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War has profound adverse effects on public health. War leads to death for military personnel and especially for civilians, long-term physical and psychological consequences to survivors, destruction of sociocultural and ambient environments, and diversion of needed resources. In addition, war legalizes and promotes violence as a mode of solving problems. These and related issues relating to war in the twenty-first century are analyzed in this paper. The authors discuss several approaches to preventing war and minimizing its consequences on health — including addressing the underlying problems that often lead to war, promoting a culture of peace, and controlling weapons.

Public health has been defined as "what we do, collectively as a society, to assure the conditions in which people can be healthy."[1] War is anathema to public health. War directly accounts for millions of deaths annually worldwide. By the destruction of societal infrastructure — safe and reliable food and water supplies, adequate housing, and access to adequate healthcare and public health services — it accounts for many more deaths. War often creates catastrophic long-term physical and psychological consequences. By destroying communities, it undermines the sociocultural fabric of society. War, and preparation for war, diverts human, financial, and other resources from health and human services. War causes damage, often irreversible, to the environment. And it perpetuates the belief that violence is an appropriate means of settling disputes among nations and among individuals.[2]

We cannot reliably predict the future of war and public health in the remainder of this century. But we can nevertheless identify major trends in the recent history of war and its impact on public health and the health of the public. And we can outline activities in which individuals and organizations can participate that will help to minimize the health consequences of war and help to prevent war itself. Advocacy of these activities is our objective in writing this paper.

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Recent and Current Trends

Massive amounts of human suffering

Although they are infrequently reported in the U.S. news media, armed conflicts — primarily civil wars — continue in many parts of the world. For example, during 2002 a total of twenty-one major armed conflicts occurred in nineteen different locations — as compared with twenty-four in twenty-two locations during the previous year and twenty-eight to thirty-three armed conflicts per year during the 1990-1995 period.[3,4] During the post-Cold War period of 1990-2001, there were a total of fifty-seven major armed conflicts in forty-five locations, all of which were internal conflicts (civil wars), except for those between Iraq and Kuwait, India and Pakistan, and Ethiopia and Eritrea. But in fifteen of these internal conflicts, other states contributed regular military troops to one side or the other.[4] During the 1990-2001 period, conflicts concerning government became slightly more frequent than those concerning territory.

These civil wars exert a huge toll in human suffering. For example, in the civil war in the Democratic Republic of Congo, it has been reliably estimated that there have been approximately two-and-a-half million civilian deaths.[5] The impact of wars extends far beyond causing deaths; wars lead to physical injuries and psychological traumas that have lifelong consequences. Civilians bear a disproportionate share of casualties; during selected wars in the 1990s, approximately 90% of deaths were among civilians, primarily women and children.[6] In addition, wars destroy the societal infrastructure in countries that often were in desperate economic condition before war began. Meanwhile, some of the underlying causes of war are becoming more prevalent or worsening. For example, the rich-poor divide is growing: in 1960, in the twenty richest countries the per-capita gross domestic product (GDP) was eighteen-fold that in the twenty poorest countries; by 1995, this gap had increased to thirty-seven-fold.[7-9] Between 1980 and the late 1990s, inequality increased in forty-eight of seventy-three countries for which there are reliable data.[9] Inequality is not restricted to personal income, but other important areas of life, including health status, access to healthcare, education, and employment opportunities. In addition, abundant national resources, such as oil, minerals, metals, gemstones, drug crops, and timber, have fueled many wars in developing countries.[8]

Increasing global military expenditures and
U.S. dominance in the global arms trade

After a brief period of decreasing global military expenditures, since 1998 these expenditures have increased, largely due to increased military expenditures in Europe, North America, and Africa, with the greatest percentage increase during this period in Russia.[4] Many factors account for changes in levels of military expenditures, including security-related, economic, political, and technological factors. Since the 9/11 terrorist attacks, the United States has significantly increased military spending, in large part due to the wars in Afghanistan and Iraq. Changes in U.S. public opinion supported these increases.

In 2001, nations spent a total of $772 billion on war and the preparation for war, with a reported $306 billion spent by the United States. Between 1940 and 1996, the United States spent $5.5 trillion on nuclear weapons; in 1998, it spent $73 million

on nuclear weapons. For fiscal year 2004, the United States is planning to spend more than $400 billion on military activities, almost one-half of all military expenditures worldwide.

"Conventional weapons," such as explosives, incendiaries, and small arms, cause the vast majority of the casualties in current wars. The sources of most of the small arms and light weapons used in ongoing armed conflicts are legal and illegal arms sales around the world. The United States is the world leader in supplying conventional weapons to other countries. The United States sold $13.3 billion in arms in 2002, representing 45.5 percent of global conventional weapons sales –- $8.6 billion of which was to developing countries.[10]

Continued diversion of resources

Expenditures for war and the preparation for war divert huge amounts of human, financial, and other resources from health and human services and other productive human endeavors. Those individuals and population groups most seriously affected by this diversion of resources are the young and the elderly, the poor, and those who are physically or mentally ill or disabled. As military expenditures in the United States increase, government-operated and government-financed health and human services face substantial cutbacks in funding.

This problem is often much more acute in less-developed countries that have been affected by armed conflict or the threat of armed conflict. Many of these countries, whose populations have high rates of disease and mortality and relatively short life expectancy, spend much more on military expenditures than they do on public health programs and services.

Refugees and internally displaced persons

Armed conflict, or the threat of armed conflict, accounts for most of the refugees and internally displaced persons in the world. There are approximately twenty million refugees worldwide. Of this total, about twelve million people are officially recognized as refugees by the United Nations High Commissioner for Refugees (UNHCR); this number does not include approximately three million Palestinians cared for by another UN agency. There are approximately twenty to twenty-five million internally displaced persons, many of whom were living in more extreme conditions, with less external assistance and fewer of their basic human needs being met, than those individuals who qualified for and received refugee assistance.[11] Donor governments and international organizations have
generally failed to provide adequate financial support for refugees and internally displaced persons. For example, in 2002, only 5.3 million internally displaced persons received UNHCR aid.

Impact on the environment

War and the preparation for war have profound impacts on the environment.[12-14] Military activities consume huge quantities of non-renewable resources, such as fuels to power aircraft and ships as well as rare metals used in the production of military equipment and weapons. More profoundly, military activities, including armed conflicts, contribute to widespread pollution and environmental contamination, as evidenced by the oil well fires in Kuwait during Gulf War I and the fires and explosions in Iraq during Gulf War II; destruction of environmental resources, such as the destruction of mangrove forests in Vietnam during the Vietnam War by Agent Orange and by bombs; radioactive contamination of the environment, as has oc-

curred downstream from the Russian nuclear weapons facility at Chelyabinsk; and chemical contamination of rivers, streams, and groundwater supplies, such as occurs with the chemical leakage from rusting metal containers at military storage sites.

Changing political and military strategies

The United States has claimed the right to conduct a "preventive" or "pre-emptive" war against nations that it perceives as posing a threat to its security and has initiated a "War on Terrorism." In addition, the U.S. Nuclear Posture Review states that the United States may choose to use nuclear weapons not only in response to a nuclear attack, but also in response to attacks with other weapons of mass destruction.[15,16] The actions of the governments of the United States and the United Kingdom in instituting a "pre-emptive strike" against Iraq may lead to abandonment of the rules and procedures of law and diplomacy that have prevented many wars during the past two centuries. This change in strategy could have far-reaching implications, as other countries plan and implement pre-emptive strikes against other countries viewed as potentially threatening their safety and security.

Looking further into the future, other military strategies are envisioned. For example, future wars may be waged by the United States and other more-developed countries with no soldiers at all or with space-based weapons.[17,18]

Proliferation of weapons of mass destruction

Weapons of mass destruction — nuclear, radiological, biological, and chemical weapons — pose the greatest potential threat to large population groups.

The nuclear bombs detonated over Hiroshima and Nagasaki in 1945 were based on nuclear fission. Each had an explosive force equivalent to about fifteen thousand tons (fifteen kilotons) of TNT and killed or fatally wounded about one hundred thousand people and caused additional thousands of injuries and illnesses from blast, heat, and radiation. During the 1950s, the United States and the Soviet Union developed thermonuclear weapons (hydrogen bombs) based on nuclear fusion. These new weapons each had an explosive force equivalent to twenty million tons (megatons) or more of TNT. Analyses of the medical consequences of the use of these new weapons, by Physicians for Social Responsibility and other organizations, demonstrated that their use would cause millions of casualties and catastrophic global health problems, such as worldwide radioactive fallout that would cause many cancer deaths, and massive clouds of smoke and debris that would block or absorb the sun's rays, causing "nuclear winter," with widespread crop loss and starvation.[19,20] Nations known to possess stockpiles of nuclear weapons are the United States, Russia, China, the United Kingdom, France, India, Pakistan, and Israel. Although there have been some reductions in the stockpiles of the United States and Russia in recent years, there are still approximately 34,000 nuclear weapons in the combined stockpiles of these eight nations, with an estimated combined explosive yield of 650,000 Hiroshima-sized bombs. Five thousand of these weapons are poised on hair-trigger alert, ready to fire on a few minutes' notice.

Chemical weapons can cause serious toxic effects and even death. Now banned by the Chemical Weapons Convention (CWC), chemical agents, such as chlorine, phosgene, and mustard gas, were used during World War I by both sides. More recently, in 1994 and 1995, two terrorist attacks using sarin gas in the subways of two Japanese cities caused nineteen deaths and many serious injuries. Destruction of these weapons is taking place, but stockpiles remain in several countries.

Biological weapons are composed of living microorganisms, such as bacteria and viruses, and products of microorganisms, such as toxins. These weapons are designed to cause disease, disability, or death in humans or animals. Some of the diseases produced, such as smallpox, can be spread from one infected person to another; others, such as anthrax, cannot be spread in this manner. Toxins, such as botulinum toxin, are viewed as both biological and chemical weapons. While the development, production, transfer, or use of biological weapons was prohibited by the 1975 Biologic Weapons Convention (BWC), several nations are believed to have stockpiles of such weapons. The verification measures included in the BWC are weak and attempts to strengthen them have been unsuccessful. During 2002, the United States blocked attempts to strengthen the verification measures, announcing that such measures might lead to exposure of U.S. industrial or military secrets.

Anti-personnel landmines have been termed "weapons of mass destruction, one person at a time." They continue to injure and kill fifteen thousand to twenty thousand people annually. Civilians are the most likely to be injured or killed by landmines, which have been buried in many of the world's nations. Since going into effect in 1997, the Mine Ban Treaty has markedly reduced production of landmines and has facilitated removal of millions of mines. But many millions more are still buried. Much money will be required to continue unearthing and destroying them — tasks that pose inherent risks to demining personnel. Three-fourths of the world's nations have signed the Mine Ban Treaty. The United States, Russia, and China are among the minority of nations that have not signed this treaty.

Weakening of the United Nations

Since its founding in 1946, the United Nations has attempted to achieve the goal stated in its charter "to save succeeding generations from the scourge of war." Its mandate, along with preventing war, includes protecting human rights, promoting international justice, and helping people to achieve a sustainable standard of living. Its affiliated programs and specialized agencies include, among others, the United Nations Children's Fund (UNICEF), the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the International Labor Organization (ILO), the United Nations Development Program (UNDP), and the Office of the UNHCR. But resources allocated to the UN by its member states are grossly inadequate. The annual budget for the entire UN system, excluding the World Bank and International Monetary Fund is $12 billion a year; annual world military expenditures ($800 billion) would pay for the entire UN system for more than 65 years.

The UN has no army and no police; it relies on the voluntary contribution of troops and other personnel to halt conflicts that threaten peace and security. The United States and other member states on the Security Council — not the Secretary-General — decide when and where to deploy peacekeeping troops. Long-term conflicts, such as those in the Sudan and Kashmir, and the Israeli-Palestinian conflict, fester while conflicting national priorities deadlock the UN's ability to act. In fact, if stymied by the veto, the organization has little power beyond the bully pulpit. We believe that the United States and the United Kingdom have severely weakened the United Nations by their unauthorized invasion of Iraq in 2003.

Spread of terrorism

Terrorism did not begin with the 9/11 attacks. Indeed, there is a long history of terrorism, dating back many years. But the 9/11 attacks heightened awareness of the

U.S. public about terrorism and its devastating effects on civilian populations.[21]

"Terrorism" has been defined in several different ways. We define it as "politically motivated violence or the threat of violence, especially against civilians, with the intent to instill fear." This definition could include state acts of terrorism, such as the indiscriminate bombing of Warsaw, Rotterdam, London, Hamburg, Dresden, Osaka, Tokyo, Hiroshima, and Nagasaki during World War II. We see little difference between terrorism and war directed primarily against civilian populations. Those called "terrorists" by others often call themselves "freedom fighters," "defenders of the faith," or "revolutionaries"; most "terrorists" believe that they have just cause for their use of arms, usually conventional weapons. Some terrorists are willing to commit suicide in the course of their actions. Whatever they are called, violent acts against civilian populations pose a grave threat to public health, with weapons of mass destruction — especially nuclear weapons, being a major concern.[21]

Underlying causes of war

Major causes of war and terrorism are poverty and despair, abrogation of human rights, and personal and national humiliation. As previously noted, disparities in personal income, health status, and access to health care, education, and employment opportunities contribute to conditions that lead to civil war and other forms of armed conflict. Other forms of social injustice that violate basic human rights are also underlying causes of war. Humiliation and grief from previous armed conflict or other violence may lead to continuing cycles of violence. Current worldwide trends, such as globalization, can worsen exploitation of people and nations and promote war and other forms of violence.[22-24]

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What Can Be Done?

The remainder of this paper addresses some major approaches to confront these problems: addressing factors that lead to war, promoting a culture of peace, and controlling weapons. While all countries need to address these problems, we focus on what can be done by the United States, given its status in the world.

Addressing social, economic, and cultural factors that lead to war

Poverty and other manifestations of social injustice contribute to conditions that lead to armed conflict. Growing socioeconomic and other disparities between the rich and the poor within countries, and between rich and poor nations, also contribute to the likelihood of armed conflict. By addressing these underlying conditions through policies and programs that redistribute wealth within nations and among nations, and by providing financial and technical assistance to less-developed nations, countries like the United States can minimize poverty and other forms of social injustice that lead to armed conflict.

Promoting a culture of peace

Much can be done to promote a culture of peace, in which nonviolent means are utilized to settle conflicts. A culture of peace is based on the values, attitudes, and behaviors that form the deep roots of peace. They are in some ways the opposite of the values, attitudes, and behaviors that reflect and inspire war and violence, but should not be equated with just the absence of war. A culture of peace can exist at the level of the family, workplace, school, community, and nation as well in interna-

tional relations. Health professionals and others can play important roles in encouraging the development of a culture of peace at all these levels.

The Hague Appeal for Peace Civil Society Conference was held in 1999 on the 100th anniversary of the 1899 Hague Peace Conference. The 1899 conference, attended by governmental representatives, was devoted to finding methods for making war more humane. The 1999 conference, attended by one thousand individuals and representatives of civil-society organizations, was devoted to finding methods to prevent war and to establish a "culture of peace." The document adopted at the 1999 conference, the *Hague Appeal for Peace and Justice for the 21st Century*,[25] which has been translated by the United Nations into all its official languages and distributed widely around the world, includes the following 10-point action agenda:

a) Educate for Peace, Human Rights, and Democracy: In order to combat the culture of violence that pervades our society, a worldwide campaign is needed to empower people at all levels with the peacemaking skills of mediation, conflict transformation, consensus-building, and non-violent social change.

b) Counter the Adverse Effects of Globalization: A just global economy should be created, with special emphasis on an international campaign among local, national, international, and intergovernmental organizations promoting respect for labor rights; democratic reform and improved regulation of international financial institutions; accountability of multinational corporations; and cancellation of the crushing debts of the world's poorest countries.

c) Advance the Sustainable and Equitable Use of Environmental Resources: We need to strengthen international environmental law and its implementation; address problems of overconsumption and misallocation of environmental resources and the inequitable allocation of water; support campaigns to save the world's forests and species from environmental degradation; end the military destruction of the environment; and identify alternative approaches to sustainable development.

d) Eradicate Colonialism and Neo-Colonialism: We need to promote efforts of colonized peoples toward the exercise of their right to self-determination; eradicate colonization; end dumping of industrialized countries' toxic materials in developing countries; and close foreign military bases.

e) Eliminate Racial, Ethnic, Religious, and Gender Intolerance: We need to promote efforts to eliminate political manipulation of racial, ethnic, religious, and gender differences for political and economic purposes; include hate crimes in the world's judicial systems; promote education and legislation designed to overcome homophobia; and promote affirmative action until the consequences of past discrimination have been addressed.

f) Promote Gender Justice: We need to promote active participation of women in significant numbers in all decision- and policy-making forums; efforts to recognize and engage the capacities of women as peace-makers; implementation of the Convention on the Elimination of All Forms of Discrimination Against Women; and redefine distorted gender roles that perpetuate violence.

g) Protect and Respect Children and Youth: We need to promote universal adoption and implementation of the Convention on the Rights of the Child, including the elimination of child labor and the use of child soldiers; promote humanitarian assistance and protection to children in situations of armed conflict; rehabilitate and reintegrate children who have been exposed and traumatized by violent conflict; and recognize the role of children and youth as peacemakers by including young people in peace-building.

h) Promote International Democracy and Just Global Governance: We need to

promote reform and democratization of the United Nations; promotion of regional institutions to advance peace through adherence to international law; modification of the weighted voting formulas utilized by the international financial institutions to protect the interests of small nations; recommendations of the Commission on Global Governance, including the participation of civil society in global governance; and reform of the United Nations Security Council to make its composition more representative and its decision-making process more transparent.

i) Proclaim Active Non-Violence: We need to develop models of active non-violence; a campaign to eliminate or reduce violence in the media and in everyday language; and activities surrounding the Decade for a Culture of Peace and Non-Violence for the Children of the World (2001-10).

j) Eliminate Communal Violence at the Local Level: We need to reintegrate into society the young people and some of their elders who have been marginalized, often as a result of limited economic opportunities, and whose marginalization has led them into violent behavior; and promote local peace initiatives, including gun exchanges, peace camps, and conflict resolution training.

Controlling weapons

The other main approach to preventing war is improving control of small arms and indiscriminate weapons of mass destruction.[26]

Small arms and light weapons

Much can be done to improve control over legal small arms to decrease the risk of their misuse and diversion into illegal arms markets. More research needs to be done to assess the effectiveness of various forms of intervention. International agreements, both at the global and regional level, that are designed to prevent or decrease illicit trade in small arms need to be promoted and strengthened. Measures to reduce the proliferation and misuse of small arms include adoption and enforcement of stronger gun-control laws, strengthening of export and import license authorizations, and better recordkeeping on arms production, possession, and transfer. The United Nations Small Arms Action Plan needs to be supported.

Landmines

The 1997 Anti-Personnel Mine Ban Treaty needs to be strengthened with ratification by the United States, Russia, China, and several other nations. In addition, substantially more resources are needed to remove the tens of millions of landmines that are still implanted in many countries. Also, more resources are needed, especially in less-developed countries, to provide medical care and rehabilitation services for the many landmine victims without current access to needed care and services.

Chemical weapons

The CWC, which went into effect in 1997, is the first disarmament agreement negotiated within a multilateral framework that provides for the elimination of an entire category of weapons of mass destruction. It prohibits all development, production,

acquisition, stockpiling, transfer, and use of chemical weapons. By 2002, a total of 132 states parties had ratified or acceded to it. The CWC requires each state party to destroy its chemical weapons and chemical weapons production facilities, and any chemical weapons it may have abandoned on the territory of another state party. The verification provisions of the CWC affect not only the military sector but also the civilian chemical industry worldwide through certain restrictions and obligations regarding the production, processing, and consumption of chemicals that are considered relevant to the objectives of the convention. These provisions are to be verified through a combination of reporting requirements, routine onsite inspection of declared sites, and short-notice challenge inspections. The CWC also contains provisions (a) on assistance in case a state party is attacked or threatened with attack by chemical weapons, and (b) on promotion of the trade in chemicals and related equipment among state parties. The Organization for the Prohibition of Chemical Weapons (OPCW) is mandated to ensure the implementation of the provisions of the CWC and to provide a forum for consultation and cooperation among state parties. U.S. legislation prohibiting work on chemical weapons and their precursors needs to be adopted.[27]

Biological weapons
The BWC was the first multilateral disarmament treaty banning the production and use of an entire category of weapons. By 2002, a total of 144 nations had ratified or acceded to it. It bans the development, production, stockpiling, or acquisition of biological agents or toxins of any type or quantity that do not have protective, medical, or other peaceful purposes, or any weapons or means of delivery for such agents or toxins. Under the treaty, all such material was to have been destroyed within nine months of the BWC's entry into force. The absence of any formal verification regime to monitor compliance has limited the effectiveness of the convention. The United States and other nations need to strengthen the BWC to include a stringent verification protocol by enactment of enabling legislation by all nations, and by suspension of ambiguous "defense" research.[28]

Nuclear weapons
Although there is no comprehensive treaty banning the use or mandating the destruction of nuclear weapons, a series of overlapping incomplete treaties has been negotiated and are in effect. The Partial Test Ban Treaty (PTBT) of 1963 promoted, in part, by public health concerns, banned nuclear tests in the atmosphere, underwater, and in outer space. The expansion of the PTBT, the Comprehensive Nuclear Test Ban Treaty (CTBT), a key step toward nuclear disarmament and preventing proliferation, was opened for signature in 1996 and has not yet entered into effect. It bans nuclear explosions, for either

military or civilian purposes, but does not ban computer simulations and subcritical tests (tests involving chain reactions that do not reach criticality), which some nations rely on to maintain the option of developing new nuclear weapons. As of early 2002, the CTBT had been signed by 165 nations and ratified by 89. Entry into force requires ratification by the forty-four nuclear-capable nations, of which thirty-one had ratified the CTBT by early 2002. The United States has not yet ratified the CTBT.

The Treaty on the Non-Proliferation of Nuclear Weapons (the "Non-Proliferation Treaty," or NPT) was opened for signature in 1968 and entered into force in 1970. By early 2002, a total of 187 states parties (nations) had ratified the treaty. The five nuclear-weapon states recognized under the NPT — China, France, Russia, the United Kingdom, and the United States — are parties to the treaty. The NPT attempts to prevent the spread of nuclear weapons by restricting transfer of certain technologies. It relies on safeguards, such as inspections carried out by the International Atomic Energy Agency (IAEA), which also promotes nuclear energy. In exchange for non-nuclear weapons states' commitment not to develop or otherwise acquire nuclear weapons, the NPT commits the nuclear-weapons states to good-faith negotiations on nuclear disarmament. The ABM Treaty, by limiting defensive systems that would otherwise spur an offensive arms race, has been seen as the foundation for the Strategic Arms Reduction Treaties (START) process. In 2001, President Bush announced that the United States would withdraw from the ABM Treaty within six months and gave formal notice, stating that it "hinders our government's ability to develop ways to protect our people from future terrorist or rogue-state missile attacks." The United States could have helped control nuclear weapons by controlling the transfer of fissile materials, ratifying the Comprehensive Nuclear Test Ban Treaty (CTBT) and working toward the nuclear disarmament required by the Nuclear Non-Proliferation Treaty (NPT). With other nations, it could have adopted a Nuclear Weapons Convention.[29]

Radiologic weapons

An example of the introduction of new weaponry was the use of depleted uranium (DU), a toxic and radioactive material, as a shell casing because of its density and pyrophoric (igniting spontaneously) qualities: DU was used by the United States in Gulf War I and the wars in the Balkans and Afghanistan, and by both the United States and the United Kingdom in Gulf War II. It has been estimated that 320 to 1,000 metric tons of DU remain in Iraq, Kuwait, and Saudi Arabia. Some critics argue that the use of DU constitutes a violation of the Hague Convention (which bans use of "poison or poisoned weapons"), the Geneva Conventions, and the United Nations Charter.[30] In

addition to DU, incendiary weapons similar to napalm were reportedly used against Iraqi troops.[31] The number of military casualties in the attack on Iraq will probably never be known, but it is estimated that between seventy-eight hundred and ninety-six hundred Iraqi civilians were killed.[32]

In addition, to international and national efforts to control specific weapons, strengthening of international organizations, such as the International War Crimes Tribunal and the International Criminal Court, and promoting international cooperation are important. Z

Notes

1. Institute of Medicine, Committee for the Study of Public Health, *The Future of Public Health* (Washington: National Academy of Sciences, 1988), 35-40.
2. Barry S. Levy and Victor W. Sidel, eds., *War and Public Health (Updated Edition)* (Washington: American Public Health Association, 2000).
3. Stockholm International Peace Research Institute, *SIPRI 2003: Armaments, Disarmament and International Security* (New York: Oxford University Press, 2003), 109.
4. Stockholm International Peace Research Institute, *SIPRI 2002: Armaments, Disarmament and International Security* (New York: Oxford University Press, 2002), 63.
5. Les Roberts, Charles Hale, Fethi Belyakdoumi et al., *Mortality in Eastern Democratic Republic of Congo: Results from Eleven Mortality Surveys* (New York: International Rescue Committee, 2001), 14.
6. Richard M. Garfield and Alfred I. Neugut, "The Human Consequences of War," in Levy and Sidel, *War and Public Health,* 33.
7. World Bank, *World Development Report 2000/2001* (New York: Oxford University Press, 2001), 51.
8. Worldwatch Institute, *Vital Signs, 2003: The Trends That Are Shaping Our Future* (New York: W.W. Norton & Company, 2003), 88-89.
9. Giovanna A. Cornia, Julius Court, *Inequality, Growth and Poverty in the Era of Liberalization and Globalization* (Helsinki, Finland: UNU World Institute for Development Economics Research, 2001), 7.
10. Thom Shanker, "U.S. Remains Leader in Global Arms Sales, Report Says," *New York Times*, September 25, 2003.
11. Worldwatch Institute, *Vital Signs, 2003*, 102-03.
12. Barry S. Levy, Gurinder S. Shahi, and Chan Lee, "The Environmental Consequences of War," in Levy and Sidel, *War and Public Health,* 51-62.
13. Victor Sidel and Gurinder Shahi, "The Impact of Military Activities on Development, Environment, and Health," in Gurinder S. Shahi, Barry S. Levy, Alan Binger et al., eds., *International Perspectives on Environment, Development, and Health: Towards a Sustainable World* (New York: Springer, 1997), 283-312.
14. Victor W. Sidel, "The Impact of Military Preparedness and Militarism on Health and the Environment," in J. E. Austin and C. E. Bruch, eds., *The Environmental Consequences of War* (New York: Cambridge University Press, 2000), 426-43.
15. William M. Arkin, "A New Nuclear Age," *Los Angeles Times*, July 6, 2003.
16. "Nuclear Posture Review," January 8, 2002, available at www.globalsecurity.org/wmd/library/policy/dod/npr.htm.
17. Matthew Brzezinski, "The Unmanned Army," *New York Times Magazine*, April 20, 2003, 38-41, 80.
18. Jack Hitt, "Battlefield: Space," *New York Times Magazine*, August 5, 2001, 30-35, 55-56, 62-63.
19. Victor W. Sidel, H. Jack Geiger, and Bernard Lown, "The Medical Consequences

of Thermonuclear War. II. The Physician's Role in the Post-Attack Period," *New England Journal of Medicine* 266(1962): 1137-45.

20. Lachlan Forrow and Victor W. Sidel, "Medicine and Nuclear War: from Hiroshima to Mutual Assured Destruction to Abolition 2000," *JAMA* 280(1998): 456-61.

21. Barry S. Levy and Victor W. Sidel, *Terrorism and Public Health* (New York: Oxford University Press, 2003), 4.

22. Anthony B. Zwi, Suzanne Fustukian, and Dinesh Sethi, "Globalisation, Conflict and the Humanitarian Response," in Kelley Lee, Kent Buse, Suzanne Fustukian, eds., *Health Policy in a Globalizing World* (Cambridge: Cambridge University Press, 2002).

23. Keith Suter, "Globalization: A Long-Term View," *Medicine, Conflict and Survival* 19(2003): 94-106.

24. Neil Arya, "Globalization: The Path to Neo-Liberal Nirvana or Health and Environmental Hell?" *Medicine, Conflict and Survival* 19(2003): 107-20.

25. The Hague Agenda for Peace and Justice for the 21st Century. (New York: Hague Appeal for Peace, 1998) (UNRefA/54/98), available at www.haguepeace.org.

26. Carnegie Commission on Preventing Deadly Conflict, *Preventing Deadly Conflict: Final Report* (New York: Carnegie Corporation, 1997).

27. Merav Datan, "International Control of Chemical Weapons," in Levy and Sidel, *Terrorism and Public Health,* 202.

28. Merav Datan, "International Control of Biological Weapons," in Levy and Sidel, *Terrorism and Public Health,* 180.

29. Merav Datan, "International Control of Nuclear Weapons," in Levy and Sidel, *Terrorism and Public Health,* 226-27.

30. Depleted Uranium Education Project, *Metal of Dishonor: Depleted Uranium* (New York: International Action Center, 1977).

31. James W. Crawley, "Officials Confirm Dropping Firebombs on Iraqi Troops — Results Are 'Remarkably Similar' to Using Napalm," *San Diego Union-Tribune*, August 5, 2003.

32. Medact, *Continuing Collateral Damage: The Health of Environmental Costs of War on Iraq, 2003* (London: Medact, 2003). Available at <http://www.ippnw.org>