



Nuclear Weapons Illegality: The Public Health Case

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Under existing international law there are four rules of war that have a particular bearing on the use of nuclear weapons. The unique effects of nuclear weapons that relate to such rules include: 1) the disproportionate magnitude of the health effects of nuclear weapons; 2) the non localised health effects of nuclear weapons and hence their effect on civilians, non-belligerents, and neutral countries; 3) the long-term nature of the health effects of nuclear weapons and hence their effect on future generations; 4) the specific health effects of radiation; and 5) the health effects of the development and production of nuclear weapons. Given these factors, it would appear that the use of nuclear weapons should be considered illegal under existing international law. Such an approach would be consistent with the reasons that have led to biological and chemical weapons being declared illegal. [M&GS 1995:115-121]

This review specifically examines health issues relating to the legality of the use of nuclear weapons. This issue is important, because the International Court of Justice (World Court) has asked all member states of the World Health Organization (WHO) for submissions on the legal status of these weapons. In a resolution passed in 1993 [1], the World Court asked:

In view of the health and environmental effects, would the use of nuclear weapons by a State in war or other armed conflict be a breach of its obligations under international law including the WHO Constitution?

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One step towards a treaty to eliminate nuclear weapons would be to declare the use of these weapons illegal under international law. Such a move may delegitimise the ownership of nuclear weapons and provide stronger international pressure for nuclear disarmament and for control of nuclear proliferation [2]. The health issues relating to the following international rules of war, as discussed in the recent text by Grief on the World Court Project, form the basis of this review [3]:

* Rule 1: It is prohibited to use weapons or tactics that cause unnecessary or aggravated devastation or suffering.

* Rule 2: It is prohibited to use weapons or tactics that cause indiscriminate harm between combatants and non-combatants, and military and civilian personnel. This also relates to the duty to discriminate between belligerent and neutral countries.

* Rule 5: It is prohibited to use weapons or tactics that cause widespread, long-term, and severe damage to the natural environment.

* Rule 6: It is prohibited to effect reprisals that are disproportionate to the antecedent provocation, or disrespectful of persons, institutions, or resources protected by the laws of war.

The Disproportionate Magnitude of the Health Effects of Nuclear Weapons

There is no doubt that "conventional" weapons have wrought great destruction, such as the use of incendiary bombs against Tokyo and Dresden in World War II. The multiple use of nuclear weapons, however, is capable of vastly greater devastation. The overwhelming magnitude of the potential effects of nuclear weapons relates to all the four rules of war described above. It is particularly relevant, however, to rule six, which deals with the issue of disproportionality of response. Particular components of the destructive impact of nuclear weapons include:

* The potential for climatic disturbances and mass starvation: Exchanges of nuclear weapons pose the threat of large injections of soot and dust into the atmosphere. This effect could cause climate change at a global and regional level. Although the risk of a superpower war in the near future is very low, a nuclear war in the Middle East or between India and Pakistan could possibly produce climatic effects at a regional level. Burning oil wells in the Middle East would greatly add to the soot generated by burning cities. The effects of regional climate change on agriculture after such nuclear conflicts could result in widespread crop failures and massive starvation¹ [4,5].

* The potential for complete social disintegration: The explosive power of nuclear weapons combined with the effects of radiation has the capacity to devastate a nation. For example, a nuclear attack on Egypt by Israel with 50 nuclear weapons, would kill much of Egypt's urban population² [6].

Radioactive fallout would also kill a significant proportion of the rural population³ [7]. Concerns about fallout exposure and disease risks would hinder the massive overseas aid that would be necessary to prevent widespread starvation (as Egypt is highly dependent on imported food).

Developed nations are even more vulnerable to nuclear explosions, because their infrastructure is more centralized, their populations are more urbanised, and they are highly dependent on electronic systems that are readily destroyed by the electromagnetic effects of nuclear weapons. Also, the populations in these countries are more aware of the hazards of radiation and, therefore, are more likely to panic and flee from their homes if they believe they are being exposed to a plume of radioactive fallout.

Two other uniquely destructive effects of nuclear explosions could add to the complete social disintegration of an attacked nation. First, there is the capacity of one high altitude nuclear explosion to severely damage electronic systems over huge areas (e.g., as large as the land mass of the continental United States [8]). Such an "electromagnetic pulse" from a nuclear explosion over a key economic area such as Tokyo could trigger a global financial crisis.

Second, only nuclear explosions have the capacity to readily destroy and disperse the radioactive contents of land-based nuclear reactors. In this way, one nuclear explosion can greatly magnify its destructive capacity in terms of radiation effects [9].

Magnitude of the psychosocial effects

The psychological and social effects of being a nuclear bomb survivor are another component of the overwhelming magnitude of the use of this type of weapon. Hiroshima survivors (the hibakusha) continue to suffer a psychological burden and stigmatisation decades after the atomic bombing [10]. Research indicates that Hiroshima was different from other disasters in that it plunged the survivors into an interminable and unresolvable encounter with death [11].

studies on the effects of nuclear attacks on American cities. Important variables are whether airburst or groundburst explosions are used and if several explosions on one city will trigger a "superfire." [See 5]

3. For example, a 100 kiloton Israeli nuclear weapon exploded at ground level would contaminate more than 100 square kilometres of land with a dose of radiation expected to kill half the population. [See 6]

1. While most modelling of climatic effects of nuclear war relate to superpower conflicts, these models do not exclude significant atmospheric and agricultural effects from smaller regional nuclear wars.

2. This is estimated from the more detailed

Complete inadequacy of any medical response

The complete inability of any health service to cope with the injured, even after only one nuclear explosion, has been known since the 1960s. In one U.S. study, the injured-to physician ratio was projected to be more than 1,000 to 1 [12]. Injuries from nuclear explosions are also likely to be much more complex than those arising from other weapons, as they may involve a mixture of the following: blast injuries, burns, radiation injury, temporary blindness (from the nuclear flash), the psychological effects associated with complete devastation of the individual's community, and fear of the consequences of radiation. There are few cities in the world that could cope with more than 20 new cases of severe burns or radiation sickness all at once.

Non-localised health effects of nuclear weapons

"Non-localised effects" on human health are summarized below. These issues relate particularly to rules of war numbers one and two.

* Potential for climatic disturbances over large areas: As described above, this effect could produce starvation in non-combatant countries. Nuclear explosions could also thin the ozone layer over a large part of the hemisphere. This could potentially increase the risks for skin cancer and cataracts for millions of people [4].

* Dispersal of radiation: As clearly demonstrated by the Chernobyl nuclear accident, radiation is readily dispersed by the wind and deposited over large parts of the planet [13]. The radiation from as little as a five megaton nuclear war in the Middle East could cause thousands of cancer deaths regionally in the long-term. Depending on wind patterns, radiation from such a war could be dispersed over Europe, Asia, and Africa. High altitude nuclear explosions in the Middle East could result in radioactive fallout distributed over the mid latitudes of the northern hemisphere⁴ [14].

Radiation is a specific hazard of nuclear weapons regardless of their size. Therefore, even if "micronukes"

or "mininukes" are produced [15], these weapons will continue to produce the non-localised and long-term health effects associated with radiation. In any case, to continue the production of small nuclear weapons necessarily means maintaining the ability to produce large ones with their more devastating potential.

* The risk of massive communicable disease outbreaks following nuclear attack: The devastation of urban centres from nuclear weapons, would lead to complete social and economic breakdown. Such breakdown combined with the debilitating effects of injuries from blast, thermal, and radiation effects associated with these weapons would increase the risk of disease outbreaks [16]. Outbreaks of communicable diseases could spread far outside areas directly involved in the conflict.

The long term nature of the health effects of nuclear explosions

All types of weapons can produce psychological and physical disabilities that last the lifetime of the individuals affected. Nuclear weapons, however, have effects that go beyond the generation directly exposed as detailed below:

* Long-term health effects from environmental destruction: Human health is completely dependent on the "health" of ecosystems. The destructive potential of nuclear war, however, is such that ecosystems could be damaged for generations. Fires from nuclear explosions, combined with climatic disruptions, radiation effects, toxins released by fires, and increased ultraviolet light from ozone layer damage, could all act together to damage ecosystems severely [5]. This damage would diminish ecosystem services to humans, (i.e., food supply, water and soil conservation, and preservation of biodiversity). Nuclear-war-induced fires, for example, could accelerate soil erosion in the affected areas and, therefore, decrease local food production and increase the risk of floods.

* Radiation induced genetic diseases: By increasing the mutation rate in exposed humans, nuclear weapon use may increase the long-term burden of genetic disease in the exposed populations [17].

4. One conservative estimate for the long term effects of global fallout from airburst explosions is 1,000 deaths per megaton. [See 14]

* Effects from ongoing radiation exposure: The use of nuclear weapons would produce radiation that would continue to expose populations for generations. In the case of airburst nuclear explosions, as at Hiroshima, radiation is distributed in the upper atmosphere and falls out around the world over many years. In ground-burst explosions, the effects would tend to be more localised. Some of these radioactive hotspots could be rendered uninhabitable for many decades [13]. This would particularly be the case in areas contaminated by the radioactive contents of bombed nuclear reactors or from the results of terrorist use of "radiation bombs."

The specific health effects of radiation

The fact that radiation from nuclear weapons can be spread over enormous areas and can produce intergenerational health effects has been discussed above. Another particular aspect of radiation as a weapon is that it is invisible in the absence of appropriate sensing equipment. This can increase the fear associated with radiation for non-combatants and civilians. This fear can contribute to the causation of various psychological illnesses and possibly even cancer, according to a study on the population around the Three Mile Island nuclear reactor [18,19]. Therefore, even populations exposed to very small doses of radiation downwind of a nuclear explosion might be expected to suffer adverse health effects.

The public fear of radiation makes nuclear weapons more attractive for terrorists who might attempt to obtain a nuclear weapon or weapons-grade materials (e.g., enriched uranium or plutonium). This may not be that unlikely in the long term, given that there are still tens of thousands of nuclear weapons in the world and that they are stored in at least 13 different countries. If terrorists could not obtain a proper nuclear bomb, they could produce a "radiation bomb" using nuclear materials and a conventional explosive⁵ [20].

Apart from these points, there is also a case that nuclear weapons should be prohibited under the Geneva Chemical Weapons Convention (1925), since radioactive fallout is a kind of poison that can be absorbed through the skin, inhaled, or eaten.

5. Radiation bombs are weapons that disperse radiation by means of a conventional explosion. Certain types of radiation bombs could convert metallic plutonium into fine particles for dispersal. [See 19]

The health effects of the development and production of nuclear weapons

* Health effects of testing nuclear weapons: Many populations have been exposed to radiation from nuclear testing, including indigenous peoples such as Aborigines, Marshall Islanders, and the peoples of French Polynesia. Many of the Marshall Islanders have radiation-induced thyroid disease and have also suffered displacement from their traditional islands. Thousands of soldiers in the military forces of the U.S., UK, Australia, and the former Soviet Union were also either deliberately or recklessly exposed to nuclear tests during the 1950s and 1960s. One recent estimate is that there have been 430,000 deaths from cancer up to the year 2000, caused by military testing of more than 1,800 nuclear weapons [21].

* Health effects of assembling nuclear weapons: Assembling nuclear weapons has damaged the health of -- and even killed -- civilian workers. Accidents have included occasions where plutonium has undergone "accidental criticality" and where plutonium induced fires have occurred [20]. Moreover, even though parts of dismantled nuclear weapons can be turned into fuel for reactors, the long-term requirement to store plutonium and bomb components is likely to impose health threats for many generations [22].

* The opportunity costs of nuclear weapons development on health: The maintenance of nuclear weapons costs many billions of dollars per year. For the U.S. alone it currently costs \$31 billion per year to buy, operate, and maintain the country's nuclear weapons and weapon delivery systems [23]. This expenditure limits the capacity of the global community to respond to critical social and environmental threats to health facing the world today, including the potential effects of global warming and overpopulation [24]. For example, providing access to family planning services to 100 million couples in developing countries who request such services could cost \$6 billion -- the approximate cost of three nuclear-armed submarines [25]. This opportunity cost of

nuclear weapons can therefore be considered an indirect adverse health effect of such weapons on civilian populations.

Summary

This review has highlighted five key aspects of the unique health effects of nuclear weapons that are particularly relevant to the international rules of war:

- * The disproportionate magnitude of the health effects of nuclear weapons;

- * The non-localised health effects of nuclear weapons and hence their effect on civilians, non-belligerents, and neutral countries;

- * The long-term nature of the health effects of nuclear weapons and hence their effect on future generations;

- * The specific health effects of radiation;

- * The health effects of the development and production of nuclear weapons. Given these factors, it would appear that the use of nuclear weapons should be considered illegal under existing international law. Indeed, the argument for the illegality of nuclear weapons use is consistent with the reasons that have led to biological and chemical weapons being declared illegal.

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