



ICRC

INFORMATION NOTE NO. 3

National Nuclear Security Administration / Nevada Site Office



SUMMARY

The use of even a single nuclear weapon with a relatively small destructive power in or near a populated area is likely to produce humanitarian needs that will be difficult to address. In light of the effects of a nuclear explosion, many survivors are likely to require urgent medical care for a wide range of serious injuries, shelter to shield them from the on-going risks of exposure to ionizing radiation, and other humanitarian assistance.

However, the significant destruction of infrastructure and large radioactively contaminated areas would considerably complicate the delivery of humanitarian assistance. In addition, ionizing radiation would pose serious risks to the health of assistance providers and special protection measures would need to be taken.

Although some countries have response capacities in place, there is presently no effective capacity at the international level to deliver appropriate humanitarian assistance to survivors if nuclear weapons were ever to be used.

HUMANITARIAN ASSISTANCE IN RESPONSE TO THE USE OF NUCLEAR WEAPONS

THE EFFECTS OF A NUCLEAR WEAPONS EXPLOSION

The effects of a nuclear explosion include immediate and long-term health consequences – expressed notably as the number of people killed, injured or made sick – and the foreseeable wide-ranging consequences for the living and non-living environment (e.g. damage to or loss of ecosystem functions, destruction of infrastructure and displacement of populations). A society's overall ability to function is likely to be severely disturbed.

The number of victims of nuclear weapons use will vary greatly, depending on the number of weapons used, their destructive power (commonly expressed as the "yield" of each weapon), and the location of the explosion(s). For instance, a nuclear weapon used in a populated area will have a greater impact in terms of human and material damage than one used in the desert or at sea against a discrete military objective.

The principal characteristics of a nuclear explosion with a potential to cause death and severe injury are as follows:

- thermal radiation (or heat): likely to ignite flammable materials, capable of producing large firestorms, may cause incineration and burns and other severe injuries, such as blindness;
- blast waves and accompanying high-speed winds: these originate in the rapidly expanding fireball of the explosion and may cause injuries similar to those from conventional explosives;

- ionizing radiation and radioactive fallout: generated and released during the explosion, these may cause radiation sickness or chronic injury (e.g. genetic damage, risk of malignancy).

The chances of survival will depend primarily on the extent of exposure to these phenomena. This is in turn largely dependent on the yield of the weapon and the person's proximity to the epicentre. Many of those in the vicinity of the epicentre at the time of the explosion are likely to die immediately or within the following days or weeks. Of the survivors, many will show acute symptoms of injury but may also suffer less obvious long-term health consequences such as cancer and birth defects, caused by exposure to significant levels of ionizing radiation.

WHAT ARE THE IMMEDIATE NEEDS OF VICTIMS?

Saving as many lives as possible in the aftermath of a nuclear explosion will require the severely injured to receive life-saving medical care quickly and to be stabilized in preparation for evacuation and further treatment. Assistance to survivors will need to include immediate field-level medical care in the form of first aid or interventions by qualified medical personnel. However, in providing such care it is important to bear in mind that the severity of some injuries will be beyond effective medical treatment.

Survivors will also need to have access to shelter to reduce on-going exposure to ionizing radiation. Additional capacities may be needed to provide other

"Conditions appalling. City wiped out, eighty percent all hospitals destroyed or seriously damaged. Inspected two emergency hospitals, conditions beyond description. Effect of bomb mysteriously serious. Many victims apparently recovering suddenly suffer fatal relapse due to decomposition of white blood cells and other internal injuries now dying in great numbers. Estimated still over one hundred thousand wounded in emergency hospitals [...] sadly lacking bandaging materials, medicines. [...] Required: substantial quantities bandages, surgical pads, ointments for burns, sulfamides, also blood plasma and transfusion equipment ..."

Excerpts from cable sent by Fritz Bilfinger, the first ICRC delegate to reach Hiroshima, 29 August 1945



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humanitarian assistance. This includes supplying uncontaminated water, food, shelter and clothes, managing the flow of people fleeing the area, some of whom may be contaminated, and recovering, identifying and storing or disposing of dead bodies.

IMPLICATIONS FOR THE DELIVERY OF HUMANITARIAN ASSISTANCE

The scale of destruction and the large numbers of people affected by the explosion of a nuclear weapon in a populated area are likely to pose significant challenges for the delivery of humanitarian assistance, particularly as regards the prioritizing of needs and allocation of available resources. For instance, operations providing medical assistance will need to plan for the triage and treatment of large numbers of severely injured victims, the possible need for decontamination of these persons, and their transfer out of affected areas, while bearing in mind how medical assistance, decontamination and transfer interact. The human resources required to manage the patient flow would be considerable and rapidly exhaust available response capacities. Furthermore, access to some areas will be almost impossible, owing to debris and damage to infrastructure, thus making it difficult to bring personnel and supplies to survivors.

In addition, one of the main safety concerns for assistance providers is the risk associated with exposure to ionizing radiation. Appropriate protective

measures may therefore have to be taken. Such measures should be based on the principles of radiation protection (see text box below) and adapted to the specific circumstances of the operation. Responders will only be able to effectively deliver humanitarian assistance in potentially contaminated areas if they understand the characteristics and effects of ionizing radiation and they are provided with the protective measures required for the particular operation.

This implies that, depending on the actual exposure and contamination levels, certain areas - and the people in them - may be off-limits and not accessible to responders for a considerable period of time or that they may only be visited for very short durations. Such restrictions would need to apply even though responders might be inclined to accept risks to their health in view of the enormous needs. In addition, working in such circumstances can be expected to take a heavy toll on the psychological well-being of responders and others who are close to the victims.

WHO IS AVAILABLE TO PROVIDE HUMANITARIAN ASSISTANCE?

In light of the complexity and magnitude of the effects of a nuclear weapon explosion, the local and, in most instances, national emergency response capacities are likely to be overwhelmed and would need support from other countries with providing humanitarian assistance.

The difficulties of coping with the expected destruction of infrastructure in the affected areas are likely to be compounded by numerous challenges to effective collaboration among assistance providers, especially if the response involves international deployments of people and material. Factors such as differences in mandates and staff security policies, resource interoperability, transport capacities, local logistical arrangements, customs procedures and the coordination of operations can be expected to affect the effectiveness of the response. Considering further that the number of victims may easily be as high as tens or hundreds of thousands of people and that there may be large areas of extensive physical destruction and contamination, the practicalities of coordinating and running operations with a multitude of responders, and of ensuring their safety, are beyond any tested capability.

These factors therefore constitute serious challenges to providing effective assistance to survivors in the event of a nuclear explosion. In addition, national response capacities, if they exist at all, would at best be severely stretched in most countries. International assistance, which would normally be expected to provide additional support, would also face significant challenges and, at present, international entities seem to have little capacity to deliver the breadth and type of aid that would be required.

PRINCIPLES OF RADIATION PROTECTION

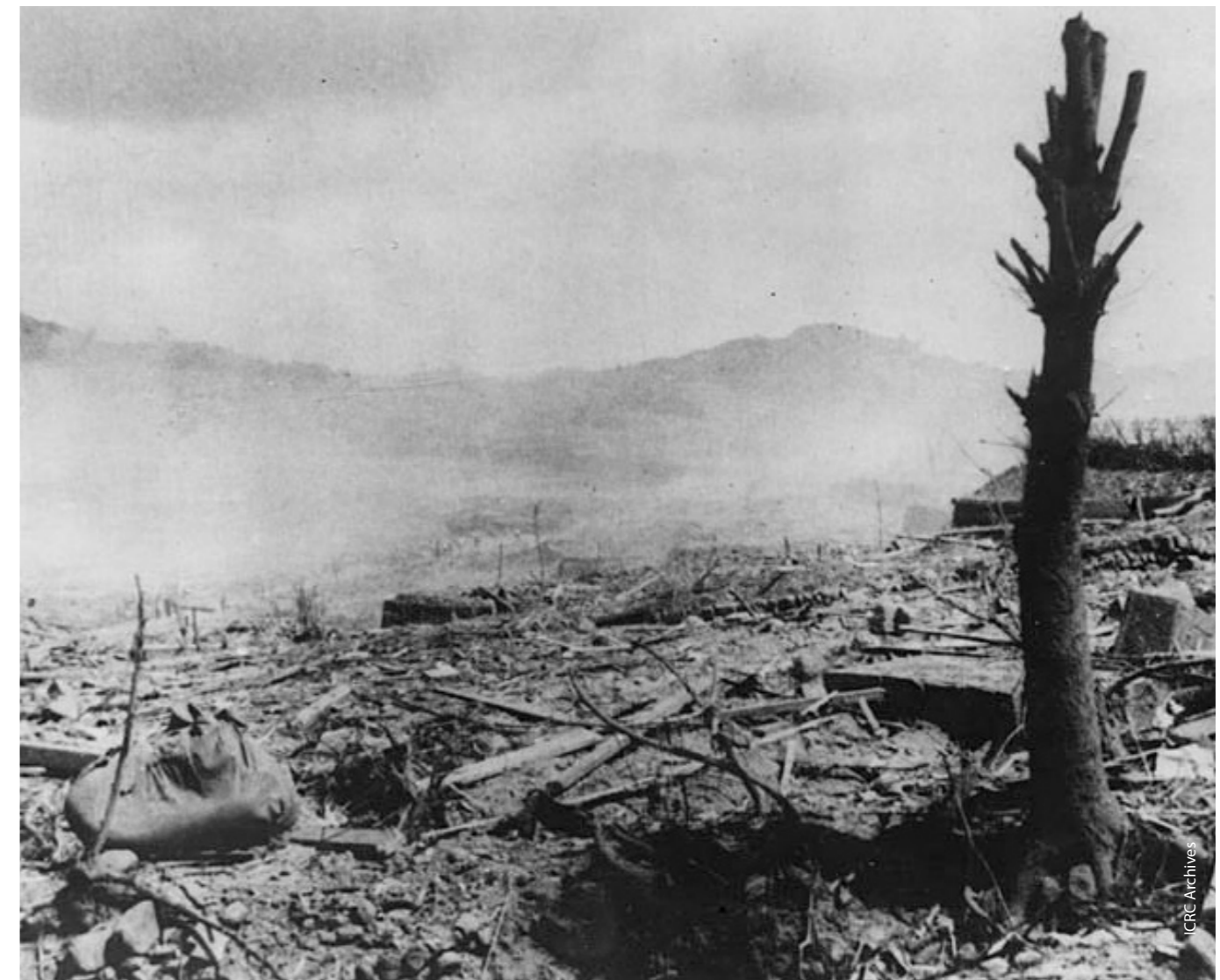
- ✓ limiting the number of persons and time spent in affected areas
- ✓ maintaining a distance from affected areas
- ✓ avoiding direct contact with radiation sources and contaminated matter
- ✓ shielding from exposure by using physical barriers
- ✓ using measures for radiation detection and monitoring
- ✓ removing contaminants (decontamination) if exposure occurred
- ✓ ensuring post exposure health monitoring and treatment if necessary

Based on principles established by the International Commission on Radiological Protection

ICRC OBSERVATIONS ON OPERATIONS IN RESPONSE TO CBRN* EVENTS

- Any planned deployment to areas affected by a CBRN event will need to take into consideration the risks to responders, whose safety is a prerequisite for effective humanitarian assistance.
- Areas and people in close proximity to CBRN agent release and dispersal may be out of reach of humanitarian assistance for a considerable period of time, owing to physical inaccessibility and/or for safety reasons.
- Humanitarian assistance operations in response to CBRN events will need to be augmented by capacities to detect and manage contamination and to protect the people affected from on-going exposure to CBRN agents.
- Third-party support for humanitarian assistance brings with it additional capacities but also challenges to effective collaboration, which requires a common understanding of each other's role in the response and adherence to standard practices on CBRN protection and humanitarian assistance.

*CBRN event – any release or dispersal of a chemical, biological, radiological or nuclear agent.



This photo taken in Nagasaki in 1945 shows the level of destruction and the challenges facing a humanitarian response. The presence of radiation also makes any humanitarian response extremely hazardous