

You Can Live Through Atomic Bomb Raid - Here's How

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TO BEGIN with you must realize that atom-splitting is just another way of causing an explosion. While an atom bomb holds more death and destruction than man has ever before wrapped in a single package its total power is definitely limited. Not even hydrogen bombs could blow the earth apart or kill us all by mysterious radiation.

Because the power of all bombs is limited your chances of living through an atomic explosion are better than you may have thought. In the city of Hiroshima slightly over half the people who were a mile from the atomic explosion are still alive. At Nagasaki almost 70 per cent of the people a mile from the bomb lived to tell their experiences. Today thousands of survivors of these two atomic attacks live in new houses built right where their old ones once stood. The war may have changed their way of life but they are not riddled with cancer. Their children are normal. Those who were temporarily unable to have children because of the radiation now are having children again.

WHAT ARE YOUR CHANCES?

If a modern A-bomb exploded without warning in the air over your home town tonight your calculated chances of living through the raid would run something like this: You would be killed or injured by the blast 100 times out of 100.

On the other hand, if the important point, from one half to 1 mile away, you have a 50-50 chance.

From 1 to 1½ miles out the odds that you will be killed are only 15 in 100.

And at points from 1½ to 2 miles away, deaths drop all the way down to 10 per cent of each 100.

Beyond 2 miles, the explosion will cause practically no deaths at all.

Naturally your chances of being injured are far greater than your chances of being killed. But even injury by radioactivity does not mean that you will be left a cripple or doomed to die an early death. Your chances of making a complete recovery are much the same as for everyday accidents. These estimates hold good for modern atomic bombs exploded without warning.

WHAT ABOUT SUPER BOMBS?

Do not be misled by loose talk of imaginary weapons a hundred or a thousand times as powerful. All cause destruction by exactly the same means; yet one 20,000-ton bomb would not create nearly as much damage as 10,000 two-ton bombs dropped a little distance apart. This is because the larger bombs "waste" too much power near the center of the explosion. From the practical point of view, it doesn't matter whether a building near the center of the explosion is completely vaporized or whether it is simply knocked into a pile of rubble.

Just like any specific modern atomic bomb can do heavy damage to houses and buildings roughly 2 miles away. But doubling its power will extend the range of damage to only about 2½ miles. In the same way, if there were a bomb 100 times as powerful it would reach out only a little more than 4½, not 100 times as far.

And remember: All these calculations of your chances of survival assume that you have absolutely no advance warning of the attack.

Just like fire bombs and ordinary high explosives, atomic weapons cause most of their death and damage by blast and heat. So first let's look at a few things you can do to escape these two dangers.

WHAT ABOUT BLAST?

Even if you have only a second's warning, there is one important thing you can do to lessen your chances of injury by blast: Fall flat on your face.

More than half of all wounds are the result of being bodily tossed about by being struck by falling and flying objects. If you lie down flat you are least likely to be thrown about. If you have time to pick a good spot there is less chance of your being struck by flying glass and other things.

If you are inside a building, the best place to flatten out is close against a wall a mile away. Try to get under a table or to lie down along an inside wall or duck under a bed or table. But don't pick a spot right opposite the windows or you are almost sure to be pelleted with shattered glass.

If caught out-of-doors, either drop down alongside the base of a substantial building or, if you have no such place, lie flat on your stomach. You are almost sure to be pelleted with shattered glass.

When you fall flat to protect yourself from a bombing, don't try to see what is going on. Even during the daylight hours, the flash from a bursting A-bomb can cause several moments of blindness. If you are facing that way. To prevent it, bury your face in your arms and hold it there for 10 or 12 seconds after the explosion. That will also help to keep flying glass and other things out of your eyes.

WHAT ABOUT BURNS?

Flash burns from the A-bomb's light and heat caused about 30 per cent of the injuries at Hiroshima and Nagasaki. Near the center of the burst the burns are often fatal. Heat can be serious, burned more than a mile away. The people can be felt on the bare face and hands at four or five miles.

To prevent flash burns, try to find a shelter where there is a wall, a high bank or some other object between you and the bursting bomb. You can expect that the bomber will aim for the city's biggest collection of industrial buildings.

A little bit of solid material will provide flash protection even close to the explosion. Further out, the thinnest sort of thing— even cotton cloth—will often do the trick.

If you are outdoors, always wear full-length, close-fitting, light-colored clothes in time of emergency. Never go around with your sleeves rolled up. Always wear a hat—the brim may save you a serious face burn.

WHAT ABOUT RADIOACTIVITY?

In all stories about atomic weapons there is a great deal about radioactivity.

Radioactivity is the only way—besides size—in which the effects of an A or H bomb are different from ordinary bombs. But, with the exception of underwater or ground explosions, the radioactivity from atomic bursts is much less feared than blast and heat.

Radioactivity is not new or mysterious. In the form of cosmic rays from the sky, all of us have been continually bombarded by radiation every hour and day of our lives. We all have also breathed and eaten very small amounts of radioactive materials without even knowing it. For over half a century, doctors and scientists have experimented and worked with X-rays and other penetrating forms of energy. Because of all this experience, we actually know much more about radioactivity and what it does to people than we know about infantile paralysis, colds, or some other common diseases.

It is easy to understand how radioactivity works if we think of how sunlight behaves.

In the northern part of the world, winter's slanting sun rays seldom cause sunburn, but the hotter rays of the summer sun often do. Still just a few moments in the midsummer sun will not give you a tan or sunburn. You must stay in its hot rays for some time before you get a tan. What's more, bad sunburn on just the face and hands may hurt but it won't seriously harm you. On the other hand, if it covers your whole body, it can make you very sick, or, sometimes even cause death.

Radioactivity is just like sun rays. The harm that can come to you from radioactivity will depend on the amount of rays and particles that strike you, upon the length of time you are exposed to them, and on how much of your body is exposed.

WHAT IS INITIAL RADIOACTIVITY?

Broadly speaking, atomic explosions produce two different kinds of radiation. The first kind, called "initial" or "primary" radiation, is an extremely powerful invisible burst of rays and particles thrown off at the time of explosion. This kind is called "initial" because it is so powerful. Its rays and particles fly off quickly, they promptly disappear. There is danger from them only for a little more than a minute. The second type of radioactivity—lingering radioactivity—will be described later.

The injury range of the explosive radioactivity from a modern A-bomb is a little over one mile. If the bomb is exploded about 200 feet in the air, if it is exploded much higher, the range of the radiation may not reach the ground, so the range may be less. If it is exploded much lower, the radiation also may not reach out as far, because it would be blocked by the ground or by buildings.

A little more than a mile away, the principal effects of the few dying rays that struck you could be seen only as temporary blood changes in a doctor's examination. You probably wouldn't even realize you had been exposed.

Little less than a mile from the explosion center, if you are unprotected, you are almost sure to suffer illness. Less than two



WHAT AN ATOMIC BOMB explosion looks like. Here is the Bikini bomb test, the one exploded among the Bikini Islands in the Pacific for effect in water. This was after the bombing of Japanese cities of Hiroshima and Nagasaki.

thousand of a mile away, those caught in the open are pretty sure to soak up a fatal dose of radioactivity.

Still, the possibility of your being caught without some protection is not very great. Even if you are on the street, there is a good chance that a building, or many buildings, will be between you and the burst, and they will partially or completely shield you.

Atomic explosions high above ground cause the most wide-spread damage. And, as happened in Japan when an A-bomb goes off in the air over an area far more likely to be hurt by the bomb's blast and heat waves than by its radioactivity. At Hiroshima and Nagasaki slightly over one-half of all deaths and injuries were caused by blast. Nearly one-third of the casualties were from the heat flash.

Radioactivity alone caused only about 15 per cent of all deaths and injuries.

If the bomb were to go off close to the ground, or slightly below its surface, the range of the explosive radiation, as well as the range of the blast and heat, would be reduced. This is due to the fact that all three would be partially blocked by the earth, by nearby buildings and by other obstacles.

In an underwater burst, there would be much less to fear from blast and nothing to fear from heat. Practically all the explosive radioactivity would be absorbed by the water. However, there would be the second type of radioactivity to be described later on.

WHAT ABOUT INDUCED RADIOACTIVITY?

If an atomic bomb goes off in the air within two-thirds of a mile or slightly more of your home, there is no practical way of keeping explosive radioactivity out of the above-ground part of your house. It is possible that, at very short range, artificial or induced radioactivity could be set up in gold, silver and many other objects. However, this kind of radioactivity will never offer great danger, so don't throw away handbags and other first aid materials in the medicine cabinet. They will be perfectly safe to use.

Naturally, the radioactivity that passes through the walls of your house won't be stopped by tin or glass. It can go right through canned and bottled foods. However, this will not make them dangerous, and it will not cause them to spoil. Go ahead and use them, provided the containers are not broken open.

WHAT ABOUT RADIATION SICKNESS? Should you be caught upstairs or in the open at the time of a bombing, you might soak up a serious dose of explosive radioactivity. Even so, the first indication that you had been pierced by the rays probably wouldn't show up for a couple of hours. Then you most likely would get sick at your stomach and begin to vomit. However, you might be sick at your stomach for other reasons, too, so vomiting won't always mean you have radiation sickness. The time it would take you to get sick would depend on how strong a dose you got. The stronger the dose, the quicker you would get sick. For a few days you might continue to feel below par, and about two weeks later most of your hair might fall out. By the time you lose your hair you would be good and even change of making a complete recovery, including having your hair grow in again.

WHERE IS THE BEST PLACE TO GO? If your house is close to the explosion, there is little you can do to protect it from the bomb's blast, or pressure wave. Within one-half mile of the surface point directly beneath the explosion, the shock wave from an atomic bomb is sure to flatten most houses. Out to a distance of about one mile, steel, brick and wooden structures are likely to be damaged beyond repair. Earlier out there is less destruction, but serious damage may be expected to extend as far as two miles.

It is only wise to figure that the upper floors of most buildings near the explosion will be pushed in. This means the base

of your house is the best place to go.

Since it is impossible to get down in the basement of most houses, you should go to the ground level, or to a ditch, or to a hole in the ground.

If you have no other place to go, you should lie flat on the ground, or in a ditch, or in a hole in the ground. This will help protect you from flying glass and other things.

Several other household precautions should be taken promptly. Atomic bombs set off high above ground seldom cause breakage in underground gas or water mains. However, shaking and twisting of the buildings by the blast wave sometimes snaps off household inlets at the point where they enter the basement. This may allow gas or oil to flow into your cellar.

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Your local utility companies can give you detailed instruction about your gas, pilot lights, and so on.

If you have a coal-burning furnace or wood stove, be sure to close all its fuel and draft doors. In other words, do all you can to prevent sparks and to put out or cover open flames.

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WHAT ABOUT LINGERING RADIOACTIVITY? Knowing how to protect yourself from blast, heat and explosive radioactivity, only one major problem remains. That is how to avoid harm from lingering radioactivity.

Explosive radioactivity bursts from the bomb at the time of the explosion and lasts for only a little more than a minute.

Lingering radioactivity remains for a longer time, from a few minutes to weeks or months, depending on the kind of radioactive material.

Lingering radioactivity may become a danger when atomic bombs are exploded on the ground, underground, or in the water.

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These totally invisible radioactive particles act much the same as ordinary, everyday dust. When present in any real quantity, they are scattered about in the air, in the water, in the soil, and on everything they fall on, including people. While they can be removed easily from some surfaces, they stick very tightly to others. It is practically impossible to get absolutely all of them out of the household corners and cracks. Most of the time, it is far easier to prevent pollution than it is to remove it.

WHAT ABOUT RADIOACTIVE CLOUDS? In spite of the huge quantities of lingering radioactivity from atomic explosions, nuclear fuel is not very likely to be exposed to dangerous amounts of radiation. However, there is one greatest danger, that is, the danger of a nuclear fuel fire.

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