

The Humanitarian Consequences of Nuclear War

In March, 130 nations gathered in Oslo for a two-day conference on the humanitarian consequences of nuclear war. The five countries that the nuclear Nonproliferation Treaty (NPT) recognizes as nuclear-weapon states staged a coordinated boycott, arguing that a meeting that discussed what will actually happen if nuclear weapons are used would somehow distract them from the important initiatives they are pursuing to lower the number of nuclear weapons that they possess.

Next February, there will be a follow-up conference in Mexico to further delineate the medical effects of nuclear war as they are now understood and to consider the circumstances under which nuclear war might occur.

Far from being a distraction, these meetings are helping to create the conditions necessary for the elimination of nuclear weapons. The United States

and the four other NPT nuclear-weapon states should participate in the Mexico conference and actively promote the process launched in Oslo to educate policymakers and the general public about the catastrophic humanitarian consequences of nuclear war.

This task is particularly urgent in view of the new data that have emerged over the last few years. This information

indicates that even a very limited nuclear war, confined to one region of the globe, would have devastating effects worldwide.

In 2006, climatologist Alan Robock; Brian Toon, a professor of atmospheric and oceanic sciences; and four colleagues examined the consequences of a potential limited nuclear war between India and Pakistan.¹ They chose to examine the effects of this scenario because of the two countries' long history of conflict and the ongoing risk of a nuclear exchange. India and Pakistan have fought three wars since they gained independence in 1947 and have come close to war twice when armed with nuclear weapons. During one crisis in the 1990s, it was reported that Pakistani planes armed with nuclear bombs were kept on the runway with their engines running 24 hours a day so they would be ready for takeoff on a few minutes' notice.² It is easy to imagine events, such as an increase in tension over the disputed territories in Kashmir or another terrorist attack like those at the Indian parliament in 2001 or in Mumbai in 2008, that could escalate into full-scale warfare and the use of nuclear weapons.

In their study, Robock and Toon assumed that each country used 50

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Norwegian Foreign Minister Espen Barth Eide (left) talks with actor Martin Sheen in Oslo on March 4 during a conference on the humanitarian impact of nuclear weapons use.

nuclear bombs, each with an explosive power of 15 kilotons—the power of the bomb dropped on Hiroshima in 1945—against urban targets in the other country. The weapons involved represent less than one-half of the current Indian and Pakistani arsenals and less than 0.5 percent of the world’s nuclear arsenals. The local effects were devastating: 20 million dead in the first week from blast effects, burns, and acute radiation exposure. Even more disturbing were their findings concerning the far-reaching disruption to global climate conditions that this conflict would cause.

The scientists found that the firestorms generated by these nuclear explosions would loft about 5 million tons of black soot high into the atmosphere. The soot would block out sunlight, dropping surface temperatures across the planet by an average of 1.3 degrees Celsius. The cooling would be much more severe in the internal regions of the major continents, shortening the growing season in areas where much of the world’s grain is produced. In addition, the cooling would lower total precipitation worldwide as less water evaporated from the oceans to fall back as rain or snow, and there would be significant changes in

precipitation patterns.

Further, by heating the upper atmosphere, the soot particles would cause a major decrease in stratospheric ozone. By allowing substantially more ultraviolet light to reach the earth’s surface, this would further reduce crop yields. The soot particles would be injected so high in the atmosphere that they would not be washed out by rainfall. Their effects would persist for a full decade until they gradually settled back to earth.

The climate disruption predicted by the Robock-Toon study has been independently confirmed in separate studies done by climatologists Michael Mills² and Andrea Stenke,³ each of whom considered the same limited war scenario but used a different climate model.

In the last two years, a number of studies have attempted to look at the effect this climate disruption would have on food production. Environmental scientist Mutlu Özdoğan looked at soybean production and corn production in the U.S. Corn Belt and found an average decline of 7 percent in soybean production and 12 percent in corn production in the decade following a limited war in South Asia.⁴ Crop

specialist Lili Xia and Robock examined the impact on middle-season rice production in China and found a 15 percent decline from the prewar level for the 10 years following this conflict.⁵

The world is not prepared to deal with this kind of significant decline in food production. World grain reserves amount to less than 70 days of consumption and would not offer a significant buffer against a sharp and sustained reduction in grain harvests.⁶ In addition, 870 million people in the world today already are malnourished.⁷ They receive less than the 1,800 calories per day required for the average adult to maintain his or her body mass and do a small amount of physical work to gather or grow food. Even a 10 or 15 percent decline from these levels of food consumption, sustained over a full decade, would be catastrophic. The decline in food consumption, however, probably would be much larger than the decline in food production. Market forces would magnify the impact with large rises in food prices, making even the available food inaccessible to the poor, who are already malnourished precisely because they cannot afford enough food at current prices.

Furthermore, some 300 million

people live in countries where, although most people enjoy adequate nutrition today, much of the food is imported. Most of the countries of North Africa and the Middle East and many of the wealthy industrial countries of East Asia, including Japan, South Korea, and Taiwan, fall into this category. In

industrial world, would be spared actual famine. The latest studies suggest that there might be widespread starvation in China, putting another 1.3 billion people at risk. At the very least, the predicted food shortfalls would create a decade of severe economic and social instability in China, which is the largest country in the

capable of causing the same or greater degrees of climate disruption.

More worrisome are the arsenals of the nuclear superpowers. Each U.S. Trident submarine can carry 96 warheads, each of which is 10 to 30 times more powerful than the weapons that were considered in the South Asia study. That means that

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the face of significant declines in food production, it is probable that grain-exporting countries would suspend exports. This has happened repeatedly, for limited periods of time, over the last decade in response to local crop shortfalls. Thus, these 300 million people also would face severe food insecurity.

In April 2012, at the Nobel Peace Laureates Summit in Chicago, International Physicians for the Prevention of Nuclear War (IPPNW) and its U.S. affiliate, Physicians for Social Responsibility, released a report, "Nuclear Famine," examining this potential catastrophe.⁸ The report concluded that more than one billion people might starve as a result of a limited, regional nuclear war.

Since then, Xia and Robock have generated new data examining the impact of a limited nuclear war in South Asia on grain crops other than rice in China. Their findings, which will be published later this year, show that these other grains are affected much more severely than rice. In particular, production of the second-largest grain crop, winter wheat, is projected to fall 31 percent.

These new findings suggest that the "Nuclear Famine" report may have seriously underestimated the extent of the catastrophe that would follow a regional nuclear conflict and that arms control advocates need to fundamentally rethink their assumptions about limited nuclear war. The report assumed that China, along with most of the rest of the

world and has the world's second-largest and most dynamic economy. China also has a large nuclear arsenal of its own, estimated to be nearly 300 warheads, about 50 to 75 of which are deliverable by land-based intercontinental ballistic missiles.

There are no simulations examining whether there will be similar shortfalls in other temperate-zone grain producers such as Canada, Russia, the United States, and Europe except for Özdoğan's study of corn and soybeans in the United States. In the absence of such studies, it seems prudent to assume that these countries might well suffer the same major food shortages that are now predicted for China.

Regional War, Global Impact

In the 1980s, there was a general understanding that large-scale nuclear war between the United States and the Soviet Union would be a disaster, not just for those countries but for the whole planet.⁹ From the studies described above, it is clear that even a much more limited nuclear war would be a global catastrophe, with severe humanitarian consequences extending far beyond the countries directly involved in the conflict.

These findings have significant implications for nuclear weapons policy choices in South Asia and for the policies of other states toward India and Pakistan. Yet, the issue extends well beyond South Asia. The arsenals of China, France, Israel, and the United Kingdom are all

each of these submarines can cause this nuclear famine scenario many times over. The United States has 14 of them, as well as an arsenal of land-based missiles and a fleet of strategic bombers armed with cruise missiles and gravity bombs. The Russian arsenal has a similar degree of overkill capacity.

The danger of nuclear war is often dismissed as a low-probability event and therefore not a cause for concern. The vast majority of the population, including people who were intensely aware of the nuclear danger during the Cold War, behaves as if this were true. Yet, the danger of nuclear war did not go away when the Berlin Wall came down. The arsenals remain, and the chance of nuclear war is not at all remote. As the number of nuclear-armed states increases, especially as nuclear arsenals grow in areas of chronic and seemingly intractable conflict, such as South Asia and the Middle East, the danger becomes even greater.

The possibility of war between the nuclear superpowers also still exists. Even if the likelihood of a deliberate nuclear war between the United States and Russia has declined, there remains the very real possibility of an accidental nuclear war. There have been at least five incidents since 1979 in which Moscow or Washington was prepared to start a nuclear war in the mistaken belief that it was already under attack by the other side.¹⁰ The most recent known incident occurred in January 1995, a full five years after the fall of the Berlin Wall. The

conditions that existed then have not changed fundamentally.

Human error, a computer failure, or perhaps a cyberattack launched by a terrorist group all could lead to the unintended launch of nuclear weapons. The new understanding of the climatic consequences of nuclear war makes it clear that even a very limited use of these weapons would be disastrous.

In his June speech in Berlin, President Barack Obama called for further reductions in the U.S. and Russian arsenals, suggesting a new target of 1,000 warheads on each side. This is a useful and important step in the right direction, but only if it is indeed a step toward further reductions designed to eliminate nuclear weapons altogether. If these reductions serve to legitimize the indefinite retention of nuclear weapons at an “acceptable” level, they will not fundamentally reduce the nuclear threat, for arsenals of this size would still pose an existential threat to human civilization.

During the Cold War, there was a widespread understanding of the medical consequences of nuclear war. That understanding and the further understanding that nuclear war was a real and immediate possibility fostered the development of a large movement in civil society that played an important role in convincing the leadership of the nuclear superpowers to stop and then reverse the arms race.

Unfortunately, the problem of nuclear war did not end when the Berlin Wall came down. Many of the 70,000 nuclear weapons that existed at

the height of the Cold War have been dismantled, but nearly 20,000 remain. Although the weapons did not go away, an understanding of their terrible destructive power faded from the world’s consciousness. Today, the medical consequences of nuclear war are not widely known, and there is inadequate appreciation of how dangerous it is to formulate nuclear policy without this knowledge.

A generation has come of age since the end of the Cold War, young people who have never been taught about the destruction that nuclear weapons can cause. People who lived through the Cold War, including many policymakers in nuclear-weapon states, have largely forgotten what will happen if these weapons are used and are completely unfamiliar with the new data on the catastrophic global effects of a “limited” nuclear war.

Attention Needed

An example of the dangerous inattention to the humanitarian consequences of nuclear war is the report released in January by the Defense Science Board, an advisory group to the U.S. Department of Defense.¹¹ The report argued that “while the manifestation of a nuclear and cyber attack are very different, in the end, the existential impact to the United States is the same” and concluded that “the situation today is such that the ultimate U.S. deterrent, including response against a catastrophic full spectrum cyber attack, is the nuclear triad—intercontinental ballistic missiles (ICBMs), submarine-launched ballistic missiles (SLBMs), and

nuclear-capable heavy bombers.” Even the most worrisome estimate of the potential damage caused by a cyberattack does not envision anything like the death of a billion people. U.S. policy that equates these threats and considers nuclear war in retaliation for a cyberattack betrays a profound and dangerous failure to understand fully the threat that nuclear weapons pose.

This lack of information is not confined to the Defense Department. Senior officials at the Department of State have privately acknowledged that they have not been aware of the nuclear famine data and that this information has not factored into policy decisions.¹²

Fortunately, there is a growing movement to promote understanding of the actual consequences of nuclear war and of the need to make these consequences the starting point from which future nuclear policy flows.

In November 2011, the International Committee of the Red Cross called for the complete elimination of nuclear weapons and called on all national Red Cross and Red Crescent societies to launch educational campaigns on “the catastrophic humanitarian consequences” of nuclear war and the inability of the Red Cross and Red Crescent to respond in a meaningful way if nuclear weapons are used.¹³ In the nongovernmental community, the IPPNW has launched a new campaign, the International Campaign to Abolish Nuclear Weapons, which has grown far beyond the medical community to encompass a broad swath of civil society.

At an April 22-May 3 meeting in Geneva of the Preparatory Committee for the 2015 NPT Review Conference, South Africa presented a statement on behalf of 80 countries citing the impossibility of responding adequately to the catastrophic humanitarian consequences of nuclear war and calling for the abolition of nuclear weapons.¹⁴ By October 21, a similar statement at the United Nations had gained the signatures of 125 countries.

On September 26, there was a high-level meeting of the UN General Assembly on nuclear disarmament. Statements delivered by a wide range of states reflected the same focus on humanitarian effects rather than security



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Soybeans are harvested near Worthington, Minnesota, on October 2. According to recent study, soybean production in the U.S. Corn Belt would drop by about 7 percent in the decade following a limited war in South Asia.

doctrines and power politics. These statements emphasized how such a focus leads to an understanding of the urgent need for nuclear abolition.

As Austrian President Heinz Fischer said,

“[T]he discourse on nuclear weapons has been dominated by traditional national security considerations.... [I]t is overdue to move beyond such a narrow perspective. ... Any nuclear weapons use would cause severe humanitarian emergencies and have global consequences for the environment, global health, the climate, the social order, human development and the economy. ... Nuclear weapons should be stigmatized, banned and eliminated before they abolish us.”¹⁵

All of these threads will come together at the upcoming meeting in Mexico. Perhaps this time, the United States and the other nuclear-armed states will choose to attend and use this important forum to build further international support for the complete elimination of these weapons. Some of the countries that will attend the Mexico meeting are discussing a possible treaty to ban nuclear weapons, a treaty that will make the use or possession of nuclear weapons illegal.¹⁶ Such a treaty would not take the place of a nuclear weapons convention, an agreement among the nuclear-armed states that spells out the concrete steps and timeline for actual dismantlement of their nuclear arsenals and the verification and enforcement measures that will be needed to assure adherence to the convention.

A treaty banning nuclear weapons would help to further delegitimize nuclear weapons and put pressure on those nuclear-weapon states that are reluctant to meet their obligations under Article VI of the NPT. The Obama administration, which “seek[s] the peace and security of a world without nuclear weapons,”¹⁷ should embrace this initiative.

A first principle of the medical community is that health care decisions must be based on informed consent: patients need to understand the consequences of proposed treatment

and the consequences of declining that treatment. Yet, the world today continues to maintain arsenals of nuclear weapons that threaten its existence, and the public’s continued consent to this profoundly dangerous situation cannot be considered informed. Indeed, even many decision-makers do not seem to be aware of the consequences that could arise from the policies they are pursuing.

It is the central belief of the physicians’ movement that when the global community does become informed, it will again demand that nuclear weapons be eliminated. The movement for nuclear disarmament secured a great but partial victory in the closing years of the Cold War. The new data on the consequences of nuclear war underscore the importance of finishing the job.

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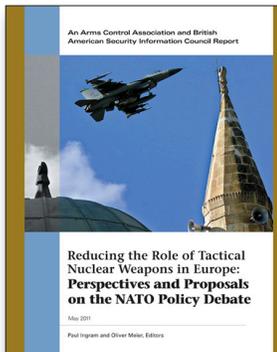
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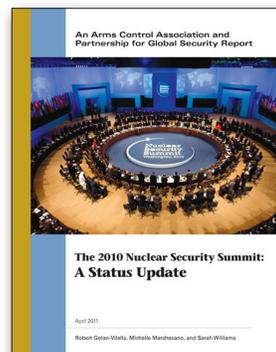


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