

Nuclear War in the Middle East: Where is the Voice of Medicine and Public Health?

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Abbreviations:

kT = kilotons

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Abstract

Once again, the politically volatile Middle East and accompanying rhetoric has escalated the risk of a major nuclear exchange. Diplomatic efforts have failed to make the medical consequences of such an exchange a leading element in negotiations. The medical and academic communities share this denial. Without exaggeration, the harsh reality of the enormous consequences of an imminently conceivable nuclear war between Iran and Israel will encompass an unprecedented millions of dead and an unavoidable decline in public health and environmental devastation that would impact major populations in the Middle East for decades to come. Nuclear deterrence and the uncomfortable but real medical and public health consequences must become an integral part of a broader global health diplomacy that emphasizes health security along with poverty reduction and good governance.

Introduction

The current acceleration of the proliferation of nuclear technology in the politically volatile Middle East greatly increases the likelihood of a catastrophic nuclear war. It is widely accepted, while not openly declared, that Israel has nuclear weapons, and that Iran has enriched enough nuclear material to build one. The rapid pace of continued enrichment, inherent resources available for large-scale production of nuclear weapons, and a tenacious and committed aggression against Israel make a future Iranian nuclear stockpile imminent. Even as the Middle East moves closer to nuclear war, the voice of medicine and public health is absent from the faltering attempts at nuclear deterrence.

Path to Nuclear War: The Next Decade

Israel is considered to have a very significant lead in the number, nuclear yield (explosive size), and delivery capability of nuclear weapons relative to Iran,¹ and will see the strategic and tactical advantages of their lead steadily erode over the next decade. Despite the terrible consequences of nuclear war (or perhaps because of them), many will, no doubt, consider it not in the strategic interest of Israel to wait until Iran significantly closes this gap. Iran possesses reserves of uranium, a steadily increasing capacity to enrich this asset to nuclear weapons-grade material, and the vital engineering capability (if not yet already developed) to use it in an operational weapon. Unlike North Korea, Iran has the eventual capacity for large-scale production of nuclear weapons within its borders. Current leadership of Iran openly asserts, with significant popular support, the steadfast belief in the return of a religious leader who will bring about the destruction of Israel. Israeli will has demonstrated the capacity to pre-empt the development of nuclear weapons of any threatening neighbor. Indeed, the capacity of Iran for nuclear weapon production far exceeds any threat potential that Saddam Hussein's Iraq possessed in the past.

Considering the current dichotomy in nuclear weapon capability of these two nations, it is expected that the number and size of nuclear detonations and subsequent effects on Iranian targets would be considerably greater than any possible nuclear attack on Israel.¹ Over the next decade, it is expected that Iran could produce up to 50 relatively small nuclear devices in the 10–30 kT yield range (approximately one to two times the size of the devices used on Hiroshima). Though an imperfect analogy, a rough approximation puts Iran in a similar position the United States found itself in immediately prior to the successful completion of a small nuclear device in 1943–1944, with large-scale production still a few years away. The Israeli nuclear stockpile size is not known (or its existence even acknowledged), but it is speculated openly that Israel currently has several hundred nuclear weapons, with explosive yields ranging to hundreds of kilotons (kT), perhaps even including some megaton (1000kT) devices. As it becomes established that Iran is systematically producing nuclear devices, it is credible to assume that Israel would claim ample incentives to dramatically increase its stockpile in number and explosive

yield. At the point of a nuclear exchange in the 2011–2020 time-window, it would be expected that Iran's maximum of 50 or so 10–30 kT weapons could be countered by up to 500 Israeli devices with hundreds of kT in yield.

The delivery systems and targeting capability of Israel's military greatly exceeds that of Iran. With the anticipated increase of Iranian air defense capabilities over the next decade, especially with Russian technology support, the Israeli delivery advantage may slowly erode. Arguably, these speculations are difficult to accurately quantify, but it is realistic to expect that the current huge gap in nuclear weapon attack capability will decidedly favor Israel over the next decade.

Perfect Nuclear Storm: Imperfect Health Management

Nuclear weapon detonations in the densely populated cities of Iran and Israel will result in staggering numbers of dead, dying, and seriously injured people, limited medical response for survivors, and the collapse of both municipal and essential services throughout both nations. Once both nations have adequate stockpiles, nuclear weapon use on one nation will result in delivery of multiple weapon strikes to both. Any pre-emptive strike that did not completely eliminate that stockpile would, no doubt, lead to desperate attempts for a nuclear retaliation. The imagined consequences of "wiping Israel off the map" only heighten preparations for a similar contingency response.

While Israel's tiny size, in comparison to Iran, lends to an inherent vulnerability for targeting in Israel, the larger number of nuclear weapons in the Israeli stockpile would enable Israel to reach virtually all the major population centers in Iran, as well as salient military and industrial targets. The location of nearly 50% of Iranian industry in the greater Tehran metropolitan area defines its greatest vulnerability; the capacity of Israel to destroy Iranian industry along with its capital population and seat of governance. Among the 69 million Iranians, nearly 13 million are in the greater metropolitan area. A distinctive geographic feature in Tehran are the mountains surrounding the city, which could reflect the thermal energy from the larger Israeli weapons back into the urban center and greatly increase the number and severity of thermal casualties. Recently, the leadership of Iran announced plans for evacuation of large numbers (millions) of people from Tehran, ostensibly out of concern for earthquakes. A full-scale nuclear attack on Iran would result in the deaths of millions (more than 10 million with only a fraction of the Israeli arsenal), with many more injured with trauma, burn, and radiation injuries, many of these in combination and nearly all would remain untreated. Iranian industry, with its concentration in Tehran and other urban areas, would be essentially erased, as well as its academic institutions. Disruption in food distribution, the spread of communicable disease and other negative public health outcomes, the inevitable foraging for food and water by desperate survivors, and an increase in crime will plague the rest of the Iranian population.

Depending on the efficiency of Iranian delivery of their smaller and less numerous weapons, the casualty impacts on Israel likely could be of a smaller magnitude. The nuclear weapons delivered to Israel likely would impact Tel Aviv and Haifa, the major population centers. While difficult to quantify, it is also likely that Israel's industry and social cohesion would survive. A paradoxical outcome of nuclear attack on Israel is that the great majority of radiation victims would be Islamic, as the far-reaching fallout plumes would extend beyond Israel's narrow

confines into the surrounding Islamic population centers in Gaza, West Bank, Jordan, Syria, and Lebanon. Even in Israel, nearly a quarter of the victims will be Muslims.

Nuclear weapon detonations create three broad categories of injuries: (1) trauma; (2) radiation; and (3) burns.² Larger nuclear weapons are called thermonuclear devices because the enhanced thermal component, relative to smaller weapons, result in prohibitively large numbers of burn victims, all of which are more difficult to treat than conventional injury categories. While current emergency systems are trained for trauma injuries, the staggering number of victims from even a relatively small weapon will overwhelm any system, Iranian, Israeli, or any other in the world. Even a dozen additional trauma victims at one time is a mass-casualty event, much less the arrival of thousands at one time. The consequences for health management of burn and radiation patients is much worse, as burn patients require enormous resources to treat, and there is little to no familiarity with the treatment of radiation victims.³ Even with the unlikely scenario that health facilities remain intact, and all healthcare workers survive, existing healthcare systems will not have the capacity to deal with the catastrophic number of victims.⁴ At best, there will be more than 1,000 critical victims for each surviving physician.

Total health management inadequacy will occur even for small nuclear weapon attacks. It is difficult to imagine what will occur if a sizable nuclear weapon exchange took place. Yet, there has been for years, largely among diplomats and military and governmental healthcare professionals, a collective atmosphere of denial surrounding the consequences of nuclear war. Denial, the most powerful of human defense mechanisms, is an attempt to reject conscious knowledge of unacceptable events. There is a blockage of awareness and the potential emotional impact of what we don't want to know, think about, or feel. This occurs at a population level as "mass denial". The technical jargon that exists aids denial by intellectualizing the consequences beyond the realm of popular understanding and stymies opportunities for debate or rebuttal. In some cultures under constant threat of a nuclear war, denial may become incorporated into religious and fantasy beliefs that interpret meaning and reason to what are seen as inevitable catastrophic outcomes, especially to those perceived as being backed into a corner.

US Defense Secretary Robert Gates recently reflected on a new reality in the military and intelligence communities: "I don't think we're prepared to even talk about containing a nuclear Iran" further admitting that whereas "Diplomacy and economic pressure remain the preferred means to force Iran to negotiate a nuclear deal ...there isn't much hope that's going to happen."⁵

Without exaggeration, the harsh reality of the enormous consequences for Iran and Israel will encompass an unprecedented millions of dead. Additionally, an unavoidable decline in public health and environmental devastation would result for decades to come, with millions of injured suffering without adequate medical and social care, a broad base of lingering mental health issues in survivors, a devastating loss of municipal infrastructure, a long-term disruption of economic, educational, and other essential social activity, and a shocking breakdown in law and order.^{6,7} Both cultures will cease to exist as we now know them. Any rational analysis of a nuclear war between Iran and Israel reveals the utterly unacceptable outcomes for either nation, but especially for Iran. Wars in the name of religion have dominated

the last three decades, with possession and use of advanced weaponry too often interpreted as being ordained by God. This real threat in the Middle East has captured our collective fear. Tragically, with modern day religious zealotry and extremism, increasing threat of nuclear weapons falling into the hands of fanatical terrorists, and the disintegrating failed state of North Korea that uses threats of a nuclear attack as their *only* negotiating leverage, the risk of experiencing a massive nuclear crisis in the 21st Century is far greater.

Consequence-based Diplomacy

It is curious that among healthcare providers there are not more references to the nuclear health catastrophe that would occur. Is this our own institutional pattern of denial? A consummate failure in diplomacy remains when medicine and public health is politically absent from conventional dialogue. This comes at a time when the foreign aid policy of the United States, China, and others is being driven primarily by health; and that multiple health interventions increasingly are being used as instruments

to advance nation-state centric foreign policy interests at the expense of global health protections. The pathway toward removing hatred among ethnic, minority, and religious groups is the offer of good social and infrastructure public health protections.⁸ Many of these populations simply do not perceive that they will ever realize an end to poverty, stagnated development, inadequate health, and poor governance.

The fear of major health burdens severely weaken and destabilize nation-state capacity. In countries where nuclear threats complicate foreign policy and negotiations, effective diplomacy surrounding nuclear deterrence is an exception to conventional dialogue. Global health diplomacy that captures both multi-level and multi-actor negotiations and health consequences of nuclear war must command attention in foreign policy agendas.^{8,9} This diplomacy must provide realistic opportunities and the means to reduce poverty and ensure human security while revealing and stressing, with total transparency and accountability, the uncomfortable but real health consequences of a catastrophic nuclear event.

References

1. Cordesman AH: Iran, Israel and Nuclear War. Washington, D.C., Center for Strategic and International Studies (CSIS). Available at <http://www.csis.org/burke>. Accessed 22 July 2010
2. Beker WK, Buescher TM, Cioffi WG, et al.: Combined radiation and thermal injury after nuclear attack. In: Brown, D., Weiss JF, MacVittie TJ, and Pillai MV (eds), *Treatment of Radiation Injuries*. New York: Plenum, 1990
3. Beker WK, Buescher TM, Cioffi WG: Combined radiation and thermal injury after nuclear attack. *Treatment of Radiation Injuries*. W. J. Brown D, Mac Vittie TJ. New York: Plenum, 1990.
4. Bell WC, Dallas CE: Vulnerability of populations and the urban health care systems to nuclear weapon attack—Examples from four American cities. *Int J Health Geogr* 2007;6:50
5. Klein J. An Attack on Iran: Back on the Table. TIME. Thursday 15 July 2010. Available at <http://time.com/time/printout/0,8816,2003921,00.html>. Accessed 17 July 2010.
6. Abrams HL: Medical resources after nuclear war: availability vs. need. *JAMA* 1984;252:653–658.
7. British Medical Association: The Medical Effects of Nuclear War: The Report of the British Medical Association. Published on behalf of the British Medical Association's Board of Science and Education. Chichester: John Wiley Press. 1983, pp 188.
8. Feldbaum H, Michaud J: Health diplomacy and the enduring relevance of foreign policy interests. *PLoS Medicine* 2010;7(4):1–6.
9. Kickbusch I, Erk C: Global health diplomacy: the new recognition of health in foreign policy. In: Clapham A, Robinson M, Hangartner S (eds), *Realizing the Right to Health*. Zurich, Switzerland: Ruffer & Rub Publishers, 2009, pp 517–524.