United Nations conference to negotiate a legally binding instrument to prohibit nuclear weapons, leading towards their total elimination

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The health and humanitarian case for banning and eliminating nuclear weapons

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Introduction

1. The health, environmental, and humanitarian facts about nuclear weapons and the consequences of their use have been the focus of three recent international conferences—in Oslo (2013), Nayarit (2014), and Vienna (2014). The evidence presented at all three conferences on the Humanitarian Impact of Nuclear Weapons (HINW) was submitted to the 2015 NPT Review Conference, to the Open-Ended Working Group Taking Forward Multilateral Nuclear Disarmament Negotiations, and to the UN General Assembly, which adopted Resolution L.41 in 2016, authorizing negotiations on a legally binding instrument to prohibit nuclear weapons, leading toward their total elimination.

2. In this paper, we review the most significant health and environmental facts and explain why—from a health perspective—a proper understanding of what nuclear weapons will do invalidates all arguments for continued possession of these weapons and requires that they urgently be prohibited and eliminated as the only course of action commensurate with the existential danger they pose.

The Evidence

3. The detonation of nuclear weapons produces incinerating heat, powerful shock waves, overpressures, ionizing radiation, and massive amounts of smoke and soot that can alter the Earth's climate. Unlike conventional weapons or other weapons of mass destruction, nuclear weapons instantaneously wipe out entire populations, level cities, and devastate the environment. They produce radioactive contamination that remains active for millennia, causing cancers and other illnesses that can persist across generations. Moreover, the environmental consequences of nuclear war, including severe climate disruption, can lead to global famine and, in the most extreme case, human extinction. No meaningful medical or disaster relief response to the detonation of nuclear weapons is possible.

a) No other weapon ever invented can cause so much death and destruction so quickly, on such a catastrophic scale, or leave such widespread and persisting toxicity in the environment. **A single nuclear weapon can destroy a city and kill most of its people**, as we tragically learned in Hiroshima and Nagasaki. The blast wave and

associated overpressures and hurricane-force winds collapse all but the strongest buildings, destroy roads and transportation systems, and turn objects (including human victims) into missiles that amplify the damage, until nothing remains but rubble. A small number of nuclear explosions over modern cities would kill tens of millions of people. **A nuclear war with weapons in existing arsenals could kill many more people in a single day than were killed during the entire Second World War**.

b) **Nuclear weapons release ionizing radiation** as a result of the uncontrolled chain reaction of fissile materials. Exposure to radiation—including fallout from nuclear tests—causes acute and long-term illnesses that are often deadly, as well as genetic and inter-generational health effects. Acute radiation sickness can cause death within hours, days, or weeks; those who recover may remain ill for months or even years. Lower doses of ionizing radiation can cause leukemia, thyroid cancer, and many other cancers, and other chronic diseases like cardiovascular disease, even many years after exposure. Increased risk of cancer persists for the lifetime of those exposed. Radiation exposure also causes birth defects and genetic damage. Subsequent generations can suffer both because of genetic damage they inherited, as well as exposure to radioactivity from lingering radioactive contamination and fallout. Exposure to dangerous ionizing radiation has become a persistent global problem because of continuing fallout from atmospheric tests and contamination of land and water around the former test sites, nuclear weapons production facilities, and radioactive waste storage sites.

c) **An electromagnetic pulse** disrupts the electricity supply grid and electronic equipment and systems, including computers, medical equipment and satellite communications. In the aftermath of a nuclear war, all forms of international travel, including planes and trains, would likely be disrupted for an indeterminate time. Electronic communications could fail worldwide as a result of EMP effects. The entire global economy would be severely impacted.

d) **Nuclear weapons detonations have extreme and long-lasting environmental consequences, including disruption of the Earth's climate and agricultural productivity.** Fewer than one percent of the nuclear weapons in the world today could disrupt the global climate and cause **nuclear famine**. The thousands of nuclear weapons possessed by the US and Russia could bring about a **nuclear winter**, destroying the essential ecosystems on which life depends.[1]

4. A limited, regional nuclear conflict involving only 100 Hiroshima-size nuclear weapons would severely disrupt the global climate and agriculture for two decades or more. Average global temperatures would drop 1.6°C for five years, would remain 1.1°C cooler after 10 years, and would not return to baseline after 26 years. Global rainfall would decrease by around 10%, with local and regional decreases of 30-40% or more in temperate, grain-growing regions of North America and Eurasia.[2,3,4] Growing seasons would be shorter by up to 40 frost-free days in the world's most important grain-producing areas. For example, US maize (corn) and soybean production would drop 15-20% in the first five years, and 10% in the next five years. Chinese maize, rice, and winter wheat production would drop 15-40% in the first five years, and 10-25% in the next five years.

5. More than two billion people would face starvation from a nuclear-war-induced famine, including 795 million people—primarily in the global South—who are chronically malnourished today. Malnourished people have impaired immune function and resistance to disease, and all famines are inevitably accompanied by epidemics of infectious diseases. Famines are also potent triggers of social unrest and violent conflict, both within and between nations. These factors are

likely to significantly increase the toll of food shortages and famine induced by a regional nuclear war, especially as the effects would be both widespread and prolonged over many years.

6. In addition to the direct agricultural impacts, stratospheric ozone depletion would result in large increases in ultraviolet (UV) radiation—30 to 100% increases in summer outside the tropics, endangering human and animal health, and further damaging crops and marine ecosystems.[5]

7. A war involving the largest nuclear arsenals would produce 50-150 million tons of smoke and soot. Global average temperature would decrease by 8ºC—temperatures not seen on Earth since the coldest point in the last ice age some 18,000 years ago. For three years there would not be a single frost-free day in the temperate regions of the Northern Hemisphere. Agriculture would stop, human civilization would be extinguished, ecosystems would collapse, and many species, perhaps our own, would become extinct.

8. **Nuclear weapons eradicate the physical and social infrastructure required for recovery from conflict.** In the aftermath of a nuclear detonation doctors and health care workers would be killed or severely injured along with the general population. Hospitals, clinics, and other medical facilities would be destroyed or rendered unusable. Medicines, blood for transfusions, diagnostic equipment, and all other essential supplies would be unavailable. There would be no water, no electricity, no transportation, and no communication systems. Roads would be impassable and the terrain would be unrecognizable. Corpses would be everywhere, strewn among the injured and the dying. Surviving health care workers would be unable to find, let alone treat, other survivors. Dangerous levels of radiation would prevent emergency responders from entering affected areas in search of survivors. In Hiroshima, 90% of physicians and nurses were killed or injured, and 42 out 45 hospitals became non-functional. The few outside physicians who arrived in Hiroshima and Nagasaki had to work without equipment, blood supplies, medicines, and other resources needed for effective treatment. IPPNW, the ICRC, and international agencies tasked with emergency and disaster response have reached the same conclusion: **a meaningful medical and humanitarian response to aid the immediate survivors of the use of nuclear weapons is impossible.** No humanitarian response could undo even a small part of the terrible destruction and cataclysmic scale of death and injury inflicted.

9. **Nuclear weapons are indiscriminate in their effects.** They cannot distinguish between military and civilian targets, or between combatants and non-combatants. Additional Protocol 1 to the Geneva Conventions, adopted in 1977, prohibits indiscriminate attacks and treats them as a violation of International Humanitarian Law (IHL). The International Court of Justice (ICJ) reaffirmed this conclusion in its 1996 advisory opinion on the illegality of nuclear weapons.

10. **Whether or not they are used against populations during war, nuclear weapons cause widespread harm to health and to the environment.** Decades of atmospheric and underground nuclear testing have led to cancers, birth defects, and other radiation-related illnesses among millions of people worldwide. The mining and processing of uranium that provides the fuel for nuclear weapons has serious and long-lasting health consequences for workers, local communities and their environment. Workers at nuclear weapons facilities have sustained severe and debilitating damage to their health as a result of occupational exposure to fissile materials and toxic chemicals involved in the production and maintenance of nuclear weapons.

11. The International Court of Justice found that "The destructive power of nuclear weapons cannot be contained in either space or time. They have the potential to destroy all civilization and the entire ecosystem of the planet."[6]

Legal and political implications

12. Since the destruction of Hiroshima and Nagasaki in August 1945, the medical, public health, and international relief communities have understood that there can be no meaningful response to the terrible devastation caused by nuclear weapons. All existing resources would be overwhelmed by the magnitude of the devastation, and no amount of planning or spending on improved capacity can change this reality. Based on this understanding, we have a responsibility to prevent what cannot be cured. Banning and eliminating nuclear weapons is the best and only way to prevent their use.

13. Chemical weapons (e.g., mustard gas and sarin) and biological weapons (e.g., anthrax and plague) are also referred to as weapons of mass destruction. These weapons, while inhumane and indiscriminate, cannot kill on the scale and with the intensity of nuclear weapons, nor do they produce the physical and environmental destruction and persistent toxicity across future generations for all living things that put nuclear weapons in a class of their own. Chemical and biological weapons, antipersonnel landmines, and cluster munitions have all been banned by treaties. While international law provides a clear basis and obligation for the elimination of nuclear weapons, they are not yet formally prohibited. A treaty banning nuclear weapons will fill that gap, and is an important step toward their elimination.

14. The nuclear-armed states and others that claim to rely upon the arsenals of the nuclear-armed states for their security have objected to the proposal for a ban treaty on the grounds that it would delegitimize **deterrence**—the one remaining purpose ascribed to nuclear weapons in order to justify continued possession, deployment, and possible use. They are correct. Nuclear deterrence doctrine would be illegal under a treaty prohibiting nuclear weapons, because it is predicated on their use, and is indefensible from a perspective that gives priority to their consequences.

15. Unlike conventional forms of deterrence, failure of which can also have terrible consequences, we cannot afford for nuclear deterrence to fail because the consequences of that are unthinkable. Nuclear deterrence, sooner or later, will inevitably fail; the history of war has taught us that sooner or later desperation leads to irrational decisions. There are no failsafe technical or human systems. We must not put ourselves in a position where nuclear deterrence can fail, and the only way to ensure this is to remove nuclear weapons as an option.

16. The purpose and practice of deterrence also fails the humanitarian test. From a humanitarian perspective, nuclear deterrence means declaring a willingness to kill millions of people indiscriminately, to irreparably destroy the Earth's ecosystems, and to deploy weapons designed to produce that outcome. We are told that only a credible threat to use nuclear weapons makes deterrence effective, yet a credible threat to use nuclear weapons is nothing short of global blackmail, with the entire world held hostage. Deterrence, regardless of the arguments offered by the nuclear-armed and nuclear-dependent states, is irreconcilable with international humanitarian law. Nuclear deterrence in any form—including extended nuclear deterrence—is an immoral and reckless security strategy that needs to be prohibited as a decisive step toward the elimination of nuclear weapons.

Recommendations to the Negotiating Conference

17. Nuclear weapons are the worst instruments of mass murder ever created. Because they are inevitably indiscriminate and disproportionate in their effects, they violate international law. The ionizing radiation produced at detonation kills people from radiation sickness, while radioactive contamination of the environment causes cancers, chronic diseases, birth defects, and

genetic damage. A single nuclear weapon can destroy a city. A nuclear war involving the massive arsenals possessed by the US and Russia could destroy virtually all life on Earth in a nuclear winter. Even a small fraction of the nuclear weapons that exist today can damage the global climate and agricultural production so severely that billions would starve.

18. The medical and international relief communities cannot respond to the terrible devastation caused by nuclear weapons, and no amount of planning or spending on improved capacity can change this reality.

19. Weapons this powerful and destructive belong in no one's hands. While international law provides a clear basis for the elimination of nuclear weapons, they are not yet formally prohibited. **A treaty banning nuclear weapons will fill that gap for the worst weapons of all, and is the best and most feasible step that can be taken now toward their elimination**.

20. This negotiating conference has an opportunity and a clear mandate to produce a new legal instrument that will prohibit nuclear weapons. The treaty can and should:

I. **Fill the current legal gap** by explicitly prohibiting development, production, testing, acquisition, stockpiling, transfer, deployment, threat of use, or use of nuclear weapons, based on their unacceptable consequences;
II. **Produce a treaty** that builds on existing norms, reinforces existing legal instruments, and closes loopholes in the current legal regime;
III. **Reaffirm the rights of people who have been victimized by nuclear weapons**, including the Hibakusha of Hiroshima and Nagasaki, the worldwide victims of nuclear testing, and nuclear weapons workers who suffer from a range of radiation-related illnesses;
IV. **Provide mechanisms for engagement with the nuclear-armed and nuclear-dependent** states with an expectation that the evidence about humanitarian consequences should determine the requirements, process, and timelines for nuclear disarmament.

† International Physicians for the Prevention of Nuclear War (IPPNW) is a non-partisan federation of national medical groups in 64 countries, representing tens of thousands of doctors, medical students, and other health workers who share the common goal of creating a more peaceful and secure world freed from the threat of nuclear annihilation. IPPNW received the Nobel Peace Prize in 1985.
†† The World Medical Association (WMA), comprising 112 national medical associations, was founded in 1947. The mission of the WMA is to serve humanity by endeavoring to achieve the highest international standards in medical education, medical science, medical art and medical ethics, and health care for all people in the world.
‡ The World Federation of Public Health Associations (WFPHA) is an international, nongovernmental organization comprising more than 100 multidisciplinary national public health associations. It is the only worldwide professional society representing and serving the broad field of public health. WFPHA's mission is to promote and protect global public health.
‡‡ The International Council of Nurses (ICN) is a federation of more than 130 national nurses associations (NNAs), representing the more than 16 million nurses worldwide. ICN's core values include advancing and sustaining the nursing profession and its contribution to peoples' health and public policy, and achieving equity and equality for society and the profession.

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