among mutually exclusive cases of epilation, purpura, oropharyngeal lesions within 39 days, vomiting day of bomb, and other hemorrhage by exposure groups.

Individuals who were living twenty days after bombing.

Symptoms	Exposure Groups												Total		
	A & B			C & D			E, F, & G			H (All Weeks)					
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
		No.	%		No.	%		No.	%		No.	%		No.	%
Epilation	46	31	67.4	20	4	20.0	0	0	-	0	0	-	66	35	53.0
Purpura	25	12	48.0	9	2	22.2	2	0	0	1	0	0	37	14	37.8
Oropharyngeal Lesions	18	6	33.3	61	4	6.6	25	3	12.0	5	0	0	109	13	11.9
Vomiting	18	6	33.3	8	1	12.5	2	0	0	0	0	0	28	7	25.0
Other Hemorrhage	8	2	25.0	11	1	9.1	8	1	12.5	2	0	0	29	4	13.8

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NAGASAKI

Table 55B. Number and percent of people with white cell counts under 3000 (weeks 2-6) among mutually exclusive cases of epilation, purpura, oropharyngeal lesions within 39 days, vomiting day of bomb, and other hemorrhage by exposure groups.

Individuals who were living twenty days after the bombing.

Symptoms	Exposure Groups														
	A & B			C & D			E, F, & G			H (All weeks)			Total		
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
		No.	%		No.	%		No.	%		No.	%		No.	%
Epilation	38	21	52.6	20	15	7.5	3	2	66.7	0	0	-	61	38	62.3
Purpura	7	3	42.9	7	3	42.9	3	1	33.3	0	0	-	17	7	41.2
Oropharyngeal Lesions	24	8	33.3	30	3	10.0	13	2	15.4	0	0	-	67	13	19.4
Vomiting	19	3	15.8	13	4	30.8	1	0	0	0	0	-	33	7	21.2
Other Hemorrhage	2	1	50.0	8	4	50.0	3	1	33.3	0	0	-	13	6	46.2

HIROSHIMA

Table 56H Number and percent of people with white cell counts under 3000 (weeks 2-6) among cases without epilation purpura, oropharyngeal lesions, vomiting or hemorrhage, by other symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptoms	Exposure Groups														
	A & B			C & D			E, F, & G			H (All Weeks)			Total		
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
		No.	%		No.	%		No.	%		No.	%		No.	%
Diarrhea	32	11	34.4	158	6	3.8	67	4	6.0	35	1	2.9	250	22	8.8
Bloody Diarrhea	6	3	50.0	17	1	5.9	5	0	0	1	0	0	29	4	13.8
Nausea	10	1	10.0	34	2	5.9	10	1	10.0	4	0	0	58	4	6.9
Melaise	50	17	34.0	209	12	5.7	82	7	8.5	26	0	0	367	36	9.8
Anorexia	28	7	25.0	89	4	4.5	30	1	3.3	7	0	0	154	12	7.8
Cramps	1	1	100.0	5	1	20.0	3	0	0	4	0	0	13	2	15.4
Fever	8	3	37.5	23	2	8.7	5	1	20.0	5	0	0	41	6	14.6
No Symptoms	47	5	10.6	302	18	6.0	85	3	3.5	49	1	2.0	507	39	7.7

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Table 56N. Number and percent of people with white cell counts under 3000 (weeks 2-6) among cases without epilation, purpura, oropharyngeal lesions, vomiting, or hemorrhage, by other symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptoms	Exposure Groups												Total		
	A & B			C & D			E, F, & G			H (All Weeks)					
	Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000		Number of People	WBC Under 3000	
No.		%	No.		%	No.		%	No.		%	No.		%	
Diarrhea	45	12	26.7	45	4	8.9	26	0	0	10	0	0	126	16	12.7
Bloody Diarrhea	2	0	0	5	0	0	3	0	0	1	0	0	11	0	0
Nausea	9	4	44.4	16	3	18.8	5	0	0	0	0	-	30	7	23.3
Malaise	35	9	25.7	38	7	18.4	25	1	4.0	9	0	0	107	17	15.9
Anorexia	25	7	28.0	33	8	24.2	12	1	8.3	5	0	0	75	16	21.3
Cranios	3	0	0	3	0	0	1	0	0	0	0	-	7	0	0
Fever	3	0	0	5	2	40.0	3	0	0	0	0	-	11	2	18.2
No Symptoms	52	12	23.1	83	12	14.5	63	1	1.6	78	0	0	276	25	9.1

HIROSHIMA

Table 57H. White blood cell counts by combination of symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptoms*	Exposure Groups A & B (weeks 2-6)						Exposure Groups C & D (weeks 2-6)					
	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC
		No.	%	No.	%			No.	%	No.	%	
Both E+ and P+	180	144	80.0	163	90.6	1923	15	11	73.3	11	73.3	2420
Either E+ or P+	224	142	63.4	177	79.0	2694	54	16	29.6	24	44.4	4157
E- P- but two or more symptoms including O+, V+, or H+	44	17	38.6	24	54.5	3980	81	7	8.6	13	16.0	5944
E- P-, but O+, V+, or H+ with no other symptoms	12	2	16.7	6	50.0	4742	18	3	16.7	4	22.2	5244
E- P- O- V- H- but some other symptoms	71	20	28.2	35	49.3	4351	316	17	5.4	58	18.4	5759
No Symptoms	47	5	10.6	19	40.4	4791	302	18	6.0	43	14.2	6268

*Key to symbols:

E+ = Epilation
 E- = No Epilation
 P+ = Purpura
 P- = No Purpura

O+ = Oropharyngeal Lesions within 39 days.
 O- = No oropharyngeal lesions within 39 days.
 V+ = Vomiting on day of bomb.
 V- = No vomiting on day of bomb.

H+ = Other hemorrhage
 H- = No other hemorrhage
 Other symptoms include diarrhea, bloody diarrhea, nausea, malaise, anorexia, cramps and fever.

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Table 57H. Hiroshima (continued)

Symptoms*	Exposure Group E, F, & G (weeks 2-6)						Exposure Group H (all weeks)					
	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC
		No.	%	No.	%			No.	%	No.	%	
Both E+ and P+	0	0	-	0	-	0	0	0	-	0	-	0
Either E+ or P+	3	0	-	0	-	5933	1	0	-	0	-	11600
E- P- But two or more Symptoms including O+, V+, or H+	39	3	7.7	9	23.1	5918	11	0	-	0	-	5900
E- P-, but O+, V+, or H+ with no other symptoms	6	1	16.7	1	16.7	4933	2	0	-	1	50.0	6350
E- P- O- V- H- but some other symptoms	120	7	5.8	21	17.5	6009	49	1	2.0	5	10.2	6171
No Symptoms	85	3	3.5	12	14.1	6431	49	1	2.0	2	4.1	6559

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NAGASAKI

Table 57N. White blood cell counts by combination of symptoms and by exposure groups.

Individuals who were living twenty days after the bombing.

Symptom *	Exposure Groups A & B (weeks 2-6)						Exposure Groups C & D (weeks 2-6)					
	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC
		No.	%	No.	%			No.	%			
Both E+ and P+	59	46	78.0	50	84.7	2181	30	19	63.3	21	70.0	2943
Either E+ or P+	108	65	60.2	82	75.9	3018	68	45	66.2	51	75.0	2975
E- P- But two or more symptoms including O+, V+, or H+	57	18	31.6	25	43.9	4511	52	13	25.0	23	44.2	5006
E- P- But O+, V+, or H+ with no other symptoms	9	2	22.2	5	55.6	4433	13	4	30.8	5	38.5	4985
E- P- O- V- H- but some other symptoms	68	16	23.5	23	33.8	5100	87	14	16.1	24	27.6	5499
No Symptoms	52	12	23.1	17	32.7	5148	83	12	14.5	18	21.7	5839

*Key to symbols:

E+ Epilation
E- No Epilation
P+ Purpura
P- No Purpura

O+ Oropharyngeal Lesions within 39 days.
O- No Oropharyngeal Lesions within 39 days.
V+ Vomiting on day of bombing.
V- No vomiting on day of bombing.

H+ Other Hemorrhage
H- No other Hemorrhage
Other symptoms includes diarrhea,
bloody diarrhea, nausea, malaise,
anorexia, cramps and fever.

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Table 57N. Nagasaki (continued)

Symptoms*	Exposure Groups E, F, & G (Weeks 2-6)						Exposure Groups H (All Weeks)					
	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC	Number of People	WBC Under 3000		WBC Under 4000		Mean WBC
		No.	%	No.	%			No.	%			
Both E+ and P+	0	0	-	0	-	0	0	0	-	0	-	0
Either E+ or P+	10	5	50.0	5	50.0	5790	0	0	-	0	-	0
E- P- But two or more symptoms including O+, V+, or H+	20	4	20.0	5	25.0	6240	0	0	-	0	-	0
E- P- but O+, V+, or H+ with no other symptoms	5	0	-	0	-	6520	0	0	-	0	-	0
E- P- O- V- H- but some other Symptoms	46	1	2.2	5	10.9	7374	16	0	0	0	0	7500
No Symptoms	63	1	1.6	3	4.8	7113	98	0	0	1	1.0	8102

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Table 58. Distribution of days from bombing to death among individuals who died 20 days or more following the day of bombing.

Individuals who were living twenty days after the bombing.

Days After Bombing to Death	HIROSHIMA		NAGASAKI	
	No.	%	No.	%
20 - 29	137	53.9	87	50.0
30 - 39	80	31.5	43	24.7
40 - 49	13	5.1	13	7.5
50 - 59	6	2.4	11	6.3
60 - 69	11	4.3	6	3.4
70 - 79	2	0.8	6	3.4
80 & over	5	2.0	8	4.6
Total Deaths	254	100.0	174	100.0

Table 59. Deaths occurring 20 days or more following the day of bombing, by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	HIROSHIMA								NAGASAKI							
		Total Deaths	Outdoors		Indoors				Shielding Unknown	Total Deaths	Outdoors		Indoors				Shielding Unknown
			Unshielded	Shielded	Japanese Building	Heavy Building	Type Bldg. Unknown	Bomb Shelters & Tunnels			Unshielded	Shielded	Japanese Building	Heavy Building	Type Bldg. Unknown	Bomb Shel- ters & Tun- nels	
1	0-1000	194	22	6	120	10	16	0	20	64	5	7	35	5	4*	1*	7
2	1100-1500	46	9	1	19	3	6	0	8	61	10	5	30	8	3	1*	4
3	1600-2000	11	4	0	3	0	0	0	4	33	12	1	17	3	0	0	0
4	2100-2500	2	1	0	0	0	0	0	1	5	2	0	2	1	0	0	0
5	2600-3000	1	0	1	0	0	0	0	0	5	3	0	2	0	0	0	0
6	3100-4000	0	0	0	0	0	0	0	0	5	2	1	1	1	0	0	0
7	4100-5000	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Total	0-5000	254	36	8	142	13	22	0	33	174	34	14	88	18	7	2	11
9	Over 5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	--	254	36	8	142	13	22	0	33	174	34	14	88	18	7	2	11

*In a cave (0.5 Km)

**In a tunnel (in entrance of air raid shelter)

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Table 60. White blood cell counts (weeks 2-6) among individuals who died 20 days or more following the day of bombing.

Individuals who were living twenty days after the bombing.

Number of WBC	HIROSHIMA		NAGASAKI	
	No.	%	No.	%
Under 500	31	24.2	8	17.8
500- 999	36	28.1	9	20.0
1000-1999	30	23.4	11	24.4
2000-2999	16	12.5	8	17.8
3000-3999	5	3.9	4	8.9
4000-4999	5	3.9	2	4.4
5000-5999	0	0	1	2.2
6000 & OVER	5	3.9	2	4.4
Total	128	100.0	45	100.0

Table 61. The incidence of symptoms, burns and mechanical injuries among individuals who died 20 days or more following the day of bombing.

Individuals who were living twenty days after the bombing.

Symptoms, Burns and Mechanical Injuries.	HIROSHIMA		NAGASAKI		
	No.	%	No.	%	
Total Deaths	254	100.0	174	100.0	
Epilation and Purpura	145	57.1	55	31.6	
Epilation or Purpura	82	32.3	69	39.6	
E- P-, but two or more Symptoms including O+, V+, or H+	12	4.7	25	14.4	
E- P-, but any one symptom including O+, V+, or H+	2	0.8	0	0	
E- P- O- V- H-, but some other symptom	8	3.1	21	12.1	
No symptoms	5	2.0	4	2.3	
Burns	Severe	8	3.1	24	13.8
	Moderate	52	20.5	27	15.5
	None	194	76.4	123	70.7
Mechanical Injuries	Severe	59	23.2	28	16.1
	Moderate	64	25.2	53	30.5
	None	131	51.6	93	53.4

Key to symbols:

E+ = Epilation
 E- = No Epilation
 P+ = Purpura
 P- = No Purpura
 O+ = Oropharyngeal lesions within 39 days
 O- = No oropharyngeal lesions within 39 days
 V+ = Vomiting day of bombing
 V- = No vomiting day of bombing

H+ = Other Hemorrhage
 H- = No other hemorrhage
 Other symptoms include
 Diarrhea, Bloody Diarrhea,
 Malaise, Anorexia, Nausea, Cramps
 and Fever.

Table 62. Distribution of days from bombing to death among individuals who died prior to 20 days following the day of bombing.

INDIVIDUALS WHO DIED WITHIN 19 DAYS FOLLOWING THE DAY OF BOMBING.

Days After Bombing to Death	HIROSHIMA		NAGASAKI	
	No.	%	No.	%
0 - 1	0	0	29	12.2
2 - 3	1	1.1	8	3.4
4 - 5	4	4.4	28	11.8
6 - 7	17	18.7	40	16.8
8 - 9	25	27.5	44	18.5
10 - 11	4	4.4	21	8.8
12 - 13	7	7.7	14	5.9
14 - 15	8	8.8	18	7.6
16 - 17	7	7.7	19	8.0
18 - 19	17	18.7	15	6.3
Unknown	1	1.1	2	0.8
Total Deaths	91	100.0	238	100.0

Table 63. Deaths occurring prior to 20 days following the bombing, by distance and shielding.

INDIVIDUALS WHO DIED WITHIN 19 DAYS FOLLOWING THE DAY OF BOMBING.

Ring	Distance (Meters)	HIROSHIMA									NAGASAKI							
		Total Deaths	Outdoors		Indoors					Shielding Unknown	Total Deaths	Outdoors		Indoors				Shielding Unknown
			Unshielded	Shielded	Jap Building	Heavy Building	Type Bldg. Unknown	Bomb Shelters	Unshielded			Shielded	Jap Building	Heavy Building	Type Bldg. Unknown	Bomb Shelters		
1	0-1000	82	16	3	32	23	3	0	5	130	24	1	78	20	1	1*	5	
2	1100-1500	6	1	0	1	0	0	0	4	76	29	4	24	12	1	0	6	
3	1600-2000	3	1	0	0	0	0	0	2	15	4	0	5	5	0	0	1	
4	2100-2500	0	0	0	0	0	0	0	0	14	7	1	5	1	0	0	0	
5	2600-3000	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	1	
6	3100-4000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7	4100-5000	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	
Total	0-5000	91	18	3	33	23	3	0	11	238	66	6	112	38	2	1	13	
9	Over 5000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total	--	91	18	3	33	23	3	0	11	238	66	6	112	38	2	1	13	

*In a cave. (0.7 Km)

Table 64. White blood cell counts of individuals who died prior to 20 days following the day of bombing.

INDIVIDUALS WHO DIED WITHIN 19 DAYS FOLLOWING THE DAY OF BOMBING.

Number of WBC	HIROSHIMA		NAGASAKI	
	No.	%	No.	%
Under 500	14	40.0	1	-
500- 999	6	17.1	0	-
1000-1999	4	11.4	0	-
2000-2999	2	5.7	0	-
3000-3999	0	0	0	-
4000-4999	4	11.4	0	-
5000-5999	1	2.9	0	-
6000 & over	4	11.4	0	-
Total	35	100.0	1	-

Table 65. The incidence of symptoms, burns and mechanical injuries among individuals who died prior to 20 days following the day of bombing.

INDIVIDUALS WHO DIED WITHIN 19 DAYS FOLLOWING THE DAY OF BOMBING.

Symptoms, Burns and Mechanical Injuries	HIROSHIMA		NAGASAKI		
	No.	%	No.	%	
Total Deaths	91	100.0	238	100.0	
Epilation and Purpura	17	18.7	23	9.7	
Epilation or Purpura	20	22.0	33	13.9	
E- P- but two or more symptoms including O+, V+, or H+	11	12.1	81	34.0	
E- P-, but any one symptom including O+, V+ or H+	0	0	4	1.7	
E- P- O- V- H-, but some other symptom	39	42.8	68	28.5	
No symptoms	4	4.4	29	12.2	
Burns	Severe	7	7.7	78	32.8
	Moderate	45	49.4	58	24.4
	None	39	42.9	102	42.8
Mechanical Injuries	Severe	27	29.7	82	34.5
	Moderate	25	27.5	52	21.8
	None	39	42.8	104	43.7

Key to symbols:

E+ = Epilation
 E- = No Epilation
 P+ = Purpura
 P- = No Purpura
 O+ = Oropharyngeal lesions within 39 days
 O- = No oropharyngeal lesions within 39 days
 V+ = Vomiting day of bombing
 V- = No vomiting day of bombing

H+ - Other hemorrhage
 H- - No other hemorrhage

Other symptoms include:
 Diarrhea, Bloody Diarrhea,
 Malaise, Anorexia, Nausea,
 Cramps and Fever.

HIROSHIMA

Table 66H. Incidence of symptom combinations by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Number of People	Epilation and/or Purpura						Neither Epilation Nor Purpura									
		Both Epilation and Purpura		Either Epilation or Purpura		Total		Oropharyngeal Lesions (within 39 days), vomiting (day of bomb) and/or hemorrhage.			O. V. H. But One Or More Symptoms		No Symptoms				
		No.	%	No.	%			Two or More Symptoms	One Symptom Only	Total							
						No.	%				No.	%	No.	%	No.	%	
A	570	255	44.7	234	41.1	489	85.8	29	5.1	3	0.5	32	5.6	32	5.6	17	3.0
B	1119	170	15.2	322	28.8	492	44.0	148	13.2	36	3.2	184	16.4	294	26.3	149	13.3
C	1817	37	2.0	204	11.2	241	13.3	245	13.5	50	2.8	295	16.2	799	44.0	481	26.5
D	1604	11	0.7	82	5.1	93	5.8	223	13.9	29	1.8	252	15.7	778	48.5	481	30.0
E	711	1	0.1	28	3.9	29	4.1	97	13.6	12	1.7	109	15.3	325	45.7	248	34.9
F	575	1	0.2	13	2.3	14	2.4	41	7.1	13	2.3	54	9.4	175	30.4	332	57.7
G	267	0	0	4	1.5	4	1.5	14	5.2	3	1.1	17	6.4	102	38.2	144	53.9
Total	6663	475	7.1	887	13.3	1362	20.4	797	12.0	146	2.2	943	14.2	2505	37.6	1852	27.8
H	219	0	0	1	0.5	1	0.5	11	5.0	4	1.8	15	6.8	84	38.4	119	54.3
Grand Total	6882	475	6.9	888	12.9	1363	19.8	808	11.7	150	2.2	958	13.9	2589	37.6	1971	28.6

NAGASAKI

Table 66M. Incidence of symptom combination by exposure groups.

Individuals who were living twenty days after the bombing.

Exposure Group	Number of People	Epilation and/or Purpura						Neither Epilation nor Purpura									
		Both Epilation and Purpura		Either Epilation or Purpura		Total		Oropharyngeal Lesions (within 39 days), Vomiting (day of bomb), and/or Hemorrhage						O-V-H- But one or more other Symptoms		No Symptoms	
								Two or More Symptoms		One Symptom Only		Total					
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A	376	73	19.4	127	33.8	200	53.2	52	13.8	5	1.3	57	15.2	62	16.5	57	15.2
B	1465	156	10.7	361	24.7	517	35.3	278	19.0	41	2.8	319	21.8	356	24.3	273	18.6
C	1630	84	5.2	271	16.6	355	21.8	298	18.3	55	3.4	353	21.7	483	29.6	439	26.9
D	702	18	2.6	55	7.8	73	10.4	85	12.1	13	1.9	98	14.0	247	35.2	284	40.5
E	663	2	0.3	18	2.7	20	3.0	64	9.7	19	2.9	83	12.5	220	33.2	340	51.3
F	1091	4	0.4	28	2.6	32	2.9	86	7.9	27	2.5	113	10.4	315	28.9	631	57.9
G	500	1	0.2	8	1.6	9	1.8	29	5.8	12	2.4	41	8.2	97	19.4	353	70.6
Total	6427	338	5.3	868	13.5	1206	18.8	892	13.9	172	2.7	1064	16.6	1780	27.7	2377	37.0
H	194	0	0	0	0	0	0	3	1.5	3	1.5	6	3.1	27	13.9	161	83.0
Grand Total	6621	338	5.1	868	13.1	1206	18.2	895	13.5	175	2.6	1070	16.2	1807	27.3	2538	38.3

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Table 67. Number and percent of cases originally diagnosed by the physician in Japan as having radiation injuries.

Individuals who were living twenty days after the bombing.

Exposure Group	Hiroshima			Nagasaki		
	Number of People	Diagnosis of Radiation Injury		Number of People	Diagnosis of Radiation Injury	
		No.	%		No.	%
A	570	302	53.0	376	160	42.6
B	1119	236	21.1	1465	401	27.4
C	1817	120	6.6	1630	275	16.9
D	1604	63	3.9	702	51	7.3
E	711	12	1.7	663	20	3.0
F	575	11	1.9	1091	27	2.5
G	267	2	0.7	500	6	1.2
Total	6663	746	11.2	6427	940	14.6
H	219	2	0.9	194	3	1.5
Grand Total	6882	748	10.9	6621	943	14.2

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Table 68H. Individuals with specific symptoms of radiation (epilation and/or purpura) by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors						Indoors								
		Unshielded			Shielded			Japanese Building			Heavy Building			Bomb Shelters & Tunnels		
		Total Number of People	People with Epilation and/or Purpura		Total Number of People	People with Epilation and/or Purpura		Total Number of People	People with Epilation and/or Purpura		Total Number of People	People with Epilation and/or Purpura		Total Number of People	People with Epilation and/or Purpura	
			No.	%		No.	%		No.	%		No.	%		No.	%
1	0-1000	105	93	88.6	53	44	83.0	410	352	85.9	113	71	62.8	20	3	15.0
2	1100-1500	249	106	42.6	150	71	47.3	560	216	38.6	118	27	22.9	1	0	0
3	1600-2000	689	98	14.2	189	21	11.1	754	76	10.1	93	5	5.4	3	0	0
4	2100-2500	590	40	6.8	94	9	9.6	731	34	4.7	12	1	8.3	1	0	0
5	2600-3000	192	15	7.8	92	3	3.3	390	10	2.6	14	1	7.1	0	0	0
6	3100-4000	159	6	3.8	63	3	4.8	325	4	1.2	13	0	0	0	0	0
7	4100-5000	68	2	2.9	7	0	0	127	1	0.8	27	1	3.7	0	0	0
Total	0-5000	2052	360	17.5	648	151	23.3	3297	693	21.0	390	106	27.2	25	3	12.0
9	8787 5000	19	1	5.3	5	0	0	22	0	0	2	0	0	0	0	0
Grand Total	—	2071	361	17.4	653	151	23.1	3319	693	20.9	392	106	27.0	25	3	12.0

NAGASAKI

Table 68N. Individuals with specific symptoms of radiation (epilation and/or purpura) by distance and by shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors						Indoors								
		Unshielded			Shielded			Japanese Building			Heavy Building			Bomb Shelters and Tunnels		
		Total Number of People	People With Epilation and/or Purpura		Total Number of People	People With Epilation and/or Purpura		Total Number of People	People With Epilation and/or Purpura		Total Number of People	People With Epilation and/or Purpura		Total Number of People	People With Epilation and/or Purpura	
			No.	%		No.	%		No.	%		No.	%		No.	%
1	0-1000	73	36	49.3	52	29	55.8	252	135	53.6	303	80	26.4	73	13	17.8
2	1100-1500	160	65	40.6	104	32	30.8	861	327	38.0	604	169	28.0	72	2	2.8
3	1600-2000	208	45	21.6	103	11	10.7	561	102	18.2	88	16	18.2	47	2	4.3
4	2100-2500	115	20	17.4	82	6	7.3	318	22	6.9	35	2	5.7	110	3	2.7
5	2600-3000	139	9	6.5	61	1	1.6	369	4	1.1	30	5	16.7	25	0	0
6	3100-4000	188	3	1.6	89	2	2.2	654	17	2.6	152	5	3.3	29	1	3.4
7	4100-5000	46	0	0	23	0	0	157	1	0.6	17	0	0	9	0	0
Total	0-5000	929	178	19.2	514	81	15.8	3172	608	19.2	1229	277	22.5	365	21	5.8
9	Over 5000	10	0	0	6	0	0	69	0	0	4	0	0	2	0	0
Grand Total	--	939	178	19.0	520	81	15.6	3241	608	18.8	1233	277	22.5	367	21	5.7

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Table 69H. Individuals with specific symptoms of radiation (epilation and/or purpura) and/or suggestive symptoms of radiation (any combination of two or more symptoms including oropharyngeal lesions, vomiting, or other hemorrhage) by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors						Indoors								
		Unshielded			Shielded			Japanese Building			Heavy Building			Bomb Shelters & Tunnels		
		Total Number of People	People with Symptoms		Total Number of People	People with Symptoms		Total Number of People	People with Symptoms		Total Number of People	People with Symptoms		Total Number of People	People with Symptoms	
			No.	%		No.	%		No.	%		No.	%		No.	%
1	0-1000	105	95	90.5	53	48	90.6	410	375	91.5	113	85	75.2	20	5	25.0
2	1100-1500	249	136	54.6	150	93	62.0	560	293	52.3	118	44	37.3	1	0	0
3	1600-2000	689	191	27.7	189	50	26.5	754	176	23.3	93	18	19.4	3	0	0
4	2100-2500	590	137	23.2	94	18	19.1	731	134	18.3	12	1	8.3	1	0	0
5	2600-3000	192	43	22.4	92	24	26.1	390	56	14.4	14	3	21.4	0	0	0
6	3100-4000	159	18	11.3	63	6	9.5	325	25	7.7	13	2	15.4	0	0	0
7	4100-5000	68	7	10.3	7	1	14.3	127	4	3.1	27	2	7.4	0	0	0
Total	0-5000	2052	627	30.6	648	240	37.0	3297	1063	32.2	390	155	39.7	25	5	20.0
9	over 5000	19	3	15.8	5	1	20.0	22	4	18.2	2	0	0	0	0	0
Grand Total	--	2071	630	30.4	653	241	36.9	3319	1067	32.1	392	155	39.5	25	5	20.0

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Table 69N. Individuals with specific symptoms of radiation (epilation and/or purpura) and/or suggestive symptoms of radiation (any combination of two or more symptoms including oropharyngeal lesions, vomiting, or other hemorrhage) by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Outdoors						Indoors								
		Unshielded			Shielded			Japanese Building			Heavy Building			Bomb Shelters and Tunnels		
		Total Number of People	People With Symptoms		Total Number of People	People With Symptoms		Total Number of People	People With Symptoms		Total Number of People	People With Symptoms		Total Number of People	People With Symptoms	
			No.	%		No.	%		No.	%		No.	%		No.	%
1	0-1000	73	44	60.3	52	36	69.2	252	172	68.3	303	147	48.5	73	20	27.4
2	1100-1500	160	84	52.5	104	48	46.2	861	498	57.8	604	317	52.5	72	8	11.1
3	1600-2000	208	76	36.5	103	22	21.4	561	194	34.6	88	34	38.6	47	6	12.8
4	2100-2500	115	36	31.3	82	12	14.6	318	58	18.2	35	6	17.1	110	16	14.5
5	2600-3000	139	22	15.8	61	8	13.1	369	38	10.3	30	9	30.0	25	2	8.0
6	3100-4000	188	29	15.4	89	5	5.6	654	53	8.1	152	18	11.8	29	4	13.8
7	4100-5000	46	2	4.3	23	2	8.7	157	5	3.2	17	2	11.8	9	0	0
Total	0-5000	929	293	31.5	514	133	25.9	3172	1018	32.1	1229	533	43.4	365	56	15.3
9	Over 5000	10	1	10.0	6	0	0	69	2	2.9	4	0	0	2	0	0
Grand Total	--	939	294	31.3	520	133	25.6	3241	1020	31.5	1233	533	43.2	367	56	15.3

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Table 70H. Radiation, burns, and mechanical injuries by distance.

Individuals who were living twenty days after the bombing.

Distance	No.	One Type of Injury Only						Two Types of Injury						Three Types		Total with Injury		
		Radiation Only		Burns Only		Mechanical Only		Radiation & Burns		Radiation & Mechanical		Burns & Mechanical		Radiation, Burns, & Mechanical		No.	%	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%			
1	0-1000	749	152	20.3	13	1.7	60	8.0	92	12.3	320	42.7	7	0.9	76	10.1	720	96.1
2	1100-1500	1125	91	8.1	114	10.1	268	23.8	149	13.2	276	24.5	55	4.9	72	6.4	1025	91.1
3	1600-2000	1824	45	2.5	489	26.8	502	27.5	193	10.6	152	8.3	126	6.9	54	3.0	1561	85.6
4	2100-2500	1450	44	3.0	406	28.0	371	25.6	100	6.9	106	7.3	71	4.9	42	2.9	1140	78.6
5	2600-3000	700	35	5.0	109	15.6	182	26.0	34	4.9	50	7.1	29	4.1	14	2.0	453	64.7
6	3100-4000	576	25	4.3	53	9.2	127	22.0	10	1.7	15	2.6	4	0.7	2	0.3	236	41.0
7	4100-5000	239	14	5.9	1	0.4	34	14.2	0	0	1	0.4	0	0	0	0	50	20.9
Total	0-5000	6663	406	6.1	1185	17.8	1544	23.2	578	8.7	920	13.8	292	4.4	260	3.9	5185	77.8
9	over 5000	219	11	5.0	1	0.5	2	0.9	0	0	1	0.5	0	0	0	0	15	6.8
Grand Total	--	6882	417	6.1	1186	17.2	1546	22.5	578	8.4	921	13.4	292	4.2	260	3.8	5200	75.6

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Table 70N. Radiation, burns, and mechanical injuries by distance

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	One Type of Injury Only						Two Types of Injury						Three Types		Total With Any Injury	
			Radiation Only		Burns Only		Mechanical Only		Radiation and Burns		Radiation and Mechanical		Burns and Mechanical		Radiation Burns and Mechanical			
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	122	15.5	44	5.6	175	22.2	68	8.6	203	25.7	23	2.9	44	5.6	679	86.1
2	1100-1500	1882	179	9.5	118	6.3	460	24.4	149	7.9	528	28.1	62	3.3	123	6.5	1619	86.0
3	1600-2000	1034	76	7.3	178	17.2	182	17.6	100	9.7	132	12.8	47	4.5	34	3.3	749	72.4
4	2100-2500	672	38	5.7	88	13.1	114	17.0	42	6.2	42	6.2	15	2.2	10	1.5	349	51.9
5	2600-3000	644	37	5.7	97	15.1	122	18.9	23	3.6	24	3.7	10	1.6	1	0.2	314	48.8
6	3100-4000	1141	64	5.6	65	5.7	163	14.3	15	1.3	32	2.8	6	0.5	0	0	345	30.2
7	4100-5000	265	9	3.4	16	6.0	22	8.2	1	0.4	1	0.4	2	0.8	1	0.4	52	19.6
Total	0-5000	6427	525	8.2	606	9.4	1238	19.2	398	6.2	962	15.0	165	2.6	213	3.3	4107	63.9
9	Over 5000	194	3	1.5	2	1.0	4	2.1	0	0	0	0	1	0.5	0	0	10	5.1
Grand Total	--	6621	528	8.0	608	9.2	1242	18.8	398	6.0	962	14.5	166	2.5	213	3.2	4117	62.2

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Table 71H. Type of most severe injury by distance

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Radiation		Burns		Mechanical		Total Any Injury		No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	749	617	82.4	18	2.4	85	11.3	720	96.1	29	3.9
2	1100-1500	1125	520	46.2	158	14.1	347	30.8	1025	91.1	100	8.9
3	1600-2000	1824	326	17.9	653	35.8	582	31.9	1561	85.6	263	14.4
4	2100-2500	1450	185	12.8	511	35.2	444	30.6	1140	78.6	310	21.4
5	2600-3000	700	94	13.4	144	20.6	215	30.7	453	64.7	247	35.3
6	3100-4000	576	46	8.0	58	10.1	132	22.9	236	41.0	340	59.0
7	4100-5000	239	15	6.3	1	0.4	34	14.2	50	20.9	189	79.1
Total	0-5000	6663	1803	27.1	1543	23.2	1839	27.5	5185	77.8	1478	22.2
9	Over 5000	219	11	5.0	1	0.5	3	1.3	15	6.8	204	93.2
Grand Total	--	6882	1814	26.4	1544	22.4	1842	26.8	5200	75.6	1682	24.4

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Table 71N. Type of most severe injury sustained by distance.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Radiation		Burns		Mechanical		Total Any Injury		No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	789	372	47.2	66	8.4	241	30.5	679	86.1	110	13.9
2	1100-1500	1882	813	43.2	169	9.0	637	33.8	1619	86.0	263	14.0
3	1600-2000	1034	281	27.2	241	23.3	227	22.0	749	72.4	285	27.6
4	2100-2500	672	112	16.7	113	16.8	124	18.4	349	51.9	323	48.1
5	2600-3000	644	75	11.7	108	16.8	131	20.3	314	48.8	330	51.2
6	3100-4000	1141	102	8.9	73	6.4	170	14.9	345	30.2	796	69.8
7	4100-5000	265	11	4.2	17	6.4	24	9.1	52	19.6	213	80.4
Total	0-5000	6427	1766	27.5	787	12.2	1554	24.2	4107	63.9	2320	36.1
9	Over 5000	194	3	1.5	3	1.5	4	2.1	10	5.1	184	94.9
Grand Total	--	6621	1769	26.7	790	11.9	1558	23.5	4117	62.2	2504	37.8

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Table 72B. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Outdoors Unshielded									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	105	95	90.5	8	7.6	2	1.9	105	100.0	0	0
2	1100-1500	249	134	53.8	92	36.9	15	6.1	241	96.8	8	3.2
3	1600-2000	689	134	19.4	487	70.7	43	6.3	664	96.4	25	3.6
4	2100-2500	590	75	12.7	439	74.4	34	5.8	548	92.9	42	7.1
5	2600-3000	192	29	15.1	100	52.1	15	7.8	144	75.0	48	25.0
6	3100-4000	159	16	10.1	47	29.6	11	6.8	74	46.5	85	53.5
7	4100-5000	68	7	10.3	1	1.5	3	4.4	11	16.2	57	83.8
Total	0-5000	2052	490	23.9	1174	57.2	123	6.0	1787	87.1	265	12.9
9	Over 5000	19	3	15.7	1	5.3	1	5.3	5	26.3	14	73.7
Grand Total	-	2071	493	23.8	1175	56.7	124	6.0	1792	86.5	279	13.5

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Table 72H. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Outdoors Shielded									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	53	46	86.8	1	1.9	3	5.6	50	94.3	3	5.7
2	1100-1500	150	81	54.0	23	15.3	37	24.7	141	94.0	9	6.0
3	1600-2000	189	43	22.7	57	30.2	50	26.5	150	79.4	39	20.6
4	2100-2500	94	14	14.9	30	31.9	25	26.6	69	73.4	25	26.6
5	2600-3000	92	21	22.8	14	15.2	16	17.4	51	55.4	41	44.6
6	3100-4000	63	5	7.9	1	1.6	10	15.9	16	25.4	47	74.6
7	4100-5000	7	1	14.3	0	0	2	28.6	3	42.9	4	57.1
Total	0-5000	648	211	32.6	126	19.4	143	22.1	480	74.1	168	25.9
9	Over 5000	5	1	20.0	0	0	0	0	1	20.0	4	80.0
Grand Total	-	653	212	32.5	126	19.3	143	21.9	481	73.7	172	26.3

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Table 72H. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Indoors Japanese Building									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	410	362	88.3	6	1.5	37	9.0	405	98.8	5	1.2
2	1100-1500	560	254	45.4	33	5.9	215	38.3	502	89.6	58	10.4
3	1600-2000	754	129	17.1	80	10.6	408	54.1	617	81.8	137	18.2
4	2100-2500	731	93	12.7	35	4.8	370	50.6	498	68.1	233	31.9
5	2600-3000	390	41	10.5	29	7.4	175	44.9	245	62.8	145	37.2
6	3100-4000	325	22	6.8	7	2.2	106	32.5	135	41.5	190	58.5
7	4100-5000	127	4	3.1	0	0	25	19.7	29	22.8	98	77.2
Total	0-5000	3297	905	27.4	190	5.8	1336	40.5	2431	73.7	866	26.3
9	Over 5000	22	3	13.6	0	0	1	4.6	4	18.2	18	81.8
Grand Total		3319	908	27.4	190	5.7	1337	40.3	2435	73.4	884	26.6

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Table 72H. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Indoors Heavy Building									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	113	77	68.2	1	0.9	30	26.5	108	95.6	5	4.4
2	1100-1500	118	31	26.3	7	5.9	69	58.5	107	90.7	11	9.3
3	1600-2000	93	12	12.9	9	9.7	54	58.0	75	80.6	18	19.4
4	2100-2500	12	1	8.3	0	0	9	75.0	10	83.3	2	16.7
5	2600-3000	14	2	14.3	1	7.1	5	35.7	8	57.1	6	42.9
6	3100-4000	13	2	15.4	0	0	4	30.8	6	46.2	7	53.8
7	4100-5000	27	2	7.4	0	0	3	11.1	5	18.5	22	81.5
Total	0-5000	390	127	32.6	18	4.6	174	44.6	319	81.8	71	18.2
9	Over-5000	2	0	0	0	0	1	50.0	1	50.0	1	50.0
Grand Total	-	392	127	32.4	18	4.6	175	44.6	320	81.6	72	18.4

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Table 72H. Type of most severe injury by distance and shielding

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Indoors, Bomb Shelters and Tunnels									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	20	5	25.0	0	0	9	45.0	14	70.0	6	30.0
2	1100-1500	1	0	0	0	0	1	100.0	1	100.0	0	0
3	1600-2000	3	0	0	2	66.7	1	33.3	3	100.0	0	0
4	2100-2500	1	0	0	0	0	0	0	0	0	1	100.0
5	2600-3000	0	0	0	0	0	0	0	0	0	0	0
6	3100-4000	0	0	0	0	0	0	0	0	0	0	0
7	4100-5000	0	0	0	0	0	0	0	0	0	0	0
Total	0-5000	25	5	20.0	2	8.0	11	44.0	18	72.0	7	28.0
9	Over 5000	0	0	0	0	0	0	0	0	0	0	0
Grand Total	-	25	5	20.0	2	8.0	11	44.0	18	72.0	7	28.0

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Table 72N. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number Of People	Outdoors Unshielded									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	73	40	54.8	22	30.2	6	8.2	68	93.2	5	6.8
2	1100-1500	160	76	47.5	59	36.9	12	7.5	147	91.9	13	8.1
3	1600-2000	208	55	26.5	115	55.3	8	3.8	178	85.6	30	14.4
4	2100-2500	115	27	23.5	62	53.8	8	7.0	97	84.3	18	15.7
5	2600-3000	139	18	12.9	72	51.9	18	12.9	108	77.7	31	22.3
6	3100-4000	188	26	13.9	48	25.5	16	8.5	90	47.9	98	52.1
7	4100-5000	46	2	4.3	14	30.4	4	8.8	20	43.5	26	56.5
Total	0-5000	929	244	26.2	392	42.2	72	7.8	708	76.2	221	23.8
9	Over 5000	10	1	10.0	0	0	1	10.0	2	20.0	8	80.0
Grand Total	--	939	245	26.1	392	41.7	73	7.8	710	75.6	229	24.4

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Table 72N. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Outdoors Shielded									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	52	35	67.3	5	9.6	5	9.6	45	86.5	7	13.5
2	1100-1500	104	44	42.3	14	13.5	23	22.1	81	77.9	23	22.1
3	1600-2000	103	20	19.4	22	21.4	12	11.6	54	52.4	49	47.6
4	2100-2500	82	11	13.4	15	18.3	15	18.3	41	50.0	41	50.0
5	2600-3000	61	8	13.2	11	18.0	11	18.0	30	49.2	31	50.8
6	3100-4000	89	5	5.6	6	6.7	14	15.8	25	28.1	64	71.9
7	4100-5000	23	2	8.7	1	4.3	1	4.3	4	17.3	19	82.7
Total	0-5000	514	125	24.3	74	14.4	81	15.8	280	54.5	234	45.5
9	Over 5000	6	0	0	0	0	0	0	0	0	6	100.0
Grand Total	--	520	125	24.0	74	14.2	81	15.6	280	53.8	240	46.2

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Table 72N. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Indoors Jap Building									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	252	156	61.9	18	7.2	57	22.6	231	91.7	21	8.3
2	1100-1500	861	418	48.6	42	4.9	299	34.7	759	88.2	102	11.8
3	1600-2000	561	166	29.6	81	14.4	170	30.3	417	74.3	144	25.7
4	2100-2500	318	50	15.7	29	9.2	84	26.4	163	51.3	155	48.7
5	2600-3000	369	32	8.7	21	5.7	85	23.0	138	37.4	231	62.6
6	3100-4000	654	48	7.4	13	2.0	103	15.7	164	25.1	490	74.9
7	4100-5000	157	5	3.1	0	0	15	9.6	20	12.7	137	87.3
Total	0-5000	3172	875	27.6	204	6.4	813	25.6	1892	59.6	1280	40.4
9	Over 5000	69	2	2.9	1	1.4	3	4.4	6	8.7	63	91.3
Grand Total	--	3241	877	27.1	205	6.3	816	25.2	1898	58.6	1343	41.4

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Table 72N. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Total Number of People	Indoors Heavy Building									
			Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	303	107	35.4	11	3.6	157	51.8	275	90.8	28	9.2
2	1100-1500	604	251	41.6	32	5.3	269	44.5	552	91.4	52	8.6
3	1600-2000	88	24	27.3	11	12.5	33	37.5	68	77.3	20	22.7
4	2100-2500	35	5	14.3	3	8.6	7	20.0	15	42.9	20	57.1
5	2600-3000	30	9	30.0	1	3.3	9	30.0	19	63.3	11	36.7
6	3100-4000	152	17	11.2	5	3.3	29	19.1	51	33.6	101	66.4
7	4100-5000	17	1	5.9	0	0	4	23.5	5	29.4	12	70.6
Total	0-5000	1229	414	33.7	63	5.1	508	41.3	985	80.1	244	19.9
9	Over 5000	4	0	0	0	0	0	0	0	0	4	100.0
Grand Total	--	1233	414	33.6	63	5.1	508	41.2	985	79.9	248	20.1

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Table 72H. Type of most severe injury by distance and shielding.

Individuals who were living twenty days after the bombing.

Ring	Distance (Meters)	Indoors Bomb Shelters and Tunnels										
		Total Number of People	Radiation		Burns		Mechanical		Total Any Injury		Total No Injury	
			No.	%	No.	%	No.	%	No.	%	No.	%
1	0-1000	73	20	27.5	5	6.8	5	6.8	30	41.1	43	58.9
2	1100-1500	72	8	11.2	6	8.3	6	8.3	20	27.8	52	72.2
3	1600-2000	47	6	12.7	2	4.3	1	2.1	9	19.1	38	80.9
4	2100-2500	110	15	13.6	3	2.7	9	8.2	27	24.5	83	75.5
5	2600-3000	25	2	8.0	1	4.0	3	12.0	6	24.0	19	76.0
6	3100-4000	29	4	13.9	1	3.4	1	3.4	6	20.7	23	79.3
7	4100-5000	9	0	0	1	11.1	0	0	1	11.1	8	88.9
Total	0-5000	365	55	15.1	19	5.2	25	6.8	99	27.1	266	72.9
9	Over 5000	2	0	0	0	0	0	0	0	0	2	100.0
Grand Total	--	367	55	15.0	19	5.2	25	6.8	99	27.0	268	73.0

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FIGURE 1a. (Front of Form)

S-25

4307 13. sup.

ATOMIC BOMB INVESTIGATION -- JOINT COMMISSION H-10367-5

1. Name 志沢資 吳市草履町大友方 Age 18 Sex ♂ Occupation or rank Private of middle school
2. Location when injured PR 2, 1, 27; 86-1600th (Locate by zone map number); on Sumiyoshi bridge
3. Primary Injury by: Bomb Burn Blow Radiation
4. Secondary Injury by: Burning Building Flying Debris Falling walls etc.
5. Protection
 - a. Position: standing walking Prone Sitting from left
 - b. Indoors: Concrete Building Brick Building Japanese Building
Covered earth or concrete shelter
 - c. Outdoors: in open Behind wall In trench Behind tree, post etc.
on the bridge
 - d. Clothing: Army cap, white short sleeve shirt, Kak coat, white pant,
Kak. trousers, no stockings. geta.
 - e. Any other protection
6. Were others present? ? Were they injured?
7. Burns: Degree - 1st 2nd 3rd Area, percent Part both face, neck, hands
Healing healed with scars on scalp Eye injury l. wrist, l. lower limb,
(except both infraorbital l. hand, l. foot) l. leg, foot
8. Radiation Effects:

Symptoms	Time Onset	Time Ceased
Nausea	<u>+ on 6 Aug.</u>	
Vomiting	<u>" " 3 times</u>	
Cramps	<u>-</u>	
Diarrhoea	<u>-</u>	<u>Watery -Bloody</u>
Malaise	<u># 6 Aug. - 20 Aug.</u>	
Anorexia	<u># 6 Aug. - 20 Aug. ⊕ - End Aug.</u>	
Gingivitis	<u>-</u>	<u>Necrotic</u>
Pharyngitis	<u>-</u>	
Purpura	<u>-</u>	<u>Petecchiae - Epistaxis - Other Hemorrhage -</u>
Epilation	<u>+ 4 Aug. - 19 Aug.</u>	<u>moderate, regeneration</u> <u>Scalp</u> <u>Axillary</u> <u>eyebrow</u> <u>Beard - Pubic</u>
Skin pigmentation:	<u>- Dirty</u>	<u>Red</u> <u>Dark Brown</u>
Absence of sweating:	<u>- Head</u>	<u>Chest</u> <u>Genitalia</u>
Menstruation	<u>-</u>	<u>Abortions</u> <u>Potency ?</u>

Where indicated make special mention of shielding from gamma rays:

9. Blast Effects:

	Early	Late
Lung	<u>-</u>	
Ears	<u>-</u>	
Intestines	<u>-</u>	
C.N.S.	<u>unconscious - dizziness - headache</u>	

Fig. 1a--Front of form (Photo File # HP 162-a).

FIGURE 1b. (Back of Form)

10. Treatments:

- 1). auto transfusion 30-10cc X 9. intramuscular (30. Aug. - 17. sep)
- 2). blood transfusion 80, 100 (31. Aug) (6. sep)

11. Death

Date:

Cause:

Autopsy findings:

12. Laboratory data:

Date	REC	Hgb	Hemat	WBC	Proton	Other data and remarks
25. Aug	2.85	52%		1000		
31. Aug	3.19	55%		1200		
5. Sep	1.84	50%		1200		
11. Sep	2.50	40%		2000		
17. Sep	4.10	51%		3100		
27. Sep	3.00	28%		0300		
6. Oct	3.13	20%		4300		
15. Oct	3.26	65%		4300		
19. Oct	2.51	65%		5400		
28. Sep					803	

13. Diagnosis:

(a) Atomic bomb injury:

1. Radiation sickness manifested by nausea + vomiting, epilation, anemia neutropenia

(b) Also other diseases existing at time of bomb:

2. 2° burn of face, neck, hands, left wrist, left leg, right leg, rt foot

14. Additional observations:

low grade fever 20. sep. - 9. Oct.
fever. 29. Aug. - 3. sep. highest 39.4°C

DATE:

23 Oct

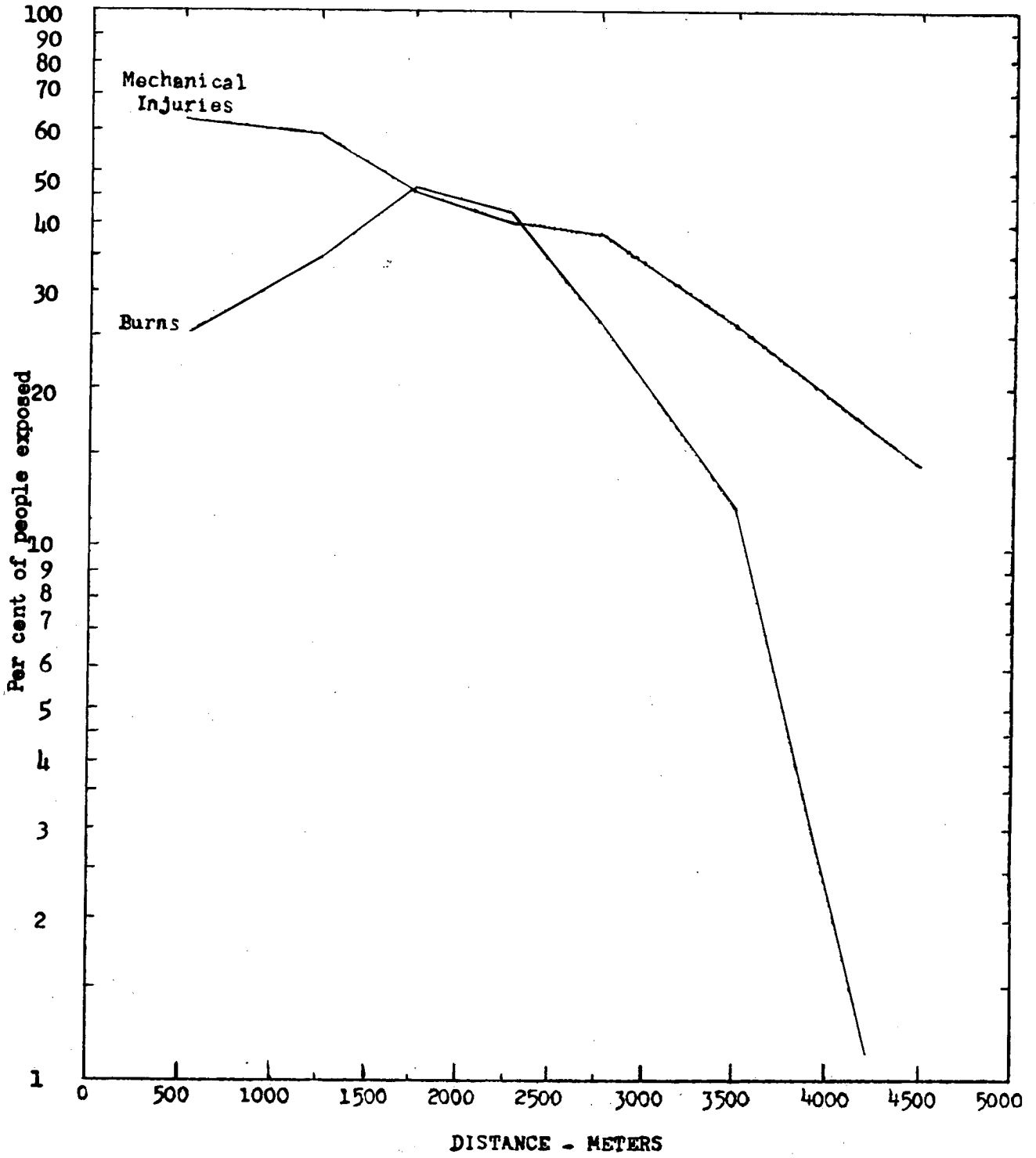
SIGNATURE:

[Handwritten Signature]
/ 100

- 2 -

Fig. 1b--Back of form (Photo File # HP 162-b).

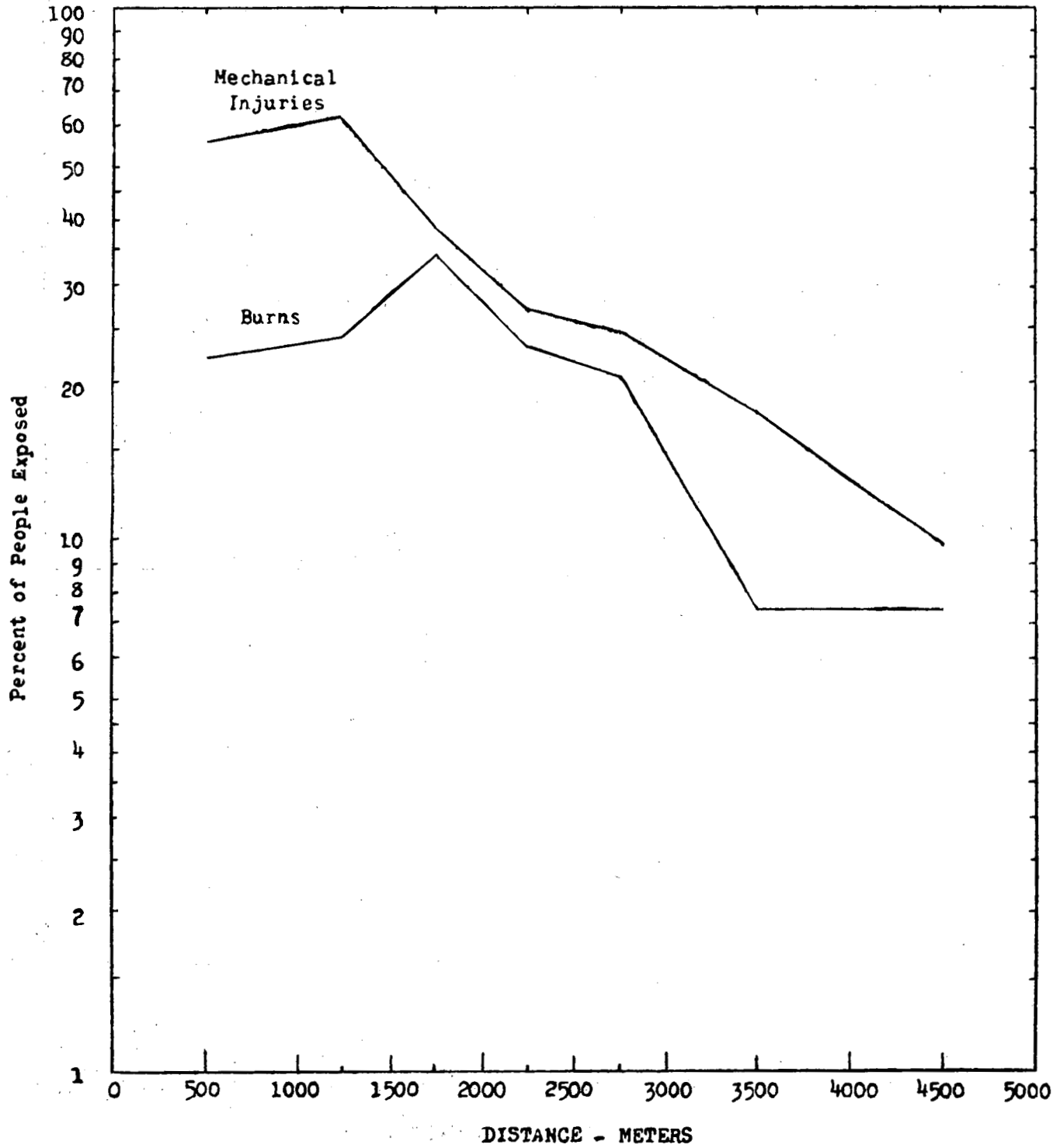
HIROSHIMA



Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 2H--Burns and mechanical injuries by distance (Hiroshima).

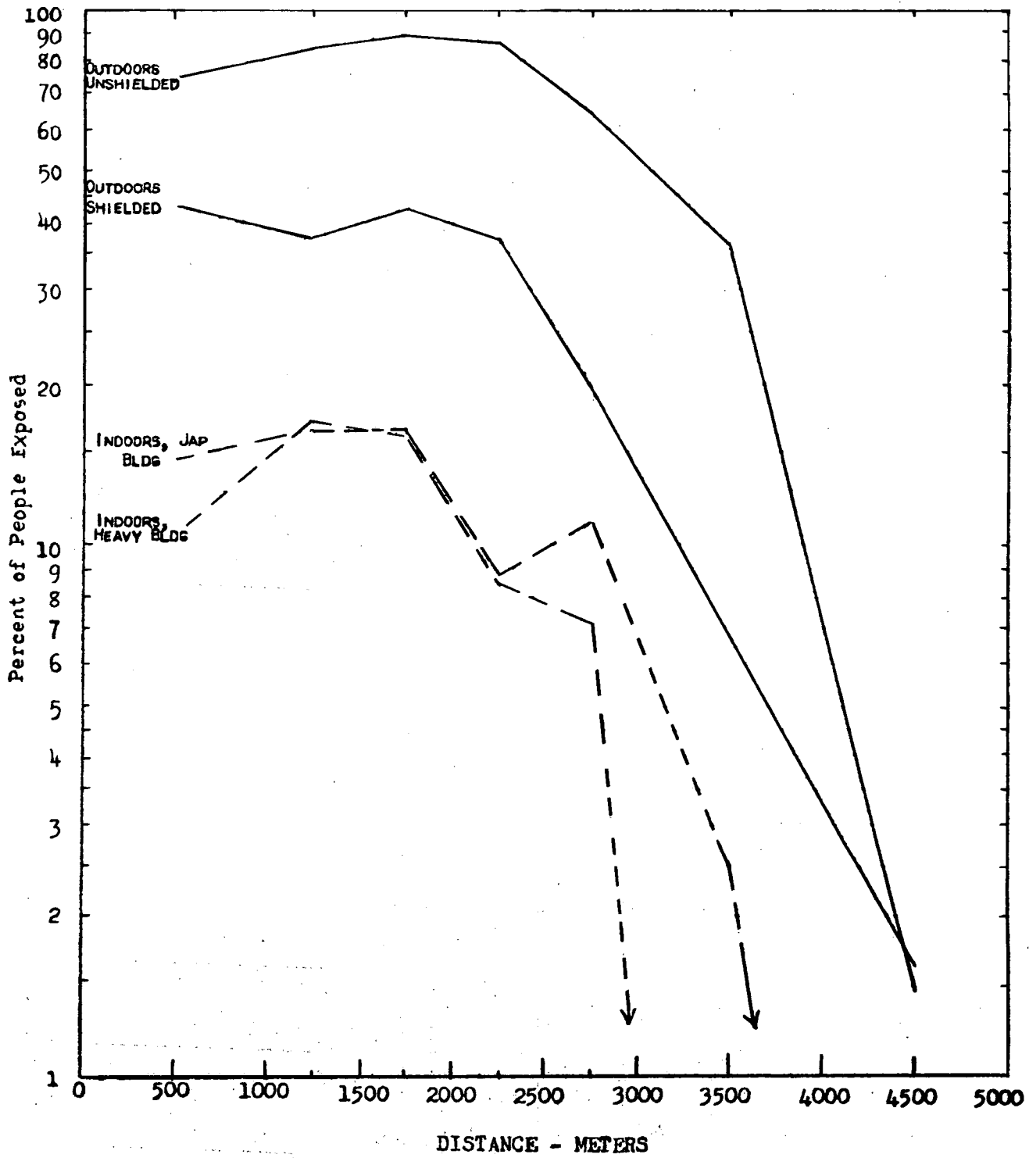
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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 2N--Burns and mechanical injuries by distance.

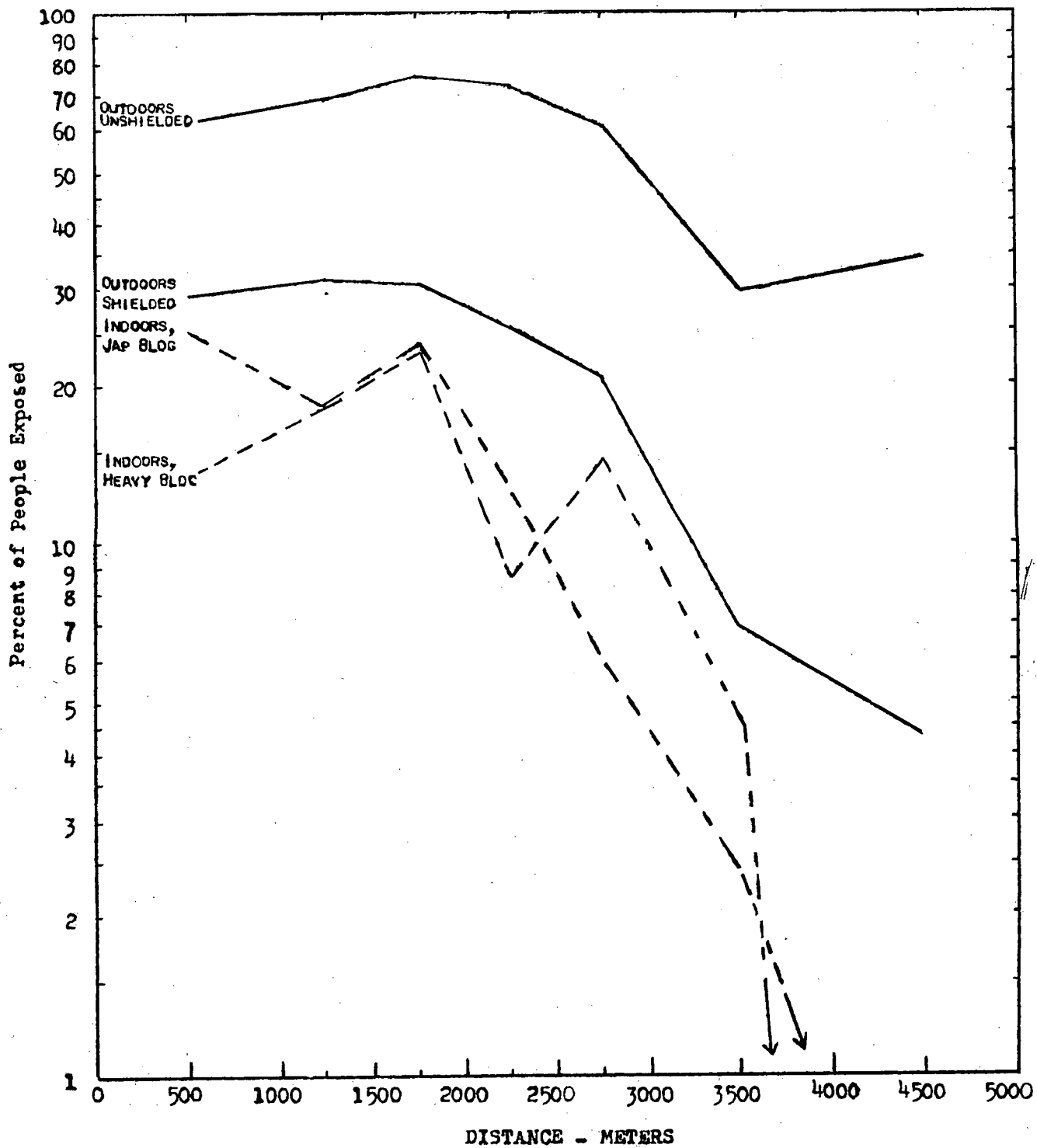
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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 3H--Burns by distance and shielding.

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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 3N--Burns by distance and shielding.

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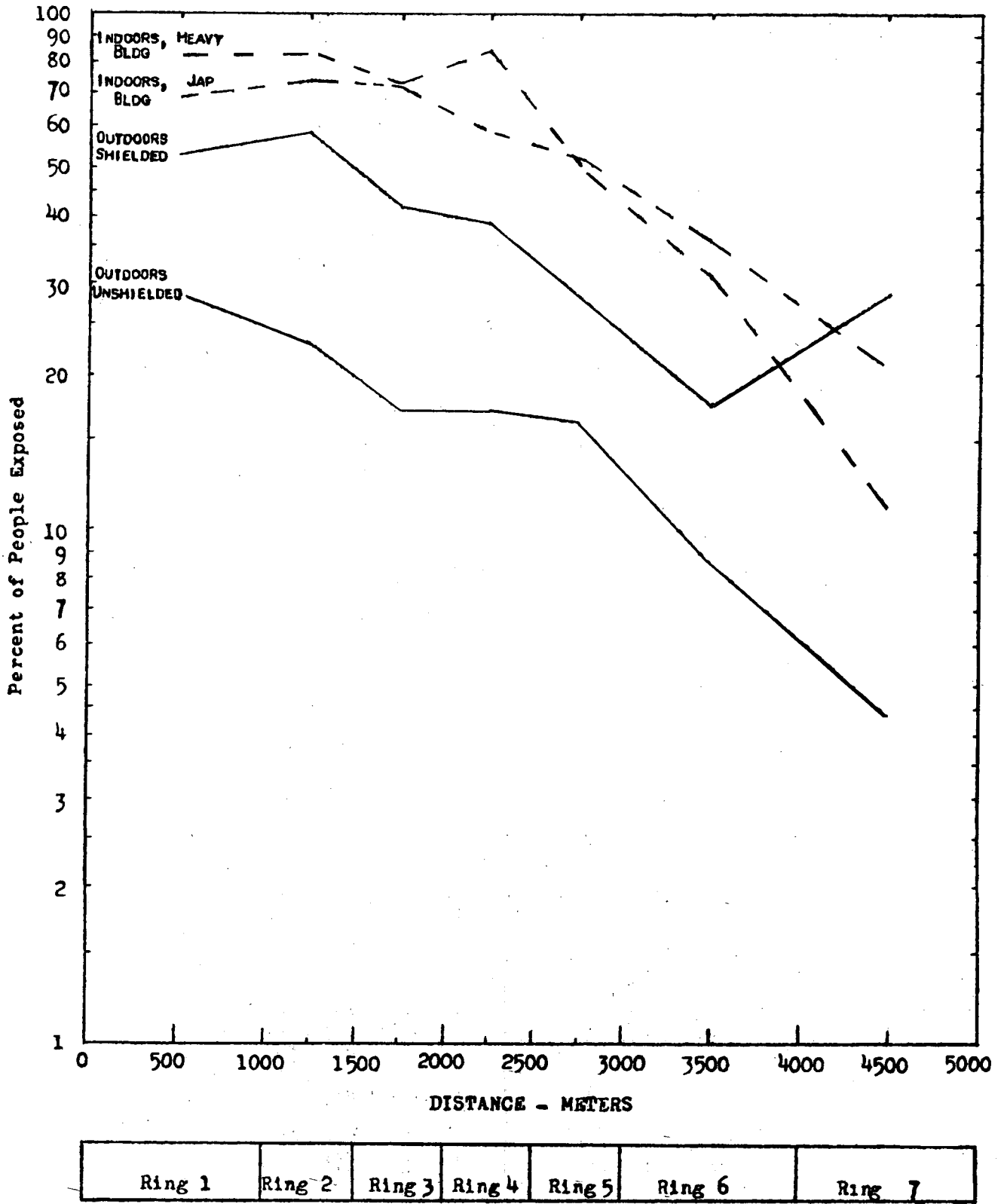
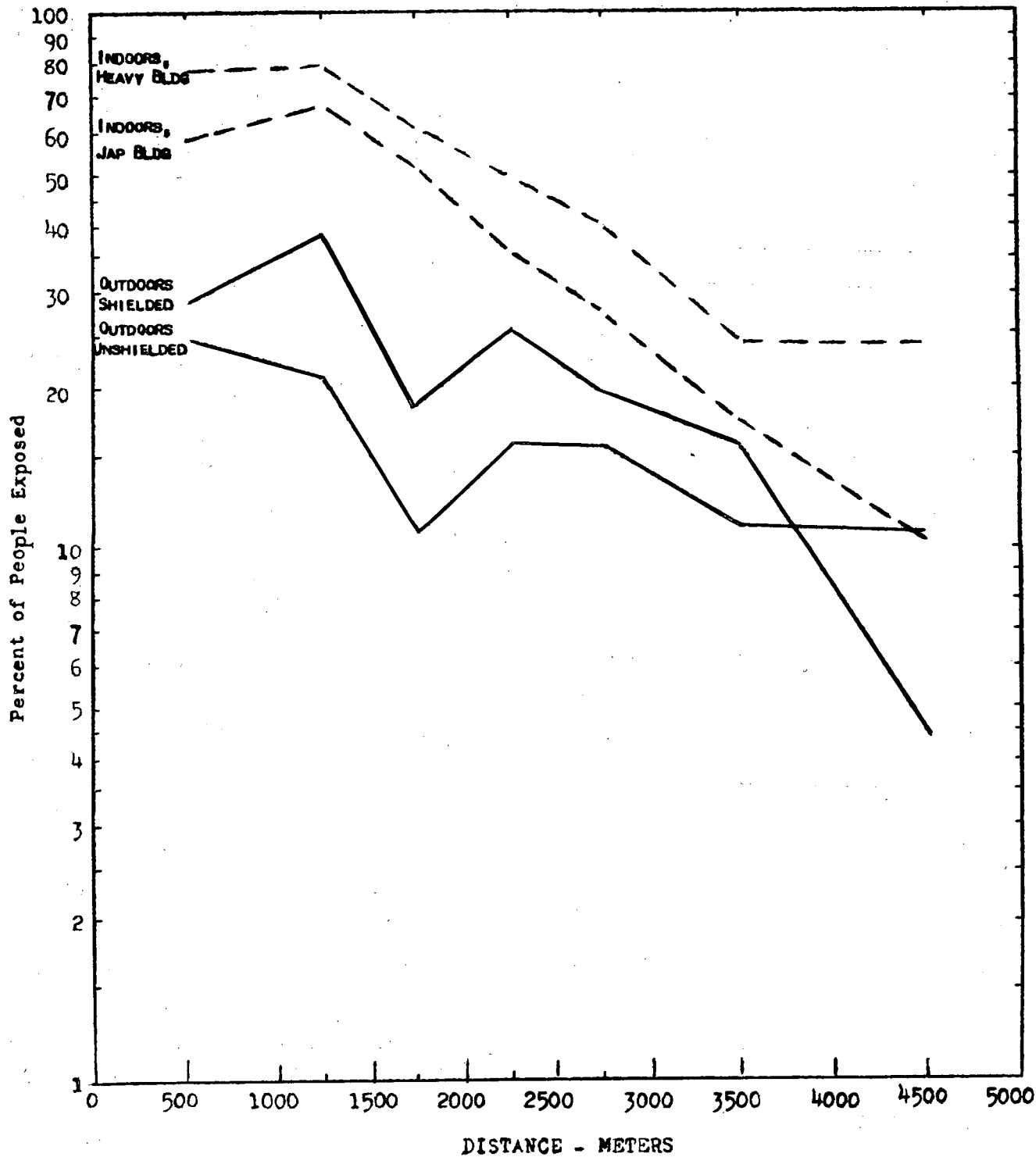


Fig. 4H--Mechanical injuries by ring and shielding.

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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
--------	--------	--------	--------	--------	--------	--------

Fig. 4N--Mechanical injuries by ring and shielding.

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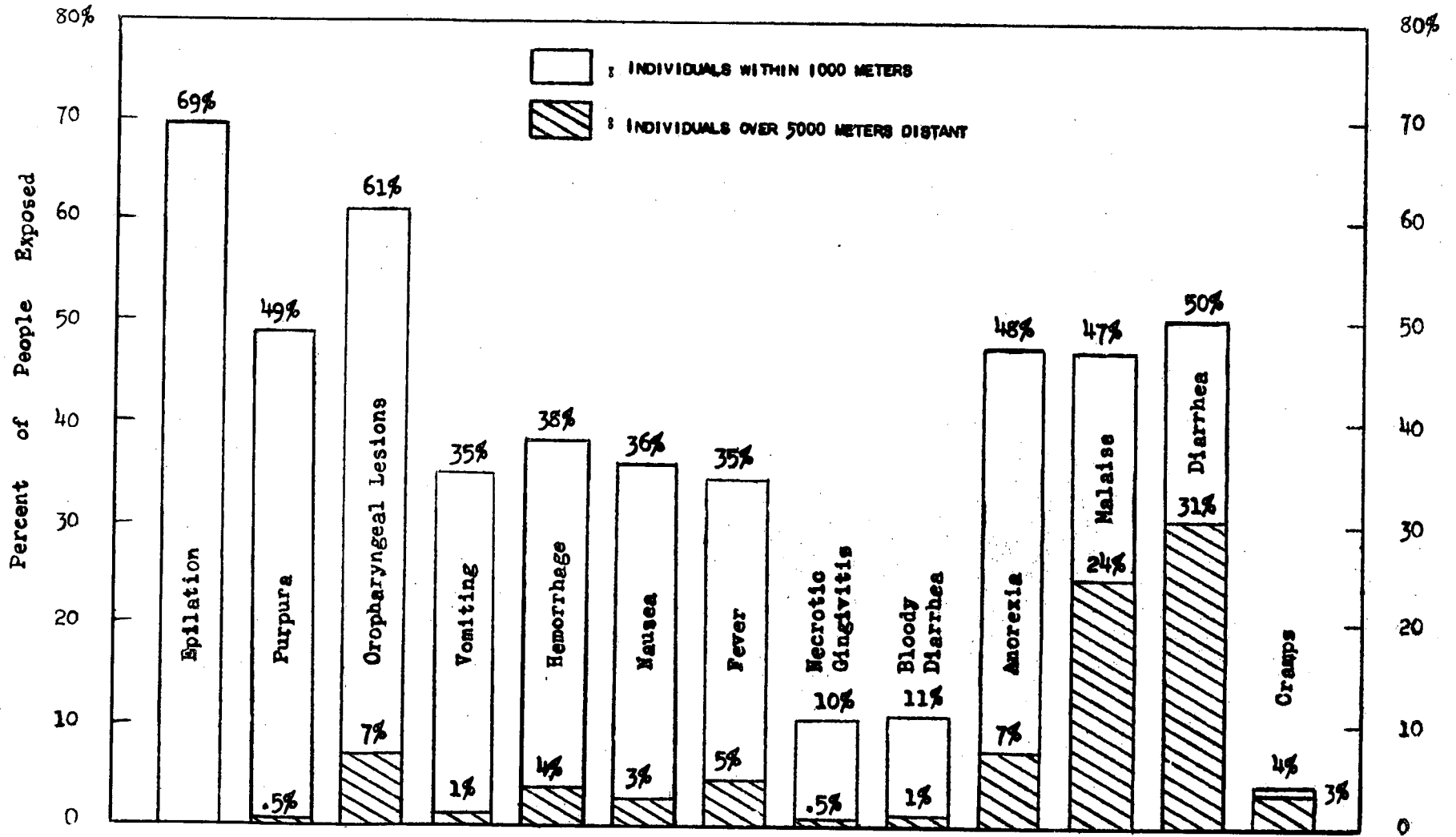


Fig. 5H--Incidence of symptoms in individuals within 1000 meters as compared with individuals at a distance of over 5000 meters.

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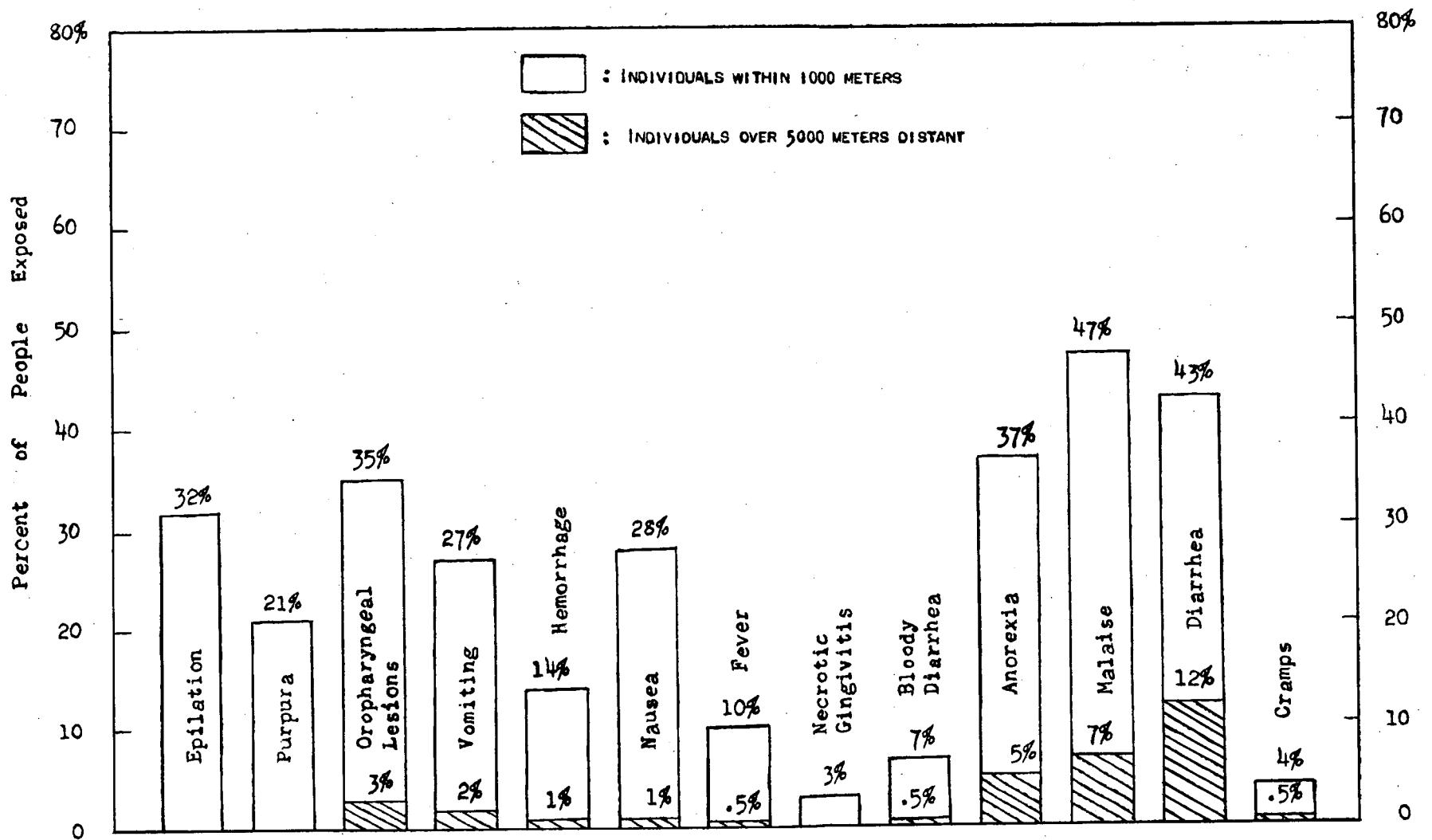
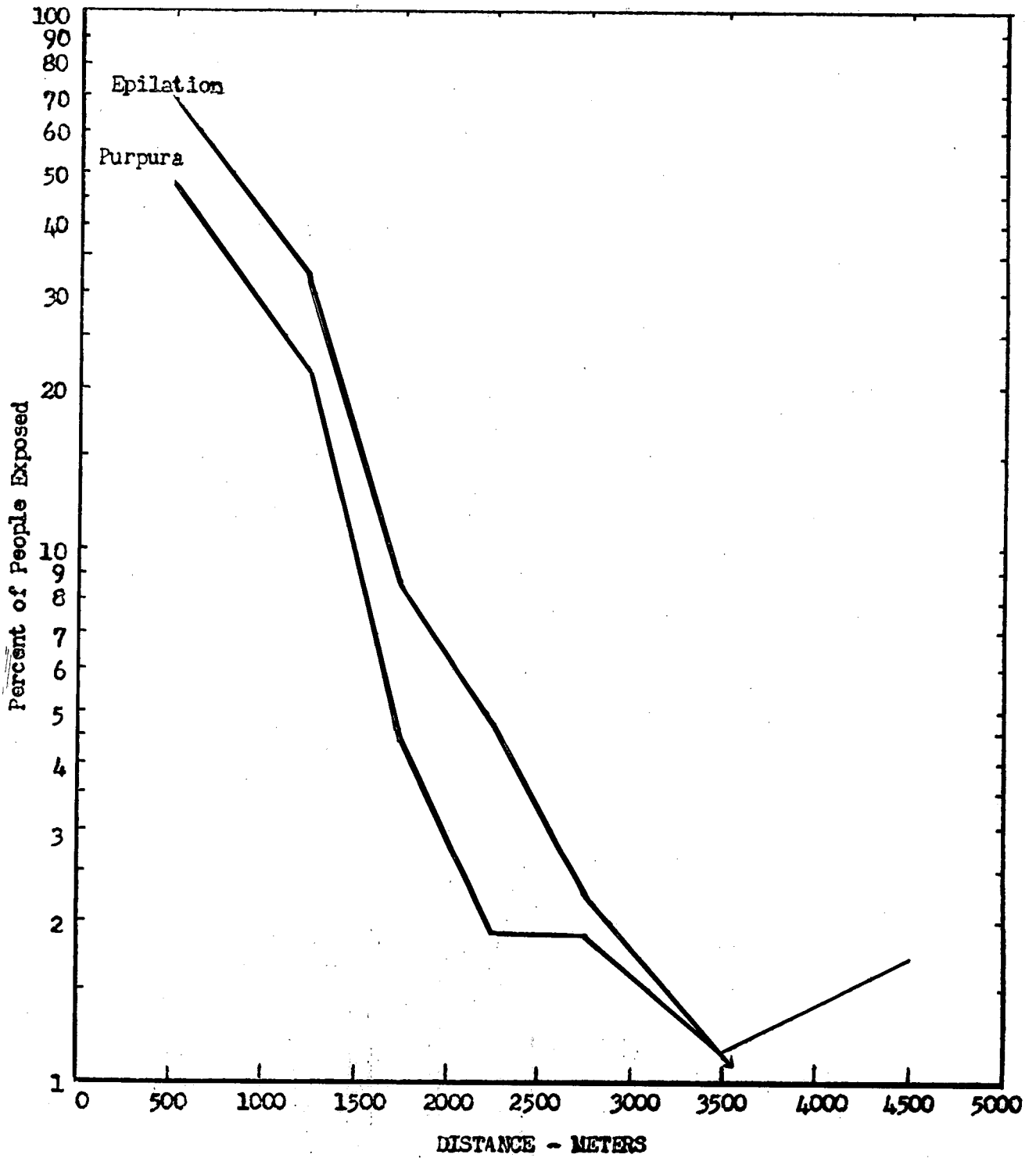


Fig. 5N--Incidence of symptoms in individuals within 1000 meters as compared with individuals at a distance of over 5000 meters.

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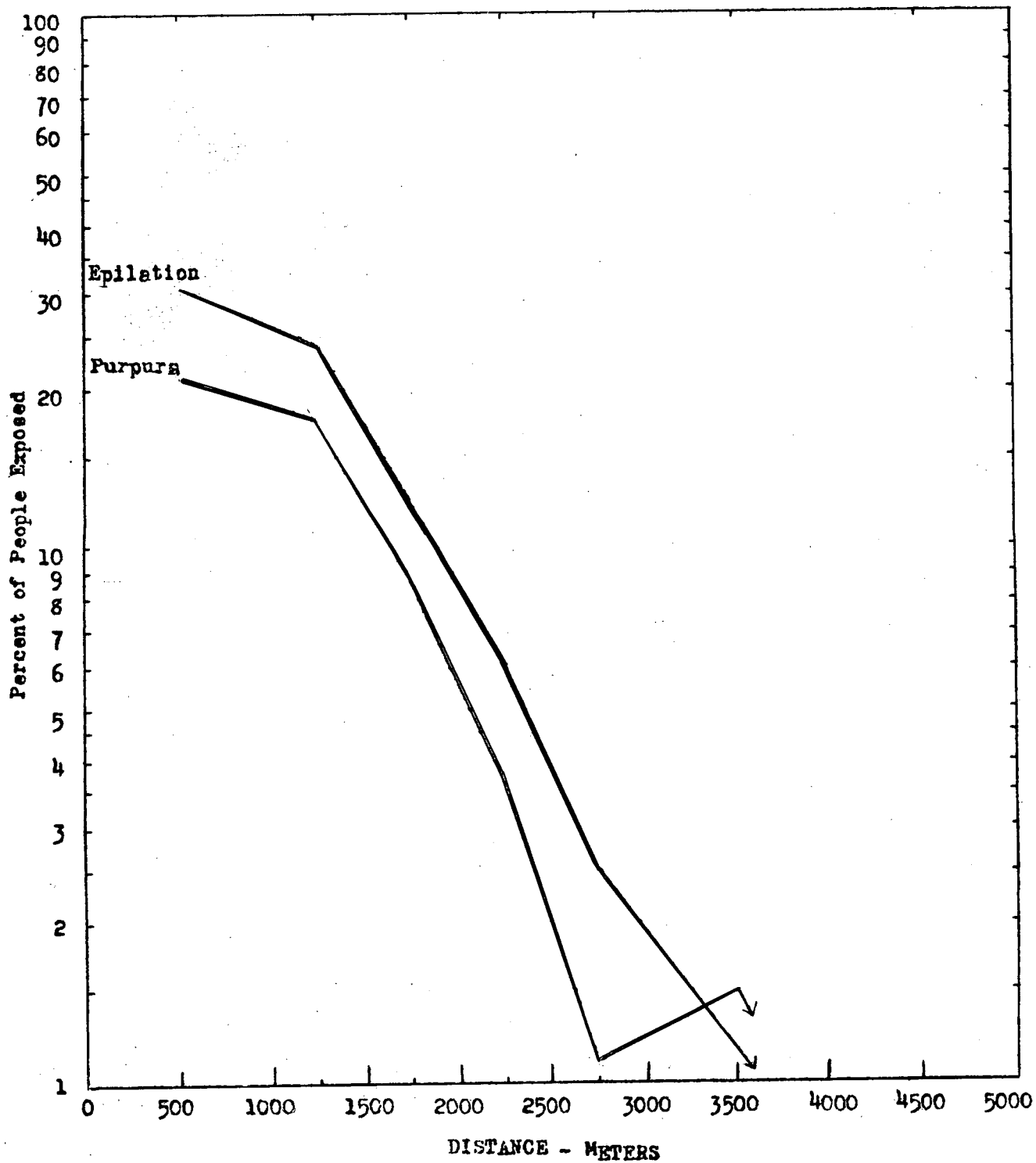
HIROSHIMA



Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 6H--Percent of people with epilation and purpura by distance.

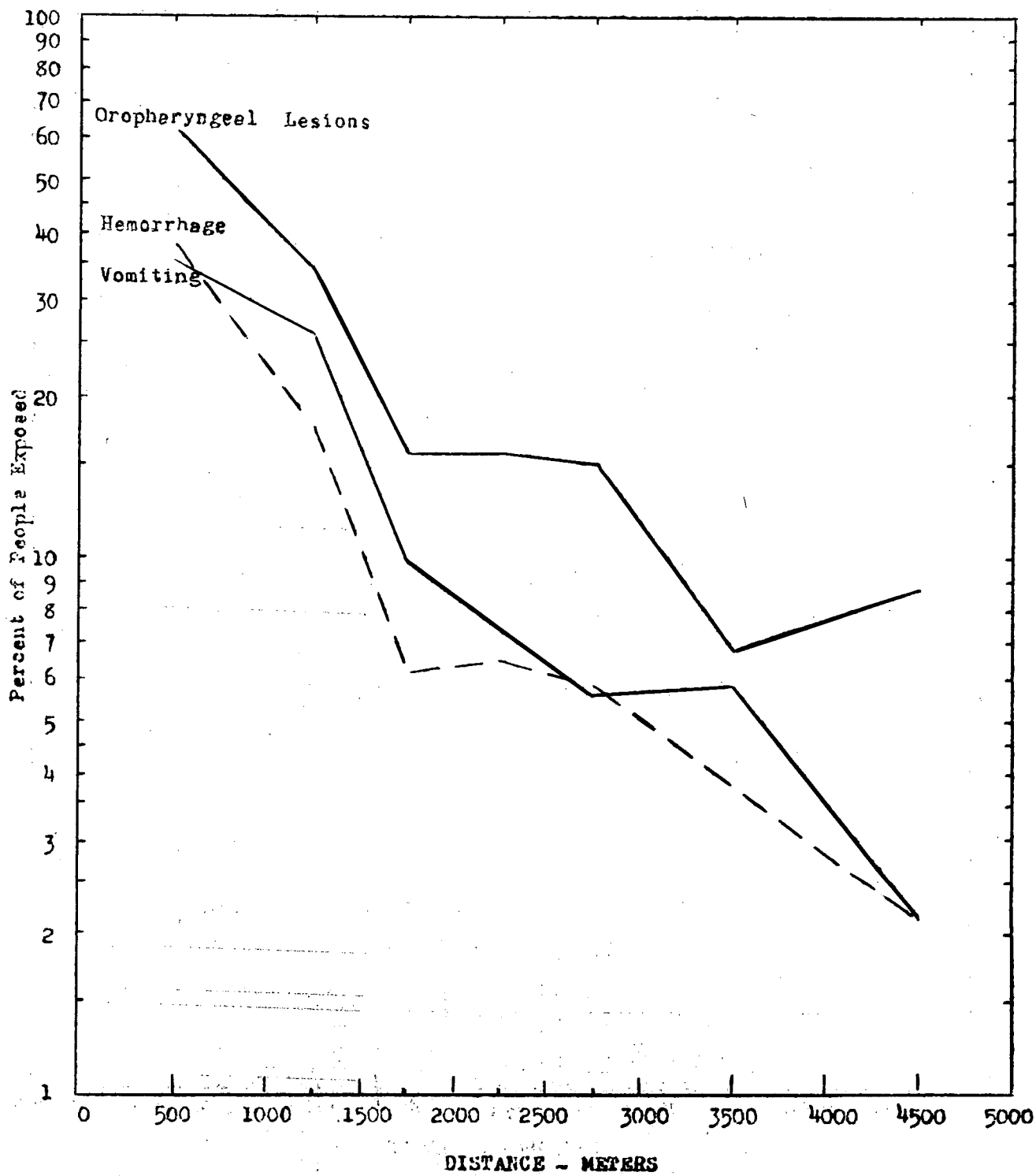
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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 6N--Percent of people with epilation and purpura by distance.

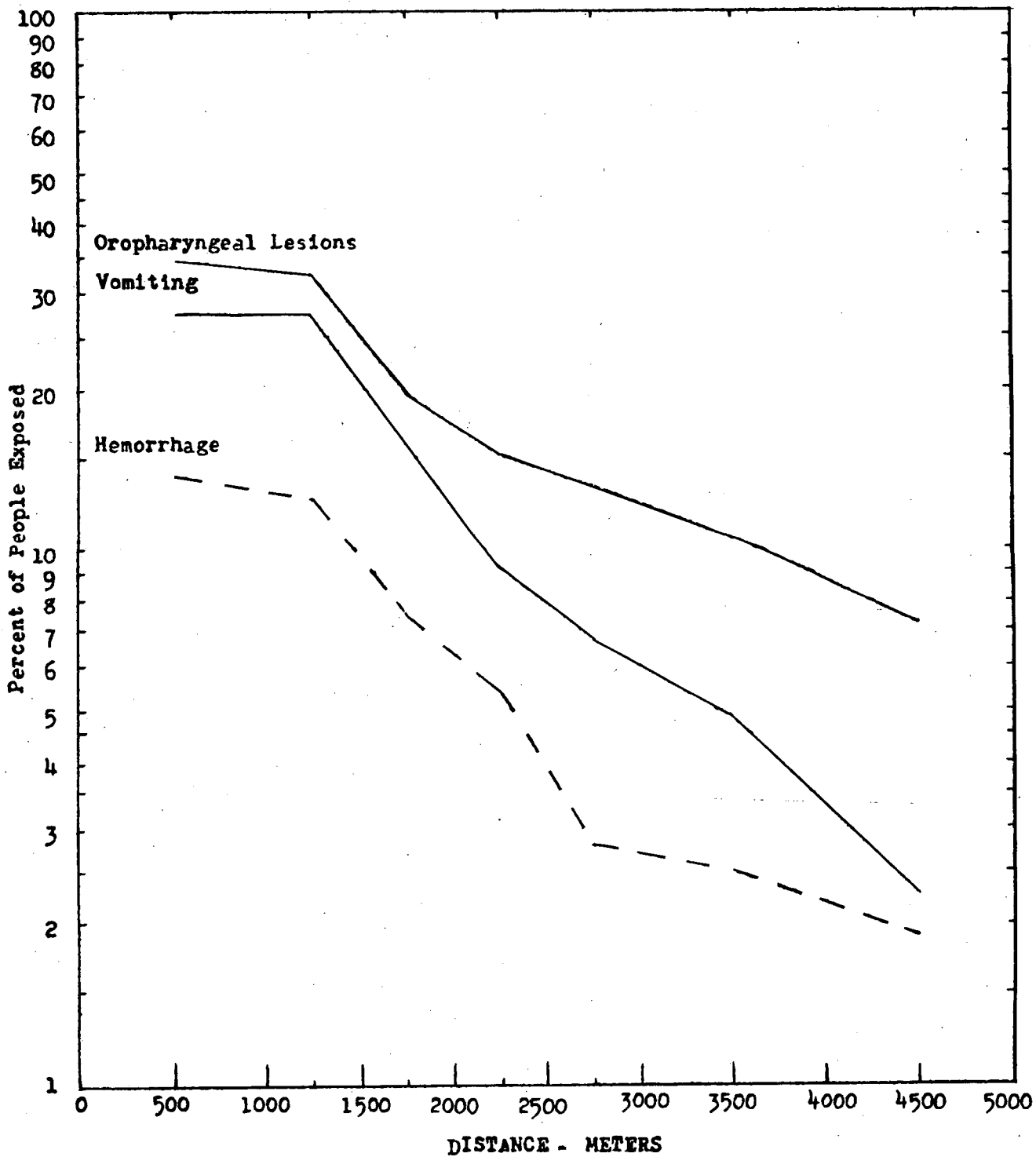
HIROSHIMA



Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 7H--Percent of people with oropharyngeal lesions, vomiting and hemorrhage by distance.

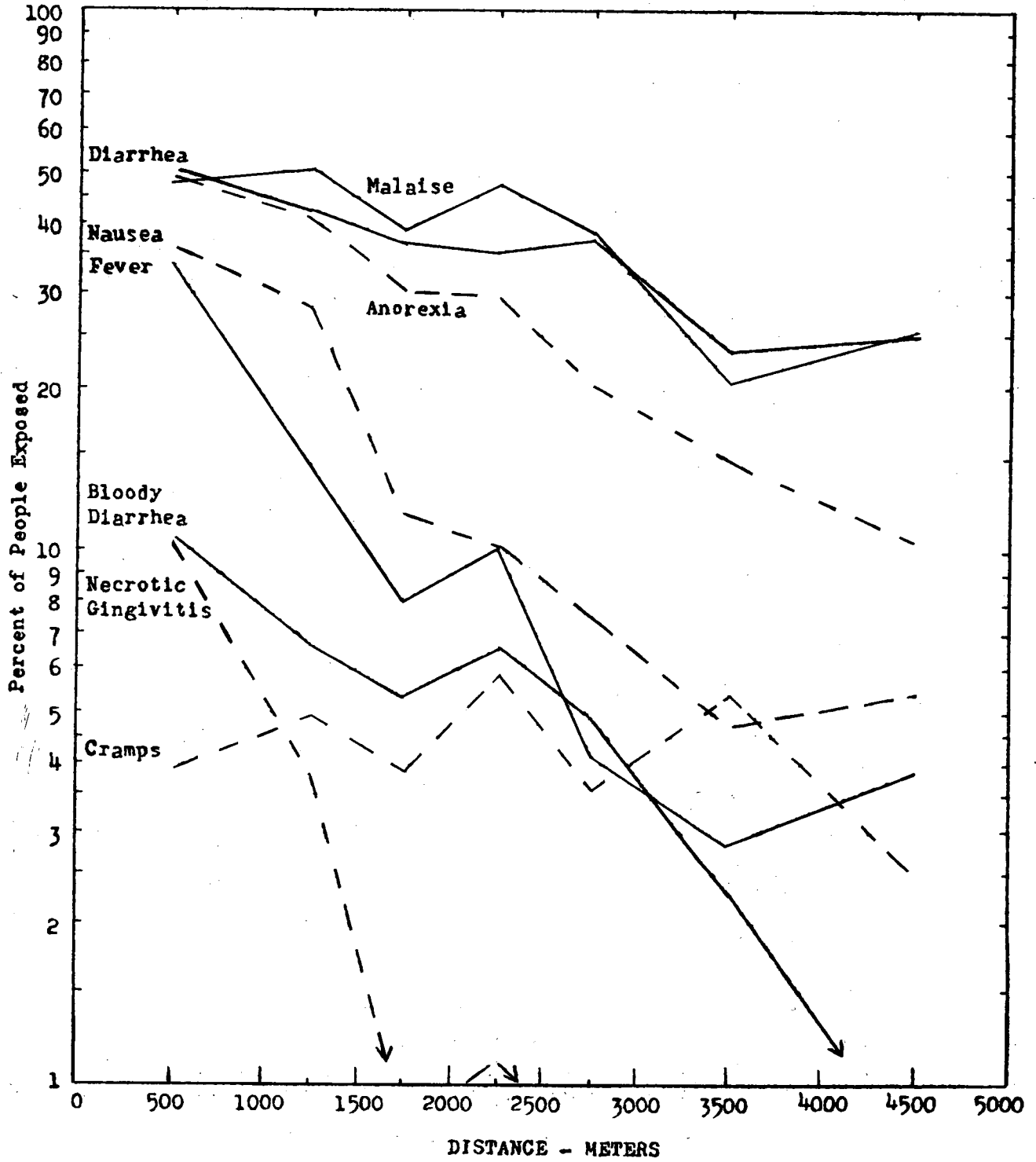
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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 7N--Percent of people with oropharyngeal lesions, vomiting and hemorrhage by distance.

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Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Ring 7
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Fig. 8H--Percent of people with malaise, anorexia, diarrhea, bloody diarrhea, nausea, fever, cramps, and necrotic gingivitis by distance.

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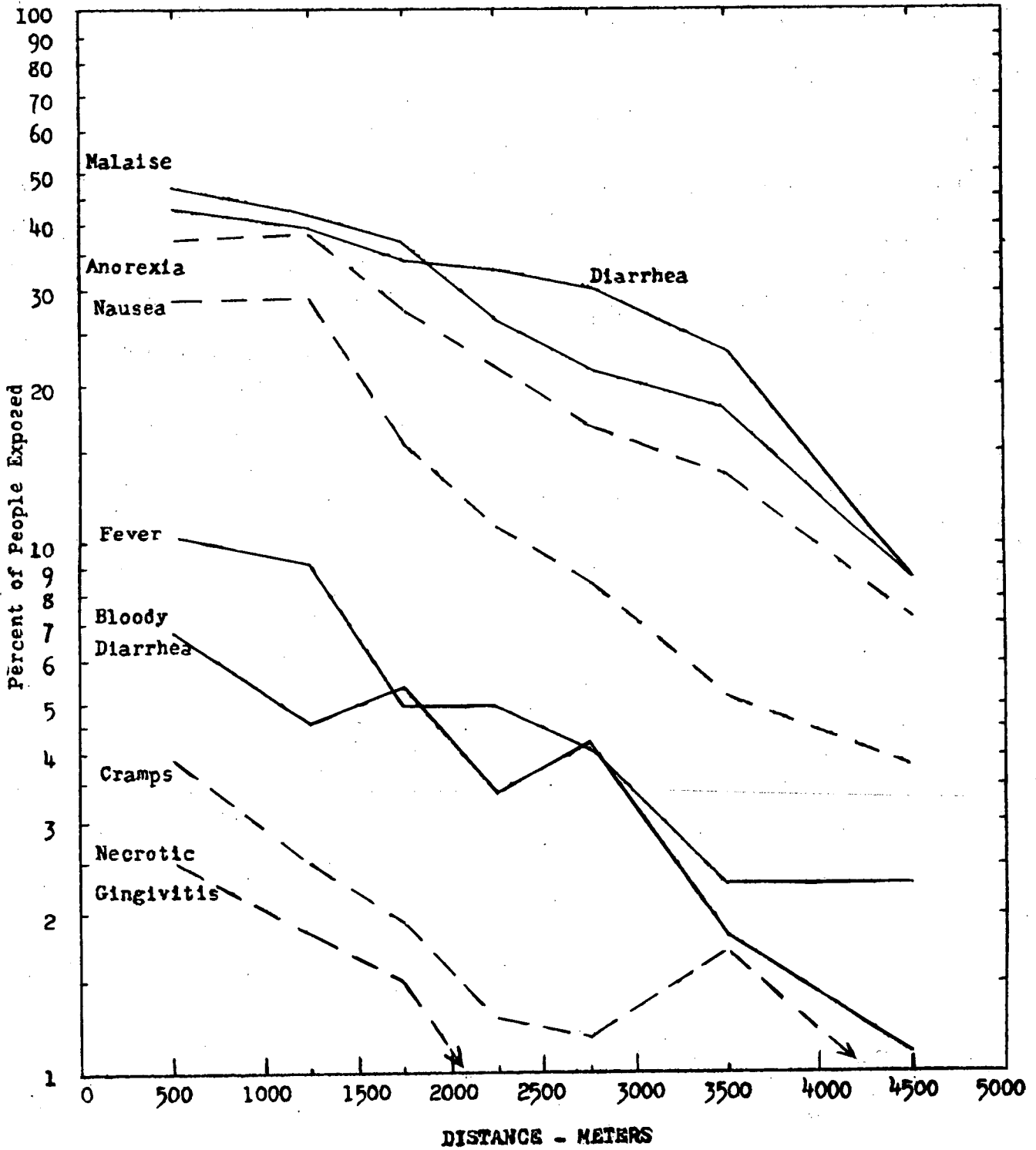


Fig. 8N--Percent of people with malaise, anorexia, diarrhea, bloody diarrhea, nausea, fever, cramps, and necrotic gingivitis by distance.

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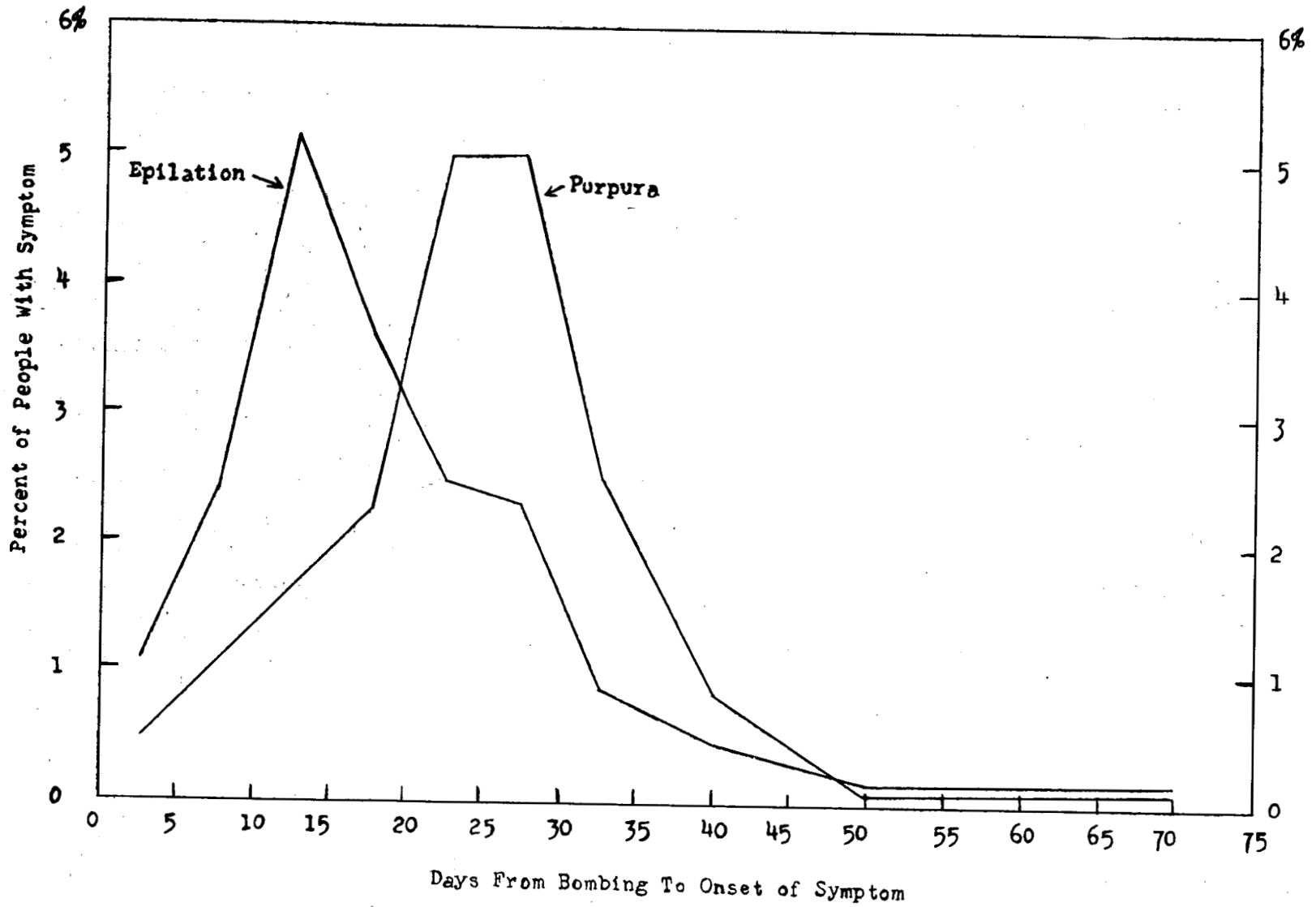


Fig. 9H--Days from bombing to onset of epilation and purpura.

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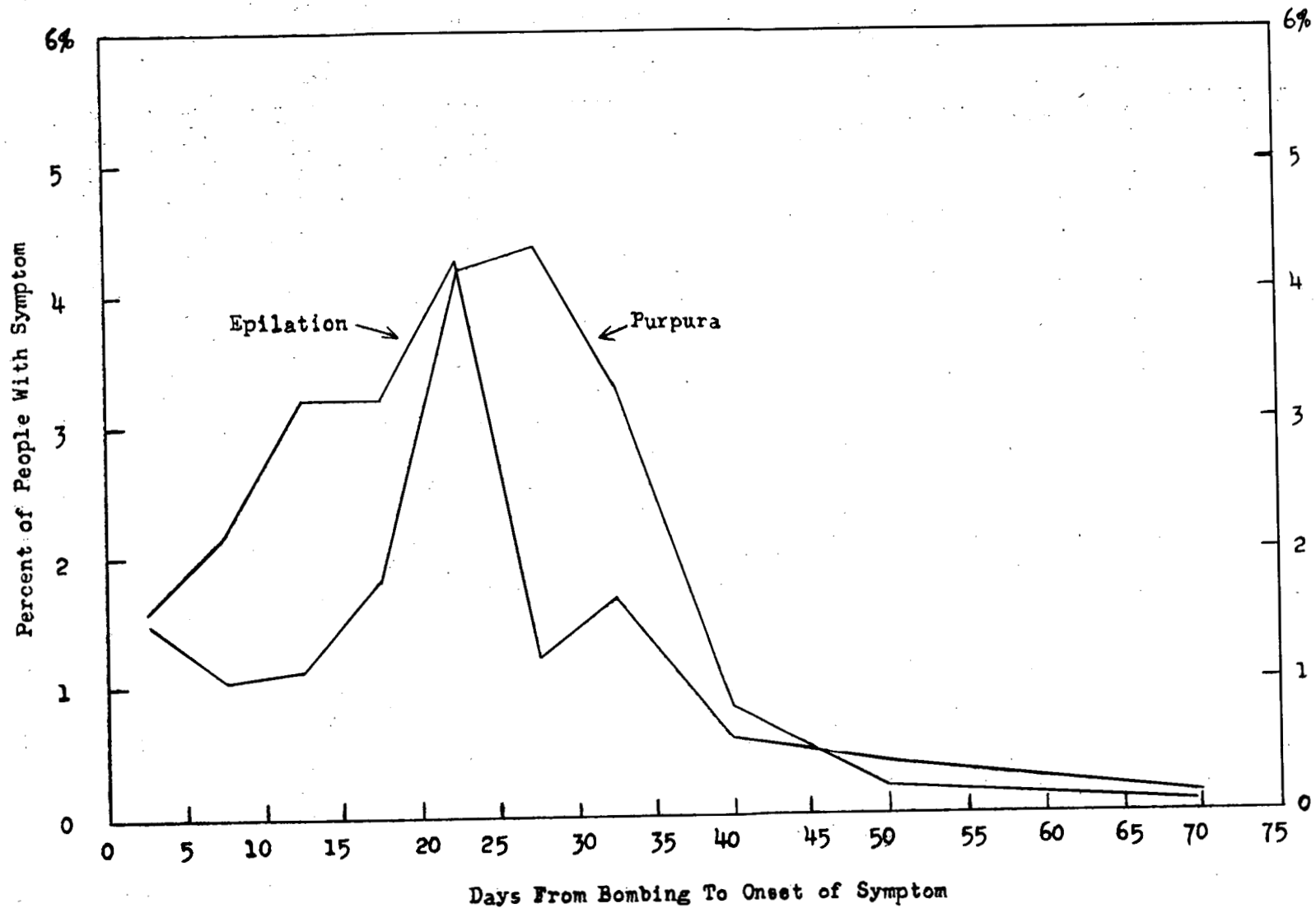


Fig. 9N--Days from bombing to onset of epilation and purpura.

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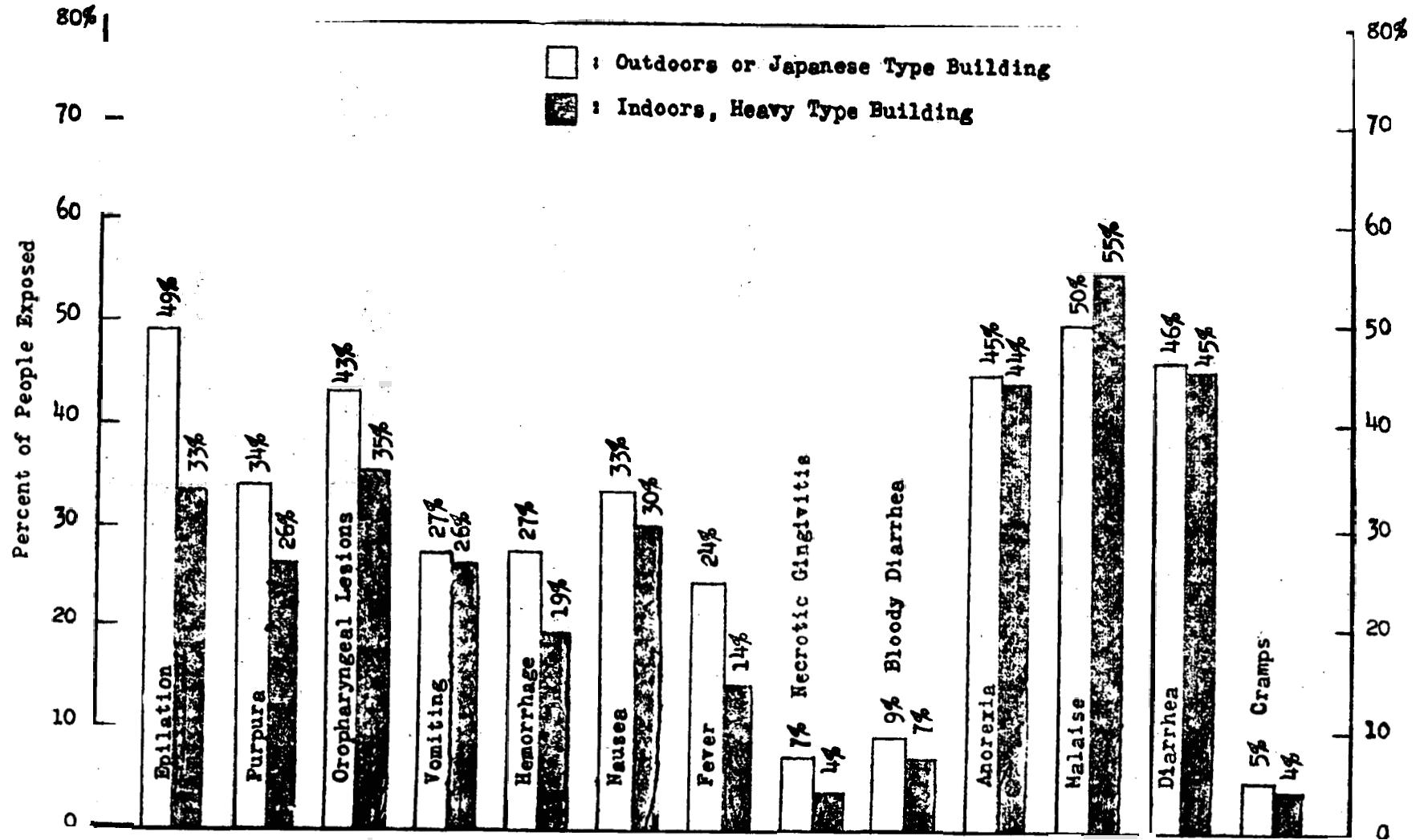


Fig. 10H--Incidence of symptoms in individuals within a distance of 1500 meters (rings 1 and 2) outdoors or in Japanese type buildings as compared with individuals within the same distance but in heavy type buildings (concrete, brick, or steel buildings).

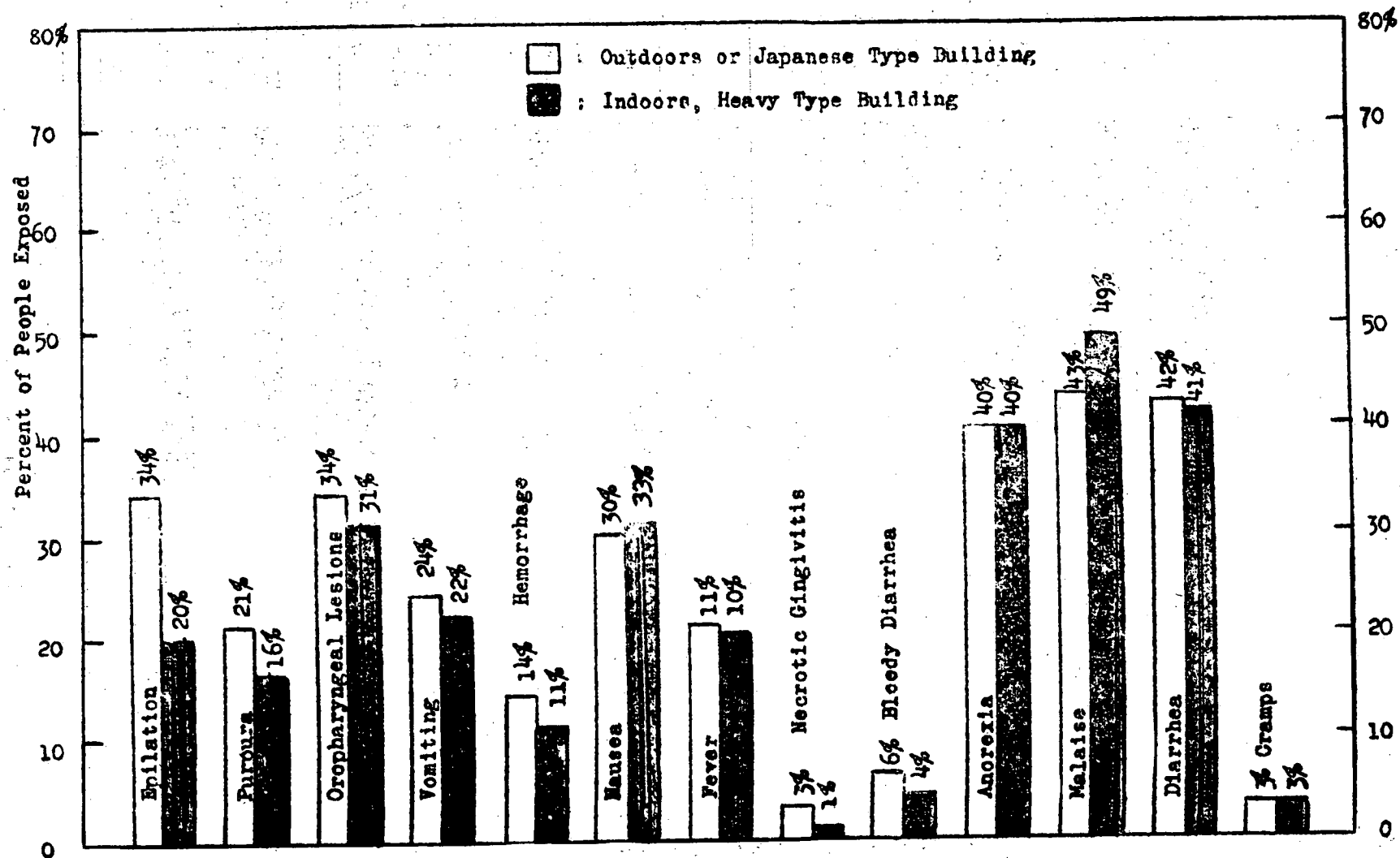


Fig. 10N--Incidence of symptoms in individuals within a distance of 1500 meters (rings 1 and 2) outdoors or in Japanese type buildings as compared with individuals within the same distance but in heavy type buildings (concrete, brick, or steel buildings).

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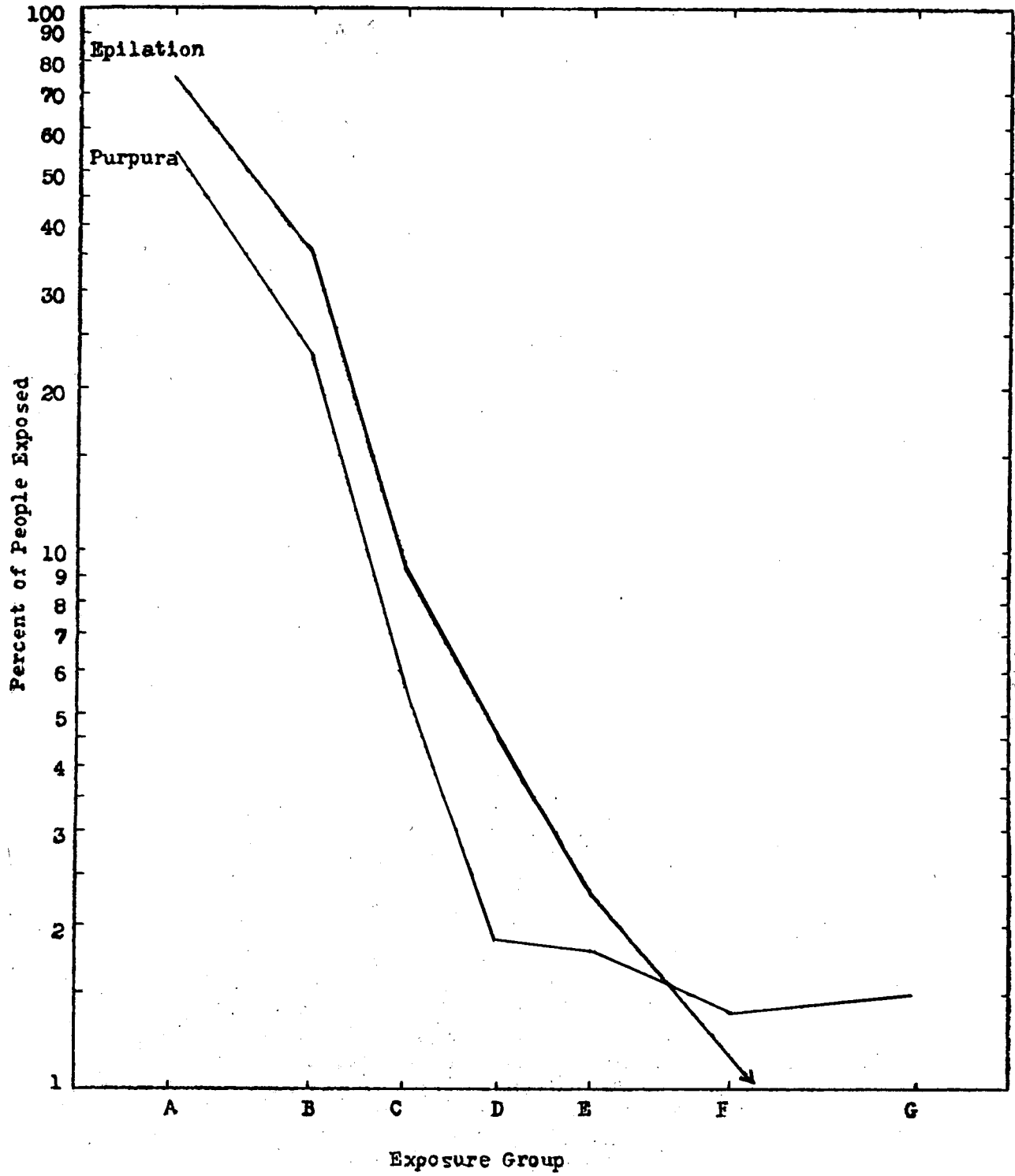


Fig. 11H--Epilation and purpura by exposure groups.

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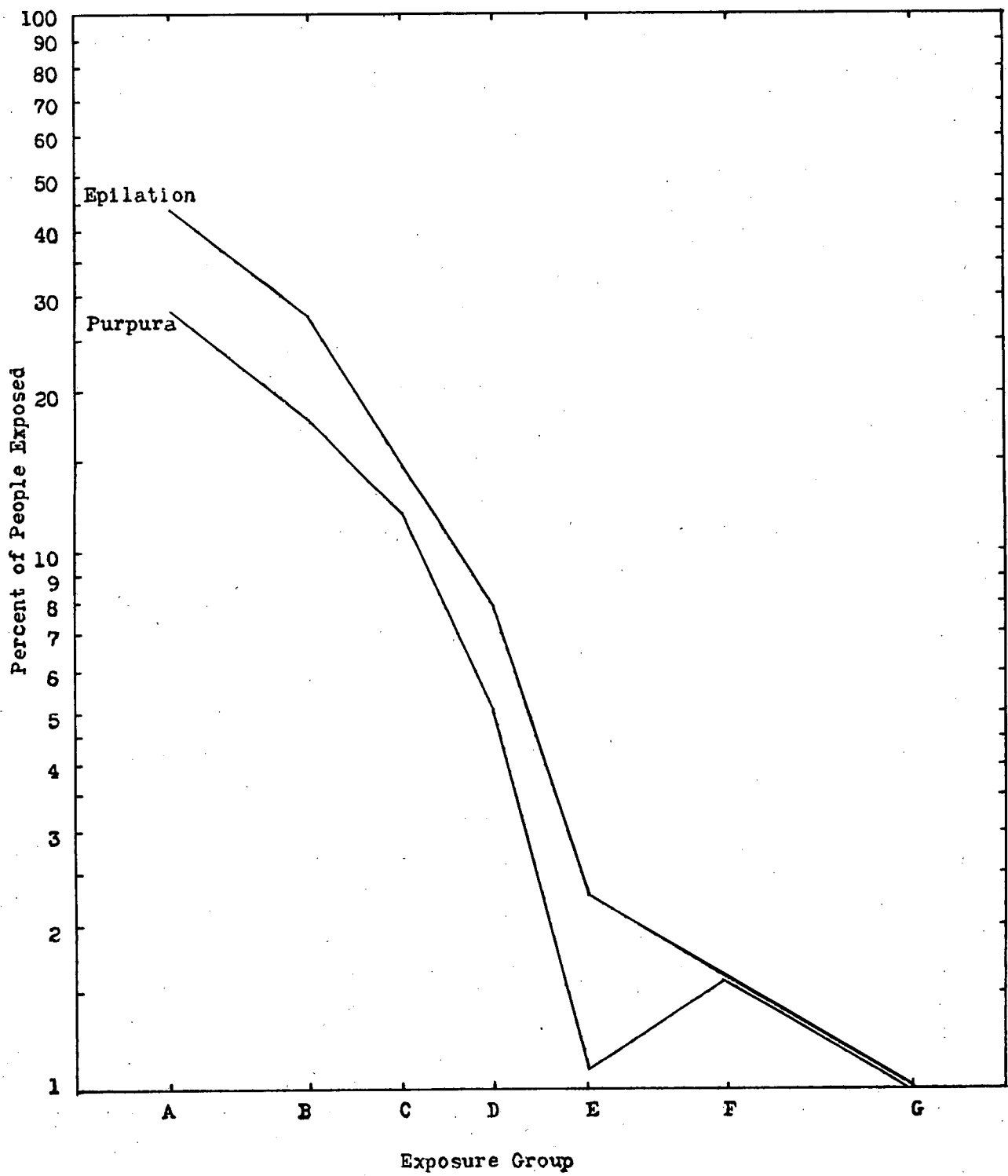


Fig. 11N--Epilation and purpura by exposure groups.

HIROSHIMA

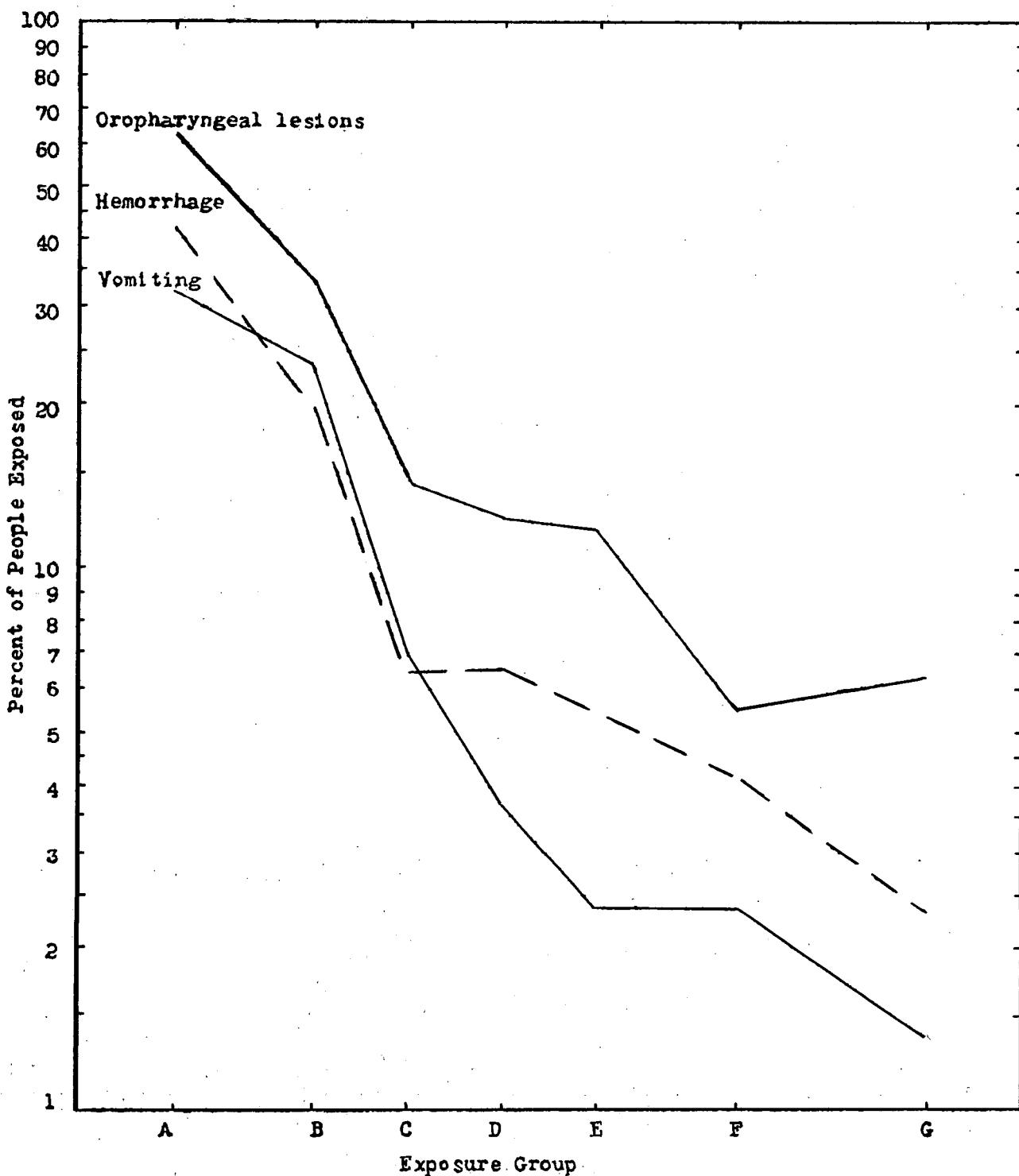


Fig. 12H--Oropharyngeal lesions, vomiting and other hemorrhage by exposure groups.

NAGASAKI

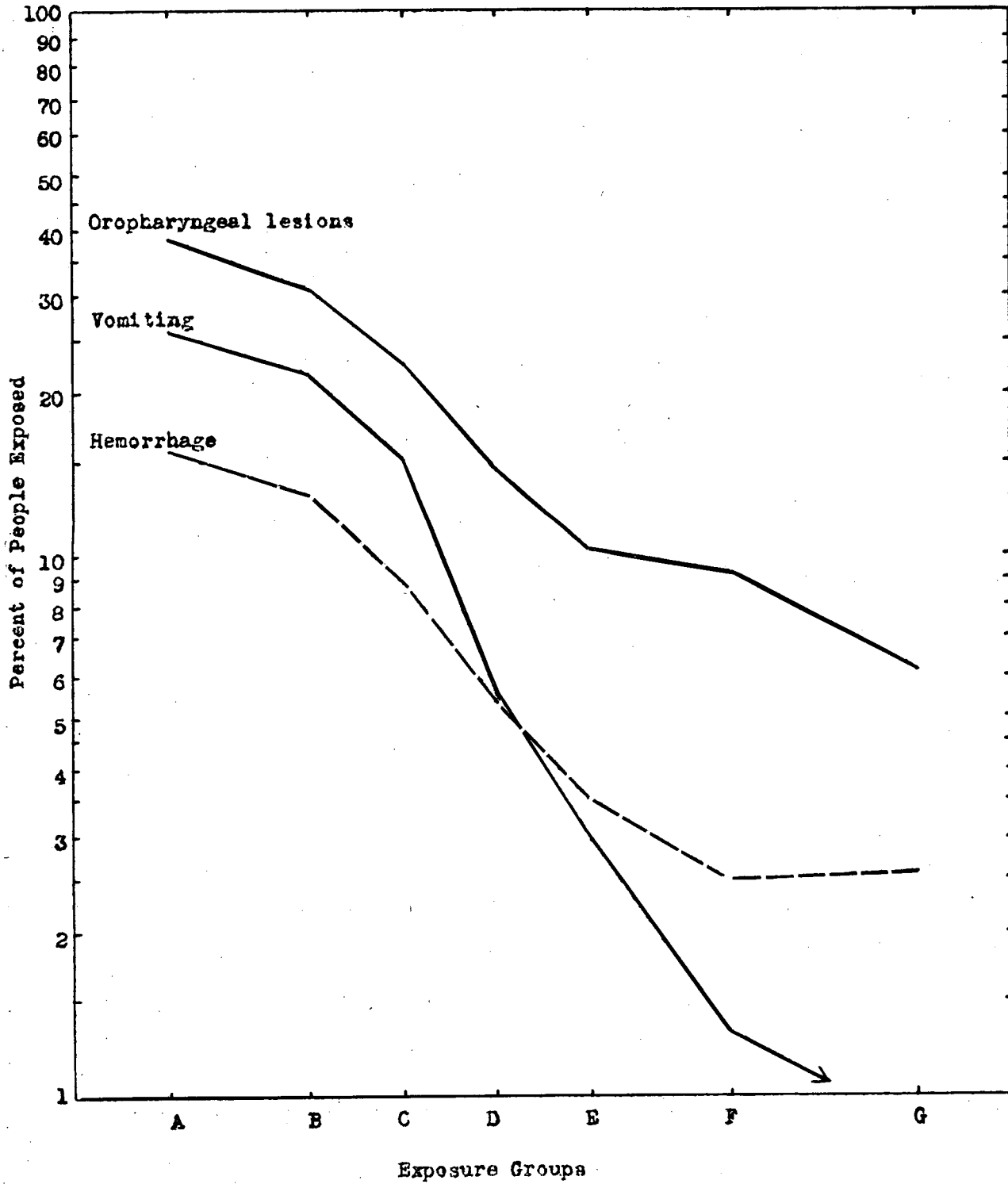


Fig. 12N--Oropharyngeal lesions, vomiting and other hemorrhage by exposure groups.

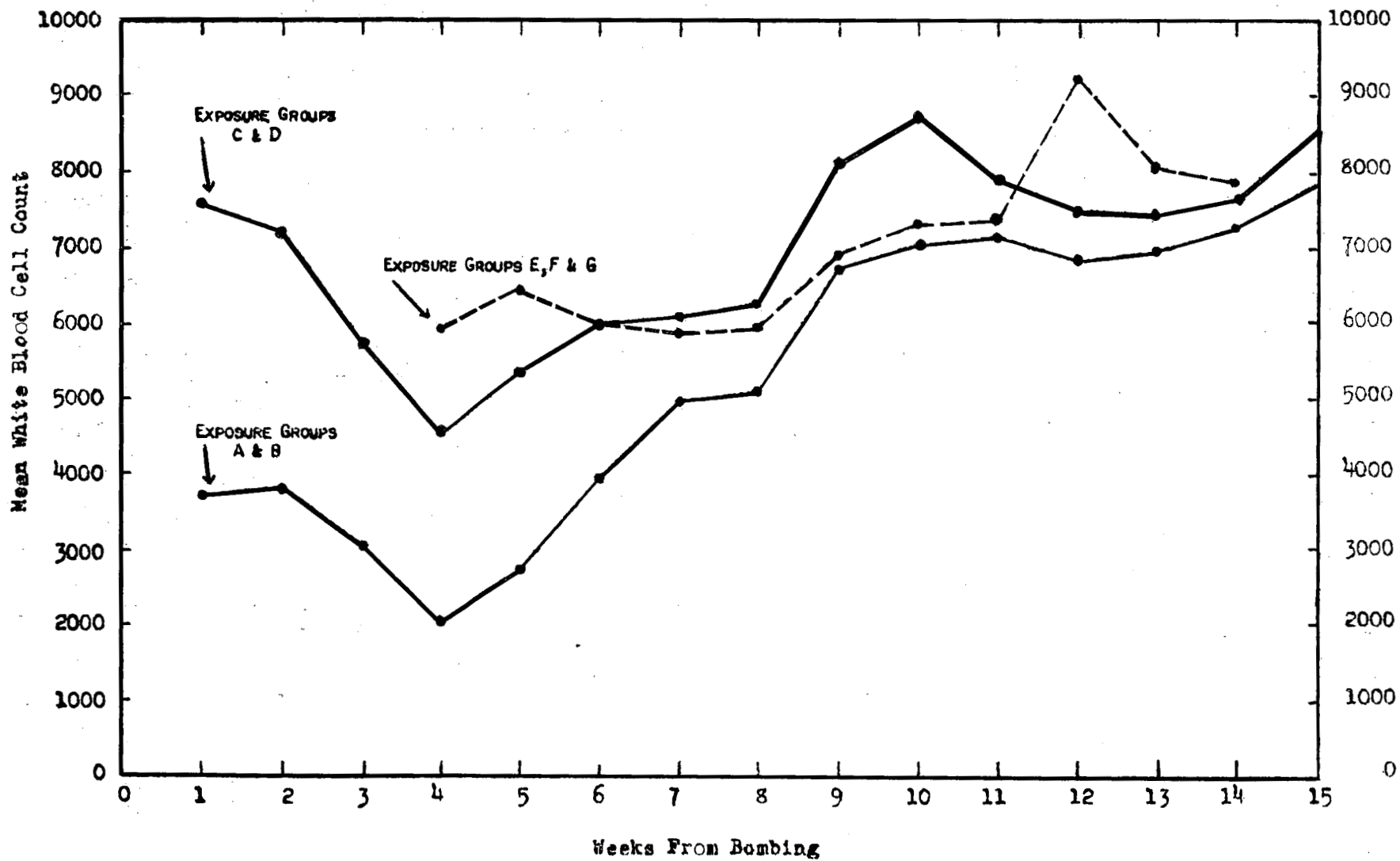


Fig. 13H--Mean white blood cell counts by weeks from bombing and by exposure groups.

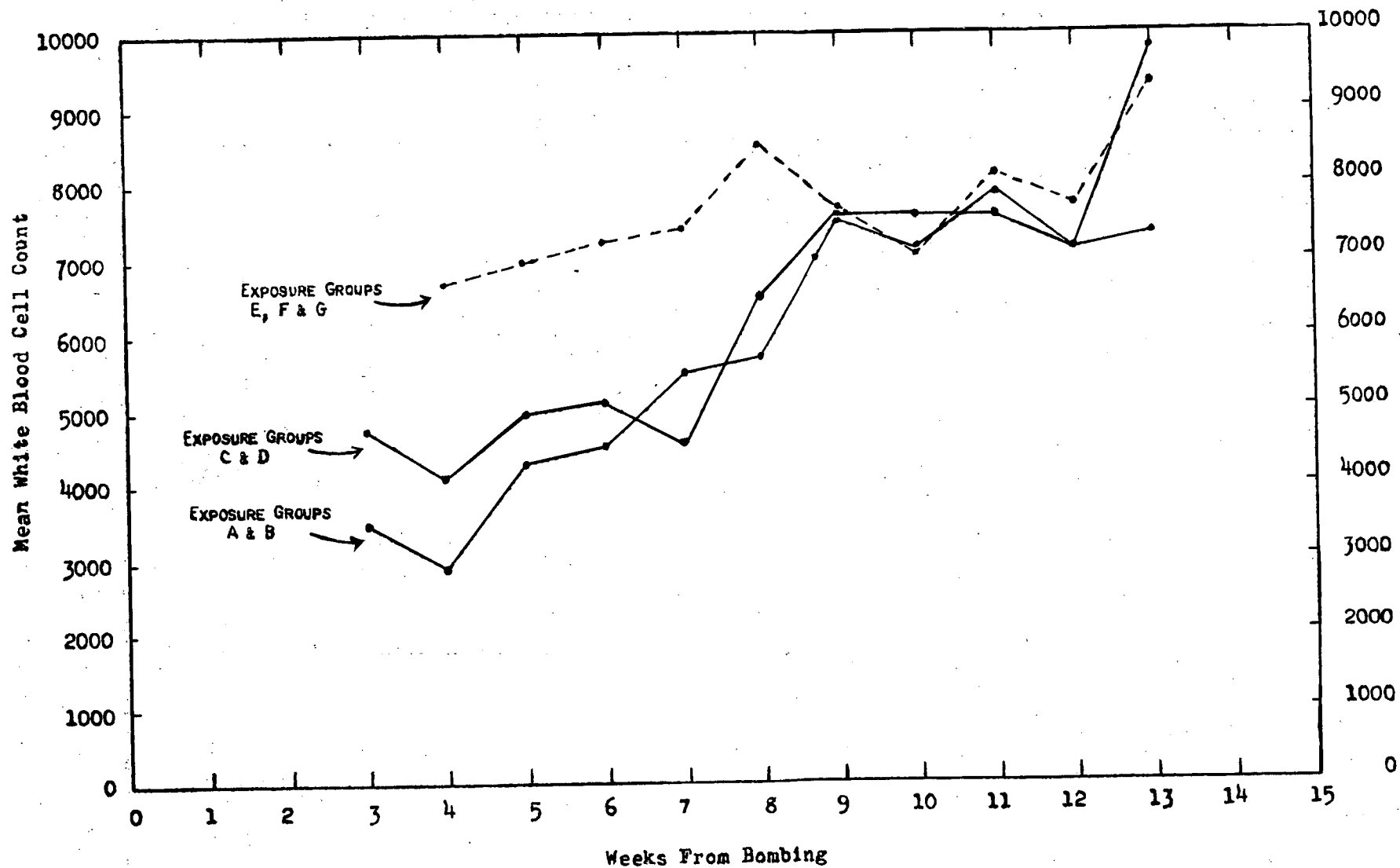


Fig. 13N--Mean white blood cell counts by weeks from bombing and by exposure groups.

HIROSHIMA

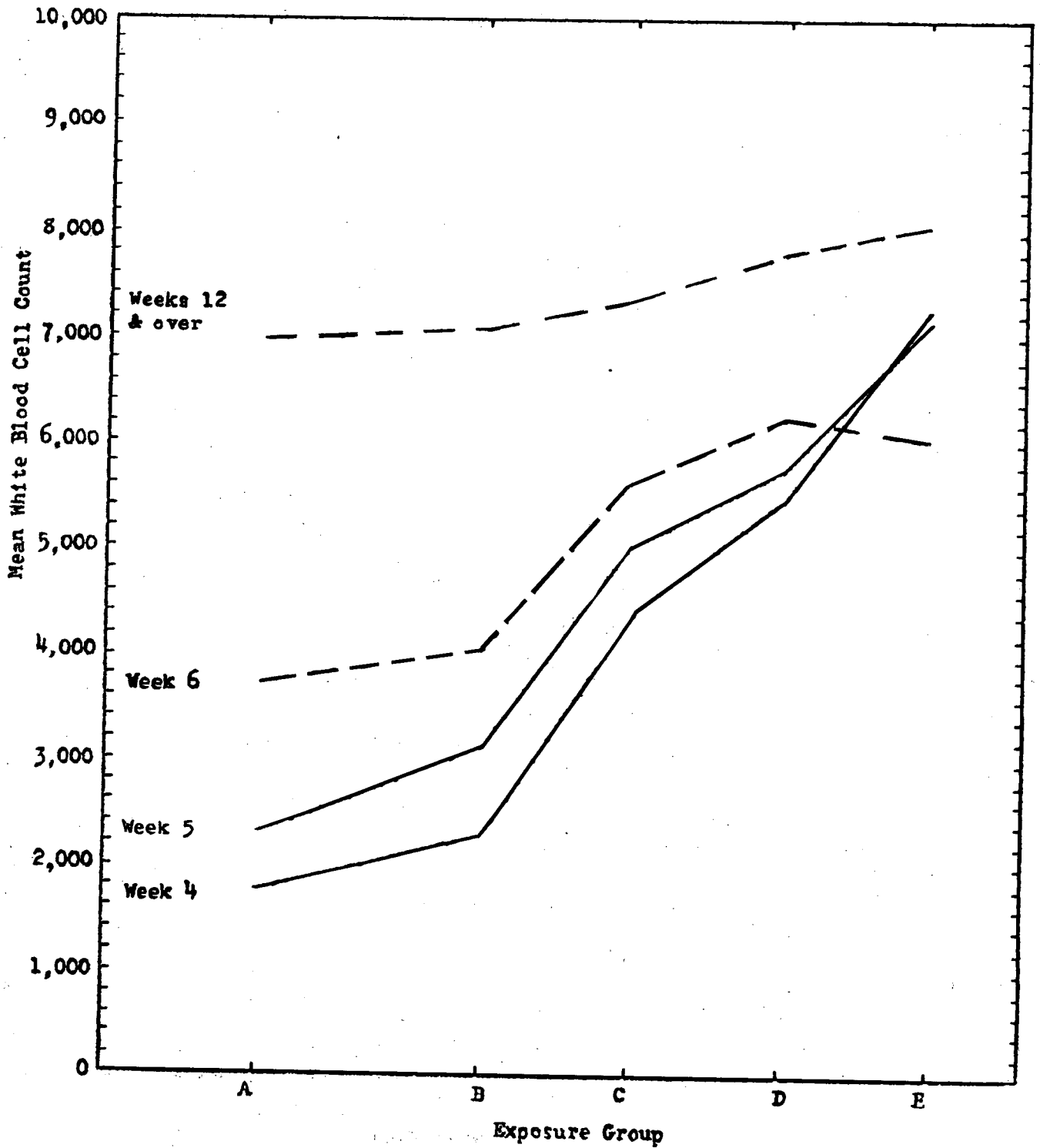


Fig. 14H--Mean white blood cell counts by exposure groups and by weeks from bombing.

NAGASAKI

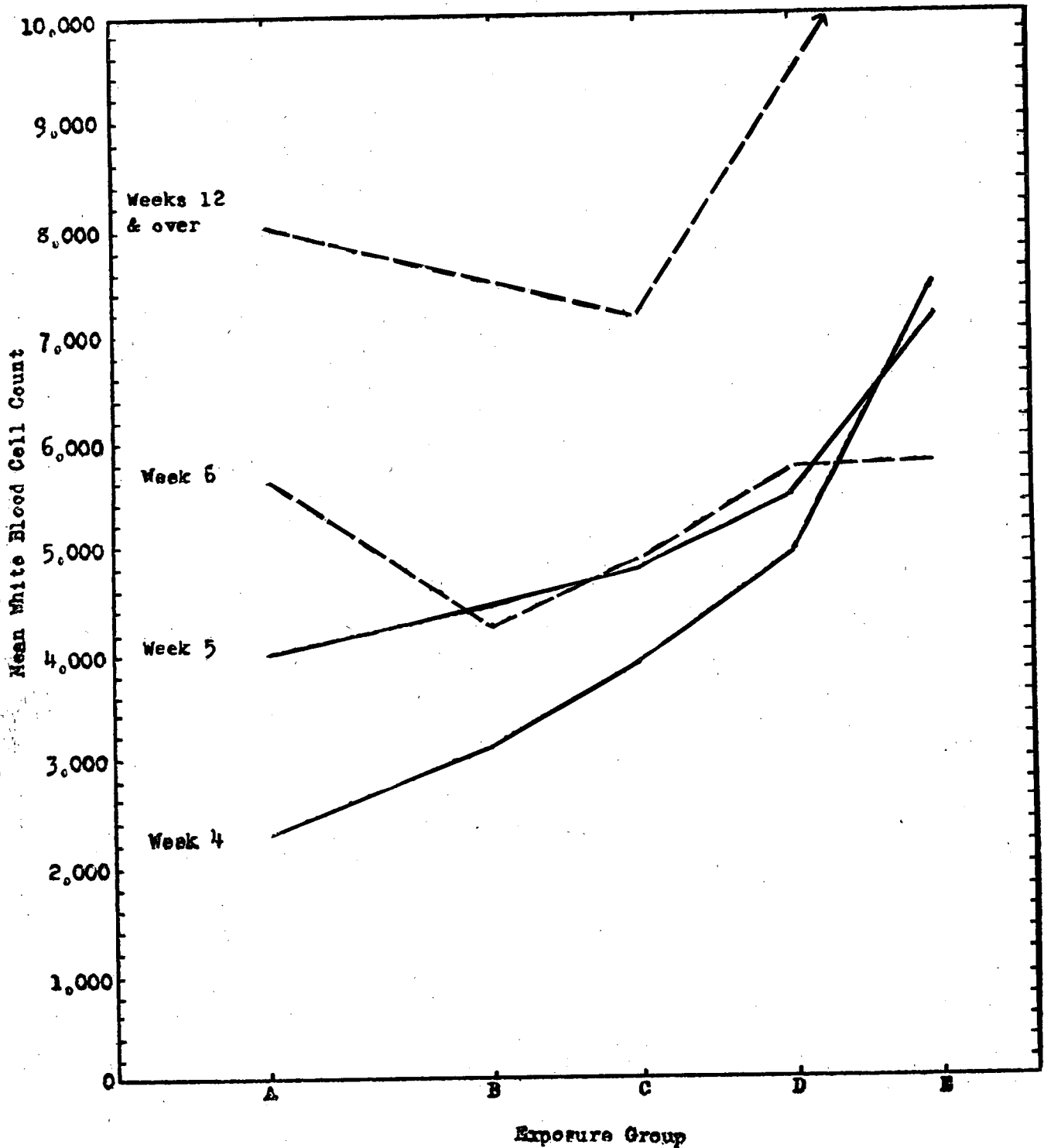


Fig. 14N--Mean white blood cell counts by exposure groups and by weeks from bombing.

HIROSHIMA

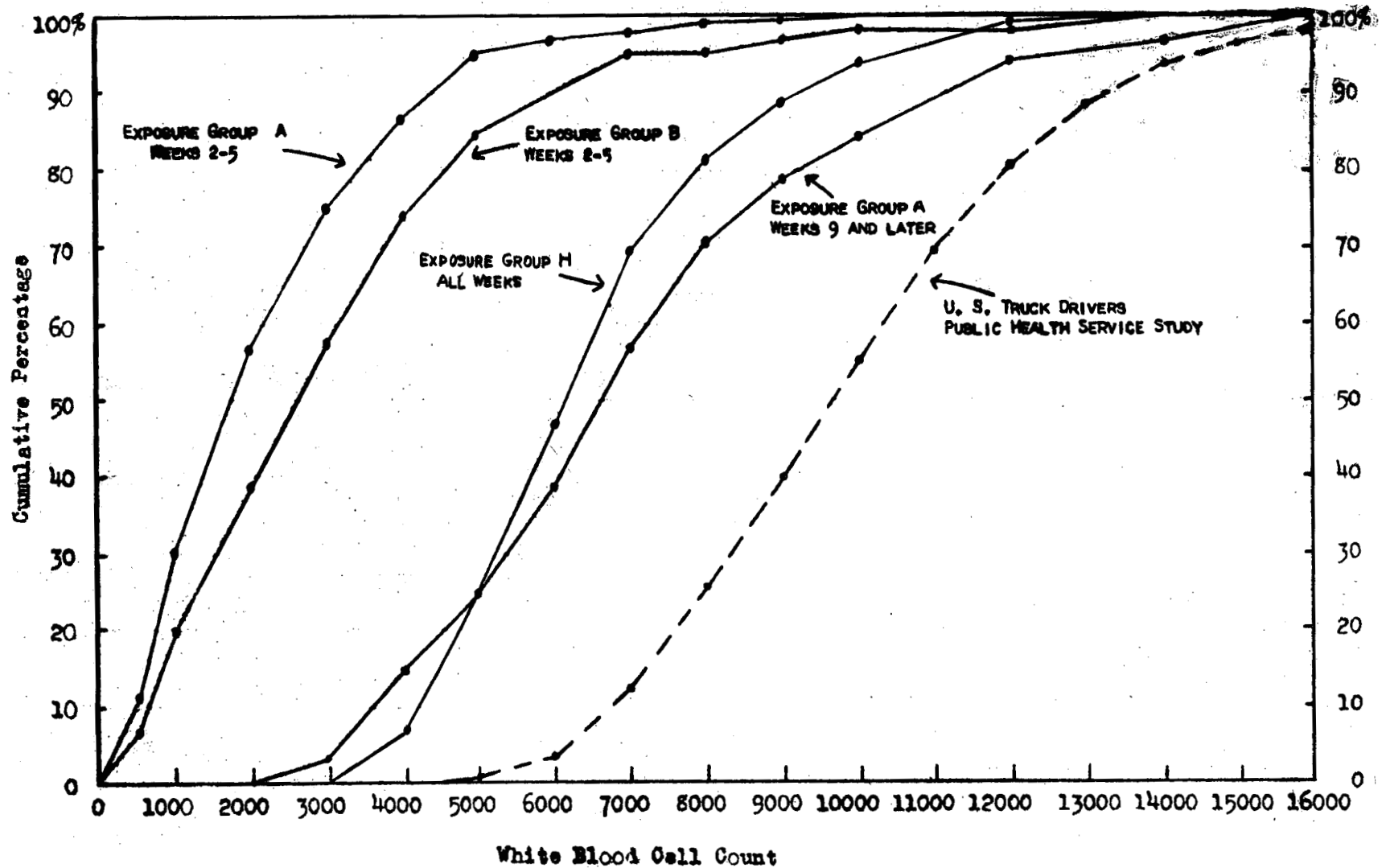


Fig. 15H--Cumulative percentage distributions of white blood cell counts by exposure groups and by weeks from bombing. The distribution of white blood cell counts among U.S. truck drivers is shown for comparison (see U.S. Public Health Bulletin No. 256).

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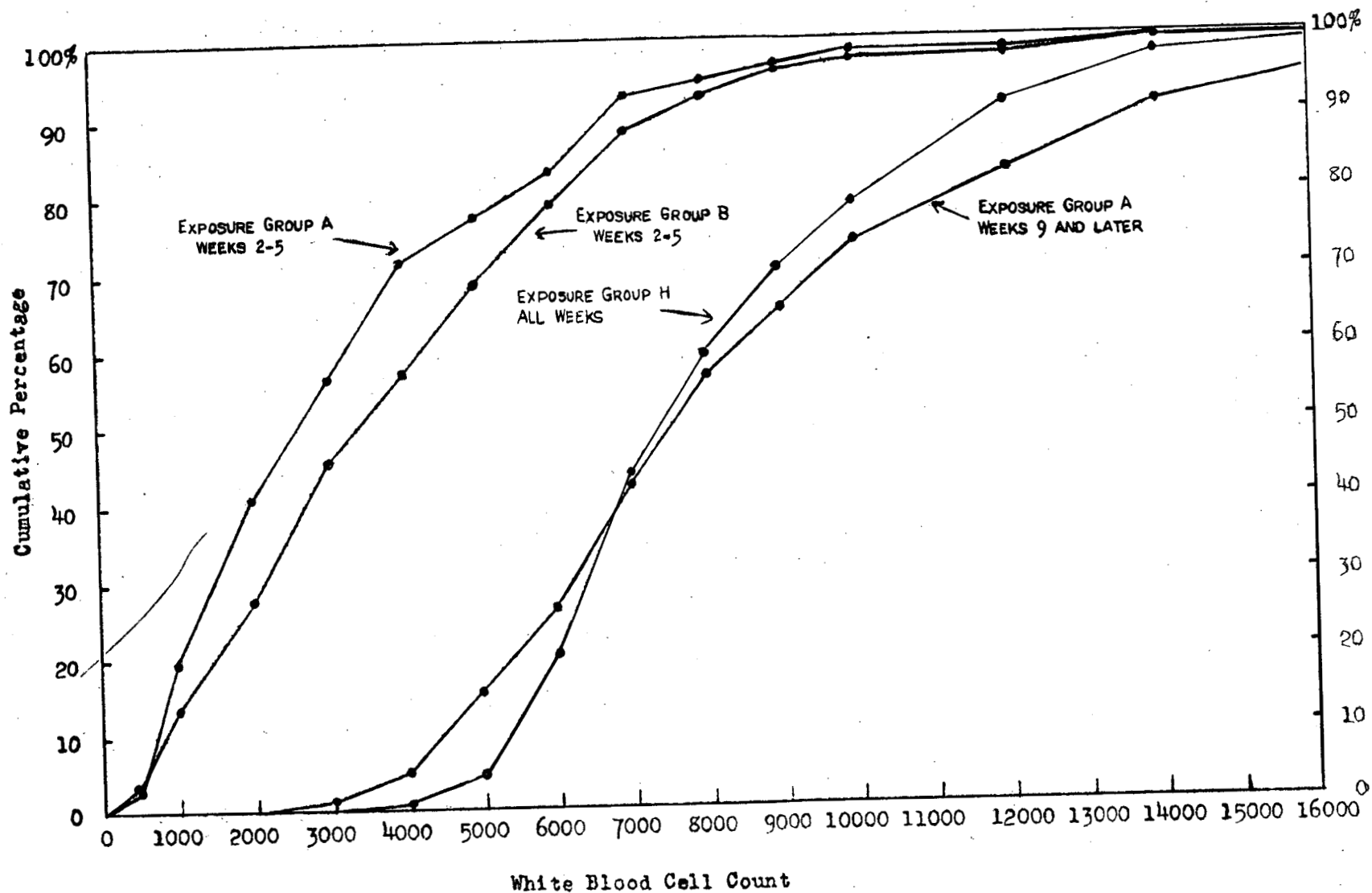


Fig. 15N--Cumulative percentage distributions of white blood cell counts by exposure groups and by weeks from bombing.

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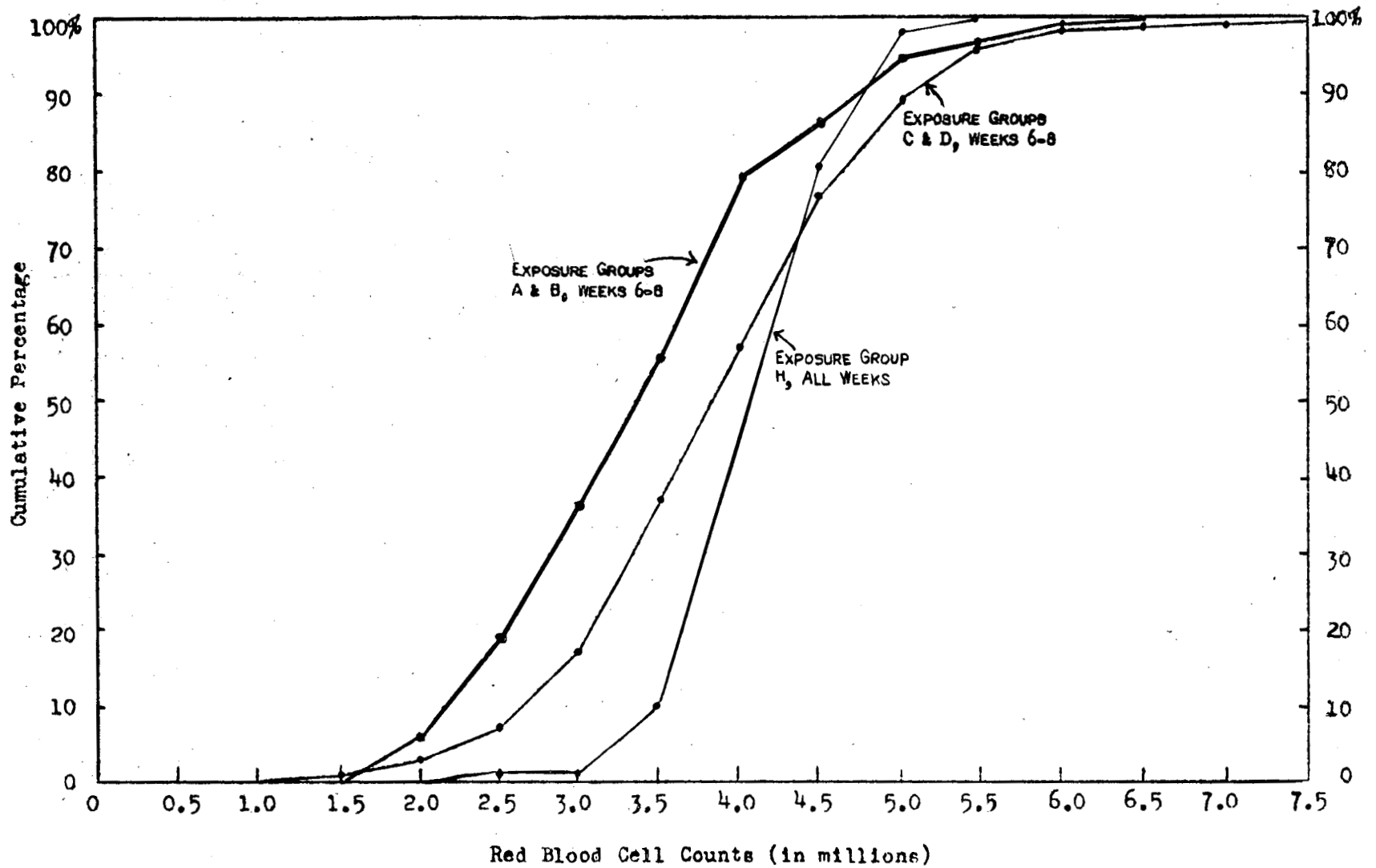


Fig. 16H--Cumulative percentage distributions of red blood cell counts (in millions) by exposure groups and weeks from bombing.

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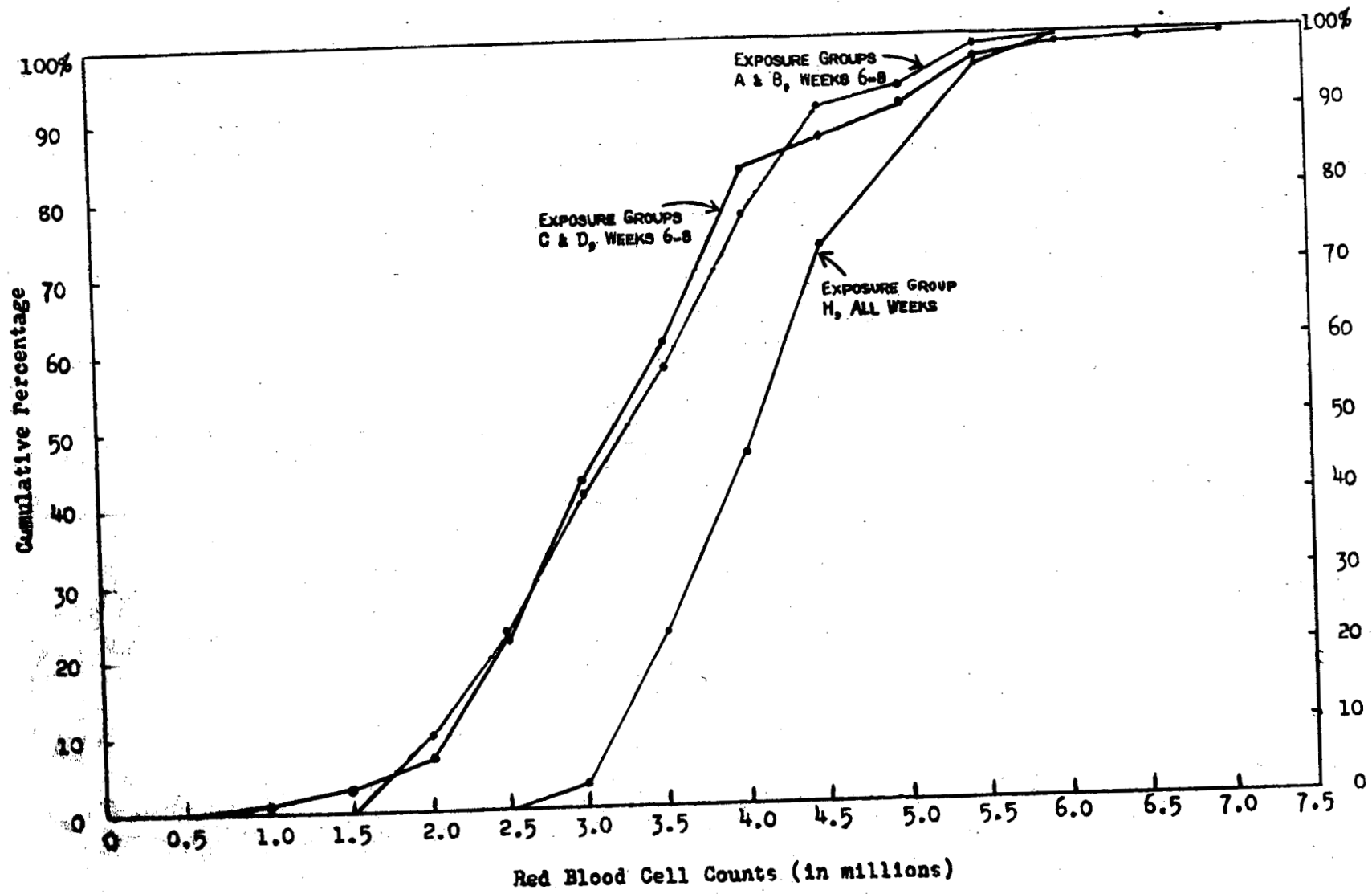


Fig. 16N--Cumulative percentage distributions of red blood cell counts (in millions) by exposure groups and weeks from bombing.

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HIROSHIMA

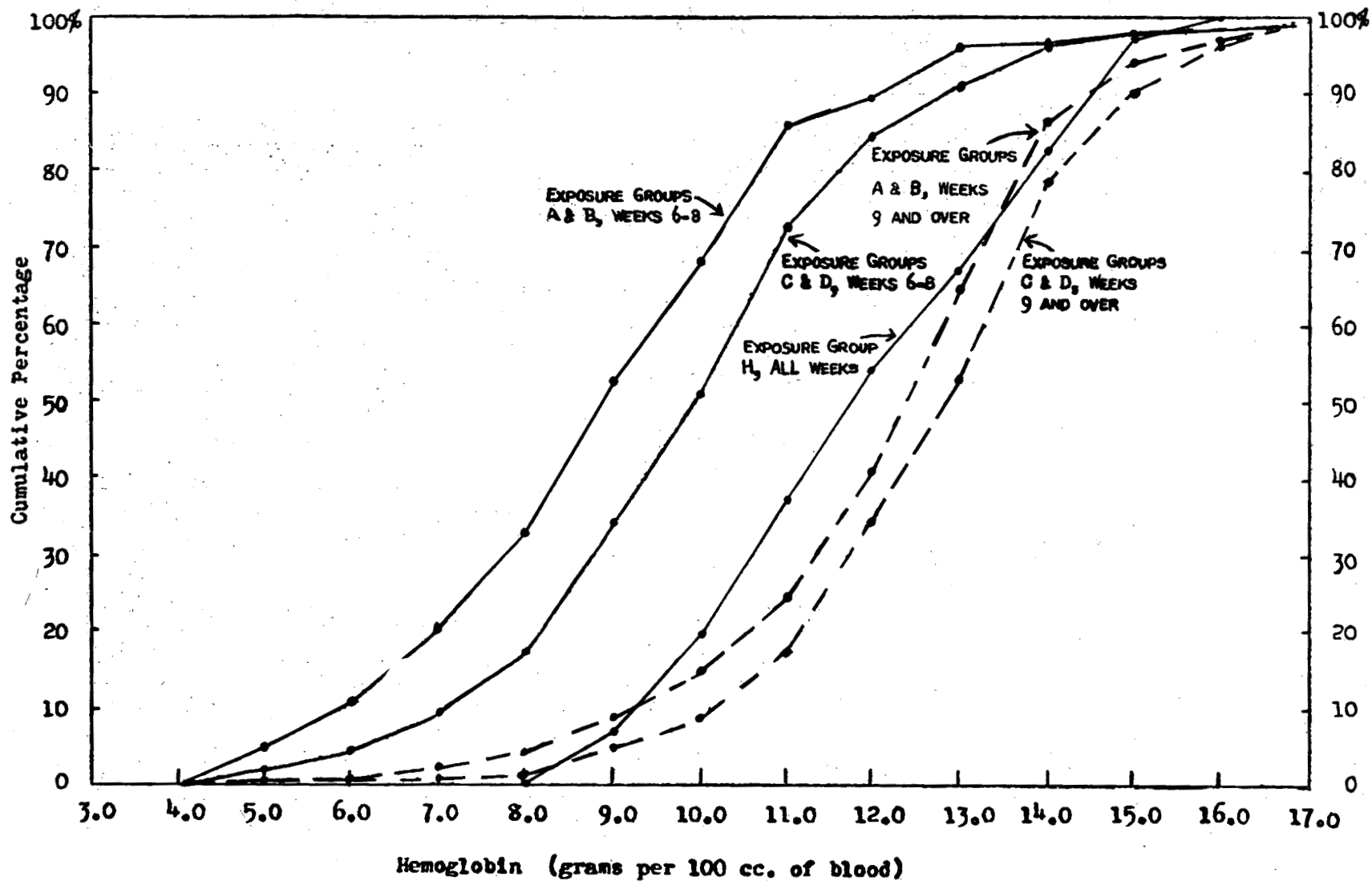


Fig. 17H--Cumulative percentage distributions of hemoglobin (grams per 100 cc. of blood) by exposure groups and by weeks from bombing.

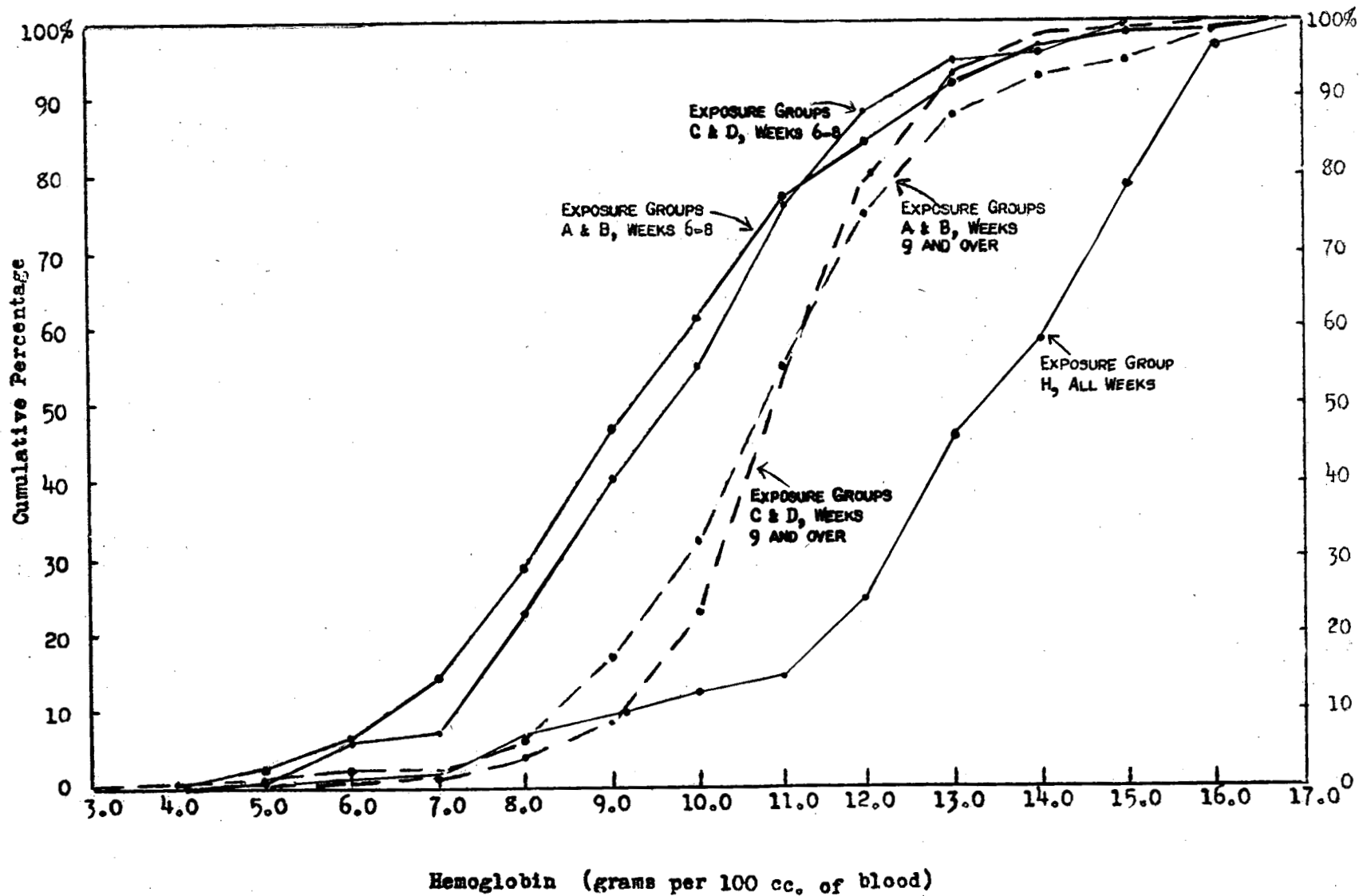


Fig. 17N--Cumulative percentage distributions of hemoglobin (grams per 100 cc. of blood) by exposure groups and by weeks from bombing.

HIROSHIMA

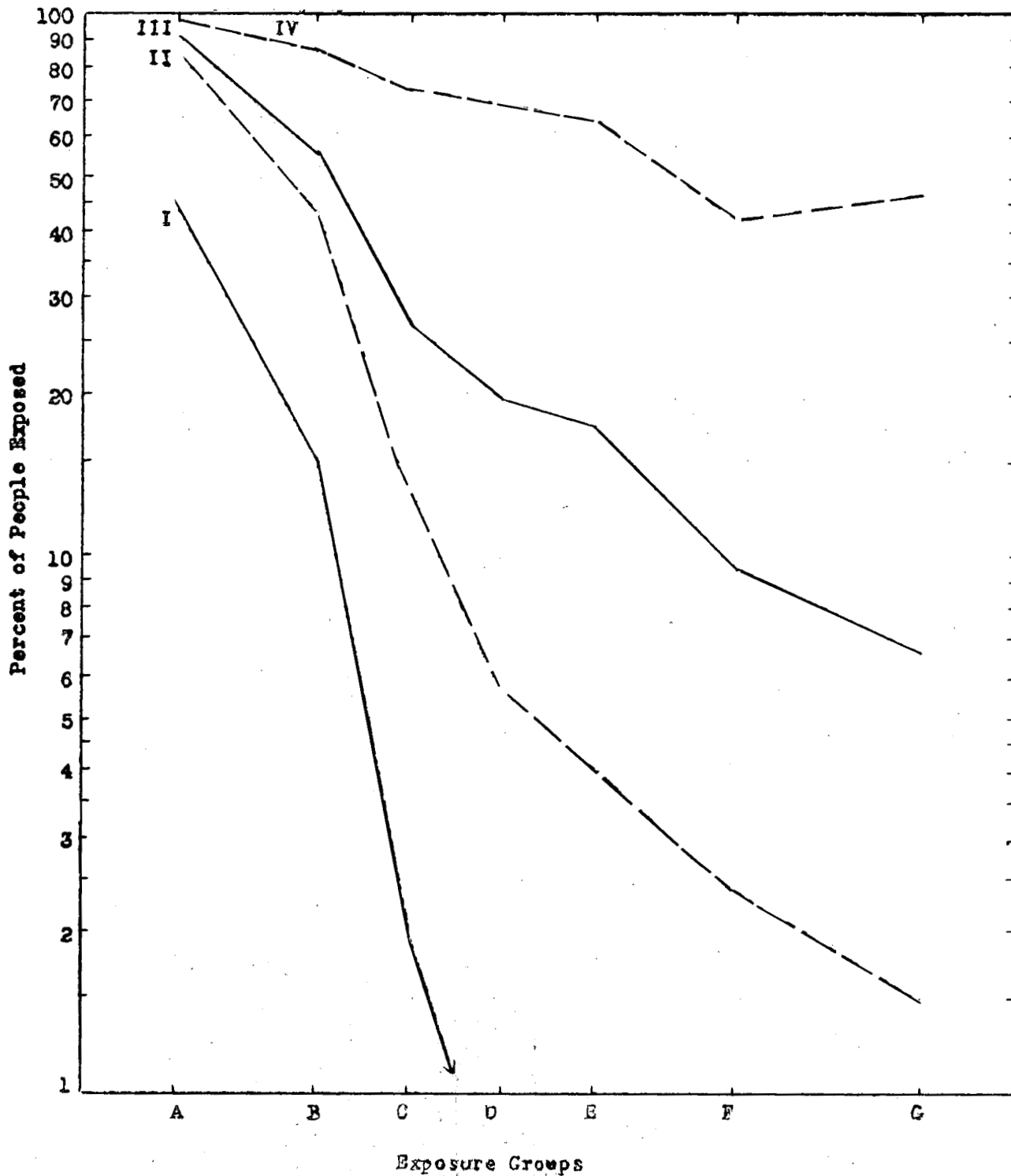


Fig. 18H--Radiation symptoms by exposure groups: I. Epilation and purpura; II. Epilation and/or purpura; III. Epilation and/or purpura, and/or any combination of two or more symptoms including oropharyngeal lesions, vomiting or hemorrhage; IV. Any symptoms.

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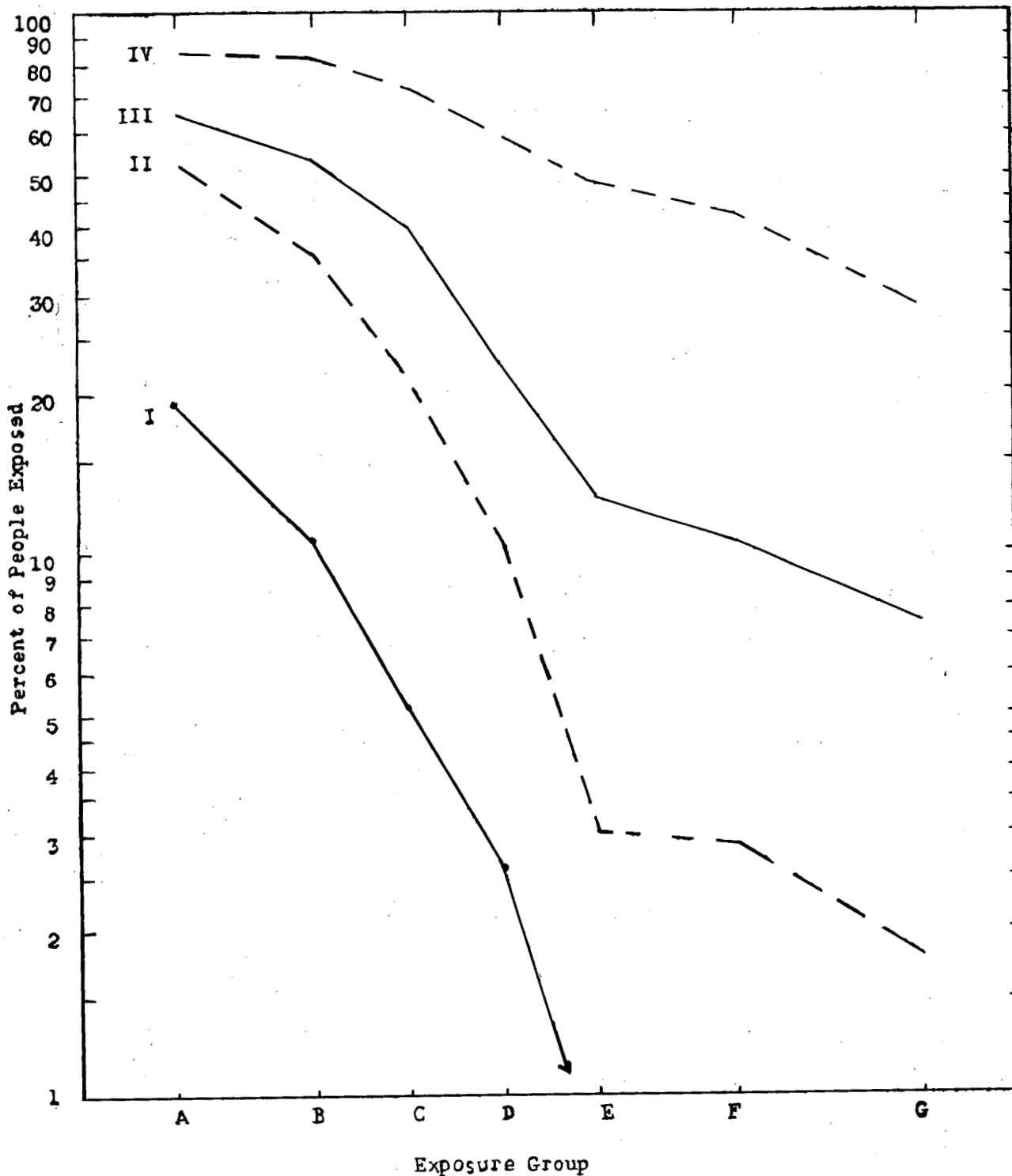


Fig. 18N--Radiation symptoms by exposure groups: I. Epilation and purpura; II. Epilation and/or purpura; III. Epilation and/or purpura, and/or any combination of two or more symptoms including oropharyngeal lesions, vomiting or other hemorrhage; IV. Any symptoms.